SUPREME COURT OF INDIA

G.Sundarrajan

Vs.

Union of India

C.A.No.4440 of 2013

(K.S.Radhakrishnan and Dipak Misra JJ.)

06.05.2013

JUDGMENT

K.S.RADHAKRISHNAN, J.

1. Leave granted.

2. We are in these appeals concerned with an issue of considerable national and international importance, pertaining to the setting up of a nuclear power plant in the South-Eastern tip of India, at Kudankulam in the State of Tamil Nadu. The incidents occurred in Three Miles Island Power Plant USA, Chernobyl, Ukraine, USSR, Fukoshima, Japan, Union Carbide, Bhopal might be haunting the memory of the people living in and around Kudankulam, leading to large-scale agitation and emotional reaction to the setting up of the Nuclear Power Plant (NPP) and its commissioning. The nature of potential adverse effect of ionizing radiation, adds to fears and unrest which might not have even thought of by Enrico Fermi a noble laureate in physics in 1938, who was responsible for the setting up of the first Nuclear reactor in a Doubles quash Court at Slagg Field, at the Chicago University, USA. Since then, it is history, India has now 20 Nuclear Reactors, in place, and the world over about 439, but people still react emotionally, for more reasons than one, when a new one is being established.

3. People's concern was mooted, even in the Constituent Assembly when it deliberated the issue before constituting India into a Sovereign Democratic Republic and adopting and enacting the Constitution of India.

GENERAL

4. The Constituent Assembly discussed the formal legal framework to regulate atomic energy in the year 1948 and the legislation by the name Atomic Energy Act, 1948 (29 of 1948) was enacted. That Act envisaged the constitution of an Atomic Energy Commission (AEC) and a Department of Atomic Energy (DAE) and both were established in the year 1954. The AEC is the apex body of the Central Government for atomic energy that provides direction on policies related to atomic energy. It consists of eminent scientists and technocrats, secretaries to different ministries, senior officials from the office of the Prime Minister. The AEC has to report to the Prime Minister of India on various policies related to atomic energy. DAE deals with the development and implementation of nuclear power and related nuclear fuel cycle activities and research and development activities carried out in various units under it. Baba Atomic Research Centre (BARC), formerly AEE, was also established in the year 1954 and research reactors namely Apsara, Cirus and Dhruva were set up in the year 1956, 1960 and 1985 respectively. The control and development of atomic energy in the country and matters connected therewith were then regulated by Act 29 of 1948.

5. Parliament having taken note of the developments in the field of atomic energy and with a view to implement the future programme of expansion in the field, thought it necessary to have a comprehensive legislation dealing with Atomic Energy, consequently, Act 29 of 1948 was repealed and the Atomic Energy Act, 1962 (33 of 1962) (in short the Act) was enacted which came into force on 29.01.1962. The Act has been enacted to provide for the development, control and use of atomic energy for the welfare of the people of India and for other peaceful purposes. The Central Government, in exercise of the powers conferred under Section 27 of the Act, constituted the Atomic Energy Regulatory Board (AERB) vide notification dated 15.11.1983 to carry out certain regulatory and safety functions envisaged under Sections 16, 17 and 23 of the Act. The AERB have powers to lay down safety standards and frame rules and regulations in regard to the regulatory and safety requirements envisaged under the Act and have to report to AEC. The Act underwent amendment vide amending Acts 59 and 29 in the years 1986 and 1987 respectively. However, the major amendment was of the year 1987, vide Amending Act 29 of 1987, by which the Central Government was empowered to produce and supply electricity from atomic energy. For achieving the envisaged target of nuclear power generation, a nuclear power corporation or a Government company was also decided to be set up which would design, construct and operate nuclear power stations in India. Following that, a separate public

sector company, namely, the Nuclear Power Corporation of India (NPCIL) with a view to design, build and operate nuclear reactors in the country was created in September 1987. NPCIL is a wholly owned by the Government of India undertaking which functions under the administrative control of DAE.

NATIONAL POLICY:

6. The Parliament in unequivocal terms has pronounced its national policy through the Act, that is to develop, control and use of atomic energy for the welfare of the people of India. The Central Government has also been entrusted with the power to provide for the control over radioactive substances or radiation generating plant and to provide for the production and supply of electricity from atomic energy etc. Central Government have also got the power to require any substance which contains uranium, plutonium or any of their isotopes and extract from that any substance which is essential to the atomic energy programme. The Act, though, provides the basic regulatory framework for the regulation of nuclear related activity, we have other related laws which have to be applied and read in tandem like the Factories Act, 1948, the Indian Electricity Act, 2003, the Environment (Protection) Act, 1986, the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control Regulation) Act, 1981, the Water (Prevention and Control of Pollution) Cess Act, 1977, the Indian Explosives Act, 1884, the Disaster Management Act, 2005, the Atomic Energy (Radiation Protection) Rules, 2004, the Industrial Radiography (Radiation Surveillance) Procedure, 1980, the Atomic Energy (Factories) Rules, 1996, the Atomic Energy (Working of Mines, Minerals and Handling of Prescribed Substances) Rules 1984, the Atomic Energy (Safe Disposal of Radioactive Waste) Rules, 1987, the Radiation Surveillance Procedure for Medical Application of Radiation, 1989 and the Atomic Energy (Control and Irradiation of Food) Rules, 1996 and so on.

7. The Central Government, as per the Act, is legally obliged to develop a sound and adequate national policy in regard to atomic power and to coordinate such policy with the Central Electricity Authority (CEA) and the State Electricity Boards (SEBs) constituted under the Act for the generation of electricity in pursuance of such policy and to operate atomic power stations in the manner determined by it in consultation with the Boards or Corporations concerned. Section 22, which deals with the provisions for the generation of electricity, reads as follows:

> "22. Special provision as to electricity.-

1) Notwithstanding anything contained in the Electricity (Supply) Act, 1948 (54 of 1948), the Central Government shall have authority—

(a) to develop a sound and adequate national policy in regard to atomic power, to co- ordinate such policy with the Central Electricity Authority and the State Electricity Boards constituted under sections 3 and 5 respectively of that Act and other similar statutory corporations concerned with the control and utilisation of other power resources, to implement schemes for the generation of 1[either by itself or through any authority or corporation established by it or a Government company,] electricity in pursuance of such policy and to operate atomic power stations in the manner determined by it in consultation with the Boards or Corporations concerned, with whom it shall enter into agreement regarding the supply of electricity so produced;

(b) to fix rates for and regulate the supply of electricity from atomic power stations 2[, either by itself or through any authority or corporation established by it or a Government company, in consultation with] the Central Electricity Authority;

(c) to enter into arrangements with the Electricity Board of the State in which an atomic power station is situated, 1[either by itself or through any authority or corporation established by it or a Government company] for the transmission of electricity to any other State: Provided that in case there is difference of opinion between the Central Government 1[or such authority or corporation or Government company, as the case may be] and any State Electricity Board in regard to the construction of necessary transmission lines, the matter shall be referred to the Central Electricity Authority whose decision shall be binding on the parties concerned.

2) No provision of the Indian Electricity Act, 1910 (9 of 1910), or any rule made thereunder or of any instrument having effect by virtue of such law or rule shall have any effect so far as it is inconsistent with any of the provisions of this Act.

(3) Save as otherwise provided in this Act, the provisions of this Act shall be in addition to, and not in derogation of the Indian Electricity Act, 1910 (9 of 1910), and the Electricity (Supply) Act, 1948 (45 of 1948).”

8. As a sequel to that national policy, the Central Government, with the active cooperation of AEC, BARC, NPCIL, AERB etc., have already set up about twenty operating power reactors in the country with installed nuclear capacity of 4780 MWe, which have been commissioned over the last four decades from the year 1969 to 2011. Seven more units with a capacity of 5300 MWe are under construction (commissioning). The latest one to be commissioned is at Kudankulam in the State of Tamil Nadu. The first nuclear power plant (NPP) in the country Tarapur Atomic Power Station (TAPS) units 1 and 2, based on boiling water reactors (BWR), was supplied by General Electric USA and became operational in the year 1969. The Rajasthan Atomic Power Stations (RAPS) 1 and 2 with two 200 MWe were established in 1970s at Rawatbhata in Rajasthan with the technical cooperation of AECL (Canada). Later, in 1980s two 220 MWe Pressurized Heavy Water Reactors (PHWRs) Madras Atomic Power Station – 1 and 2 were constructed at Kalpakkam in Tamil Nadu. Later, India developed a standardized design of 220 MWe PHWRs. Four reactors of that standardized design were built, two each at Narora in Uttar Pradesh (Narora Atomic Power Station – 1 and 2) and Kakrapar in Gujarat (Kakrapar Atomic Power Project – 1 and 2). Those plants became operational in 1990s. Later eight more units of standardized 220 MWe PHWRs were built, four each at Kaiga in Karnataka (Kaiga Generating Stations units 1-4) and Rawatbhata in Rajasthan (RAPS Units 3-6). India in 1990s undertook the design and development of 540 MWe PHWR. Two reactors based on that design became operational in 2005- 06 at Tarapur. India has also developed 700 MWe design with limited boiling in the coolant channels. The construction of four such units was almost completed at Kakrapar and Rawatbhata sites. Currently, 500 MWe Prototype Fast Breeder Reactor (PFBR) is under construction at Kalpakkam. PFBR is built with the design and technology developed at Indira Gandhi Centre for Atomic Research (IGCAR). Over and above, India has now set up two PHWRs of VVER based NPPs (2 X 1000 MWe) at Kudankulam in Tamil Nadu with the co-operation of Russian Federation which is the subject matter of this litigation.

9. India draws bulk of its electricity, above 64%, from thermal sources, especially coal. Hydro power comes second of 18% and then renewable sources provide small share at about 15%. We are informed that, at present, the share of nuclear energy is hardly three per cent of India's total electricity production, while France accounts for 74.6% as on 2008. NPPs provide about 6% of the world's energy and 13-14% of the world's electricity with U.S., France and Japan together accounting for about 50% of nuclear generated electricity. U.S.A. has 104 nuclear reactors and more than 100,000 MWe of electricity is produced by nuclear generation.

International Atomic Energy Agency (IAEA) has reported that in the year 2007, there were 439 Nuclear Power Reactors in operation in the world operating in thirty one countries. The DAE, it is reported, plans to increase its nuclear energy production to 20000 MWe by 2020 and 63,000 by 2030. The Policy makers consider that the nuclear energy remains as an important element in India's energy mix for sustaining economic growth of natural and domestic use. One of the reasons for preferring nuclear energy as an alternative source of energy is that it is a clean, safe, reliable and competitive energy source which can replace a significant part of the fossil fuels like coal, oil, gas etc. Oil and natural gas resources might exhaust themselves. Coal is also not an effective substitution since forests are also no longer able to satisfy the energy requirements. Major source of electricity generation, about 66%, is still contributed by fossil thermal powers, like coal. To put into practice the national policy, India has already entered into various collaborations with most of the developed countries which have proved expertise and experience in the field of establishment and production of nuclear energy.

10. Economic growth and energy support have to go hand in hand, for the country's development for which India has entered into various collaboration agreements with U.S.A., Canada, Russia etc. and several NPPs have already been set up in the country. Government of India, in implementation of its national policy, had made a joint statement with U.S.A., called Indo-U.S. Joint Statement 2005, for a renewed global civil nuclear energy co-operation. A co-operation agreement called 2007 Co- operation Agreement was also entered into between India and U.S.A. for the peaceful uses of nuclear energy. This was later followed by the Indo- France Joint Statement in September, 2008. A Joint Statement was made in February 2010 with United Kingdom. Above facts would indicate that in order to give effect to the National Policy for development, control and use of atomic energy, India has entered into various bilateral treaties and arrangements with countries which have considerable expertise and experience. For establishing the NPP at Kudankulam, India had entered into an inter-governmental agreement with the erstwhile USSR in November 1988 followed by a supplementary agreement on 21.06.1998 signed by India and Russia which is in tune with India's National Policy.

11. India's National Policy has been clearly and unequivocally expressed by the legislature in the Atomic Energy Act. National and International policy of the country is to develop control and use of atomic energy for the welfare of the people and for other peaceful purposes. NPP has been set up at Kudankulam as part of the national policy which is discernible from the Preamble of the Act and the

provisions contained therein. It is not for Courts to determine whether a particular policy or a particular decision taken in fulfillment of a policy, is fair. Reason is obvious, it is not the province of a court to scan the wisdom or reasonableness of the policy behind the Statute. Lord Macnaughten in Vacher & Sons v. London Society of Compositors, (1913)AC107(118)HL has stated:

> "Some people think the policy of the Act unwise and even dangerous to the community……But a Judicial tribunal has nothing to do with the policy of any Act which it may be called upon to interpret. That may be a matter for private judgment. The duty of the Court, and its only duty is to expand the language of the Act in accordance with the settled rules of construction."

12. In CCSU v. Min. (1984) 3 All ER 935 (954) HL, it was held that it is not for the Courts to determine whether a particular policy or particular decision taken in fulfillment of that policy are fair. They are concerned only with the manner in which those decisions have been taken, if that manner is unfair, the decision will be tainted with that Lord Diplock labels as 'procedural impropriety'.

13. This Court in M.P. Oil Extraction and Anr. v. State of M.P. and Ors., (1997)7SCC 592 held that unless the policy framed is absolutely capricious, unreasonable and arbitrary and based on mere ipse dixit of the executive authority or is invalid in constitutional or statutory mandate, court's interference is not called for. Reference may also be made in the judgment of this Court in M/s. Ugar Sugar Works Ltd. v. Delhi Administration & Ors., (2001) 3 SCC 635; Dhampur Sugar (Kashipur) Ltd. v. State of Uttranchal and Ors. (2007) 8 SCC 418 and Delhi Bar Association v. Union of India and Ors., (2008) 13 SCC 628. We are therefore firmly of the opinion that we cannot sit in judgment over the decision taken by the Government of India, NPCIL etc. for setting up of KKNPP at Kudankulam in view of the Indo-Russia agreement. Courts also cannot stand in the way of the Union of India honouring its Inter-Governmental Agreement entered into between India and Russia.

14. We may, however, focus our attention on various other issues raised in these appeals in the light of the provisions of the Atomic Energy Act, Rules and Regulations framed thereunder, International conventions, covenants entered into by India with other countries, AERB Code of Practices and Safety Guides, Expert's opinion, Environmental and other related laws. Part I of this judgment, we propose to deal with the safety and security of NPP, International Conventions and Treaties, KKNPP Project, NSF and its management and transportation, DGR, Civil

Liabilities, DMA, CSR and other related issues and in Part II, we mainly focus on the environmental issues, CRZ, Desalination Plant, Impact of Radiation on Eco-system, Experts opinions etc.

PART I

15. KKNPP has been set up by NPCIL based on the Indo-Russia Joint Agreement under the guidance and supervision of AEC, BARC, AERB, MoEF, TNPCB, Central and State Governments etc.

ARGUMENTS – FOR AND AGAINST

16. Shri Prashant Bhushan, learned counsel appearing for the appellant in SLP Nos. 27335 of 2012, submitted that having seen the experience at Three Mile Island (USA), Chernobyl in Russia and Fukushina in Japan etc., safety of the people and the environment are of paramount importance and if the units are allowed to be commissioned before making sufficient safeguards on the basis of the recommendations made by the Task Force of NPCIL, it may lead to serious consequences which could not be remedied. Learned counsel submitted unless the seventeen recommendations made by the Task Force appointed by NPCIL are implemented before commissioning the plant, serious consequences may follow. Learned counsel submitted that AERB and NPCIL are legally obliged to implement the recommendations and this Court sitting in this jurisdiction is bound to safeguard the life and property of the people residing in and near Kudakulam which is a fundamental right guaranteed to them under Article 21 of the Constitution of India.

17. Mrs. Nagasaila, learned counsel appearing for the 8th respondent in SLP (C) No. 27813 of 2012, also pointed out that sufficient safeguards have not been taken for the safe disposal of the radioactive waste and no site has so far been identified for the safe handling of radioactive waste, failing which it may cause serious health hazard. Learned counsel also pointed out that even, at the plant site, there is no proper facility for storage of spent fuel and high level radioactive waste. Learned counsel also pointed out that no adequate measures have been taken to safeguard the life and property of the people in case of any potential disaster, in accordance with the Disaster Management Plan.

18. Learned Attorney General appearing for AERB submitted that the plant has been set up after following all the safety standards laid down by AERB. The design

of KKNPP incorporates advance safety features complying with current standards of redundancy, reliability, independence and prevention of common cause failures in its safety system. Further, it was also pointed out that the design takes care of Anticipated Operational Occurrences (AOO), Design Basis Accidents (DBA) and Beyond Design Basis Accidents (BDBA) like Station Black Out (SBO), Anticipated Transients Without Scram (ATWS), Metal Water reaction etc. Further, it was pointed out that the Board of AERB met on 23.3.2011 and took stock of safety and NPPs in the light of Fukushima accident. AERB also constituted a High Level Committee of Specialists to review and recommend safety upgrades as required to handle extreme external events of natural origin. Learned Attorney General also pointed out that KKNPP design also has several Advanced Safety Features, including those for ensuring safety against external events of natural origin and for management of design basis as well as beyond design basis accidents. Further, it was pointed out that, over and above, steps are being taken to implement the 17 recommendations made by the Task Force of NPCIL and that, amongst them, few recommendations have already been implemented.

19. Shri Rohington Nariman, learned Solicitor General of India appearing for NPCIL, submitted that KKNPP is a 3+Generation NPP and its design incorporates advanced safety features complying with current standards of redundancy, reliability, independence and prevention of common cause failures in its safety systems. The design includes provisions for withstanding external events like earthquake, tsunami/storm, tidal waves, cyclones, shock waves, aircraft impact on main buildings and fire. KKNPP also incorporates various additional safety features like Quick Boron Injection System, Passive Heat Removal System, Second Stage Hydro Accumulators, Passive Hydrogen Re-combiners, Annulus Passive Filtering System (Passive System), Core Catcher etc. Details of further safety measure adopted have already been elaborately stated in the counter-affidavit filed by NPCIL on 26.9.2012. Learned Solicitor General submitted that KKNPP is absolutely safe even without the 17 recommendations made out of abundant caution by AERB. Learned Solicitor General submitted that the 17 recommendations of AERB would also be complied with in a phased manner, out of which 7 have already been implemented.

20. Shri Mohan Parasaran, learned Additional Solicitor General of India, appearing on behalf of respondent no. 1, while referring to the affidavit filed by the Union of India, submitted with regard to the process – "Re- processing and Disposal of Spent Fuel" - that most of the spent fuel i.e. 97% is capable of being reused, the remaining 3% of the spent fuel consists of various Fission Products (FPs) and

Minor Actinides (MAs). All MAs have varying half-lives/decay periods, the dominant amongst them have half-lives of the order of 1 lakh 70 thousand years. Each NPP has a water storage pool for storage of spent fuel, namely "Spent Fuel Storage Bay" (SFSB). Those pools are temporary storage facilities for recyclable fuel and are essentially water filled concrete vaults with SS lining, having the arrangement for storing spent fuel in racks. They are designed, constructed and operated as per the AERB Guidelines and requirements. It was also stated that AERB Safety Guide 'Design of fuel handling and storage systems for pressurized heavy water reactors – AERB/SG/D-24" deals with the safety in design of storage of spent fuel. Further, it was also pointed out that the transportation of spent fuel is governed by the Regulations specified by AERB in "Safety Code for the transport of radioactive materials – AERB/SC/TR-1' and international requirements given in IAEA Regulation for safe transport of radioactive material, 2005. Learned Additional Solicitor General also submitted that the Department of Atomic Energy is also aware of the importance of safety and security and takes utmost care to ensure that the management and transport is carried out safely, following the internationally recognized norms and regulations and that the same is done under the supervision of AERB and Government of India.

21. Government of India's decision to establish the NPP at Kudankulam, as already stated, cannot be questioned before this Court being part of a National Policy. Lot of scientific literatures, experts opinions etc. have been produced before us to show its dangers, harm it may cause to human health, environment, marine life and so on not only on the present generation but on future generation as well. Further, it was also pointed out that due to growing nuclear accidents and the resultant ecological and other dangers, many countries have started retreating from their forward nuclear programmes.

22. We have already indicated that these issues are to be addressed to policy makers, not to courts because the destiny of a nation is shaped by the people's representatives and not by a handful of judges, unless there is an attempt to tamper with the fundamental Constitutional principles or basic structure of the Constitution.

23. We are however deeply concerned with the safety and security of the people of this country, its environment, its flora and fauna, its marine life, ecology, bio-diversity and so on which the policy makers cannot be on the guise of national policy, mutilate or rob of, in such an event the courts can unveil the mask and find out the truth for the safety, security and welfare of the people and the mother earth.

Safeguards and Security

24. Safety and security of the people and the nation are of paramount importance when a nuclear plant is being set up and it is vital to have in place all safety standards in which public can have full confidence to safeguard them against risks which they fear and to avoid serious long term or irreversible environmental consequences. It is, therefore, necessary to examine at some length the safety standards already in place to allay the fears expressed at some quarters.

25. Let us first examine whether the project proponent has taken adequate safety requirements in site and off site of the KKNPP and followed the Code of Practices laid down by AERB and nationally and internationally recognized safety methods. Before examining those issues, we have to first examine the role of the AERB in the matter of setting up of nuclear plant and what are the codes and safety guides laid down by the AERB for maintaining high safety standards for setting up and for the functioning of nuclear plants in the country.

AERB Safety Codes

26. AERB, as already indicated, was constituted by the Central Government in exercise of powers conferred under Section 27 of the Act to carry out certain regulatory and safety functions envisaged under Sections 16, 17 and 23 of the Act vide notification dated 15.11.1983. The functions to be discharged by the Board have also been enumerated in the said notification which reads as follows:

> i) Develop Safety Codes, Guides and Standards for siting, design, construction, commissioning, operation, and decommissioning of the different types of plants, keeping in view the international recommendations and local requirements and develop safety policies in both radiation and industrial safety areas.
>
> ii) Ensure compliance by DAE and non-DAE installations of safety codes and standards during construction commissioning stages
>
> iii) Advise AEC/DAE on technical matters that may specifically be referred to it in connection with the siting, design, construction, commissioning, operation, and decommissioning of the plants under DAE.

iv) Review from the safety angle requests for authorizing/commissioning/operation of DAE Projects/plants. Before authorization of commissioning / operation of the plant / project is granted, the AERB will be satisfied by appropriate review of:

a) Final design Analysis Report prepared by the project plant;

b) Commissioning reports and results thereof; and

c) Proposed operating procedures and operational limits and conditions; that the plant/project can be operated without undue risk to the operating personnel and the population. For this purpose, AERB may ask for relevant additional supporting information.

v) Review health and safety aspects of modifications in design/operation involving changes in the technical specification adopted in any of the DAE units.

vi) Review operational experience in the light of the radiological and other safety criteria recommended by the International Commission on Radiological Protection, International Atomic Energy Agency and such other international bodies and adapted to suit Indian conditions, and I thereby evolve major safety policies.

vii) Prescribe acceptable limits of radiation exposure to occupational workers and members of the public and approve acceptable limits of environmental release of radioactive substances. (In the DAE units, the AERB shall also prescribe limits for environmental release of conventional pollutants).

viii) Review the emergency preparedness plans prepared by the different DAE units, similar plans for non-DAE installations and during transport of large radioactive sources (eg. Irradiated fuel kilo/mega curie sources, fissile materials).

ix) Promote research and development efforts for fulfilling the above functions and responsibilities.

x) Review the training programme, qualifications and licensing policies for personnel by the project/plants.

xi) Prescribe the syllabi for training of personnel in safety aspects at all levels.

xii) Enforce rules and regulations promulgated under the Atomic Energy Act, 1962 for radiation safety in the country and under the Factories Act, 1948 for industrial safety in the units under the control of DAE.

xiii) Maintain liaison with statutory bodies in the country as well as abroad regarding safety matters.

xiv) Take such steps as necessary to keep the public informed on major issues of radiological safety significance.

xv) Perform such other functions as may be assigned to it by the Atomic Energy Commission.

xvi) Send reports periodically to Chairman, AEC on safety status including observance of safety regulations and standards and implementation of the recommendations in all DAE and non DAE units. It will also submit an Annual Report of its activities to Chairman, AEC.

27. The notification clearly states that the Board shall be assisted by the DAE SRC and DRP BARC in the performance of its functions at (ii), (iv), (v) and (xii) mentioned above. The AERB has also been entrusted with the powers of the competent authority to enforce rules and regulations framed under the Act for radiation safety in the country. The powers have also been entrusted with the AERB to administer the provisions of the Factories Act 1948, the industrial safety for the units of DAE as per Section 23 of the Act. The AERB under its programme of developing Codes and Safety Guides issued four Codes of practice covering the following topics namely (i) Safety in Nuclear Power Plant Siting; (ii) Safety in Nuclear Power Plant Design; (iii) Safety in Nuclear Power Plant Operation; (iv) Quality Assurance for Safety in Nuclear Power Plants. Those Codes are intended to establish the objectives and to set the minimum requirements that have been fulfilled to provide assurance that nuclear power plants will be sited, designed, constructed and operated without undue risk to personnel, public and environment. The Code of Practice for Nuclear Power Plant Siting provides appropriate criteria

and outlines the procedures to be applied to assess the suitability of a site for the location of nuclear power plant taking into account, the operational requirements and accidental conditions. The same has to be prepared following the criteria laid down by DAE for selection of site and the relevant IAEA documents under the Nuclear Safety Standards (NUSS) programme specially the Code of Practice for Nuclear Power Plant Siting and similar documents from various leading countries. The Code of Practice on Safety in Nuclear Power Plant Siting was issued by the AERB on March 9, 1990. The Code encompasses site-related characteristics, natural events and man-induced events specific to the site which will have a bearing on the safety of the plant and the radiological impact on the environment and population due to the location of NPP at the site. The Code also lays down appropriate criteria and outlines the procedures for assessing the suitability of a site taking into account the operational requirements and accident conditions. The Code also indicates the extent of site-related information required to be obtained and also defines site-related design bases. Certain man-induced events like war, acts of sabotage which can cause large scale damage to the plant safety systems, however, are beyond the scope of 1990 Code, in other words, the Code prescribes minimum requirements in siting considerations for limiting the radiological impact. The main aim is protection of man and his environment. The Code outlined the requirements for limiting doses to man.

28. The AERB in October 1999 issued guidance for the Preparation of Off- Site Emergency Preparedness Plans for Nuclear Installations. This document has been issued as a lead document to facilitate preparation of specific site manuals by the responsible organization for emergency response plans at each site to ensure their preparedness to meet any eventuality due to site emergency in order to mitigate its consequences on the health and safety of site personnel. The document also takes cognizance of an earlier AERB publication on the subject: “Safety Manual on Off-Site Emergency Plan for Nuclear Installations” issued in the year 1988. While drafting this document, reference has been also made to the documents of the IAEA and also the statutory requirements laid down in the Manufacture, Storage and Transport of Hazardous Chemicals Rules, 1989 as well as the amendments incorporated therein subsequently.

29. The purpose of these Safety Guidelines is to lay down the requirements of the Regulatory Body for the operating organization and state public authorities in preparing an emergency response plan for off- site emergency for the nuclear installation. Radiological emergencies at the nuclear installations are mainly categorized as Plant emergency alert; Plant emergency; Site emergency and Off-

site emergency. The operating organization is responsible for handling the first three categories of emergencies, while the off-site emergencies involving radiation fallout in the public domain is handled by the state public authorities with the technical input and guidance from the operating organization and the Regulatory Body. The main objectives of this Safety Guidelines are stated hereunder:

i) To provide detailed guidelines for nuclear installations in the country on the essential components of off-site emergency preparedness and response plans at each installation taking into consideration any ongoing construction activities at the off- site.

ii) To elaborate various aspects of the response plan such as: Emergency Organisation, Emergency Equipment and Facilities needed outside the nuclear installation in order to protect the site personnel from risks of undue radiation exposure.

iii) To advise on other aspects such as: enforcement of off-site emergency plans, conduct of periodic off-site emergency drills to ensure readiness of the nuclear installation for handling off- site emergencies.

iv) To indicate guidelines on off-site related factors, which may influence management of off-site emergencies.

v) To highlight the need for the operating organization/plant management to establish and maintain communication lines between the site, the headquarters of the operating organization, Regulatory Body and the state public authorities for prompt and effective use in times of off-site emergency.

30. The AERB has also issued the document "Preparedness of the Operating Organization for handling Emergencies" at Nuclear Power Plants in March 2000. This document supplemented the Code of Practice on Safety in NPP Operation (AERB/SC/O). The purpose of this document is to prescribe guidelines for the development of a state of preparedness for response to emergencies at nuclear power plants. The main objectives of this safety guide are given as follows:

a) To highlight to plant management the various categories of emergencies that could rise at NPP;

b) To focus on the contents of the emergency manuals in respect of resources and procedures to help respond adequately to emergency situations;

c) To emphasize the responsibilities of plant management regarding personnel, plant and site emergency and responsibilities of the State Government in respect of off-site emergency and need for close liaison between Plant Management and Public Authorities;

d) To bring out the importance of maintaining efficient and effective communication links among Plant Management, Operating Organisation, Responsible Organisation, Regulatory Body, State Authorities and the Department of Atomic Energy Crisis Management Group (DAE-CMG); and

e) To develop the infrastructure including manpower and their training.

31. The AERB issued another safety code in August 2000 on "Regulation of Nuclear and Radiation Facilities". This document has been issued to spell out the minimum safety related requirements/obligations to meet by a nuclear or radiation facility to qualify for the issue of regulatory consent at every stage leading to eventual operation. The Code also elaborates on the regulatory inspection and enforcement to be carried out by the Regulatory Body on such facilities. This document has also been prepared by the AERB from the information contained in the relevant documents issued by IAEA under the NUSS programme especially the Code on "Governmental Organization for Regulation of Nuclear Power Plants" (50-C- G).

The main objectives of the Code are to ensure that:-

a) Only such practices are permitted which are justified in terms of their societal and/or individual benefits,

b) Radiation protection is duly optimized in all nuclear/radiation facilities,

c) Radiation doses to the personnel in these facilities, and to the members of the public in their vicinity, do not exceed the prescribed limits and

d) The potential for accidental exposures from the facilities remains acceptably low.

32. The scope of the Code also covers the various facilities and activities like mining and processing of radioactive ores and minerals; uranium/thorium processing and fuel fabrication plants , heavy water plants, research reactors, experimental reactors and critical assemblies, nuclear power plants, fuel reprocessing plants, radioactive waste management facilities, industrial facilities related to nuclear fuel cycle activities, transport of radioactive materials, medical applications of radiation, industrial and agricultural applications of radiation, research applications of radiation, and all other practices involving the handling of radioactive sources.

33. The AERB also issued another safety guide on October 2002 on "Design of Fuel Handling and Storage Systems for Pressurized Heavy Water Reactors". The Code of Practice on Design for Safety in Pressurized Heavy Water Based Nuclear Power Plants (AERB/SC/D,1989) lays down the minimum requirements for ensuring adequate safety in plant design. The safety code issued in October 2002 is one of a series of guides. The objective of this safety guide is to specify the minimum requirements to be met in the design of fuel handling and storage system in PHWR. It is intended to be used by the designer to ensure safety of plant and personnel by providing adequate measures for prevention of accidents and mitigation of adverse consequences, should an accident occur, in other words, the scope of this guide includes the safety in design of equipment for handling and storage of new fuel, spent fuel and other irradiated core components, which are related to handling of fuel including handling and storage of failed or damaged fuel bundles. The guide also addresses the safety aspects in fuel handling control and instrumentation and auxiliary equipment related to the fuel handling system. Design provisions to facilitate inspection and testing of fuel handling and storage systems are also covered in that guide. The same has been prepared following the safety standards laid down by IAEA. The Code has been prepared by specialists in the field drawn from the AERB, BARC, IGCAR and NPCIL.

34. Various codes and safety standards issued by the AERB, referred to above, mainly deal with siting, design, construction, operation, quality assurance, decommissioning etc. Safety codes and safety standards are formulated on the basis of nationally and internationally accepted safety criteria for design, construction and operation of specific equipment, systems, structures and components of nuclear and radiation facilities. Further, India has also entered into various bilateral treaties and is also a party to various international conventions on nuclear safety, physical protection of nuclear material, nuclear accident,

radiological emergency and so on. India, as already stated, is also governed by the safety and security standards laid down by IAEA. A brief reference to those conventions, treaties and IAEA may be apposite.

INTERNATIONAL CONVENTIONS, BILETERAL TREATIES ETC.:

35. India is not a signatory to the Nuclear Non-Proliferation Treaty (NPT). India is, however, party to various international conventions, such as:

> The Convention on the Physical Protection of Nuclear Material, which was adopted on 26.10.1979 and was signed at Vienna and at New York on 3.3.1980. The Convention makes it legally binding for States parties to protect nuclear facilities and material for peaceful domestic use, storage as well transport. It also provides expanded cooperation between and among States regarding rapid measures to locate and recover stolen or smuggled nuclear material, mitigate any radiological consequences of sabotage and prevent and combat related offences.

36. The Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency was adopted by the General Conference at its special session 24-26.9.1986 and was opened for signature at Vienna on 26.9.1986 and at New York on 6.10.1986.

37. The Convention on Nuclear Safety was adopted on 17.6.1994 by a Diplomatic Conference convened by IAEA at its Headquarters from 14- 17.6.1994. The Convention was opened for signature on 20.9.1994.

38. The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, the first legal instrument to directly address these issues on a global scale, was opened for signature on 29.9.1997 and entered into force on 18.6.2001.

39. The Convention on Early Notification of a Nuclear Accident establishes a notification system for nuclear accidents which have the potential for international trans-boundary release that could be of radiological safety significance for another State. Date of adoption is 26.9.1986.

40. India has also entered into various Bilateral Civil Nuclear Co- operations. India has entered into a cooperation agreement with France for the construction of ERR

Power Plants (10,000 MWe) at Jethapur site in Maharashtra, which also comprises of cooperation in the areas of research, safety and security, waste management, education etc., followed by various other commercial contracts as well. India and Canada have finalized the terms for their nuclear deal paving the way for Canadian firms to export Uranium to India in the year 2010. Discussions are on for safe nuclear cooperation as well with Canada.

41. India has also signed civil nuclear deal with Mongolia for supply of uranium to India. MOUs on the Development of Co-operation on Peaceful Uses of Radioactive Minerals and Nuclear Energy by senior officials of the Department of Atomic Energy of both the countries. India has also entered into agreements with Namibia including one on civil nuclear energy which allows for supply of uranium from Namibia. India-Namibian Agreement for Peaceful Uses of Nuclear Energy allows for supply of uranium for setting up of nuclear reactors. India-Kazakhstan have also signed a pact on nuclear co-operation in April 2011 and agreed to have collaboration in nuclear energy for peaceful purposes. Discussions are on to execute a civil nuclear agreement with Argentina.

42. India-U.S. issued an Inter U.S. Joint Statement at Washington on 18.7.2005 which has located the final broad policy so as to actually facilitate and also outline the broad contours of a legally binding agreement. Some of the policy frameworks relate to preventing WMD Proliferation, goals of prompting nuclear power and achieving nuclear energy, expeditious consideration of fuel steps for safeguarded nuclear reactors etc. Nuclear 2007 – an agreement for co-operation between India and U.S. concerning peaceful uses of nuclear energy (2007 Co-operation Agreement) laid down certain binding obligations between the two countries. Though, India is not a party to any of the Liability Conventions, specifically, IAEA Vienna Convention on Civil Liability for Nuclear Damage, India has enacted the Civil Liability for Nuclear Damage Act, 2010 (Nuclear Liability Act) which aims to provide a civil liability for nuclear damage and prompt compensation to the victims of a nuclear accident through No- Fault Liability to the operators.

International Atomic Energy Agency (IAEA)

43. IAEA is an independent international organization situated in Vienna, Austria is related to the United Nations system, its relationship with the United Nations is regulated by special agreement. The IAEA reports annually to the United Nations General Assembly and when appropriate, to the Security Council regarding non-compliance by States with their safeguards obligations as well as on matters

relating to international peace and security. The IAEA works with its member States and multiple partners worldwide to promote safe, secure and peaceful nuclear technologies. The IAEA has the responsibility to help member States to put in place the necessary infrastructure needed to develop nuclear energy safely, securely and peacefully and it works with member States to coordinate research to design reactors that are economical, safe and proliferation-resistant.

44. The IAEA's object is to maximize the contributions from nuclear technologies to human well being while minimizing their risks. Few facts and trends highlighted in the report prepared by an independent commission at the request of the IAEA in May 2008 highlights the ten key facts and trends which frame the nuclear opportunities and challenges the world now faces. The report highlights that to sustain rapid global economic growth, it is necessary to double the supply of energy and tripling supply of electricity by 2050. Further, it is stated billions of poor people need energy and other life saving and job creating technologies. The report also noticed that energy prices are increasing, a broader reliance on nuclear energy whose prices are much less dependent on its fuel costs conceivably could help to ameliorate those tensions and risks. The report highlights that the world still dependent on burning coal, oil and natural gas for 80% of its energy supply surging energy use causes surging emissions of greenhouse gases disrupting the climate with potentially catastrophic results. Nuclear energy, it is stated, is a readily expandable source of low-carbon baseload electricity and in the future might also help to meet other energy needs such as hydrogen production and water desalination.

45. The IAEA's International Project on Innovative Nuclear Reactor and Fuel Cycles (INPRO) brings many States together to consider approaches to safer, cheaper, more secure and more proliferation-resistant nuclear systems with effective management of nuclear waste. India is in partnership with the IAEA and has incorporated many of its directives in the code of practice framed by the AERB, hence there could be no compromise on safety and security of the NPPs in the country. We have elaborately discussed the Safety and Security Code of Practices laid down by AERB, IAEA and its supports so as to allay the apprehension or fears expressed from various quarters on the safety and security of KKNPP and its effect on human life, property and environment and we notice that adequate and effective protection measures are in place.

46. Parliament, as we have already indicated, is very much concerned with the safety and security of its people and its environment. The Preamble of the Act

pronounces in an eloquent terms that it has been enacted for the development, control and use of atomic energy for the "welfare of the people of India". People's comfort, happiness, prosperity and the economic growth of the nation is always the concern of their representatives in the Parliament. Safety and security of people in that process have to be in the uppermost mind of the legislature. Keeping in mind that concern, special provisions have been incorporated for the safety and security. Reference has already been made to Section 17 of the Act which casts an obligation on the Central Government to ensure proper rules with regard to the safety, which we have already examined at length. We have also examined both nationally as well as internationally accepted guidelines for safety and security of the people of the Nation and notice that those are being followed. In People's Union for Civil Liberties and Another v. Union of India and Others, (2004) 2 SCC 476, the Court held that the Atomic Energy Act deals with a sensitive subject. Statutory scheme contained in the provisions of the Act, the Rules framed thereunder, composition of the AEC and AERB leave no manner of doubt that the effective functions of the nuclear power plants are sensitive in nature. Various Codes of Practice, safety guidelines, extensively discussed above and the decision taken in various international conventions and the guidelines laid down by various international agencies followed by India are meant to protect the life and property of people including the environment, guaranteed under Article 21 of the Constitution of India.

KKNPP Project

47. The Government of India, following its national nuclear policy, decided to set up a NPP in the southern part of the country. DAE, for that purpose constituted a Site Selection Committee (SSC) for selecting a suitable site in the coramandel coast of Tamil Nadu. The Committee, after surveying various sites, selected Kudankulam in the Tirunelveli District of Tamil Nadu as the most suitable place for locating NPP. NPCIL also made a detailed study of the selected site in the light of the Code of Practice framed by AERB regarding safety in NPP Siting. Kudankulam, the site located, is situated on the Shore of Gulf of Mannar near the South-Eastern tip of India in the coastal track at an elevation of +3 to +45m above MSL forming the southern fringe of soil covered plains. Most of the rivers in the area are seasonal and there are no major lakes, dams or ponds existing within 20 km radius around project site. The climate in the area is arid and is similar to other coastal regions. As per IMD Station at Kanyakumari, the wind speed is in the range of 6 to 30 km/hr. The ambient temperature varies in the range of 21°C - 34°C, while the relative humidity ranges from 68% to 80%. Geologically, the site

is made up of the Archean super group of crystalline rocks, sedimentary rocks of Precambrian origin and recent quaternary deposits. The geological profiles studied up to 80m depth indicates that the site comprises of highly metamorphosed rocks with granulated and amphibolites faces of charnokites belonging to the archean super group. NPP site is situated in the South of Pandian movable belt, the metamorphic rocks of which are the foundations of ancient platform.

48. The NPP site is situated in an area with expected earthquake intensity of up to V on the modified intensity scale. The site area falls within the seismic zone II which is a moderately stable area as per Seismic Zoning Map (SZP) of India. The strongest earthquake near this area and within the Indian peninsula was Coimbatore earthquake of February 1900. The epicentre of this earthquake was situated at a radial distance of 300 km from the proposed NPP site. The site of the plant lies in zone II of the SZP of India, where shocks of intensity VI or magnitude 5 can occur. In the region, no shock of magnitude 5 is known to have occurred at less than 100 km distance from the plant site. Within the distance of 300 kms., some 27 earthquakes of intensity IV to VIII or a magnitude ranging between 4 to 5.7 are known to have occurred from 1341 to 1972. A detailed study was also conducted as to whether a site-plant interaction would reduce any radiological risk or others of an unacceptable magnitude. Radiological risk to nuclear plant due to external events should not exceed the range of radiological risk associated with accidents of internal origin and the possible radiological impact of a NPP on the environment should be acceptably low for normal operation and accident conditions and within the stipulated criteria for radiological safety. In evaluating the suitability of a site for locating a NPP, the effect of external events (natural and man-induced) on the plant; effect of plant on environment and population; and implementation of emergency procedures particularly protective counter-measures in the public domain, had to be addressed. SSC study also included the assessment of seismicity, location of faults, geology, foundation conditions, meteorology, potential of flooding (from tsunami, storm surge etc. at coastal sites and from rain, upstream dam break, etc. at inland sites), proximity to airports, military installations, facilities storing explosive and toxic substances etc. The environmental setting comprising of bio-diversity including flora and fauna, marine ecology etc. in the region was also evaluated. SSC had taken care of all those aspects before making its recommendations to the Government. NPCIL, Union of India and other statutory authorities had taken care to follow the practice laid down by AERB on safety in NPP site.

49. KKNPP consists of two VVER-1000 types of units having 1000 MWe rating each. VVER reactors being established at KKNPP belong to the family of Advance Pressurized Water Reactors (PWRs) and presently 439 nuclear reactors are under operation in the world and about 209 of them belong to PWR family, including 55 VVERs. The construction activities had started at the site on 31.3.2002 and two units are being implemented with the technical assistance of Russian Federation as per the Inter Government Agreement (IGA) between India and Russia. As per the agreement, design and supply of major equipments are done by Russian Federation, while construction, erection, commission and operation are being carried out by NPCIL. KKNPP is of a most modern design. PWR cooled and moderated by light, water and its core containing the nuclear fuel is located inside a pressure vessel. There are no pressurizing tubes, no graphite moderator and no boiling of water in the core. The reactor is located inside an air tight primary containment building which is surrounded by secondary containment. There are other design features in NPP which assure adequate core cooling under deconceivable off-normal conditions including total loss of electric power. Even for the hypothetical case of a core melt down, a core catcher is provided where the molten core is retained and cooled and the double containment ensures that there will be no significant radiological impact in the public domain. NPP, has been divided into three stages, first stage comprises of building PHWR's and using natural uranium. The second stage includes setting up 'Fast Breeder Reactor's backed by reprocessing plants and plutonium based fuel fabrication plants. The third stage is based on the thorium-uranium-233 cycle.

Nuclear Spent Fuel (NSF)

50. Radioactive wastes is generated during operation, maintenance and decommissioning of nuclear and radiation facilities. The waste generated needs to be managed in a safe manner to ensure protection of human health and the environment from the undue effects of ionizing radiation now and in future without imposing undue burden on future generations. Radioactive waste is to be managed in a manner that ensures compliance with the fundamental principles of radiation protection and environmental safety. Monitoring and surveillance programme helps to ensure radiation protection of the occupational workers, public and the environment. The Central Government in exercise of powers conferred by sub-section (1) read with clause (i) of sub-section (2) of Section 30 and clause (b) of sub-section (1) of Section 17 of the Act framed the Atomic Energy (Safe Disposal of Radioactive Wastes) Rules 1987, which provide requirements for the safe disposal of radioactive wastes in the country. The disposal has to be done in

accordance with terms and conditions specified in the authorization which include the process materials and equipments generating radioactive wastes in the installations, environment around the installation, safety devices and other equipments in the installation for conditioning, treatment and disposal of radioactive wastes, estimates of annual releases, discharges and leakages in normal conditions and its anticipated environment impact, potential accidents, design features and monitoring equipment to control the release of radio activity and procedure to be followed in the safe collection of radioactive wastes. The Hazardous Waste Management and Handling Rules 1989 provide that these rules will not apply to radioactive wastes (Rule 2e). The radioactive wastes are covered under the provisions of Atomic Energy Act, 1962 and rules framed thereunder. Further, Rules 2(b) and 3 of Manufacture, Storage and Import of Hazardous Chemical Rules 1989 under the Environmental (Protection) Act, 1986 has notified AERB as the authority to enforce directions and procedures as per the Atomic Energy Act, 1962 with respect to radioactive materials.

51. The AERB issued a code "Management of Radioactive Waste" on June 22, 2007, the objective of that is to establish the requirements, which shall be fulfilled for the safe management of solid, liquid and gaseous radioactive waste from generation through disposal. The code specifies basic requirements for the safe management of radioactive waste from nuclear and radiation facilities such as mining and milling and processing of uranium and thorium ores; fuel fabrication; nuclear power plants; research/experimental reactors; fuel reprocessing; medical, industrial, agriculture and research facilities using radionuclides; and other facilities handling radioactive materials. The safety code also deals with the requirements for radiation protection aspects in design, construction and operation of waste management facilities and the responsibilities of different agencies involved. The code is also applicable to the management of radioactive waste containing chemically and biologically hazardous substances even though other specific requirements may additionally be applicable as per relevant standards. The specific requirements pertaining to management of radioactive waste from application of sealed/unsealed sources, mining and milling of uranium/thorium ores and site remediation are covered in Appendices A, B and C respectively of that code. Appendix D provides requirements of transportation/transfer for radioactive solid and liquid waste. Annexures I and II of the Code deals with the principles, philosophy and basic steps of management of radioactive waste. The code specifically states that deep geological disposal methodology of high level radioactive solid waste requiring long time isolation of thousands of years from biosphere is presently under development. Para 2.2 of the code specifically refers

to Protection of Human Health and the Environment. The said para is of considerable importance, hence given below in detail:

> "2.2 Protection of Human Health and the Environment
>
> 2.2.1 Radioactive waste shall be managed within the dose constraints and other safety requirements prescribed by the regulatory body.
>
> 2.2.2 Radiation exposure to workers and the public from radioactive waste shall be kept as low as reasonably achievable, social and economic factors being taken into account. A well-defined radiation protection programme shall be established for radioactive waste management. Approved procedures and control measures shall be used for radiation protection.
>
> 2.2.3 Radiation exposures to workers and the members of public shall not exceed the limits prescribed by the regulatory body.
>
> 2.3 Effluent Release Criteria, Control and Monitoring
>
> 2.3.1 Radioactive waste shall be characterized, monitored segregated, treated and conditioned, as necessary, prior to disposal.
>
> 2.3.2 Radioactive discharges to the environment (aquatic, atmospheric and terrestrial route) shall not exceed the limits prescribed by the regulatory body.
>
> 2.3.3 At a given site, facility specific disposal schemes for radioactive solid, liquid and gaseous wastes to the environment shall be established and got approved by the regulatory body prior to the commencement of operation.
>
> 2.3.4 The facility shall assess the adequacy of controls on release of activity into the environment and demonstrate compliance with the regulatory requirements. The facility shall obtain approval from the regulatory body, if the discharges exceed the authorized limits.
>
> 2.3.5 For all non-radiological releases/discharges, the relevant clearances shall be obtained from respective statutory agencies and stipulations therein shall be complied with.

2.4 Environment Monitoring and Surveillance

2.4.1 The facility shall implement approved environmental monitoring and surveillance programme for the identified exposure pathways to meet the requirements set by the regulatory body. The programme shall include pre-operational, operational, closure, and post-closure monitoring and surveillance.

2.4.2 The facility shall implement approved quality assurance programme on sampling, monitoring and analysis to ensure a reliable data.

2.5 Safety Assessment

2.5.1 A Safety assessment report shall be prepared for waste management facilities including waste disposal facilities/repositories to demonstrate compliance with the regulatory requirements.

2.5.2 Assessments shall be made to identify various possible sequences of internal or external events that may lead to incidents or accidents and to evaluate their impact on workers, the public and the environment.

2.5.3 Assessments shall be made to identify, describe and analyse the potential non-radiological impact of releases from radioactive waste management facilities on human beings, the environment (soil, water, air, and non-human biota) and natural resources.

2.5.4 The safety assessments of the long-term performance of a waste disposal facility/repository shall take account of the radionuclide content, physic-chemical characteristics of the waste/waste form and the effectiveness of engineered / natural barriers."

52. Responsibilities associated with the Radioactive Waste Management are also dealt with in the Code. Safe management of radioactive waste requires clear allocation of responsibilities of the agencies involved which may involve transfer of the responsibility of the management of radioactive waste from one facility to another or to a different agency other than the one responsible for the operation of the facility. The continuity of responsibility required to be ensured through regulatory control by a licence or a sequence of licences according to the procedures laid down by the regulatory body. The code provides that the waste

generator / manager or both shall be responsible for identifying on an appropriate time-scale, a destination for the waste in accordance with the regulatory requirements and for seeking any necessary authorization. The waste generator/manager shall dispose of the radioactive waste in an approved manner or transfer it in an authorized manner to another waste manager for processing, storage or disposal. Para 3.2.6 of the code specifically refers to the publication of the waste generator/manager.

53. Para 4 of the code specifically deals with predisposal measures to be taken by Predisposal Management of Radioactive Waste. Para 5 of the code deals with near surface disposal of solid waste which says that solid waste disposal deals with emplacement of waste in approved facilities. Further, it also stated that disposal may be in a Near Surface Disposal facility (NSDF) or a Deep Geological Repository (DGR). The design, construction, operation and post-operation of the NSDF has to meet necessary safety requirements. Appendix II of the code deals with the principles and philosophy of radioactive waste management.

NSF AND MANAGEMENT OF WASTE:

54. Serious apprehension has been voiced by the appellants that huge amounts of radioactive waste are generated with the use of nuclear energy which, unless handled, treated, transported, stored and disposed off safely without any leaks, can cause serious contamination of land, water, food, air and the ecosystems. Further, it was also the case of the appellants that during the nuclear fission process, nuclear plants convert almost all of their fuel into radioactive waste with little reduction in mass and even re-processing creates its own high-level waste. Further, it was also pointed out that many of the repositories designed to be temporary ones are turning into permanent ones and the interim storage is by its very nature storage for a small period, which can never be a substitute for permanent geologic repository. Appellants further pointed out that, as on today, no sustainable solution has been found or implemented worldwide so as to do away with nuclear waste. Appellants also submitted that, under the earlier Agreement of 1988 with Russia, nuclear waste had to be shifted back to Russia and the site clearance and environment clearance are based on this factor. However, a new agreement was signed in the year 1998 under which nuclear waste had to be retained and stored in India.

55. Management of radioactive waste includes all types of radioactive waste generated from the entire fuel cycle right from mining uranium fuel fabrication through reactor operations, and whole re-processing spent fuel. A coherent,

comprehensive and consistent set of principles by way of IAEA document titled "Storage and Disposal of Spent Fuel and High Level Radioactive Waste", AERB Safety Guide to AERB Management of Radioactive Waste Code 2007 are already in place. Further, the 15 member team in its report, in December 2011, has to say this on spent fuel management.

> "6.3 Spent Fuel Management:
>
> First and foremost it should be remembered that Spent Fuel is not a waste in the Indian Nuclear Programme. A closed fuel cycle is followed, where the valuable fissile materials like Uranium and Plutonium which are present in the Spent Fuel are recovered to reuse.
>
> 1) Spent fuel is therefore an asset that needs to be preserved. At Kudankulam, Spent Fuel from the Reactors will be carefully stored in Storage Pools, which are always filled with pure, demineralised borated water which is constantly recirculated. These pools are high integrity concrete pools which are additionally lined with stainless steel sheets, to ensure effective containment for extended periods of time. The Department of Atomic Energy has long experience and expertise of a high order in the safe management of Spent Fuel.
>
> 2) There is no plan to do the reprocessing of the Spent Fuel at Kudankulam site. As such the storage of Spent Fuel at Kudankulam is to be considered only as an interim measure till they are transported to a Reprocessing Facility.
>
> 3) Adequate Technology and years of experience are available with Department of Atomic Energy for transporting Spent Fuel from one site to another through both Railways and by roadways, in a safe manner without any public hazard. This is done as per stipulations of AERB, regarding Transport Regulations that govern safety."

56. NPCIL, MoEF and the Department of Atomic Energy (DAE) have filed a detailed counter affidavit on the various issues posed by the appellants. NPCIL, DAE submitted that even though, as per the earlier agreement of 1988 between India and USSR, spent fuel had to be transported to Russia, in a subsequent agreement in 1998 signed between two countries, Government of India had insisted that it should be allowed to retain the spend fuel in India, so that it could

be recycled and used. Spent fuel, it is stated, discharged from the reactor contains materials suitable for recycling and hence could be reused to produce electricity. The spent fuel contains minerals, both uranium and plutonium, which constitutes about 96% and 1% of the spent fuel respectively. The remaining 3% contains other components that are normally not recyclable. Further, it has also been pointed out that KKNPP had adequate provisions for safe storage of spent fuel. In KKNPP, Spent Fuel Pool (SFP) is located inside the primary containment, adjacent to reactor cavity which has the capacity to store fuel equivalent to 7 years of full power operation of the plant plus one full core load. AERB Safety Guide "Design of fuel handling and storage systems for pressurized heavy water reactors – AERB/SG/D-24" deals with the safety in design of storage of spent fuel. NPCIL submitted that they are scrupulously following the safety guidelines issued by AERB. However, the Nuclear Recycle Group of the BARC has got an overall view of radioactive waste management in India and has developed certain guidelines for management of nuclear fuel.

NSF WASTE - TRANSPORTATION:

57. The SNF from NPPs, after an adequate storage period, is transported to reprocessing facilities located within the country, following the International and AERB guidelines and standards. NPCIL, DAE and MoEF have maintained the stand that they are aware of the importance of safety and security and have taken care to ensure that the management and transportation of spent fuel is carried out safely following the international recognized norms and regulations and the same is being done under the observation of AERB and the Government of India.

58. SNF poses a dangerous, long-term health and environmental risk and it is often said that it remains dangerous "for time spans seemingly beyond human comprehension." Issue, needless to say, is of great concern. It may be noted, twenty years of work on establishing a 'geologic repository' at Yucca Mountain, USA, had to be abandoned when the Department of Energy decided to withdraw its licence application for the facility. NPCIL has maintained SNF is being kept at the site for re-processing or transported to a permanent repository and how save it is, if not properly kept, as we have already indicated, can cause serious health hazard not only to the present generation but to the future generation as well, to whom we owe a responsibility.

59. India has got the capability for re-processing SNF, experts say. Currently, India has three operating processing plants based on solvent extraction process – one

each at Trombay, Tarapur and Kalpakkam. Trombay plant reprocesses the spent fuel from research reactors with the capacity of 60 tons per year. The plants at Tarapur and Kalpakkan process off-site fuels from PHWRs with operating capacity of 100 tons per year each. Additional re-processing facilities are being set up with the active participation of the Indian industry to accelerate the programme.

60. We notice that with the limited resources of uranium available in India, the indigenous achievable NP is estimated to be 10,000 MWe by PHWR, without re-processing. With the help of re-processing, the achievable capacity could go up to 63000 MWe imported LWR and recycling LWR fuel to 275,000 MWe, by 2052. NPCIL has, therefore, taken up the stand that re- processing of spent fuel is the key to the country's three stage nuclear power programme. 97% of the SNF is capable of being re-used, but what has to be done with regard to the remaining 3% SNF, is a moot question, since it is not re-useable, which consists of various fission products and minor actinides. This 3% waste comprises of minor actinides which have a long half-life of lakhs of years. Experts, however, say that if the minor actinides are "partitioned" or removed, the rest of the waste is dominated by FP's having a half-life of about 30 years and so in 10 half-lives (300 years) will have negligible activity and the partitioned minor actinides can then be "transmuted" or burnt by inducing fission in Fast Breeder Reactors or in Accelerator Driven Systems (ADS).

> Facts mentioned above would indicate that certain percentage of SNF will have long life of lakhs of years and will have some impact on the environment, but how to contain that?
>
> The Supreme Court of Pakistan in Human Rights (Environmental Pollution in Baluchistan) PLD 1994 SC 102, took suo moto notice of a paper report of dumping nuclear waste along the Coast of the province of Baluchistan. The Court directed that provisional Government to investigate the claim and ruled that such dumping of Nuclear Waste is in violation of the fundamental rights to life enshrined in Article 9 of the Constitution.

61. We may, in this connection, refer to the judgment of the US Court of Appeals in State of New York, ETAL v. NRC and USA dated 8.6.2012. In that case, the Court was dealing with the issue regarding temporary storage and permanent disposal of nuclear waste. The Court held that the Nuclear Regulatory Commission's evaluation of the risks of spent nuclear fuel is deficient in two ways: First, in concluding that permanent storage will be available "when necessary," the

Commission did not calculate the environmental effects of failing to secure permanent storage – a possibility that cannot be ignored. Second, in determining that spent fuel can safely be stored on site at nuclear plants for sixty years after the expiration of a plant's license, the Commission failed to property examine future dangers and key consequences.

62. We notice that the above decision would not directly apply to the facts of the present case. United States is following "open fuel cycle" process where spent fuel is not reprocessed, but disposed of treating the same as waste but, in India, we follow "close fuel cycle" process, where reprocessing of SNF to obtain uranium and plutonium is an essential step.

63. AERB, way back in 1989, had recommended to have an Away from Rector Storage (AFR) facility at KKNPP for prolonged storage of SNF while granting siting clearance. Design-Safety aspects of AFR, it is stated, would be reviewed by AERB, one such facility is already available at Tarapur, where it is reported that there has been no adverse impact on the environment issue of such storage. AERB, in subsequent reviews, made recommendations with respect to AFR facilities. In ACPSR 126th Meeting held on 15/16.9.2011, the issue related to AFR was reviewed and it was recommended that AFR should be finalized well before 5 years of operation.

DEEP GEOLOGICAL REPOSITORY (DGR):

64. Permanent DGR, India may require, after a few decades, states NPCIL. Research and development work, we are informed, are in progress over three decades in the field of in-situ experiments, natural barrier characterisation, numerical modelling, conceptual design and natural analogue of waste forms and repository processes. Keeping in line with the international developments, initial focus of work in 80's centred mainly on setting up of generic Underground Research Laboratory (URL), in one of the abandoned mines in India and resulted in the development of an underground chamber in Kolar goldmine located in South India. Current efforts within the Indian geological repository programme are directed towards granite based URL. The experts feel that setting up of a DGR is not much of a technological challenge, but as is the case internationally everywhere, the issue is more of a socio-political issue.

65. We are of the view that these issues have to be dealt with by the Experts in the field, evidently, without much delay. The AERB Safety Code on "Management of

Redioactive Waste" of 2007 does not deal with the requirements for DGR. The problem of this nature is being faced by all the nuclear plant operating countries, including India. Research is on to handle SNF in DGR which, in the near future, let us hope, would be a reality, but that shall not deter us in holding up of such a project which has been established at KKNPP in implementation of the India's Nuclear Policy.

66. We may, however, caution that it is of utmost importance that the Union of India, NPCIL etc. should find out a place for a permanent DGR. Storing of SNF at NPP site will, in the long run, poses a dangerous, long term health and environmental risk. NPCIL and the Union of India is bound to look at the probabilities of potentially harmful events and the consequences in future. Noticeably, NPCIL does not seem to have a long term plan, other than, stating and hoping that in the near future, it would establishes a DGR. The Atomic Energy Act, especially Section 17, envisages present and future safety of our NPPs and the lives and environment around. NPCIL and the Union of India must have a hard look at the environmental consequences of its action of setting up of NPPs, hence a permanent DGR is of utmost importance, which they should plan now.

Radioactive material

67. We are all exposed to the naturally occurring radiation in our daily lives. Cosmic radiation from outside the solar system is also common phenomenon. Earth's crust is radioactive, so also above the earth's surface where we fly by aeroplane, we also get doses of radiation. Medical diagnostic treatment such as X-Ray, CT-Scan, angiography, angioplasty also radiates radioactive dose. However, the development of nuclear reactors which, for the first time, made possible the production of radioisotopes of many different elements, expanded the field of radioactive materials. Production and use of it, therefore, is bound to create a little bit of marginal radiation which seldom can be prevented. The Atomic Energy (Radiation Protection) Rules, (Radio Protection Rules now) were initially framed and revised in 2004. According to the Rules no person could handle radioactive material or operate any radiation generating equipment except in accordance with the terms and conditions of a licence. The Atomic Energy (Control of Irradiation of Food) Rules, 1990 (revised in 1996) seeks to regulate the irradiation of foods in the country. Provisions of the Act, statutory rules and regulations, various codes, safety standards etc. issued by the AERB buttressed by the technical assistance provided by IAEA, NEA, The World Association of Nuclear Operations (WANO) etc. are being followed in India in respect of 20 operating power reactors which are

existing in this country. Safeguarding the nuclear plants, radioactive materials and ensuring its physical security have therefore become a central part of nuclear law. Risks arising from NPP, do affect not merely the country which choose to use that technology but can have catastrophic consequences to the neighboring countries as well. Non-proliferation, disarmament and peaceful use are stated to be the three pillars of all the international conventions. Nuclear technologies and techniques, it is well accepted, can offer vital benefits for improving human-well being, like health care, radio-therapy, food security, agricultural advantages to the present and generation.

68. The Prime Minister of India, as already indicated, ordered a fresh review of all safety of NPPs, on 11.3.2011, immediately after the accident at Fukushima NPP, Japan with respect to external events. The Prime Minister of India had emphasized that the safety of nuclear power plants was a matter of highest priority for the Government and called for safety audits of all the NPPs. NPCIL, the operating agency, constituted separate task forces to review safety of NPPs depending on types of reactor designs and their vintages in India. NPCIL constituted broad categories of Indian NPPs to make an assessment of:

- Boiling Water Reactors (BWR) (TAPS 1&2).

- Pressurized Heavy Water Reactors (PHWRs) at RAPS 1&2

- PHWRs at MAPS 1&2

- Standard PHWRs from NAPS onwards

69. The Task Forces reviewed safety of the NPPs with a postulated scenario of non-availability of off-site and on-site electric power and water supply sources. The reports of the task forces are summarized in a document titled “Safety Evaluation of Indian NPPs Post Fukushima Incident” to provide an integrated assessment of strength of Indian NPPs to withstand extreme external events. Report was submitted by the end of March 2011. Over and above, two more task forces were constituted for VVERs one of which was for the VVER, Presssurised Water Reactors (PWR), under construction at KKNPP, and another for 700 MWe PHWRs. NPCIL also constituted task forces on safety evaluation of the systems of KKNPP Post Fukushima which gave its interim report on 11.05.2011. The task force found that KKNPP had already incorporated all safety standards, including passive systems to ensure reactor shutdown.

70. The AERB, in pursuance of the direction of Prime Minister, constituted a high level committee (AERBSC-EE) to review safety of NPPs against external events of natural origin (post Fukushima accident) with national level experts in the areas of (i) design, safety analysis and NPP operation and (ii) external events in the field of seismology, hydrology and earthquake engineering to carry out a comprehensive review of capability of NPPs to deal with external events within and beyond design basis. The committee constituted specialist working groups and they reviewed the following major areas:

- External events in relation to the safety of NPPs

- Safety of electrical, control and instrumentation systems against external events

- Safety of NPPs under prolonged Station Black Out (SBO) and loss of Ultimate Heat Sink

- Safety of spent fuel storage facilities at NPPs against external events

- Severe Accident Management provisions and guidelines (SAMG)

AERBSC-EE submitted its report on 31.08.2011. The AERB has also taken cognizance of self-assessment carried out by the NPCIL and the site specific focused regulatory inspections. The NPCIL and AERB report indicate that the overall assessment of safety of Indian NPPs following Fukushima Nuclear accident and the actions taken/planned based on the lessons learnt are enumerated in the report. The following aspects were addressed :

i) External Events

ii) Design

iii) Severe Accident Management and Recovery (Onsite)

iv) National Organisations

v) Emergency Preparedness and Response and Post-Accident Management (Offiste)

vi) International Cooperation

71. The Government of India also submitted a National report in May 2012 on the actions taken for Indian NPPs, subsequent to Fukushima Nuclear Accident to the Convention on Nuclear Safety in the Second Extraordinary Meeting of contracting parties, held in August 2012 at Vienna.

72. The expert committee of AERB, LWR in its final report dated 31.8.2011 gave 17 safety measures by way of abundant caution. We have directed NPCIL to file a status report with respect to the completion date of implementation of all the 17 recommendations made by AERB in Annexure-A of the Post Fukushima AERB Recommendations. A comparative chart giving the status and implementation of Post Fukushima AERB Recommendations has been filed as Annexure-A by NPCIL in its affidavit dated 3.12.2012, which will indicate that twelve recommendations have already been complied with, except the following:

|Sr. |Recommendations |Status |Completion | |No. | | |Schedule | |3. |Mobile self-powered |Two fire tenders with |April 2013 | | |pumping equipment for |diesel operated pump is | | | |emergency use. |available at site. | | | | |To augment the capacity, | | | | |two additional fire | | | | |tenders are being | | | | |procured and made | | | | |available. Chassis has | | | | |been procured and | | | | |fabrication of the fire | | | | |tender is in progress. | | |4. |Facility for monitoring|Present design of KKNPP |April 2013 | | |safety parameters using|envisages 24 hour battery| | | |portable power packs. |bank for monitoring | | | | |parameters and 2 hour | | | | |battery bank for valve | | | | |operation during an event| | | |of station blackout. | | | |In order to extent the | | | | |duration of the | | | | |monitoring for not less | | | | |than 7 days, portable DG | | | | |sets will be connected to| | | |the instruments for | | | | |monitoring safety | | | | |parameters. One portable| | | |DG set is readily | | | | |available for use at | | | | |site. | | | | |Portable measuring | | | | |devices are also | | | | |available at site for | | | | |local monitoring. | | |6. |Primary Containment to |Based on design margins |Long Term. | | |be assessed for |available, it has been |Under progress. | | |Ultimate Load Bearing |assessed that for primary| | | |Capacity (ULBC). |containment, Ultimate | | | |Load Baring Capacity | | | |(ULBC) is at least 1.5 | | | | |times Design Basis | | | | |Accident (DBA) value. | | | | |Detailed analysis for | | | | |Ultimate Load Bearing | | | | |Capacity (ULBC) will be | | | | |carried out | | | | |progressively. | | |8. |Ensuring that highly |The required analysis |Long term. | | |active water used for |covering dose

estimation,|Under progress. | | |cooling the core |equipment qualification | | | |catcher vessel under |assessment of containing | | | |Beyond Design basis |pressure is being carried| | |Accident (BDBA) is |out. | | | |contained inside the | | | | |primary containment. | | | |12. |Adequacy of |All the important |April 2013 | | |instrumentation for |parameters of the reactor|(Adequacy of | | |monitoring plant status|such as neutron flux, |instrumentation | | |during Design basis |pressure above the core, |ensured. | | |Accident (BDBA) |containment pressure, |Provision to | | | |Hydrogen concentration, |extend power | | | |reactor coolant level, |supply to these | | | |radiation levels in |instruments will| | |containment, coolant |be implemented | | | |temperatures in hot and |under item 4 | | | |cold legs, level of fuel |above.) | | | |pool, and accumulators | | | | |etc. will be monitored | | | | |during Design basis | | | | |Accident (BDBA). | | | | |Please refer item – 4 | | | | |also. | | |17. |Provision of additional|One portable DG set is |April 2013. | | |backup power supply |readily available for use| | | |sources for performing |at site. | | | |essential safety |Another mobile Diesel | | | |functions, like air |Generator (DG) set is | | | |cooled Diesel Generator|being made available for | | | |(DG) located at a high |redundancy. | | | |elevation, should be | | | | |considered. | | |

73. We are convinced that KKNPP design incorporates advanced safety features complying with the current standards of redundancy, reliability, independence and prevention of common cause failures in its safety systems. Design also takes care of Anticipated Operational Occurrences (AOO), Design Basis Accidents (DBA) and Beyond Design Basis Accidents (BDBA) like Station Black Out (SBO), Anticipated Transients Without Scram (ATWS), Metal Water reaction in the water core and provision of core catcher to take care of core degradation. The design also includes the provisions for withstanding external events like earthquake, tsunami/storm, tidal waves, cyclones, shock waves, aircraft impact on main buildings and fire. The 17 recommendations were made after Fukushima accident the cause of which is natural phenomenon. The facts would indicate that Tsunami-genic zone along East Coast of India is more than 1300 km away from the nearest NPP site (Madras/Kalpakkam) and about 1000 km. away from Kudakulam. The possibility of hitting tsunami at Kudakulam, as the one that hit Fukushima, seems to be very remote.

Response to People’s Resistance:

74. The Government of India, in order to allay various apprehensions raised by the people’s movement against the production of nuclear energy as well as against

commissioning of KKNPP, constituted a 15 Member Expert Group to provide clarifications on the issue raised by the agitators by interacting with the forum provided by State Government comprising of 2 State Government nominees and 4 representatives of the people. Public hearing was held and views and suggestions made for and against the project were heard. The Committee specifically examined the safety features of KKNPP in the wake of the accidents occurred at TMI, Chernobyl, Fukushima etc.

75. The radiation around the NPP and impact on the public health were also effectively addressed. The reactor design and safety of the plant was also examined. Principles and Practices taken for radioactive waste and spent fuel management were also examined. Ecological effects of the project in question on marine ecology and fish protection, impact on land, agriculture, livestock, and food, impact on flora and fauna were also examined. The effect of a possible, though remote, impact of earthquake and Tsunami was also examined. The committee concluded as follows:

> "Conclusions:
>
> EG observes that KKNPP is designed and engineered to the state of art of nuclear reactors in line with the current international safety requirements and principles. KK site related aspects such as seismic, tsunami, tropical storms are taken into consideration at design stage. More than 20 VVER-1000 are operating in Russian Federation and in other countries. While finalizing the contract for KKNPP, additional safety features were specified which have been incorporated and their functionality is being established during commissioning. The radiological releases during the plant operation are expected to be well below prescribed limits. This fact is borne out by the experience from operating NPPs in India and abroad. Based on the national and international studies and experience, such radiological releases have no adverse effects on public health, environment and plant personnel. Safety of KKNPP was examined in relation to the TMI, Chernobyl and Fukushima accidents. It is seen that based on the advanced design safety features, safe grade level and high elevation of safety related equipment and the fact that all key operating personnel are graduate engineers who also receive intensive training, it is not conceivable that any accident of these types can take place at KKNPP.

EG also notes that clearances for various stages of the project are given by the Atomic Energy Regulatory Board after an elaborate and exhaustive safety review at each stage. Similarly, other statutory bodies have also conducted detailed and in depth reviews before according clearances pertaining to areas relevant to their purview. This clearly indicates that all applicable safety aspects of the project have been subjected to careful scrutiny by the concerned statutory bodies in the country.

In particular, safety of KKNPP has been thoroughly evaluated against external events of natural origin viz., earthquakes and possible flooding of the site from cyclonic storms and tsunamis. It is seen that the seismic design of its SSCs and location of safety related components provide high level of safety against such events. Possibility of volcanic eruptions in the vicinity of the site has also been examined and no active volcanism has been identified. The magnitude of any possible tsunami that can be generated from submarine landslides in the Gulf of Mannar has been found to be much smaller than tsunamis that may get generated from the submarine active seismic faults, which has already been taken into consideration.

In view of the above, the EG would like to conclude that the fears of the local population are unfounded and design of KKNPP meets the current safety standards."

76. The Committee prepared a detailed report in December 2011. The report was later presented to Tamil Nadu Government nominees and people representatives. The Expert Group submitted another supplementary report dated 31.02.2012.

77. The Government of Tamil Nadu also appointed an Expert Committee headed by Former President of the AEC along with three other experts. The Committee submitted its report after assessing that the project has a unique passive safety feature which provides cooling to the nuclear fuel without the need for operator action or power supply, namely a Passive Heat Removal System, which is a novel safety feature. In addition to the various reports mentioned herein before, the Russian Nuclear Safety Authority also known as GosAtomNadzor (GAN) reviewed and cleared the Safety Analysis Report of KKNPP Units 1 and 2, which forms the basis of the licensing safety review.

CIVIL LIABILITY FOR NUCLEAR DAMAGE:

78. Developing modern sources for energy through NPPs carry the problem of potential damage, which might flow from a nuclear catastrophe. Several Nuclear Energy Generating countries have adopted their own Legislation on the issue of Civil and Criminal Liability. The U.S. Price-Anderson Act, 1957, the German Atomic Energy Act (1959), the Swiss Federal Law on the Exploitation of Nuclear Energy for Peaceful Purposes and Protection from Radiation (1959) and the Japanese Law on the Compensation of Nuclear Damage (1961) are some of them. Few of such legislations followed the basic principle of imposing legal liability on a strict liability basis on the operator of a nuclear installation coupled with the limitation on liability.

79. Currently, there are two main conventions on third-party liability in the field of nuclear energy. The first is the Paris Convention of 1960, which was supplemented by the Brussels Supplementary Convention Act, 1963. IAEA's Vienna Convention on Civil Liability for Nuclear Damage, 1963 is yet another convention. India's Civil Liability for Nuclear Damage Act, 2010 or the Nuclear Liability Act mainly rests on the above Conventions, though India is not a signatory to those conventions. India's Nuclear Liability Act aims to provide a civil liability for nuclear damage and prompt compensation to victims of a nuclear incident through a No Fault Liability to the operator, appointment of Claims Commissioner, establishment of Nuclear Damage Claims Commission, Nuclear Liability Fund and other matters connected therewith. The constitutional validity of the said Act is under challenge before this Court in Writ Petition (Civil) No. 464 of 2011. Various prayers have been made in the above mentioned writ petition, but this Court issued the notice only with regard to the prayer clause no. (e), i.e. to declare the act as unconstitutional and void ab initio.

80. NPCIL had undertaken the task of constructing the two IGW reactors of VVER-1000 Model in collaboration with Atomstroyexport, a wholly owned Russian Government Company. Safety features of the NPP as well the quality requirements for the plant equipment are part of the detailed specifications agreed between the vendor and the purchaser, and as per the Quality Assurance Plan. NPCIL, AERB also should ensure that there can be no compromise on the quality of plant equipment, components and other systems.

81. The India's Nuclear Liability Act states that the liability of the operator to the tune of Rs.1500 crores and the maximum liability to rupee equivalent of 300 millions SDR's, though the Act, speaks of no fault liability. It is unnecessary to

examine the scope of various provisions contained in the Act, for our purpose, especially when the constitutional validity of the Act is under challenge.

82. We may, in this connection, point out that the constitutional validity of the Price-Anderson Act, 1957 of U.S. which was challenged in the year 1978 before the U.S. Supreme Court in Duke Power Company v. Carolina Environmental Study Group 438 US 59(1978). It was urged before the U.S. Supreme Court that the Act did not ensure adequate compensation for victims of accidents and it violated Equal Protection Clause of the 14th Amendment by treating the nuclear accidents differently from other accidents etc. The U.S. Supreme Court upheld the validity of the Act holding that it was lawful, in that there was adequate justification for treating nuclear accidents different to other claims; that Act provides a reasonably just substitute for the common law or state tort law remedies it replaces and that it cannot be said that the Act encouraged irresponsibility in the matter of safety and environmental protection.

83. Strict Liability Principle has been examined by this Court in the environmental point of view in several judgments. In M. C. Mehta v. Union of India AIR 1987 SC 1086 (Oleum Gas Leakage case), this Court held that the industries which are engaged in hazardous or inherently dangerous activity, possess serious threat to health and safety of persons and have an absolute and non-delegable duty to ensure that no harm is caused to the life and safety of the people. In Indian Council for Enviro-Legal Action v. Union of India (1996) 3 SCC 212, this Court held that once the activity carried on in hazardous or inherently dangerous, the person carrying on such activity is liable to make good losses caused to any other person by his activity, irrespective of the fact that he took reasonable care while carrying on his activity. In Vellore Citizens Welfare Forum v. Union of India (1996) 5 SCC 647, this Court held that once the activity carried on is hazardous or potential hazardous, the person carrying on such activity is liable to make good the loss caused to any other person by his activity, irrespective of the fact that he took reasonable care. The absolute liability extends not only to compensate the victims of pollution, but also the cost of restoring environmental degradation. In Vellore Citizens Welfare Forum (supra), this Court reiterated the "polluter pays principles". It is unnecessary to multiply the authorities on the principle of strict liability, precautionary principle, polluter pays etc., which find their expression in Articles 21, 47, 48-A, 51-A(g) of the Constitution of India.

84. We have examined the above principles only to highlight the importance of the Act and the steps taken for its effective implementation. People in this country

have not forgotten the incidents which had happened in the Union Carbide Pesticides Plant in Bhopal in the night of 24.12.1984. This Court in Union Carbide Corporation v. Union of India (1989) 2 SCC 40, based on an earlier settlement, directed the Union Carbide to pay US $ 470 million to the Union of India in full and final settlement of all claims, rights and liabilities related to and arising out of Bhopal Gas Tragedy. Following that, it was ordered that all civil proceedings arising out of Bhopal Gas Disaster, shall stand concluded in terms of the settlement and all criminal proceedings related to and arising out of the disaster shall stand quashed, wherever they were pending. Later, this Court modified that order upholding the settlement except the condition of quashing criminal charges in Union Carbide Corporation v. Union of India AIR 1992 SC 248.

85. Considering India's population density and our National Policy for setting up various NPPs in the country, safety and security of the plants are of extreme importance, lest a nuclear accident can cause immense damage both in terms of human life as well as environmental destruction. Provisions have also to be made for remedying or compensating environmental damage caused by the accidents, without merely limiting it to personal injury and damage to property.

DISASTER MANAGEMENT PLAN:

86. Disaster Management Plan (DMP) is of paramount importance, since we are dealing with a substance which has huge potential of causing immense damage to human beings and to the environment, which may cross over generations after generations.

87. After the accidents in Three Mile Island, Chernobyl and Fukoshima, there has been an uproar all over the world including India for adopting sufficient safety measures for handling nuclear/radiological emergencies which may likely to occur in various NPPs situated in the country. Any radiation incident resulting in or having a potential to result in exposure and/or contamination in excess of the respective permissible limits can lead to a nuclear/radiological emergency. Situations are, of course, not bound to occur quite often, but one must be prepared to face nuclear/radiological emergencies because of high population density in a country like India. Nuclear/radiological emergencies can occur due to factors beyond the control of the operating agencies, for example, human error, system failure, sabotage, earthquake, cyclone, flood etc. Noticing the above factors, the Central Government decided to enact a law on Disaster Management to provide for requisite institutional mechanisms for drawing up and monitoring the

implementation of the disaster management plans, ensuring measure by various wings of Government for prevention and mitigating affects of disasters and for undertaking a holistic, coordinated and prompt response to any disaster situation.

88. The Parliament enacted the Disaster Management Act, 2005 (DM Act), following that, the National Disaster Management Authority (NDMA) was constituted with the Prime Minister as the Chairperson. Similar authorities have been created in various States with their Chief Ministers as the Chairpersons. NDMA has assumed the responsibility of strengthening the existing nuclear/radiological emergency management framework by involving all stake holders in a holistic approach through a series of mutually interactive, reciprocal and supplementary actions to be taken on the basis of a common thread – the National Guidelines. Following that, NDMA, after conducting a detailed discussion with all the stake holders, issued the National Disaster Management Guidelines, 2009, which has the concurrence of the DAE, AREB. The guidelines recommended a series of actions on the part of various stake holders at different levels of administration that would (i) mitigate the accident at source; (ii) prevent deterministic health effects in individuals and limit the probability of stochastic effects in the population; (iii) provide first aid and treatment of injuries; (iv) reduce the psychological impact on the population; and (v) protect the environment and property. The guidelines have been prepared to provide direction to the central Ministries/departments, State Governments and local authorities for preparing detailed action plans to ensure inbuilt capabilities to handle nuclear and radiological emergencies as part of an all-hazard Disaster Management plan in the public domain.

89. The National Guidelines consist of 10 chapters. Chapter 1 deals with the introduction which provides a brief of all possible scenarios of nuclear and radiological emergencies. These emergencies have been broadly classified into the following five categories:

> i) An accident taking place in any nuclear facility of the nuclear fuel cycle including the nuclear reactor, or in a facility using radioactive sources, leading to a large-scale release of radioactivity in the environment.
>
> ii) A ‘criticality’ accident in a nuclear fuel cycle facility where an uncontrolled nuclear chain reaction takes place inadvertently, leading to bursts of neutrons and gamma radiations.

iii) An accident during the transportation of radioactive material.

iv) The malevolent use of radioactive material as a Radiological Dispersal Device by terrorists for dispersing radioactive material in the environment.

v) A large-scale nuclear disaster, resulting from a nuclear weapon attack (as had happened at Hiroshima and Nagasaki) which would lead to mass casualties and destruction of large areas and property.

90. Chapter 2 deals with the Approach to Nuclear and Radiological Emergency Management, which spells out a four-pronged strategy to be adopted for a holistic management of nuclear/radiological emergencies. Chapter 3 deals with the Present Status and Situation Analysis, which highlights some of the technical and administrative issues yet to be addressed in a holistic approach, besides analysing the present status. Chapter 4 deals with the Prevention of Nuclear/Radiological Emergencies, which enumerates how nuclear and radiological emergencies are prevented in nuclear facilities by adopting the defence-in-depth approach, where the safety systems are inbuilt with adequate redundancy and diverse working principles. Chapter 5 of the Guidelines deals with the Mitigation of Nuclear/Radiological Emergencies, which explains the various engineered safety features and accident management procedures that are in place in a nuclear plant as accident mitigation measures for minimising the impact of a nuclear emergency by keeping the radioactivity release in the environment to levels as low as possible. Chapter 6 deals with the Preparedness for Nuclear/Radiological Emergencies and covers various aspects of preparedness. Chapter 7 deals with the Capacity Development for Nuclear/Radiological Emergencies and deals with the capacity development for coping with nuclear/radiological emergency situations. Chapter 8 deals with the Response to Nuclear/Radiological Emergencies and describes the action to be taken in nuclear/radiological emergencies. Chapter 9 deals with the Implementation of the Guidelines which spells out the preparation of action plans by various levels of stakeholders. Such plans should indicate the detailed work plan and milestones with recommended time-frame and suitable indicators to enable monitoring and review of the actual progress made. Chapter 10 deals with the Summary of Action Points and sums up the major recommendations that have been made in the text of the National Guidelines.

91. NDMA, established under Section 3 of the DM Act, is responsible for each of the three phases of disaster management continuum with six major responsibilities, namely, pre-disaster (prevention, mitigation and preparedness), during disaster

(rescue and relief) and post-disaster (rehabilitation and reconstruction) scenarios. NDMA will be assisted by the National Executive Committee, which is the executive arm of NDMA. The National Crisis Management Committee/National Executive Committee has to take on relief operations on a war footing. The District Management Authorities of the States/Union Territories will be responsible for implementing the nuclear/radiological disaster risk management programmes in their respective areas and each State has to develop a detailed micro- level action plan in a mutually interactive and supplementary mode with its district level plans.

92. DAE, as a nodal agency, has to provide the necessary technical inputs to the national or local authorities for responding to any nuclear or radiological emergency in the public domain. In the event of a nuclear/radiological emergency in the public domain, the basic regulatory framework for safety of all activities related to the atomic energy programme and the use of ionising radiation in India is derived from the Atomic Energy Act, 1962 (AE Act). Para 3.6 of the Guidelines dealing with Public Awareness is of some importance and the same is extracted hereunder for our easy reference:

> "3.6 Public Awareness:
>
> Public awareness plays a key role in the emergency preparedness and response plans for any type of emergency/disaster where the participation/role of the public is of prime importance. The fact that one cannot see, feel or smell the presence of radiation, coupled with a general lack of credible and authentic information to the public at large about radiation and radiation emergencies and the wide publicity given to any nuclear/radiation-related incident, has resulted in several erroneous perceptions about nuclear technology. Not surprisingly, most people perceive that any small nuclear/radiation- related incident will lead to a situation like Hiroshima or Nagasaki, or the Chernobyl accident.
>
> To educate the people about the beneficial aspects of nuclear radiation and to remove their misgivings about it, the authorities of nuclear fuel cycle facilities in general, and that of nuclear power stations in particular, are actively involved in carrying out regular public awareness programmes for people living in the vicinity of these facilities. People are invited and taken on guided tours of the nuclear power stations, made conversant with the basics of radiation protection, safety limits, safety practices, and the dos and don'ts during a nuclear emergency. The station authorities also make visits

to the surrounding villages and population centres to create awareness of the same. Good coordination is also maintained with the district officials. Prior to any off-site emergency exercise, awareness programmes are specially conducted for the public officials, making them conversant with their responsibilities during any off-site emergency."

93. NPCIL and the State of Tamil Nadu should take adequate steps to educate the public of the need for generation of power through NPP, since it is part of India's National Policy and also how to deal with nuclear/radiological emergencies. Para 3.9.1 of the Guidelines specifically refers to Education and Knowledge Management, which reads as follows:

"3.9 Institutions for Education, Knowledge Management, Public Awareness and Training:

3.9.1 Education and Knowledge Management:

At present, practically no education is imparted at any level on nuclear/radiological emergencies in the national educational system. It goes against one of the basic concepts of good emergency response, which envisages that the culture of preparedness has to be imbibed right from childhood in all sections of the society. The basics of radiation, radioactivity and the use of nuclear radiation in day-to- day life (with its beneficial aspects) should be taught in schools and colleges. Once people are sensitised about this subject, it will help in removing prejudices/misconceptions of the general public about nuclear radiation/programmes and they will treat a nuclear/radiological emergency like any other type of natural or man- made emergency."

94. The necessity for Enhancing Public Awareness about Nuclear/Radiation Hazards has also been dealt with in para 3.9.2, which reads as follows: "3.9.2 Enhancing Public Awareness about Nuclear/Radiation Hazards:

In general, there is very limited public awareness about radiation emergencies. Even the intelligentsia have misconceptions about nuclear energy in general. Ever since the reactor accidents at Three Mile Island and Chernobyl, any news of a clear/radiological emergency has always been of great interest that generates misconceptions in the minds of the public. The sensationalisation of such news by the media has also erroneously caused a

perception that any radiation or nuclear emergency will result in cancer or death. Such lack of public awareness is a major constraint in handling and objectively responding to these emergencies. To overcome this, sincere and concerted efforts are needed to create awareness amongst the general public with the target audience of school and college students, teachers, technocrats and government officials. The fear in the minds of the public that even a small accident in nuclear facilities will lead to a situation like Hiroshima/Nagasaki, can be removed only through proper awareness generation and training programmes (Appendix 1)."

95. The necessity to accord proper training to the personnel involved in the management of radiation emergencies, which includes education of senior public functionaries like the district or state-level officials who would manage a radiation emergency as well as the first responders, needs special emphasis. This would also include RSOs, civil defence personnel and home guards, police and fire and emergency services personnel and medical professionals. The guidelines also highlight the necessity of a proper network of roads and transport system. An off-site emergency situation, the emergency response plans envisage evacuation of the public from the affected zone which requires well-defined routes and evacuation strategies. The availability of both adequate transport and good roads, which would provide the evacuation routes, is of paramount importance. Further, certain radiation emergency scenarios envisage a sheltering requirement for a large number of people. Normally, community centres, schools, colleges, religious places, marriage halls, etc. are chosen for this purpose. SDMAs/DDMAs should identify those places during a non-emergency period, with assistance from DAE/DRDO.

96. It is also highly necessary to identify alternate sources of food, water and hygiene facilities. Because of the assembly of a large number of persons at the emergency shelters, poor hygiene facilities may lead to the spread of diseases, including epidemics. In addition to providing good hygiene facilities, good medical care with adequate stock of medicines, should be made available in all areas of possible nuclear emergencies/disasters.

97. Major highlights indicated in para 3.20 of the Guidelines are of prime importance. Para 3.20 is extracted hereunder for easy reference: "3.20 Highlights:

Some of the highlights of this chapter are given below:

i) In the event of any nuclear/radiological emergency in the public domain, CMG is immediately activated and it coordinates with the local authority in the affected area and all the concerned authorities at the centre (NCMC/NEC/NDMA) to ensure that the necessary technical/administrative inputs are available to respond to the nuclear/radiological emergency.

ii) The AERB, which oversees nuclear and radiological safety in the country, has been playing a very crucial role in the prevention of nuclear/radiological accidents by ensuring that proper safety design features and operating procedures in all nuclear and radiation facilities are in place. The AERB has the power to not only licence the operation of a facility but also to order the partial or full shutdown of any facility that violates its guidelines.

iii) As per statutory requirements, the local district administration is responsible for drawing up and rehearsing the off-site emergency plan in coordination with the facility operator.

iv) It is also mandatory for the power plant operators to periodically rehearse various emergency preparedness plans by way of exercises, and based on the feedback and experience, take corrective measures. As the first stage of the trigger mechanism, CMG, DAE and the resource agencies are alerted even when a plant or site emergency exercise is conducted.

v) The basic training for NDRF teams, 'first responders' and TOT is being imparted by BARC in addition to training of QRTs of the paramilitary forces and defence CBRN officers.

vi) Emergency preparedness exists at all nuclear and radiation facilities to respond to any on-site or off-site emergency in their areas. A network of 18 units of ERCs has been established by BARC to handle radiological emergencies arising from a transport accident or the movement/handling of 'orphan sources' or any malevolent act like the explosion of an RDD, RED or IND at any time or anywhere in the country.

vii) The fact that one cannot see, feel or smell the presence of radiation, coupled with a general lack of credible and authentic information to the public at large about radiation and radiation emergencies and the wide publicity given to any nuclear/radiation related incident, has resulted in several erroneous perceptions about nuclear radiation/technology. Not

surprisingly, most people perceive that any small nuclear/radiation related incident will lead to a situation like Hiroshima/Nagasaki or the Chernobyl accident.

To remove such misgivings, the authorities of nuclear fuel cycle facilities in general, and that of nuclear power stations in particular, are actively involved in carrying out regular public awareness programmes for people living in the vicinity of these facilities.

viii) The AERB, the national regulatory authority, has been regulating the nuclear and radiation facilities in the country very effectively and has, over the years, issued a large number of codes, standards and guides.

ix) In the event of the private sector getting involved in the nuclear power programme, it might be required for the regulatory authority to ensure that the necessary knowledge base does exist in the concerned private industry for building and operating the nuclear facility as per the stipulated safety standards of the AERB.

x) In case of a nuclear/radiological emergency, the rescue and relief measures will be highly demanding in terms of availability of adequate trained manpower as well as advanced instruments/equipment. In this case, the nature of relief measures would be different in many ways from those carried out in natural disasters like fire, floods, earthquakes, etc. (where there is very little detrimental effect to the health of the personnel involved in the relief work). In a nuclear emergency/disaster, however, the persons carrying out the relief work are also likely to be exposed to both high doses of radiation and/or high levels of contamination which, if not controlled, may affect their health including their potential to carry out the relief work effectively.

xi) Several major metros and other vulnerable locations will need to have ERCs established in their areas. Local civil defence, police, fire brigade, hospitals and other agencies also need to develop liaison with these ERCs.

xii) Facilities using radioactive sources need to strengthen their physical protection systems along with proper inventory and control procedures of the radiation sources.

xiii) In the current security threat scenario, there is a need for enhancing the security of the sources at radiation facilities and during their transportation, to ensure that they do not go ‘out of control’ by any deliberate acts of theft and/or sabotage and become a potential radiation hazard to the public.

xiv) In the context of large-scale radiation disasters, the involvement of civil defence personnel and home guards is usually considered highly desirable.

xv) Because of their preoccupation in defending the country from the enemy, the armed forces are normally not always available to respond to a nuclear disaster scenario. However, for any major nuclear accident where the situation is beyond the coping capability of the civil administration, the services of the armed forces may be called for to take over several critical operations related to response (i.e., rescue and relief), rehabilitation (i.e., evacuation and sheltering) and reconstruction activities, including the immediate restoration of essential infrastructures like communication, electrical power, transportation, etc. Civil-military coordination will be developed for such purposes so that specially trained and rehearsed teams of the Army can be inducted to assist the civil administration, as and when called for and are available.

xvi) To start with, the SDMAs, SECs and DDMAs concerned will aim to cover all cities with a population of 20 lakh or more, that may be affected by a major nuclear/radiological emergency in respect of the preparedness for response to a nuclear/radiological emergency. This cover will be progressively extended to other cities.

xvii) Presently, there is no network of hospitals in the country which can handle radiation induced injuries on a large scale. The establishment of such a network is essential for handling nuclear emergencies/disasters. This will also include the establishment of a nationwide capability for utilisation of the services of a large number of RSOs for managing both RDD-related scenarios and largescale nuclear disasters on priority. There will also be a dedicated and reliable communication facility among hospitals so that, whenever required, they can pool their resources.

xviii) There can always be a possibility of some radioactive sources going ‘out of control’ in some country and from there, entering into our country inadvertently or deliberately. Such unnoticed entry has the potential of the

end products of steel mills being contaminated or, in the worst scenario, the source being used in an RDD. Hence the strengthening of border controls will need to be addressed on priority by MHA.

xix) In an off-site emergency situation in a nuclear facility, emergency response plans envisage the evacuation of the public from the affected zone. This requires well-defined routes and evacuation strategies, taking into account the topology of the site. Problems related to the availability of well-defined routes, transport facilities, food, drinking water, shelters, etc. also need to be addressed by the concerned DDMAs/SDMAs as part of the preparedness/response programme in an all-hazards approach.

xx) In the emerging security threat scenario, there is a possibility of 'orphan' sources (stolen or misplaced sources that may go out of regulatory control of the AERB) falling into the wrong hands and being used for malevolent purposes through an RDD (also called a 'dirty bomb').

At present, there is no mobile monitoring system available with law and order authorities which can warn them of any significant/abnormal rise in background radiation levels in the public domain. The establishment/strengthening of monitoring and detection systems of such sources on priority is considered highly desirable, to detect any unauthorised presence or movement of radioactive material in the public domain.

xxi) With the increasing incidences of terrorists activities and impending threat of RDD, it is imperative that the police, which in all probability will be the first to reach the site of an explosion, should have some simple portable monitoring instruments (at each police station within the areas with radiological threat perception) which will warn them as they approach the radiation source (from, say, a blast of RDD).

xxii) The values of the radiation dose levels at which intervention is required for various actions (like sheltering, iodine prophylaxis, evacuation, etc.) and the action levels that will be needed to control the consumption of contaminated food items in the affected areas are presently not available either for any RDD or nuclear emergency/disaster and are needed to be generated because these are essential in respect of both (i) the members of the relief and rescue teams and (ii) the public.

xxiii) The lack of public awareness is a major constraint in handling and objectively responding to nuclear and radiological emergencies. Further, presently there is no mechanism for maintaining a knowledge base or case studies in the public domain on the events of previous emergencies and their consequences. As a result, the lessons that should have been learnt from the handling of those emergencies have been lost sight of. To overcome this, sincere and concerted efforts are needed to create awareness amongst the general public with the target audience of school and college students, teachers, technocrats and government officials."

98. 2009 Guidelines issued by AERB are very exhaustive which have to be implemented and attended to forthwith. AERB, in the Code of Practice on Safety in NPP Siting, also has dealt with the term "Exclusion Zone". Para 5.5.3 and 5.5.4 are relevant and extracted below:

"5.5.3 An exclusion area of appropriate size (at least 1.5 km radius from the reactor centre) shall be established around the reactor and entry to this is to be restricted to authorised personnel only.

5.5.4 A sterilised area up to 5 km around the plant shall be established by administrative measures where the growth of population will be restricted for effective implementation of emergency measures. National growth, however, is allowed in this zone."

99. Facts presented indicate that there is no population in the "Exclusion Zone" of KKNPP. "Exclusion Zone" is under the exclusive control of the plant operator NPCIL, guarded by CISF, where no public habitation is permitted. The property wall at a distance of 2 km from the reactor buildings existing at KKNPP, which encloses the exclusion zone, and no people reside permanently inside the property wall. A sterilised area around the exclusion area covering an area of up to 5 km radius from the plant has also been established. As per AERB Citing Code, the desirable population within the sterilised zone is about 20000. As per the documents available, 3 villages are within SZ of KKNPP, namely, Kudankulam, Vijayapathi (Idinthikarai) and Irrukkandurai. As per 2001 census, the population residing with SZ consisting of these three villages is approximately 23960, which has been taken care of while preparation of the Emergency Preparedness Plan (EPP) of KKNPP.

100. NPCIL, after due concurrence with AERB, as already indicated, has prepared the Emergency Preparedness Plan Vol. V for off-site emergency at KKNPP. The EPP has listed the composition of Off-Site Emergency Response Co-ordination Committee (OERCC) comprising of 14 disrict administration officials for implementing counter measures in public domain in case of an emergency. The District Collector, Tirunelveli is the Off-Site Emergency Director and the members are District Revenue Office, Site Director, KKNPP, Superintendent of Police, District Forest Officer, Joint Director (Fisheries), Deputy Controller (Civil Defence), Divisional Fire Officer, Executive Engineer (Irrigation), Joint Director (Agriculture), Deputy Director (Animal Husbandry), District Supply Officer, Regional Transport Officer, Deputy Director (Health Services). The overall responsibility of OERCC and individual responsibilities of the members o the Committee have been chartered in the Emergency Preparedness Plan for effective implementation of counter measures. Eleven Emergency response teams such as warning and advise Team, Emergency Response Teams, Traffic Control Team, Prophylactics Distribution Team, Evacuation Advice Team, Convoy Team, Decontamination Team, Rallying Post Team, Patrolling Team, Information Team and Services Support Team have also been formed and are in place as well.

EMERGENCY EXERCISE – ON AND OFF-SITE

101. KKNPP site comprises of two units along with their auxiliary facilities. In the Plant or the Site, an unplanned event at a particular unit may result in an emergency situation which may affect either the offending unit alone (Plant Emergency) or the other facilities as well within the site Exclusion Zone of the KKNPP (Site Emergency). Site emergency may result in off-site emergency which may affect the public personnel living beyond 1.6 km radius of the plant boundary. NPCIL, therefore, prepared an Emergency Preparedness Plan for KKNPP. Vol. 1 contains the on-site emergency plan and Vol. 2 contains the off-site emergency plan. The off-site emergency preparedness procedures was issued in July 2010 after incorporating the comments and instructions made by NPSD and AERB. Final revised plain was incorporated on recommendations made by OPSD and SARCOP. We have gone through the Emergency Preparedness Plan Vol. II (off-site Emergency Plan) which is very comprehensive and deals with almost all eventualities.

102. The Off-Site Emergency Exercise was carried out as per the requirements of AERB Safety Guide on Consenting Process for NPPs. Off- Site Emergency Exercise is required to be carried out once in two years and that NPCIL and State

Authorities would conduct such exercises in other nearby villages frequently. Such mock-drills are conducted to educate the public not to scare them away, but make them understand that the Project is part of the National Policy, participatory in nature, and hence we cannot remain as a nuclear isolated Nation. We have to find out a substitute for other sources of energy. Such exercise was carried out annually to assess whether plant management and the local authorities, including the communication and infrastructure facilities, are geared up for tackling with a real emergency situation, in case it arises.

103. We heard Shri Rakesh Diwedi, learned senior counsel appearing for the State of Tamil Nadu, who gave an overall view of the steps taken by the State Government and the District Collector, Tiruvelveli for implementing the Neighbourhood Development Scheme relating to housing, steps taken for off-site emergencies, awareness programme, other infrastructural facilities. We have also gone through the detailed affidavit filed by the District Collector, Tirunelveli District on December 2012 and noticed the steps taken by the District Administration and the State to meet the Off- Site emergencies, awreness programmes and the other steps taken to provide infrastructural facilities like up-gradation of Primary Health Centres, opening of New Primary Health Centres, setting up of Desalinate place at Uvari, solar energy lighting system etc.

CORPORATE SOCIAL RESPONSIBILITY (CSR):

104. Sustainable Development and CSR are inseparable twins, integrated into the principles of Inter and Intra-Generational Equity, not merely human-centric, but eco-centric. CSR is much more when the Project proponent sets up NPPs, thermal power plants, since every step taken for generation of energy from such hazardous substances, is bound to have some impact on human beings and environment, even though it is marginal. The Department of Public Enterprises (DPE), recently, issued a Comprehensive Guidelines on CSR for Central Public Sector Enterprises, which includes NPCIL, to create, through the Board Resolution, a CSR budget as a specific percentage of net profit of the previous year. CSR is envisaged as a commitment to meet its social obligations by playing an active role to improve the quality of life to the communities and stake-holders on a sustainable basis, preferably, in the project area where it is operating. CSR strategy has to be put in practice in line with the millennium development goals as lodged by United Nations and adopted by the Government of India in the 11th Five Year Plan i.e. 2007-2012, which could cover the areas of education, health, drinking water/sanitation, environment, solar lighting system, infrastructure for backward

areas, community development and social empowerment, promotion of sports and traditional forms of arts and culture, generation of employment opportunities and livelihood to be a part of the National/Local initiatives to provide reliefs/rehabilitation in terms of natural disaster, calamities etc.

105. NPCIL has allocated funds for providing health, education, infrastructural development under CSR at Kudankulam. The allocation and utilization of funds by NPCIL during the last three years and the current year are enumerated below:

|Financial Year |Funds Allocated |Funds Utilized | | |(rupees in lakhs) |(rupees in lakhs) | |2009-10 |14.50 |14.47 | |2010-11 |120.00 |45.20 | |2011-12 |160.00 |18.67 | |2012-13 |800.00 |13.91 (up to July | | | |2012) |

We notice that, apart from the above, Rs.500 crores has been allocated for Neighbourhood Development Programme (NDP) around the nuclear plant at Kudankulam, which would be utilized for taking up various development works like setting up of cold storage and fishing marketing area, Public board motor works, housing facilities, levelling of roads, upgradation of health services, grownes and drinking water etc. The Chief Secretary of Tamil Nadu convened a meeting on 15.5.2012 following CSR, in which it was decided to set up a fund of Rs.300 crores for the housing scheme for a projected period from 2012 to 2015. The proposal is to construct 10000 houses in the housing project with a unit cost of Rs.3,00,000/- per house with a plinth area of 300 sq. Feet under NDS. Various other development activities are also being undertaken as part of CSR, like upgradation of public health centres, establishment of new public health centres etc.

106. This Court in Banwasi Seva Ashram v. State of U.P. AIR 1987 SC 374 allowed the construction of NPP in a displaced forest area, but ordered inter alia that every family of forest dwellers be provided with a housing plot of specified dimensions elsewhere, that health, education, sanitation services and the like, be provided there, as part of CSR.

107. NPCIL in association with the District Collector, Tirunelveli should take effective steps to discharge their CSR in accordance with the DPE Guidelines. Needless to say, there must 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.

PART II

108. Environmental impact on setting up of a nuclear plant anywhere in the world is bound to generate some apprehension, at least in the minds of the ordinary people, of its possible impact on environment, life and property, flora and fauna, marine life, radiation, nuclear waste and its disposal and other related issues.

> "Royal Commission on Environmental Pollution, Sixth Report, 'Nuclear Power and the Environment.'
>
> There are few subjects in the field of environmental pollution to which people react so emotionally as they do to radioactivity."
>
> (Cmnd 6618 1976 para 5)

109. Public opinion, national policy, economic growth, sustainable development, energy security are all intrinsically interlinked. One cannot be divorced from other, all the same, a balance has to be struck. National policy of this country, as already stated, is that atomic energy has a unique position in the emerging economics in India. Nuclear energy is, therefore, considered to be a viable source of energy and it is necessary to increase country's economic growth. Nuclear energy is now considered in India as a sustainable source of energy and India cannot afford to be a nuclear isolated nation, when most of the developed countries consider it as a major source of energy for their economic growth. Renewed momentum against the setting up of NPPs picked up fast after accidents at the Three Miles Island Power Plant in USA, Chernobyl in Ukraine and Fukoshima in Japan. Primary reason for such opposition seems to be on the issues of the impact of nuclear installations on life and property, environment, flora and fauna, marine life, nuclear waste disposal, health, displacement of people etc. which has a direct link with Article 21 of the Constitution of India and the environmental laws of the country.

110. Learned counsel appearing for the appellants mainly contended so far as this project is concerned, the Regulatory Authorities have consistently legalized the fait accompali violations presented by the project proponent. Further, it was alleged that the plant standards had been relaxed, statutory violations such as construction without permission, unauthorized setting up and commissioning of discharge outlets had not only merely been condoned but justified by the TNPCB, MoEF etc. Learned counsel also submitted that the environment clearance granted by the MoEF on 9.5.1989 was not only vague but with imprecise conditions and that no

environmental impact study or public hearing was conducted. Further it was stated that no construction was started after getting the above clearance, but only in the year 2002, by the time 1994 EIA Notification came into force, consequently, fresh environmental clearance had to be obtained. Reference was made to a circular dated 27.3.1998 issued by the MoEF, which stated that the environmental clearance issued prior to 1994 would not be valid in the case of projects which did not commence work before 1.8.1998. Referring to explanation 8 to the EIA Notification of 1994, it was submitted that the project did not obtain all clearances including NOC from the State Pollution Control Board, which was required under the Water Act of 1974 and Air Act of 1981. Project, therefore, did not have NOC, from the Pollution Control Board, when 1994 Notification came into effect. No fresh environmental clearance was obtained from MoEF as per the 1994 Notification and even if obtained, the same would be valid only for five years of the construction or operation of the project. Further, it is also pointed out that the environmental clearance granted on 9.5.1989 was revalidated by a letter dated 6.9.2001, when EIA Notification of 1994 was in force.

111. Appellants pointed out that the refusal of Russia in accepting the spent-Fuel also brought about complete change in the project, since it expanded the activities of transportation of spent fuel for reprocessing, reprocessing of spent fuel, generation, storage and disposal of nuclear waste. These changes, according to the appellants would amount to expansion and modernization of the project, which required fresh environmental clearance and revalidation of 1989 clearance, according to the appellants, was impermissible in law. Learned counsel, therefore, pointed out that all those factors would indicate that KKNPP Units 1 and 2 required fresh environmental clearance which the project proponent did not obtain. KKNPP, it was submitted, is located within 500 metres of HTL and therefore was a prohibited activity under CRZ notification 1991. It was pointed out that the project of NPCIL is not a project of DAE and that only those construction activities are allowed for which foreshore facilities are essential. Construction of KKNPP is therefore not allowed under CRZ notification. Further, it was pointed out that no environmental clearance was obtained from MoEF before setting up the desalination plant and the same is also situated in the CRZ zone. NPCIL, it was submitted, had not followed the CRZ Notifications dated 21.5.2002, 19.10.2002 etc. which have got serious impact on marine life and also on the coastal area. The discharge of water from the plant into the sea also causes serious environment impact, especially on the marine life. Appellants submitted that all those factors were not taken into consideration when the environmental clearance was granted by the TNPCB as well as the MoEF. The appellants submitted that the discharge of

radioactive liquid from the two units if not adequately treated and will affect the quality of marine life and bio-diversity of flora and fauna and marine resources found in the Marine National Park and the wedge bank of Gulf of Mannar. Further, it was contended that as per the stipulation of MoEF of the year 1980 temperature of the coolant water should not exceed 5°C. However, NEERI has unilaterally increased it to 7°C which will have serious effect on marine life apart from changes in salinity levels.

112. NPCIL, AERB, MoEF as well as TNPCB have filed detailed counter affidavits and explained the steps they have taken for getting environmental clearance for the project at various levels. Counter affidavits state that comprehensive studies have been conducted on all issues by environmental experts and scientists and permissions have been granted taking into consideration of all safety measures under the Environmental Protection Act, Notifications issued thereunder and also following/taking into consideration guidelines laid down by well-known International organizations.

113. NPCIL submits that it had submitted its application for grant of environmental clearance for the project on 12.12.1988. Clearance for installation of NPP was granted by the Department of Environment and Forests, Government of Department of Tamil Nadu on 26.12.1988. The Department of Environment and Forest, Government of Tamil Nadu also accorded amended clearance to the project vide letter dated 13.2.1989 with certain stipulations. The MoEF also accorded its approval to Unit 1 and 2 subject to certain conditions stated therein on 9.5.1989. After the receipt of Government clearance, process of land acquisition was initiated and land acquisition was completed during the period 1991 to 1993. Pre-project activities like construction of boundary wall, roads and some buildings were also initiated and completed during the said period. AERB on 10.11.1989 granted clearance for locating the plant at Kudankulam after the evaluation of the site by the Site Selection Committee. Environment Impact Assessment (EIA) Notification came into force on 27.1.1994 which provided an exception for the project which had commenced the pre-project stage activities vide exception clause 8. Notification of 1994, therefore, it was pointed, would not apply to Units 1 and 2 for which environmental clearance was already granted on 9.5.1989. Further, it was pointed out that the environmental clearance dated 9.5.1989 stipulated that temperature of the Coolant Water should not exceed 5°C, however, in the light of paragraph 5 of the clearance dated 9.5.1989 and the amendment of Rule 84 of the Environmental (Protection) Rules, 1986 and Notification dated 22.12.1988 stipulation of 5°C contained in the clearance can be varied. Further, it was stated

that since the discharge from Units 3 to 6 is essentially in the same area, the temperature of discharge from Units 1 and 2 can also be limited to 7°C, which according to NPCIL, will have no impact on marine life.

114. NPCIL, further pointed out that the report of the studies conducted by the Institute of Ocean Management (IOM), Anna University, would indicate that there would be no impact on marine ecosystem due to such discharge and opined that the temperature differential of the discharged water with respect to the receiving water should not exceed 7°C. The environmental clearance was accorded to Units 3 to 6 on the same design as Units 1 and 2 which stipulated the Condenser Cooling Water Discharge limit as 7°C. Further it was also pointed out that during the appraisal of CRZ clearance for Units 3 to 6 before the grant of CRZ clearance on 25.7.2012 the Expert Appraisal Committee (EAC) considered the marine impact assessment and opined that there would be no impact on water qualities due to the proposed discharge. Further, the TNPCB has also accorded consent to operate on 28.8.2012 for Units 1 and 2 stipulating the condenser cooling water discharge limit as 7°C. NPCIL, also submitted that the EIA of units 3 to 6 includes the impact of units 1 and 2 as a baseline for computing the additional impact of units 3 to 6. The concern of the public, it was submitted, regarding safety, livelihood, radiation etc. have been adequately addressed during the public hearings on units 3-4 and 5-6 which was granted on 23.09.2008 and 31.12.2009 respectively. Procedure required to be followed under the EIA notification, 2006 had also been strictly followed. Further, it was also pointed out that no environmental clearance is required for establishing the desalination plant since the same has not been included in the schedule to either 1994 notification or 2006 notification and there is no prohibition in establishing the plant in the CRZ area.

115. MoEF has filed detailed counter affidavits and also submitted their written submissions on various aspects. MoEF submitted that at the relevant point of time, when KKNPP Units 1 & 2 were sought to be established, there was no regulatory requirement of Coastal Zone Regulations (except 500 meter norm). Everything was based on the letter written by the then Prime Minister in November, 1981 to the Chief Ministers of coastal States regarding necessity to keep clear of all activities at least up to 500 metres from the water at the Maximum High Tide (MHT). Further, it was also urged that pollution from industrial and town wastes should also be avoided totally. Following the letter of the then Prime Minister, a working group was constituted which formulated some environmental guidelines for the development of beaches in the year 1983. The permission for location of NPP at Kudankulam was granted on 25.02.1988 by the Committee on Conservation of

Seashore, State of Tamil Nadu. Later, the Tamil Nadu State Environmental Committee (TNSEC) also met on 15.12.1988 and cleared the KKNPP project subject to further monitoring by a Special Committee. The decision was communicated vide letter dated 26.12.1988 which was later modified by the Committee on 13.02.1989 subject to certain conditions mentioned therein. MoEF had also stated that the DAE, Government of India had sought for relaxation in respect of the project from 500 metres. On 19.04.1989, the Prime Minister approved an exemption of 500 metres norm especially for the Kudankulam project subject to the MoEF prescribing and ensuring sufficient safeguards for preserving the ecology, for which MoEF accorded approval to KKNPP Units 1 & 2 subject to the conditions stipulated therein.

116. MoEF issued the CRZ Notification on 19.02.1991 imposing restrictions on the setting up and expansion of industries, operation or processes etc. in the coastal zone. This notification, it was pointed out, did not prohibit the project already in operation, granted clearance prior to the date of the issue of Notification. Later, by an amendment dated 12.04.2001, S.O.329(C) amended paragraph 2 on "prohibited activities" of the Notification dated 19.02.1991 by substituting a new clause which exempted the projects of DAE. EIA came into force on 27.10.1994 but MoEF issued a Circular dated 23.07.1998 conveying its decision that the environmental clearances granted prior to 1994 would be valid in the case of projects where work had commenced before 01.08.1998. On 31.08.2001, the Director of MoEF visited the Kudankulam plant site and found that the land acquisition was completed and construction of Township, Environment and Health Research Centre and RO plant was in progress.

117. MoEF took up the stand that 1994 notification would not apply qua Units 1 & 2 in view of the fact that the environmental clearance was already granted in the year 1989. Further, it was also submitted that subsequently while granting the environmental clearance for Units 3 to 6, public hearing was conducted as per EIA Notification, 2006. Consequently, it was submitted that the EIA for the expansion of KKNPP i.e. for setting up of Units 3 to 6 included the environmental impact on account of Units 1 & 2. Environmental clearance, it was pointed out, for the Units 3-4 and 5- 6 was granted on 23.09.2008 and 31.12.2012 respectively after following due procedures required under EIA Notification, 2006.

118. MoEF also maintained the stand that prior environmental clearance is required only for those activities which are listed in Schedule to the EIA Notification dated 27.01.1994 or the subsequent Notification dated 14.09.2006,

which superseded the notification dated 27.01.1994. Desalination plant, it was submitted, did not find a place in the above mentioned notifications, hence prior environmental clearance for establishment of a desalination plant was not required. Further, it was pointed out that the same would not preclude MoEF from considering the issue of desalination plant from the CRZ point of view. Referring to CRZ amended notification dated 19.02.1991, it was submitted that the desalination plant could be established within CRZ area except CRZ-I(i)- i.e. eco-sensitive areas viz. mangroves, sand dunes reserve forests etc. Reference was also made to CRZ notification dated 06.01.2011, which superseded the CRZ Notification dated 19.02.1991. MoEF therefore, maintained the stand that in view of the legal position desalination plant could be established within the CRZ area. However, it was pointed out that even though the desalination plant is a permissible activity within the CRZ area, MoEF would again take into account the establishment of the desalination plant from the CRZ point of view and ensure that it would continue to function to the full satisfaction of MoEF.

119. MoEF has also in the affidavit dealt with the issue of change in the temperature limit of condenser cooling water discharge and its impact on marine environment. It was pointed out that at the time of grant of environmental clearance on 09.05.1989, the standard temperature difference between the inlet and outlet of condensed cooling water for discharge for temperature was fixed at 5oC. However, vide notification dated 22.12.1998, Environment (Protection) Rules, 1986 were amended. Rule 84 dealing with the thermal power plant, the limit prescribed therein would equally apply to NPPs as the technology for condenser cooling in both thermal as well as NPPs are the same. The environmental impact on the marine ecosystem due to +7oC Condenser Cooling Water (CCW) has been considered by MoEF through the EAC before giving the environmental clearances for the units 3-4 and 5-6 by stipulating that the temperature differential of the discharged water with respect to the receiving water would not exceed 7oC. MoEF therefore concluded that during the appraisal of the CRZ clearance for units 3-6 of KKNPP before grant of CRZ clearance on 25.07.2012, the EAC considered the marine impact assessment, thermal dispersion modeling studies conducted for condenser cooling water discharge considering the CCW discharge from all the 6 units i.e. KKNPP 1-6. Further, it was also pointed out that TNPCB has also accorded consent to operate on 28.08.2012 for KKNPP units 1 & 2 by stipulating the CCW discharge limit as 7oC as per the amended Environmental Protection Rules. MoEF also maintained the stand that it will continue to monitor the environmental standards of KKNPP and periodically inspect as to examine whether KKNPP units conform to the safety of environment set by MoEF.

120. Shri Guru Krishna Kumar, learned senior counsel appearing for TNPCB submitted that it had vide its letter dated 21.06.2001 requested the DAE to apply and obtain a fresh environmental clearance from the MoEF. MoEF, at that time, maintained the stand that NPCIL had already taken steps to implement the project and hence there was no necessity of a fresh environmental clearance. TNPCB's officials then inspected the site of KKNPP on 19.09.2001 and found that it had started construction of the NPP without valid consent for establishment as required under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981, consequently, show cause notices vide proceedings No. DEE/TNPCB/TNV/F.NPP-RDF/W/2001 dated 11.10.2001 and DEE/TNPCB/TNV/F.NPP-RDF/A/2001 dated 11.10.2001 were issued calling for explanation. NPCIL later filed applications dated 20.12.2001 for consent of the TNPCB for the NPP of capacity 2X1000 MW. The TNPCB issued consent for Establishment vide proceeding dated 25.02.2004. NPCIL had a proposal to use sea water for cooling, Pechiparai reservoir for fresh water and ground water for construction. Later, they applied for revised consent which included additional facilities for desalination plant using sea water as an input, in place of water supply from Pechiparai dam. The TNPCB later issued Consent to Operate vide proceedings dated 23.07.2012 with tolerance limits prescribed for trade effluent discharge, as per Board Proceeding dated 21.02.1984, which included the tolerance limit for temperature as 45oC at the point of discharge. Later, TNPCB vide proceedings dated 22.08.2012 altered the condition to be read as "not to exceed 7oC over and above the ambient temperature of sea for trade effluents".

121. Appellants filed detailed common rejoinder affidavit traversing the various statements made by AERB, NPCIL, MoEF.

122. Appellants urged that all facilities related to nuclear fuel and nuclear waste required an environment clearance under the EIA notifications of 1994 and 2006. Further, it is pointed out that when the supplemental agreement with Russia was entered into in the year 1998 that envisaged this critical change and hence NPCIL ought to have applied for a fresh clearance from the MoEF. But MoEF had consistently condoned such violations of law. Desalination plant, it was pointed, is bound to cause serious environmental implications and significant impact on marine life. It was pointed out that plant has been constructed without mandatory previous "Consent to Establish" from the TNPCB under the Water Act. The TNPCB consent to establish was given in the year 2004 while the desalination plant was envisaged only in the year 2006 and the construction of the plant has also

violated in provisions of the Water Act since any activity that discharges anything in water required PCB clearance. Fresh environmental clearance was therefore not just required for the desalination plant, but for the nuclear plant as a whole because the desalination plant introduced a significantly different dimension to pollution, especially given the fact that highly concentrated salty water is being released into the eco- sensitive Gulf of Mannar Biosphere Reserve. Further, without any legal sanction, NPCIL has unilaterally increased the temperature from 5oC to 7oC. The appellant, therefore maintained the stand that unless and until the plant conforms to the environmental protection laws, the same shall not be allowed to be commissioned which gives threat to the life and property of the people who are staying in and around the plant and it will have adverse effect on the environment as well as marine life.

Judicial evaluation

123. We will first examine the question whether NPCIL, the project proponent while establishing the KKNPP, had obtained all necessary environmental clearance and other requisite permission from the authorities. No plant specifically the one dealing with radioactive materials can be allowed to function or commission even if it has been cleared by AEC, AERB, NPCIL etc. unless it strictly conforms to the standards set by the statutory authorities like MoEF, TNPCB etc. and follow the environmental laws. Most of the issues referred to hereinbefore, as already indicated, are inter-related and inter-connected, therefore, there are bound to be some overlapping while examining the same. Before examining various legal issues raised before us, let us first examine the factual foundation on which they rest.

124. The Government of India after due deliberation with AEC, AERB, NPCIL and other organizations decided, in principle, to set up a NPP, for which Site Selection Committee of DAE was constituted and the Committee examined various sites in the Coramandel Coast of Tamil Nadu and selected the site at Kudankulam as the most ideal for selling up of NPP on scientific, technical, safety, security and environmental point of view. No regulatory requirement of CZR (except 500 metres norm) at the sea coast was in force at that time. The Prime Minister of India had written a letter in November 1981 to all the Chief Ministers of Coastal States in which it was stated as under:

> “The degradation and misutilization of beaches in the coastal states is worrying as the beaches have aesthetic and environmental value as well as

other values. They have to be kept clear of all activities at least up to 500 metres from the water at the maximum high tide. If the area is vulnerable to erosion, suitable trees and plants have to be planted on the beaches without marring their beauty. Beaches must be kept free from all kinds of artificial development. Pollution from industrial and town wastes must also be avoided totally."

125. Following the letter of the Prime Minister, a nine Member Working Group comprising experts in the fields of marine biology, nature conservation, tourism, pollution control and human settlements was constituted to formulate guidelines for the development of beaches. The Committee formulated the environment guidelines for development of beaches in July 1983. Before selecting the site at Kudankulam, a detailed study was conducted as to the suitability of the site, safety, radiological impact and its assessment, external natural events, foundation conditions, water availability and various other factors. Following that, an application was submitted in the year 1988 by the NPCIL before the State of Tamil Nadu for location of NPP at Kudankulam. The application was considered by the Committee on conservation of seashore of Government of Tamil Nadu since the plant had to be set up at the sea shore. The committee after considering the proposal accorded clearance for the location of the plant at Kudankulam which is reflected in the letter dated 25.02.1988 sent by the Secretary to the Government, State of Tamil Nadu.

126. NPCIL later submitted its application to the Government of Tamil Nadu for grant of environmental clearance vide its application dated 12.12.1988. As per the then existing practice, applications for environmental clearance of a project like NPP had to be placed before TNSEC which consisted of high ranking officials including the Chairman and Secretary of TNPCB etc. Application was placed before the Committee which met on 15.12.1988 and discussed various issues. The Executive Director of the project NPCIL explained the project in detail to the Committee with particular reference to safety measures. It was also pointed out that a disaster management plan had already been prepared and submitted by them to the Government of India and that no rehabilitation of the people around the site would be necessary. Some of the Members expressed the apprehension that cyclone condition might affect nuclear plant, which was allayed by the Executive Director, NPCIL stating that the proximity of Srilanka would deactivate the cyclone. The Additional Director (Public Health and Preventive Medicines) expressed the apprehension that the project might pollute the sea water thereby affecting the fish and the consumers. The Executive Director, NPCIL had assured

that an Environmental Survey Laboratory (ESL) would be set up 30 km away from Kudankulam and samples of water and fish would be analysed to find out the amount of radioactivity on the flora and fauna. Safety issues were also discussed in that meeting. After detailed discussions on various aspects, the Committee decided to clear the project subject to the monitoring by a Special Committee, which Committee, it was stated, would go into the details of safety and rehabilitation measures proposed in the areas communicated in the project report.

127. The decision of the TNSEC dated 15.12.1988 was communicated to NPCIL vide letter dated 26.12.1988 followed by another letter dated 30.12.1988. On 13.02.1989, TNSEC modified the environmental clearance contained in its letter dated 26.12.1988 and decided that environmental clearance accorded for the installation of KKNPP would be subject to the thirty one conditions specified in the annexure to the letter dated 13.02.1989.

128. The DAE, Government of India sought relaxation in respect of proposed KKNPP of the guidelines that the coastal beaches should be kept clear from all building activities upto 500 metres from the HTL. At that point of time only the Environment Protection Act, 1986 was in force and the letter of the Prime Minister of 1981 and 1983 Environmental Guidelines for Development of Beaches. On 19.04.1989, the then Prime Minister approved an exemption of 500 metre norm specifically for KKNPP project subject to the MoEF prescribing and ensuring sufficient safeguards for preserving the ecology of the beach. The MoEF vide its Office Memorandum dated 09.05.1989 accorded approval to KKNPP –Units 1 & 2 (2x1000 MW) subject to following conditions which are given below:

> "2. Approval of this Ministry from environmental angle is accorded subject to the following conditions:-
>
> i) Special exemption from the present ban on undertaking any construction within 500 metres from high tide line (HTL) is accorded to this project subject to the condition that:
>
> a) In such area only the plant and essential associated structures may be put up and nothing else should come up in this area;
>
> b) Attempts should be made to keep such construction within 500 metres of high tide line as far way from high tide line as possible;

c) Adequate measures and environmental safeguards will be taken for ensuring preservation of the ecology of the beach;

d) Since this area has been declared as a bio-sphere reserve, the project authorities should take special precautions to avoid any damage to the coral reefs or changes in the water quality near the shore; and

e) At Environmental Management Plant (EMP) for the area upto 500 metres from HTL should be submitted to the Ministry for review.

ii) The temperature of the condenser water should not exceed 5oC over and above the ambient temperature of the water at the point of discharge in the sea.

iii) The liquid effluents emanating from the different plants of the power station should be treated to conform to the standards stipulated by Central/State Pollution Control Board and International Commission for Radiological Protection (ICRP)/AERB. Steps should be taken to prevent ground water pollution. Adequate number of coastal water quality monitoring stations should be setup.

iv) Radio-active wastes (solids and semi-solids) generated during various operations, both low level and high level, should be properly treated and disposed of after proper containment to fix the radio-activity as per the standards/guidelines prescribed by ICRP/AERB.

v) No radio-active emissions, fugitive or otherwise, will be permitted beyond the safety standards prescribed by AERB.

vi) The location/alignment of the off-shore berth/jetty should be selected in such a way that no damage is caused to the coral reefs. Such construction should be kept at the minimum.

vii) The route of the pipeline from Pechiprai reservoir to the power station should preferably be so selected that it does not affect forest areas.

viii) Efforts should be made to avoid forest areas to be affected due to the proposed transmission corridors and power evacuation system.

ix) Adequate precautionary measures should be taken in transportation of radioactive fuel/ spent fuel/radioactive wastes, in/out of the country.

x) Periodical environmental surveillance and monitoring for radioactive emissions should be undertaken for measuring radioactivity and record maintained.

xi) Necessary steps may be taken for educating local people about the project to allay their apprehension due to the proposed power station.

xii) All the vacant lands within the project zone should be afforested with a tree density of 1000 per acre. The type of tree species should be so selected that they will be able to give maximum density of canopy.

xiii) From the initial stages of the project the environmental surveillance and monitoring of this particular area including the health status of the population around the power station location should be carried out and records maintained. This activity should continue in future also.

xiv) On-site and Off-site Disaster Management Plan (DMP) should be prepared as per the guidelines stipulated by ICRP/AERB and approved by the National Emergency Response Committee (NERC) of Department of Atomic Energy, Government of India.

xv) Necessary approval under the Forest (Conservation) Act, 1980 and the Wildlife (Protection) Act, 1972 will be obtained, when applicable.

xvi) A committee will be set up by the Department of Atomic Energy consisting of Additional Secretary, Department of Atomic Energy, Additional Secretary, Ministry of Environment and Forests, Project Director, Kudankulam Atomic Power Project, representative of AERB, Director NEERI, representative of Government of Tamil Nadu and two prominent public persons for review of the rehabilitation programmes, environmental protection measures and public awareness concerning the project.

xvii) A detailed rehabilitation plan should be prepared covering the affected persons within a radius of 2 kms exclusion zone. It will also be necessary to provide for some package of benefits for the people residing in the sterilized zone as there will be some restriction on the activities of this area. These

should be submitted to this Ministry for review after examination by the Committee.

3. There should be an environmental cell with suitable personnel and a laboratory in the project.

4. Adequate financial provisions should be made for implementation of the above conditions.

5. Conditions may be varied or new conditions imposed in the interest of environmental protection.

6. The stipulations will be implemented among others, under the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981 and the Environment (Protection) Act, 1986."

129. MoEF has a duty to see that the above-mentioned conditions are fully complied; which has also dealt with the exemption from the ban which was at that point of time only a norm prohibiting any construction within 500 metres of the HTL. Permission granted also dealt with the temperature of the condenser and also with radioactive rays, solid and semisolid generated during various operations including proper containment to fix the radio activity as per the standards / guidelines prescribed by ICRB / AERB. Condition for periodical environmental surveillance was also stipulated so also the necessity of educating the people, monitoring the health and also the provisions for onsite and offsite disaster management plan and the need for framing a detailed rehabilitation plan. After the receipt of the nuclear clearance, the process of land acquisition was initiated and the land acquisition was completed during the period 1991-1993. Project activities like construction of boundary was initiated and completed during the said period. AERB on 10.11.1989 granted clearance for locating nuclear power plant at Kudankulam after evaluation of the site by the Site Selection Committee of DAE with stipulations given in the Annexure alongwith that letter. Following are the stipulations laid down by AERB:

1. Stipulations made by various State and Central authorities in giving clearance, should be met. In addition, plantation in the area under control of the project should be taken up along with site development. Studies to assess thermal pollution by making appropriate models should be carried out.

2. An exclusion zone of 1.6 km radius from the NPP stack should be established with access control. The Dose limits specified by AERB will be complied with at this boundary.

3. The Board noted that Vairavikinaru quarry, Idinthikarai and Kudankulam settlements are beyond 2 km distance but within sterilized zone. Suitable legislative and administrative control measures should be taken through state authorities to prevent increase in population within the sterilized zone beyond natural growth. Also arrangements must be made to terminate the lease of the lime stone quarry in 1994.

4. Facility to store at site adequate quantities of water should be provided to meet the make up requirements of uninterrupted cooling of core and other safety related systems on a long term basis. Facilities engineered at site should meet the requirements even in the event of possible disruption of piped water supply from Pechiparai Dam. Ground water sources in the site area should be surveyed and developed to serve as an additional back up source to meet the safety needs of the plant, if water supply from the Pechiparai dam is interrupted due to any contingency.

5. The Board requires that the safety of the long pipeline from Pechiparai dam should be ensured by appropriate security arrangement.

6. NPCIL should take up the water management schemes with the state government so that water supply to NPP is ensured all the time. The intake well at the dam should be provided at lower elevation than the minimum draw down level of the reservoir.

The Board desires that the structure stability of the Pechiparai dam should be assessed taking into account the recent work of strengthening the dam.

7. In the unlikely event of the breach of the dam alternative sources of water supply should be available for the site within a reasonable time. NPCIL should conceptualize schemes at the Detailed Project Report (DPR) stage for utilization of the water from upper Kodiyar storage reservoir for such eventuality.

8. Site related design considerations such as seismic aspects etc. are to be established before submission of PSAR. Design should be engineered to meet site related design basis events.

9. The Board noted that as per the estimate of Health Physics Division, Maximum Flood Level (MFL) should be +7.5 m after considering a return period of 1000 years for the maximum storm. This was reviewed against the estimated figure of 5.9 m given by the CWPRS. The Board suggested that MFL must be re-evaluated by CWPRS conforming with the requirements of IAEA Safety Guide 50-SG- S10B on "Flooding on Coastal Sites". Revised Report of CWPRS should be submitted to Design Safety Committee.

10. Bore-hole investigations are to be carried out at the proposed location of various buildings and structures. The report should be forwarded to design group for taking into account at the time of actual design.

11. Radiological impact should be assessed with proper source terms, consideration of topography and relevant dispersion characteristics of the site. Dose limits prescribed should be met at a distance of 1.6 km by incorporating design features in the plant. The radioactivity releases should be maintained in line with ALARA principle.

12. The typical radioactivity emission rates used in evaluation of the site should be compared with the releases from similar reactors and should be suitably adjusted taking into consideration acceptable failed fuel rates during evaluation by the design safety committee.

13. The Board desires that the adequacy of stack height of 100 m should be confirmed by NPC at the design stage, specifically in view of the change in the ground level of about 40 m on the north side of the plant.

14. Environmental Survey Laboratory should be set up at site and instruments are to be installed at site to collect meteorological data and background radiation.

15. Two independent reliable sources of start up power connected to two points in the electrical network located in different regions of the grid should be made available. Availability of a dedicated source of reliable start up power should be examined.

16. Power evacuation studies particularly that influence the plant-grid interaction should be pursued. Feasibility of operation on islanding mode may be studied in collaboration with CEA.

17. Studies on Biofouling and Jelly-fish etc. that may affect the water supply should be taken up.

18. Studies on accretion/erosion rate around the plant site should be carried out. If required, proper protection should be provided.

19. At least two evacuation routes from plant site during an emergency should be provided.

20. The Board recommends that NPCIL shall consider the possibility of providing an additional facility for spent fuel storage in future (Away from Reactor Storage AFR). The site for this should be reserved after considering the transportation and handling requirement of spent fuel.

21. Over Dimension Consignment (ODC) committee of NPCIL should evaluate suitability of transportation of ODC at design stage.

22. Analysis for the quality of construction water is to be carried out.

23. This approval is given only for the location of two units of VVER of 1000 MWe capacity each at the proposed site. Other detailed investigations are necessary and NPCIL will have to apply and obtain permission of AERB before construction at the site begins.

Coastal Regulation Zone (CRZ)

130. India is a gifted country which has coastal seas, bays, estuaries, creeks, rivers, backwaters. Critical importance of sea coast in a country like India need not be over emphasized, the protection of the same calls for scientific care and diligence and following Tsunami, Cyclone, earthquake etc., the protection of the sea coast has assumed added importance.

131. MoEF in exercise of powers conferred under Section 3(i) and 3(2)(v) of the Environmental (Protection) Act, 1986 and Rule 5(3)(d) of the Environmental

(Protection) Rules, 1986 issued a Notification dated 19.2.1991 declaring coastal stretches as Coastal stretches of seas, backwaters, creeks, rivers and backwaters which are influenced by tidal action (in the landward side) upto 500 Mtrs. from the HTL and the land between the low tide line (LTL) and the HTL are called coastal regulation zone and regulating activities in the CRZ, both prohibited and permitted activities. However, it did not prohibit the project already in operation and granted clearance prior to the date of the issue of notification. Later by an amendment dated 12.4.2001 S.O.329(C) amended paragraph 2 on "prohibited activities" and the notification dated 19.2.1991 by substituting clause (1) to the following effect "setting up of new industries and expansion of existing industries except (a) those directly related to water front or directly needing foreshore facilities (b) projects of Department of Atomic Energy".

132. We find with regard to the location of KKNPP within the prescribed 500 mtr. within the CRZ an exemption had already granted as per the then existing norms even prior to 1991 by the then Prime Minister of India by the communication dated 19.4.1989. Over and above, paragraph 2(1) of 1991 CRZ Notification as amended by Notification dated 12.4.2011, exempted projects of Department of Atomic Energy. A cumulative reading of the permission dated 19.04.1989 accorded by the then existing norms read with paragraph 2(1) of 1991 Notification, as amended by Notification dated 12.4.2011, we are of the view the KKNPP Units 1 and 2 have not violated the 1991 CRZ Notification.

EIA Notification 1994 and Environmental clearance:

133. MoEF in exercise of powers conferred under sub-section (1) and clause (v) of sub-section (2) of Section 3 of the Environment (Protection) Rules, 1986 read with clause (d) of sub-rule(3) of Rule 5 of the Environment (Protection) Rules, 1986, issued a Notification dated 27.1.1994 directing that on and from the date of publication of that notification in the Official Gazette expansion or modernization of any activity (without pollution load is to exceed the existing one) or a new project listed in Schedule 1 of that Notification shall not be undertaken in any part of India unless it has been accorded environmental clearance by the Central Government in accordance with the procedure specified in the Notification. The Notification contains an explanatory note regarding the impact of the assessment Notification dated 27.1.1994. Relevant portions of the notification are given below for easy reference:

Expansion and modernization of existing projects:

"A project proponent is required to seek environmental clearance for a proposed expansion/modernization activity if the resultant pollution load is to exceed the existing levels. The words 'pollution load" will in this context cover emission, liquid effluents and solid or semi-solid wastes generated. A project proponent may approach the concerned State Pollution Control Board (SPCB) for certifying whether the proposed modernization/expansion activity as listed in Schedule-I to the notification is likely to exceed the existing pollution load or not. If it is certified that no increase is likely to occur in the existing pollution load due to the proposed expansion or modernization, the project proponent will not be required to seek environmental clearance, but a copy of such certificate issued by the SPCB will have to be submitted to the Impact Assessment Agency (IAA) for information. The IAA will, however, reserve the right to review such cases in the public interest if material facts justifying the need for such review come to light."

134. The Note also deals with exemption for project already initiated under the explanatory Note 8 which reads as follows:

8. Exemption for projects already initiated:

"For projects listed in Schedule-I to the notification in respect of which the required land has been acquired and all relevant clearances of the State Government including NOC from the respective State Pollution Control Boards have been obtained before 27th January, 1994, a project proponent will not be required to seek environmental clearance from the IAA. However, those units who have not as yet commenced production will inform the IAA."

135. Schedule 1 of the Notification refers to Nuclear power project and related projects such as heavy water plants, nuclear fuel complex, rare earths etc. and the same also deals with Thermal Power Plant as well.

136. The Central Government, later in exercise of the powers conferred under Section 23 of Environment Protection Act, 1986 issued a Notification S.O.318(E) dated 10.4.1997, whereby inter alia introduced Schedule IV into the 1994 Notification prescribing the procedure for public hearing. MoEF later issued Circular dated 23.7.1998 after reviewing the progress of cases which were

accorded environmental clearance prior to 27.1.1994 Notification and it had been observed that a large number of projects had not commenced constructions or other operations due to various reasons like non- availability of financial resources, non-availability of forestry clearance, inter-State water disputes and non-availability of essential infrastructure like land, electricity, road etc. Further it was also noticed that certain projects which were environmentally appraised even as early as 1980 had not commenced construction activities. MoEF felt there might have been significant changes during those years which would have implications to the environment and ecology of the area. MoEF issued the above Circular pointing out that the environment clearance issued prior to 1994 would not be valid in the cases, where work did not commence before 1.8.1998. Further it was also clarified in all such cases fresh environmental clearance would be required, if those come in the 29 categories listed in the EIA Notification. Further it was also clarified that projects which were not listed in Schedule 1 in EIA Notification would not require environmental clearance.

137. MoEF later inspected the site of the plant on 31.8.2001 and found that land acquisition had been completed and the construction work on various components such as township, Environmental and Health Research Centre and RO plant was in progress. Further, it was noticed that afforestation programme was undertaken by M.S. Swaminathan Research Foundation and that till August 2001, Rs.377.30 crore was spent for KKNPP on various activities.

138. MoEF, noticing the above facts, vide its letter dated 6.9.2001 clarified that environmental clearance granted on 9.5.1989 stands valid and that there is no need to conduct public hearing and seek fresh environmental clearance. A chart giving the details of land acquisition and compensation amount paid reads as follows:

LAND ACQUISITION DETAILS OF KKNPP

|S.No. |Name of Village |Private land |Puramboke land |Total (in | | | |(in hectares) |(in hectares) |hectares) | |For Plant site | |1 |Kudankulam |862.775 |112.945 |975.720 | |2 |Irukkundarai |-- |2.675 |2.675 | |3 |Vijayapathi |66.750 |1.815 |68.565 | | |Sub Total |929.525 |117.435 |1046.960 | | | | | | | |For Township | |1 |Chettikulam |153.905 |24.300 |178.205 | | | | | | | |Total Land acquired |1225.165 | | | |Hectares | | |Land and Acquisition completed and awards |1991-1993 | | |pronounced | | | |Number of displaced persons |Nil | | |Type of acquired land |Dry |

Compensation details

|S.No. |Village |Amount paid (Rs.) | | |Kudankulam |62,02,332.00 | | |Irukkundarai |31,09,727.00 | | |Vijayapathi |6,09,834.00 | | |Total |99,21,893.00 |

139. We are of the view that the EIA Notification of 1994 would not apply to KKNPP Units 1 and 2 for which environmental clearance was granted on 19.5.1989. 1994 notification, in our view, would be operative only prospectively except in the case of expansion and modernization of any activity (if the pollution load is to exceed the existing one) as on the date of publication of that notification or a new project listed in Schedule 1 for which environmental clearance is necessary as per the notification dated 27.01.1994. So far as KKNPP units 1 and 2 are concerned, they had the relevant clearance from the State Government including the NOC from the State Pollution Control Board. Facts stated above would indicate that the land acquisition process for the plant site and township had commenced during the year 1990-1991 and awards were pronounced during the period 1991-1993 by the Land Acquisition Officer and Special Tehsildars (Land Acquisition) Government of Tamil Nadu. Annexure R-15 produced along with the affidavit filed by the MoEF dated 18.10.2012 indicates the details of total land acquired, the awards pronounced and the details of the compensation paid. Further sites surveys, infrastructure design, construction of boundary wall, roads and some buildings etc. had been completed between1989 to 1994. The Committee on Conservation of Seashore of Government of Tamil Nadu had also granted clearance on 25.2.1988 and the TNSEC had also granted clearance on 15.12.1988, modified on 13.2.1989. Above facts clearly indicate that the EIA Notification dated 27.1.1994 would not apply to KKNPP Unites 1 and 2 since these units stood exempted from the Notification and the Explanatory Note 8 to the Notification and also the Circular issued by the MoEF on 23.7.1998 make it more explicit.

140. We may now examine whether there has been any expansion or modernization of units 1 and 2 resulting in increase in pollution loads. Plant capacity, we have noticed, always remained 1000 MWs X2, and the plant model V-412 remained to be as envisaged in 1988 Agreement and 1998 supplementary agreement of 1988. Further, for the purpose of cooling the steam generated in the steam generator sea water is required which goes through the steam turbine which runs the electrical generator to produce electricity. Sea water consumption is 2,40,000 m3/Hr and the water is to be drawn from the sea and pass through the condenser for both Units 1 and 2 and once the cooling process is over, it is to be

released to the sea, a process, which has undergone no change from what was envisaged before obtaining clearance from MoEF in 9th May, 1989 till date and hence we find no necessity for a fresh clearance.

Desalination Plant

141. We may now examine whether prior environmental clearance is a pre-requisite for the establishment of a desalination plant in terms of EIA Notification dated 27.1.1994 or in terms of the subsequent Notification dated 14.9.2006 which superseded the Notification dated 27.1.1994. Further we may also examine whether establishment of desalination plant is permissible in CRZ. We have already indicated that prior environmental clearance is required only for those activities which are listed in Schedule 1 to the EIA Notification dated 27.1.1994 or the subsequent Notification dated 14.9.2006 which superseded earlier Notification dated 27.1.1994. Desalination plant is not seen listed under the above-mentioned notifications. The decision to establish desalination plant for the purpose of domestic water requirement was taken by the NPCIL in the year 2004. Earlier when environmental clearance was granted on 9.5.1989 the proposal was to take fresh water from the Pachipari Dam, situated at about 65KM away from the plant site. The same had to be given up in view of the involvement of forest land as well as the apprehensions expressed by the local villagers that the withdrawal of water from the Dam would deplete the scarce natural resource, especially at the time of drought. Desalination plant functions on distillation (Mechanical Vapour Compression) principle. Sea water would be drawn and would be fed to the plant which consists of four streams each having capacity of 106.66 cubic mtr. p.h. Cumulative feed flow of all three operating streams is 670 cubic.mtr p.h. and cumulative reject flow is 350 cubic mtr ph., balance 320 cubic mtr. p.h. is purified water. Facts would indicate that there is no generation of air emission, solid waste and effluent are flowing from the desalination process except rejects (which also called brine) which is nothing but concentrated sea water which remains after desalination process and does not contains external elements. The rejects will have concentration of 69000 parts per million which would be mixed with the sea water 1,20,000 cubic mtr. p.h. and discharged through the outlet channel into the sea which would give dilution 343 times and reduce the reject to the ambient sea water concentration of 35000 parts per million. Experts say the process would not cause any increase in pollution load due to desalination.

142. CRZ Notification of 1991, though prohibited, the setting up of new industries as well as expansion within CRZ, it had permitted the laying of pipeline and

conveying system. 1991 Notification was amended on 21.05.2002 and it was provided that the desalination plants could be established in the notified special economic zone, for non-polluting industries within CRZ. On 19.10.2002, it was again amended and it was provided that the desalination plants could be established within CRZ except CRZ – 1(i) – i.e. eco-sensitive areas viz. mangroves, sand dunes, reserve forests etc. MoEF later issued another notification dated 06.01.2011 superseding 1991 notification, as per that para 3(i)(c) and as per para 4(ii)(h) (of 06.01.2011 notification) makes provisions for the establishment of desalination plants within CRZ area except CRZ – 1(i).

143. NPCIL informed TNPCB for the inclusion of desalination facility which was not earlier included in the original application for 'Consent to Operate'. TNPCB considered the request and accorded "Consent to Operate' on 20.08.2012 which included desalination plant. The establishment of desalination plant, therefore, would not require any fresh environmental clearance, especially when the same has not been included in the Schedule 1 to the EIA Notification dated 27.1.1994 or in the subsequent Notifications dated 14.9.2006, 06.01.2011 etc. except within CRZ – 1(i).

Change in Temperature Limit

144. We may now examine whether, in the light of paragraph 5 of the clearance dated 9.5.1989 and the amendment to Rule 84 of the Environment (Protection) Rules 1986 by Notification dated 22.12.1988, the stipulation of 5°C contained in the clearance can be varied. Environment (Protection) Rules, 1986 was amended vide notification dated 22.12.1988 as Environment (Protection) Second Amendment Rules, 1988. Rule 84 deals with the temperature limit for discharge of condensed cooling water which reads as follows:

> "84. Temperature limit for Discharge of Condenser Cooling Water from Thermal Power Plant:
>
> A. New thermal power plants, which will be using water from rivers/lakes/reservoirs, shall install cooling towers irrespective of location and capacity. Thermal power plants which will use sea water for cooling purposes, the condition below will apply.
>
> B. New projects in coastal areas using sea water:

The thermal power plants using sea water should adopt suitable system to reduce water temperature at the final discharge point so that the resultant rise in the temperature of receiving water does not exceed 7°C over and above the ambient temperature of the receiving water bodies.

C. Existing thermal power plants:

Rise in temperature of condenser cooling water from inlet to the outlet of condenser shall not be more than 10°C.

D. Guidelines for discharge point:

The discharge point shall preferably be located at the bottom of the water body at mid-term for proper dispersion of thermal discharge.

In case of discharge of cooling water into sea, proper marine outfall shall be designed to achieve the prescribed standards. The point of discharge may be selected in consultation with concerned State Authorities/NIO.

No cooling water discharge shall be permitted in estuaries or near ecologically sensitive areas such as mangroves, coral reefs/spawning and breeding grounds of aquatic flora and fauna."

145. Rule 84, of course, deals with the Thermal Power Plant, which states that the resultant rise in temperature of receiving water shall not exceed 7°C over and above the ambient temperature of the receiving water body. Facts indicate that the limit prescribed under Rule 84 will equally be applicable to Nuclear Power Plant as well since the technology for condenser cooling in both, thermal as well as Nuclear Power Plant is the same. In both systems condenser is cooled by using water, therefore, the limit on temperature of discharged water will have to be the same.

146. Let us also examine whether there will be any impact on the marine eco-system due to +7oC CCW water, for which detailed study was conducted by the Institute of Ocean Management, Anna University, which has submitted its report in July 2008 and the Engineers India Ltd. along with CHFRI submitted its report in August 2011. Environmental Impact was analysed in desalination and the experts are unanimous in their views, that there would be no impact on the marine ecosystem. Reports were also considered by the MoEF through the EAC before giving environmental clearance for the units 3 to 6 on 23.09.2008 and 31.12.2009

and the CRZ clearance on 25.07.2012. TNPCB has also accorded consent to operate on 28.08.2012 for KKNPP Units 1 and 2 by stipulating that condenser cooling water discharge limit as 7oC as per the amended Environmental Protection Rules. Therefore, the contention raised by the appellants that the rise in temperature of receiving water due to rise in temperature of condenser cooling water would affect marine eco-system and cannot be sustained.

147. Appellants have also raised a contention under the EIA Notification of 1994 that those projects where "all clearances" including "NOC" from State "PCBs" had not been obtained required fresh environmental clearance from MoEF in accordance with the said notification. Reference was made to Explanation 8 of the EIA Notification of 1994. Further it was pointed out that all projects having environmental implications "required previous consent" to establish and "to operate" under the Water Act, 1974 and Air Act, 1981 from the State Pollution Control Board and unless those consents are existing, plant cannot said to have "all clearances from the State PCBs as required by the Explanation 8 of the EIA Notification of 1994".

148. We are of the view that the "environmental clearance" or "No Objection Certificate" cannot be equated to "consent to establish" under Section 25 of the Air Act and "consent to operate" under Section 21 of the Water Act, which were granted on 25.2.2004 and 28.8.2012 respectively. NPCIL had undertaken various activities with respect to KKNPP subsequent to the environment clearance granted by TNSEC on 26.12.1988, subsequently modified on 13.2.1989.

149. TNSEC had on 15.12.1988 had already cleared the project, which tantamount to No Object Certificate (NOC). Only after clearance or NOC, the question of 'establishing' or 'operating' a plant arises. Environmental clearance or NOC was granted to KKNPP units 1 and 2 as early as 26.12.1988 though the TNPCB had granted 'consent to establish' under Section 25 of the Air Act on 25.02.2004 and 'consent to operate' under the Water Act on 28.08.2012. Explanatory Note 8 to the Environment Notification dated 27.01.1994 speaks of exemption for projects already initiated that is land has been acquired and clearance of the State Government including NOC, from Pollution Control Board had been obtained before 27th January 1994, for which no fresh environmental clearance would be required from Impact Assessment Agency (IAA). KKNPP units 1 and 2 is, therefore, entitled to get the benefit of the Explanatory Note 8 to EIA notification dated 27.01.1994.

150. We also notice that there has been no expansion or modernization of units 1 and 2, which has resulted in increase of pollution load. Plant capacity remained the same i.e. 1000 MWs X2, till date and there is no substantial difference in plant model and the specifications envisaged in the 1988 agreement and 1998 supplement agreement. Plant model remains as V- 412, consequently the 1994 EIA notification will not apply qua KKNPP units 1 and 2.

151. NPCIL, as part of the continuous process to ensure safety of environment made a Rapid Environmental Impact Assessment (REIA) of KKNPP Units 1 and 2 in the year 2001. The National Environmental Engineering Research Institute (NEERI) retained by NPCIL for conducting their assessment. REIA report of NEERI examined the baseline data collected during summer season 2001 within the impact zone for air, noise, water, land, biological and socio economic environment including data on radiological parameters which has formed the basis for predicting, evaluating the potential impact due to proposed two units of KKNPP at Kudankulam. NEERI submitted its report in May 2002. In the year 2003 there was yet another comprehensive EIA by NEERI of KKNPP units 1 and 2 which took into account the entire season i.e. 12 months. Assessments were made as part of the continuous process to monitor the safety of the environment as well as to establish an existing base-line status with respect to various environmental points like air, noise, water, land, biological and socio-economic for identifying, predicting and evaluating the environmental potential impact as also to formulate an effective Environmental Management Plan (EMP). Report was submitted in January 2003 which was later implemented under the expert guidance of MS Swaminathan Research Foundation.

Environmental Clearance for KKNPP Units 3 to 6

152. NPCIL consent letter dated 18.2.2007, for grant of environmental clearance for expansion of the then existing Nuclear Project (2 x 1000 MW, by adding 2x1000 MW Units 3 & 4), pointed out that the land acquired for locating the proposed units was already available within the NPP Complex and no additional land would be required for expansion of the project. Further it was stated that water for condenser cooling system would be drawn from the sea and sweet water requirement would be met from the desalination plant. Further it was pointed out that no forest land was involved in the project. The Gulf of Mannar Marine National Park is about 87 KM from the site, though the Gulf of Mannar Biosphere Reserve Boundary is at a distance of about 20-50 mtr. Further it was pointed out that no displacement of population was envisaged. Project, it was stated, was to be

located in the CRZ-III and that exemption from 500 mtr. norm in respect of CRZ for Units 1 and 2 was obtained from the Government of India as far as back in 1989. Further it was also stated that public consultation was held on 2.6.2007 and that the total cost of the project would be Rs.14,000 crores which included 307.50 crore for environmental protection measures.

153. MoEF considered the above-mentioned proposal in accordance with paragraph 12 of the EIA Notification 2006 read with paragraph 2.2 sub- clause 2.2.1 (i)(a) of Circular dated 13.10.2006 and MoEF accorded clearance vide communication dated 23.09.2008 under the provisions of EIA Notification of 2006 subject to the implementation of several conditions, which read as follow:

i) On-line continuous monitoring of the temperature of the discharged cooling water shall be carried out at the discharged point. It shall be ensured that the temperature differential of the discharged water w.r.t. the receiving water does not exceed 7°C at any given point of time.

ii) Necessary prior clearance under the provisions of CRZ Notification, 1991 for the activities to be located in CRZ shall be obtained from the Competent Authority.

iii) No additional land shall be acquired for any activity/facility of project.

iv) AERB clearance for the site shall be obtained before starting any construction work and a copy of the same shall be provided to the Ministry of Environment & Forests.

v) A scheme for rain water harvesting shall be prepared in consultation with an expert agency/State Ground Water Board and details furnished within 3 months of the issue of the environment clearance letter.

vi) Greenbelt shall be developed all around the project boundary covering an area of 180 ha preferably with local species.

vii) Noise levels shall be limited to 75dBA. For people working in the high noise area, requisite personal protective equipment like earplugs/ear muffs etc. shall be provided.

viii) Regular monitoring of conventional gaseous pollutants, radioactive pollutants in the air as well in the discharged water shall be monitored regularly as per AERB standards.

ix) Regular monitoring of ambient air quality shall be carried out in and around the power plant and records maintained. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to the Regional Office of this Ministry. Besides air quality, water, food samples and soil shall also be monitored regularly for radioactive levels in the surrounding areas and records maintained.

x) A Disaster Management Plan and Emergency Preparedness Plan shall be prepared and put in place as per the norms of AERB. Regular mock drills shall be undertaken and based on the same, any modification required, if any, shall also be incorporated.

xi) The radioactive waste shall be managed as per the norms prescribed by AERB.

xii) The non-radioactive waste water generated from the plant premises will be suitably treated in STP and the treated effluents shall be recycled and reused within the plant premises for greenbelt etc.

xiii) The radioactive liquid waste emanating from the plant will be treated and managed as per the guidelines of AERB/ICRD in this regard.

xiv) Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

xv) The project proponent shall advertise in at least two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned within seven days from the date of this clearance letter, informing that the project has been accorded environmental clearance and copies of clearance letter are available with the

State Pollution Control Board/Committee and may also be seen at Website of the Ministry of Environment and Forest at http://envfor.nic.in

xvi) A separate environment management cell with qualified staff shall be set up for implementation of the stipulated environment safeguards.

xvii) Half yearly report on the status of implementation of the stipulated conditions and environmental safeguards shall be submitted to this Ministry/Regional Office/CPCB/SPCB.

xviii) Regional Office of the Ministry of Environment & Forests located at Bangalore will monitor the implementation of the stipulated conditions. A complete set of documents including Environmental Impact Assessment Report and Environment Management Plan along with the additional information submitted from time to time shall be forwarded to the Regional Office for their use during monitoring.

xix) Separate funds shall be allocated for implementation of environmental protection measures along with item-wise break-up. These cost shall be included as part of the project cost.

xx) Full cooperation shall be extended to the Scientists/Officers from the Ministry /Regional Office of the Ministry at Chandigarh/the CPCB/ the SPCB who would be monitoring the compliance of environmental status."

154. Notification also stated that the environmental clearance would be valid for a period of five years to start the operation of the power plant and that in case of any deviation or alteration in the project proposed and already submitted to the MoEF for clearance, a fresh reference should be made to the MoEF to assess the adequacy of the conditions imposed and to add additional protection measures required, if any. Further it was also pointed out that the above stipulations would be in force amongst others under the Water Act, 1974, The Air Act, 1981 and the Environment (Protection) Act, 1986 and the Rules thereunder, Hazardous Wastes (Management and Handling) Rules, 1989 and its Rules, the Public Liability Insurance Act, 1991 and its amendment.

155. NPCIL submitted yet another application dated 19.11.2009 for environmental clearance for KKNPP expansion Units 5 & 6 (2 x 1000MW). Environmental clearance was granted by the MoEF vide its communication dated 31.12.2009

incorporating all the conditions which were stipulated in respect of Units 3 and 4 in the Notification dated 23.9.2008 and also with additional conditions which reads as under:

I. "Environmental clearance is subject to obtaining prior clearance from wildlife angle as applicable due to proximity of Gulf of Mannar Biosphere Reserve.

II. The grant of environmental clearance does not necessarily implies that wildlife clearance shall be granted to the project and that their proposal for wildlife clearance will be considered by the respective authorities on their merits and decision taken. The investment made in the project, if any, based on environmental clearance so granted, in anticipation of the clearance from wildlife angle shall be entirely at the cost and risk of the project proponent and Ministry of Environment and Forests shall not be responsible in this regard in any manner.

III. Environmental clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation v. Union of India in Writ Petition (Civil) No.460 of 2004, as may be applicable to this project.

IV. First aid and sanitation arrangements shall be made for the drivers and the contract workers during construction phase.

V. A sewage treatment plant shall be provided and the treated sewage conforming to the prescribed standards shall be used for raising green belt/plantation.

VI. The proponent shall upload the status of compliance of the stipulated EC conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MoEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels (stack and ambient levels) indicated for the project shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.

VII. The project proponent shall also submit six monthly reports on the status of compliance of the stipulated EC conditions including results of monitored data (both in hard copies as well by e-mail) to the respective

Regional Office of MoEF, the respective Zonal Office of CPCB and the SPCB.

VIII. A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parishad/Municipal Corporation, urban local Body and the Local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.

IX. The Environment statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of EC conditions and shall also be sent to the respective Regional Offices of MoEF by e-mail.

This issues with the approval of the Competent Authority."

156. As provided under EIA 2006 Notification before applying for environmental clearance for Units 3 to 6 a comprehensive EIA study was conducted for Units 3 to 6 which included the impact of Units 1 and 2 aspect as a base-line for computing additional impacts of Units 3 to 6. Concern of the public regarding safety, livelihood, radiation etc. had been addressed during the public hearing on units 3 to 6 held on 2.6.2007. Issues raised in the public hearing were:

1. Use of water from Pachi Pari Dam

2. Effect of temperature of discharge water on marine life

3. Radiation emission

4. Solid waste and fuel management

5. Welfare activities of the nearby villagers

6. Compliance with MoEF, IEA and AERB guidelines

7. Environmental impact and monitoring and

8. Site location criteria.

157. It was discussed in the meeting that sea water intake structure would be located at a depth of 10 mtr. from the Main Sea Level (MSL) and at a distance of 1.2 Kms. off shore from the shore line. The temperature differential of cooling water at the discharge point would be limited to 7°C with respect to the ambient temperature. Discharge of all units, including the existing two units will be let off into a common discharge channel parallel to the shore bound and release at the two extreme ends of the channel. Gates will be provided on East and West side of the channel, which will be operated depending upon the ocean current direction in different season. The modeling was done for all the units of 1000MW each taking into consideration the futuristic plan of expansion at the proposed site. The impact zone was shown to be 5 KM.

158. The Environmental Appraisal Committee (EAC) after holding the public meeting on 02.06.2007 again met on 22.8.2008 and made its recommendations for environmental clearance for Units 3 and 4 subject to their obtaining CRZ clearance. We have already indicated that the proposal of EAC was approved by the MoEF on 23.9.2008 with respect to Units 3 and 4. Later after getting the administrative approval from the Competent Authority for Units 5 and 6, the same was also reported by NPCIL to the MoEF and MoEF vide its letter accorded clearance on 31.12.2009 for Units 5 and 6 as well.

159. Appellants, therefore, cannot contend that the procedure laid down under the 1994 and 2006 Notifications had not been followed. In our view, the EIA for the expansion of KKNPP i.e. for setting up Units 3 to 6 included the environment impact on Units 1 and 2 and the cumulative effect of all the six units definitely formed the base line for the clearance granted by the MoEF on 23.9.2008 and 31.12.2009. The concern of the public regarding safety, livelihood, radiation, impact on marine life, rehabilitation, impact on the sea shore etc. were also considered and following that necessary clearance was granted.

160. KKNPP 3 to 6, after having got environmental clearance from MoEF in September 2008 and December 2009 entrusted the task of updation of EIA study to M/s Engineers India Ltd. (EIL), Gurgaon (a Govt. of India Undertaking). EIL, accordingly carried out the study along with the Central Marine Fisheries Research Institute (CHFRI) for the expansion of projects on air, water, land, noise, biological and socio-economic aspects within a radius of 10 km from the proposed

location. Detailed study was conducted on the Reactor system of KKNPP 3 to 6, impact on environment existing environmental status, its prediction and on environmental management plan report was submitted in August 2011. The report has also analysed the environmental impact on the marine ecosystem due to +7oC CCW water and concluded that it will have no impact on the marine ecosystem. EIA was considered EAC, while granting CRZ clearance for the additional reactors 3 to 6 at KKNPP along with sea water intake and outfall facilities for cooling purpose. CRZ clearance was granted by MoEF on 25.07.2012 after following the procedure laid down in the CRZ notification of 2011. TNPCB, as already indicated, has also accorded consent to operate vide proceeding dated 28.08.2012 incorporating stringent standard of 7oC over and above the ambient temperature of sea for the discharge of effluents, through the cooling water and trade effluent and included permission for discharge of effluents from desalination plant.

Sustainable Development and impact on eco-system

161. The Government of India, as already stated, constituted a fifteen member experts group covering all fields technical, scientific, environment etc. to provide clarifications on the various issues raised by group of general public. Efforts were made by the group to have interaction with the agitators but met with little success. Group elaborately discussed apart from safety features of the plant, its ecological effects on environment and marine life and a Report was submitted to the Government of India on December 2011. The Government of Tamil Nadu also appointed an Expert Committee headed by the former President of AEC Prof. R. Srinivasan along with three other experts to review the safety features. There has been consensus among all the expert committee on safety and security of the plant as well as on the effect on marine ecology, high protection, impact on land, agriculture, livestock, food, impact on flora and fauna, biosphere, environmental clearance, CRZ clearance, fresh water supply, desalination plants, emergency preparedness etc. Detailed studies have been conducted on various occasions of the effect of the NPP on air, water, noise, land, environment and also on biological, marine and socio-economic environment; to allay the apprehension voiced by a section of the people and its worth.

162. Royal Commission on Environmental pollution (UK) in its very first report, 4(1971) stated as follows:

> "The problem we face is how to strike a balance between the benefits of rising standard of living and its costs in terms of deteriorations of the

physical environment and the quality of life. In the past, the danger of polluting the air, water and land was not fully recognized, but now there is no doubt that it is a matter of great concern".

163. Royal Commission had said so in the year 1971. Next year 1972, the international community convened the United Nations Conference on Human Environment at Stockholm (Stockholm Conference) of which India is a signatory.

164. Stockholm Conference not only brought into focus the human rights approach to the problem of environmental protection but also recognized the linkage between the development and environment from which the concept of "sustainable development" has emerged. The Conference noticed that while man is both creature and moulder of this environment, rapid advances in science and technology had invested man with the potent power to transform his environment in countless ways and on an unprecedented scale. The benefits of development and opportunity to enhance quality of life, if wrongly or carelessly used, man could do incalculable harm to human beings and to the environment. The responsibility of the people to protect and improve the environment for the present and the future generations was also recognized. Later the Nairobi Conference and Declaration 1982 re-stated the principles of Stockholm Conference and high-lighted the importance of intensifying the efforts at the global, regional and national levels to protect and improve environment. The United Nations General Assembly (UNGA) in October 1982 adopted "The World Charter For Nature" and laid down general principles of environmental protection, action plan and implementation of scheme which high-lighted the conservation principles. New Delhi hosted the Delhi International Conference on Environmental Education 1982 where the International Community called for massive programme of environmental research and monitoring. The Conference suggested that environmental education should start from childhood and it should be both formal and informal.

165. The United Nations General Assembly vide Resolution 38/161, in the year 1983 suggested the creation of "The World Commission on Environment and Development" for suggesting and recommending legal principles based on Stockholm Conference and Nairobi Conference and many other, then existing International Conventions and General Assembly Resolutions. The World Commission submitted its report in year 1987 which indicated that politicians, industrial leaders and environmental groups around the world had endorsed "sustainable development" i.e. meeting the needs of the present without compromising the ability of future generations to meet their own needs. United

Nations convened a conference in the year 1983 at Vienna for protection of Ozone layer which provided foundation for global multilateral undertakings to protect the environment and public health from the potential adverse effects of depletion of Stratospheric Ozone.

166. United Nations Environmental Programme (UNEP) convened a Conference at Plenipotentiaries in Montreal in the year 1987, called the Montreal Protocol 1987, which high-lighted the necessity of limiting and reducing the use of chlorofluro carbons and other chemicals that deplete ozone. India has acceded to both the Vienna Convention 1985 and the related Montreal Protocol, 1987, in the year 1992.

167. Following the Stockholm Conference the second landmark on environmental protection and development was "United Nations Conference on Environment and Development (UNCED), 1992 (Rio Summit). The Conference was held at Rio (Brazil) in the year 1992 which addressed the twin problems of environment and development. Rio declaration sets out general non-binding commands for "sustainable development" i.e. "human beings who are at the centre of sustainable development concerns have to exercise their right to healthy and productive life in harmony with nature". The Rio Conference also high-lighted the principle of inter generational equity. Principles like "precautionary principle" so as to prevent the environmental degradation and the principle of "polluter pays" i.e. to bear the cost of pollution with due regard to public interest" were high-lighted. The Conference resulted in conclusion of a treaty on climate change with a general recognition of the importance of curbing emission of green house gases, another treaty on bio-diversity aiming at the preservation of flora and fauna was also concluded. The Rio Conference also adopted Agenda 21. Section II of that Agenda deals with topics like protection of the atmosphere, land resources, deforestation, sustainable agriculture and rural development, conservation of biodiversity, protection of oceans, fresh water, toxic chemicals management, hazardous waste management, solid waste management and radioactive waste management.

168. An international instrument expressing international concern for the protection of global environment was the convention on the Climate Change (UNFCCC) 1992. The Convention high-lighted the necessity to reduce emissions of green-house gases believed to be contributing to global warming. Yet another, convention was The Biodiversity Convention, 1992 which sought to ensure that animals, plants and micro-organisms as well as genetic variety and ecosystem, water, land and air, in which they live are property protected. It obligates the

countries to promote the protection of eco-systems, natural habitat and the maintenance of viable populations of species in natural surroundings. Following the Rio Summit a Special Session of UNFA held in June 1997 in New York to review the progress of Rio Earth Summit called "Earth Summit+5" which adopted a comprehensive document titled "Programme For Further Implementation of Agenda 21". The Conference noticed that since the Rio Conference, global environment had continued to deteriorate with rising level of polluting emissions, notably of green house gases, toxic substances and waste volumes and at operational levels, including the lowest administrative levels.

169. UN Millennium Declaration, 2000 articulated that prudence must be shown in the management of all living species and natural resources, based on the principle of "sustainable development" and that only then, can the immeasurable riches provided to us by the nature be preserved for posterity. Further it was declared that current unsustainable pattern of production and consumption must be changed in the interest of our future welfare and that of our descendants.

170. United Nations General Assembly (UNGA) following the Rio Declaration and Agenda 21 created a Commission on Sustainable Development under the United Nations Economic and Social Council to ensure the effective implementation at the local, national, regional and international levels of what had been agreed at the Rio Conference, to ensure follow up of Rio Summit, to enhance adequate international, scientific and technological cooperation to catalyse inter-governmental decision making capacity to ensure regular and effective reporting on the Agenda 21 and at the national, regional and global levels.

171. The Delhi Sustainable Development Summit (DSDS) held in February 2002 at New Delhi, examined and elaborated the dynamics of concept of sustainable development, with a view to make recommendations for consideration at the World Summit at sustainable development to be held in Johannesburg. Delhi Summit sought to focus on poverty alleviation as the overriding concern to achieve sustainable development.

172. The World Summit on Sustainable Development (Johannesburg Summit) 2002 convened under the auspices of commission of sustainable development recommended various steps for further implementation of Rio Principles and Agenda 21. The Summit recognized that the reduction of poverty is the greatest global challenge facing the world, for which the World Solidarity Fund was required to be established to eradicate poverty and to promote social and human

development in various developing countries. Further, Conference also noticed that since oceans, seas, islands and coastal areas form an integrated and essential component of earth's ecosystem and are crucial for global food security and for sustaining economic prosperity and the well-being of many national economies, particularly, developing countries, it is necessary to ensure sustainable development of the oceans.

173. United Nations Conference on Sustainable Development, Rio +20 took place in Rio de Janeiro in June 2012, which also took forward looking decisions on a number of thematic areas including energy, food security, oceans, cities etc. Conference also focused its attention on green economy in the context of sustainable development, poverty eradication and an institutional framework for sustainable development.

174. We have already found on facts that the KKNPP has been set up and is made functional on the touchstone of sustainable development and its impact on ecology has been taken care of following all national and international environmental principles.

Public Interest and Human Rights

175. We have to resolve the issue whether the establishment of NPP would have the effect of violating the right to life guaranteed under Article 21 to the persons who are residing in and around Kudankulam or by establishing the NPP, it will uphold the right to life in a larger sense. 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.

176. Problems highlighted, while setting up a nuclear plant, are not unique to this nation, because other countries are also grappling with those situations. In R. v. Inspectorate of Pollution, ex p Greenpeace Ltd (1994) ALLER 321, the Court of Appeal in England had occasion to examine the correctness of the decision taken by Her Majesty's Inspectorate of Pollution (HMIP) and Ministry of Agriculture, Fisheries and Food (MAFF) for allowing testing of new Thermal Oxide reprocessing plant THORP at Sellafield, HMIP and MAFF had concluded that the

radiological impact of emissions from THORP would be very small, a plea which was accepted by the court. In R. v. The Secretary of State for the Environment, ex p Greenpeace Ltd. (1994) 4 All England Reports 352, the Greenpeace and Lancashire Country Council sought to quash the decision to grant authorization for the disposal of radioactive waste from THORP. Overall, Potts J. concluded that Minister had acted correctly in considering first the human issues related to acceptability of risk and then examining the wider issue of justification as if they were relevant even though Minister (incorrectly) believed that they were not relevant, they had, in fact, weighed the benefits and detriments and were entitled to reach the conclusion that balance came down on the side of justification. In R. v. Secretary of State for Environment, Food and Rural Affairs, ex p Friends on the Earth Ltd (2002) Environmental Law Review 24, the Court of Appeal in England had to consider the application of the principle of justification to the substantive decision in October 2001 with the proposed practice by the British Nuclear Fuels Limited (BNFL) of manufacturing mixed oxide fuel (MOX) at Sellafield. Government's stand was that the "economic benefits" were sufficient to justify "the very minor radiological detriments" which would result from the manufacture of MOX. The Court of Appeal accepted the stand of the Government. In Marchiorii v. Environment Agency (2002) EWCA Civ 3, the Court of Appeal examined the validity of the authorization granted by the environment agency for the discharge of liquid wastes from the Atomic Weapons Establishment (AWE) on the basis of that they could not be justified having regard to the humanitarian and international law objections to the use of nuclear weapons. The environment agency took the stand that the practice of designing, constructing, maintaining and dismantling nuclear weapons at the AWE justified in the light of the government's defence policy. The Court of Appeal rejected the suggestion that the government decisions on matters such as the national nuclear deterrent should be subjected to review by the Courts on merits. However, in R. (Greepeace Ltd) v. Secretary of State for Trade and Industry (2007) Environmental Law Reports 29, Sullivan J. high-lighted the importance of 'public participation in decision making and access to justice' in environmental matters and held that the government was obliged to honour the promise that it had made of the fullest public consultation, even if it had made no such promise which was difficult to see how anything less could have been consistent with the obligations to provide opportunities for public participation accepted by the Government under the United Nations Economic Commission of Europe (UNECE). In S.V. France 3RUOH (1991), the European Commission of Human Rights found that noise, night time illumination of the power plant, nuclear risk and changes in the micro climate while interfering with

the applicant's private life had to be weighed with the general interests of the community.

177. The United States Supreme Court in Metropolitan Edison Co. v. People Against Nuclear Energy [460 US 766 (1983)] was called upon to determine whether psychological health damage flowing directly from the perceived risk of a nuclear accident, in the context of restarting the second reactor at Three Mile Island, following the accident affecting the other reactor fell within the scope of environmental impact assessment under the National Environmental Policy Act. The Court regarded the perceived risk of a nuclear accident as "a pervasive element of modern life" and held that such risk was not an effect on the physical environment. In Alberta Wilderness Association v. Express Pipelines Ltd. 137 DLR (4th) 177, in Canadian Court held that no information about probable future effects of a project can ever be complete or exclude all possible future outcomes. This principle has been endorsed by the Federal Court of Appeal, Canada in Inverhuron District Ratepayers' Assn v. Canada (Minister of the Environment) 2001 FCA 203 in a case involving a dry storage facility for used nuclear fuel.

178. Much hue and cry has been raised by some sections of the people about the possible impact of radiation from KKNPP Units 1 and 2, a point which has been addressed by the AERB, NPCIL, MoEF and all the Expert Committees constituted to go into the impact and effect of radiation from the units not only on humans but also on ecology. Experts Committees are of the unanimous opinion that there will not be any deleterious effects due to radiation from the operation of KKNPP, and that adequate safety measures have already been taken. We cannot forget that there are many potential areas of radiation reflected in many uses of radioactive materials. Radioactive materials are used in hospitals, surgeries and so on. Mobile phone use, though minor, also causes radiation. In a report of the Department of Telecommunication "Mobile Communication – Radio Wave and Safety released in October 2012, it has been stated that a human body is exposed to more electromagnetic field radiation in case of a call from mobile phone in comparison to the radiation from a mobile tower.

179. We have, therefore, to balance "economic scientific benefits" with that of "minor radiological detriments" on the touchstone of our national nuclear policy. Economic benefit, we have already indicated has to be viewed on a larger canvas which not only augment our economic growth but alleviate poverty and generate more employment. NPCIL, while setting up the NPP at Kudankulam, have satisfied the environmental principle like sustainable development, corporate social

responsibility, precautionary principle, inter - intra generational equity and so on to implement our National Policy to develop, control and use of atomic energy for the welfare of the people and for economic growth of the country. Larger public interest of the community should give way to individual apprehension of violation of human rights and right to life guaranteed under Article 21.

180. Public money running into crores and crores rupees have already been spent for the development, control and use of atomic energy for the welfare of the people and hence, we have to put up with such "minor inconveniences", "minor radiological detriments" and minor environmental detriments" in our lives because the benefits we reap from KKNPP are enormous since Nuclear energy remains as an important element in India's energy mix which can replace a significant part of fossil fuels like coal, gas oil etc.

181. The necessity of establishing KKNPP at Kudankulam has elaborately been discussed in the earlier part of the judgment, hence not repeated. Justification for establishing KKNPP at Kudankulam, therefore has been vindicated and all safety and security measures have already been taken, necessary permissions and clearances have been obtained from all statutory authorities. Apprehension expressed by some sections of the public that if the units are commissioned or put into operation, it will have far reaching consequences, not only on the present generation, but also on the future generation, of the possible radioactive effects of the units, in our view has no basis. Few of them raised the apprehension that it might repeat accidents like the one that had happened at Three Miles Island, Chernobyl, Union Carbide and Fukushima etc. Apprehension, however, legitimate it may be, cannot override the justification of the project. Nobody on this earth can predict what would happen in future and to a larger extent we have to leave it to the destiny. But once the justification test is satisfied, the apprehension test is bound to fail. Apprehension is something we anticipate with anxiety or fear, a fearful anticipation, which may vary from person to person.

182. 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. They should also have an adequate means of

livelihood, job opportunities for which we have to set up Industries and commercial undertakings in the public as well as private sector and also have to invite foreign investment. Generation of electricity is of extreme importance for their establishment and functioning and also for domestic consumption. Power generation with the traditional means, through hydro, thermal electric project, coal etc are not effective substitution to the power generation through Nuclear Plant. India has a mammoth population unlike developed countries, and the consumption of electricity in domestic, industries, agricultural sector etc. is going up day-by-day. Most of the States are in the grip of power cut; day and night, for a number of hours, which has adverse effect on their economic and industrial growth. To sustain rapid economic growth, it is necessary to double the supply of energy. Energy tariff is also increasing, nuclear power in the long run will be much cheaper than other forms of energy.

183. This Court in Chameli Singh and others v. State of U.P. and another (1996) 2 SCC 549 held that an organized society right to live as a human being is not ensured by meeting only the animal needs of man, but secured only when he is assured of all facilities to develop himself and is freed from restrictions which inhibit his growth. Right to shelter includes adequate living space, safe and decent structure, clean and decent surroundings, sufficient light, pure air and water, electricity, sanitation and civil amenities like road etc. so as to have easy access to his daily avocation.

184. Nuclear power plant is being established not to negate right to life but to protect the right to life guaranteed under Article 21 of the Constitution. The petitioner's contention that the establishment of nuclear power plant at Kudankulam will make an inroad into the right to live guaranteed under Article 21 of the Constitution, is therefore has no basis. On the other hand it will only protect the right to life guaranteed under Article 21 of the Constitution for achieving a larger public interest and will also achieve the object and purpose of Atomic Energy Act.

EXPERTS' VIEWS –TECHNICAL AND SCIENTIFIC

185. AEC, DAE, BARC, AERB, NPCIL, TNPCB the expert bodies, are all unanimous in their opinions that adequate safety and security measures have already taken at KKNPP which are to be given due weight that they deserve. Further, as already indicated NPCIL Task Force Report on Security of all NPPs including KKNPP dated March 2011, 11.5.2011, AERB-EE Expert Opinion on

Design Committee Safety dated 31.8.2011, 15 Member Expert Team Committee Report (post Fukishama) dated December 2011, Supplementary Report dated 31.2.2012 on the Grievances raised by some of the agitators, report submitted by Sri R. Srinivasan, Former President, Atomic Energy Commission appointed by the State of Tamil Nadu are all unanimous in their view on the safety and security of KKNPP.

186. MoEF, EAC, TNPCB, Report of IOM, Anna University dated July 2008 on Impact of NPP on Marine Eco-system, Committee on Conservation of Sea-Shore of the State of Tamil Nadu, Report of Engineers India Limited with CHFRI dated August 2011, NEERI dated May 2002 and January 2003 on the Impact on Air, Water, Land, Eco-system etc. are all unanimous that the radiation as well as the discharge of water from NPP to the sea shore will not have serious impact on the marine ecology or on marine life.

187. A Constitution Bench of this Court in University of Mysore v. C. D. Govinda Rao AIR 1965 SC 491, held that, normally, Court should be slow to interfere with the opinion expressed by the Experts and it would normally be wise and safe for the courts to leave the decisions to experts who are more familiar with the problems which they face than the courts generally can be which has been the consistent view taken by this Court. Reference may be made to the judgments of this Court in State of Bihar v. Asis Kumar Mukherjee (Dr.) (1975) 3 SCC 602, Dalpat Abasaheb Solunke v. B. S. Mahajan (1990) 1 SCC 305, Central Areca Nut & Cocoa Marketing & Processing Coop. Ltd. v. State of Karnataka (1997) 8 SCC 31, Dental Council of India v. Subharti K. K. B. Charitable Trust & Another (2001) 5 SCC 486, Basavaiah (Dr.) v. Dr. H. L. Ramesh (2010) 8 SCC 372 and Avishek Goenka v. Union of India (2012) 5 SCC 275. In Woon Tankan and Seven Others v. Asian Rare Earth Sdn. Ehd. CLJ (1992) 2 207, the Supreme Court of Malaysia vide its judgment dated 23.12.1993 examined the effect of low-level radioactive waste on the health of the population. The Supreme Court upheld the plea of the company, placing reliance on the expert opinion expressed by the Atomic Energy Licensing Board (AELB) and took the view that since the company has been operating under license granted by AELB, an expert body, it will be taken that the expert body had the expertise to speak on the radiation level of the radioactive waste, on the health of the population.

188. We have noticed that, so far as this case is concerned, from the safety and security point of view of life and property, on environment and all that related aspects, all the Expert Bodies are unanimous in their opinion that KKNPP has fully

satisfied all safety norms to safeguard the human life, property and environment which, we are sure, will allay the fears and apprehensions expressed by the people living in and around Kudankulam. The Court, in our view, cannot sit in judgment on the views expressed by the Technical and Scientific Bodies in setting up of KKNPP plant at Kudankulam and on its safety and security.

CONCLUSION

189. KKNPP has, therefore been set up as part of India's National Policy so as to develop, control and use of atomic energy for the welfare of the people of India. Policy makers consider nuclear energy as an important element in India's energy mix for sustaining economic growth of natural and domestic use. For setting up the project, the project proponent has taken all safety requirements in site and off site and has followed the code of practices laid down by AERB, based on nationally and internationally recognized safety methods. Safeguarding the nuclear plants, radioactive materials and ensuring its physical security have become a central part of Nuclear Law. Adequate measures have, therefore, to be taken for storage of NSF at site, and also for the physical safety of stored NSF. Of the seventeen suggested safety measures, by AERB, LWR, twelve have already been implemented and the rest, in a phased manner have to be implemented which the experts say, are meant for extra security. DMP is already in place, so also the emergency preparedness plan, off site and on site and all programmes under CSR are progressing in the right direction with the co- operation and assistance of the District Administration.

190. NPCIL, has also received necessary environmental clearance from MoEF, TNPCB, etc for Units 1 to 6. No violation of CRZ is also noticed. Desalination Plant is also established after following rules and regulations and there is no violation of CRZ. Experts say that there will be no impact on the marine eco-system due to discharge of +7ºCC, CCW over and above the ambient temperature of the sea. Radiation impact on the eco- system is also within the standard set by AERB, MoEF, EAC, Pollution Control Board etc., so opined by the Experts. In other words, 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 KKNPP has been set up.

Dipak Misra, J.

191. I have my respectful concurrence with the views and conclusions expressed by my respected learned Brother Radhakrishnan on all aspects. However, I propose to add a few words in addition to what has been eruditely stated by my learned Brother.

Prologue

192. At the very inception, I may state that in the cases at hand, we are faced with a situation whether to interfere in the establishment, operation and functionalism of a nuclear plant coming up at Kudankulam and interdict its operation because of numerous grounds assiduously urged in voluminous pleadings encompassing the broad canvas, namely, statutory violations of the entire gamut of environmental law, exhibition of non-chalant attitude towards public opinion, show of total disrespect towards nature's inconsistencies, keeping at bay the constant apprehension and threat of the known and the unknown, absolute contempt for predictable danger that has surfaced on certain parts of the Globe and the unpredictable disaster that may be faced by the populace of the locality and, most importantly, the public safety in praesenti and in futuro, or take cognizance of the needs and necessities of the public at large, the concept of public policy and the scope of judicial review, the precautions already undertaken and further assured to be taken within a specific time span, the opinion of the experts, the impossible avoidance of certain facets of existence in today's world, the global phenomena of requirement of electricity as a source of energy and various innovative methods to meet the same, the safety measures carried out and the steps undertaken to manage the disaster in case it occurs and finally to march ahead with life allaying all apprehensions with a scientific mindset accepting the nature's unpredictability to survive on the planet earth on the bedrock of the doctrine – survival of the fittest.

The concern for safety under the Atomic Energy Act, 1948:

193. Bearing in mind the broad scenario, few aspects are required to be harped upon. Independent India perceived the need and use of nuclear energy in this country. The Atomic Energy Act, 1948 conceived the constitution of the Atomic Energy Commission which came into being in 1954. After the repeal of the 1948 Act and coming into force of the Atomic Energy Act, 1962 (for brevity "the 1962 Act"), a larger field was covered. The 1962 Act was enacted to provide for the development, control and use of atomic energy for the welfare of the people of

India and for other peaceful purposes and for matters connected therewith. The dictionary clause as contained in Section 2 takes into consideration many an aspect pertaining to equipment, substance, radiation and radioactive substance, etc.

194. Certain provisions of the 1962 Act may be usefully referred to. Section 3 of the 1962 Act deals with general powers of the Central Government. Sub-section (e) of Section 3 reads as follows:-

> "3. General powers of the Central Government
>
> Subject to the provisions of this Act, Central Government shall have power –
>
> (e) to provide for control over radioactive substances or radiation generating plant in order to-
>
> (i) prevent radiation hazards;
>
> (ii) secure public safety and safety of persons handling radioactive substances or radiation generating plant; and
>
> (iii) ensure safe disposal of radioactive wastes;"
>
> [Emphasis supplied]

195. Section 17 deals with special provisions for safety which reads as follows :-

> Special provisions as to safety
>
> (1) The Central Government may, as regards any class or description of premises or places, being premises or places, in which radioactive substances are manufactured, produced, mined, treated, stored or used or any radiation generating plant, equipment or appliance is used, make such provision by rules as appear to the Central Government to be necessary —
>
> (a) to prevent injury being caused to the health of persons employed at such premises or places or other persons either by radiations, or by the ingestion of any radioactive substance;

(b) to secure that any radioactive waste products resulting from such manufacture, production, mining, treatment, storage, or use as aforesaid are disposed of safely;

(c) to prescribe qualifications of the persons for employment at such premises or places and the regulation of their hours of employment, minimum leave and periodical medical examination. and the rules may, in particular and without prejudice to the generality of this subsection provide for imposing requirements as to the erection or structural alterations of buildings or the carrying out of works.

(2) The Central Government may, as respects the transport of any radioactive substance or any prescribed substance specified by an order issued under this Act as being dangerous to health, make such rules as appear to be necessary to prevent injury being caused by such transport to the health of persons engaged therein and other persons.

(3) Rules made under this section may provide for imposing requirements, prohibitions and restrictions on employers, employed persons and other persons.

(4) Any person authorised by the Central Government under this section, may, on producing, if so required, a duly authenticated document showing his authority, enter at all reasonable hours any premises, or any vehicle, vessel or aircraft for the purpose of ascertaining whether there has been committed, or is being committed, in or in connection with the premises, vehicle, vessel or aircraft, any contravention of the rules made under this section.

(5) In the event of any contravention of the rules made under this section, the Central Government shall have the right to take such measures as it may deem necessary to prevent further injury to persons or damage to property arising from radiation or contamination by radioactive substances including, without prejudice to the generality of the foregoing provisions, and to the right to take further action for the enforcement of penalties under section 24, the sealing of premises, vehicle, vessel, or aircraft, and the seizure of radioactive substances and contaminated equipment.”

[Emphasis added]

196. I have referred to the aforesaid provisions to highlight the emphasis laid on the public safety and safety of persons handling radioactive substances and to control the repercussions by the legislature. Before I dwell upon in detail with regard to the necessity of safety, the measures taken and the constant vigil for future, it is apt to scan the anatomy of the Preamble, which has already been referred to. The preamble can be segregated into three parts namely, (i) development, control and use of atomic energy, (ii) for the welfare of the people of India and (iii) for other peaceful purposes. Thus, on one hand, the need was felt to get into the global arena for producing nuclear energy and, on the other, which is as important as the first one, for the welfare of the people. The necessity to generate energy from various sources in India was and still is a felt necessity. It has been submitted by the learned counsel for the appellant with immense emphasis that apart from violation of the Environment (Protection) Act, 1986 and the notifications framed thereunder, the study would reflect that there would be multiple ecological problems and further the safety of the local people would be absolutely in peril. My learned brother has already dealt in detail with regard to the submissions pertaining to the violations of the statutory provisions, the Rules and the Notifications relating to various environmental issues. I do not intend to add anything in that regard. My deliberation shall be on the concept of welfare and safety relating to the use of nuclear energy for the purpose of development. Needless to say, it has to be totally guided by the conception of public safety and welfare of the citizens. The term 'welfare' is always related to the living generation and generations to come. It has been contended before us by the learned counsel for the appellant that the basic care has not been taken to make the nuclear plant at Kudankulam a safe one and further when the entire globe has been shaken by the Fukushima tragedy, the Government of India, without taking recourse to the participative process of public hearing and showing scant respect for public safety, has plunged into such an activity. That apart, it is highlighted that the radioactive substances have the real potentiality to gravely affect the present generation and that, in turn, will usher in immense disaster and suffering for the future generations. Per contra, learned counsel for the respondents would urge that the plant is based and founded on sophisticated technology and there are more than three layers of protection for safety which is not available in other nuclear plants in other parts of the world. In essence, it is submitted that all possible measures have been taken to avoid any kind of calamity.

197. It is borne out from the material on record that two aspects have weighed with many a nation while thinking of a nuclear energy plant, namely, the caution and

circumspection at the time of operation and how to deal with radioactive waste. We have been apprised how the re-use of radioactive waste is done by a sophisticated method and the danger is kept at bay. On one hand, there is requirement of energy and the need of progress and development and, in a way, to compete with the progressive phenomenon of the other countries in many a sphere and, on the other, the likelihood of danger to be caused to the people of the locality and the effect-potentiality to affect the larger section of public because of disposal of radioactive waste and transportation.

Certain Conventions pertaining to safety:

198. At this juncture, I may profitably refer to the Convention on Nuclear Safety adopted on 17th June, 1994 in the Conference convened by the International Atomic Energy Agency at its Headquarters. India is a signatory to the said Convention. The Preamble of the Treaty reads as follows: -

> i. "Aware of the importance to the international community of ensuring that the use of nuclear energy is safe, well regulated and environmentally sound;
>
> ii. Reaffirming the necessity of continuing to promote a high level of nuclear safety worldwide;
>
> iii. Reaffirming that responsibility for nuclear safety rests with the State having jurisdiction over a nuclear installation;
>
> iv. Desiring to promote an effective nuclear safety culture;
>
> v. Aware that accidents at nuclear installations have the potential for transboundary impacts;
>
> vi. Keeping in mind the Convention on the Physical Protection of Nuclear Material (1979), the Convention on Early Notification of a Nuclear Accident (1986), and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (1986);
>
> vii. Affirming the importance of international co-operation for the enhancement of nuclear safety through existing bilateral and multilateral mechanisms and the establishment of this incentive Convention;

viii. Recognizing that this Convention entails a commitment to the application of fundamental safety principles for nuclear installations rather than of detailed safety standards and that there are internationally formulated safety guidelines which are updated from time to time and so can provide guidance on contemporary means of achieving a high level of safety;

ix. Affirming the need to begin promptly the development of an international convention on the safety of radioactive waste management as soon as the ongoing process to develop waste management safety fundamentals has resulted in broad international agreement;

x. Recognizing the usefulness of further technical work in connection with the safety of other parts of the nuclear fuel cycle, and that this work may, in time, facilitate the development of current or future international instruments;"

[Emphasis supplied]

199. Article 10 deals with priority to nuclear safety. It reads as follows: -

"Each Contracting Party shall take the appropriate steps to ensure that all organizations engaged in activities directly related to nuclear installations shall establish policies that give due priority to nuclear safety."

[Emphasis added]

200. Article 14 provides for assessment and verification of safety. It is as under: -

"(i) comprehensive and systematic safety assessments are carried out before the construction and commissioning of a nuclear installation and throughout its life. Such assessments shall be well documented, subsequently updated in the light of operating experience and significant new safety information, and reviewed under the authority of the regulatory body;

ii) verification by analysis, surveillance, testing and inspection is carried out to ensure that the physical state and the operation of a nuclear installation continue to be in accordance with its design, applicable national safety requirements, and operational limits and conditions."

[Emphasis supplied]

201. Article 16 stipulates emergency preparedness. It reads as follows: -

> "1. Each Contracting Party shall take the appropriate steps to ensure that there are on-site and off-site emergency plans that are routinely tested for nuclear installations and cover the activities to be carried out in the event of an emergency.
>
> For any new nuclear installation, such plans shall be prepared and tested before it commences operation above a low power level agreed by the regulatory body.
>
> 2. Each Contracting Party shall take the appropriate steps to ensure that, insofar as they are likely to be affected by a radiological emergency, its own population and the competent authorities of the States in the vicinity of the nuclear installation are provided with appropriate information for emergency planning and response.
>
> 3. Contracting Parties which do not have a nuclear installation on their territory, insofar as they are likely to be affected in the event of a radiological emergency at a nuclear installation in the vicinity, shall take the appropriate steps for the preparation and testing of emergency plans for their territory that cover the activities to be carried out in the event of such an emergency."

202. Article 19 deals with operations. It is as follows: -

> "Each Contracting Party shall take the appropriate steps to ensure that:
>
> i) the initial authorization to operate a nuclear installation is based upon an appropriate safety analysis and a commissioning programme demonstrating that the installation, as constructed, is consistent with design and safety requirements;
>
> ii) operational limits and conditions derived from the safety analysis, tests and operational experience are defined and revised as necessary for identifying safe boundaries for operation;

iii) operation, maintenance, inspection and testing of a nuclear installation are conducted in accordance with approved procedures;

iv) procedures are established for responding to anticipated operational occurrences and to accidents;

v) necessary engineering and technical support in all safety- related fields is available throughout the lifetime of a nuclear installation;

vi) incidents significant to safety are reported in a timely manner by the holder of the relevant licence to the regulatory body;

vii) programmes to collect and analyse operating experience are established, the results obtained and the conclusions drawn are acted upon and that existing mechanisms are used to share important experience with international bodies and with other operating organizations and regulatory bodies;

viii) the generation of radioactive waste resulting from the operation of a nuclear installation is kept to the minimum practicable for the process concerned, both in activity and in volume, and any necessary treatment and storage of spent fuel and waste directly related to the operation and on the same site as that of the nuclear installation take into consideration conditioning and disposal."

[Underlining is mine]

203. The aforesaid Convention, as is demonstrable from the various Articles, lays down the priority to nuclear safety, comprehensive and systematic safety assessments at all stages including the life span of the plants, verification by analysis, surveillance, testing and inspection, regard being had to the safety requirements, emergency planning and preparedness to take care of the people in the vicinity of the nuclear installation, necessary engineering and technical support in all safety related fields available throughout the life time of the nuclear installation, constant reporting by the operator to the regulatory body pertaining to safety and the handling of radioactive waste resulting from the operation and the measures of safety carried thereon.

204. In this regard, I may refer with profit to another Convention, namely, the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management dated 5th September, 1997. I may hasten to add that India is not a signatory to the same but the said Convention is worth referring to in order to understand and appreciate the world-wide concern for public safety. Chapter 2 deals with safety of spent fuel management, Chapter 3 deals with safety of Radioactive Waste Management and Chapter 4 deals with General safety provisions. Article 4 occurring in Chapter 2 deals with general safety requirements. Clauses (v) and (vii) read as follows: -

> "Article 4. General Safety Requirements
>
> Each Contracting Party shall take the appropriate steps to ensure that at all stages of spent fuel management, individuals, society and the environment are adequately protected against radiological hazards.
>
> In so doing, each Contracting Party shall take the appropriate steps to:
>
> (v) take into account the biological, chemical and other hazards that may be associated with spent fuel management;
>
> (vii) aim to avoid imposing undue burdens on future generations."

205. Article 11 in Chapter 3 pertains to General Safety Requirements. It is reproduced below: -

> "Each contracting Party shall take the appropriate steps to ensure that at all stages of radioactive waste management individuals, society and the environment are adequately protected against radiological and other hazards.
>
> In so doing, each Contracting party shall take the appropriate steps to:
>
> i) ensure that criticality and removal of residual heat generated during radioactive waste management are adequately addressed;
>
> ii) ensure that the generation of radioactive waste is kept to the minimum practicable;

iii) take into account interdependencies among the different steps in radioactive waste management;

iv) provide for effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards;

v) take into account the biological, chemical and other hazards that may be associated with radioactive waste management;

vi) strive to avoid actions that impose reasonable predictable impacts on future generations greater than those permitted for the current generation;

vii) aim to avoid imposing undue burdens on future generations."

[Emphasis added]

206. Article 15 deals with Assessment of Safety of facilities. The relevant clauses are as under: -

"Each Contracting Party shall take the appropriate steps to ensure that:

i) before construction of a radioactive waste management facility, a systematic safety assessment and an environmental assessment appropriate to the hazard presented by the facility and covering its operating lifetime shall be carried out;

ii) in addition, before construction of a disposal facility, a systematic safety assessment and environmental assessment for the period following closure shall be carried out and the results evaluated against the criteria established by the regulatory body;

iii) before the operation of a radioactive waste management facility, updated and detailed versions of the safety assessment and of the environmental assessment shall be prepared when deemed necessary to complement the assessments referred to in paragraph (i)."

207. Article 22 that occurs in Chapter 4 deals with Human and Financial Resources. It is apt to reproduce the same: -

> "Each Contracting Party shall take the appropriate steps to ensure that:
>
> i) qualified staff are available as needed for safety-related activities during the operating lifetime of a spent fuel and a radioactive waste management facility;
>
> ii) adequate financial resources are available to support the safety of facilities for spent fuel and radioactive waste management during their lifetime and for decommissioning;
>
> iii) financial provision is made which will enable the appropriate institutional control and monitoring arrangements to be continued for the period deemed necessary following the closure of a disposal facility."

208. Article 23 deals with quality assurance. It reads as follows:-

> "Each Contracting Party shall take the necessary steps to ensure that all appropriate quality assurance programmes concerning the safety of spent fuel and radioactive waste management are established and implemented."

209. The aforesaid Convention, as is seen, lays emphasis on ecological hazards, avoidance of undue burden on future generations, management of radioactive waste, adequate protection against radiological and other hazards, application of suitable protective methods approved by the regulatory body keeping in view the interest of the individual and the society, to avoid actions that impose reasonable predictable impact on future generations, the systematic safety assessment and environmental assessment appropriate to the hazards presented by the facility and covering its operating lifetime, the institutional control and mandatory arrangements and ensuring of appropriate quality assurance programmes concerning the safety from spent fuel and radioactive waste. I am absolutely conscious that India has not ratified the said Convention but the safety concern at any level is a fundamental human concern. I have referred to the same, to repeat at the cost of repetition, to show the concern of many countries, especially, relating to safety measures taken at all times. The 1962 Act and the Convention which has been ratified by India speak eloquently about that. The conception of public safety, at no stage, can be brushed aside or ignored. It has to be treated with paramount

primacy and highest priority for the simon pure reason life delights every person and creates an innate desire to live.

Necessity of Electrical Energy by the State and Concept of Public Safety:

210. In Anderson v. Dunn[1], the U.S. Supreme Court, in a different context, long back had stated about the role of the State and the safety of the citizens: -

> "No one is so visionary as to dispute the assertion, that the sole end and aim of all our institutions is the safety and happiness of the citizen. But the relation between the action and the end, is not always so direct and palpable as to strike the eye of every observer. The science of government is the most abstruse of all sciences; if, indeed, that can be called a science which has but few fixed principles, and practically consists in little more than the exercise of a sound discretion, applied to the exigencies of the state as they arise. It is the science of experiment."
>
> After so stating, the U.S. Supreme Court proceeded to observe as follows: -
>
> "That 'the safety of the people is the supreme law', not only comforts with, but is indispensable to, the exercise of those powers in their public functionaries, without which that safety cannot be guarded."

211. In Charan Lal Sahu v. Union of India[2], this Court, while dealing with the constitutional validity of the Bhopal Gas Leak Disaster (Processing of Claims) Act, 1985, observed that the said enactment was passed as a sequel to a grim tragedy that occurred on the night of December 2, 1984. This Court treated it to be the most tragic industrial disaster in recorded human history. While discussing the concept of parens patriae, the learned Chief Justice observed that the conception of the parens patriae theory is the obligation of the State to protect and it takes into custody the rights and the privileges of its citizens for discharging its obligation. While dealing with the said concept, it has been opined that the maxim salus populi suprema lex – regard for public welfare - is the highest law.

212. I have referred to the said pronouncement solely to emphasize on the role of the State to act in the greater welfare of the collective and how the public welfare has been treated to be at the zenith of law.

213. In Union Carbide Corporation v. Union of India and others[3], a Constitution Bench regarded the Bhopal Gas Leak Tragedy as a horrendous industrial mass disaster, unparalleled in its magnitude, and the devastation and remains a ghastly monument to the dehumanizing influence of inherently dangerous technologies. While dealing with the justness and reasonableness of the quantum of settlement, the Constitution Bench adverted to the problems emerging from the pursuit of such dangerous technologies for economic gains by multinationals, availability of cheap labour, captive markets and the facets of economic exploitation in developing countries where the matters of concern were propounded before the court and in that context, it has been observed as follows: -

> "32. These issues and certain cognate areas of even wider significance and the limits of the adjudicative disposition of some of their aspects are indeed questions of seminal importance. The culture of modern industrial technologies, which is sustained on processes of such pernicious potentialities, in the ultimate analysis, has thrown open vital and fundamental issues of technology options. Associated problems of the adequacy of legal protection against such exploitative and hazardous industrial adventurism, and whether the citizens of the country are assured the protection of a legal system which could be said to be adequate in a comprehensive sense in such contexts arise. These, indeed, are issues of vital importance and this tragedy, and the conditions that enabled it happen, are of particular concern."

214. Thereafter, the Court referred to the technology in agriculture that has given a big impetus to enterprises of chemical fertilizers and its serious problems. Thereafter, it has been stated thus: -

> "34. Indeed, there is also need to evolve a national policy to protect national interests from such ultra-hazardous pursuits of economic gains. Jurists, technologists and other experts in economics, environmentology, futurology, sociology and public health etc. should identify areas of common concern and help in evolving proper criteria which may receive judicial recognition and legal sanction."

215. In Pritam Pal v. High Court of Madhya Pradesh, Jabalpur through Registrar[4], the maxim salus populi suprema lex, i.e., welfare of the people is the supreme law, was again emphasised upon, though in a different context.

216. At this juncture, I must also refer to the other maxim salys republicae supreme lex, i.e., safety of the State is the supreme law and in case of any conflict, an individual must yield to the collective interest. But, it should not be done at the cost of safety. At all times and at all quarters, sincere efforts are to be made to maintain and sustain the safety of the people. That has been spoken by the ancients when the Kings ruled and the same reigns supreme in a democratic set-up. True it is, there are exceptions, but the exceptions are to remain in the realm of exceptions only and should not be brought into play either at the whim or fancy of the executive. The purpose of saying is that the law has many a mansion and the mosaic of law covers many spectrums so that both the maxims, namely, solus populi supreme lex and salus republicae supreme lex, can harmoniously coexist. The present case is one where there is need for nuclear energy for the welfare of the public and for other welfare of the people of India and for peaceful purpose. Definitely, the interest of the economy and the interest of safety are to be the real concerns of a Welfare State. In this regard, I may usefully refer to the following observations made by this Court, though in a different context, in State of Karnataka and others v. Dr. Praveen Bhai Thogadia[5]: -

> "Welfare of the people is the ultimate goal of all laws, and State action and above all the Constitution. They have one common object, that is to promote the well-being and larger interest of the society as a whole and not of any individual or particular groups carrying any brand names. It is inconceivable that there can be social well-being without communal harmony, love for each other and hatred for none. The core of religion based upon spiritual values, which the Vedas, Upanishads and Puranas were said to reveal to mankind seem to be: "Love others, serve others, help ever, hurt never" and "sarvae jana sukhino bhavantoo"."

217. The concept of welfare State is a facet of Article 38 of the Constitution of India. It is the obligation of the State to see that the welfare of the people is appositely promoted. It is the obligation passed by the Constitution of the State to establish a welfare State. The words used in the Preamble of the 1962 Act are "welfare for the people" and "peace". There is a necessity for generation of electrical energy and regard being had to the hazards, there has to be guidance which the Acts, Rules and Notifications provide. The collective interests should not totally be thrown overboard for the development of the power sector. If the safety measures are adequately not taken and the apprehensions are not removed and the fear is not totally ostracized from the minds of the people of the locality, posterity may not recognize the same as a development or a progressive step. The

conscientious and conscious policy decisions by the Government are to be taken with due care and consideration, keeping in mind the welfare of the people at large. True it is, when such policies are framed, especially for establishment of nuclear plants or such big projects, the safety measures become the primary concern and the same have to be adequately addressed to and taken care of. However, the Courts, in exercise of power of judicial review, cannot assume the role of approving authority for laying safety measures, but, a significant one, what the regulatory authorities have stated are to be regarded as the primary and principal concern.

AERB Report:

218. In this context, I may refer to the report of the AERB to review the safety of Indian Nuclear Power Plants against External Events of Natural Origin. For the sake of necessity and completeness, it is reproduced below: -

> "SAFETY ASSESSMENT OF KUDANKULAM NUCLEAR POWER PLANT UNITS-1&2 (KK NPP1&2) IN THE WAKE OF FUKUSHIMA ACCIDENT
>
> Two Units of VVER Pressurized Water Reactors (Model V-412) each of 1000 MW rating are being built at the Kudankulam Site in Tamil Nadu. Initial commissioning activities for Unit # 1 have started with AERB issuing clearance for "Hot-Run" on June 30, 2011. Construction of Unit # 2 is in an advanced stage of completion.
>
> The design of KK NPP incorporates a number of engineered safety features (ESFs) for catering to design basis accident (DBAs) and beyond design basis accidents (BDBAs), and several other design safety features.
>
> ESFs for catering to DBA.
>
> a. Emergency Core Cooling System (ECCS)
>
> b. Secondary circuit protection against over-pressurisation
>
> c. Emergency Gas Removal System
>
> d. Fission Products Removal and Control Systems

e. Emergency Safety Boron Injection System

f. Quick Boron Injection System (QBIS)

ESFs for catering to

BDBA

• Passive Heat Removal System (PHRS)

• Additional System for core passive flooding

• Annuls passive filtering system (APFS)

• System for retaining and cooling of molten core Other salient design safety

Features

• 4 x 100% active safety system trains and 4 x 33% passive safety system trains

• Large water inventory in I and II stage ECCS hydro-accumulators

• Automatic Reactor Scram on seismic signal

• Battery banks with 24 hrs capacity

• Sea water pumps located at more than 2.2m above design basis flood level (DBFL)

• Safety related buildings and structures located at least 3.0m above DBFL

• A shore protection rubble wall

Po st-Fakushima safety Assessment

A Task Force (TF) constituted by NPCIL carried out safety assessment of KKNPP-1&2 in the light of Fakushipa accident and its findings were

reviewed by the AERB's Advisory committee on Project safety review of light water reactors (ACPSR-LWR) and the AERB Committee on safety review of Indian NPPs in the light of Fukushima accident. Salient points emerging from the assessment and its reviews are given below: -

• Back up provisions from alternate sources should be made for

- Charging water to secondary side of SGs

- Make-up of borated water to spent fuel pools

- Injection of borated water in the reactor coolant system.

• Sciesmic qualification of emergency water storage facility and augmentation of its storage capacity for core decay heat removal for a period of at least one week.

• Mobile self powered pumping equipment for emergency use

• Facility for monitoring safety parameters using portable power packs

• Finalization of emergency operating procedures for BDBA conditions

• Primary Containment to be assessed for ultimate load bearing capacity.

• Doors and barrels of airlocks to be qualified for proof test pressure.

• Ensuring that highly active water used for cooling the core catcher vessel under BDBA is contained inside the primary containment.

• Reconfirmation of design adequacy of hydrogen management system.

• Environmental qualification of core catcher temperature monitoring system

• Adequacy of design provision for remote water addition to core catcher

• Adequacy of instrumentation for monitoring plant status during BDBA.

• Details of margin available on location of various safety related SSCs above DBFL should be reviewed again,

• Need for design provision for containment venting, that has been deleted, should be re-examined.

• The backup sources for water injection to SG secondary side should be seismically qualified.

• Provisions for addition of water to core catcher require a detailed study, to ensure that there is no possibility of any steam explosion.

• Provision of additional backup power supply sources for performing essential safety functions, like air cooled DGs located at a high elevation, should be considered.

The recommendations are being examined and NPCIL's response would be reviewed in ACPSR-LWR before initial fuel loading in unit-1.

219. A status report has been filed by NPCIL. An affidavit has been filed on 3.12.2012 and it is asserted therein that most of the recommendations have already been complied with. It has been dealt with by my respected learned Brother that there is substantial compliance of the same and dates or fixed time frame has been given for compliance of certain recommendations which have not yet been complied. This Court has been apprised of the fact that the AERB and, in turn, the MoEF are in total control of things and scrutiny is made and the same shall be looked into from time to time and all possible measures shall be taken to avoid any kind of accident. As advised, at present, I have noted the categorical assurance of the Statutory Authority.

Nuclear Energy development and doctrine of balance and proportionality vis- à-vis safety:

220. It must be stated that the safety of the people residing in Kudankulam and the areas in its vicinity and also the people who are likely to be affected because of radioactive generation has to be respected, for their human dignity is their divinity. This Court has not directed for closure of the plant on the basis of the asseverations made before this Court. But, it is the highest concern of this Court that a devastating disaster should be avoided at all costs by the people who are in-charge

of looking after the safety measures. The statutory regulatory authority should responsibly keep the vigil and no one, who has the responsibility, should be complacent. The tragedy that has occurred at Fukushima shall remain as one of the darkest elements of history. The catastrophe of the Bhopal Gas Leak Disaster has not been erased or effaced from the minds of the public. The moan and mourns of the affected people of Bhopal who have been injured or lost their kith and kin are still heard and humane sensitivity would not permit one to ignore it. The nuclear scientists, the administrators and other authorities cannot remain oblivious or totally insensitive to the possible hazards when the nuclear plant operates.

221. When one thinks of safety in the context of establishment of a nuclear plant, the inevitable thought that gets into the depth of mind is security. Safety and security, in this context, are insegregably inter- twined commencing the planning, quality of construction, committed efforts to avoid operational jeopardy and monitoring and all are bound to remain in a singular chain. All endeavours are to be made to prevent, monitor and control. The concept of disaster management cannot be allowed to remain on paper. Its procrastination itself rings the bell of peril. The administration has to be alive to the said situation and the awakening to manage the disaster in case of an unfortunate incident has to be founded on scientific and sophisticated methods. Taking care of the situation of the present alone is not the solution. All concerned with the same are required to look to the future because that elevates the real concern. The danger of the future should be seriously taken note of and should not be veiled in the guise of thought for the present. Not for nothing, it has been said that he who prepares for the future and remains prepared for the future has a good control over the present, and if one remains in a state of blindness thinking the future to be uncertain, he suffers the agony of the present and the anguish of the future. This is not only the truth in respect of an individual life but also the paramount truth for the collective of the present generation and the future generations. The present generation has no right to enjoy by eating away the time of the future generation. The protection of the environment and the safety for the present generation in its connotative sense covers the posterity.

222. I have already discussed about the signification of the safety needed in respect of nuclear plants. Generation of nuclear energy is a necessity in a progressive modern State. As has been stated earlier, there is an enactment and notifications governing the field in various aspects. A policy decision has been taken to establish the nuclear plant at Kudankulam. Promotion of development and protection of environment are to be harmonized at the same time. In Intellectuals

Forum, Tirupathi v. State of A.P. and others[6], it has been held that merely asserting an intention for development will not be enough to sanction the destruction of local ecological resources. What is required to be prescribed is the principle of sustainable development and find a balance between the developmental needs and the environmental degradation.

223. In Bombay Dying & Mfg. Co. Ltd. (3) v. Bombay Environmental Action Group and others[7], while dealing with the concept of sustainable development and planned development vis-à-vis Article 21 of the Constitution, a two-Judge Bench has opined thus: -

> "It is often felt that in the process of encouraging development the environment gets sidelined. However, with major threats to the euvironment, such as climate change, depletion of natural resources, the eutrophication of water systems and biodiversity and global warming, the need to protect the environment has become a priority. At the same time, it is also necessary to promote development. The harmonisation of the two needs has led to the concept of sustainable development, so much so that it has become the most significant and focal point of environmental legislation and judicial decisions relating to the same. Sustainable development, simply put, is a process in which development can be sustained over generations. Brundtland Report defines "sustainable development" as development that meets the needs of the present generations without compromising the ability of the future generations to meet their own needs. Making the concept of sustainable development operational for public policies raises important challenges that involve complex synergies and trade offs."

224. In M.C. Mehta v. Union of India and others[8], while stating about sustainable development and the needs of the present without compromising the ability of the future generation to meet their own needs, this Court has expressed thus: -

> "The definition of "sustainable development" which Brundtland gave more than 3 decades back still holds good. The phrase covers the development that meets the needs of the present without compromising the ability of the future generation to meet their own needs. In Narmada Bachao Andolan v. Union of India[9] this Court observed that sustainable development means the type or extent of development that can take place and which can be sustained by nature/ecology with or without mitigation. In these matters, the required

> standard now is that the risk of harm to the environment or to human health is to be decided in public interest, according to a "reasonable person's" test. [See Chairman Barton: The Status of the Precautionary Principle in Australia (Vol. 22, 1998, Harv. Envtt. Law Review, p. 509 at p. 549-A) as referred to in para 28 in A.P. Pollution Control Board v. Prof. M.V. Nayudu[10].]"

225. In Tirupur Dyeing Factory Owners Association v. Noyyal River Ayacutdars Protection Association and others[11], while dealing with the concept of sustainable development, the Court has observed as under: -

> "The concept of "sustainable development" has been explained that it covers the development that meets the needs of the person without compromising the ability of the future generation to meet their own needs. It means the development, that can take place and which can be sustained by nature/ecology with or without mitigation. Therefore, in such matters, the required standard is that the risk of harm to the environment or to human health is to be decided in public interest, according to a "reasonable person's" test. The development of the industries, irrigation resources and power projects are necessary to improve employment opportunities and generation of revenue, therefore, cannot be ignored. In such eventuality, a balance has to be struck for the reason that if the activity is allowed to go on, there may be irreparable damage to the environment and there may be irreparable damage to the economic interest. A similar view has been reiterated by this Court in T.N. Godavarman Thirumulpad (104) v. Union of India[12] and M.C. Mehta v. Union of India[13]."

226. In T.N. Godavarman Thirumalpad (through K.M. Chinnappa) v. Union of India and others[14], this Court observed that it cannot be disputed that no development is possible without some adverse effect on the ecology and environment, and the projects of public utility cannot be abandoned and it is necessary to adjust the interest of the people as well as the necessity to maintain the environment. A balance has to be struck between the two interests. Where the commercial venture or enterprise would bring in results which are far more useful for the people, difficulty of a small number of people has to be bypassed. The comparative hardships have to be balanced and the convenience and benefit to a larger section of the people has to get primacy over comparatively lesser hardship.

227. In Narmada Bachao Andolan v. Union of India and others[15], a three- Judge Bench, while dealing with the public projects and policies, has opined that the court does not become the approving authority of such policies. Thereafter, the Bench observed thus: -

> "Normally such decisions are taken by the Government after due care and consideration. In a democracy welfare of the people at large, and not merely of a small section of the society, has to be the concern of a responsible Government."

228. I have referred to the aforesaid pronouncements only to highlight that this Court has emphasized on striking a balance between the ecology and environment on one hand and the projects of public utility on the other. The trend of authorities is that a delicate balance has to be struck between the ecological impact and development. The other principle that has been ingrained is that if a project is beneficial for the larger public, inconvenience to smaller number of people is to be accepted. It has to be respectfully accepted as a proposition of law that individual interest or, for that matter, smaller public interest must yield to the larger public interest. Inconvenience of some should be bypassed for a larger interest or cause of the society. But, a pregnant one, the present case really does not fall within the four corners of that principle. It is not a case of the land oustees. It is not a case of "some inconvenience". It is not comparable to the loss caused to property. I have already emphasized upon the concept of living with the borrowed time of the future generation which essentially means not to ignore the inter-generational interests. Needless to emphasize, the dire need of the present society has to be treated with urgency, but, the said urgency cannot be conferred with absolute supremacy over life. Ouster from land or deprivation of some benefit of different nature relatively would come within the compartment of smaller public interest or certain inconveniences. But when it touches the very atom of life, which is the dearest and noblest possession of every person, it becomes the obligation of the constitutional courts to see how the delicate balance has been struck and can remain in a continuum in a sustained position. To elaborate, unless adequate care, caution and monitoring at every stage is taken and there is constant vigil, life of "some" can be in danger. That will be totally shattering of the constitutional guarantee enshrined under Article 21 of the Constitution. It would be guillotining the human right, for when the candle of life gets extinguished, all rights of that person perish with it. Safety, security and life would constitute a pyramid within the sanctity of Article 21 and no jettisoning is permissible. Therefore, I am obliged to think that the delicate balance in other spheres may have some allowance but in

the case of establishment of a nuclear plant, the safety measures would not tolerate any lapse. The grammar has to be totally different. I may hasten to clarify that I have not discussed anything about the ecology and environment which has been propounded before us, but I may particularly put that the proportionality of risk may not be "zero" regard being had to the nature's unpredictability. All efforts are to be made to avoid any man-made disaster. Though the concept of delicate balance and the doctrine of proportionality of risk factor gets attracted, yet the same commands the highest degree of constant alertness, for it is disaster affecting the living. The life of some cannot be sacrificed for the purpose of the eventual larger good.

229. Before proceeding to issue certain directions, it is required to be stated that the appellant, by this Public Interest Litigation, has, in a way, invoked and aroused the conscience/concern of the court to such an issue. True it is, the prayer is for the total closure of the plant and the Court has not acceded to the said prayer but his noble effort is appreciated to put forth the grievance of the local people and the necessity of adequate safety measures as is perceived. When such cause comes up before this Court, it is the bounden duty to remind the authorities "Be alert, remain always alert and duty calls you to nurture constant and sustained vigilance and nation warns you not to be complacent and get into a mild slumber". The AERB as the regulatory authority and the MoEF are obliged to perform their duty that safety measures are adequately taken before the plant commences its operation. That is the trust of the people in the authorities which they can ill afford to betray, and it shall not be an exaggeration to state that safety in a case of this nature in any one's hand has to be placed on the pedestal of "Constitutional Trust".

230. We, therefore, fully endorse the view taken by the Division Bench of the High Court, however, in the facts and circumstances of the case, we are inclined to give the following directions:

DIRECTIONS:

1. The plant should not be made operational unless AERB, NPCIL, DAE accord final clearance for commissioning of the plant ensuring the quality of various components and systems because their reliability is of vital importance.

2. MoEF should oversee and monitor whether the NPCIL is complying with the conditions laid down, while granting clearance vide its communication

dated 23.9.2008 under the provisions of EIA Notification of 2006, so also the conditions laid down in the environmental clearance granted by the MoEF vide its communication dated 31.12.2009. AERB and MoEF will see that all the conditions stipulated by them are duly complied with before the plant is made operational.

3. Maintaining safety is an ongoing process not only at the design level, but also during the operation for the nuclear plant. Safeguarding NPP, radioactive materials, ensuring physical security of the NSF are of paramount importance. NPCIL, AERB, the regulatory authority, should maintain constant vigil and make periodical inspection of the plant at least once in three months and if any defect is noticed, the same has to be rectified forthwith.

4. NPCIL shall send periodical reports to AERB and the AERB shall take prompt action on those reports, if any fallacy is noticed in the reports.

5. SNF generated needs to be managed in a safe manner to ensure protection of human health and environment from the undue effect of ionizing radiation now and future, for which sufficient surveillance and monitoring programme have to be evolved and implemented.

6. AERB should periodically review the design-safety aspects of AFR feasibly at KKNPP so that there will be no adverse impact on the environment due to such storage which may also allay the fears and apprehensions expressed by the people.

7. DGR has to be set up at the earliest so that SNF could be transported from the nuclear plant to DGR. NPCIL says the same would be done within a period of five years. Effective steps should be taken by the Union of India, NPCIL, AERB, AEC, DAE etc. to have a permanent DGR at the earliest so that apprehension voiced by the people of keeping the NSF at the site of Kudankulam NPP could be dispelled.

8. NPCIL should ensure that the radioactive discharges to the environmental aquatic atmosphere and terrestrial route shall not cross the limits prescribed by the Regulatory Body.

9. The Union of India, AERB and NPCIL should take steps at the earliest to comply with rest of the seventeen recommendations, within the time stipulated in the affidavit filed by the NPCIL on 3.12.2012.

10. SNF is not being re-processed at the site, which has to be transported to a Re-Processing facility. Therefore, the management and transportation of SNF be carried out strictly by the Code of Practices laid down by the AERB, following the norms and regulations laid down by IAEA.

11. NPCIL, AERB and State of Tamil Nadu should take adequate steps to implement the National Disaster Management Guidelines, 2009 and also carry out the periodical emergency exercises on and off site, with the support of the concerned Ministries of the Government of India, Officials of the State Government and local authorities.

12. NPCIL, in association with the District Collector, Tiruneveli should take steps to discharge NPCIL Corporate Social Responsibilities in accordance with DPE Guidelines and there must be 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 KKNPP.

13. NPCIL and the State of Tamil Nadu, based on the comprehensive emergency preparedness plan should conduct training courses on site and off site administer personnel, including the State Government officials and other stake holders, including police, fire service, medicos, emergency services etc.

14. Endeavour should be made to withdraw all the criminal cases filed against the agitators so that peace and normalcy be restored at Kudankulam and nearby places and steps should be taken to educate the people of the necessity of the plant which is in the largest interest of the nation particularly the State of Tamil Nadu.

15. The AERB, NPCIL, MoEF and TNPCB would oversee each and every aspect of the matter, including the safety of the plant, impact on environment, quality of various components and systems in the plant before commissioning of the plant. A report to that effect be filed before this Court before commissioning of the plant.

The appeals are accordingly disposed of without any order as to costs.

[1] 19 U.S. [6 Wheat.] 204 (1821)]
[2] (1990) 1 SCC 613
[3] (1989) 3 SCC 38
[4] 1993 Supp (1) SCC 529
[5] (2004) 4 SCC 684
[6] (2006) 3 SCC 549
[7] (2006) 3 SCC 434
[8] (2004) 12 SCC 118
[9] (2000) 10 SCC 664
[10] (1999) 2 SCC 718
[11] (2009) 9 SCC 737
[12] (2008) 2 SCC 222
[13] (2009) 6 SCC 142
[14] (2002) 10 SCC 606
[15] (2000) 10 SCC 664