PREAMBLE

The responses have been prepared to the observations of the public consultation process of public hearing which was held on May 16, 2010 at JNPP Site, Village Madban, District Ratnagiri, as per the following:

1.0 NPCIL received MoM of public hearing along with written submissions from the members of public on their observations/queries related to EIA and other aspects of JNPP from the Office of MPCB, Ratnagiri on July 16, 2010. It is to mention that along with the MoM, the observations from members of public have been submitted in 964 pages during the process of public hearing. These are part of Volume-III.

2.0 While preparing the responses, it is noted that volumes of observations / queries have been received from public during public hearing. The response has been prepared and presented in following sequence:

i) Summary of all the issues and their responses (which have been covered in MoM as well as in the written submissions) has been prepared and placed first in this Volume.

ii) Responses to MoM have been placed in next to above responses.

iii) The responses for written observation / queries of public have been prepared and placed sequentially. It may be noted that while preparing the responses, the submissions have been segregated in various Annexure. There are many single page submissions made by individuals, where observations raised are similar, hence they have been grouped together and there common responses have been prepared and presented in Annexure-XVIII.

3.0 A letter of observations from Shri Pradeep Indulkar addressed to the Secretary, MoEF, New Delhi, has also been received by NPCIL, separately from Regional Office, MPCB. Mumbai, for response by NPCIL. The response to the same is included as Annexure-XVII.

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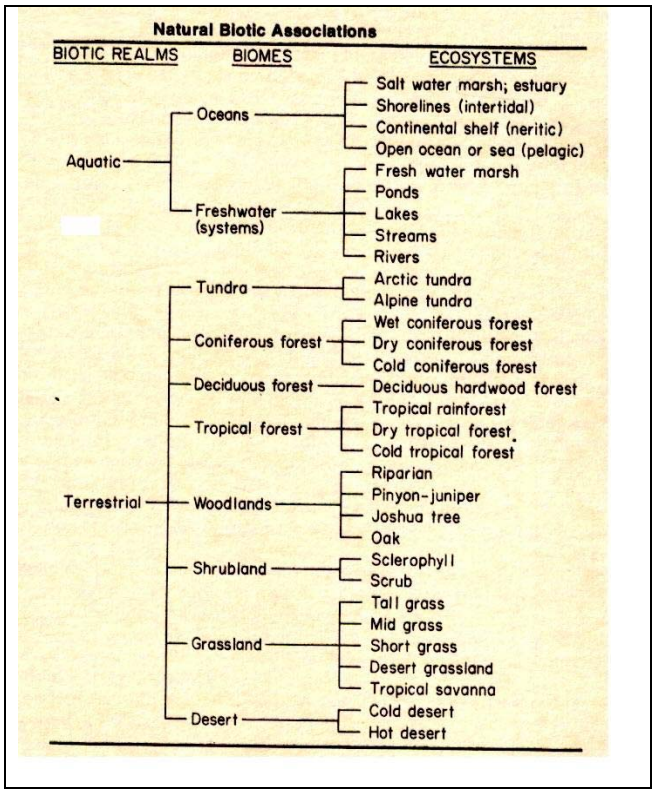
Summary
of
MoM of Public Hearing & Submission
and
Responses

1.0 Environmental Aspects

1.1 A standard classification system is not used while presenting the results in ecological study

Response

Standard IUCN habitat classification given by J.G. Rau and D.C. Wooten in their book "Environmental Impact Analysis Handbook" (Publisher: McGraw-Hill, Inc.) (please refer following Table) was used in the study. Accordingly, College of Forestry has classified the Terrestrial ecosystems of the study area as grassland, forest (or woodland), and Aquatic: Oceans: salt water marsh; estuary i.e. mangrove (Section 4.1 of Biodiversity Report of College of Forestry, Dapoli) and the College of Fisheries, Ratnagiri studied Aquatic: Oceans: shorelines (intertidal) ecosystem and coastal ecology (Annexure VIII of EIA Report Vol. II).



1.2 Specific study of lateritic plateau especially lateritic plateaus ephemeral flora is not carried out.

Response

Study of the project site and its ecosystem is given in the report. The plateau region is mostly composed of the laterites, which are derived from original basaltic rock (section 3.7.1, page 207 of Vol.-I of EIA report) with insignificant bio-diversity. So the loss of biodiversity due to construction of the NPP will be insignificant. This will be compensated by conservation of grassland ecosystem along with the proposed green belt in the exclusion zone of the JNPP. Moreover the whole Ratnagiri District have laterite plateau ecosystem at various places

which will not be affected by the JNPP project activity. The detail information on the flora of project site and residential complex with respect to bagayat, kharip land, varkas land, pot kharaba land is given in Table 1 and Table 2 respectively in Summary EIA of Vol.-I. Details of tree vegetation on the land being acquired for plant and residential complex of JNPP is given in Table 3.10.7 on page 324 in Chapter 3 of draft EIA Report Vol. I. The construction of residential complex will be carried out carefully to avoid unwanted destruction of trees and only the minimum number of trees from the area earmarked for construction will be cut and compensated in the form of green belt around the plant, and all other trees will be maintained as such.

1.3 Species of herbs are not identified upto species level.

Response

The endemic species are identified based on genera and those which were identified as endemic were studied upto species level. Non endemic genera were not taken up for analysis up to species level.

1.4 Latest botanical survey of india publication on threatened plants are not used as reference document.

Response

College of Forestry is a renowned Institute in taxonomical study of the plants in the forests. They have rich experience in identifying the taxa and have all the available expertise, reference herbariums, and Biodiversity Park as support. They have used standard taxonomical references as well as the standard books on local plants for identification of the plant taxa. This is the general practice in any scientific study. College of Forestry used the Flora of Maharashtra (2000) of Botanical Survey of India for the analysis of the plant taxa, which is itself enough to identify the plant species. They have also used standard book on taxonomy like Flora of Bombay Presidency Vol I – III (1956) of Botanical Survey of India. In addition, the book "Flowers of Sahyadri" was used as support literature during the study

1.5 For the present site, stratified random sampling should have been used instead of random sampling technique**.**

Response

The study area has predominant lateritic plateau area. The study area is undulating plateau but not stratified like vegetation communities on the slopes of very high mountain. So random sampling is the best method to study the study area. Whole study area was divided into 1250 grids with each grid measuring 1km x 1km area and 100 grids were selected for study .

1.6 The secondary information about laterite plateau, reptiles and amphibians is not presented in the report.

Response

The data on reptiles and amphibians are mostly based on the information from the local people which is authentic information on the presence of species in the area. Six species of amphibians and 12 species of reptiles are recorded to be present in the area.

1.7 There are ample mangrove trees in the project area.

Response

The mangroves vegetation is present in the creeks beyond 5 kms distance from the project site and hence will not be disturbed or felled for the project activity.

1.8 The Ecological values of mangroves forest has not been considered

Response

The ecological value of mangrove forest has been considered and accordingly environmental management plan has been prepared to ensure that surrounding eco systems including mangrove vegetation will not be adversely affected.

1.9 Some of the species like Xylocartes found in Konkan region are not considered in the EIA report

Response

The presence of Xylocrates species in Ratnagiri and Sindhudurg Districts is mentioned in Section 3.8.8 on page 241 of Chapter 3 in EIA Report Vol. I. The rare and endangered plant species are given in Section 3.8.12 on page 243 and animals species in Section 3.8.13 on page 246 of Chapter 3 in EIA report Vol. I.

1.10 Biodiversity of lateratic Jambha rock is neglected in the report

Response

The Konkan plateau in Ratnagiri is derived from basaltic rocks and extensive spread of laterite is observed through the district especially on south Ratnagiri side. The list of rare and endangered species (Biodiversity Report of College of Forestry, Dapoli annexed as Annexure – VII in EIA Report Vol. II) in this study area consisting of laterite formation

1.11 EC should be given only after the report of Western Ghats –Ecology Expert Panel Constituted by Central Government.

1.12 JNPP site is included as proposed site for Sahyadri Ecologically sensitive Area

1.13 On the acquired land and in the region, there will be total loss of biodiversity.

1.14 The project would affect the rich flora, fauna and biodiversity

Response for 1.11, 1.12, 1.13 &1.14

The proposed plant site is adjoining the sea coast and is mostly a barren stretch of land with sparse savanna vegetation (Ref. Indian Remote Sensing data, Section 3.7.8, page No. 214-218 of Vol-I, EIA report). From the project site upto 5 km, only sparse vegetation is present, however, beyond 5 km, a part of land is covered with agriculture and orchards. These areas will not be disturbed by project activities. The project site and surrounding 25 km area and the entire available ecosystems like forest, mangroves, grassland, the creeks have been studied including the project site, the information on project site is given on pages 28-29 of biodiversity report of College of Forestry, Dapoli (Annexure VII in Volume II of EIA Report). Additionally the land use of project site and residential complex was also studied by using improved recent technology of remote sensing data (Feb. 2006) by Maharashtra Remote Sensing Data Application Centre, Nagpur. This study also concludes that project site is mostly barren with sparse vegetation. Further, suitable green belt will be developed around JNPP using selected plant species to improve the aesthetic value of the project area.

The details of the green belt development are presented in Section 10.10.3.1.2, page no. 458 – 464 of Chapter-10 of Vol-I of the EIA report.

1.15 The creation of green belt will drastically modify the lateritic plateau for which natural vegetation is ephemerals.

Response

The current state-of-the-art technology available for remediation of mines, spoil dumps, rocky areas with proper supplementation of soil and bio-fertilizers is available in the country. NEERI has remediated number of spoil areas using this biotechnology. A proper assessment of lateritic soil and its amendment with good soil and bio-fertilizer can be used to create proper greenbelt. This technology is environment friendly and will not endanger the existing habitat.

1.16 The Jaitapur and Vijaydurg creek are important part of natural corridor and breeding site for marine biodiversity will be affected by the project.

Response

Fish breeding sites are present in the mangrove vegetation present in Jaitapur creek and Vijayadurg creek which are beyond 5 km from water intake structure of JNPP. Thus breeding places of marine organisms will not be affected

1.17 No Fishing zone will affect the lively hood of the large number of fishermen.

Response

AERB has stipulated an area around Nuclear Power Plant with no permanent habitant and called as "Exclusion zone". In line with the above, JNPP will also have a specific 'Exclusion Zone' of 1.6 km. Being a coastal site, some of the area of 'Exclusion zone' will fall on sea front. From security point of view and being a prohibited area, no unauthorized person is envisaged to be allowed to enter in this zone on land as well as sea front. The expected exclusion zone area under sea from shoreline may vary from 500 metre to 1 km. approximately. Accordingly, the entry of fisherman in this zone will be restricted and regulated. Beyond this zone, there will be no restriction of fishing.

Further, fish catch near the shore is generally very low and therefore fishermen go to deep sea for fishing purpose. The survey done by College Of Fisheries, Ratnagiri around JNPP has indicated average yield near shore to be 10 % of average deep sea yield and thus confirmed the above general observation. In view of above, there will be no adverse impact on lively hood of fishermen. The details are presented in Section 3.2.4, Page-9, Annexure-VII of EIA Report Volume-II.

1.18 Crop pattern and yield in the acquired land and in the Taluka region.

1.19 Farmers are carrying out agricultural activities on proposed land. The project will affect their livelihood

Response for 1.18 &1.19

The joint valuation of the landed assets on acquired land by District Authorities, as a part of land acquisition activity, for the purpose of payment of land compensation, study report by Indian Remote Sensing centre Nagpur and survey/study by NEERI, Nagpur in the year 2006 indicate the land use pattern of the same. Accordingly, 8.99% (62.04 Ha) land is kharip, 32.96% is varkas, and 58.05% is pot kharaba for the total land of 690.401 Hectares from village Madban

for project site. Further, as per revenue record from district authorities of Jaitapur circle (Madban is part of this circle).The above study establishes that there is no significant farming activity in acquired land.

1.20 Old NIO report should have been considered for marine ecological assessment.

Response

The report is on Eco-biological characterization of the environs of seacoast around Jaitapur site, which has been carried out by NIO, Goa in 1990. The study was of preliminary nature. The study conducted short term investigation on biotic and abiotic parameters at few locations around Jaitapur coast and had recommended long term monitoring and experimental studies for remedial measures for maintaining ecological balance in the marine environment of Jaitapur. Subsequently, as suggested in the report, NPCIL made a comprehensive study on the effect of temperature rise due to condenser cooling water discharge on marine environment of Jaitapur coast, which establishes that there is no adverse impact on marine environment.

1.21 What will be the resultant Temperature rise of the sea water body due to condenser cooling sea water discharge from the plant.

Response

A detailed 2D mathematical model studies for dispersion of condenser cooling sea water discharges from the proposed Nuclear Power Plant at Jaitapur site is carried out by Central Water Power research Station (CWPRS), Pune, in 2008. The CWPRS report is attached as Annexure- V(b) of Volume –II of the EIA report. Further, as part of EIA study, NEERI, Nagpur has carried out detailed marine ecological studies for the Jaitapur coast and specific study through College of Fisheries, Ratnagiri, on Baseline Marine Ecological Assessment of sea coast around the Jaitapur site due to condenser cooling sea water discharge (report from College of Fisheries is enclosed as Annexure-VIII of the Volume –II of the EIA report).

These studies establish that the marine aquatic food chain organisms will not be affected by the predicted maximum temperature rise of around 5 ^{0}C, which will be confined to a limited area of 0.28 sq km, that too during October/February (when ocean currents are under transition around Jaitapur site) with all the six units are under operation, which is the most severe condition during the year.

1.22 Impact of impingement on Suction Screen ignored.

Response

The breakwater, to be constructed to form the intake channel, will isolate the sea from the intake pump house. Besides, the width of the channel will be kept such that a low water velocity of 0.2- 0.3 m/s is maintained in the channel zone. In addition, the sea water retaining structures consisting of gates and screens of various sizes will be installed to further minimize entry of marine organisms. Thus, the tranquil water basin and above system, which will exist in front of the pump house intake bay will minimize the impingement and sucking of marine organisms.

1.23 Effect of temperature rise on marine organism.

1.24 The rise in sea water temperature will harm the fish eggs.

Response for 1.23 &1.24

The rise in temperature above ambient temperature of water as explained in 1.21 above will not affect marine organism *and may derive benefit of stimulation of metabolic activity. Fish breeding sites are present in the mangrove vegetation present in Jaitapur creek and Vijayadurg creek, which are beyond 5 km from water intake structure of JNPP. Thus breeding places of marine organisms will not be affected. The details are presented in Section 4.2.2.1.4, of Chapter-4 of Volume –I of the EIA report.*

1.25 Effect of increased salinity due to discharge of desalination plant.

Response

Brine generated by desalination plant will have salt concentration typically 2 to 3 times that of intake sea water. To dilute the salt concentration, the brine shall be mixed with condenser cooling sea water before discharging into sea. Because of this mixing with a large quantity of water, the salinity level of the discharge will be comparable to intake sea water levels and hence will not have any impact on sea water due to discharges from desalination plant.

1.26 The marine and river ecosystem would be polluted and destroyed.

Response

There is no emission of conventional pollutants from nuclear power plants.
The radioactivity release through water route will be insignificant compared to back ground radiation level in the area and the limit of release specified by AERB. Further, these releases are constantly monitored and reviewed. As a result, there will not be any effect on marine and river ecosystem.

1.27 Fisheries study is not done in detail.

Response

A detailed thermal dispersion study through 2D mathematical model for condenser cooling sea water discharges from the proposed Nuclear Power Plant at Jaitapur, Ratnagiri has been carried out by CWPRS, Pune, in 2008 (The CWPRS report is attached as Annexure- V(b) of Volume –II of the EIA report). Further, NEERI, Nagpur has carried out detailed marine ecological studies for the Jaitapur coast including a specialized study on Baseline Marine Ecological Assessment of sea coast around the Jaitapur site through College of Fisheries, Ratnagiri (The report from College of Fisheries is enclosed as Annexure-VIII of the Volume –II of the EIA report). These studies have concluded that the marine aquatic food chain organisms will not be affected by the predicted maximum temperature rise of around 5 deg.C, which will be confined to a limited area of 0.28 sq.km, when all the six units are under operation and ocean currents are under transition (October/February), which is the most severe condition during the year. At this range of temperature rise above ambient temperature of water, most of the organisms are either not affected or get benefit of stimulation of metabolic activity. The details are presented in Section 4.2.2.1.4, of Chapter-4 of Volume –I of the EIA report.

1.28 Adequate secondary information from marine coastal fauna has not been included in the report.

Response

The secondary information on marine coastal fauna is given in the EIA report. A list of 85 species of marine fishes along the coastal belt of Ratnagiri district is given in Table 3.8.4 (Source: Department of Fisheries, Ratnagiri), details of marine fishery in Table 3.8.5 and details of inland fishery in Table 3.8.6 (source: Statistic Abstract book, Ratnagiri and Sindhudurg Districts for the year 2003-2004) and local fisheries scenario on page 253-254 (Source: fish landing Centers at Sakharinate and Tulsunde) in Chapter 3 of EIA Report Vol I.

1.29 The project construction would cause noise pollution in the public domain.

Response

During the construction of project low level sound, would be created due to machinery, heavy machinery & the traffic of vehicles. But since the adjoining villages are situated 1.6 - 2 kms away, that pollution would be hardly felt. Moreover, to reduce the sound pollution, every machinery would be tested regularly.

To reduce the sound pollution created due to the blasting during the construction of the project, the blasting would be done in restricted manner. NPCIL will take due care that the adjoining villages would not suffer the sound pollution created by this blasting.

After the project gets operational, large machineries are installed in specially built buildings so that the level of sound pollution is kept low. Moreover, the green belt created in the 1.6km radius of the project further reduces the level of the sound pollution by the time it reaches the adjoining villages.

1.**30** Domestic Solid waste management scheme is not provided.

Response

The domestic solid waste management plan / scheme is presented in Section 10.10.3.1 of Chapter-10 of the Vol-I of EIA report.

1.31 The project construction would increase suspended particulate matter in the air in the public domain.

Response

During the construction of project, the activities that will pollute the atmosphere will be drilling, blasting, traffic of vehicles and loading -unloading of dumpers. To reduce the pollution level, water will be sprinkled in the project area & green belt will be created to hinder the flow of air. Due to these measures, the impact of solid suspended particles on humans, animals & trees will be minimum.

1.32 The EIA has not been carried out in Monsoon season.

Response

College of Forestry has taken all the efforts to do the sampling periodically during winter, summer and monsoon seasons and recorded all the species including ephemeral flora and fauna. Comparison of seasonal changes in Diversity Indices of the major groups of flora in the study area is presented in Table 4.8 of Annexure –VII of Vol –II of EIA report. For other parameters monitoring has been carried out as per approved TORs for EIA by MoEF (Section 1.4 of Chapter -1 of Vol-I of the EIA report).

1.33 Violation of CRZ -1991. Proposed CRZ -2010 ignored

Response

Based on NOC issued by Maharashtra Coastal Zone Management Authority in March 2009 and application from NPCIL, the proposal for CRZ clearance of JNPP was taken up by the CRZ Expert Appraisal Committee, MoEF for review during 74th meeting held on 23rd -24th April, 2009. The committee has recommended CRZ clearance for JNPP and issue of formal clearance by MoEF for same is subject to Environmental Clearance to Main Project, as communicated to NPCIL vide their letter no, 11-24/2009-IA.III Dt. 24.06.09.

The details of the Assessment and Prediction of Impact under CRZ are presented in Section III of Chapter -4 of Main EIA Report.

This is also to confirm that all the provisions, prevailing as on date, under applicable notifications by MoEF are complied with by NPCIL.

1.34 No detailed Impact assessment of Jetty is presented in the report.

Response

As described in Section 4.5.5.2 of Chapter-4 of the Vol-I of the EIA report, a RORO jetty is proposed to be developed in the sheltered area of the breakwater.

1.35 Impact of radioactive releases through air, water and land routes.

1.36 Potential health impact of routine release from nuclear power plant are not considered in the EIA report.

1.37 Project should ensure safe radiation doses in the public domain.

1.38 Members of public will receive radiation dose through food **chain.**

Response to 1.35 to 1.38

The NPP unit is so designed that activity releases to the environment are through pre-designated release points. These radioactive effluent releases to the environment through the designated release points are continuously monitored and controlled. The minimum sensitivity of the monitoring instruments is such that even a sufficiently small fraction of the releases, which leads to dose consumption in the public domain, can be measured.

The authorized limits on the radioactive discharges are stipulated by AERB for the site. The Total Effective Dose to public at Fence Post is far below the maximum permissible limit of 1000 µSv/y by AERB, which are in line with International Commission on Radiation Protection (ICRP). These limits are not depending on the combined electrical out- put of the NPPs at the site. The limits take into considerations all the power producing units as well as other radiological facilities at the site.

The environmental survey data at various operating nuclear power plant sites of NPCIL, where multi units are under operation with varying capacity shows that the radiation dose to the members of the public due to released radioactive elements subsequent to the operation of nuclear power plants is only a fraction of AERB dose limit or background radiation levels. For JNPP, the design will be such that the radiation dose to the members of public from all the routes is restricted to 100 µSv/y per unit. The details are presented in Annexure-IX (d), of Vol-II of EIA report.

The radiation dose to public due to NPCIL's nuclear power plants is observed to be 500 to 24 times lesser than the stipulated dose limit of 1000 µSv/y and 1200 to 48 times lesser than the natural background radiation.

1.39 EIA does not talk about serious accident

Response

Plant conditions are generally categorized as Normal operation, Anticipated Operational Occurrences (AOO), Design Basis Accidents (DBA) and Beyond Design Basis Accidents (BDBA) based on the frequency of occurrence and consequences. The basic principle followed is that the most probable occurrence should result in the lowest radiological risk and the extreme situations having the potential for the greatest risk should be the least likely to occur. In the plant design, various postulations of initiating events are made and the scenarios are analyzed. Defense in depth provisions are made in the design to avoid, prevent escalation or mitigate the consequences. Since extensive analysis of accidents is carried out, the term accident is found frequently in NPP documents, although accident in NPP is very rare.

The EIA report outlines the safety analysis requirements in Chapter-2, Vol –I. The detailed PSAR will be submitted to AERB for review and approval.

1.40 EIA does not address long term plan for radioactive waste storage.

1.41 The geology of the site and high rainfall make JNPP site unsuitable for burying nuclear waste.

1.42 The project would cause radioactive pollution of ground as well as surface water.

1.43 Whether solid radioactive waste management buildings earthquake proof.

Response for 1.40 to 1.43

As per present practice, the low and intermediate radio- active solid / solidified wastes are stored in Near Surface Disposal Facility (NSDF). They are stored under ground at a depth of maximum up to 4 m either in trenches / RCC vaults / tile holes depending upon the surface dose rate of the waste. The solid waste disposal site is fenced and designed to store waste for an active control (monitoring, surveillance, remedial work) period of 100 years followed by passive control (land use control) period of 200 years.

The above facility has sufficient number of bore-holes all around at definite intervals. Ground water samples are collected from these bore-holes on regular basis to check the activity in ground water.

However, in case of EPR design, the low and intermediate radioactive solid / solidified waste has an option to be stored in the radioactive waste storage building, where solid waste storage will be above ground. Both these technology options will be reviewed by NPCIL for JNPP and final decision will be taken with due approval of AERB, before implementation.

The radioactive waste storage building is planned to store low and intermediate level radioactive solid / solidified waste having half life less than 30 yrs. The total storage time envisaged for this waste is 100 years active control period followed by passive control period of another 200 years. Hence in the design an active storage period of 100 years is considered. After 300 years of storage (with ten or more half lives), the total radioactivity of the material will be almost negligible.

Waste storage facility is a seismically qualified structure. Solid / solidified waste is always stored inside the building with multiple barrier concepts. The stored

solid waste will never come in contact with ground water during its operational life.

Radiation dose to the general public from all exposure pathways of solid / solidified waste stored in waste storage facility will not exceed the limit (0.05 mSv in a year) as prescribed by AERB.

1.44 Risk due to storage of radioactive material storage at the site.

1.45 Risk arising due to malicious act / sabotage

1.46 Risk of Radioactive release arising out of terrorist attack and malicious act not considered in the EIA.

1.47 Initiating events due to intentional mal operation or sabotage and malicious events like intentional aircraft crash are not considered in PSA**.**

Response 1.44 to 1.47

Location for the siting of a NPP is decided based on various siting criteria which take care of the screening distance from the air fields. However, it may be noted that protection against aircraft crash is considered in the safety analysis. The accidental aircraft crash and its consequences in term of core damage are quantified in the PSA. Regarding the risk of off-site releases, the risk contribution from accidental aircraft crash on buildings where radioactive containing system are located, has been assessed (i.e. Nuclear Auxiliary Building and Waste Treatment Building).

EPR reactor has the inner containment steel lined and designed to withstand accidental pressures and temperatures and an outer hardened concrete shell enveloping the inner one and protecting it against external hazards such as aircraft crashes and explosion pressure wave, etc.. The reactor design follows the latest international standards and guidelines. It incorporates a large number of diverse and redundant safety features

Based on the need of the country, a specialized force known as Central Industrial Security Force (CISF) is made responsible to provide specialized security to industrial installations in the country including NPPs. The CISF works under the Ministry of Home Affairs of Government of India.

All Nuclear Power Stations of NPCIL are provided security cover by CISF personnel, who are specially trained. Based on the location of NPP in the country and security threat perception, the required defense cover is provided. The design of Physical Protection System of NPP is carried out on the basis of design basis threats. The physical protection system is subject of review and approval by AERB.

1.48 Size of the affected zone in case of accident and its magnitude of impact

1.49 On Site and Off site emergency preparedness plans should be prepared.

Response for 1.48 & 1.49

The Section 4.4 of Chapter-4 of the Vol-I of the EIA report presents the Emergency Response system. Based on this a detailed plan will be prepared, which will be put up for approval of AERB and State Government before the consent for operation of the plant is granted by AERB. For all operating stations of NPCIL, approved off-site emergency plans exist and are also available with respective District Authorities.

1.50 EIA does not consider fuel reprocessing.

1.51 EIA does not consider high level long term disposal of radio- active waste.
1.52 Where are the permanent repositories for high level radioactive solid waste?
1.53 Radiation dose due to fuel reprocessing is not considered.
1.54 Transportation of high level radio- active waste is not covered in the EIA.

Response for 1.50 to 1.54

For JNPP, the design will be such that the radiation dose to the members of public from all the routes is restricted to 100 µSv/y per unit.

At present no reprocessing facility is envisaged at JNPP Site. The establishment and management of reprocessing facility of spent fuel falls within the purview of DAE and the same will be addressed suitably. It may be noted that the requirement of reprocessing of the spent fuel will arise only after 12 years as the reactor will be under construction for 5-6 years followed by another 5-10 years for the cooling of spent fuel. The technology to be adopted at that time will depend on the size of the plant and hence cannot be indicated at this stage as technology undergoes continuous improvements. Therefore, it is evident that there is sufficient time available to decide upon the establishment of reprocessing facility.

The requirement of permanent repository will be only after reprocessing plants are commissioned.

1.55 JNPP does not have an approved decommissioning plan.

Response

Decommissioning of the facility is considered as an integral part of the project. In Section 4.3, Page No. 383, Chapter-4, of EIA report, the brief write up on impact during decommissioning of the project is presented. Detailed decommissioning aspects are envisaged to be covered in PSAR for JNPP and will be put up for review / approval by AERB before operation of the project. The project decommissioning aspects are already considered in the design stage itself such that decommissioning of the plant will have insignificant impact in the public domain. The cost towards decommissioning is included as a part of unit energy cost.

1.56 What is the scientific basis for exclusion zone of 1.6 km and how it is of same size for 1000 MW and 10,000 MW projects
1.57 On what basis an emergency zone of 16 km considered**.**

Response for 1.56 & 1.57

As per the guidelines of AERB, ''Code of Practice on Safety in NPP Siting'; for nuclear power plants, the 'site' include the area surrounding the plant enclosed by a boundary, which is under effective control of the plant management. Mandatory requirement of AREB siting code is that an exclusion zone of 1.6 km radius around the plant is to be established and this area should be under the exclusive control of the station where public habitation is prohibited. The exclusion zone boundary does not depend on the electrical output of any NPP unit at the site.

The emergency planning zone of 16 km is based on infrastructure required to effectively implement the emergency measures such as sheltering, evacuation, communication, etc., which are vital during emergency condition.

2.0 Technical Aspects

2.1 Why other power sources such as hydro and solar power are not considered?

Response

The assessment of various energy sources (including conventional and non-conventional) suitable for India has been carried out by Government of India. The report of this assessment has been issued by Government of India as "The integrated energy policy of India 2005" The role of Nuclear power is clearly defined in this policy and it is envisaged that share of nuclear is to be increased It is planned to have total installed capacity of 63 GWE by year 2032 through nuclear power.

EIA report explains the need to augment the existing generation capacity of electricity in western region of India and also takes into account the recommendation of Site Selection Committee (appointed by Government of India). With these considerations, Jaitapur site has been approved by Government of India, for establishment of 6x1650 MW NPP units,

This is a well known fact in public domain in the world that the nuclear power is proved to be environmental friendly and is able to meet the huge demand of power by ever increasing developmental activities and population and this demand cannot be satisfied by other non-conventional sources of energy due to their low production potential per unit area and their dependence on vagaries of nature. This is being proved by the increasing number of NPPs all over the world and many nations opting for the nuclear energy in future. Therefore, the available option is to develop NPPs for the progress of the nation.

2.2 Inadequate EPR experience

2.3 International feed -back on EPR safety is not considered.

Response to 2.2 & 2.3

The proposed European Pressurized Reactor (EPR) at Jaitapur site is a generation -III Pressurized Water Reactor (PWR). The EPR technology is evolved by European countries specially France and Germany based on the successfully operating power plants French -N4 reactor of capacity 1400 MW and German Konvoi reactor of capacity 1365 MW for several years. The EPR technology has evolved on the basis of best safety features from presently operating French N-4 and German Konvoi reactors. The EPR technology is licensed by French, Finland and Chinese regulating authorities and is under implementation in these countries. The design certification for EPR is under review by US -NRC and UK regulating authorities. It is also submitted that at present, 23 EPR nuclear power projects are under consideration worldwide in seven countries including India.

The design safety requirements of NPPs are defined in various safety codes of AERB which are in line with the requirements specified by International Atomic Energy Agency (IAEA). Accordingly, the design of the NPPs in India is carried out to meet the requirements as specified in the above mentioned safety codes. In the case of Jaitapur, NPPs constructed will be as per the EPR technology from M/s AREVA, France. It is pertinent to mention here that as per policy of NPCIL, any imported technology for NPPs should be licensable by the regulatory body of the country of the origin.

2.4 Safety of the plant during grid failure.

Response

In any NPP safety is given prime importance. Accordingly, a typical NPP is provided with number of safety systems. Therefore, the power supply to these systems of the plant is supplied through engineered multi class electrical system, which is normally fed through switch yard. The switch yard of NPP is connected by minimum of two transmission lines of the grid with diverse source of power for redundancy. Further, the important safety systems like reactor core cooling are provided with uninterrupted power supply in case of loss of total power supply from the grid. The uninterrupted power supply is ensured by redundant bank of batteries backed up standby emergency diesel generators sets. This arrangement ensures that the reliable power supply to the important systems of the nuclear reactor in the event of failure of power supply from the switch yard / grid.

2.5 Transmission system and power evacuation should be part of EIA.

Response

The erection of transmission lines will carried out by a separate agency, for which the required studies and clearances from the regulating agencies will be obtained by the implementing agency.

2.6 Whether regulatory requirements are updated.

Response

The design safety requirements of NPPs are defined in various safety codes of AERB which are in line with the requirements specified by International Atomic Energy Agency (IAEA). Accordingly, the design of the NPPs in India is carried out to meet the requirements as specified in the above mentioned safety codes. In the case of Jaitapur, NPPs constructed will be as per the EPR technology from M/s AREVA, France. It is pertinent to mention here that as per policy of NPCIL, any imported technology for NPPs should be licensable by the regulatory body of the country of origin. The EPR has been licensed for construction in France, Finland and China. The EPR technology has evolved on the basis of best safety features from current operating French N-4 and German Konvoi reactors.

The regulatory consenting process for NPPs in India is governed by AERB Guide No. AERB/NPP & RR/SG/G-1, which envisages five major consenting stages, viz, siting, construction, commissioning, operation and decommissioning. Accordingly, at each stage review is carried out by AERB before granting of consent.

2.7 PSAR is yet to be submitted to AERB for approval then how EIA can be finalized.

Response

The consent by AERB at the second stage, namely, construction involves the review of the design safety aspects based on the PSAR submitted by NPCIL to AERB. Hence Preliminary Safety Analysis Report (PSAR) submitted by NPCIL is reviewed by AERB at the stage of consent for construction. EIA is independent activity required for obtaining Environmental Clearance from MoEF Govt. of India.

2.8 Has EIA been vetted by AERB

Response

The EIA report for JNPP is prepared as per approved Terms of Reference (TOR) by MoEF as per their notification of September, 2006 for environmental clearance of JNPP and does not call for vetting by AERB. However, environmental clearance of the proposed project is one of the mandatory requirements of AERB, before the siting consent of the project is accorded by AERB.

2.9 AERB independence is questionable

2.10 Safety issues raised by retired AERB Chairman are not addressed by NPCIL.

Response to 2.9 & 2.10

AERB is constituted by Government of India for exercising regulatory and safety functions envisaged under the Atomic Energy Act 1962. AERB directly report to Atomic Energy Commission and does not come under Department of Atomic Energy (DAE). Further, NPCIL is Public Sector Undertaking under DAE and none of its Director is on the Board of AERB.

With respect to the Article published in Frontline magazine (Vol.16, March 13-26, 1999), suitable action was taken to address all these issues. As such, all these issues have been closed to the satisfaction of AERB.

2.11 Risk due to earth quake on the plant.

Response

NPPs built all over the world, including those which are built in a highly earthquake prone country like Japan, are designed considering seismic effects specific to the site.

Nuclear Power Plants, whether located in active tectonic region or in stable continental region, are designed for earthquake resistance. Jaitapur Site is located in stable continental region and is 1600 Km away from the active tectonic region of Himalayas. Even for such stable continental regions, the plants are designed for a 6.5 magnitude (Ritcher scale) earthquake (intra-plate earthquake of Koyna).

There is no earthquake activity around Jaitapur site in a radius of 39 Km. This is based on the earthquake data collected from Koyna Bandkam Vibhag and MERI from 1973 till date, as well as from NPCIL's own micro earthquake recorders installed by NGRI, Hyderabad around Jaitapur site which have not recorded any event of a micro earthquake or major earthquake within a distance of 39 Km around Jaitapur.

Conventional plants like thermal power plants, hydro power plants, and chemical industries are designed for earthquake loading using the seismic coefficient method described in the seismic design standard IS 1893 in terms of acceleration in the zone in which the plant is located. As per the standard, the country is divided into various seismic zones and for each seismic zone a seismic coefficient is specified for design. Compared to the seismic coefficient method followed for seismic design of conventional power plants & industries, the seismic design of Nuclear Power Plants are carried out for site specific ground motion. For this, detailed geological & seismological studies are conducted with different scales of field check, such as up to 5 km radius, 50 km radius, and 300 km radius, around the plant site.

The active faults within the region are confirmed by experts from Geological Survey of India after carrying out field checks. The status of the faults is then reviewed by independent national experts to arrive at the maximum earthquake potential of these faults. The values so arrived at are generally enhanced by one magnitude over the maximum magnitude of the recorded earthquake in the vicinity of the active fault. Such enhanced magnitude earthquake is then assumed to be occurring on a fault closest to the plant site. The peak ground acceleration (PGA) at the plant site is then arrived at for such enhanced magnitude and reduced epicentral distance. Using this PGA, a Site Specific Ground Motion (SSGM) is generated, for which the nuclear plant structures, systems and equipment are designed by detailed analysis and testing.

Jaitapur site is located in a stable continental region and is situated away from active tectonic faults. The foundation strata for the NPP structures will be hard rock with shear wave velocity V_{s30} of 2000 m/sec and above. the expected PGA for plants located in stable continental region and hard rock (such as at Jaitapur) is less than 0.2g. It is pertinent to note that even for a 0.68g PGA earthquake, the plants were shutdown without any difficulty and there was no damage to the reactor core as well as to the structures, systems and equipment important to safety. The above confirms that, generally, the NPP designs have inherent design margins for dynamic loads such as earthquakes.

2.12 Authencity of the Seismic zone map of the site

Response

The seismic zoning map of India as appended in the EIA report has been taken from IS – 1893 (part-I): 2002 issued by Bureau of Indian Standards, Government of India, which is a authentic source of information. On the subject map, the location of Jaitapur site has been marked. According to this Jaitapur site falls in zone III.

2.13 The secondary information about what happened to Kashiwazaki – Kariwa nuclear power station due to earthquake that struck Japan is not considered.

Response

The Nuclear Power Plants at Kashiwazaki-Kariwa witnessed a 6.8 magnitude earthquake with an epicenter at 16 Km from the plant site on July 16, 2007 .In spite of such large magnitude earthquake experienced at Kashiwazaki-Kariwa NPPs, the major damage was only a fire to one of the electrical transformers. The safety systems of the plants functioned as per design intent and the reactors were brought under safe shut down condition. The transformer, which caught fire, was on a raft foundation with piles underneath it, whereas the bus bars connected to the transformer bushings were resting on a foundation which was resting on backfilled soil. On account of vigorous ground shaking, the back fill soil got compacted/consolidated resulting in ground subsidence. This consolidation /subsidence led to the foundation of the bus bar settling down with respect to the raft foundation of the transformer and this differential settlement caused the weight of the foundation of the bus bar & the bus bar to come on to the transformer bushings. This, in turn, resulted in breakage in the bushing, leakage of transformer oil and the oil catching fire due to electric sparks caused by short circuit and eventually the transformer catching fire. Such an incident is not expected to occur at Jaitapur site, as the plant structures will be located on

hard rock strata (which do not suffer from consolidation settlement in the event of vibratory ground motion). .

Jaitapur site is located in a stable continental region and is situated away from active tectonic faults. The foundation strata for the NPP structures will be hard rock with shear wave velocity V_{s30} of 2000 m/sec and above. In contrast the Kashiwazaki-Kariwa plants are founded on soft soil with shear V_{s30} of 400 m/sec. It is well known that during an earthquake, the displacements on soft soil is higher compared to hard rock and such large displacements cause more damage to structures, systems and equipment. Furthermore, because of a peculiar local geological condition, one of the plants of the Kashiwazaki-Kariwa witnessed a PGA of 0.68g. In comparison, the expected PGA for plants located in stable continental region and hard rock (such as at Jaitapur) is less than 0.2g. It is pertinent to note that even for a 0.68g PGA earthquake, the plants were shutdown without any difficulty and there was no damage to the reactor core as well as to the structures, systems and equipment important to safety.

As indicated above, one of the units of Kashiwazaki-Kariwa NPPs experienced a PGA of 0.68g which was 2.5 times higher than the design PGA of 0.273g. Even for such a large acceleration of 0.68g, the plants could be shutdown, demonstrating that all the reactor equipment, shutdown system, control and electrical equipment performing safety functions have functioned normally during and after the earthquake. Other plant systems and equipment have also performed well without any damages (except for the damage to the transformer mentioned above) and damage to the penetrations in the civil structure below the ground level in the soil.

The above confirms that, generally, the NPP designs have inherent design margins for dynamic loads such as earthquakes.

3.0 General Aspects

3.1 Displacement of the villages due to project. Number of villages falling in the exclusion zone of the proposed project.

Response

Neither of the villages including Madban and any of the families is displaced nor do these villages fall in the exclusion zone of the project.

3.2 Land acquisition for land required for roads for the project

Response

The road expansion / improvement program needed for project implementation will be undertaken through PWD, State Government.

3.3 The land being acquired is forest land

Response

No forest land has been acquired for JNPP. The declaration in this respect and NOC from Sub Divisional Forest Officers, Ratnagiri is enclosed as Annexure-X and Annexure-XI respectively of Vol-II of EIA report for JNPP.

3.4 The gram panchayat –wise population data is not presented in the EIA report.

Response

The village wise population data is presented in the EIA report obtained from the concerned Government Department based on 2001 census (refer Table no. 3.10.2 on Page No. 315 to 320 of EIA report Volume-I

3.5 Employment to Project Affected Families (PAFs).

Response

There is standard government policy for recruitment of people in all the three categories i.e. Group-A, Group-B & Group-C. For group-C, the employment will be given to PAFs (Project Affected Peoples), provided they qualify for the particular job. Next preference will be given to local people of the area and those within the District for Group C.

Further, the construction work force by the contractor will preferably be inducted from the local population around the plant / region except for some specialized trades.

3.6 Land acquisition should be only after public hearing

3.7 Necessity for emergency land acquisition section was issued.

Response to 3.6 and 3.7

The land acquisition for the project has been carried out as per Land Acquisition Act, 1894 by Special Land Acquisition Officer, Office of District Collector, Ratnagiri appointed for the purpose under the said Act.

The JNPP is the project of national importance as it will cater the need of supply of power to the country, hence the urgency clause for land acquisition was made applicable.

3.8 Access to the exclusion zone

Response

As per the guidelines of AERB, ''Code of Practice on Safety in NPP Siting'; for nuclear power plants, the 'site' include the area surrounding the plant enclosed by a boundary, which is under effective control of the plant management. Mandatory requirement of AREB siting code is that an exclusion zone of 1.6 km radius around the plant is to be established and this area should be under the exclusive control of the station where public habitation is prohibited.

3.9 Site does not conform to approved land use of the area.

Response

The site for JNPP is in line with the approved Regional Plan for the development and use of land in the District Ratnagiri/Sindhudurg of the Government of Maharashtra vide Notification No. TPS 1290 / CR-120/UP-12 dated June 2, 1995 (Appended in Volume –II of EIA Report for JNPP).

3.10 EIA does not talk about access to the light house after construction of the project.

Response

The access to the Light house will be maintained, so that its functioning is not hampered

3.11 Whether access to Madban beach will be restricted.

Response

The area acquired for JNPP will only be under restricted access.

3.12 Site selection should be based on requirement of the electricity of the local people.

Response

The assessment of various energy sources (including conventional and non-conventional) suitable to meet energy need of country has been carried out by Government of India. The report of this assessment has been issued by Government of India as "The integrated energy policy of India 2005" The role of Nuclear power is clearly defined in this policy and it is envisaged that share of nuclear is to be increased It is planned to have total installed capacity of 63 GWE by year 2032 through nuclear power. Based on above study and the requirement of Western Regional Grid, the Jaitapur site has been considered for establishment of Nuclear Power Park.

This has been explained in the subject EIA report under Section 1.2, Chapter-1 of Vol-I.

3.13 R & R does not consider those fishermen who are land less.

3.14 Security constraints will affect the fisheries activities in the area.

Response to 3.13 & 3.14

There will be no effect on fisheries activities due to JNPP. AERB has stipulated an area around Nuclear Power Plant with no permanent habitant and called as "Exclusion zone". In line with the above, JNPP will also have a specific 'Exclusion Zone' of 1.6 km. Being a coastal site, some of the area of 'Exclusion zone' will fall on sea front. From security point of view and being a prohibited area, no unauthorized person is envisaged to be allowed to enter in this zone on land as well as sea front. The expected exclusion zone area under sea from

shoreline may vary from 500 metre to 1 km. approximately. Accordingly, the entry of fisherman in this zone will be restricted and regulated. Beyond this zone, there will be no restriction of fishing.

3.15 Site selection devoid of Safety and Security concern.

Response

The overall security scenario is considered during the site selection process. Further, site specific graded security system is designed to safeguard against all possible external & internal threat perceptions.

There are security organizations at various levels at DAE, AERB and NPCIL. The security audits/inspections are regularly carried out to ensure compliance of security provisions. Over and above, an independent review of nuclear security related issues is in place by national regulators i.e. Atomic Energy Regulatory Board (AERB). It may be noted that each NPCIL plant have Multi-tier physical barriers with intrusion detection systems which are in place with isolation zone.

3.16 Competence of NEERI, Nagpur with respect to radiological Impact assessment.

3.17 NEERI has not carried out a scientific EIA study and independent examination of impact due to radiation.

3.18 Competence of Forestry and College of Fisheries to carry out Biodiversity and marine ecological studies.

Response for 3.16, 3.17 and 3.18

NEERI, Nagpur routinely carries out EIA studies for various industrial projects including number of nuclear power projects (NPPs) all over India and hence possess vast experience and expertise for carrying out environmental impact assessment studies. Based on such studies, NPCIL has been granted environmental clearance in recent past by MoEF, New Delhi for these projects.

The Environmental Impact Assessment study for nuclear power project requires assessment of conventional as well as radiological aspects. Although, NEERI has got expertise on overall assessment of radiological aspects, they need to be provided basic input data about technological and regulatory aspects of the nuclear power plants and special studies with regard to radiological aspects. This is to mention that Health Physics Division (HPD), BARC, is the only agency, who is authorized and has requisite expertise with well developed techniques for assessment of radiological aspects. Accordingly, NPCIL facilitated NEERI in the task by providing all requisite data related to technical and regulatory aspects of the project as well as special study report from HPD, BARC on radiological aspects.

The EIA report for JNPP is a detailed comprehensive document by NEERI, Nagpur, one of the most reputed institute, under Ministry of Science & Technology, Govt. of India. The report is based on the studies carried out by professional experts of NEERI, Nagpur as well as the special studies by the following organizations:

- *"Pre-operational baseline radiological survey of the area around JNPP site"- by Health Physics Division (HPD), BARC, Mumbai.*
- *"Status of biodiversity study of the area around JNPP site" – by Collage of Forestry, Agricultural University, Dapoli through NEERI, Nagpur.*

- *"Thermal dispersion studies for Condenser Cooling Water (CCW) discharges" - by Central Water and Power Research Station (CWPRS), Pune.*
- *"Marine ecological studies" –by Collage of Fisheries, Ratnagiri, Agricultural University, Dapoli, through NEERI, Nagpur.*
- *"HTL, LTL and CRZ demarcation Study"- by National Institute of Ocean Technology (NIOT), Chennai.*

The College of Forestry, Dapoli has wide experience of studying the biodiversity of the Ratnagiri District as well as in other parts of the country. This college has prepared e-herbarium of the plants for reference purpose during their taxonomical study. The College of Forestry also maintains a 50 ha Biodiversity Park or genomic valley where there is collection of many rare, endangered and medicinal plants. This indicates that the College of Forestry is the competent institution to carry out biodiversity study in the study area of JNPP. Therefore the study of wildlife and biodiversity at proposed project site and within 25 km radial area around the project site was awarded to this college and the Biodiversity Report submitted by them is annexed as Annexure – VII in EIA Report Vol. II.

The above organizations are professional and reputed in their area of work and posses immense experience & expertise. Based on the specialized studies carried out in a scientific manner & as per standard methodologies by the above organizations, including their own study & assessment, NEERI, Nagpur prepared the EIA report. The report addresses all the issues elaborately covering relevant aspects of environment.

As a part of EIA study, NEERI, Nagpur has carried out detailed marine ecological studies for the Jaitapur coast and through College of Fisheries, Ratnagiri, a specialized study on Baseline Marine Ecological Assessment of sea cost around the Jaitapur site.

3.19 Due to the project Chira mining activity, which is source of livelihood of the many people in the area will get affected.

Response

The Chira mining which is not part of the acquired land will not get affected by the project activities.

3.20 It is feared that project will construct dam and many people will be displaced.

Response

The proposed JNPP Project will not construct any dam.

3.21 How the water requirement for the project will be met, till the desalination plant is commissioned

Response

In the initial phase of construction, efforts will be made for early commissioning of desalination plant to cater the need of potable water requirements of plant and colony. Once the desalination unit is commissioned, there will not be any load on the local potable water resources on the account of plant and residential complex.

3.22 EIA should have been cleared by Ministry of Defense**.**

Response
Not Applicable

3.23 The project will induce social problems like crime, alcoholism, gambling etc.
Response
NPCIL has sufficient experience of constructing multi Unit sites. The number of people required for construction of a plant does not vary in direct proportion with the plant capacity. NPCIL has got the well set systems and procedures for management of construction activities and work force and all the associated issues like safety and security. NPCIL will ensure that the construction activity will have minimum adverse impact on the surrounding villages and population and will take help of state authorities as and when necessary.

3.24 No Socio- economic study initiated by YASHADA
Response
YASHADA, has tried to carry out the survey, but some people in the villages around have not allowed them to carry out the survey. NPCIL will provide all the support needed to complete the study and implement its recommendations with the approval of the State Government.

3.25 Unit energy cost. What will be Tariff structure from the proposed JNPP.
3.26 How cost of power will be in comparison to Dhabol Power Project.
Response to 3.25 & 3.26
As a principle, the capital cost of all imported NPP units in India should be such that the unit energy cost from above plants is comparable with prevailing tariff from power plants from Indian origin constructed at same period. Same principle is being followed for establishment of EPR units at Jaitapur site. The discussions between NPCIL and AREVA are in progress, so that the capital cost is optimized by sharing the scope of the responsibilities with regard to construction, erection of the plant facilities by NPCIL.
All the elements required for computation of the tariff, would be taken into account so that the final tariff for electricity form JNPP is comparable to the unit energy cost of electricity from other contemporary electricity generating technologies in area around Jaitapur site.
Jaitapur Nuclear Power Project cannot be compared with Dhabol Power Project as there is no analogy between JNPP and Enron Project.

3.27 Whether cost of managing nuclear waste and decommissioning is part of tariff.
Response
The cost towards decommissioning and management of radio- active waste is included as a part of unit energy cost.

3.28 How much accident compensation
Response
For nuclear power plants, the accident compensation is decided by Government of India.

3.29 The project is envisaging mining, which should not be allowed.

Response

JNPP Project does not envisage any mining activity at site.

3.30 In the entire report it is hard to find a single negative impact.

Response

The implementation of large project like JNPP will bring up the economic improvement in the surrounding area of JNPP. Therefore the overall impact of the project is expected to be positive on all fronts. However, there are few areas where adverse impact cannot be avoided completely (section 4.2.6, page nos 376-382 of the EIA report), and NEERI has also suggested the measures by which these adverse impacts can be mitigated.

4.0 Legal Aspects

4.1 Full Marathi EIA report was not made available to all the three Grampanchayats of the project affected villages.

4.2 Majority of the people participating in the public hearing are not provided with EIA report

Response to 4.1 & 4.2

- *Public hearing process has been organized by MPCB, Ratnagiri as per the provision under notification, issued by MoEF vide no. S.O. 1533 (E), dated the 14th September, 2006 and its amendment vide No. S. O. 3067 (E) dated 1st December, 2009.*
- *Further to the compliance by NPCIL to the provisions of subject Notifications with regard to submission of Summary EIA document in local language, along with application for JNPP public hearing, officials of MPCB, Ratnagiri and District Collector Ratnagiri, advised NPCIL, over and above the said provisions, to provide Marathi version of complete EIA report. NPCIL immediately organized translation of complete EIA report (Vol.-1 and Vol -II). The exercise was completed in two phases and 10 copies of the first Volume of the EIA report, containing the main report was delivered by NPCIL to MPCB, Ratnagiri on 26-04-2010 and placed by them, at all designated places by 30.04 2010. Similarly, the Vol.II, which contains the special study reports and other reference documents was delivered to MPCB, Ratnagiri on 10-05-2010 and placed by them at all designated places by 12.05. 2010.*
- *Over and above the provisions of the aforementioned Notifications from MoEF, to facilitate the people of all the project affected villages around JNPP, the EIA documents, i. e. one copy of the full set of EIA report in English and Summary EIA report in English and Marathi were placed with Gram Panchayat, Madban, Tal. Rajapur, District Ratnagiri, the village from where maximum land for the project has been acquired and other affected villages being in close proximity.*

4.3 Postponement of the date of Public Hearing

Response

- *The matter of postponement of date of public hearing is under purview of MPCB and NPCIL had has no role. However, as per applicable MoEF notification "No postponement of the date, time and venue of the public hearing shall be undertaken, unless some untoward emergency situation occurs". Accordingly, appropriate response was given by the committee during public hearing.*

4.4 Composition of Panel for Public Hearing

4.5 Inclusion of AERB officials in the panel

Response to 4.4 & 4.5

It is understood that the public hearing for JNPP was conducted on 16.5.2010 by MPCB, Ratnagiri complying with provisions of EIA Notification No. S.O. 1533 dated 14th September, 2006 and amendments dated 1st December, 2009 issued by MoEF and not as per Notification No. 318 (E) and 319 (E) dated 10th April, 1997. The Constitution of the panel was in line with the provisions of current Notifications.

4.6 Clearance form AERB should have been obtained before public hearing.

4.7 Prior approval of AERB should have been obtained before certifying the safety of the plant.

Response for 4.6 and 4.7

The regulatory consenting process for NPPs in India is governed by AERB Guide No. AERB/NPP & RR/SG/G-1, which envisages five major consenting stages, viz, siting, construction, commissioning, operation and decommissioning. At each stage, review is carried out by AERB before granting of consent. The environmental impact assessment study carried out by NEERI, Nagpur has suggested suitable environmental management plan for JNPP keeping in view that NPCIL will obtain the various regulatory clearances from AERB at appropriate stages of the project.

4.8 India is signatory to various conventions like Convention on Biodiversity-1992, UNFCC -1992, Kyoto Protocol-1997 etc and hence they should be strictly followed**.**

4.9 The project is not complying with various environmental Acts

Response to 4.8 & 4.9

All the applicable provisions as notified by MoEF & other statutory bodies of the country are being complied with by NPCIL.

Responses to MoM
of
Public Hearing

(Ref. MoM of Public Hearing,Vol-III Part I)
(Page no E-1 to E-16 & M-1 to M-2)

Annexure-I

Responses to MoM of Public Hearing
(refer MoM of Public Hearing, Vol-III)

1 Observation:

Dr. Wagdhare informed that this public hearing is illegal. As per notification 2002 before speaking NPCIL should give us the 2 x 2 size Marathi copy which they have not given.

Response

- *Public hearing process has been organized by MPCB, Ratnagiri as per the provision under notification, issued by MoEF vide no. S.O. 1533 (E), dated the 14th September, 2006 and its amendment vide No. S. O. 3067 (E) dated 1st December, 2009.*
- *It may please be noted that MoEF notification of Year 2002, if any, is not applicable for JNPP Public Hearing.*
- *Further to the compliance by NPCIL to the provisions of subject Notifications with regard to submission of Summary EIA document in local language, along with application for JNPP public hearing, officials of MPCB, Ratnagiri and District Collector Ratnagiri, advised NPCIL, over and above the said provisions, to provide Marathi version of complete EIA report. NPCIL immediately organized translation of complete EIA report (Vol.-1 and Vol -II). The exercise was completed in two phases and 10 copies of the first Volume of the EIA report, containing the main report was delivered by NPCIL to MPCB, Ratnagiri on 26-04-2010 and placed by them, at all designated places by 30.04 2010. Similarly, the Vol.II, which contains the special study reports and other reference documents was delivered to MPCB, Ratnagiri on 10-05-2010 and placed by them at all designated places by 12.05. 2010.*

2 Observation:

Hon'ble MLA Mr. Rajan Salvi:- Today on the auspicious occasion of Akshaytritiya marriage functions & other programmes are going on at various places. This Grampanchayats have submitted letter to you for postponement of the public hearing. But you have not taken the cognizance of it.

Response

The matter of postponement of date of public hearing is under perview of MPCB and NPCIL has no role. However, as per applicable MoEF notification "No postponement of the date, time and venue of the public hearing shall be undertaken, unless some untoward emergency situation occurs". Accordingly, appropriate response was given by the committee during public hearing.

3 Observation:

Hon'ble MLA Mr. Rajan Salvi:- Further it was necessary to give a copy in Marathi of EIA report to the respective Grampanchayat before, one month. But you have given it only to Madban Grampanchayats on 12th May, 2010. EIA report is not given to Mithgavane & other Grampanchayts before one month which are falling in the affected area. The public hearing shall be postponed for following a wrong procedure.

Response

Please refer our response at point no. 1& 2 above.

4 Observation:

Dr. Wagdhare: We are not against you & atomic energy projects, but we are opposing this procedure. As per the Gazettee Notification 2002 Marathi Report has to be given, which is not given & for this reason the public hearing shall be stopped.

Response

Please refer our response at point no 1 and 2 above.

5 Observation:

Mr. Gavankar: You gave the English EIA report before one month. Marathi EIA report was given to Madban Grampanchayat on 12th May. Whether it is possible for us to study it within four days? You have not given the EIA report to the concerned Niveli, Mithgavane, Ansure & Karel Grampanchayats. Zilla Parishad & Panchyat Samiti's opinion is against the project, Grampanchyat has passed a resolution against the project, in spite of this land acquisition process is started. You have not considered our feelings & today on the occasion of Akshaytritiya you are taking away our feed. This public hearing shall be cancelled.

Response

Please refer our response at point no 1 and 2 above for EIA reports and schedule of Public Hearing respectively.

The land acquisition for the project has been carried out as per Land Acquisition Act, 1894 by Special Land Acqusition Officer, Office of District Collector, Ratnagiri appointed for the purpose under the said Act.

6 Observation:

Dr. Waghdhare: He read out the public hearing notification & informed that company has violated the provisions of Environment (protection) Act, 1986, Environment (Protection) Rules 2006 & 2009.

Response

Public hearing process has been organized by MPCB, Ratnagiri as per the provision under notification, issued by by MoEF vide no. S.O. 1533 (E), dated the 14th September, 2006 and its amendment vide No. S. O. 3067 (E) dated 1st December, 2009

7 Observation:

Mr. Bhikaji Dhondu Waghdhare, Sarpanch Madban: After receipt of public hearing books we received one part on 12 & other on 14th May. Our farmers can't do the study of even two pages for postponement of public hearing we submitted the representation. You have not given reply to our representations except the letter stating that postponement of hearing will not be done. We never received reply for our representation. The officers only inform that the matter is submitted to higher office. You have declared that no farming is done here, village is rehabilitated & for this I have submitted a representation

Response

Please refer our response at point no 2 with respect to the postponement of public hearing.

With regard to farming on acquired land for project, Following is clarified:

As per the joint valuation of the landed assets on acquired land by District Authorities for the purpose of payment of land compensation, survey/study by NEERI, Nagpur and study report by Indian Remote Sensing centre, Nagpur, in the year 2006, indicate the land use pattern of the same as 8.99% (62.04 Ha)

land is kharip, 32.96% is varkas, and 58.05% is pot kharaba for the total land of 690.401 Hectares from village Madban for project site.

8 Observation:

Smt. Vaishali Patil: - There are guidelines of Supreme Court for conducting the public hearing & GR is issued. Dr. Waghdhare has given its reference. It is the fact that EIA report is not received by many villages before one month, EIA report is not given to Karel, Mithgavane & Niveli villages which is a serious lapse & for this the Chairman should explain:

Response

Please refer our response at point no 1 regarding applicable notifications on public hearing.

Over and above the provisions of the aforementioned Notifications from MoEF, to facilitate the people of all the project affected villages around JNPP, the EIA documents, i. e. one copy of the full set of EIA report in English and Summary EIA report in English and Marathi were placed with Gram Panchayat, Madban, Tal. Rajapur, District Ratnagiri, the village from where maximum land for the project has been acquired and other affected villages being in close proximity.

9 Observation:

Hon'ble MLA Mr. Rajan Salvi:- Report is not given to Mithgavane, Karel & Niveli Grampanchyats, it given to Madban Grampanchayat: Which are the project affected villages? The public hearing shall be cancelled as EIA report is not given one month in advance to respective the Grampanchyats.

Response

Please refer our response at point no 1,2 and 8 above.

10 Observation:

Dr. Desai :- We want answer that why the report is given to Madban Grampanchayat only & not to Mithgavane, Niveli & Karel Grampanchyats?

Response

Please refer our response at point no 1 and 8 above.

11 Observation:

Mr. Gavankar, Chairman Janahit Seva Samiti:- Your have distributed 8 EIA & whether the 2 EIA have been sold? You have followed Bristish Rule in distribution of EIA. Your nelglected the Grampanchyat which is very important in decentralization of power. You have not considered the objections of farmers. The EIA reports is not true. They can't even identify alphanso mango.

Legally five Grampanchyats must get the EIA report but they were not given the same.

Response

Please refer our response at point no 1 above with respect to EIA report.

The land area under various horticultural crops like mangoes, chashewnut, coconut and others for the year 2000-01 to 2005-06 are given in Table 3.8.8 of Chapter-3 of Vol-I of EIA report for Rajapur, Ratnagiri.

12 Observation:

One Villager: Collector should explain that whether the EIA report can be given to other Grampanchayats at this moment & only after that the public hearing shall be concluded.

Response

Please refer our response at point no.1, 2 and 8 above.

13 Observation:

Dr Vivek Bhide: EIA report has to be given one month in advance to the four Grampanchyats wherein land acquisition is done but the same is not done so for, You should explain for this.

Response

Please refer our response at point no 1 and 8 above.

14 Observation:

Other villager: The notification of four villages for the public hearing is same & the four villages are common:

Response

Please refer our response at point no 1 above.

15 Observation:

Villager: - Your have started the work on our land. It is not fair to do this before the pubic hearing. Hence you have violated the law.

Response

NPCIL has not started any project construction activities at JNPP site. However, as per the approval of Government of India, pre project activities like acquisition of land, environmental impact assessment studies for environmental clearance for JNPP, Oceanographic / Bathymetry Survey of sea, pre –operational radiological Survey, Marine Ecological Studies, On –shore/Off -shore soil investigations and property fencing wall are being carried out. NPCIL will not carry out any project related activities before obtaining the environmental clearance and AERB siting approval.

16 Observation:

Villager: - Whether it is true that Madban & other three villages are project affected? Excluding Madban EIA & Summary Report is not given to the remaining three villages.

Response

Please refer our response at point no 1 and 8 above.

17 Observation:

Mr. Gavankar: - As the three Grampanchyats have not received the EIA Report they can't register their objections. Hence this public hearing shall be cancelled.

Response

Please refer our response at point no 1 and 8 above.

18 Observation:

Dr. Waghdhare: They say that employment will be given to the locals but nobody from this area will be given employment. He explained the discrepancies of land acquisition.

Response

The land acquisition for the project has been carried out as per Land Acquisition Act, 1894 by Special Land Acquisition Officer, Office of District Collector, Ratnagiri appointed for the purpose under the said Act.

There is standard government policy for recruitment of people in all the three categories i.e. Group-A, Group-B & Group-C. For group-C, the employment will

be given to PAFs (Project Affected Peoples), provided they qualify for the particular job. Next preference will be given to local people of the area and those within the District for Group C.
Further, the construction work force by the contractor will preferably be inducted from the local population around the plant / region except for some specialized trades.

19 Observation:

Mr. Gavankar What will be the per unit rate of NPCIL's generated power? Whether it will be sold to Maharashtra or other states?

Response

As a principle, the capital cost of all imported NPP units in India should be such that the unit energy cost from above plants is comparable with prevailing tariff from power plants in the region constructed during same period. Same principle is being followed for establishment of EPR units at Jaitapur site. The discussions between NPCIL and AREVA are in progress, so that the capital cost is optimized by sharing the scope of the responsibilities between NPCIL & AREVA and localization of supply from India.

JNPP will contribute to meet the much needed electricity requirement of the Konkan region, Maharashtra State and the country and it will boost the development in the area around.

20 Observation:

Mr. Prakash Waghdhare: We are cultivating the paddy at this place & people are entirely dependent on it. You inform that green zone will be developed within the 5 kilometers periphery. Madban, Niveli, Mithgavan & many more villages are falling in this zone. The land which belongs to us will be acquired. You informed the Government that 900 Ha Of land will be acquired. Whether you will permit us to graze our animals, on the land surrounding to this Mango cultivation exists surrounding the 1 kilometer project periphery. It not mentioned that in which season project study is done.

You are going to construct the residential colonies at a distance of 8 to 9 kms. Madban village is at a distance of half km which will be displaced. However in the report it is mentioned that village will not be displaced. If the atomic particles are displaced in the atmosphere we have to leave the village for saving our life.

Rajapur Taluka is within 30 kms radius. NEERI has done the survey of 60kms radius covering 18,000 people if the project is sanctioned many villages have to be displaced. Grampanchayat, Panchayat Samiti & Zilla Parishad have submitted the resolutions against the project but you have neither replied for this nor discussed anything. If the atom is disposed in soil it will pass into well water & ruin all. You said its for its disposal into water but please note that we are earning 600 crores from fishing. About 50,000 to 60,000 people are dependent on this. Many are dependent on agriculture. There are many mistakes in the environmental report.

Response

As per the joint valuation of the landed assets on acquired land by District Authorities for the purpose of payment of land compensation, survey/study by NEERI, Nagpur and study report by Indian Remote Sensing centre, Nagpur, in the year 2006, indicate the land use pattern of the same as 8.99% (62.04 Ha) land is kharip, 32.96% is varkas, and 58.05% is pot kharaba for the total land of 690.401 Hectares from village Madban for project site.

AERB has stipulated an area around Nuclear Power Plant with no permanent habitant and called as "Exclusion zone". In line with the above, JNPP will also have a specific 'Exclusion Zone' of 1.6 km. Being a coastal site, some of the area of 'Exclusion zone' will fall on sea front. From security point of view and being a prohibited area, no unauthorized person is envisaged to be allowed to enter in this zone on land as well as sea front. The expected exclusion zone area under sea from shoreline may vary from 500 metre to 1 km. approximately. Accordingly, the entry of fisherman in this zone will be restricted and regulated. Beyond this zone, there will be no restriction of fishing. The villages as mentioned above are not falling under exclusion zone of JNPP.

NEERI has carried out the EIA study for three seasons (post monsoon, winter and summer season).

None of the villages including Madban is in the exclusion zone of the project and hence not a single family will be physically displaced.

In the EIA, the radiological doses from all sources of the plant have been appropriately considered and the total exposures for individual member of public and other elements of environment has been arrived at in the EIA report. As the exposure so estimated is not only well within the safe limits as specified by ICRP / AERB, but also far below compared to the natural background radiation dose of 2400 µSv/y, hence there will not be any significant impact on the environment around the plant. Therefore, beyond the exclusion zone of the project not a single family will be physically displaced.

For socio –economic environment, NEERI has carried out survey up to 25 km and HPD, BARC has carried out radiological survey up to 30 km from the project.

NEERI, Nagpur routinely carries out EIA studies for various industrial projects including number of nuclear power projects (NPPs) all over India and hence possess vast experience and expertise for carrying out environmental impact assessment studies. Based on such studies, NPCIL has been granted environmental clearance in recent past by MoEF, New Delhi for these projects.

21 Observation:

Mr. Satish Narkar:- Padve, Maharashtra Samajik Navnirman Academy:- radioactive pollution will be created from the nuclear power project which does not come under the control of MPCB & for this AERB is the regulatory authority formed by Central Government . In spite of this MPCB is conducting the public hearing. We have objection for this as it is a wrong thing.

Response

It is understood that the public hearing for JNPP was conducted on 16.5.2010 by MPCB, Ratnagiri complying with provisions of EIA Notification No. S.O. 1533 dated 14th September, 2006 and amendments dated 1st December, 2009 issued by MoEF and not as per Notification No. 318 (E) and 319 (E) dated 10th April, 1997. The Constitution of the panel was in line with the provisions of current Notifications.

22 Observation:

Satish Narkar: After doing the EIA of the project, land acquisition shall be done & afterwards contracting has to be done. You have already done the land acquisition & contracting & now you are· conducting the public hearing. Whether MPCB can check

the radioactive pollution? Public Hearing shall be conducted-in presence of AERB people & the people shall give answers to our questions. No any person from - AERB is present here to explain whether the environmental protection or degradation will take place after the project.

Response

The land acquisition for the project has been carried out as per Land Acquisition Act, 1894 and public hearing for JNPP was conducted on 16.5.2010 by MPCB, Ratnagiri complying with provisions of EIA Notification No. S.O. 1533 dated 14th September, 2006 and amendments dated 1st December, 2009 issued by MoEF.

23 Observation:

Smt Sita Ramchandra Katkar: You have no right to take the land owned by us. How you have taken our land ? We have not received the notices.

Smt. Sangita Deu Thakkar: We have not understood the contents of the report, please explain briefly.

Response

The land acquisition for the project has been carried out as per Land Acquisition Act, 1894 by Special Land Acqution Officer, Offcie of District Collector, Ratnagiri appointed for the purpose under the said Act.

The summary EIA report in Marathi and English as well as the EIA study report is self explanatory.

24 Observation:

Vaishali Patil: One lady has told that she has not received the report to study. The project representation is neither visualized nor understood by the people.

Response

The EIA report was placed at the designated places as per MoEF notification for public hearing.

25 Observation:

Mr. Pratik Parulekar, Ratnagiri: The information of accident compensation is not given in the ElA report. You should clarify it.

Response

The legal provision about the compensation is under the consideration of Government of India and the same will be followed after it is enacted.

26 Observation:

Mr. Satish Narkar: It is mentioned in the report that necessary steps will be taken after the accident & radioactive exposure. You should explain it in detail. Information of disposal of radioactive waste is not mentioned in the report.

Mr. Pratik Parulekar: It not explained in the report about the disposal of atomic waste?

Response

The Section 4.4 of Chapter-4 of the Vol-I of the EIA report presents the Emergency Response system. Based on this a detailed plan will be prepared, which will be put up for approval of AERB and State Government before the consent for operation of the plant is granted by AERB.

The average dose to the members of the public from all exposure pathways will not exceed 1 mSv in a year by virtue of disposal of liquid, solid and gaseous

waste to the environment as stipulated in AERB Safety Manual no. AERB/NF/SM/0-2 (Rev.4).
The details of management of gaseous, liquid and solid waste are presented in Chapter-4 of Vol-I of the EIA report. Additionally information on the subject is also presented in Chapter-4 of Annexure-14 of this document.

27 Observation:

Dr. Vivek Monteiro, Indian School of Social Sciences:

The amount of radiations will be ten times than the Chernobyl rays. In the 10,000 MW project the radiations will be of ten times than the Chernobyl.

Response

It may be noted that in case of Chernobyl (plants of RBMK design), the high radioactivity release into atmosphere was because of the accident scenario of directly opening the reactor core to atmosphere aided by subsequent large fires. The EPR design is different from the design of Chernobyl reactor. Chernobyl reactor was housed in a building which was not designed for resisting accident pressures and temperatures, whereas the EPR reactor has the inner containment steel lined and designed to withstand accidental pressures and temperatures and an outer hardened concrete shell enveloping the inner one and protecting it against external hazards such as aircraft crashes and explosion pressure wave, etc.. The reactor design follows the latest international standards and guidelines. It incorporates a large number of diverse and redundant safety features.

28 Observation:

Dr. Vivek Monteiro: The amount of radioactive substances, which will be produced in the six reactors, weather inside the reactors, whether pure grid processing facility, pure storing facility or in underground storage, the sum total of the radioactive substances produced in the 10,000 MW reactor will be approximately ten time than the radiation created in 1000 MW Chernobyl reactor.

Response

The authorized limits on the radioactive discharges are stipulated by AERB for the site. The Total Effective Dose to public at Fence Post is far below the maximum permissible limit of 1000 µSv/y by AERB, which are in line with International Commission on Radiation Protection (ICRP). These limits are not depending on the combined electrical out- put of the NPPs at the site. The limits take into considerations all the power producing units as well as other radiological facilities at the site.

29 Observation:

Dr. Vivek Monteiro: Is it correct to say that as per Economic Survey of Maharashtra Government 2009-2010, the capital cost for the two units of atomic power project will cost Rs 60, 000 crores.

Response

The nuclear power plants in India are established by Central Government under Department of Atomic Energy through NPCIL / BHAVINI. The cost estimation for such plans also falls under the purview of above establishments. The mechanism, by which the figure of 60,000 crores for two EPR units at JNPP site has been arrived, needs to checked, as the cost of these two units is yet to be finalized.

The discussions between NPCIL and AREVA are in progress, so that the capital cost is optimized by sharing the scope of the responsibilities with regard to construction, erection of the plant facilities by NPCIL.

30 Observation:

Dr. Vivek Monteiro: On what basis in the EIA Report it is claimed that the electricity will be provided at compensative rates?

Response

As a principle, the capital cost of all imported NPP units in India should be such that the unit energy cost from above plants is comparable with prevailing tariff from power plants from Indian origin constructed at same period. Same principle is being followed for establishment of EPR units at Jaitapur site. The discussions between NPCIL and AREVA are in progress, so that the capital cost is optimized by sharing the scope of the responsibilities with regard to construction, erection of the plant facilities by NPCIL.

Additionally information on the subject is also presented in Chapter-6 of Annexure-14 of this document.

31 Observation:

Dr. Vivek Monteiro: In the EIA report you have mentioned that you have taken care of solid waste for a period of 100 years. Have you taken care of after 100 years?

Radioactive waste it is highly dangerous for a period of 10,000 years. Is that correct?

India does not have depositaries. Without having depositaries you will be putting our future generations not only Maharashtra, Goa, Karnataka but the whole country to expose for the nuclear radiations.

Response

Presently, the low and intermediate radio- active solid / solidified wastes are stored in Near Surface Disposal Facility (NSDF). They are stored under ground at a depth of maximum up to 4 m either in trenches / RCC vaults / tile holes depending upon the surface dose rate of the waste. The solid waste disposal site is fenced and designed to store waste for an active control (monitoring, surveillance, remedial work) period of 100 years followed by passive control (land use control) period of 200 years.

The above facility has sufficient number of bore-holes all around at definite intervals. Ground water samples are collected from these bore-holes on regular basis to check the activity in ground water.

However, in case of Jaitapur EPR, the low and intermediate radioactive solid / solidified waste is designed to be stored in the radioactive waste storage building, where solid waste storage will be above ground as an improved design feature.

The radioactive waste storage building is planned to store low and intermediate level radioactive solid / solidified waste having half life less than 30 yrs. The total storage time envisaged for this waste is 100 years active control period followed by passive control period of another 200 years. Hence in the design an active storage period of 100 years is considered. After 300 years of storage (with ten or more half lives), the total radioactivity of the material will be almost negligible.

Waste storage facility is a seismically qualified structure. Solid / solidified waste is always stored inside the building with multiple barrier concepts. The stored solid waste will never come in contact with ground water during its operational life.

32 Observation:

Dr. Vivek Monteiro: As per safety report UK plant is not designed to protect against deliberate acts & terrorism. In United States in 2005 the energy policy is amended in order to take care of threats & terrorism no nuclear plants & nuclear storages. Is any provision is made by AERB to protect our plants from terrorism. Please take a note that this plant is not protect against terrorist action.

Response

The design features and the procedures take care of malicious events and mal-operations. Based on the need of the country, a specialized force known as Central Industrial Security Force (CISF) is made responsible to provide specialized security to industrial installations in the country including NPPs. The CISF works under the Ministry of Home Affairs of Government of India.

All Nuclear Power Stations of NPCIL are provided security cover by CISF personnel, who are specially trained. Based on the location of NPP in the country and security threat perception, the required defense cover is provided. The design of Physical Protection System of NPP is carried out on the basis of design basis threats. The physical protection system is subject of review and approval by AERB.

33 Observation:

Mr. Premanand Vijay Tiwarkar, Madban:-

I have submitted the objections on environmental issues & Balasaheb Sawant Krishi Vidyapeeth. Atomic Institute told NEERI to prepare the report. NEERI told Balasaheb Sawant Krishi Vidyapeeth to prepare the report. Sawant Krishi Vidyapeeth has given the information under RTI they have not done survey of Project site. How the survey work is allotted to such institution. In the report it is mentioned that there is no well in Madban Village & if so from where the villagers drink the water? Whether of sea or they have river for it? Whether the Chairman has read the report?

Response

The College of Forestry, Dapoli has wide experience of studying the biodiversity of the Ratnagiri District as well as in other parts of the country. This college has prepared e-herbarium of the plants for reference purpose during their taxonomical study. The College of Forestry also maintains a 50 ha Biodiversity Park or genomic valley where there is collection of many rare, endangered and medicinal plants. This indicates that the College of Forestry is the competent institution to carry out biodiversity study in the study area of JNPP. Therefore the study of wildlife and biodiversity at proposed project site and within 25 km radial area around the project site was awarded to this college and the Biodiversity Report submitted by them is annexed as Annexure – VII in EIA Report Vol. II.

For assessment of ground water quality, water samples were collected from wells in the study area. The well water quality in Madban village is presented in the Table 3.4.2, S. No. 24 at page no. 132 of Chapter -3 of Vol-I of the EIA report.

34 Observation:

Amjad Borkar, Ex. Chairman - Macchimar Society, Deputy Chairman- Maharashtra Macchimar Krishi Samiti:-

a) It is proved that NEERI has not done homework before preparing the report. They are lacking in fishery subject also. The fishing harbour is at a aerial distance of 3.0 km from the project where fishng is done using minimum 300 mechanized boats & minimum 10,000 fisherman are dependent on if. This fishing harbour

ranks on 2nd position in Ratnagiri District. –Smuggling is not done here which is stated by Mr. Raja Paranjape. NEERI has neither contacted the fishermen's institutions nor they have not considered about the fishing business while preparing the Report.

b) In this project 6 reactors will be installed. The cooling water from these reactors will be disposed through sea bottom. Up to how much distance it will be disposed? Due to intake & outfall of sea water what difference in the sea water quality will take place? whether the fishing boats will be permitted for transport over the water disposing tunnels?

c) As per our information even the 2 degrees difference will harm the existence of marine life.

d) If this much amount of water having the temperature difference will be discharged then definitely the fishing business will be ruined. They have not considered this. You informed that water will be disposed up to 2.0 Km. in to sea. This distance comes under Maharashtra Fishing Rules, 1981. If pipeline passes through this zone & fishermen are prohibited for fishing then the fishery business will come to zero. Water depth is 10 fathom/Wave up to 2 Km distance in the sea. We are permitted for fishing in this much area only then what should we do? If this happens & the fishing is displaced then no reference is given for the rehabilitation of the fishermen.

e) The report is prepared by sitting in NEERI office because you have not understood the sea depth. Sea depth increases while traveling from Mumbai towards south ·direction. Maharashtra Government has put a limit of 10 fathom depth to the fishermen which is up to 2 Km. distance. The project pipeline will be laid up to this distance. If the fishermen are not allowed for fishing up to this distance then it is clear that you have not considered them. You must do the home work.

Response

As a part of EIA study, NEERI, Nagpur has carried out detailed marine ecological studies for the Jaitapur coast and through College of Fisheries, Ratnagiri, a specialized study on Baseline Marine Ecological Assessment of sea cost around the Jaitapur site. (kindly refer Section 4.1.3 on page 10 & Table 11 in Annexure VIII of Vol.II of EIA report; page 252 to 254 and Table 3.8.4 to 3.8.6 in Vol.I of EIA report).The impact on marine ecological studies are based on a detailed 2D mathematical model studies for dispersion of condenser cooling water discharges from the proposed Nuclear Power Plant at Jaitapur, carried out by Central Water Power Research Station (CWPRS), Pune, in 2008. The CWPRS report is attached as Annexure- V(b) of Volume –II of the EIA report. The report from College of Fisheries is enclosed as Annexure-VIII of the Volume –II of the EIA report. These studies have concluded that the marine ecology will not be affected by the predicted maximum temperature rise of around 5 ^{0}C, which will be confined to a limited area of 0.28 Km^2, when all the six units are under operation and ocean currents are under transient state, which is the most severe condition thoughout the year. At this range of temperature rise above ambient temperature of water, most of the organisms are either not affected or get benefit of stimulation of metabolic activity. The details are presented in Section 4.2.2.1.4, of Chapter-4 of Volume –I of the EIA report.

AERB has stipulated an area around Nuclear Power Plant with no permanent habitant and called as "Exclusion zone". In line with the above, JNPP will also have a specific 'Exclusion Zone' of 1.6 km. Being a coastal site, some of the

area of 'Exclusion zone' will fall on sea front. From security point of view and being a prohibited area, no unauthorized person is envisaged to be allowed to enter in this zone on land as well as sea front. The expected exclusion zone area under sea from shoreline may vary from 500 metre to 1 km. approximately. Accordingly, the entry of fisherman in this zone will be restricted and regulated. Beyond this zone, there will be no restriction of fishing.

35 Observation:

Dr. Vivek Bhide: Whether you have taken the reference or report prepared by Dr. P. N. Desai & others of National Institute of Oceanography. You have prepared the report from them before 17 years. If you have only referred the report of Dapoli Krishi Vidyapeeth or this report also.

Response

The NIO, Goa carried out the study for Jaitapur coast in 1990. The study was of preliminary nature. The study conducted short term investigation on biotic and abiotic parameters at few locations around Jaitapur coast and had recommended long term monitoring and experimental studies for remedial measures for maintaining ecological balance in the marine environment of Jaitapur.

Subsequently, as suggested in the report, NPCIL made a comprehensive plan to investigate the effect of temperature rise on marine environment of Jaitapur coast. In line with this plan, a detailed 2D mathematical model studies for dispersion of condenser cooling water discharges from the proposed Nuclear Power Plant at Jaitapur, Ratanagiri is carried out by Central Water Power Research Station (CWPRS), Pune, in 2008. The CWPRS report is attached as Annexure- V(b) of Volume –II of the EIA report. And also as part of EIA study, NEERI, Nagpur has carried out detailed marine ecological studies for the Jaitapur coast and through College of Fisheries, Ratnagiri, a specialized study on Baseline Marine Ecological Assessment of sea cost around the Jaitapur site. The report from College of Fisheries is enclosed as Annexure-VIII of the Volume –II of the EIA report.

36 Observation:

Dr. Vivek Bhide: Mangroves are referred in the report but Xylocartes species are not referred in the report. I am submitting the report of Kolhapur University wherein it is clearly mentioned that According to RUCL endangered species of Maharashtra were rediscovered after a long gap of 90 years from 11 estuaries. They were discovered from Purnagad, Vijaydurg, Jaitapur estuaries. Endangered species are not referred in the report as they might have been ignored. Vultures are endangered species which are not observed in Konkan region except Jaitapur this has not been referred in the report. We are ready to come with you & provide information.

Response

The presence of Xylocartes species in Ratnagiri and Sindhudurg Districts is mentioned in Section 3.8.8 on page 241 of Chapter 3 in EIA Report Vol. I. The rare and endangered plant species are given in Section 3.8.12 on page 243 and animals species in Section 3.8.13 on page 246 of Chapter 3 in EIA report Vol. I. The presence of vultures has been recorded in Section 3.8.13 on page 248 in Chapter 3 of EIA Report Vol. I.

37 Observation:

Dr. Vivek Bhide: How much temperature rise or ambient air & water will take place?

Response

There will not be any rise in temperature of the air around the project and for rise in water temperature due to condenser cooling water, please refer our response at point no 34 above

38 Observation:

Dr. Vivek Bhide:

MPCB has not done the carrying capacity. I am having CPCB's reply under RTI according to this CPCB has also not done the carrying capacity.

Whether as per MPCB's zoning atlas for sitting of industries the sitting of industries for Ratnagiri District is submitted? Within the 30 square kilometer jurisdiction of the project on what area (acre of hectare) alphanso mango, cashew & coconut plantation exists? Whether this is noted in the report ?

Ratnagiri district is horticulture district in which at Rajapur mango plantation is on 8000 Ha. cashew plantation is on 10,000 Ha. At Vijaydurg cashew plantation is over 6000 Ha, mango plantation is over 4000 Ha. Vijaydurg & Rajapur taluka are within a jurisdiction 30 square kilometers. If the bursting of reactor takes place in core zone this much plantation will be destroyed. Our economy depends on mango, cashew & coconut, it is not dependent on atomic energy. You have not collected data from Agriculture Department, Horticulture Board & Statistical Department. What is the electricity requirement or Ratnagiri & Sindhurg district is 180MW. What is the electricity requirement within 200 square kilometer periphery?

Response

The EIA for JNPP is carried out as per approved TORs by MoEF. The details of the scope of the EIA study is given in Section 1.4 page nos 8-14 of Chapter-1 of Vol-I of the EIA report.

The land area under various horticultural crops like mangoes, chashewnut, coconut and others for the year 2000-01 to 2005-06 are given in Table 3.8.8 of Chapter-3 of Vol-I of EIA report.

The EPR technology has evolved on the basis of best safety features from presently operating French N-4 and German Konvoi reactors. The EPR reactor has the inner containment steel lined and designed to withstand accidental pressures and temperatures and an outer hardened concrete shell enveloping the inner one and protecting it against external hazards. The reactor design follows the latest international standards and guidelines. It incorporates a large number of diverse and redundant safety features.

The requirement of electricity for the State is considered while preparing the project. Electricity deficiency is observed at number of locations.

39 Observation:

Dr. Vivek Bhide:Legally the EIA report should be given to three Grampanchayats however it is not given.

Response

Please refer response at S. No. 1 & 8 above.

40 Observation:

Mr. Shivalkar, Madban;-

How many villages will be displaced & in which state the displacement will be done due to this project is not declared.

Mr. Ramesh Bhagwan Kaple, Mithgavane:
The project proponent should assure us that no displacement will be done

Response

None of the villages is in the exclusion zone of the project and hence not a single family will be physically displaced.

41 Observation

Mr. Arvind Jagannath Hirloskar, Niveli:
There is democracy in our state & if so environment report has to be given to Niveli Grampanchyat. I can't submit my objections as the report was not kept in Niveli Grampanchayat. Public hearing shall be reorganized.

Response

Please refer response at S. No. 1 and 8 above.

42 Observation:

Mrs. Taramati Harischandra Waghdhare, Madban:
I have not read the report given to Grampanchayat. Our earning is from agriculture. You will give the land cost once. You will first promise us to give employment & afterwards put the condition of education. Our children are not so educated. It requires permission to meet you. Illiterate farmers can't meet you. We don't want the project. It is not possible for us to contact you.
Smt. Bharti:
Our life is dependent on agriculture. We are opposing the project, we want our agriculture land.
Smt. Mina Gokul Survey, Madban:
I was in Government service however I am yet to receive the pension. We don't want to give our land for project. We are opposing the project.

Response

The land acquisition for the project has been carried out as per Land Acquisition Act, 1894 by Special Land Acqution Officer, Offcie of District Collector, Ratnagiri appointed for the purpose under the said Act.

43 Observation:

Mr. Arun Velaskar, Secretary-Konkan Bachav Samiti: Is it true that Union Government has obliged to pay Rs. 500 crores rupees as compensation in case of accidents occurring due to the operation of the project?

Response

The legal provision about the compensation is under the consideration of Government of India and the same will be followed after it is enacted.

44 Observation:

Mr. Premanand Puralkar, Madban:
Map of India is given on page number 20 in which Maharashtra State is not shown also the coastal districts i.e. Thane, Raigad, Ratnagiri & Sindhudurg are not clarified. It is mentioned in the report that there is no industry near to the proposed project site. Distance of Finolex project, Golap is not mentioned in the report. Rough sketch of the project is shown on page number 35 wherein I: I 0,000 figures are shown. Its scale whether meters, kilometers is not clarified Distance between the reactors is not shown. Actually light house is towards north western direction but in the map it is shown towards northern side. If the light house is towards northern direction then whether the six points

of the project are towards southern side? If southern side then where is the location of Madban village? When I will get answers of my question? From the morning meaningless answers have been given. Considering all this the public hearing shall be reorganized.

Response

On page no. 20 of EIA report, Seismic map of India is given. The study area of EIA is 25 km, in which there is no industry at present.

The referred figures are Fig 6 and Fig. 7 at page No. S-24 and S-25 of theVol-I of the EIA report for which the scale is 1:10000. The light house is in N-W direction with respect to the entry to the acquired land.

45 Observation:

Mr.Pravin Gavankar:

Why you are taking 700 Ha of land? Emergence land acquisition notices are issued without making agreement with State Government.

If the reactors are placed in a row then where will be the position of last reactor? Our Mithgavane junction is at a distance of 5 kms

Response

The plant site area of 692 Ha encompasses an Exclusion Zone of 1.6 km radius from the centers of the nuclear power plant units proposed for the Jaitapur site.

The land acquisition for the project has been carried out as per Land Acquisition Act, 1894 by Special Land Acqution Officer, Offcie of District Collector, Ratnagiri appointed for the purpose under the said Act

The tentative plot plan for six units for JNPP is given in Fig. 6, page no. S-24 of Vol-I of EIA report. All the six units will be accommodated within the acquired land.

46 Observation:

Mr. Devdutta Warse:

Land acquisition has to be done after hearing but you are conducting the hearing after the land acquisition. You have not yet given the answer to Mr. Amjad Borkar's question that whether the fishermen's boats will be permitted to travel over the project pipelines?

Response

The land acquisition for the project has been carried out as per Land Acquisition Act, 1894 by Special Land Acqution Officer, Offcie of District Collector, Ratnagiri appointed for the purpose under the said Act.

Fish catch near the shore is generally very low and therefore fishermen go to deep sea for fishing purpose. The survey done by College Of Fisheries, Ratnagiri around JNPP has indicated average yield near shore to be 10 % of average deep sea yield and thus confirmed the above general observation. In view of above, there will be no adverse impact on lively hood of fishermen. The details are presented in Section 3.2.4, Page-9, Annexure-VII of EIA Report Volume-II.

AERB has stipulated an area around Nuclear Power Plant with no permanent habitant and called as "Exclusion zone". In line with the above, JNPP will also have a specific 'Exclusion Zone' of 1.6 km. Being a coastal site, some of the area of 'Exclusion zone' will fall on sea front. From security point of view and being a prohibited area, no unauthorized person is envisaged to be allowed to enter in this zone on land as well as sea front. The expected exclusion zone area under sea from shoreline may vary from 500 metre to 1 km. approximately.

Accordingly, the entry of fisherman in this zone will be restricted and regulated. Beyond this zone, there will be no restriction of fishing.

47 Observation:

Smt. Vaishali Patil, Vinashkari Konkan Praklap Virodhi Samiti:

More than 75% of the affected persons present today are not given the EIA Report its translation & Summary Report. 75% of the project affected persons were not given the report. More than 200 farmers has submitted the objections that EIA Report is not given to them, nor they have not read it. Hence this public hearing is illegal therefore the report shall prepared once again & the public hearing shall be reorganized.

Response

Please refer our response at point no 1, 2 and 8 above.

48 Observation:

Hon'ble MLA Mr. Rajan Salvi:

Konkan people, fishermen, horticulturist & farmers of this area will be ruined due to this project. Notification states that in order to have maximum participation of the villagers the public hearing has to be conducted at project site in as per people's convenient. Madban, Mithgavane & Niveli Grampanchayat has passed the resolution & submitted the representation to postpone the today's public hearing. Today on the occasion of Akshay Tritiya marriage ceremonies & other functions are organized & because of this the public hearing has to be postponed. The Grampanchayat shall be given Marathi copy of the report one month in advance. However the Marathi translation of the report is given to Madban Grampanchyat on 12th May. Report is not given to remaining Grampanchayats this is a major mistake

Response

Please refer our response at point no 1, 2 and 8 above.

There will not be any adverse impact on environment. However, due to project, the local and regional economy will improve and will have overall positive impact. The details are given in Chapter-4 of Vol-I of EIA report.

49 Observation:

Hon'ble MLA Mr. Rajan Salvi:

9900 MW of electricity will be generated from 6 reactors each having capacity 1650 MW. But in the report it is mentioned that 10000 MW of electricity will be generated from where you will bring the 100 MW power?

Response

JNPP has got six units of 1650 MW nominal power output. However the efficiency improves with respect to seasonal conditions and hence nominal total capacity of 10,000 MW is envisaged.

50 Observation:

Hon'ble MLA Mr. Rajan Salvi:

The ISO Certification attached by NEERI is valid for the period 2005 to 2008. Today this certificate is not valid.

Response

The renewed valid ISO certificate from NEERI, Nagpur is attached in Chapter-12 Vol-I EIA report.

51 Observation:

Hon'ble MLA Mr. Rajan Salvi:

It is mentioned in the report that the land surround the Madban area is barren & non cultivable and non productive.

Response

As per the joint valuation of the landed assets on acquired land by District Authorities for the purpose of payment of land compensation, survey/study by NEERI, Nagpur and study report by Indian Remote Sensing centre, Nagpur, in the year 2006, indicate the land use pattern of the same as 8.99% (62.04 Ha) land is kharip, 32.96% is varkas, and 58.05% is pot kharaba for the total land of 690.401 Hectares from village Madban for project site.

52 Observation:

Hon'ble MLA Mr. Rajan Salvi:

The importance of lateratic Jambha rock is neglected in the report. It mentioned that environmental damage will not take place. In this are various types of inspects, birds, porcupine and wild pig are observed in this area however this information is not mentioned.

Response

The Konkan plateau in Ratnagiri is derived from basaltic rocks and extensive spread of laterite is observed through the district especially on south Ratnagiri side. The list of rare and endangered species (Biodiversity Report of College of Forestry, Dapoli annexed as Annexure – VII in EIA Report Vol. II) in this study area consisting of laterite formation

53 Observation:

Hon'ble MLA Mr. Rajan Salvi:

Atomic power is proved to be costlier all over the world. Hydroelectric & solar power projects can be established in India then why such projects can't be established in this area?

Response

The assessment of various energy sources (including conventional and non-conventional) suitable for India has been carried out by Government of India. The report of this assessment has been issued by Government of India as "The integrated energy policy of India 2005" The role of Nuclear power is clearly defined in this policy and it is envisaged that share of nuclear is to be increased It is planned to have total installed capacity of 63 GWE by year 2032 through nuclear power.

54 Observation:

Hon'ble MLA Mr. Rajan Salvi:

Social economic loss is not mentioned in the report.

Response

There will not be any adverse impact on socio- economic environment. In fact due to project, the local and regional economy will improve. The details are given in Chapter-4 of Vol-I of EIA report.

55 Observation:

Dr. Waghdhare:

The site selection committee in their first report mentioned that in Dhanivare village there are 135 villagers & one village falls in exclusion-Zone. It is clearly mentioned in the AERB Rules that no body can reside with 1.6 kms from the atomic project. You should clearly state that where the first reactor will be installed & where the sixth reactor will be installed so that we can understand if our home is displaced or not.

Response

None of the villages is in the exclusion zone of the project and hence not a single family will be physically displaced.

The tentative plot plan for six units for JNPP is given in Fig. 6, page no. S-24 of Vol-I of EIA report. All the six units will be accommodated within the acquired land.

56 Observation:

One villager: Earth quake has taken place in Cidney. Deep underground changes can cause harm to the project & serious damage will be caused.

Response

NPPs built all over the world, including those which are built in a highly earthquake prone country like Japan, are designed considering seismic effects specific to the site.

Nuclear Power Plants, whether located in active tectonic region or in stable continental region, are designed for earthquake resistance. Jaitapur Site is located in stable continental region and is 1600 Km away from the active tectonic region of Himalayas. Even for such stable continental regions, the plants are designed for a 6.5 magnitude (Ritcher scale) earthquake (intra-plate earthquake of Koyna).

There is no earthquake activity around Jaitapur site in a radius of 39 Km. This is based on the earthquake data collected from Koyna Bandkam Vibhag and MERI from 1973 till date, as well as from NPCIL's own micro earthquake recorders installed by NGRI, Hyderabad around Jaitapur site which have not recorded any event of a micro earthquake or major earthquake within a distance of 39 Km around Jaitapur.

Conventional plants like thermal power plants, hydro power plants, and chemical industries are designed for earthquake loading using the seismic coefficient method described in the seismic design standard IS 1893 in terms of acceleration in the zone in which the plant is located. As per the standard, the country is divided into various seismic zones and for each seismic zone a seismic coefficient is specified for design. Compared to the seismic coefficient method followed for seismic design of conventional power plants & industries, the seismic design of Nuclear Power Plants are carried out for site specific ground motion. For this, detailed geological & seismological studies are conducted with different scales of field check, such as upto 5 km radius, 50 km radius, and 300 km radius, around the plant site.

The active faults within the region are confirmed by experts from Geological Survey of India after carrying out field checks. The status of the faults is then reviewed by independent national experts to arrive at the maximum earthquake potential of these faults. The values so arrived at are generally enhanced by one magnitude over the maximum magnitude of the recorded earthquake in the vicinity of the active fault. Such enhanced magnitude earthquake is then

assumed to be occurring on a fault closest to the plant site. The peak ground acceleration (PGA) at the plant site is then arrived at for such enhanced magnitude and reduced epicentral distance. Using this PGA, a Site Specific Ground Motion (SSGM) is generated, for which the nuclear plant structures, systems and equipment are designed by detailed analysis and testing.

57 Observation:

Smt. Vaishali Patil:- First you must accept & note that English & Marathi EIA Reprot, Executive summary is not given to project affected Karel, Mithgavane & Niveli Grampanchyats.

Response

Please refer our response at point no 1 and 8 above.

Responses
For
Submissions by Public Members
During Public Hearing

(Refer page 1 to 971 Vol. III)

Annexure - II

Responses to the observations of Shri S V Ranade, Shetkari Sangharsh Samiti, (Page no. 1 to 5)

1 Observation

Location of Reactors and Storage of Radioactive Waste violates CRZ 1991 and negates proposed CRZ 2010.

a) Violation of CRZ 1991:

Response

Based on NOC issued by Maharashtra Coastal Zone Management Authority in March 2009 and application from NPCIL, the proposal for CRZ clearance of JNPP was taken up by the CRZ Expert Appraisal Committee, MoEF for review during 74th meeting held on 23rd -24th April, 2009. The committee has recommended CRZ clearance for JNPP and issue of formal clearance by MoEF for same is subject to Environmental Clearance to Main Project, as communicated to NPCIL vide their letter no, 11-24/2009-IA.III Dt. 24.06.09.

The details of the Assessment and Prediction of Impact under CRZ are presented in Section III of Chapter -4 of Main EIA Report.

This is also to confirm that all the provisions, prevailing as on date, under applicable notifications by MoEF are complied with by NPCIL.

Observation

Proposed CRZ 2010 ignored.

i) Impact of Tsunami on Kalpakam Atomic Power Plant Ignored.

ii) Safety concept of set back line ignored.

iii) Inclusion of Aquatic Part ignored

Response

All the provisions prevailing as on date under applicable notifications by MoEF are complied with by NPCIL. The specific responses to the queries are given below:

i) Impact of Tsunami on the proposed JNPP has been assessed and taken into account for the safe grade elevation.

ii) The MoEF notification in-force does not define set back line. However, the same will be reviewed with MoEF and other associated authority after implementation of the Notification, if applicable.

iii) NPCIL has addressed all the issues of impact on the aquatic/ marine environment around JNPP site by conducting specific analysis by NEERI, Nagpur, based on specific studies by CWPRS, Pune and College of Fisheries, Ratnagiri wherein it is concluded that there is no adverse impact.

2. Observation

Proposed Site does not confirm to the Approved Land Use of the Area.

Response

The site for JNPP is in line with the approved Regional Plan for the development and use of land in the District Ratnagiri/Sindhudurg of the Government of Maharashtra vide Notification No. TPS 1290 / CR-120/UP-12 dated June 2, 1995 (Appended in Volume –II of EIA Report for JNPP).

3. Observation

Severe thermal Pollution

Response

A detailed 2D mathematical model studies for dispersion of condenser cooling water discharges from the proposed Nuclear Power Plant at Jaitapur, Ratanagiri has been carried out by CWPRS, Pune, in 2008 (The CWPRS report is attached as Annexure- V(b) of Volume –II of the EIA report). Further, NEERI, Nagpur has carried out detailed marine ecological studies for the Jaitapur coast including a specialized study on Baseline Marine Ecological Assessment of sea coast around the Jaitapur site through College of Fisheries, Ratnagiri (The report from College of Fisheries is enclosed as Annexure-VIII of the Volume –II of the EIA report). These studies have concluded that the marine aquatic food chain organisms will not be affected by the predicted maximum temperature rise of around 5 ^{0}C, which will be confined to a limited area of 0.28 sq.km, when all the six units are under operation and ocean currents are under transition (October/February), which is the most severe condition during the year. At this range of temperature rise above ambient temperature of water, most of the organisms are either not affected or get benefit of stimulation of metabolic activity. The details are presented in Section 4.2.2.1.4, of Chapter-4 of Volume – I of the EIA report.

4. Observation

Impact of Impingement on Suction Screen Ignored.

Response

The breakwater, to be constructed to form the intake channel, will isolate the sea from the intake pump house. Besides, the width of the channel will be kept such that a low water velocity of 0.2- 0.3 m/s is maintained in the channel zone. In addition, the sea water retaining structures consisting of gates and screens of various sizes will be installed to further minimize entry of marine organisms. Thus, the tranquil water basin and above system, which will exist in front of the pump house intake bay will minimize the impingement and sucking of marine organisms.

5. Observation

Site Selection Devoid of Safety and Security Concern

Response

The overall security scenario is considered during the site selection process. Further, site specific graded security system is designed to safeguard against all possible external & internal threat perceptions.

There are security organizations at various levels at DAE, AERB and NPCIL. The security audits/inspections are regularly carried out to ensure compliance of security provisions. Over and above, an independent review of nuclear security related issues is in place by national regulators i.e. Atomic Energy Regulatory Board (AERB). It may be noted that each NPCIL plant have Multi-tier physical barriers with intrusion detection systems which are in place with isolation zone.

Annexure - III

Responses to the observations of Dr.B. J. Waghdhare (Page no. 6 to 77)

Most of the matter in this submission is in the form statements, out of which few issues emerging out are responded below:

Observation (Page 10)
The population of Dhanivarewadi is 135 and come in exclusive zone. So they cannot live there.

Response
The land is not being acquired from Dhanivarewadi for the Project. No person will be displaced from this village. This may please be noted that not a single family has been displaced during the land acquisition process of JNPP.

Observation 1 &2 (Page 10)
Transmission system and power evacuation need to be considered before completion of the Project.

Response
The erection of transmission lines will be carried out by a separate agency for which the required studies and clearances from the regulating agencies will be obtained by the implementing agency.

Observation 3 (Page 10)
Large good roads will be required to transport heavy equipment. The equipment can be brought by sea route for which jetty will be required.

Response
The heavy equipments will be transported by sea route for which a RORO jetty is proposed to be constructed at the Project site.

Observation 4 (Page 10)
The clearance from AERB and MoEF will be required:

Response
The process of obtaining Environment clearance from MoEF is in progress. In parallel, the consenting process from AERB is also initiated.

Observation 4 (Page 10)
NPCIL assures that the accidents do not occur or care is taken to avoid accidents. However, the description of previous accidents is given in the comments.

Response
In the design stage, various anticipated accidents and their combinations are assumed and suitable design is worked out on the basis of analysis of the accident scenario. Even very unlikely events are analyzed and mitigating measures are included in the design. Design also incorporates defense in depth philosophy by providing a series of physical barrier and levels of protection. In addition to conservative design, effective radiological protection is achieved by combination of quality assurance, high quality construction and safe operating practices. Since extensive analysis of accidents is carried out, the term accident is found frequently in NPP documents, although accident in NPP is very rare.

Observation (Page 11)

Active solid waste is highly hazardous and threat to environment and health.

Response

The average dose to the members of the public from all exposure pathways will not exceed 1 mSv in a year by virtue of disposal of liquid, solid and gaseous waste to the environment as stipulated in AERB Safety Manual no. AERB/NF/SM/0-2 (Rev.4)

The NPP unit is so designed that activity releases to the environment are through pre-designated release points. These radioactive effluent releases to the environment through the designated release points are continuously monitored and controlled. The minimum sensitivity of the monitoring instruments is such that even a sufficiently small fraction of the releases, which leads to dose consumption in the public domain, can be measured.

Presently, the low and intermediate radio- active solid / solidified wastes are stored in Near Surface Disposal Facility (NSDF). They are stored under ground at a depth of maximum up to 4 m either in trenches / RCC vaults / tile holes depending upon the surface dose rate of the waste. The solid waste disposal site is fenced and designed to store waste for an active control (monitoring, surveillance, remedial work) period of 100 years followed by passive control (land use control) period of 200 years.

The above facility has sufficient number of bore-holes all around at definite intervals. Ground water samples are collected from these bore-holes on regular basis to check the activity in ground water.

However, in case of Jaitapur EPR, the low and intermediate radioactive solid / solidified waste is designed to be stored in the radioactive waste storage building, where solid waste storage will be above ground as an improved design feature.

The radioactive waste storage building is planned to store low and intermediate level radioactive solid / solidified waste having half life less than 30 yrs. The total storage time envisaged for this waste is 100 years active control period followed by passive control period of another 200 years. Hence in the design an active storage period of 100 years is considered. After 300 years of storage (with ten or more half lives), the total radioactivity of the material will be almost negligible.

Waste storage facility is a seismically qualified structure. Solid / solidified waste is always stored inside the building with multiple barrier concepts. The stored solid waste will never come in contact with ground water during its operational life.

Presently, at Jaitapur site, Spent Fuel Reprocessing Plant is not envisaged. However, the spent fuel bundles will be transported to the reprocessing facility for spent fuel reprocessing. The transportation of spent fuel will be in line with approved regulatory procedure .i.e. in line with AERB Safety Code, AERB-SC-TR-1, which is already in practice at other sites of NPCIL.

Observation (Page 11):

The plant has to take power from grid or diesel generator for its operation and accidents may occur during black-outs.

Response

In any NPP safety is given prime importance. Accordingly, a typical NPP is provided with number of safety systems. Therefore, the power supply to these systems of the plant is supplied through engineered multi class electrical system, which is normally fed through switch yard. The switch yard of NPP is connected by minimum of two transmission lines of the grid with diverse source of power for redundancy. Further, the important safety systems like reactor core cooling are provided with uninterrupted power supply in case of loss of total power supply from the grid. The uninterrupted power

supply is ensured by redundant bank of batteries backed up standby emergency diesel generators sets. This arrangement ensures that the reliable power supply to the important systems of the nuclear reactor in the event of failure of power supply from the switch yard / grid.

Observation (Page 12):
While designing the Project, the factors like geological set up, active waste and its management and disposal should be taken into consideration.

Response
All these factors have been considered in the design of the project. The geological considerations of the project are presented in Section 3.7 of Chapter-3 of Vol – I of EIA report. The details active waste management and disposal are described in the Response to the Observation (page -11) of this submission.

Observation (Page 12):
As per report, the project site is included in Seismic Zone III, however, this site is present in Seismic Zone IV and is threat to environment due to earthquake.

Response
The Project site is in Seismic Zone III, as per seismic zone Map of India (IS-1893 part-1; 2002). Please refer Fig. 1.2, page 20 of Chapter-1 of Vol-I of EIA report.

Observation (Page 13):
NPP project should be based on the requirement of energy for the local people.

Response
The assessment of various energy sources (including conventional and non-conventional) suitable for India has been carried out by Government of India. The report of this assessment has been issued by Government of India as "The integrated energy policy of India 2005" The role of Nuclear power is clearly defined in this policy and it is envisaged that share of nuclear is to be increased It is planned to have total installed capacity of 63 GWE by year 2032 through nuclear power.

Observation (Page 14):
On site and Offsite emergency plan should be prepared for project site and surrounding area.

Response
The Section 4.4 of Chapter-4 of the Vol-I of the EIA report presents the Emergency Response system. Based on this a detailed plan will be prepared, which will be put up for approval of AERB and State Government before the consent for operation of the plant is granted by AERB. For all operating stations of NPCIL, approved off-site emergency plans exist and are also available with respective District Authorities.

Observation (Page 14):
What will happen to active solid waste which is stored underground? Whether such area and land are also made earthquake proof by the Company?

Response
Waste storage facility is a seismically qualified structure. Solid / solidified waste is always stored inside the building with multiple barrier concepts. The stored solid waste will never come in contact with ground water during its operational life.

Observation (Page 15)
Whether the 100 m stack will provide safety against the radioactive emission through air ?

Response

Radioactive emission through air will be well below AERB requirement and will be diluted in atmosphere due to 100 m stack ensuring insignificant addition of radioactivity to the environment.

Observation (Page 15)

Many health problems due to high radiation doses are cited in the comment.

Response

All these health problems are related to the very high radiation doses, which are not envisaged for JNPP by incorporating defense in depth philosophy by providing a series of physical barrier and levels of protection.

Observation (Page 16)

During emergency, NPCIL will take care of people from 1.6 km exclusion zone, while people from outside will have to take care by themselves or by Tehsildar or Gram Panchayat.

Response

It is clarified that for any NPP unit in India, the emergency planning zone is up to 16 km. The Section 4.4 of Chapter-4 of the Vol-I of the EIA report presents the Emergency Response system. Based on this a detailed plan will be prepared, which will be put up for approval of AERB and State Government before the consent for operation of the plant is granted by AERB. For all operating stations of NPCIL, approved off-site emergency plans exist and are also available with respective District Authorities.

Observation (Page 18)

The rise in temperature upto 47 ^{o}C in the sea will destroy the marine organisms around Jaitapur like fishes, eggs, young ones, plants, organisms, living & mammals.

Response

A detailed 2D mathematical model studies for dispersion of condenser cooling water discharges from the proposed Nuclear Power Plant at Jaitapur, Ratanagiri has been carried out by CWPRS, Pune, in 2008 (The CWPRS report is attached as Annexure-V(b) of Volume –II of the EIA report). Further, NEERI, Nagpur has carried out detailed marine ecological studies for the Jaitapur coast including a specialized study on Baseline Marine Ecological Assessment of sea coast around the Jaitapur site through College of Fisheries, Ratnagiri (The report from College of Fisheries is enclosed as Annexure-VIII of the Volume –II of the EIA report). These studies have concluded that the marine aquatic food chain organisms will not be affected by the predicted maximum temperature rise of around 5 ^{0}C, which will be confined to a limited area of 0.28 sq.km, when all the six units are under operation and ocean currents are under transition (October/February), which is the most severe condition during the year. At this range of temperature rise above ambient temperature of water, most of the organisms are either not affected or get benefit of stimulation of metabolic activity. Fish breeding sites are present in the mangrove vegetation present in Jaitapur creek and Vijayadurg creek, which are beyond 5 km from water intake structure of JNPP. Thus breeding places of marine organisms will not be affected. The details are presented in Section 4.2.2.1.4, of Chapter-4 of Volume –I of the EIA report.

Observation (Page 19)
Nuclear Energy & Global Warming.
Response
No conventional pollutants are produced during production of nuclear energy, hence, nuclear energy does not contribute to global warming.

Observation (Page 20)
There are many alternatives to nuclear energy.
Response
The assessment of various energy sources (including conventional and non-conventional) suitable for India has been carried out by Government of India. The report of this assessment has been issued by Government of India as "The integrated energy policy of India 2005" The role of Nuclear power is clearly defined in this policy and it is envisaged that share of nuclear is to be increased It is planned to have total installed capacity of 63 GWE by year 2032 through nuclear power.

Observation (Page 22)
Employment to for Project Affected People.
Response
There is standard government policy for recruitment of people in all the three categories i.e. Group-A to C. For group-C, the preference will be given to PAFs (Project Affected Families), provided they qualify for the particular skilled job. Next preference will be given to local people of the area and those within the District for Group C.

Observation (Page 23)
Joint Land Survey is illegal.
Response
The land acquisition for JNPP has been carried out as per Land Acquisition Act -1894

Observation (Page 24)
Demands of people:
(1) Employment to one person from each PAF
Response
Employment will be given to one person per PAF subject to qualifying recruitment norms and avaialblity of vacancy. Otherwise, one time lump sum compensation of Rs 3 lakhs per PAF in lieu of employment.

(2) 100% employment of non-technical persons to local people
Response
Employment will be given to one person per PAF subject to qualifying recruitment norms and avaialblity of vacancy. Otherwise, one time lump sum compensation of Rs 3 lakhs per PAF in lieu of employment.

(3) Rehabilitation of displaced PAFs before Project.
Response
No family is physically displaced in case of JNPP.

(4) Give alternate land instead of due cost of land.

Response

No government land avialble in area around JNPP, hence No family is physically displaced in case of JNPP.

(5) Land cost by market rates.

Response

Land compensation has been completed by Special Land Acqution Offcier (SLAO) office of Disctirct Colelctor Ratnagiri as per provisions of Land Acquisition Act -1894, which accounts for market rate.

(6) Cost of each fruit trees should be included in compensation.

Response

This has been taken into account while computing the rate by SLAO, Ratnagiri under Land Acquistition Act 1894

(7) Compensation to fishermen.

Response

No fisherman is envisaged to be affected. However, detailed survey has yet to be allowed to undertaken by local villages / YASHADA, Pune, who has been assigned subject work by Sate Government in Feb., 2007.

(8) Training to semi-technical workers.

Response

Trainign will be provided as a part of Rehabilitation package.

(9) Give the guarantee with MOU

Response

MOU is under conclusion between NPCIL and State Government for rehabilitation package for JNPP as approved by State Rehabilitation Authority of Maharashtra Government, which consider such provisions.

(10) While counting, however, the houses, land and animal-sheds as per record of Gram Panchayat should be considered.

Response

Already taken into account as part of Joint evaluation of landed assets on agriculture land as part of land acquisition process by SLAO, Ratnagiri

Observation (Page32)

Concerns on reprocessing plant and spent fuel storage facility has been expressed.

Response

The spent fuel assemblies after discharge from reactor are stored in a water pool, as an interim storage with adequate shielding. This spent fuel will remain under continuous surveillance of NPCIL.

At present no reprocessing facility is envisaged at JNPP Site. The establishment and management of reprocessing facility of spent fuel falls within the purview of DAE and the same will be addressed suitably. It may be noted that the requirement of reprocessing of the spent fuel will arise only after 12 years as the reactor will be under construction for 5-6 years followed by another 5-10 years for the cooling of spent fuel. The technology to be adopted at that time will depend on the size of the plant and

hence cannot be indicated at this stage as technology undergoes continuous improvements. Therefore, it is evident that there is sufficient time available to decide upon the establishment of reprocessing facility.

Observation (Page 33-42)

GSI response on seismic zoning map of India as expressed of the submission.

Response

Nuclear Power Plants, whether located in active tectonic region or in stable continental region, are designed for earthquake resistance. Jaitapur Site is located in stable continental region and is 1600 Km away from the active tectonic region of Himalayas. Even for such stable continental regions, the plants are designed for a 6.5 magnitude (Ritcher scale) earthquake (intra-plate earthquake of Koyna).

There is no earthquake activity around Jaitapur site in a radius of 39 Km. This is based on the earthquake data collected from Koyna Bundhkam Vibhag and MERI from 1973 till date, as well as from NPCIL's own micro earthquake recorders installed by NGRI, Hyderabad around Jaitapur site which have not recorded any event of a micro earthquake or major earthquake within a distance of 39 Km around Jaitapur. Compared to the seismic coefficient method followed for seismic design of conventional power plants & industries, the seismic design of Nuclear Power Plants are carried out for site specific ground motion. For this, detailed geological & seismological studies are conducted with different scales of field check, such as upto 5 km radius, 50 km radius, and 300 km radius, around the plant site.

Observation (Page 43)

The report of NIO, Goa (1990) on "Ecobiological characteristics of the environs of Nuclear Power Station at Jaitapur & bioassay test for tolerance & lethal limits of thermal effluent" indicate destruction of fishes.

Response

The report attached along with is Eco-biological characterization of the environs of Jaitapur site carried out by NIO, Goa in 1990. The study was of preliminary nature and was carried out 20 years back.

The study conducted short term investigation on biotic and abiotic parameters at few locations around Jaitapur coast and had recommended long term monitoring and experimental studies for remedial measures for maintaining ecological balance in the marine environment of Jaitapur

Subsequently, as suggested in the report, NPCIL made a comprehensive plan to investigate the effect of temperature rise on marine environment of Jaitapur coast. In line with this plan, a detailed 2D mathematical model studies for dispersion of condenser cooling water discharges from the proposed Nuclear Power Plant at Jaitapur, Ratanagiri is carried out by Central Water Power research Station (CWPRS), Pune, in 2008. The CWPRS report is attached as Annexure- V(b) of Volume –II of the EIA report. And also as part of EIA study, NEERI, Nagpur has carried out detailed marine ecological studies for the Jaitapur coast and through College of Fisheries, Ratnagiri, a specialized study on Baseline Marine Ecological Assessment of sea cost around the Jaitapur site. The report from College of Fisheries is enclosed as Annexure-VIII of the Volume –II of the EIA report.

These studies have concluded that the marine aquatic food chain organisms will not be affected by the predicted maximum temperature rise of around 5 0C, which will be confined to a limited area of 0.28 sqkm, when all the six units are under operation and

ocean currents are under transition (October/February), which is the most severe condition during the year. At this range of temperature rise above ambient temperature of water, most of the organisms are either not affected or get benefit of stimulation of metabolic activity. The details are presented in Section 4.2.2.1.4, of Chapter-4 of Volume –I of the EIA report.

Annexure – IV

Responses to the observations of Adv. Kedar Vasant Munishwar (Page no. 78 to 81)

1.0 Observation

The Central Government has constituted Western Ghats-Ecology Expert Panel chaired by Prof. Madhav Gadgil. The Panel will assess current status of ecology of Western Ghats Region; demarcate areas within the Western Ghats region as Ecologically Sensitive Areas, make recommendations for conservation, protection and rejuvenation of Western Ghats Region. The panel will furnish its report to Central Govt. within six months from the date of its constitution. Therefore, no permission or any activity (also public hearing) should be made in the Western Ghats Region.

Response

The proposed plant site is adjoining the sea coast and is mostly a barren stretch of land with sparse savanna vegetation (Ref. Indian Remote Sensing data, Section 3.7.8, page No. 214-218 of Vol-I, EIA report). From the project site upto 5 km, only sparse vegetation is present, however, beyond 5 km, a part of land is covered with agriculture and orchards. These areas will not be disturbed by project activities. The project site and surrounding 25 km area and the entire available ecosystems like forest, mangroves, grassland, the creeks have been studied including the project site, the information on project site is given on pages 28-29 of biodiversity report of College of Forestry, Dapoli (Annexure VII in Volume II of EIA Report). Additionally the land use of project site and residential complex was also studied by using improved recent technology of remote sensing data (Feb. 2006) by Maharashtra Remote Sensing Data Application Centre, Nagpur. This study also concludes that project site is mostly barren with sparse vegetation. Further, suitable green belt will be developed around JNPP using selected plant species to improve the aesthetic value of the project area. The details of the green belt development are presented in Section 10.10.3.1.2, page no. 458 – 464 of Chapter-10 of Vol-I of the EIA report

2.0 Observation

The proposed Jaitapur Nuclear Power Park area is also included as proposed site for Sahyadri Ecologically Sensitive Area (SESA). The proposal is under active consideration by MoEF, NewDelhi. If the permission to the said mining is given; the whole purpose of the SESA will be frustrated. The Mohan ram Committee of MoEF has visited the various areas in the SESA and their report is awaiting.

Response

Please refer response at para 1.0 above. Also for JNPP, there will not be any mining activity. Hence the biodiversity of the area will not be affected.

3.0 Observation

In the case T.N.Godavarman V/s Union of India (W.P. 202/1995) the Supreme Court in it's order 12/12/1996 held that" The provisions enacted in the Act, for the conservation of forests must apply clearly to all forests so understood irrespective of the ownership classification thereof" Thus any forest whether it may be revenue forest, private forest (Malaki), village forest or protected forest as per Forest Laws it has to be conserved as

per the existing forest laws and conventions. The Proposed mining is contravention of the said orders.

Response

JNPP site is non forest land site. The declaration in this respect and NOC from Sub Divisional Forest Officers, Ratnagiri is enclosed as Annexure-X and Annexure-XI respectively of Vol-II of EIA report for JNPP. As mentioned in response 1.0 above, there will not be any mining activity at JNPP site.

4.0 Observation

In Kidremukh Case (I.A. 670/2001 in the said Godavarman Case) the Supreme Court emphasized the need to implement the provisions of convention on Biological Diversity;"Duty is cast upon the government under article 21 of the Constitution of India to protect the environment and two salutary principles which govern the law of the environment are; (i) the principles of sustainable development and (ii) the precautionary principles. It needs to be highlighted that our country has acceded to the convention on Biological Diversity and, therefore, it has to implement the same. As was observed by this Court in Vishaka v. State of Rajasthan (1997 (6) SCC 241), in the absence of any inconsistency between the domestic law and international conventions, the rule of judicial construction is that regard must be had to international conventions and norms evening construing the domestic law. It is, therefore, necessary for the government to keep in view the international obligation while exercising the discretionary powers under the conservation act unless there are compelling reason to depart there from."

These observations of the:Hon'bIe Supreme,Court are binding in nature.

Response

Please refer response at paragraph 1.0 above.

5.0 Observation

Convention on Biological Diversity 1992, United Nations Framework Convention on Climate Change 1992, Kyoto Protocol 1997, United Nations Convention to Combat Desertification 1992, Convention concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention, 1972), Convention on International Trade in Endangered Species 1973, ASEAN Agreement on the Conservation of Nature and Natural Resources 1985 etc. these conventions are legally binding on the Government of India as India is party to the same. Hence, they should be strictly followed

Response

All the applicable provisions as notified by MoEF & other Statutory bodies of the country are being complied with by NPCIL.

6.0 Observation

Apart from these conventions further conventions like Global Programme of Action for the Protection of the Marine Environment from Land based Activities Johannesburg Plan of Implementation of the World Summit on Sustainable Development, The United Nations Forum on Forests, G8 Action Programme on Forests (Canada, France, Germany, Italy, Japan, the Russian Federation, the United Kingdom and the United States), Commission on Sustainable Development, FAO Committee on Forestry etc. needs to be taken into consideration which are of vital importance.

Response

All the applicable provisions as notified by MoEF & other Statutory bodies of the country are being complied with by NPCIL.

7.0 Observation

Executive summary, EIA and other documents regarding the said proposal provides that total extent of project is 976 Hectares. Therefore, it would certainly cause permanent loss of Biodiversity.

Response

Please refer response at paragraph 1.0 above. However there will not be any adverse impact on the biodiversity around JNPP due to the project.

8.0 Observation

The proposed area of project is derogatory and in contravention of the object of the CRZ notification.

Response

The project has obtained NOC from MCZMA and in-principle clearance from MoEF under CRZ Notification in force from MoEF.

9.0 Observation

The proposed area falls in Western Ghats, which are a Global Megabiodiversity Centre and one of the 34 ecologically sensitive Global Hot Spot Regions of the world.

Response

Please refer response at paragraph 1.0 above. There will not be any adverse impact on the biodiversity around JNPP due to the project.

10.0 Observation

The proposed JNPP area would cause permanent biodiversity loss in the region.

Response

Please refer response at paragraph 1.0 above. There will not be any adverse impact on the biodiversity around JNPP due to the project.

11.0 Observation

The proposed JNPP area lies within proposed Eco Sensitive Zone

Response

Please refer response at paragraph 1.0 above. As there is no eco-sensitive zone around JNPP, there will not be any adverse impact on the biodiversity around JNPP due to the project.

12.0 Observation

The proposed JNPP area is lies nearby Arabian Sea, Rajapur and Vijaydurg creek important part of natural corridor and breeding site for marine biodiversity.

Response

The Mangrove patches in Jaitapur (Rajapur) and Vijayadurg creeks, which are the breeding places of marine organisms, are beyond 5 kms from project site and will not have any adverse impact on them due to project activity. The details are presented in Section 4.5.5.6 of Chapter-4 of Vol-I of the EIA report.

13.0 Observation

The Proposed JNPP would cause Radioactive Solid Waste.

Response

The operation and maintenance of nuclear power plant result in the generation of low and intermediate level solid radioactive waste, which is suitably handled,

monitored, treated and safely stored. To meet this objective a Waste Management Plant (WMP) is provided at site.

The radioactive waste storage building is planned to store such low and intermediate level radioactive solid / solidified waste having half life less than 30 yrs. The total storage time envisaged for this waste is 100 years active control period followed by passive control period of another 200 years. Hence in the design an active storage period of 100 years is considered. After 300 years of storage (with ten or more half lives), the total radioactivity of the material will be almost negligible. Waste storage facility is a seismically qualified structure. Solid / solidified waste is always stored inside the building with multiple barrier concepts. The stored solid waste will never come in contact with ground water during its operational life. The details of the radio-active solid waste management are further explained in Section 4.2.3.2 of Vol-I of the EIA report.

14.0 Observation

JNPP Project would violate the provisions of the Irrigation Act and River Restriction Zone Notification of the State of Maharashtra.

Response

JNPP site does not fall under River Restriction Zone, hence same is not applicable.

15.0 Observation

The Marine and River ecosystems would be polluted or would be destroyed as the result of the project activity.

Response

A detailed 2D mathematical model studies for dispersion of condenser cooling water discharges from the proposed Nuclear Power Plant at Jaitapur, Ratanagiri has been carried out by CWPRS, Pune, in 2008 (The CWPRS report is attached as Annexure- V(b) of Volume –II of the EIA report). Further, NEERI, Nagpur has carried out detailed marine ecological studies for the Jaitapur coast including a specialized study on Baseline Marine Ecological Assessment of sea coast around the Jaitapur site through College of Fisheries, Ratnagiri (The report from College of Fisheries is enclosed as Annexure-VIII of the Volume –II of the EIA report). These studies have concluded that the marine aquatic food chain organisms will not be affected by the predicted maximum temperature rise of around 5 ^{0}C, which will be confined to a limited area of 0.28 sq.km, when all the six units are under operation and ocean currents are under transition (October/February), which is the most severe condition during the year. At this range of temperature rise above ambient temperature of water, most of the organisms are either not affected or get benefit of stimulation of metabolic activity. The details are presented in Section 4.2.2.1.4, of Chapter-4 of Volume – I of the EIA report.

16.0 Observation

The project activity will require total sea water 86, 60,000 m3/day and Total raw fresh water 6650m3/day. The requirement of the water will be met from the marine water.

Response

The cooling water as well as fresh water (through desalination plant) requirement will be met by drawing water from sea.

17.0 Observation

The project activity would cause the radioactive pollution of ground as well as surface water.

Response

As explained in response to point no. 13 , the stored solid waste will never come in contact with ground water hence there will be no radioactive pollution of groundwater. Similarly there will be no discharge to surface water body, hence no radioactive pollution of surface water is envisaged.

18.0 Observation

The project will certainly affect the flora, fauna and the rich bio-diversity.

Response

Please refer response for point no. 1.0 above.

19.0 Observation

There are various Schedule-I and II and other Flora and Fauna as per the Wildlife Protection Act. The various researches were carried out on the said area including the proposed project .site by Renowned Researcher and students. They need to be taken into consideration. The Proposed project would certainly affect the same. Hence, it is the violation of the Wildlife Protection Act.

Response

The rare & endangered plant species and schedule I & II animals species from of 25 km radius study area have been recorded in the report in section 3.8 of Chapter 3 of EIA report Vol. I. The proposed project site is rocky & barren and is devoid of rare & endangered species. Therefore the flora & fauna will not be affected due to project activities. The provisions of Wildlife Protection Act will not be violated.

20.0 Observation

The Historical and Heritage Site, Vijaydurg and Deogad is lying just 25 Km.

Response

The Historical and Heritage Sites of Vijaydurg and Deogad are located beyond 5 km distance from the JNPP project site. Nuclear energy is clean and green source of energy. Hence these historical sites will not be affected by JNPP.

21.0 Observation

The EIA Report has not been carried out in the Monsoon season

Response

College of Forestry has taken all the efforts to do the sampling periodically during winter, summer and monsoon seasons and recorded all the species including ephemeral flora and fauna. Comparison of seasonal changes in Diversity Indices of the major groups of flora in the study area is presented in Table 4.8 of Annexure –VII of Vol –II of EIA report. For other parameters monitoring has been carried out as per approved TORs for EIA by MoEF (Section 1.4 of Chapter -1 of Vol-I of the EIA report).

22.0 Observation

Mangroves are included in the schedule to the Maharashtra felling of trees (Regulation) Act, 1964. These trees found ample in the study area.

Response

The mangroves vegetation is present in the creeks beyond 5 kms distance from the project site and hence will not be disturbed or felled for the project activity.

23.0 Observation

Total population of the area in the radius of 32 km from the project is 187952 as per census of Maharashtra CD 2001 which depend upon waghotan and kodawali rivers, wells, ground water and various nallas for drinking and irrigation purpose.

Response

The water requirement for the project will be met from sea. The project will not affect the Wagothan & Kodawali rivers and wells and various Nallas, the details are presented in Section 4.5 of Chapter-4 of Vol-I of the EIA report.

24.0 Observation

The project area has area of heavy rainfall of more than 5000mm/year.

Response

The IMD, Ratnagiri data for more than 30 years indicate that the region receives annual rainfall of less than 4000 mm. Please refer Section 3.5.1.2 of Chapter-3 of the Vol-I of the EIA report. The Ratnagiri IMD rainfall data are taken into account for the design of the plant. The project site will be designed with proper drainage for runoff water.

25.0 Observation

The project area is included in the Seismic Zone-III.

Response

NPPs built all over the world, including those which are built in a highly earthquake prone country like Japan, are designed considering seismic effects specific to the site. JNPP design meets the requirements of Seismic Zone –III. Moreover, Jaitapur Site is located in stable continental region and is 1600 km away from the active tectonic region of Himalayas. The details are given in Section 3.7.1.7 of Chapter-7 of Vol-I of the EIA report.

26.0 Observation

Project will also result in Water, Sound and Soil Pollution. These are harmful to the wild life and vegetation and clear violation of the various Environmental and Forest Laws.

Response

Conventional pollutants will not be released from JNPP during operation. As explained in response to point no. 17 there will not be any pollution of ground water or surface water bodies. Radiation doses will be insignificant as compared to stipulated standards and baseline radiation dose levels (please refer Figure-8 of Page S-29 of Summary EIA report for environmental radiation dose data at other operating plants of NPCIL).

All the equipment and machinery will be housed inside properly designed and engineered buildings. There will not be any significant increase in noise levels outside the buildings of the NPP. Therefore, there will not be noise pollution in the surrounding area.

27.0 Observation

The proposed activity have to be tested on the touch stone of Indian Forest Act 1927, National Forest Policy 1952, The Wild Life (Protection) Act 1972, Water (Prevention and

Control of Pollution) Act 1974, Forest (Conservation) Act 1980, Air (Prevention and Control of Pollution) Act 1981, The Environment (Protection) Act 1986, Environment (Protection) Rules 1986, National Forest Policy 1988, Noise Pollution (Regulation and Control) Rules 2000, Forest(Conservation) Rules 2003, Biological Diversity Act 2002 and Biological Diversity Rules 2004,Ground Water Management Act, etc. The proposed project area is in derogation with these various Acts,

Response

All the applicable provisions as notified by MoEF & other Statutory bodies of the country are being complied with by NPCIL.

28.0 Observation

The proposed project is hazardous to nature, wildlife and environment and hence, it deserves to be cancelled.

Response

Please refer response at paragraphs no. 26 above. In view of this the project is not hazardous to nature, water and wild life.

29.0 Observation

The various instant and long term impacts are ignored in the Report. They require proper attention.

Response

The EIA report addressing the short term as well as long term impacts on the environment has been prepared as per the guidelines and TORs specified by MoEF. The report adequately addresses all the impacts during construction and operation phases of the project. . Apart from this, the irreversible & irretrievable impacts and significant impacts are also considered in the report (kindly refer Section-IV: 4.6 on page 411 of Chapter 4 of Vol.I of EIA).

30.0 Observation

The ecological value of the mangroves forest has not taken into consideration by the EIA. Considering the various reasons stated above, we strongly oppose the proposed JNPP project at Jaitapur and record our objection to the same.Hence, considering the various reasons stated above and which may be argued at the time of hearing, it is prayed that the proposed JNPP project should not be given permission and it should be cancelled forthwith.

Response

The ecological value of mangrove forest has been considered and accordingly environmental management plan has been prepared to ensure that surrounding eco systems including mangrove vegetation will not be adversely affected.

Annexure –V

Response to the representation from Environ Legal Forum vide their submission dated May 14, 2010 addressed to the District Collector & Presiding Officer, Public Hearing for JNPP, Village Madban, Tal. Rajapur, District Ratanagiri (Page No.-82-85)

1 Observation

The Central Government has constituted Western Ghats-Ecology Expert Panel chaired by Prof. Madhav Gadgil. The Panel will assess current status of ecology of Western Ghats Region; demarcate areas within the Western Ghats region as Ecologically Sensitive Areas, make recommendations for conservation, protection and rejuvenation of Western Ghats Region. The panel will furnish its report to Central Govt. within six months from the date of its constitution. Therefore, no permission or any activity (also public hearing) should be made in the Western Ghats Region.

Response

The proposed plant site is adjoining the sea coast and is mostly a barren stretch of land with sparse savanna vegetation (Ref. Indian Remote Sensing data, Section 3.7.8, page No. 214-218 of Vol-I, EIA report). From the project site upto 5 km, only sparse vegetation is present, however, beyond 5 km, a part of land is covered with agriculture and orchards. These areas will not be disturbed by project activities. The project site and surrounding 25 km area and the entire available ecosystems like forest, mangroves, grassland, the creeks have been studied including the project site, the information on project site is given on pages 28-29 of biodiversity report of College of Forestry, Dapoli (Annexure VII in Volume II of EIA Report). Additionally the land use of project site and residential complex was also studied by using improved recent technology of remote sensing data (Feb. 2006) by Maharashtra Remote Sensing Data Application Centre, Nagpur. This study also concludes that project site is mostly barren with sparse vegetation. Further, suitable green belt will be developed around JNPP using selected plant species to improve the aesthetic value of the project area. The details of the green belt development are presented in Section 10.10.3.1.2, page no. 458 – 464 of Chapter-10 of Vol-I of the EIA report

2 Observation

The proposed Jaitapur Nuclear Power Park area is also included as proposed site for Sahyadri Ecologically Sensitive Area (SESA). The proposal is under active consideration by MoEF, NewDelhi. If the permission to the said mining is given; the whole purpose of the SESA will be frustrated. The Mohan ram Committee of MoEF has visited the various areas in the SESA and their report is awaiting.

Response

Please refer response at para 1.0 above. Also for JNPP, there will not be any mining activity. Hence the biodiversity of the area will not be affected.

3 Observation

In the case T.N.Godavarman V/s Union of India (W.P. 202/1995) the Supreme Court in it's order 12/12/1996 held that" The provisions enacted in the Act, for the conservation of forests must apply clearly to all forests so understood irrespective of the ownership classification thereof" Thus any forest whether it may be revenue forest, private forest (Malaki), village forest or protected forest as per Forest Laws it has to be conserved as

per the existing forest laws and conventions. The Proposed mining is contravention of the said orders.

Response

JNPP site is non forest land site. The declaration in this respect and NOC from Sub Divisional Forest Officers, Ratnagiri is enclosed as Annexure-X and Annexure-XI respectively of Vol-II of EIA report for JNPP. As mentioned in response 1.0 above, there will not be any mining activity at JNPP site.

4 Observation

In Kidremukh Case (I.A. 670/2001 in the said Godavarman Case) the Supreme Court emphasized the need to implement the provisions of convention on Biological Diversity;"Duty is cast upon the government under article 21 of the Constitution of India to protect the environment and two salutary principles which govern the law of the environment are; (i) the principles of sustainable development and (ii) the precautionary principles. It needs to be highlighted that our country has acceded to the convention on Biological Diversity and, therefore, it has to implement the same. As was observed by this Court in Vishaka v. State of Rajasthan (1997 (6) SCC 241), in the absence of any inconsistency between the domestic law and international conventions, the rule of judicial construction is that regard must be had to international conventions and norms evening construing the domestic law. It is, therefore, necessary for the government to keep in view the international obligation while exercising the discretionary powers under the conservation act unless there are compelling reason to depart there from."

These observations of the:Hon'bIe Supreme,Court are binding in nature.

Response

Please refer response at paragraph 1.0 above.

5 Observation

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Response

All the applicable provisions as notified by MoEF & other Statutory bodies of the country are being complied with by NPCIL.

6 Observation

Apart from these conventions further conventions like Global Programme of Action for the Protection of the Marine Environment from Land based Activities Johannesburg Plan of Implementation of the World Summit on Sustainable Development, The United Nations Forum on Forests, G8 Action Programme on Forests (Canada, France, Germany, Italy, Japan, the Russian Federation, the United Kingdom and the United States), Commission on Sustainable Development, FAO Committee on Forestry etc. needs to be taken into consideration which are of vital importance.

Response

All the applicable provisions as notified by MoEF & other Statutory bodies of the country are being complied with by NPCIL.

7 Observation

Executive summary, EIA and other documents regarding the said proposal provides that total extent of project is 976 Hectares. Therefore, it would certainly cause permanent loss of Biodiversity.

Response

Please refer response at paragraph 1.0 above. However there will not be any adverse impact on the biodiversity around JNPP due to the project.

8 Observation

The proposed area of project is derogatory and in contravention of the object of the CRZ notification.

Response

The project has obtained NOC from MCZMA and in-principle clearance from MoEF under CRZ Notification in force from MoEF.

9 Observation

The proposed area falls in Western Ghats, which are a Global Megabiodiversity Centre and one of the 34 ecologically sensitive Global Hot Spot Regions of the world.

Response

Please refer response at paragraph 1.0 above. There will not be any adverse impact on the biodiversity around JNPP due to the project.

10 Observation

The proposed JNPP area would cause permanent biodiversity loss in the region.

Response

Please refer response at paragraph 1.0 above. There will not be any adverse impact on the biodiversity around JNPP due to the project.

11 Observation

The proposed JNPP area lies within proposed Eco Sensitive Zone

Response

Please refer response at paragraph 1.0 above. As there is no eco-sensitive zone around JNPP, there will not be any adverse impact on the biodiversity around JNPP due to the project.

12 Observation

The proposed JNPP area is lies nearby Arabian Sea, Rajapur and Vijaydurg creek important part of natural corridor and breeding site for marine biodiversity.

Response

The Mangrove patches in Jaitapur (Rajapur) and Vijayadurg creeks, which are the breeding places of marine organisms, are beyond 5 kms from project site and will not have any adverse impact on them due to project activity. The details are presented in Section 4.5.5.6 of Chapter-4 of Vol-I of the EIA report.

13 Observation

The Proposed JNPP would cause Radioactive Solid Waste.

Response

The operation and maintenance of nuclear power plant result in the generation of low and intermediate level solid radioactive waste, which is suitably handled,

monitored, treated and safely stored. To meet this objective a Waste Management Plant (WMP) is provided at site.

The radioactive waste storage building is planned to store such low and intermediate level radioactive solid / solidified waste having half life less than 30 yrs. The total storage time envisaged for this waste is 100 years active control period followed by passive control period of another 200 years. Hence in the design an active storage period of 100 years is considered. After 300 years of storage (with ten or more half lives), the total radioactivity of the material will be almost negligible. Waste storage facility is a seismically qualified structure. Solid / solidified waste is always stored inside the building with multiple barrier concepts. The stored solid waste will never come in contact with ground water during its operational life. The details of the radio-active solid waste management are further explained in Section 4.2.3.2 of Vol-I of the EIA report.

14 Observation

JNPP Project would violate the provisions of the Irrigation Act and River Restriction Zone Notification of the State of Maharashtra.

Response

JNPP site does not fall under River Restriction Zone, hence same is not applicable.

15 Observation

The Marine and River ecosystems would be polluted or would be destroyed as the result of the project activity.

Response

A detailed 2D mathematical model studies for dispersion of condenser cooling water discharges from the proposed Nuclear Power Plant at Jaitapur, Ratanagiri has been carried out by CWPRS, Pune, in 2008 (The CWPRS report is attached as Annexure- V(b) of Volume –II of the EIA report). Further, NEERI, Nagpur has carried out detailed marine ecological studies for the Jaitapur coast including a specialized study on Baseline Marine Ecological Assessment of sea coast around the Jaitapur site through College of Fisheries, Ratnagiri (The report from College of Fisheries is enclosed as Annexure-VIII of the Volume –II of the EIA report). These studies have concluded that the marine aquatic food chain organisms will not be affected by the predicted maximum temperature rise of around 5 ^{0}C, which will be confined to a limited area of 0.28 sq.km, when all the six units are under operation and ocean currents are under transition (October/February), which is the most severe condition during the year. At this range of temperature rise above ambient temperature of water, most of the organisms are either not affected or get benefit of stimulation of metabolic activity. The details are presented in Section 4.2.2.1.4, of Chapter-4 of Volume – I of the EIA report.

16 Observation

The project activity will require total sea water 86, 60,000 m3/day and Total raw fresh water 6650m3/day. The requirement of the water will be met from the marine water.

Response

The cooling water as well as fresh water (through desalination plant) requirement will be met by drawing water from sea.

17 Observation

The project activity would cause the radioactive pollution of ground as well as surface water.

Response

As explained in response to point no. 13 , the stored solid waste will never come in contact with ground water hence there will be no radioactive pollution of groundwater. Similarly there will be no discharge to surface water body, hence no radioactive pollution of surface water is envisaged.

18 Observation

The project will certainly affect the flora, fauna and the rich bio-diversity.

Response

Please refer response for point no. 1.0 above.

19 Observation

There are various Schedule-I and II and other Flora and Fauna as per the Wildlife Protection Act. The various researches were carried out on the said area including the proposed project .site by Renowned Researcher and students. They need to be taken into consideration. The Proposed project would certainly affect the same. Hence, it is the violation of the Wildlife Protection Act.

Response

The rare & endangered plant species and schedule I & II animals species from of 25 km radius study area have been recorded in the report in section 3.8 of Chapter 3 of EIA report Vol. I. The proposed project site is rocky & barren and is devoid of rare & endangered species. Therefore the flora & fauna will not be affected due to project activities. The provisions of Wildlife Protection Act will not be violated.

20 Observation

The Historical and Heritage Site, Vijaydurg and Deogad is lying just 25 Km.

Response

The Historical and Heritage Sites of Vijaydurg and Deogad are located beyond 5 km distance from the JNPP project site. Nuclear energy is clean and green source of energy. Hence these historical sites will not be affected by JNPP.

21 Observation

The EIA Report has not been carried out in the Monsoon season

Response

College of Forestry has taken all the efforts to do the sampling periodically during winter, summer and monsoon seasons and recorded all the species including ephemeral flora and fauna. Comparison of seasonal changes in Diversity Indices of the major groups of flora in the study area is presented in Table 4.8 of Annexure –VII of Vol –II of EIA report. For other parameters monitoring has been carried out as per approved TORs for EIA by MoEF (Section 1.4 of Chapter -1 of Vol-I of the EIA report).

22 Observation

Mangroves are included in the schedule to the Maharashtra felling of trees (Regulation) Act, 1964. These trees found ample in the study area.

Response

The mangroves vegetation is present in the creeks beyond 5 kms distance from the project site and hence will not be disturbed or felled for the project activity.

23 Observation

Total population of the area in the radius of 32 km from the project is 187952 as per census of Maharashtra CD 2001 which depend upon waghotan and kodawali rivers, wells, ground water and various nallas for drinking and irrigation purpose.

Response

The water requirement for the project will be met from sea. The project will not affect the Wagothan & Kodawali rivers and wells and various Nallas, the details are presented in Section 4.5 of Chapter-4 of Vol-I of the EIA report.

24 Observation

The project area has area of heavy rainfall of more than 5000mm/year.

Response

The IMD, Ratnagiri data for more than 30 years indicate that the region receives annual rainfall of less than 4000 mm. Please refer Section 3.5.1.2 of Chapter-3 of the Vol-I of the EIA report. The Ratnagiri IMD rainfall data are taken into account for the design of the plant. The project site will be designed with proper drainage for runoff water.

25 Observation

The project area is included in the Seismic Zone-III.

Response

NPPs built all over the world, including those which are built in a highly earthquake prone country like Japan, are designed considering seismic effects specific to the site. JNPP design meets the requirements of Seismic Zone –III. Moreover, Jaitapur Site is located in stable continental region and is 1600 km away from the active tectonic region of Himalayas. The details are given in Section 3.7.1.7 of Chapter-7 of Vol-I of the EIA report.

26 Observation

Project will also result in Water, Sound and Soil Pollution. These are harmful to the wild life and vegetation and clear violation of the various Environmental and Forest Laws.

Response

Conventional pollutants will not be released from JNPP during operation. As explained in response to point no. 17 there will not be any pollution of ground water or surface water bodies. Radiation doses will be insignificant as compared to stipulated standards and baseline radiation dose levels (please refer Figure-8 of Page S-29 of Summary EIA report for environmental radiation dose data at other operating plants of NPCIL).

All the equipment and machinery will be housed inside properly designed and engineered buildings. There will not be any significant increase in noise levels outside the buildings of the NPP. Therefore, there will not be noise pollution in the surrounding area.

27 Observation

The proposed activity have to be tested on the touch stone of Indian Forest Act 1927, National Forest Policy 1952, The Wild Life (Protection) Act 1972, Water (Prevention and

Control of Pollution) Act 1974, Forest (Conservation) Act 1980, Air (Prevention and Control of Pollution) Act 1981, The Environment (Protection) Act 1986, Environment (Protection) Rules 1986, National Forest Policy 1988, Noise Pollution (Regulation and Control) Rules 2000, Forest(Conservation) Rules 2003, Biological Diversity Act 2002 and Biological Diversity Rules 2004,Ground Water Management Act, etc. The proposed project area is in derogation with these various Acts,

Response

All the applicable provisions as notified by MoEF & other Statutory bodies of the country are being complied with by NPCIL.

28 Observation

The proposed project is hazardous to nature, wildlife and environment and hence, it deserves to be cancelled.

Response

Please refer response at paragraphs no. 26 above. In view of this the project is not hazardous to nature, water and wild life.

29 Observation

The various instant and long term impacts are ignored in the Report. They require proper attention.

Response

The EIA report addressing the short term as well as long term impacts on the environment has been prepared as per the guidelines and TORs specified by MoEF. The report adequately addresses all the impacts during construction and operation phases of the project.

30 Observation

The ecological value of the mangroves forest has not taken into consideration by the EIA. Considering the various reasons stated above, we strongly oppose the proposed JNPP project at Jaitapur and record our objection to the same.Hence, considering the various reasons stated above and which may be argued at the time of hearing, it is prayed that the proposed JNPP project should not be given permission and it should be cancelled forthwith.

Response

The ecological value of mangrove forest has been considered and accordingly environmental management plan has been prepared to ensure that surrounding eco systems including mangrove vegetation will not be adversely affected.

Annexure-VI

Response to the representation from Indian School of Social Science, Mumbai, Lok Vidnyan Sangathana, Mumbai Shramik Sangh (CITU)

Chapter -1: Fatally flawed methodology

1.1 Observation:

The accident at Chernobyl released into the atmosphere an amount of radioactivity equivalent to 400 bombs of the Hiroshima variety. The Nuclear Power Project of Jaitapur is about 10 times the size of the Chernobyl Power Plant. The huge radioactive accumulations at the plant site are the principal causes of concern which must be addressed.

Response:

Please refer Section 1.1 of Chapter-1 of Annexure-XIV.

1.2 Observation:

Prima Facie the NEERI EIA study is a disgraceful unscientific-exercise in the name of science. Unfortunately, since NEERI is a CSIR institution, the EIA becomes a blot on the face of Indian Science. The unscientific character of NEERI study is brought out by the following example.

Response:

The EIA report for JNPP is a detailed comprehensive document prepared in the most scientific and orderly manner by NEERI, Nagpur, one of the most reputed institute, under Ministry of Science & Technology, Govt. of India. The report is based on the studies carried out by professional experts of NEERI, Nagpur as well as the special studies by the following organizations:

-"Pre-operational baseline radiological survey of the area around JNPP site"- by Health Physics Division (HPD), BARC, Mumbai.

-"Status of biodiversity study of the area around JNPP site" – by Collage of Forestry, Agricultural University, Dapoli through NEERI, Nagpur.

-"Thermal dispersion studies for Condenser Cooling Water (CCW) discharges" - by Central Water and Power Research Station (CWPRS), Pune.

-"Marine ecological studies" –by Collage of Fisheries, Ratnagiri, Agricultural University, Dapoli, through NEERI, Nagpur.

-"HTL, LTL and CRZ demarcation Study"- by National Institute of Ocean Technology (NIOT), Chennai.

The above organizations are professional and reputed in their area of work and posses immense experience & expertise. Based on the specialized studies carried out in a scientific manner & as per standard methodologies by the above organizations, including their own study & assessment, NEERI, Nagpur prepared the EIA report. The subject report addresses all the issues elaborately covering relevant aspects of environment.

1.3 Observation:

The following is an excerpt from Chapter 4 of the draft EIA report at page 378 of Vol 1, which tabulates the findings of the NEERl study team in regard to socio-economic impact. In the entire table, there is not **a** single 'negative impact'.

Table 4.6

Prediction of Impacts on Socio-Economic Environment

Sr. No.	Parameter	Direct	Indirect	Reversible	Irreversible
1	Employment	+	+	•	+
2	Income	+	+	•	+
3	Transport	•	+	•	+
4	Education	•	+	•	+
5	Medical Facilities	•	+	•	+
6	Communication	•	+	•	+
7	Availability of Power Supply	+	•	•	+
8	Sanitation	•	+	+	•
9	Housing	•	+	•	+
10	Health	•	+	+	+
11	Agriculture	+	•	•	+
12	Cost of Living	•	+	•	+
13	Business	+	+	•	+
14	Per Capita Income	•	+	•	+

\+ Positive Impact
\- Negative Impact
• Insignificant

Response:
Please refer Section 1.3 of Chapter-1 of Annexure-XIV.

1.4 Observation:
The above is not an isolated example. Throughout the voluminous report it is hard to find a single observation of negative impact of the project on any parameter. The NEERl study is supposed to be a scientific study of the environmental and safety issues and a scientific assessment of the risks and potential hazards of the JNPP. Reading the report and its summary conclusions, one feels ashamed and appalled to see what is going on in the name of science in India. The report reads as if it were written by the Public Relations Department of NPCIL or AREVA. This is necessary and sufficient reason to reject the entire report.

Response:
Please refer Section 1.4 of Chapter-1 of Annexure-XIV.

1.5 Observation:
Another example of the methodological incompetence and looseness of the study team is from the Summary and Conclusions at page 475 of Volume 1. According to the authors, : "The design of the plant will be done according to the guidelines to keep the radiological discharges through air and liquid routes below the stipulated levels of 1 mSv/year during normal operation." The authors seem to be unaware that milli-sievert is not a unit to measure the quantum of radiological discharges (which is measured in Curie or Becquerel.) Sievert is a measure of exposure dosage to living beings, Though exposure is linked to discharges, the two are conceptually different.

Response:
Please refer Section 1.4 (a) of Chapter-1 of Annexure-XIV.

1.6 Observation:

It is evident that NEERI does not have the competence to assess a nuclear project. On all matters relating to radioactivity, the NEERI repeatedly asserts that the project meets AERB norms and standards. What these standards are is not stated.

Response:

The Environmental Impact Assessment study for nuclear power project requires assessment of conventional as well as radiological aspects. Although, NEERI has got expertise on overall assessment of radiological aspects, they need to be provided basic input data about technological and regulatory aspects of the nuclear power plants and special studies with regard to radiological aspects. This is to mention that Health Physics Division (HPD), BARC, is the only agency, who is authorized and has requisite expertise with well developed techniques for assessment of radiological aspects. Accordingly, NPCIL facilitated NEERI in the task by providing all requisite data related to technical and regulatory aspects of the project as well as special study report from HPD, BARC on radiological aspects.

The AERB documents are mentioned in the report wherever required viz. at section 9.4 (radiation dose Limits for NPP Workers / Public) of Summary EIA; also at section 2.9.4 of Chapter 2; page 353 (air route) and 363 (water route) of Chapter 4. The listing of existing codes and guides of AERB applicable to NPPs are presented in Table 1.2 (a), 1.2 (b), 1.2 (c), and 1.2 (d) at page nos 24-27 of Chapter-1, of EIA Vol-I.

1.7 Observation:

It is clear that on nuclear matters, the NEERI is completely relying on the AERB. The AERB reports however, if they exist, are not part of the ElA, We demand access to these reports, if any, and reserve our right to comment on them, when given access.

Response:

Please refer Section 1.9 of Chapter-1 of Annexure-XIV.

1.8 Observation:

The AERB itself is constituted by and functions under the authority of the DAE. It is not an independent body. It cannot play the, independent role that is required to perform an environmental audit of the proposed project, which is a project of the NPCIL It may be mentioned that the NPCIL Director sits on the Board of governors, there is a central and direct conflict of interest involved in the role of the AERB in this context.

Response:

Please refer Section 1.10 of Chapter-1 of Annexure-XIV.

1.9 Observation:

We annex hereto an article written by a retired Chairman of the AERB on this question (Annexure 1 A), which clearly sets out the need for an independent regulator. In the present context, the project needs to be assessed by an independent body different from the AERB. The ElA is fundamentally flawed on this account.

Response:

NPCIL is Government of India Undertaking following the rules and guidelines set by the concerned regulators. In the present context, EIA is carried out as per MoEF guidelines and is submitted to MoEF for review and clearance. The response to Annexure-1-A is enclosed as Annexure-XIII- A to this document.

CHAPTER 2

Fundamental Design Inadequacies relative to Credible Risks

1 Observation:
The NEERI ElA report correctly states in Section 7.2, "The risk assessment is an important component for Nuclear Rower Project. Therefore the subject is dealt in detail as presented in Section II-4.4 of Chapter 4 of this report".

2 Observation:
The report states_ (page 385), "It systematically considers conceivable accident causes (Postulated Initiating Events (PlEs)) and for each initiating event, which can lead to core damage of different categories Core Damage Frequency (CDF) is calculated based on individual initiating events (IE) frequency. Through individual event sequence analysis for different lEs, it is estimated that the plant is provided adequate safety features and measures to mitigate or minimize any unsafe consequences".

3 Observation:
As we will see in the following, the above conclusion is unwarranted and premature. In fact all the available material supports the opposite conclusion i.e. that the design based safety measures are inadequate to address threats and risks which are credible in the current conjuncture.

4 Observation:
The draft EIA report refers to AERB Safety Guide (SG-D-5), Design Based Events and Beyond Design Based Events, it states (Vol 1page 385) that "The concept of defense in depth is conveyed at all phases or activities related to ensuring the NPP safety. Here, the strategy for preventing unfavourable plant damage state initiating events, especially for the 1st and 2nd level is of primary importance (details are provided in section 2.3 of Chapter 2 of this report).

5 Observation:
Turning to chapter 2 of Vo! 1, at page 40, there is a startling admission: "All the above scenarios explained namely Design Basis Accidents (DBAs) and Beyond Design Basis Accidents (BDBAs) are thoroughly studied and detailed reports are generated as Preliminary Safety Analysis Reports (PSAR) and these reports will be submitted to Atomic Energy Regulatory Board (AERB) for review and approval for construction of Nuclear Power project at Jaitapur."

6 Observation:
On the basis of the above admission that the design approval of the Power Plant in respect of the crucial matters of DBAa and BDBAs is not yet obtained from the AERB, the NEERI ought to have insisted on prior approval from AERB, before certifying the safety of the plant as in para 2 above. This is a crucial lacuna and fundamental flaw in the NEERI EIA report and is by itself a necessary and sufficient ground for rejection of the report.

Response for 1 to 6:
Please refer Section 2.6 of Chapter-2 of Annexure-XIV.

7 Observation:

We annex hereto the summary Probabilistic Safety Assessment of the UK-EPR NPP proposed to be constructed by the same partner Areva. The UK-EPR plant is a 1630 MW plant very similar in design to the JNPP. (Annexure 2 A) Chapter 15 of the detailed Pre Construction Safety Report (PCSR) is on the subject of Safety Requirements and Probabilistic Safety Assessment Objectives for the EPR system. It lists the design objectives in respect of safety measures at various levels of consequences.

One safety objective of the reactor design is to ensure that the risk of release of radioactive products into the environment. is reduced to as low as is reasonably practicable. The identified sources of potential radioactive releases are:

The reactor core,

The spent fuel storage pool,

The spent fuel handling facilities,

The radioactive waste storage tanks.

In order to give confidence that the UK EPR design complies with this general safety objective, a probabilistic safety assessment (PSA) is performed, covering three levels of consequences.

The Level 1 PSA considers both internal events (see Sub-chapter 15.1) and internal and external hazards (see Sub-chapter 15.2) that, together with total or partial failure of protection or mitigation measures, can lead to core damage, and evaluates the resulting core damage frequencies (CDF). Other, less onerous, endpoints are considered that do not result in a designated failure state such as core damage but lead to potential releases: these include those relating to the spent fuel pool (loss of cooling or fast draining) (see Sub-chapter 15.3).

The level 2 PSA (Sub-chapter 15.4) evaluates the nature, magnitude and frequency of radioactive releases outside the containment boundary, it takes, the Level 1 PSA failure states, analyses the containment response in those situations, and assigns a Release Category to containment fault sequences that present similar characteristics of activity release to the environment.

The Off-site consequence analysis (Level 3 PSA) presented in Sub-chapter 15.5 determines the risk to the off-site public from the potential releases, in terms of both individual and societal risk.

The initiating events studied include internal events or hazards originating inside the facility, and external hazards. The assessment is performed for the various plant operational states (i.e. full power, low power and shutdown).

8 Observation:

In this same report, at page 5, it is made clear that:

Initiating events due to intentional mal-operation or sabotage and malicious events like intentional aircraft crash are not considered in the PSA, i.e. it is made clear that threats arising out of malicious events, mal-operations and sabotage such as will arise in terrorist attacks have not been addressed by the current plant design. This is obvious when it is noted that only the reactor building is protected by the hardened dome containment and not the waste storage buildings. This is a fundamental design flaw in the current environment. The project therefore deserves to be rejected on the basis of this fundament design flaw. The question of risk arising out of terrorist threat is the subject of the next chapter.

Response for 7 & 8:

Please refer Section 2.7 and 2.8 of Chapter-2 of Annexure-XIV.

CHAPTER 3

Risk of radioactive release arising out of terrorist attack and Malicious act not addressed in EIA

3.1 Observation:

As pointed out in the previous chapter, AREVA has placed on record that the design of its EPR power plant does not address the risks of radioactivity release arising out of internal and external malicious acts.

Response:

Please refer Section 3.1 of Chapter-3 of Annexure-XIV.

3.2 Observation:

However, after the 9/11 terrorist attack on the USA, the issue of design basis threat has come to the top of the agenda of safety of nuclear installations. In 2005, the Energy Policy Act 2005 of the USA was enacted in the USA to specifically address this issue. Below are given some relevant excerpts from the legislation:

SEC. 651. NUCLEAR FACILITY AND MATERIALS SECURITY

(a) SECURITY EVALUATIONS; DESIGN BASIS THREAT RULEMAKING.—

(1) IN GENERAL—Chapter 14 of the Atomic Energy Act of 1954 (42 U.S.C. 2201 et seq.) (as amended by section 624(a)) is amended by adding at the end the following:

SEC. 170D. SECURITY EVALUATIONS

a) SECURITY RESPONSE EVALUATIONS.—Not less often than once every 3 years, the Commission shall conduct security evaluations at each licensed facility that is part of a class of licensed facilities, as the Commission considers to be appropriate, to assess the ability of a private security force of a licensed facility to defend against any applicable design basis threat.

b) FORCE-ON-FORCE EXERCISES.

(1) The security evaluations shall include force-on-force exercises.

(2) The force-on-force exercises shall, to the maximum extent practicable, simulate security threats in accordance with any design basis threat applicable to a facility.

(3) In conducting a security evaluation, the Commission shall mitigate any potential conflict of interest that could influence the results of a force-on-force exercise, as the Commission determines to be necessary and-appropriate.

c) ACTION BY LICENSEES

.—The Commission shall ensure that an affected licensee corrects those material defects in performance that adversely affect the ability of a private security force at that facility to defend against any applicable design basis threat.

d) FACILITIES UNDER HEIGHTENED THREAT LEVELS.—The Commission may suspend a security evaluation under this section if the Commission determines that the evaluation would compromise security at a nuclear facility under a heightened threat level.

e) REPORT.—Not less often than once each year, the Commission shall submit to the Committee on environment and Public Works of the Senate and the committee on Energy and Commerce of the House of Representatives a report, in classified form and unclassified form, that describes the results of each security response

evaluation conducted and any relevant corrective action taken by a licensee during the previous year.

SEC. 170E. DESIGN BASIS THREAT RULEMAKING

a) RULEMAKING.—The Commission shall

(1) not later than 90 days after the date of enactment of this section, initiate a Rule making proceeding, including notice and opportunity for public comment, to be completed not later than 18 months after that date, to revise the design basis threats of the Commission; or

(2) not later than 18 months after the date of enactment of this section, complete any ongoing rulemaking to revise the design basis threats.

b) FACTORS When conducting its rulemaking, the .Commission shall consider the following, but not be limited to—

(1) the events of September 11, 2001;

(2) an assessment of physical; cyber, biochemical, and other terrorist threats;

(3) the potential for attack on facilities by multiple coordinated teams of a large number of individuals;

(4) the potential for assistance in an attack from several persons employed at the facility;

(5) the potential for suicide attacks;

(6) the potential for water-based and air-based threats;

(7) the potential use of explosive devices of considerable size and other modern weaponry;

(8) the potential for attacks by persons with a sophisticated knowledge of facility operations;

(9) the potential for fires, especially fires of long duration;

(10) the potential for attacks on spent fuel shipments by multiple coordinated teams of a large number of individuals;

(11) the adequacy of planning to protect the public health and safety at and around nuclear facilities, as appropriate, in the event of a terrorist attack against a nuclear facility; and

(12) the potential for theft and diversion of nuclear materials from such facilities.".

(2) CONFORMING AMENDMENT.—The table of sections of the Atomic Energy Act of 1954 (42 U.S.C. prec. 2011} (as amended by section 624(b)) is amended by adding at the end of the items relating to chapter 14 the following:

"Sec. 170D. Security evaluations.

"Sec. 170E. Design basis threat rulemaking".

(3) FEDERAL SECURITY COORDINATORS.

(A) REGIONAL OFFICES, Not later than 18 months after the date of enactment of this Act, the Nuclear Regulatory Commission (referred to in this section as the "Commission") shall assign a Federal security coordinator, under the employment of the Commission, to each region of the Commission.

(B) RESPONSIBILITIES The Federal security coordinator shall be responsible for

(i) communicating with the Commission and other Federal, State, and local authorities concerning threats, including threats against such classes of facilities as the Commission determines to be appropriate;

(ii) monitoring such classes of facilities as the Commission determines to be appropriate to ensure that they maintain security consistent with the security plan inaccordance with the appropriate threat level; and

(iii) assisting in the coordination of security measures among the private security forces at such classes of facilities as the Commission determines to be appropriate and Federal, State, and local authorities, as appropriate.

SEC. 655. SABOTAGE OF NUCLEAR FACILITIES, FUEL, OR DESIGNATED MATERIAL

(a) **IN GENERAL** Section 236a. of the Atomic Energy Act of 1954 (42 U.S.C.2284(a)) is amended

(1) in paragraph (2), by striking "storage facility" and inserting "treatment, storage, or disposal facility".

(2) in paragraph (3)

(A) by striking "such a utilization facility" and inserting "a utilization facility licensed nder this Act"; and .

(B) by striking "or" at the end;

(3) in paragraph (4)

(A) by striking "facility licensed" and inserting-", uranium conversion, or nuclear fuel fabrication facility licensed or certified"; and

(B) by striking the comma at the end-and inserting a semicolon; and

(4) by inserting after paragraph (4) the following:

(5) any production, utilization, waste storage, waste treatment, waste disposal, uranium enrichment, uranium conversion, or nuclear fuel fabrication facility subject to licensing or certification under this Act during construction of the facility, if the destruction or damage caused or attempted to be caused could adversely affect public health and safety during the operation of the facility;

(6) any primary facility or backup facility from which a radiological emergency preparedness alert and warning system is activated; or

(7) any radioactive material or other, property subject-to regulation by the Commission that, before the date of the offense, the Commission determines, by order or regulation published in the Federal Register, is of significance to the public health and. safety or to common defense and security;".

(b) CONFORMING AMENDMENT.—Section 236 of the Atomic Energy Act of 1954 (42 U.S.C. 2284) is amended by striking "intentionally and willfully" each place it appears and inserting "knowingly".

Response:

Please refer Section 3.2 of Chapter-3 of Annexure-XIV.

3.3 Observation:

The rules made by the Nuclear Regulatory Commission pursuant to the above legislation are classified information and are not in the public domain. However a note on "Nuclear Power Plant Security and Vulnerabilities" prepared by the Congressional Research Service and presented to the U.S. Congress is in the public domain and contains a summary of the situation around 2009. (Annexure 3A) We present below some relevant excerpts from this report:

Design Basis Threat

The design basis threat describes general characteristics of adversaries that nuclear plants and nuclear fuel cycle facilities must defend against to prevent radiological sabotage and theft of strategic special nuclear material. NRC licensees use the DBT as the basis for

implementing defensive strategies of a specific nuclear plant site through security plans, safeguards contingency plans, and guard training and qualification plans.
General requirements for the DBT are prescribed in NRC regulations, while specific attributes of potential attackers, such as their weapons and ammunition, are contained in classified adversary characteristics documents (ACDs).

Fundamental policies on nuclear plant security threats date back to the Cold War. In 1967, the Atomic Energy Commission (AEC) instituted a rule that nuclear plants are not required to protect against an attack directed by an "enemy of the United States." That so-called "Enemy of the State Rule" specifies that nuclear power plants are not required to provide for design features or other measures for the specific purpose of protection against the effects of (a) attacks and destructive acts, including sabotage, directed against the facility by an enemy of the United States, "whether a foreign government or other-person, or (b) use or deployment of weapons incident to U.S. defense activities.
The Nuclear Regulatory Commission (NRQ, the AEC's successor regulatory agency, says that the rule "was primarily intended to make clear that privately-owned nuclear facilities were not responsible for defending against attacks that typically could only be carried out by foreign military organizations." NRC's initial DBT, established in the late 1970s, was intended to be consistent with the enemy of the state rule, which remains in effect.
However, the 9/11 attacks drew greater attention to the potential severity of credible terrorist threats. Following the attacks, NRC evaluated the extent to which nuclear plant security forces should be able to defend, against such threats, and ordered a strengthening of the DBT, along with other security measures, on April 29, 2003. That oкieг changed the DBT to "represent the largest reasonable threat against which a regulated private guard force should be expected to defend under existing law, according to the NRC announcement.6
In the Energy Policy Act of 2005 (EPACT), Congress imposed a statutory requirement on the NRC to initiate rulemaking for revising the design basis threat. EPACT required NRC to consider 12 factors in revising the DBT, such as an assessment of various terrorist threats/ sizable explosive devices and modern weapons, attacks by persons with sophisticated knowledge of facility operations, and attacks on spent fuel shipments.
NRC approved its final rule amending the DBT (10 C.F.R. Part 73.1) on January 29, 2007 effective April 18, 2007. Although specific details of the revised DBT were not released to the public, in general the final rule;
clarifies that physical protection systems are required to protect against diversion and theft of fissile material;
expands the assumed capabilities of adversaries to operate as one or more teams and attack from multiple entry points;
assumes that adversaries are willing to kill or be killed and are knowledgeable about specific target selection;
expands the. scope of vehicles that licensees must defend against to include water vehicles and land vehicles beyond four-wheel-drive type;
revises the threat posed by an insider to be more flexible in scope; and
adds a new mode of attack from adversaries coordinating a vehicle bomb assault with another external assault.
The DBT final rule excluded aircraft attacks, a decision that raised considerable controversy. In approving the rule, NRC rejected a petition from the Union of Concerned Scientists to require that nuclear plants be surrounded by aircraft barriers made of steel beams and cables (the so called "beamhenge" concept). Critics of the rule charged that deliberate aircraft crashes were a highly plausible mode of attack, given the events of'9/11.

However, NRC contended, that power plants were already required to mitigate the effects of aircraft crashes and that "active protection against airborne threats is addressed by other federal organizations, including the military."
Additional NRC action on aircraft threats is discussed below.
NRC Commissioners in January 2009 rejected a proposal by the NRC staff to strengthen the classified portion of the DBT to include additional capabilities by potential attackers, according to news reports. The staff proposal lost in a 2-2 vote, with one commissioner position currently vacant. In an interview afterward, NRC Chairman Dale Klein &aid the vote could be reconsidered after completion of an ongoing interagency study.
Large Aircraft Crashes
Nuclear power plants were designed to withstand hurricanes, earthquakes, and other extreme events. But deliberate attacks by large airliners loaded with fuel, such as those that crashed into the World Trade Center and Pentagon, were not analyzed when design requirements" for today's reactors were determined. 12 Concern about aircraft crashes was intensified by a taped interview shown September 10, 2002, on the Arab TV station al-Jazeera, which contained a statement that Al Qaeda initially planned to include a nuclear plant in its list of 2001attack sites.
In light of the possibility that an air attack might penetrate the containment structure of a. nuclear plant or a spent fuel storage facility, some interest groups have suggested that such an event could be followed by a meltdown or spent fuel fire and wide spread radiation exposure. Nuclear industry spokespersons have countered by pointing out that relatively small, low-lying nuclear power plants are difficult targets for attack, and have argued that penetration of the containment is unlikely, and that even if such penetration occurred it probably would not reach the reactor vessel. They suggest that a sustained fire, such as that which melted the steel support structures in the World Trade Center buildings, would be impossible unless an attacking plane penetrated the containment completely, including its fuel-bearing wings. According to former NRC Chairman Nils Diaz, NRC studies "confirm that the likelihood of both damaging the reactor core and releasing radioactivity that could affect public health and safety is low."
NRC proposed in October 2007 to amend its regulations to require newly designed power reactors to take into account the potential effects of the impact of a large commercial aircraft.
As discussed in the previous section, NRC considers an aircraft attack to be 'beyond the design' basis threat that plants must be able to withstand, so the requirements of the proposed rule were intended to provide an additional margin of safety. The proposed rule would affect only new reactor designs not previously certified by NRC, because the previous designs were still considered adequately safe. Nevertheless, Westinghouse submitted changes in the certified design of its AP1000 reactor to NRC on May 29, 2007, proposing to line the inside and outside of the reactor's concrete containment structure with steel plates to increase resistance to aircraft penetration.
Under NRC's 2007 proposed rule, applicants for new certified designs or for new reactor licenses using uncertified designs would have been required to assess the effects that a large aircraft crash would have on the proposed facilities. Each applicant would then describe how the plant's design features, capabilities, and operations would avoid or mitigate the effects of such a crash, particularly on core cooling, containment integrity, and spent fuel storage pools. In response to comments, the-NRC staff, proposed in October 2008 that the aircraft impact assessments be conducted by all new reactors, including those using 'previously certified designs. The NRC Commissioners, in a 3-1 vote, approved the change February 17, 2009, and added specific design requirements that all new reactors would have to meet: Each applicant subject to this section shall perform a

design-specific assessment of the effects on the facility of the impact of a larger commercial
aircraft. Using realistic analyses, the applicant shall identify and incorporate into the design those design features and functional capabilities to show that -with reduced use of operator actions;
the reactor core remains cooled, or the containment remains intact; and
spent fuel cooling or spent fuel pool integrity is maintained.

Response:

Please refer Section 3.3 of Chapter-3 of Annexure-XIV.

3.4 Observation:

It is not publicly known if the AERB has made any new licensing or safety rules to address the problem of terrorist attack on nuclear facilities. Clearly the threat of such attack occurring in India is no less than the threat in the USA. It is also clear that AREVA has not designed the EPR plant to withstand such attacks. In particular, the spent fuel cooling and spent fuel storage areas are obviously vulnerable. In the report to US Congress cited in 3.3 above the consequences of attack on spent fuel storage are elaborated:

3.5 Observation:

In the report to US Congress cited in 3.3 above the consequences of attack on spent fuel storage are elaborated:

Spent Fuel Storage

When no longer capable of sustaining a nuclear chain reaction, highly radioactive "spent" nuclear fuel is removed from the reactor and stored in a pool of water in the reactor building and at some sites later transferred to dry casks on the plant grounds. Because both types of storage are located outside the reactor containment structure, particular concern has been raised about the vulnerability of spent fuel to attack by aircraft or other means. If terrorists could breach a spent fuel pool's concrete walls and drain the cooling water, the spent fuel's zirconium cladding could overheat and catch fire.

The National Academy of Sciences (NAS) released a report in April 2005 that found that "successful terrorist attacks on spent fuel pools, though difficult, are possible," and that "if an attack leads to a propagating zirconium cladding fire, it could result in the release of large amounts of radioactive material." NAS recommended that the hottest spent fuel be interspersed with cooler spent fuel to reduce the likelihood of fire, and that water-spray systems be installed to cool spent fuel if pool water were lost. The report also called for NRC to conduct more analysis of the issue and consider earlier movement of spent fuel from. PJ>ols into dry .storage.27 The FY2006 Energy and Water Development Appropriations Act (P.L 109-103, H. Rept. 109-275) provided $21 million for NRG to carry out the site-specific analyses recommended by NAS. NRC has long contended that the potential effects of terrorist attacks are too speculative to include in environmental studies for proposed spent fuel storage and other nuclear facilities.

However, the U.S. Court of Appeals for the 9th Circuit ruled in June 2006 that terrorist attacks must be included in the environmental study of a dry storage facility at California's Diablo Canyon nuclear plant.

Response for 3.4 and 3.5:

Based on perceived threat scenarios and for effective regulatory framework, AERB has issued necessary requirements in this regard, which are followed. Licensing of the plant for its operation is given by AERB only after meeting various specified requirements.

3.6 Observation:

It should be noted that there is no naval or air force base within 50 kilometers from the site. Even if there were such a base it would be impossible to protect the vulnerable facilities against multiple missiles of the Exocet type launched from ships or boats at a distance from the site. It would be prudent and necessary to seek the views of the naval and air force authorities on this question.

3.7 Observation:

Thus the spent fuel facilities at JNPP would create a very large "dirty nuclear time bomb" on the West Coast of India, which could be detonated virtually at will by multiple strikes with weapons which are known to be in the possession of terrorist enemies of the Indian State.

This is sufficient and necessary cause to reject the application for environmental clearance for the JNPP.

It is likely that the collateral requirement of defense of the JNPP against sea attack would require the Indian Navy to enforce an exclusion zone with a radius of several tens of kilometers from the site. This would destroy the livelihoods of the fishing community on a large scale, which needs to be estimated and included in the cost benefit analysis.

Response for 3.6 & 3.7:

Please refer Section 3.6 and 3.7 of Chapter-3 of Annexure-XIV.

CHAPTER 4

Absence of Long Term Plan for Solid Radioactive Waste Storage

4.1 Observation:

It is stated in the El A as follows in respect of the long term storage of radioactive waste;

After sealing, the dose rate at outside surface of the drum / container will be <2 mSv/h. They are then placed in temporary storage area. After some time they are then stored in long-term storage area. The dose rate at outside surface of the drum will be <2 mSv/h. The dose rate outside the storage building will be < 0.75 mSv/h.

The radioactive waste depending upon the activity levels are buried in secured earth trenches, in steel containers which are immobilized in secured concrete vault. The solid waste disposal site is fenced, secured and designed to store waste for sufficiently long time of the order of 100 years. To ensure that the activity from the solid waste does not leach out to ground water, the activity levels in the ground water are periodically monitored and records maintained as per the requirements of AERB. Therefore, solid radioactive waste disposal with effective disposal mechanism will not have any adverse impact on the land and water components of the environment.

The existing environmental radioactivity levels are not expected to be changed due to operation of proposed nuclear plant. The design of the plant, radioactive monitoring and waste management systems are of highest quality as per international and national guidelines and the radioactive emissions from the stacks would be significant. Therefore the fallout would be minimum and land would not be exposed to radioactive pollutants.

4.2 Observation:

It is evident from the above admission that safe storage of highly hazardous radioactive waste is designed for only 100 years. There is no long term arrangement for safe storage of-nuclear waste after that. With nuclear waste 100 years is a very short and temporary period. The waste itself remains highly dangerous for more than 10,000 years. If the safety of the storage beyond 100 years is not assured, and without a long term geological depository in India it is irresponsible to future generations of Maharashtra's residents to commence generating very large quantities of highly hazardous wastes in the absence of any long term solution beyond 100 years.

4.3 Observation:

The US President Barack Obama in a 2008 policy statement defined nuclear policy of the US government under his administration as follows:

"However, there is no future for expanded nuclear without first addressing four key issues: public right-to-know, security of nuclear fuel and waste, waste storage, and proliferation."

It is necessary to note that the issue of safety of nuclear wastes storage has become a critical issue in the USA. In 1982 a special legislation was enacted to address this problem and to create long term storage for high level nuclear waste in the Yucca Mountains of Nevada. Despite billions of dollars spent in preparatory studies for building in the Yucca Mountain geological formation as a safe permanent repository, it has been recently found that these studies were faulty and unreliable, and the decision to build a long term depository at the Yucca Mountains has been revoked by the Obama administration. The cost consequences of this decision for the American government have been estimated to amount to over $50 billion (Rs 225 lakh crores) as compensation to nuclear facilities that have to manage their temporary facilities.

We annex hereto as Annexure 4A - 4C some relevant reports on the subject which highlight how important is the question of long term waste storage.

4.4 Observation:

Every nuclear establishment claims that its waste storage facilities are safe. Science, however, must proceed not on the basis of claims, but on the basis of facts and experience. The facts and experience show that whether it is USA or France, there have been leakages from buried nuclear wastes which have contaminated ground water. We annex hereto as Annexure 4D-4G some reports on the leakages from buried nuclear wastes in different parts of the world.

4.5 Observation:

It must be noted that the soil at the JNPP is laterite, which is highly porous. The region receives heavy rainfall each year. Buried nuclear waste sites require non porous rock and low rainfall. The site of the JNPP is not suitable for buried nuclear wastes facilities on both these counts.

4.6 Observation:

The above multiple factors of absence of long term high level waste disposal, and, unsuitable geology and rainfall at the site for burying nuclear wastes are necessary and sufficient grounds for rejecting the Environmental Clearance to the JNPP.

Response to 4.1 – 4.6

Please refer Section 4.1 to 4.6 of Chapter-4 of Annexure-XIV.

CHAPTERS 5
Absence of Decommissioning Plan

5.1 Observation:

Current international norms and practices require nuclear projects to prepare and provision for decommissioning of the nuclear facilities as an integral part of the project. In the United States of America, recent legislative amendments have been made to ensure that decommissioning is taken care of at the very outset of the project. No nuclear project in the USA or Europe can be sanctioned in the absence of a decommissioning plan.

5.2 Observation:

In the USA and Europe, the costs of decommissioning have to be computed and are to be recovered as part of the electricity tariff.

5.3 Observation:

In the year 2005, new legislation was introduced in the USA to specifically authorize the Nuclear Regulatory Commission to mandate and regulate decommissioning. Section 626 of the Energy Policy Act 2005, of the USA amends section 161 of the Atomic Energy Act 1954 of the USA as follows:

SEC. 626. DECOMMISSIONING

Section 161 i. of the Atomic Energy Act of 1954 (42 U.S.C. 2201 (i)) is amended (1) by striking “and (3)" and inserting "(3)"; and (2) by inserting before the semicolon at the end the following:” and (4) to ensure that sufficient funds will be available for the decommissioning of any production or utilization facility licensed under section 103 or 104 b., including standards and restrictions governing the control, maintenance, use, and disbursement by any former licensee under this Act that has control over any fund for the decommissioning of the facility".

5.4 Observation:

In the NEERI draft EIA Report, the following startling admission is made in regard to decommissioning in Chapter 4 of Volume 1:

At the end of the operating life of the operating units, which would be around 60 years for EPR type NPPs, proposed to be established at Jaitapur site, a detail decommissioning plan will be worked out. The process of decommissioning will start after the final shutdown of the plant and ends with the release of the site for a responsible organization as authorized by AERB or for unrestricted use by the public.

The decommissioning plan will be prepared by NPCIL & approved by AERB and will be implemented as stated above. The plan will ensure that there will not be any radioactive releases in the public domain / environment, thus impact in the public domain due to decommissioning of the unit will be negligible.

From the above it is evident that at the present conjuncture the JNPP does not have an approved decommissioning plan. This is a basic and fundamental lacuna, without which the project cannot go forward. The NEERI ought to have pointed out this lacuna and highlighted it. On the contrary it has tried to overlook the fundamental lacuna and goes so far as to certify that "Thus impact in the public domain due to decommissioning of the unit will be negligible". This is a very serious act of professional negligence and dereliction of duty on the part of NEERI for which it should be held responsible and called to account.

Response to S. No. 5.1 - 5.4

Please refer Section 5.1 to 5.4 of Chapter-5 of Annexure-XIV.

CHAPTER 6
ISSUE OF COST OF POWER FROM IMPORTED COMMERCIAL NUCLEAR REACTORS

6.1 Observation:

Chapter 8 of the JNPP- draft EIA deals with the issue of Project Benefits. The following statement is made: "The analysis of economics of the technologies as on date reveals that nuclear power, in the long term, is an economical option particularly at locations away from coal mines." This statement does not apply to imported commercial nuclear power plants, in this particular case to the Areva EPR power plant.

Response:

Please refer Section 6.1 of Chapter-6 of Annexure-XIV.

6.2 Observation:

Another statement which is made in the JNPP-draft EIA is, "The current average tariff of NPCIL is Rs. 2.28 per kWh for all the operating plants." This statement when made in the context of the JNPP is misleading as all current NPCIL operating plants are indigenously manufactured. JNPP however is based on imported nuclear plant. These indigenous plants cannot be equated with imported commercial nuclear plants. It is highly unscientific to base a decision about an imported commercial nuclear power plant on the costs of indigenous nuclear power plants.

Response:

Please refer Section 6.2 of Chapter-6 of Annexure-XIV.

6.3 Observation:

Indigenous NPCIL plants currently in operation have a number of subsidies, being in the government sector. If these subsidies are quantified and calculated on commercial principles and added to the tariff, it will be seen that the actual tariff is higher than Rs. 2.28 per unit. However, this" is not necessary for the present purpose, and we will not perform this analysis, or discuss this issue further here. What is necessary for the present purpose is to correctly estimate the costs and resulting commercial tariff for the Areva EPR commercial imported nuclear power plant of the JNPP.

Response:

Please refer Section 6.3 of Chapter-6 of Annexure-XIV.

6.4 Observation:

The capacity charge component of the future tariff can readily be calculated based on information like capex for the plant, debt-equity ratio, permissible ROE, interest rate on loans etc. In the case of nuclear power plants there are additional costs like liability insurance, costs of managing and disposing of nuclear waste, costs of decommissioning, which must also be computed and added to the tariff.

Response:

Please refer Section 6.4 of Chapter-6 of Annexure-XIV.

6.5 Observation:

The draft EIA mentions the-so-called levelised lifetime costs. "Levelised lifetime costs have been evaluated at 2005-06 price level. The break even discount rate for nuclear and coal fired power at which levelised costs are equal, works out to be 7.12% and the corresponding levelised cost Rs 1.78 per kWh." This statement is reminiscent of the statements about levelised tariff which were made in the context of the Enron Dabhol Power Project. A great deal of mischief has been perpetrated on the Indian nation and the Indian citizens in the name of fictitious 'levelised tariff' calculated on fictitious parameters.

Response:

Please refer Section 6.5 of Chapter-6 of Annexure-XIV.

6.6 Observation:

What the nation, its public sector institutions and its citizens have to pay is not levelised tariff, but real tariffs based on actual costs and parameters. We hereby demand that NPCIL make public the actual capex and other parameters which go into the computation of tariff for the first two units of the proposed JNPP.

Response:

Please refer Section 6.6 of Chapter-6 of Annexure-XIV.

6.7 Observation:

The Enron experience is pertinent in this context. The Dabhol project began to supply power in 1999. It soon became clear that the actual tariff was much higher than earlier claims. By 2001 MSEB could not make the monthly payments due to lack of funds and power supply was stopped. Had Enron itself hot collapsed and gone bankrupt in September 2001, MSEB would have been bankrupted.

Response:

Please refer Section 6.7 of Chapter-6 of Annexure-XIV.

6.8. Observation:

Even though MSEB escaped bankruptcy due to the collapse of the creditor, the resultant costs of the Dabhol debacle are huge and are of the order of tens of thousands of crores. Our banks like IDBI are sitting on thousands of crores of NPAs. The situation demands that a fresh cost benefit analysis of the Dabhol Project be performed till date. A current Cost-Benefit analysis of the Dabhol Project will show huge negative balance financially, socially and economically. It is being avoided in -the same way that the Kurdukar Commission was scuttled, due to political reasons, by the governments at the State and Centre. We should at least learn from the mistakes of the Dabhol Project and not repeat them with JNPP.

Response:

Please refer Section 6.8 of Chapter-6 of Annexure-XIV.

6.9 Observation:

The Dabhol Power Project was a 2,000 MW project. The JNPP is five times that size. The World Bank had warned that the Dabhol Project was not viable on the grounds that expensive hydrocarbon fuel based power is not a viable option for a base load plant. By the same token, it is very necessary to do correct calculations based on correct data, to calculate the correct costs of power from imported commercial nuclear power plant., and then decide whether this kind of power is a viable option for base load power. Nuclear power can only function in base load configuration. .

Response:

Please refer Section 6.9 of Chapter-6 of Annexure-XIV.

6.10 Observation:

It is also relevant to note that according to the World Bank, unsubsidized nuclear power is not commercially viable or bankable. The World Bank has stated: "Bank fending for the energy sector requires a review of sector investments, institutions and policies. Nuclear plants in the power sector would not be economic; they are large white elephants", (World Bank 1992, Guideline for Environmental Assessment of Energy and Industry Projects, World Bank technical paper No. 154 / 1992. Environmental Assessment Sourcebook, Vol III.)

Response:

Please refer Section 6.10 of Chapter-6 of Annexure-XIV.

6.11 Observation:

There is no information regarding the capital cost of the JNPP in the EIA. However, a similar plant being built in Finland, the Olkiluoto Plant has incurred costs of Euro 5.3 billion till date for 1630 MW. This translates into a cost per MW of Rs 19.5 crores. (See Annexure 6A)

Response:

Please refer Section 6.11 of Chapter-6 of Annexure-XIV..

.12 Observation:

The Maharashtra Government Economic Survey (2009-10, P. 135) has revealed that the 2 units of JNPP will cost Rs. 60,000 crores. This translates into a cost of Rs 18.2 crores per MW installed. (See Annexure 6B)

Response:

Please refer Section 6.12 of Chapter-6 of Annexure-XIV.

6.13 Observation:

Based on Capex of Rs. 60,000 cr. The electricity tariff can be computed based on certain reasonable assumptions. (Annexure 6G) On this basis the tariff for the first ten years works out to Rs. 9.91 per unit.

Response:

Please refer Section 6.13 of Chapter-6 of Annexure-XIV.

6.14 Observation:

The economic consequences of supplying such expensive power in a base load configuration will be severe, and must not be overlooked or underestimated. They will result in an increase of the average tariff of power supplied by NPCIL. This cost will have to be borne by the consumers. Risk of default by consumers, or demand contraction, due to unaffordable power price is not negligible and must be estimated before the decision is taken to go ahead with the project. Having to sell such large quantum of expensive power raises the possibility or prospect of NPCIL becoming destabilized, or else the national exchequer being loaded with huge bail-out subsidy costs.

Response:

Please refer Section 6.14 of Chapter-6 of Annexure-XIV.

6.15 Observation:

A bankrupt nuclear power project has far worse consequences and hazards than a bankrupt LNG based power plant, because of the serious problem of nuclear waste management after bankruptcy.

Response:

Please refer Section 6.15 of Chapter-6 of Annexure-XIV.

Annexure- VII

Response to Comments from Shri Mahesh Laxman Palsuledeasai, Navjeeven Vikas Sasthan at Raipatan, Taluka, District Ratnagiri (Page 186-188)

Observation

Shri Mahesh and his friend welcomed the NEERI's EIA Report as it is based on conservation of natural ecosystems around it and through development of green belt. NPCIL welcomes his desire that his organization Konkan Ayurvedic Sewa Sangh will help in developing all purpose green belt around NPCIL.

He suggested that NPCIL will help in development of co-operative societies in the area and the process of progress should start through the development of green belt around JNPP. NPCIL should undertake the social welfare activities as per corporate social responsibility.

Shri Mahesh and his friends finally welcome JNPP if it is environment friendly technology.

Response

NPCIL also welcomes following suggestions given in his letter and assure to take necessary action on these points:

1. *To conduct social awakening programme to give proper information on pollution from JNPP the impacts of thermal pollution and impacts due to radiological discharge from JNPP.*
2. *Green belt should be developed with diverse local plant species.*
3. *To promote local cottage industry like improvement of agricultural production horticultural technology to protect self employment and to create market for local products. Formation of co-operative societies at Village level is the way to achieve this objective.*
4. *Promotion of dairy trade, industrial technology training and service institute for the progress of local area.*

Annexure- VIII

Response to Observation of Gram Panchyat Sarpanch of Village Madban, Dist. Ratnagiri Page No. - 189 to 241

1. Observation

Madban Gram Panchayat passed resolution that proposed JNPP will cause Radiation danger so it should be cancelled.

Response:

Based on the environmental survey data of last four decades at various operating nuclear power plants of NPCIL, it is noted that the radiation dose to the members of the public due to the release of radioactive elements due to the operation of nuclear power plant is insignificant. It is to mention that at each nuclear power plant site, Environmental Survey Laboratories are set up long before the plant goes into operation.

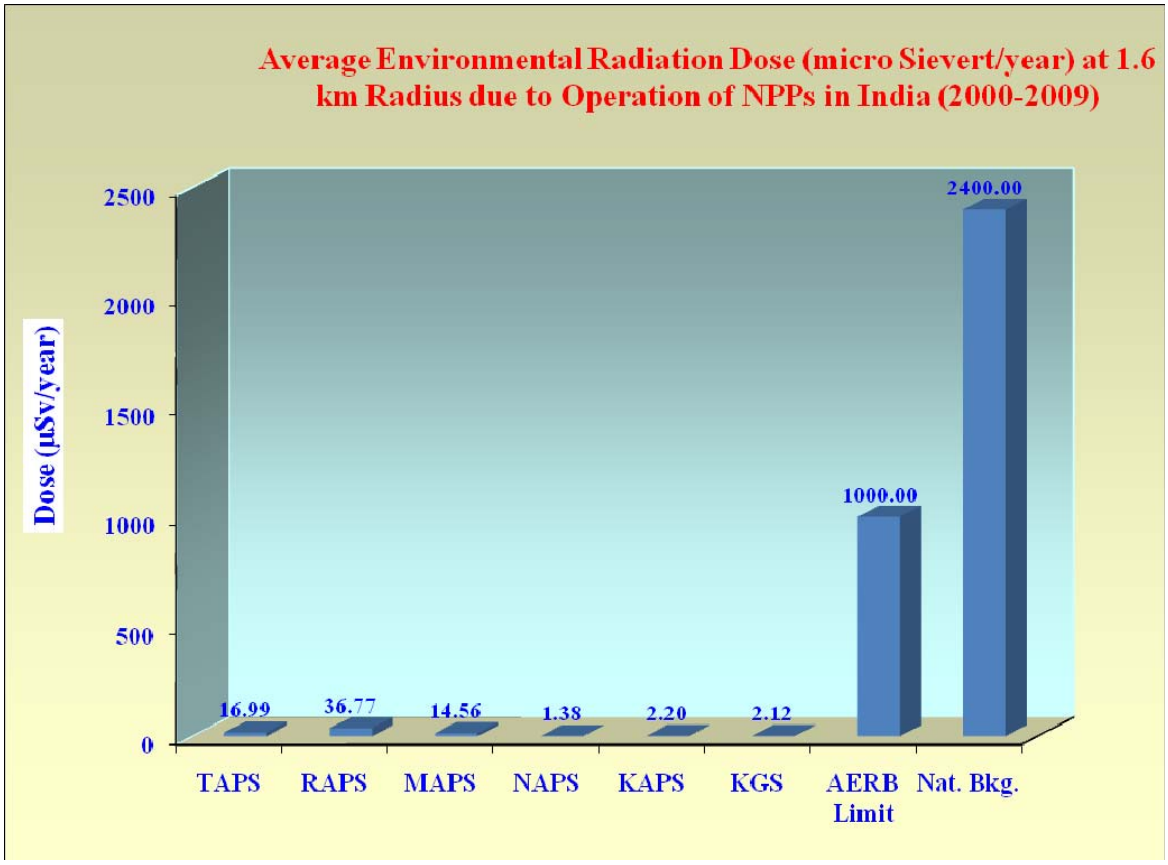
- *To generate environmental radiological database.*
- *To assess the possible dose commitments to the population due to operation of the nuclear power station.*
- *To determine control action during site / off site emergencies.*

This requires detailed measurements on a number of environmental matrices for radioactivity content that may result from the release of radioactivity effluents during normal operation of the nuclear facilities. The typical environmental samples collected by an ESL are presented as below for reference:

Type of Sample	***Number of Typical Samples Analyzed in a Year***
Surface water	*500*
Drinking water	*200*
Well water	*400*
Air Samples for tritium	*500*
Air samples for particulates	*50*
Goat Thyroid	*50*
Vegetables, milk, pulses, cereals, meat, eggs, fish, etc	*70*
Weed, silt, soil, sediments, grass, leaves, etc.	*40*

For JNPP also, an Environmental Survey Laboratory (ESL) will be set up for regular monitoring of environmental parameters.

The average environmental radiation dose from NPPs (operating projects) in India is presented for year 2000-2007 in Fig. 8 of Summary EIA, page no. S-29 of EIA report. The similar details for year 2000-2009 is presented as below for quick reference. It may be noted that subject radiation dose have further reduced.



It is clear from the above figure that the radiation dose to public due to NPCIL's nuclear power plants is observed to be 500 to 24 times lesser than the stipulated dose limit of 1000 µSv/y and 1200 to 48 times lesser than the natural background radiation. For, JNPP, the design of the project will be such that the radiation dose to the members of public from all the routes is restricted to 100 µSv/y per unit. Therefore, the radiological releases from JNPP will not pose any significant health hazard to human and other life forms.

2. Observation

Mangroves were planted in the Jaitapur & Kuveshi villages by Kharland department in 2000. This fact has not been mentioned in the EIA report.

Response:

The plantations are carried out at suitable places by social forestry department as well as other Government & non government organizations. It is not possible to list a large number of organizations contributing to plantations year after year. The observations on the present status of vegetation are more important from environmental Impact Assessment point of view. The EIA report takes into accouint the exsiitng flora and fauna in the area of study.

3. Observation

In the EIA report , it is mentioned that the acquired land is non-agricultural, barren, wasteland. Last year Governement of Maharashtra had given compensation to Madban farmers for rice crop. It indicates that this land is not barren.

Response:

The details of land acquired for JNPP plant site and residential complex is presented in Summary EIA page no. 6 & 7 as follows:

Table 1: Details of Land for JNPP Plant Site

Sr No	Name of the Village	Type of Land (Area in Hectares and as percentage of Total)								Total land being acquired (Ha)	No. of Khatedars
		Bagayat (Irrigated)		Kharip		Varkas (Fallow land)		Pot Kharaba (Barren)			
		Area	%	Area	%	Area	%	Area	%		
1	Madban	0	0%	62.074	8.99%	227.565	32.96%	400.762	58.05%	690.401	1719
2	Varilwada	0	0%	0	0.00%	0.380	19.90%	1.53	80.10%	1.910	22
Total		0	0%	62.074	8.97%	227.945	32.93%	402.292	58.11%	692.311	1741

Source: District Administration Ratnagiri, May, 2008

*Further, land admeasuring 245.715 ha is also being acquired which is located at a distance of about 5 km from the proposed site of nuclear power plant to set-up residential complex. The brief details of present Land Use of the JNPP residential complex is presented in **Table 2** as given below.*

Table 2: Details of Land for JNPP Residential Complex

Sr No	Name of the Village	Type of Land (Area in Hectares and as percentage of Total)								Total land being acquired (Ha)	No. of Khatedars
		Bagayat (Irrigated)		Kharip		Varkas (Fallow land)		Pot Kharaba (Barren)			
		Area	%	Area	%	Area	%	Area	%		
1	Niveli	0	0%	2.031	2.80%	16.150	22.24%	54.433	74.96%	72.614	144
2	Karel	0	0%	5.025	7.11%	6.402	9.06%	59.259	83.83%	70.686	142
3	Mithgavane	0	0%	0.857	0.84%	10.270	10.03%	91.288	89.14%	102.415	118
Total		0	0%	7.913	3.22%	32.822	13.36%	204.98	83.42%	245.715	404

Source: District Administration Ratnagiri, May, 2008

*It may be noted from above tables that most of the land is barren. The satellite images and maps showing of actual land use pattern of the land being acquired for Nuclear Power Plant and residential complex are presented in **Fig. 3 (a)** & **(b)** and **Fig. 4 (a)** & **(b)** respectivel of summary EIA Vol.-I of EIA Report.*

4. Observation

The Marathi version of Environmental impact Assessment Report was not provided to the Gram Panchayat one month before the Public hearing so it was illegal and should be cancelled.

Response:

- *Public hearing process has been organized by MPCB, Ratnagiri as per the provision under notification, issued by MoEF vide no. S.O. 1533 (E), dated the 14th September, 2006 and its amendment vide No. S. O. 3067 (E) dated 1st December, 2009.*
- *It may please be noted that MoEF notification of Year 2002, if any, is not applicable for JNPP Public Hearing.*

- *Further to the compliance by NPCIL to the provisions of subject Notifications with regard to submission of Summary EIA document in local language, along with application for JNPP public hearing, officials of MPCB, Ratnagiri and District Collector Ratnagiri, advised NPCIL, over and above the said provisions, to provide Marathi version of complete EIA report. NPCIL immediately organized translation of complete EIA report (Vol.-1 and Vol -II). The exercise was completed in two phases and 10 copies of the first Volume of the EIA report, containing the main report was delivered by NPCIL to MPCB, Ratnagiri on 26-04-2010 and placed by them, at all designated places by 30.04 2010. Similarly, the Vol.II, which contains the special study reports and other reference documents was delivered to MPCB, Ratnagiri on 10-05-2010 and placed by them at all designated places by 12.05. 2010.*

Annexure-IX

Response to Shri Shaifuddin Kazi (Page No 242)

Observation

I am owner of Chira Mining, in the area of proposed Project. My family depends on it. Earning for me from this Mining is Rs. One lakh eighty thousand. On this Mining activity, Labourers, Transporters, Builders are also dependent. Due to proposed project, I will have to close my business.

Response

The Chira mining which is not part of the acquired land will not get affected by the project activities.

Annexure-X

Response to Shri Raja Patwardhan: (page no 243 to 245

Note : The response in Marathi to above submission received through MPCB Ratnagiri was already sent by NPCIL to MPCB, Ratnagiri (Ref. page 281-287 Vol. III part-I) English translation of same is given below.

Observation 1.

Although Jaitapur Project falls in zone III, which is a safe zone, a campaign is frequently unleashed saying that it falls in zone IV and therefore susceptible to danger. In this regard, a decisive explanation based on the scientific facts needs to be given.

Response

The seismic zoning map of India as appended in the EIA report has been taken from IS – 1893 (part-I): 2002 issued by Bureau of Indian Standards, Government of India, which is a authentic source of information. On the subject map, the location of Jaitapur site has been marked. According to this Jaitapur site falls in zone III.

"Narora Nuclear Power Project" falls in zone IV. So also, nuclear projects in Japan fall in zone IV. Nuclear Power Project could be created in any zone. The design & structure of the project is so as to suit that zone. Furthermore, the safety of the reactor is designed based upon the study of the earthquakes in the region.

In the history of Indian Nuclear Projects there are examples showing that the safety of Nuclear Projects was not at all affected by earthquakes. e.g. In 1991 Uttarkashi experienced a big earthquake of the capacity of 6.6 Richter scale. Even the city of Delhi trembled. Other Electricity generating plants got shut down, but 'Narora Nuclear Project' was not only safe but it was generating power soundly. Another example is of the earthquake of Gujarat on 26 Jan. 2001. Then also, only 'Kakarpar Nuclear Project' generating electricity was running soundly, and all other projects got shut down. 'Jaitapur Nuclear Power Project' is not at all susceptible to danger from earthquakes.

Seismographs are installed on the periphery of the Project. Whether these Seismographs are working as not is regularly monitored. If the reading crosses a certain set point, the reactor automatically shuts down safely.

Observation 2

About 135 persons in Dhaniware wadi reside within 0-2 km distance from the project site. It is feared that these people will have to face alarming levels of sound pollution during and after project construction phase. This doubt needs to be dispelled.

Response

a) *During the construction of project:*

During this period low level sound pollution, would be created due to machinery, heavy machinery & the traffic of vehicles. But since the adjoining villages are situated 1.6 - 2 kms away, that pollution would be hardly felt. Moreover, to try to reduce the sound pollution, every machinery would be tested regularly.

To reduce the sound pollution created due to the blasting during the construction of the project, the blasting would be done in restricted manner. NPCIL will take due care that the adjoining villages would not suffer the sound pollution created by this blasting.

b) *After the project gets operational:*

Loud machinery is installed in specially built buildings so that the level of sound pollution is kept low. Moreover, the green belt created in the 1.5km

radius of the project further reduces the level of the sound pollution by the time it reaches the adjoining villages.

Observation 3

A big project for making salt water into potable one is to be set up. But the information about how the requirement of water will be to be met till such project is made operational should be given. Whether the effect of using water during such period, will affect the availability of water in local area has been considered? If this results in the shortage of water, how the shortage will be met?

Response

The level of amount of water required during the erection of the plant would not be high. The survey of underground water sources within the project boundaries is undertaken. For this purpose, basis of the 1989 report of 'Central Water Board, Nagpur' is considered. So also to detect the underground water sources, NPCIL is taking assistance of 'Bhu-garbha Jal Sanshodhan Sanstha, Ratnagiri' and the water required during the erection of the project would be drawn from these sources. While doing this, due care would be taken to ensure that the water source from adjoining villages would not be adversely affected. Meanwhile, the project for making salt water into potable one will be set up. After that the water required will be drawn from the above plant.

Observation 4

What will be the quantum of impact of solid suspended particles, that will be spread in the atmosphere due to construction activities in plant & residential areas, on humans, animals & trees. The information about how pollution will be controlled should be given.

Response

During the erection of project, the activities that will pollute the atmosphere will be drilling, blasting, traffic of vehicles and loading -unloading of dumpers. During these activities, what will be the level of pollution has been studied. It shows that the level of pollution in village & residential areas will be lower than the prescribed one. Still, to further reduce the pollution level, water will be sprinkled in the project area & green belt will be created to hinder the flow of air. Due to all these measures, the impact of solid suspended particles on humans, animals & trees will be reduced.

Observation 5

The site of Jaitapur has been selected due to its proximity to seashore. Which are the nearby ports available for bringing heavy machinery & equipments brought by sea route will be transported to project site.

Response

Heavy machinery & equipments will be unloaded on nearby ports e.g. Jaigad or Madgaon. From there, those will be transported to Jaitapur on 'Barges'. NPCIL will build a jetty there. The heavy machinery & equipments coming on barges will be unloaded on the jetty.

Observation 6

People fear that once project is started, the proponent would demand additional land. Fears that dams would be constructed and villages would be submerged are spread among the people. Such Fears should be dispelled by giving written assurance.

Response

In Jaitapur, 6 nuclear reactors of 1650 MW capacity each would be erected. The land required for this purpose, i.e. 938 hectares has already been acquired by NPCIL. Except that a approach road to be built from the project site to the main road.

Since NPCIL would not be building any dam in this region, the fear that villages would be submerged, does not at all arise.

Annexure-XI

Response to Shri Rajan Salvi, MLA Rajapur

Observation Para 1

Today is a Akshaya Tritiya. Public Hearing is planned intentionally on this day. Even after request from Project Affected People and local Gram Panchayat, why Public Hearing is not postponed?

Response

The matter of postponement of date of public hearing is under perview of MPCB and NPCIL had has no role. However, as per applicable MoEF notification "No postponement of the date, time and venue of the public hearing shall be undertaken, unless some untoward emergency situation occurs". Accordingly, appropriate response was given by the committee during public hearing.

Observation Para 2

Gram Panchayat of Affected Villages, Panchayat Samiti, Rajapur, Z.P. Ratnagiri opposed land acquisition, Government not taken note of this.

Response

The land acquisition for JNPP has been carried out as per provisions of Land Acquisition Act, 1894.

Observation Para 3

Land compensation is not accepted by more than 99% of people. NEERI persons did not contact local/fishermen and they have not taken them in confidence. EIA Marathi version got only 4 days before the Public Hearing.

Response

The land acquisition for JNPP has been carried out as per provisions of Land Acquisition Act, 1894. Teams from NEERI, Nagpur & College of Fisheries, Ratnagiri have contacted local /fishermen and local fisheries societies at three fish landing centres in study area and collected information about the fishery activity in the area. (please refer " Fisheries Scenario" on Page No253 & 254 as well as Table Nos. 3.8.4, 3.8.5, 3.8.6 & 3.8.7 of EIA Report Vol-I).

- *Public hearing process has been organized by MPCB, Ratnagiri as per the provision under notification, issued by MoEF vide no. S.O. 1533 (E), dated the 14th September, 2006 and its amendment vide No. S. O. 3067 (E) dated 1st December, 2009.*
- *Further to the compliance by NPCIL to the provisions of subject Notifications with regard to submission of Summary EIA document in local language, along with application for JNPP public hearing, officials of MPCB, Ratnagiri and District Collector Ratnagiri, advised NPCIL, over and above the said provisions, to provide Marathi version of complete EIA report. NPCIL immediately organized translation of complete draft EIA report (Vol.-1 and Vol -II). The exercise was completed in two phases and 10 copies of the first Volume of the EIA report, containing the main report was delivered by NPCIL to MPCB, Ratnagiri on 26-04-2010 and placed bythem, at all designated places by 30.04 2010. Similarly, the Vol.II, which contains the special study reports and other reference documents was delivered to MPCB, Ratnagiri on 10-05-2010 and placed by them at all designated places by 12.05. 2010.*
- *Over and above the provisions of the aforementioned Notifications from MoEF, to facilitate the people of all the project affected villages around JNPP, the draft EIA*

documents, i. e. one copy of the full set of EIA report in English and Summary EIA report in English and Marathi were placed with Gram Panchayat, Madban, Tal. Rajapur, District Ratnagiri, the village from where maximum land for the project has been acquired and other affected villages being in close proximity.

-

Observation Para 4

Barren land as per EIA, but, it is a horticultural land.

Response

The categorization of the acquired land has been done on the basis of the data received from Maharashtra Remote Sensing Application Centre, Nagpur and District Administration Ratnagiri. The details of land catogrisation for JNPP plant site and residential complex are presented in Summary EIA page no. S6 & S7.Land use of acquired land does not show any horticultural land.

Observation Para 5

In Konkan region, horticulture is mainly on such type of land. Thousands of hectares of land comes under horticultural in this area. After acquisition of such land, you are saying that the land is barren. That means, NEERI does not study this region properly.

Response

Please refer the Response for Para 4

Observation Para 6

Fisheries study in this area is not done in details. Daily 5.19 crores M3 water will be taken & hot water will be discharged in sea. EIA does not clearly indicate the ban of fishing due to security reason of JNPP.

Response

A detailed 2D mathematical model studies for dispersion of condenser cooling water discharges from the proposed Nuclear Power Plant at Jaitapur, Ratanagiri has been carried out by CWPRS, Pune, in 2008 (The CWPRS report is attached as Annexure-V(b) of Volume –II of the EIA report). Further, NEERI, Nagpur has carried out detailed marine ecological studies for the Jaitapur coast including a specialized study on Baseline Marine Ecological Assessment of sea coast around the Jaitapur site through College of Fisheries, Ratnagiri (The report from College of Fisheries is enclosed as Annexure-VIII of the Volume –II of the EIA report). These studies have concluded that the marine aquatic food chain organisms will not be affected by the predicted maximum temperature rise of around 5 0C, which will be confined to a limited area of 0.28 sq.km, when all the six units are under operation and ocean currents are under transition (October/February), which is the most severe condition during the year. At this range of temperature rise above ambient temperature of water, most of the organisms are either not affected or get benefit of stimulation of metabolic activity. The details are presented in Section 4.2.2.1.4, of Chapter-4 of Volume –I of the EIA report.

AERB has stipulated an area around Nuclear Power Plant with no permanent habitant and called as "Exclusion zone". In line with the above, JNPP will also have a specific 'Exclusion Zone' of 1.6 km. Being a coastal site, some of the area of 'Exclusion zone' will fall on sea front. From security point of view and being a prohibited area, no unauthorized person is envisaged to be allowed to enter in this zone on land as well as sea front. The expected exclusion zone area under sea from shoreline may vary from 500 metre to 1 km. approximately. Accordingly, the entry of fisherman in this zone will be restricted and regulated. Beyond this zone, there will be no restriction of fishing.

Observation Para 7

Reactor selected for proposed Project is being told that it is safe due to its special features. Anywhere in the world have NEERI worked for such EIA. There is a fear in people's mind about TMI and Chernobyl accident.

Response

The proposed European Pressurized Reactor (EPR) at Jaitapur site is a generation -III Pressurized Water Reactor (PWR). The EPR technology is evolved by European countries specially France and Germany based on the successfully operating power plants French -N4 reactor of capacity 1400 MW and German Konvoi reactor of capacity 1365 MW for several years. The EPR technology is licensed by French, Finland and Chinese regulating authorities and is under implementation in these countries. The design certification for EPR is under review by US -NRC and UK regulating authorities. It is also submitted that at present, 23 EPR nuclear power projects are under consideration worldwide in seven countries including India.

The EPR design is different from the design of Chernobyl reactor. Chernobyl reactor was housed in a building which was not designed for resisting accident pressures and temperatures, whereas the EPR reactor has the inner containment steel lined and designed to withstand accidental pressures and temperatures and an outer hardened concrete shell enveloping the inner one and protecting it against external hazards such as aircraft crashes and explosion pressure wave, etc.. The reactor design follows the latest international standards and guidelines. It incorporates a large number of diverse and redundant safety features.

Observation Para 8

You have ignored seismic zones and earthquakes.

Response

The seismic zoning map of India as appended in the EIA report has been taken from IS – 1893 (part-I): 2002 issued by Bureau of Indian Standards, Government of India, which is a authentic source of information. On the subject map, the location of Jaitapur site has been marked. According to this Jaitapur site falls in zone III.

NPPs built all over the world, including those which are built in a highly earthquake prone country like Japan, are designed considering seismic effects specific to the site.

Nuclear Power Plants, whether located in active tectonic region or in stable continental region, are designed for earthquake resistance. Jaitapur Site is located in stable continental region and is 1600 Km away from the active tectonic region of Himalayas. Even for such stable continental regions, the plants are designed for a 6.5 magnitude (Ritcher scale) earthquake (intra-plate earthquake of Koyna).

There is no earthquake activity around Jaitapur site in a radius of 39 Km. This is based on the earthquake data collected from Koyna Bandkam Vibhag and MERI from 1973 till date, as well as from NPCIL's own micro earthquake recorders installed by NGRI, Hyderabad around Jaitapur site which have not recorded any event of a micro earthquake or major earthquake within a distance of 39 Km around Jaitapur.

The active faults within the region are confirmed by experts from Geological Survey of India after carrying out field checks. The status of the faults is then reviewed by independent national experts to arrive at the maximum earthquake potential of these faults. The values so arrived at are generally enhanced by one magnitude over the maximum magnitude of the recorded earthquake in the vicinity of the active fault. Such enhanced magnitude earthquake is then assumed to be occurring on a fault closest to the plant site. The peak ground acceleration (PGA) at the plant site is then arrived at for such enhanced magnitude and reduced epicentral distance. Using this PGA, a Site

Specific Ground Motion (SSGM) is generated, for which the nuclear plant structures, systems and equipment are designed by detailed analysis and testing.
The above confirms that, generally, the NPP designs have inherent design margins for dynamic loads such as earthquakes.

Observation Para 9
What is the scientific base for 1.6 KM? How it is possible the value is same for 1000 MWe and 10,000 MWe projects. That means, NEERI have not studied well.

Response
As per the guidelines of AERB, ''Code of Practice on Safety in NPP Siting'; AERB/SC/S, for nuclear power plants, the 'site' include the area surrounding the plant enclosed by a boundary, which is under effective control of the plant management. Mandatory requirement of AREB siting code is that an exclusion zone of 1.6 km radius around the plant is to be established and this area should be under the exclusive control of the station where public habitation is prohibited. The exclusion boundary is relevant from the point of view of dose limits to public.

Observation Para 10
It is not fair to conduct Public Hearing before preparing emergency plan and mitigation plan and inadequate project affected villages social and economical studies.

Response
The Section 4.4 of Chapter-4 of the Vol-I of the EIA report presents the Emergency Response system. Based on this a detailed plan will be prepared, which will be put up for approval of AERB and State Government before the consent for operation of the plant is granted by AERB.

Annexure-XII

Response to Documents submitted by Ms. Vaishali Raj Patil, (Page No. 447-530)

Oberservation

The objection raised orally by Ms. Vaishali Patil during the public hearing on May 16, 2010 at Village Madban Taluka Rajapur, District Ratnagiri. " Jaitapur Site is ecologically sensitive site with reference to NIO study of October, 1990". The following documents were submitted in support of this objections:

(i) NIO report of 1990 – Ecobiological characterization of the environs of the Nuclear Power Station Site at Jaitapur & Bioassay Tests for Tolerance and Lethal Limit of thermal Effluents on Biota& Environment.

(ii) Maps showing proposed Atomic Power Plants Site and Settlement with vicinity.

(iii) Letter for Rescheduling of Public Hearing

Response (i) and (ii)

The report attached along with is Eco-biological characterization of the environs of Jaitapur site carried out by NIO, Goa in 1990. The study was of preliminary nature and was carried out 20 years back.

The study conducted short term investigation on biotic and abiotic parameters at few locations around Jaitapur coast and had recommended long term monitoring and experimental studies for remedial measures for maintaining ecological balance in the marine environment of Jaitapur.

Subsequently, as suggested in the report, NPCIL made a comprehensive plan to investigate the effect of temperature rise on marine environment of Jaitapur coast. In line with this plan, a detailed 2D mathematical model studies for dispersion of condenser cooling water discharges from the proposed Nuclear Power Plant at Jaitapur, Ratanagiri is carried out by Central Water Power research Station (CWPRS), Pune, in 2008. The CWPRS report is attached as Annexure- V(b) of Volume –II of the EIA report. And also as part of EIA study, NEERI, Nagpur has carried out detailed marine ecological studies for the Jaitapur coast and through College of Fisheries, Ratnagiri, a specialized study on Baseline Marine Ecological Assessment of sea cost around the Jaitapur site. The report from College of Fisheries is enclosed as Annexure-VIII of the Volume –II of the EIA report.

These studies have concluded that the marine aquatic food chain organisms will not be affected by the predicted maximum temperature rise of around 5 ^{0}C, which will be confined to a limited area of 0.28 sqkm, when all the six units are under operation and ocean currents are under transition (October/February), which is the most severe condition during the year. At this range of temperature rise above ambient temperature of water, most of the organisms are either not affected or get benefit of stimulation of metabolic activity. The details are presented in Section 4.2.2.1.4, of Chapter-4 of Volume –I of the EIA report.

Response (iii)

Please refer response of point no. 3 of Annexure-I.

Annexure-XIII

Response Comments from Chairman, Marchhimar Sahakari Sanstha (Page No. 639-641)

1. Observation

Fishing is our ancestral business, our society have 300-400 members, 3-4 thousand labours are working for this business, we don't have any land. EIA doesn't say that we are project affected; NEERI did not contact any of the members of our society.

Response

The information on local fishery activity is given in Section 4.1.3, Table 8 and Table 11 in " The Baseline Marine Ecological Assessment of Sea around Proposed JNPP near Village Madban, District – Ratnagiri (March-2008)" (Annexure VIII in EIA Report Volume-II Annexure). The impact on fisheries has bbeen given in Chapter-4 of Vol-I of EIA report. NEERI has collected data from the local State Administration and local people..

2. Observation

Security of nuclear reactor is an international issue for this purpose Military forces are used area around project will be prohibited, it will be impossible to do our fishing business.

Response

AERB has stipulated an area around Nuclear Power Plant with no permanent habitant and called as "Exclusion zone". In line with the above, JNPP will also have a specific 'Exclusion Zone' of 1.6 km. Being a coastal site, some of the area of 'Exclusion zone' will fall on sea front. From security point of view and being a prohibited area, no unauthorized person is envisaged to be allowed to enter in this zone on land as well as sea front. The expected exclusion zone area under sea from shoreline may vary from 500 metre to 1 km. approximately. Accordingly, the entry of fisherman in this zone will be restricted and regulated. Beyond this zone, there will be no restriction of fishing.

3. Observation

Crores of liters sea water will be drawn for cooling of reactor, fish eggs will be sucked in and destroyed. Hot water will be released in sea after cooling this will increase temperature of sea water same is experienced by Tarapur fishermen. This is hidden in EIA report.

Response

Fish breeding sites are present in the mangrove vegetation present in Jaitapur creek and Vijayadurg creek which are beyond 5 km from water intake structure of JNPP. Thus breeding places of marine organisms will not be affected.

Regarding temperature rise, a detailed 2D mathematical model studies for dispersion of condenser cooling water discharges from the proposed Nuclear Power Plant at Jaitapur, Ratanagiri has been carried out by CWPRS, Pune, in 2008 (The CWPRS report is attached as Annexure- V(b) of Volume –II of the EIA report). Further, NEERI, Nagpur has carried out detailed marine ecological studies for the Jaitapur coast including a specialized study on Baseline Marine Ecological Assessment of sea coast around the Jaitapur site through College of Fisheries, Ratnagiri (The report from College of Fisheries is enclosed as

Annexure-VIII of the Volume –II of the EIA report). These studies have concluded that the marine aquatic food chain organisms will not be affected by the predicted maximum temperature rise of around 5 0C, which will be confined to a limited area of 0.28 sq.km, when all the six units are under operation and ocean currents are under transition (October/February), which is the most severe condition during the year. At this range of temperature rise above ambient temperature of water, most of the organisms are either not affected or get benefit of stimulation of metabolic activity. The details are presented in Section 4.2.2.1.4, of Chapter-4 of Volume –I of the EIA report.

4. Observation

It is mentioned in EIA that mangroves are there beyond 5 kms from project. It is not true beaches at Madban, Jaitapur Nate & Karel mangroves are there which helps for reproduction of fishes.

Response

EIA report has rightly reported that mangrove vegetation is present beyond 5 km distance in Jaitapur Creek (which is near to villages Jaitapur and Nate and in Vijaydurg creek at around 8 km distance (which is near to villages Madban and Karel).

5. Observation

Water discharged to the sea contains radioactivity though it may be in small quantity it will go in fishes and in it will go to [persons eating these fishes. Radiation through chain of food is dangerous it is not mentioned by NEERI in EIA.

Response

The radioactivity release through water route will be much less than the limit specified by AERB. These releases are constantly monitored and reviewed. As a result, there will not be biomagnification and effect on quality of fish and other marine organisms. As a result the aquatic food chain and the edible quality of fish will not be affected.

Response to the representation from Konkan Bachao Samiti (KBS), Mumbai

Chapter -1: Fatally flawed methodology of draft EIA

1.1 KBS Observation:

The accident at Chernobyl released into the atmosphere an amount of radioactivity equivalent to 400 bombs of the Hiroshima variety. The Nuclear Power Project of Jaitapur is about 10 times the size of the Chernobyl Power Plant. The huge radioactive accumulations at the plant site are the principal causes of concern which must be addressed.

Response:

It may be noted that in case of Chernobyl (plants of RBMK design), the high radioactivity release into atmosphere was because of the accident scenario of directly opening the reactor core to atmosphere aided by subsequent large fires. The EPR design is different from the design of Chernobyl reactor. Chernobyl reactor was housed in a building which was not designed for resisting accident pressures and temperatures, whereas the EPR reactor has the inner containment steel lined and designed to withstand accidental pressures and temperatures and an outer hardened concrete shell enveloping the inner one and protecting it against external hazards such as aircraft crashes and explosion pressure wave, etc.. The reactor design follows the latest international standards and guidelines. It incorporates a large number of diverse and redundant safety features.

1.3 KBS Observation:

The following is an excerpt from Chapter 4 of the draft EIA report at page 378 of Vol 1, which tabulates the findings of the NEERl study team in regard to socio-economic impact. In the entire table, there is not **a** single 'negative impact'.

Table 4.6
Prediction of Impacts on Socio-Economic Environment

Sr. No.	**Parameter**	**Direct**	Indirect	**Reversible**	Irreversible
1	Employment	+	+	•	+
2	Income	+	+	•	+
3	Transport	•	+	•	+
4	Education	•	+	•	+
5	Medical Facilities	•	+	•	+
6	Communication	•	+	•	+
7	Availability of Power Supply	+	•	•	+
8	Sanitation	•	+	+	•
9	Housing	•	+	•	+
10	Health	•	+	+	+
11	Agriculture	+	•	•	+
12	Cost of Living	•	+	•	+
13	Business	+	+	•	+
14	Per Capita Income	•	+	•	+

+ Positive Impact
- Negative Impact
• Insignificant

Response:

The implementation of large project like JNPP will bring up the economic improvement in the surrounding area of JNPP. Therefore the overall impact of the project is expected to be positive on all fronts. However, there are few areas where adverse impact cannot be avoided completely, and NEERI has also suggested the measures by which these adverse impacts can be mitigated. These are based on the baseline study carried out by NEER, for JNPP site. The impact assessment for socioeconomic environment has been presented in section 4.2.6, page nos 376-382 of the EIA report.

Similarly, all the impacts on environmental components both during construction and operation phase have been addressed in detail i.e., type of impact, its description and the suggested mitigation measures in Table No 5 & 6 of the Summary EIA (Page No.s S-51 to S-56).

1.4 KBS Observation:

The above is not an isolated example. Throughout the voluminous report it is hard to find a single observation of negative impact of the project on any parameter. The NEERl study is supposed to be a scientific study of the environmental and safety issues and a scientific assessment of the risks and potential hazards of the JNPP. Reading the report and its summary conclusions, one feels ashamed and appalled to see what is going on in the name of science in India. The report reads as if it were written by the Public Relations Department of NPCIL or AREVA. This is necessary and sufficient reason to reject the entire report.

Response:

NEERI's EIA report has been prepared, complying to the provisions given in Environmental Impact Assessment Notification, 2006 issued vide no. S.O. 1533(E), dated 14th September 2006 and its amendment vide no. S.O. 3067(E) dated 1st December 2009 and based on the guidelines on EIA methodology by CPCB / MoEF. NEERI has also involved the appropriate agencies to address specific issues related to environmental impact on horticulture, agriculture*, fisheries as well as radiation effects through specialized agencies like College of Forestry, Dapoli / College of Fisheries, Ratnagiri, CWPRS, Pune, and BARC, Mumbai. The EIA report envisages to identify potential impacts which in this case are considered as ecological impacts, impacts on fisheries, impact on human being, impacts on agriculture and vegetation. The impacts are to be quantified by superimposing the change which is likely to be contributed by the proposed activity on the baseline data and suggest mitigation measures to prevents / minimize the impacts using the existing available control technologies. In the instant case, this has been meticulously followed by carrying out detailed study on all the issues viz ; radiation levels prediction by BARC - ESL, dispersion study of hot water discharge by CWPRS, the impact on fisheries indicated through a study by College of Fisheries, and impact on horticulture/agriculture studied by College of Forestry. The above organizations are professional and reputed in their area of work and possess immense experience & expertise. The report prepared by NEERI also summarize data on existing level of radiations at*

the fence post of operating plants viz. Tarapur, Rawatbhata, Kalpakkam, Narora, Kakrapar, Kaiga to substantiate the predicted values in the instant case.

1.4 (a) KBS Observation:

Another example of the methodological incompetence and looseness of the study team is from the Summary and Conclusions at page 475 of Volume 1. According to the authors, : "The design of the plant will be done according to the guidelines to keep the radiological discharges through air and liquid routes below the stipulated levels of 1 mSv/year during normal operation." The authors seem to be unaware that milli-sievert is not a unit to measure the quantum of radiological discharges (which is measured in Curie or Becquerel.) Sievert is a measure of exposure dosage to living beings,. Though exposure is linked to discharges, the two are conceptually different.

Response:

The radiation dose is related to radiological discharges. The radiation dose limit of 1 mSv/year during normal operation to the public at the boundary of the site as stipulated by AERB is the criterion for deciding the discharge limits through air and liquid routes. Accordingly, the plant is designed such that the dose arising out of the discharges through air and liquid routes is within the limit of 1mSv/year.

1.5 KBS Observation:

NEERI accepts the site selection committee's recommendations without critical review of a very vital factor like seismicity. NEERI does not seem to have taken cognizance of tremors felt in the region from over the years and more specifically recent past events like in the period September to November 2009? They have not taken cognizance of a huge crater created due to tremors, rivulet that changed the directions and other damages not very far from the proposed site for JNPP.

Response:

The recommendation of the site selection committee which is appointed by Government of India consists of appropriate experts in all relevant fields required for assessment of site for nuclear power plant. The above recommendations have been accepted and the Government of India has approved the site, advising NPCIL to finalise the project proposal.

Land- slides and craters are generally experienced on steep slopes with loose material loosened over years, or due to heavy rain. Nuclear Power Plants are constructed on excavated area and founded on competent foundation strata. As such, for hard rock sites, which are the category of foundation medium at Jaitapur plant site, such craters are not expected to form.

1.6 KBS Observation:

NEERI does not show any evidence that they have verified the radiation dose limits for the workers and the public. They have just accepted the inputs provided by NPCIL as design norms for the reactor and referring to the AERB guidelines. NEERI has not shown any evidence of cross verifying the current status radiological emissions from the running NPPs w. r. t. their design targets. NEERI does not show any evidence of methodology used for such scientific verification.

Response:

In EIA report, NEERI has recorded the radiation doses from operating Indian NPP sites from the data published by Environmental Survey Laboratory (ESL), under the control of BARC, Govt. of India.

AERB is the regulatory body, which has prescribed the radiation dose limits to workers and public. The regulation is based on international norms.
The radioactive emissions from present NPPs operated by NPCIL are well below the limits as stipulated by AERB. Correspondingly the total Effective Dose at fence post of the NPPs are well below the limit stipulated by AERB (Fig. 8 of Summary EIA Page no. S-29 of EIA report Vol I). The radiation dose to the workers and environment are regularly reviewed by AERB.

1.7 KBS Observation:

The pre-operational baseline radiological status study has been carried out by Health Physics Division (HPD), BARC, Dept. of Atomic Energy. NEERI is not seen to have reviewed this report critically either. Other important aspect is that HPD is an interested party being part of DAE as the project proponent, NPCIL. There is no effort on the part of NEERI to cross verify what is actual status of exposures at the running NPPs of NPCIL. NEERI has not even bothered to get this study carried out through an "independent third party".

The instrument deployed by HPD, BARC to conduct the measurements is claimed to have been duly "calibrated" and a calibration certificate is attached in the annexure. Surprisingly, this calibration certificate is dated May 1994 whereas the study is conducted more than 12 years later in October - November 2006. It is quite obvious that the instrument calibration validity is lapsed and hence the results from such instrument cannot be accepted. This is a major fallacy in the system at HPD, BARC. Overlooking it, NEERI has adapted the results and approved it.

Response:

The preoperational baseline radiological data are collected by HPD, BARC. This is to mention that Health Physics Division (HPD), BARC is the only agency, who has requisite expertise with well developed techniques for assessment of radiological aspects. NPCIL and HPD, BARC are totally independent establishments under Department of Atomic Energy (DAE).
NEERI has utilized the authentic radiological data of HPD, BARC during EIA studies. BARC has established Environmental Survey Laboratory at every nuclear power plant in India to carry out radiological observations.
Further, the experience at other Nuclear Power Plants in India has been described in relation to radiological dose to public at NPP fence, which is presented in the report at Fig. 8, page S-29 of Summary EIA.
Regarding the issue of the instrument calibration, it is clarified that the copy of the manufacturer's certificate of instrument calibration has been enclosed in the EIA report. However, it may be worthwhile to mention that this instrument is calibrated at regular interval and the same was carried out prior to commencement of survey at Jaitapur site. This has been re-confirmed from BARC.

1.8 KBS Observation:

In case of study of thermal water pollution and its impact on marine ecology entrusted to and carried out by College of Fisheries is a blanket certificate has been given that the temperature rise of sea water will not be beyond stipulated standards. The references have been given to reports prepared by DAE-BRNS and others. There is no evidence of College of Fisheries or the NEERI engaging into scientific exercises to verify the current status of impacts on fisheries around the running NPPs.

It is evident that NEERI does not have the competence to assess a nuclear project. On all matters relating to radioactivity, the NEERI repeatedly asserts that the project meets AERB norms and standards. What these standards are is not stated.

Response:

The thermal pollution study was carried out by CWPRS, Pune, based on the in-depth modeling study, considering the hydrography of the sea, various options on design of CCW discharge, seasonal variations in flow pattern, and maximum possible temperature of the CCW. The output of this study in the form of temperature distribution around the discharge points, were provided to College of Fisheries, Ratnagiri to study the effect on marine ecology around Jaitapur coast. NEERI reviewed these studies and incorporated the same in the EIA report. Even in the referred DAE-BRNS project on thermal ecological studies carried out at various NPP sites, NEERI was one of the investigating agencies along with other reputed institutes. The other references give the observations on thermal tolerance of marine fish and other marine organisms which indicate that the predicted temperature range would not have any impact on marine organisms.

The AERB documents are mentioned in the report wherever required viz. at section 9.4 (radiation dose Limits for NPP Workers / Public) of Summary EIA; also at section 2.9.4 of Chapter 2; page 353 (air route) and 363 (water route) of Chapter 4. The listing of existing codes and guides of AERB applicable to NPPs are presented in Table 1.2 (a), 1.2 (b), 1.2 (c), and 1.2 (d) at page nos 24-27 of Chapter-1, of EIA Vol-I.

1.9 KBS Observation:

It is clear that on nuclear matters, the NEERI is completely relying on the AERB. The AERB reports however, if they exist, are not part of the ElA, We demand access to these reports, if any, and reserve our right to comment on them, when given access.

Response:

For nuclear matters, NEERI has utilized the data published by Environmental Survey Laboratory (ESL), HPD, BARC. The reports from BARC are available in Annexures IX(a), IX(b), IX(c),and IX(d) of Vol.II of EIA report.

1.10 KBS Observation:

The AERB itself is constituted by and functions under the authority of the DAE. It is not an independent body. It cannot play the, independent role that is required to perform an environmental audit of the proposed project, which is a project of the NPCIL It may be mentioned that the NPCIL Director sits on the Board of governors, there is a central and direct conflict of interest involved in the role of the AERB in this context.

Response:

AERB is constituted by Government of India for exercising regulatory and safety functions envisaged under the Atomic Energy Act 1962. NPCIL is Public Sector Undertaking working under Department of Atomic Energy (DAE) and none of its Director is on the Board of AERB.

1.11 KBS Observation:

We annex hereto an article written by a retired Chairman of the AERB on this question (Annexure 1 A), which clearly sets out the need for an independent regulator. In the present context, the project needs to be assessed by an

independent body different from the AERB. The ElA is fundamentally flawed on this account.

Response:

NPCIL is Government of India Undertaking following the rules and guidelines set by the concerned regulators. In the present context, EIA is carried out as per MoEF guidelines and is submitted to MoEF for review and clearance. The response to Annexure-1-A is enclosed as Annexure-XIV-A to this document

1.12 KBS Observation:

The Chapter 5, Vol. 1 is titled 'Analysis of Alternatives (Technology & Site)'. The fashion in which NEERl has dealt with can be described as pathetic. The draft EIA for the Proposed Nuclear Power Park at Jaitapur simply lacks an assessment of competitive alternative energy sources and systems. This chapter is a narrow analysis of alternatives excluding any other possibility except for construction of a new nuclear power plant. This narrow assessment fails to examine alternatives -involving meeting electrical energy demand without constructing new generating capacity (for example, purchasing from another utility) or initiating energy conservation on demand management (including energy efficiency) measures that would avoid the need for the plant. This narrow assessment also fails to examine alternatives uniquely available within the region and appropriate for the ecology of the region (e.g. solar, hydropower and geothermal).

This is a critical failure of the draft EIA. Even under the rosy scenario of the draft EIA, the Proposed Nuclear Power Park at Jaitapur would not begin generating electricity for another 8 - 10 years. The draft EIA for the Proposed Nuclear Power Park at Jaitapur needs to inform the Indian citizens whether the staggering cost of building a new nuclear power plant is a better way forward than investing limited public funds in initiating energy conservation on demand management (including energy efficiency) measures or certain new energy generating projects that close the gap between energy needs and energy availability over a much shorter time period.

The ElA prepared by NEERI has many such flaws. Prima Facie the NEERI ElA study is a disgraceful unscientific exercise in the name of science. Unfortunately since NEERI is a CSIR institution, the ElA becomes a blot on the face of Indian science. The unscientific character of the NEERI study is brought out by the examples cited above.

Response:

The assessment of various energy sources (including conventional and non-conventional) suitable for India has been carried out by Government of India. The report of this assessment has been issued by Government of India as "The integrated energy policy of India 2005" The role of Nuclear power is clearly defined in this policy and it is envisaged that share of nuclear is to be increased It is planned to have total installed capacity of 63 GWE by year 2032 through nuclear power. JNPP is one step towards achieving the part of the above objective.

This has been explained in the subject EIA report that is based on the need to augment the existing generation capacity of electricity in western region of India and after taking into account the recommendation of Site Selection Committee (appointed by Government of India), as well as other considerations, Jaitapur site has been approved by Government of India, for establishment of 6x1650 MW NPP units,

This is a well known fact in public domain in the world that the nuclear power is proved to be environmental friendly and is able to meet the huge demand of

power by ever increasing developmental activities and population and this demand cannot be satisfied by other non-conventional sources of energy due to their low production potential per unit area and their dependence on vagaries of nature. This is being proved by the increasing number of NPPs all over the world and many nations opting for the nuclear energy in future. Therefore, the available option is to develop NPPs for the progress of the nation.

CHAPTER 2

Fundamental Design Inadequacies relative to Credible Risks

2.1 KBS Observation:

The NEERI ElA report correctly states in Section 7.2, "The risk assessment is an important component for Nuclear Rower Project. Therefore the subject is dealt in detail as presented in Section II-4.4 of Chapter 4 of this report".

2.2 KBS Observation:

The report states_ (page 385), "It systematically considers conceivable accident causes (Postulated Initiating Events (PlEs)) and for each initiating event, which can lead to core damage of different categories Core Damage Frequency (CDF) is calculated based on individual initiating events (IE) frequency. Through individual event sequence analysis for different lEs, it is estimated that the plant is provided adequate safety features and measures to mitigate or minimize any unsafe consequences".

2.3 KBS Observation:

As we will see in the following, the above conclusion is unwarranted and premature. In fact all the available material supports the opposite conclusion i.e. that the design based safety measures are inadequate to address threats and risks which are credible in the current conjuncture.

2.4 KBS Observation:

The draft EIA report refers to AERB Safety Guide (SG-D-5), Design Based Events and Beyond Design Based Events, it states (Vol 1page 385) that "The concept of defense in depth is conveyed at all phases or activities related to ensuring the NPP safety. Here, the strategy for preventing unfavourable plant damage state initiating events, especially for the 1st and 2nd level is of primary importance (details are provided in section 2.3 of Chapter 2 of this report).

2.5 KBS Observation:

Turning to chapter 2 of Vo! 1, at page 40, there is a startling admission: "All the above scenarios explained namely Design Basis Accidents (DBAs) and Beyond Design Basis Accidents (BDBAs) are thoroughly studied and detailed reports are generated as Preliminary Safety Analysis Reports (PSAR) and these reports will be submitted to Atomic Energy Regulatory Board (AERB) for review and approval for construction of Nuclear Power project at Jaitapur."

2.6 KBS Observation:

On the basis of the above admission that the design approval of the Power Plant in respect of the crucial matters of DBAa and BDBAs is not yet obtained from the AERB, the NEERI ought to have insisted on prior approval from AERB, before certifying the safety of the plant as in para 2 above. This is a crucial lacuna and fundamental flaw in the NEERI EIA report and is by itself a necessary and sufficient ground for rejection of the report.

Response for 2.1 to 2.6:

The design safety requirements of NPPs are defined in various safety codes of AERB which are in line with the requirements specified by International Atomic Energy Agency (IAEA). Accordingly, the design of the NPPs in India is carried out to meet the requirements as specified in the above mentioned safety codes. In the case of Jaitapur, NPPs constructed will be as per the EPR technology from M/s AREVA, France. It is pertinent to mention here that as

per policy of NPCIL, any imported technology for NPPs should be licensable by the regulatory body of the country of the origin. The EPR has been licensed for construction in France, Finland and China. The EPR technology has evolved on the basis of best safety features from presently operating French N-4 and German Konvoi reactors.

The regulatory consenting process for NPPs in India is governed by AERB Guide No. AERB / NPP & RR / SG / G-1, which envisages five major consenting stages, viz, siting, construction, commissioning, operation and decommissioning. At each stage, review is carried out by AERB before granting of consent. The consent at the first stage namely, siting involves the review of various site related safety aspects considering the conceptual design and issue of consent for the site for locating the project. The consent at the second stage namely construction involves the review of the design safety aspects and issue of a construction consent. At this stage Preliminary Safety Analysis Report (PSAR) submitted by NPCIL is reviewed by AERB. The PSAR addresses all credible Postulated Initiating Events (PIEs) for the plant and consequential Design Basis Accidents (DBAs) and Beyond Design Basis Accidents (BDBAs) scenarios. The PSAR review includes the defense in depth safety provisions in the design to take care of these scenarios. The Probabilistic Safety Assessment (PSA), the details of which are also covered in the PSAR, evaluates the risk, in terms of core damage frequency for the PIEs considered.

All these studies are to be carried out for a specific NPP site taking into the account site specific characteristics. Thus, the environmental impact assessment study carried out by NEERI, Nagpur has suggested suitable environmental management plan for JNPP keeping in view that NPCIL will obtain the various regulatory clearances from AERB at appropriate stages of the project.

2.7 KBS Observation:

We annex hereto the summary Probabilistic Safety Assessment of the UK-EPR NPP proposed to be constructed by the same partner Areva. The UK-EPR plant is a 1630 MW plant very similar in design to the JNPP. (Annexure 2 A) Chapter 15 of the detailed Pre Construction Safety Report (PCSR) is on the subject of Safety Requirements and Probabilistic Safety Assessment Objectives for the EPR system. It lists the design objectives in respect of safety measures at various levels of consequences.

One safety objective of the reactor design is to ensure that the risk of release of radioactive products into the environment. is reduced to as low as is reasonably practicable. The identified sources of potential radioactive releases are:

The reactor core,

The spent fuel storage pool,

The spent fuel handling facilities,

The radioactive waste storage tanks.

In order to give confidence that the UK EPR design complies with this general safety objective, a probabilistic safety assessment (PSA) is performed, covering three levels of consequences.

The Level 1 PSA considers both internal events (see Sub-chapter 15.1) and internal and external hazards (see Sub-chapter 15.2) that, together with total or partial failure of

protection or mitigation measures, can lead to core damage, and evaluates the resulting core damage frequencies (CDF). Other, less onerous, endpoints are considered that do not result in a designated failure state such as core damage but lead to potential releases: these include those relating to the spent fuel pool (loss of cooling or fast draining) (see Sub-chapter 15.3).

The level 2 PSA (Sub-chapter 15.4) evaluates the nature, magnitude and frequency of radioactive releases outside the containment boundary, it takes, the Level 1 PSA failure states, analyses the containment response in those situations, and assigns a Release Category to containment fault sequences that present similar characteristics of activity release to the environment.

The Off-site consequence analysis (Level 3 PSA) presented in Sub-chapter 15.5 determines the risk to the off-site public from the potential releases, in terms of both individual and societal risk.

The initiating events studied include internal events or hazards originating inside the facility, and external hazards. The assessment is performed for the various plant operational states (i.e. full power, low power and shutdown).

2.8 KBS Observation:

In this same report, at page 5, it is made clear that:

Initiating events due to intentional mal-operation or sabotage and malicious events like intentional aircraft crash are not considered in the PSA, i.e. it is made clear that threats arising out of malicious events, mal-operations and sabotage such as will arise in terrorist attacks have not been addressed by the current plant design. This is obvious when it is noted that only the reactor building is protected by the hardened dome containment and not the waste storage buildings. This is a fundamental design flaw in the current environment. The project therefore deserves to be rejected on the basis of this fundament design flaw. The question of risk arising out of terrorist threat is the subject of the next chapter.

Response for 2.7 & 2.8:

Safety studies are carried out for nuclear power plants using two approaches viz. the Deterministic Approach and the Probabilistic Approach. The purpose and the goals of these two approaches are different.

The deterministic approach is used to evaluate all the safety features required to keep the plant safe for all the Design Basis Accident (DBA) scenarios. The analysis assumes the occurrence of the DBAs and predicts its consequences to enable the design to build in all the safety features necessary to cope up with these scenarios and to keep the plant in the safe condition at all times.

The PSA has a different purpose and different methodology. PSA is performed to assess plant design and operation by identifying the sequences (multiple failures of safety and safety support systems given the occurrence of an event) that can lead to core damage and to assess their frequencies. It also provides insights into design strengths and weaknesses and into ways of preventing core damage. PSA is performed for both internally generated initiating events and externally generated events (i.e. flood, fire, seismic etc).

PSA is carried out basically to evaluate risk. It consists of 3 levels classified as Level 1, Level 2 & Level 3.

Level 1 PSA is the assessment of the probability for core damage (expressed in terms of Core Damage Frequency [CDF]), considering internal events and internal & external hazards.

Level 2 PSA evaluates the probability of radioactivity release from the reactor containment, assuming core damage. Hence the Level 1 PSA result becomes the input to Level 2 PSA.

Level 3 PSA analyses the impact of the radioactivity release on the public domain.

External hazard protection is provided to ensure that the safety related functions are not hampered by the hazard. Protection against such hazard can be achieved by the design of the safety classified buildings and/or by physical separation of redundant systems. The protection against other localized effects will be achieved by geographical separation and by redundancy of the required systems or components. This is justified on a probabilistic basis or by analysis of the consequences of the failure of the unprotected equipment.

The EPR design considers external hazards which, inter-alia, include aircraft crash. In the EPR structures, Reactor building, Safeguard buildings & the Fuel building (which stores the spent fuel assemblies) are designed deterministically to withstand aircraft crash.

In the context of aircraft crash, the PSA studies evaluate the risk associated with aircraft crash as an initiating event. Accidental aircraft crash and its consequences in terms of core damage are quantified in the PSA using a frequency of such an event based on the site specific data for air traffic. The impact of accidental or intentional aircraft crash is the same and design provisions exist to guard against these. Appropriate security measures to avoid the intentional aircraft crash in collaboration with the national security agencies/forces are also a part of the security strategy for nuclear power plants.

The design features and the procedures take care of malicious events and mal-operations. Security being a sensitive subject, further details is available only with the respective Site-specific security agencies.

The risk contribution from accidental aircraft crash on the buildings not protected from aircraft crash like Waste Storage Building has been assessed in level – 3 PSA by the Designers of the UK-EPR. This involves release without core damage. The risk associated with such an event for UK-EPR is considered to be insignificant. It may be noted that for the EPR to be built at Jaitapur, the above aspects will be evaluated by NPCIL and submitted to AERB for regulatory clearance.

CHAPTER 3
Risk of radioactive release arising out of terrorist attack and Malicious act not addressed in ElA

3.1 KBS Observation:

As pointed out in the previous chapter, AREVA has placed on record that the design of its EPR power plant does not address the risks of radioactivity release arising out of internal and external malicious acts.

Response:

The adequate measures are in place for ensuring security of NPP units in India by appropriate security agencies of Government of India. Please refer NPCIL's response at S. No. 3.1 & 3.3.

3.2 KBS Observation:

However, after the 9/11 terrorist attack on the USA, the issue of design basis threat has come to the top of the agenda of safety of nuclear installations. In 2005, the Energy Policy Act 2005 of the USA was enacted in the USA to specifically address this issue. Below are given some relevant excerpts from the legislation:

SEC. 651. NUCLEAR FACILITY AND MATERIALS SECURITY

(a) SECURITY EVALUATIONS; DESIGN BASIS THREAT RULEMAKING.—

(1) IN GENERAL—Chapter 14 of the Atomic Energy Act of 1954 (42 U.S.C. 2201 et seq.) (as amended by section 624(a)) is amended by adding at the end the following:

"SEC. 170D. SECURITY EVALUATIONS

"a) SECURITY RESPONSE EVALUATIONS.—Not less often than once every 3 years, the Commission shall conduct security evaluations at each licensed facility that is part of a class of licensed facilities, as the Commission considers to be appropriate, to assess the ability of a private security force of a licensed facility to defend against any applicable design basis threat.

"b) FORCE-ON-FORCE EXERCISES.

(4) The security evaluations shall include force-on-force exercises.

(5) The force-on-force exercises shall, to the maximum extent practicable, simulate security threats in accordance with any design basis threat applicable to a facility.

(6) In conducting a security evaluation, the Commission shall mitigate any potential conflict of interest that could influence the results of a force-on-force exercise, as the Commission determines to be necessary and-appropriate.

"c) ACTION BY LICENSEES

.—The Commission shall ensure that an affected licensee corrects those material defects in performance that adversely affect the ability of a private security force at that facility to defend against any applicable design basis threat.

"d). FACILITIES UNDER HEIGHTENED THREAT LEVELS.—The Commission may suspend a security evaluation under this section if the Commission determines that the evaluation would compromise security at a nuclear facility under a heightened threat level.

"**e) REPORT.**—Not less often than once each year, the Commission shall submit to the Committee on environment and Public Works of the Senate and the committee on Energy and Commerce of the House of Representatives a report, in classified form and unclassified form, that describes the results of each security response evaluation conducted and any relevant corrective action taken by a licensee during the previous year.

"SEC. 170E. DESIGN BASIS THREAT RULEMAKING

"a) RULEMAKING.—The Commission shall

"(1) not later than 90 days after the date of enactment of this section, initiate a Rule making proceeding, including notice and opportunity for public comment, to be completed not later than 18 months after that date, to revise the design basis threats of the Commission; or

"(2) not later than 18 months after the date of enactment of this section, complete any ongoing rulemaking to revise the design basis threats.

"b) FACTORS When conducting its rulemaking, the .Commission shall consider the following, but not be limited to—

"(1) the events of September 11, 2001;

"(2) an assessment of physical; cyber, biochemical, and other terrorist threats;

"(3) the potential for attack on facilities by multiple coordinated teams of a large number of individuals;

"(4) the potential for assistance in an attack from several persons employed at the facility;

"(5) the potential for suicide attacks;

"(6) the potential for water-based and air-based threats;

"(7) the potential use of explosive devices of considerable size and other modern weaponry;

"(8) the potential for attacks by persons with a sophisticated knowledge of facility operations;

"(9) the potential for fires, especially fires of long duration;

"(10) the potential for attacks on spent fuel shipments by multiple coordinated teams of a large number of individuals;

"(11) the adequacy of planning to protect the public health and safety at and around nuclear facilities, as appropriate, in the event of a terrorist attack against a nuclear facility; and

"(12) the potential for theft and diversion of nuclear materials from such facilities.".

(2) CONFORMING AMENDMENT.—The table of sections of the Atomic Energy Act of 1954 (42 U.S.C. prec. 2011} (as amended by section 624(b)) is amended by adding at the end of the items relating to chapter 14 the following:

"Sec. 170D. Security evaluations.

"Sec. 170E. Design basis threat rulemaking".

(3) FEDERAL SECURITY COORDINATORS.

(A) REGIONAL OFFICES, Not later than 18 months after the date of enactment of this Act, the Nuclear Regulatory Commission (referred to in this section as the "Commission") shall assign a Federal security coordinator, under the employment of the Commission, to each region of the Commission.

(B) RESPONSIBILITIES The Federal security coordinator shall be responsible for

(i) communicating with the Commission and other Federal, State, and local authorities concerning threats, including threats against such classes of facilities as the Commission determines to be appropriate;

(ii) monitoring such classes of facilities as the Commission determines to be appropriate to ensure that they maintain security consistent with the security plan inaccordance with the appropriate threat level; and

(iii) assisting in the coordination of security measures among the private security forces at such classes of facilities as the Commission determines to be appropriate and Federal, State, and local authorities, as appropriate.

SEC. 655. SABOTAGE OF NUCLEAR FACILITIES, FUEL, OR DESIGNATED MATERIAL

(a) **IN GENERAL** Section 236a. of the Atomic Energy Act of 1954 (42 U.S.C.2284(a)) is amended

(1) in paragraph (2), by striking "storage facility" and inserting "treatment, storage, or disposal facility".

(2) in paragraph (3)

(A) by striking "such a utilization facility" and inserting "a utilization facility licensed nder this Act"; and .

(B) by striking "or" at the end;

(3) in paragraph (4)

(A) by striking "facility licensed" and inserting-", uranium conversion, or nuclear fuel fabrication facility licensed or certified"; and

(B) by striking the comma at the end-and inserting a semicolon; and

(4) by inserting after paragraph (4) the following:

"(5) any production, utilization, waste storage, waste treatment, waste disposal, uranium enrichment, uranium conversion, or nuclear fuel fabrication facility subject to licensing or certification under this Act during construction of the facility, if the destruction or damage caused or attempted to be caused could adversely affect public health and safety during the operation of the facility;

"(6) any primary facility or backup facility from which a radiological emergency preparedness alert and warning system is activated; or

"(7) any radioactive material or other, property subject-to regulation by the Commission that, before the date of the offense, the Commission determines, by order or regulation published in the Federal Register, is of significance to the public health and. safety or to common defense and security;".

(b) CONFORMING AMENDMENT.—Section 236 of the Atomic Energy Act of 1954 (42 U.S.C. 2284) is amended by striking "intentionally and willfully" each place it appears and inserting "knowingly".

Response:

Based on the need of the country, a specialized force known as Central Industrial Security Force (CISF) is made responsible to provide specialized security to industrial installations in the country including NPPs. The CISF works under the Ministry of Home Affairs of Government of India.

All Nuclear Power Stations of NPCIL are provided security cover by CISF personnel, who are specially trained. Based on the location of NPP in the country and security threat perception, the required defense cover is provided. The design of Physical Protection System of NPP is carried out on the basis of design basis threats. The physical protection system is subject of review and approval by AERB.

3.3 KBS Observation:

The rules made by the Nuclear Regulatory Commission pursuant to the above legislation are classified information and are not in the public domain. However a note on "Nuclear Power Plant Security and Vulnerabilities" prepared by the Congressional Research Service and presented to the U.S. Congress is in the public domain and contains a summary of the situation around 2009. (Annexure 3A) We present below some relevant excerpts from this report:

Design Basis Threat

The design basis threat describes general characteristics of adversaries that nuclear plants and nuclear fuel cycle facilities must defend against to prevent radiological sabotage and theft of strategic special nuclear material. NRC licensees use the DBT as the basis for implementing defensive strategies of a specific nuclear plant site through security plans, safeguards contingency plans, and guard training and qualification plans.

General requirements for the DBT are prescribed in NRC regulations, while specific attributes of potential attackers, such as their weapons and ammunition, are contained in classified adversary characteristics documents (ACDs).

Fundamental policies on nuclear plant security threats date back to the Cold War. In 1967, the Atomic Energy Commission (AEC) instituted a rule that nuclear plants are not required to protect against an attack directed by an "enemy of the United States." That so-called "Enemy of the State Rule" specifies that nuclear power plants are not required to provide for design features or other measures for the specific purpose of protection against the effects of (a) attacks and destructive acts, including sabotage, directed against the facility by an enemy of the United States, "whether a foreign government or other-person, or (b) use or deployment of weapons incident to U.S. defense activities.

The Nuclear Regulatory Commission (NRQ, the AEC's successor regulatory agency, says that the rule "was primarily intended to make clear that privately-owned nuclear facilities were not responsible for defending against attacks that typically could only be carried out by foreign military organizations." NRC's initial DBT, established in the late 1970s, was intended to be consistent with the enemy of the state rule, which remains in effect.

However, the 9/11 attacks drew greater attention to the potential severity of credible terrorist threats. Following the attacks, NRC evaluated the extent to which nuclear plant security forces should be able to defend, against such threats, and ordered a strengthening of the DBT, along with other security measures, on April 29, 2003. That oкieг changed the DBT to "represent the largest reasonable threat against which a regulated private guard force should be expected to defend under existing law, according to the NRC announcement.6

In the Energy Policy Act of 2005 (EPACT), Congress imposed a statutory requirement on the NRC to initiate rulemaking for revising the design basis threat. EPACT required NRC to consider 12 factors in revising the DBT, such as an assessment of various terrorist threats/ sizable explosive devices and modern weapons, attacks by persons with sophisticated knowledge of facility operations, and attacks on spent fuel shipments.

NRC approved its final rule amending the DBT (10 C.F.R. Part 73.1) on January 29, 2007 effective April 18, 2007. Although specific details of the revised DBT were not released to the public, in general the final rule;

- clarifies that physical protection systems are required to protect against diversion and theft of fissile material;
- expands the assumed capabilities of adversaries to operate as one or more teams and attack from multiple entry points;
- assumes that adversaries are willing to kill or be killed and are knowledgeable about specific target selection;
- expands the. scope of vehicles that licensees must defend against to include water vehicles and land vehicles beyond four-wheel-drive type;
- revises the threat posed by an insider to be more flexible in scope; and
- adds a new mode of attack from adversaries coordinating a vehicle bomb assault with another external assault.

The DBT final rule excluded aircraft attacks, a decision that raised considerable controversy. In approving the rule, NRC rejected a petition from the Union of

Concerned Scientists to require that nuclear plants be surrounded by aircraft barriers made of steel beams and cables (the so called "beamhenge" concept). Critics of the rule charged that deliberate aircraft crashes were a highly plausible mode of attack, given the events of'9/11. However, NRC contended, that power plants were already required to mitigate the effects of aircraft crashes and that "active protection against airborne threats is addressed by other federal organizations, including the military."
Additional NRC action on aircraft threats is discussed below.
NRC Commissioners in January 2009 rejected a proposal by the NRC staff to strengthen the classified portion of the DBT to include additional capabilities by potential attackers, according to news reports. The staff proposal lost in a 2-2 vote, with one commissioner position currently vacant. In an interview afterward, NRC Chairman Dale Klein &aid the vote could be reconsidered after completion of an ongoing interagency study.

Large Aircraft Crashes

Nuclear power plants were designed to withstand hurricanes, earthquakes, and other extreme events. But deliberate attacks by large airliners loaded with fuel, such as those that crashed into the World Trade Center and Pentagon, were not analyzed when design requirements" for today's reactors were determined. 12 Concern about aircraft crashes was intensified by a taped interview shown September 10, 2002, on the Arab TV station al-Jazeera, which contained a statement that Al Qaeda initially planned to include a nuclear plant in its list of 2001attack sites.
In light of the possibility that an air attack might penetrate the containment structure of a. nuclear plant or a spent fuel storage facility, some interest groups have suggested that such an event could be followed by a meltdown or spent fuel fire and wide spread radiation exposure. Nuclear industry spokespersons have countered by pointing out that relatively small, low-lying nuclear power plants are difficult targets for attack, and have argued that penetration of the containment is unlikely, and that even if such penetration occurred it probably would not reach the reactor vessel. They suggest that a sustained fire, such as that which melted the steel support structures in the World Trade Center buildings, would be impossible unless an attacking plane penetrated the containment completely, including its fuel-bearing wings. According to former NRC Chairman Nils Diaz, NRC studies "confirm that the likelihood of both damaging the reactor core and releasing radioactivity that could affect public health and safety is low."
NRC proposed in October 2007 to amend its regulations to require newly designed power reactors to take into account the potential effects of the impact of a large commercial aircraft.
As discussed in the previous section, NRC considers an aircraft attack to be 'beyond the design' basis threat that plants must be able to withstand, so the requirements of the proposed rule were intended to provide an additional margin of safety. The proposed rule would affect only new reactor designs not previously certified by NRC, because the previous designs were still considered adequately safe. Nevertheless, Westinghouse submitted changes in the certified design of its AP1000 reactor to NRC on May 29, 2007, proposing to line the inside and outside of the reactor's concrete containment structure with steel plates to increase resistance to aircraft penetration.
Under NRC's 2007 proposed rule, applicants for new certified designs or for new reactor licenses using uncertified designs would have been required to assess the effects that a large aircraft crash would have on the proposed facilities. Each applicant would then describe how the plant's design features, capabilities, and operations would avoid or mitigate the effects of such a crash, particularly on core cooling, containment integrity, and spent fuel storage pools. In response to comments, the-NRC staff, proposed in

October 2008 that the aircraft impact assessments be conducted by all new reactors, including those using 'previously certified designs. The NRC Commissioners, in a 3-1 vote, approved the change February 17, 2009, and added specific design requirements that all new reactors would have to meet: Each applicant subject to this section shall perform a design-specific assessment of the effects on the facility of the impact of a larger commercial
aircraft. Using realistic analyses, the applicant shall identify and incorporate into the design those design features and functional capabilities to show that -with reduced use of operator actions;
(A) the reactor core remains cooled, or the containment remains intact; and
(B) spent fuel cooling or spent fuel pool integrity is maintained.

Response:

CISF is fully capable of taking care of the design basis threats (DBTs) in conjunction with design provisions made. The DBTs and various other security arrangements are regularly under review by various government bodies which include Intelligence Bureau also. Security organizations have been functioning at various levels at DAE, AERB and NPCIL. The security audits/inspections are regularly carried out to ensure compliance of security provisions. Over and above, an independent review of nuclear security related issues is in place by national regulators i.e. Atomic Energy Regulatory Board (AERB).

It may be noted that each NPCIL plant has Multi-tier physical barriers with intrusion detection systems which are in place with isolation zone.

Entry to all the points of personnel and vehicle access into protected areas is based on laid down procedures. Identification of personnel and vehicles are made and authorization is checked at each of the access control point. Access to certain vital areas of the plant is limited to individuals who require such access in order to perform their duties.

3.4 KBS Observation:

It is not publicly known if the AERB has made any new licensing or safety rules to address the problem of terrorist attack on nuclear facilities. Clearly the threat of such attack occurring in India is no less than the threat in the USA. It is also clear that AREVA has not designed the EPR plant to withstand such attacks. In particular, the spent fuel cooling and spent fuel storage areas are obviously vulnerable. In the report to US Congress cited in 3.3 above the consequences of attack on spent fuel storage are elaborated:

Spent Fuel Storage

When no longer capable of sustaining a nuclear chain reaction, highly radioactive "spent" nuclear fuel is removed from the reactor and stored in a pool of water in the reactor building and at some sites later transferred to dry casks on the plant grounds. Because both types of storage are located outside the reactor containment structure, particular concern has been raised about the vulnerability of spent fuel to attack by aircraft or other means. If terrorists could breach a spent fuel pool's concrete walls and drain the cooling water, the spent fuel's zirconium cladding could overheat and catch fire.
The National Academy of Sciences (NAS) released a report in April 2005 that found that "successful terrorist attacks on spent fuel pools, though difficult, are possible," and that "if an attack leads to a propagating zirconium cladding fire, it could result in the release of large amounts of radioactive material." NAS recommended that the hottest spent fuel be interspersed with cooler spent fuel to reduce the likelihood of fire, and that water-spray systems be installed to cool spent fuel if pool water were lost. The report also

called for NRC to conduct more analysis of the issue and consider earlier movement of spent fuel from. PJ>ols into dry .storage.27 The FY2006 Energy and Water Development Appropriations Act (P.L 109-103, H. Rept. 109-275) provided $21 million for NRG to carry out the site-specific analyses recommended by NAS. NRC has long contended that the potential effects of terrorist attacks are too speculative to include in environmental studies for proposed spent fuel storage and other nuclear facilities.

However, the U.S. Court of Appeals for the 9th Circuit ruled in June 2006 that terrorist attacks must be included in the environmental study of a dry storage facility at California's Diablo Canyon nuclear plant.

Response:

Based on perceived threat scenarios and for effective regulatory framework, AERB has issued necessary requirements in this regard, which are followed. Licensing of the plant for its operation is given by AERB only after meeting various specified requirements.

3.6 KBS Observation:

It should be noted that there is no naval or air force base within 50 kilometers from the site. Even if there were such a base it would be impossible to protect the vulnerable facilities against multiple missiles of the Exocet type launched from ships or boats at a distance from the site. It would be prudent and necessary to seek the views of the naval and air force authorities on this question.

3.7 KBS Observation:

Thus the spent fuel facilities at JNPP would create a very large "dirty nuclear time bomb" on the West Coast of India, which could be detonated virtually at will by multiple strikes with weapons which are known to be in the possession of terrorist enemies of the Indian State.

This is sufficient and necessary cause to reject the application for environmental clearance for the JNPP.

It is likely that the collateral requirement of defense of the JNPP against sea attack would require the Indian Navy to enforce an exclusion zone with a radius of several tens of kilometers from the site. This would destroy the livelihoods of the fishing community on a large scale, which needs to be estimated and included in the cost benefit analysis.

Response for 3.6 & 3.7:

Location for the siting of a NPP is decided based on various siting criteria which take care of the screening distance from the air fields. However, it may be noted that protection against aircraft crash is considered in the safety analysis. The accidental aircraft crash and its consequences in term of core damage are quantified in the PSA. Regarding the risk of off-site releases, the risk contribution from accidental aircraft crash on buildings where radioactive containing system are located, has been assessed (i.e. Nuclear Auxiliary Building and Waste Treatment Building).

Requirement of coastal water patrol and physical observation by the security guards exist for all the NPPs. Also a 'No Fishing Zone' of 500 meters inside the water body from the existing plants is declared. This is in addition to multi-tier physical barriers on land side of each NPP. The same will commence for JNPP when operation of the plant commences.

NPCIL is conscious towards prevention of any malicious act, and therefore, have adequate arrangements in place for the same. However, with the changing

scenario nationally as well as internationally, NPCIL periodically reviews the need for augmentation of the security arrangements.

CHAPTER 4

Absence of Long Term Plan for Solid Radioactive Waste Storage

4.1 KBS Observation:

It is stated in the El A as follows in respect of the long term storage of radioactive waste;

After sealing, the dose rate at outside surface of the drum / container will be <2 mSv/h. They are then placed in temporary storage area. After some time they are then stored in long-term storage area. The dose rate at outside surface of the drum will be <2 mSv/h. The dose rate outside the storage building will be < 0.75 mSv/h.

The radioactive waste depending upon the activity levels are buried in secured earth trenches, in steel containers which are immobilized in secured concrete vault. The solid waste disposal site is fenced, secured and designed to store waste for sufficiently long time of the order of 100 years. To ensure that the activity from the solid waste does not leach out to ground water, the activity levels in the ground water are periodically monitored and records maintained as per the requirements of AERB. Therefore, solid radioactive waste disposal with effective disposal mechanism will not have any adverse impact on the land and water components of the environment.

The existing environmental radioactivity levels are not expected to be changed due to operation of proposed nuclear plant. The design of the plant, radioactive monitoring and waste management systems are of highest quality as per international and national guidelines and the radioactive emissions from the stacks would be significant. Therefore the fallout would be minimum and land would not be exposed to radioactive pollutants.

4.2 KBS Observation:

It is evident from the above admission that safe storage of highly hazardous radioactive waste is designed for only 100 years. There is no long term arrangement for safe storage of-nuclear waste after that. With nuclear waste 100 years is a very short and temporary period. The waste itself remains highly dangerous for more than 10,000 years. If the safety of the storage beyond 100 years is not assured, and without a long term geological depository in India it is irresponsible to future generations of Maharashtra's residents to commence generating very large quantities of highly hazardous wastes in the absence of any long term solution beyond 100 years.

4.3 KBS Observation:

The US President Barack Obama in a 2008 policy statement defined nuclear policy of the US government under his administration as follows:

"However, there is no future for expanded nuclear without first addressing four key issues: public right-to-know, security of nuclear fuel and waste, waste storage, and proliferation."

It is necessary to note that the issue of safety of nuclear wastes storage has become a critical issue in the USA. In 1982 a special legislation was enacted to address this problem and to create long term storage for high level nuclear waste in the Yucca Mountains of Nevada. Despite billions of dollars spent in preparatory studies for building in the Yucca Mountain geological formation as a safe permanent repository, it has been recently found that these studies were faulty and unreliable, and the decision to build a long term depository at the Yucca Mountains has been revoked by the Obama administration. The cost consequences of this decision for the American

government have been estimated to amount to over $50 billion (Rs 225 lakh crores) as compensation to nuclear facilities that have to manage their temporary facilities.

We annex hereto as Annexure 4A - 4C some relevant reports on the subject which highlight how important is the question of long term waste storage.

4.4 KBS Observation:

Every nuclear establishment claims that its waste storage facilities are safe. Science, however, must proceed not on the basis of claims, but on the basis of facts and experience. The facts and experience show that whether it is USA or France, there have been leakages from buried nuclear wastes which have contaminated ground water. We annex hereto as Annexure 4D-4G some reports on the leakages from buried nuclear wastes in different parts of the world.

4.5 KBS Observation:

It must be noted that the soil at the JNPP is laterite, which is highly porous. The region receives heavy rainfall each year. Buried nuclear waste sites require non porous rock and low rainfall. The site of the JNPP is not suitable for buried nuclear wastes facilities on both these counts.

4.6 KBS Observation:

The above multiple factors of absence of long term high level waste disposal, and, unsuitable geology and rainfall at the site for burying nuclear wastes are necessary and sufficient grounds for rejecting the Environmental Clearance to the JNPP.

Response to 4.1 – 4.6

The NPP is so designed that the radioactive releases to the environment always remains As Low As Reasonably Achievable (ALARA) during operation of the plant.

The average dose to the members of the public from all exposure pathways will not exceed 1 mSv in a year by virtue of disposal of liquid, solid and gaseous waste to the environment as stipulated in AERB Safety Manual no. AERB/NF/SM/0-2 (Rev.4)

Expected annual release through the air route and through water route are given in Section 4.2.1.3, page no. 353 and Section 4.2.2.2.1, page no. 362 respectively of Chapter-4 of Vol-I of the EIA report.

The NPP unit is so designed that activity releases to the environment are through pre-designated release points. These radioactive effluent releases to the environment through the designated release points are continuously monitored and controlled. The minimum sensitivity of the monitoring instruments is such that even a sufficiently small fraction of the releases, which leads to dose consumption in the public domain, can be measured.

Presently, the low and intermediate radio- active solid / solidified wastes are stored in Near Surface Disposal Facility (NSDF). They are stored under ground at a depth of maximum up to 4 m either in trenches / RCC vaults / tile holes depending upon the surface dose rate of the waste. The solid waste disposal site is fenced and designed to store waste for an active control (monitoring, surveillance, remedial work) period of 100 years followed by passive control (land use control) period of 200 years.

The above facility has sufficient number of bore-holes all around at definite intervals. Ground water samples are collected from these bore-holes on regular basis to check the activity in ground water.

However, in case of Jaitapur EPR, the low and intermediate radioactive solid / solidified waste is designed to be stored in the radioactive waste storage

building, where solid waste storage will be above ground as an improved design feature.

The radioactive waste storage building is planned to store low and intermediate level radioactive solid / solidified waste having half life less than 30 yrs. The total storage time envisaged for this waste is 100 years active control period followed by passive control period of another 200 years. Hence in the design an active storage period of 100 years is considered. After 300 years of storage (with ten or more half lives), the total radioactivity of the material will be almost negligible.

Waste storage facility is a seismically qualified structure. Solid / solidified waste is always stored inside the building with multiple barrier concepts. The stored solid waste will never come in contact with ground water during its operational life.

Radiation dose to the general public from all exposure pathways of solid / solidified waste stored in waste storage facility will not exceed the limit (0.05 mSv in a year) as prescribed by AERB.

The spent fuel assemblies after discharge from reactor are stored in a water pool, as an interim storage with adequate shielding. This spent fuel will remain under continuous surveillance of NPCIL.

Presently, at Jaitapur site, Spent Fuel Reprocessing Plant is not envisaged. However, the spent fuel bundles will be transported to the reprocessing facility for spent fuel reprocessing. The transportation of spent fuel will be in line with approved regulatory procedure .i.e. in line with AERB Safety Code, AERB-SC-TR-1, which is already in practice at other sites of NPCIL.

CHAPTERS 5
Absence of Decommissioning Plan

5.1 KBS Observation:

Current international norms and practices require nuclear projects to prepare and provision for decommissioning of the nuclear facilities as an integral part of the project. In the United States of America, recent legislative amendments have been made to ensure that decommissioning is taken care of at the very outset of the project. No nuclear project in the USA or Europe can be sanctioned in the absence of a decommissioning plan.

5.2 KBS Observation:

In the USA and Europe, the costs of decommissioning have to be computed and are to be recovered as part of the electricity tariff.

5.3 KBS Observation:

In the year 2005, new legislation was introduced in the USA to specifically authorize the Nuclear Regulatory Commission to mandate and regulate decommissioning. Section 626 of the Energy Policy Act 2005, of the USA amends section 161 of the Atomic Energy Act 1954 of the USA as follows:

SEC. 626. DECOMMISSIONING

Section 161 i. of the Atomic Energy Act of 1954 (42 U.S.C. 2201 (i)) is amended (1) by striking “and (3)" and inserting "(3)"; and (2) by inserting before the semicolon at the end the following:” and (4) to ensure that sufficient funds will be available for the decommissioning of any production or utilization facility licensed under section 103 or 104 b., including standards and restrictions governing the control, maintenance, use, and disbursement by any former licensee under this Act that has control over any fund for the decommissioning of the facility".

5.4 KBS Observation:

In the NEERI draft EIA Report, the following startling admission is made in regard to decommissioning in Chapter 4 of Volume 1:

At the end of the operating life of the operating units, which would be around 60 years for EPR type NPPs, proposed to be established at Jaitapur site, a detail decommissioning plan will be worked out. The process of decommissioning will start after the final shutdown of the plant and ends with the release of the site for a responsible organization as authorized by AERB or for unrestricted use by the public.

The decommissioning plan will be prepared by NPCIL & approved by AERB and will be implemented as stated above. The plan will ensure that there will not be any radioactive releases in the public domain / environment, thus impact in the public domain due to decommissioning of the unit will be negligible.

5.5 KBS Observation:

From the above it is evident that **at the present conjuncture the JNPP does not have an approved decommissioning plan.** This is a basic and fundamental lacuna, without which the project cannot go forward. The NEERI ought to have pointed out this lacuna and highlighted it. On the contrary it has tried to overlook the fundamental lacuna and goes so far as to certify that "Thus impact in the public domain due to decommissioning of the unit will be negligible". This is a very serious act of professional negligence and dereliction of duty on the part of NEERI for which it should be held responsible and called to account.

Response to S. No. 5.1 - 5.5

Decommissioning of the facility is considered as an integral part of the project. In Section 4.3, Page No. 383, Chapter-4, of EIA report, the brief write up on impact during decommissioning of the project is presented. Detailed decommissioning

aspects are envisaged to be covered in PSAR for JNPP and will be put up for review / approval by AERB before operation of the project. The project decommissioning aspects are already considered in the design stage itself such that decommissioning of the plant will have insignificant impact in the public domain. The cost towards decommissioning is included as a part of unit energy cost.

CHAPTER 6
ISSUE OF COST OF POWER FROM IMPORTED COMMERCIAL NUCLEAR ACTORS

6.1 KBS Observation:

Chapter 8 of the JNPP- draft EIA deals with the issue of Project Benefits. The following statement is made: "The analysis of economics of the technologies as on date reveals that nuclear power, in the long term, is an economical option particularly at locations away from coal mines." This statement does not apply to imported commercial nuclear power plants, in this particular case to the Areva EPR power plant.

Response:

Nuclear Power provides long term economy of power generation, whether based on imported or indigenous fuel. This is due to fact that the fuel requirements for per unit of power generation is much lower in case of nuclear power plants compared to coal requirement for the same in case of thermal power. In case of nuclear power plants is located away from coal mines, the economic advantage of nuclear power further gets enhanced due to huge transportation cost required for transportation of coal for thermal power plants located at the same location.

As a principle, the capital cost of all imported NPP units in India should be such that the unit energy cost from above plants is comparable with prevailing tariff from power plants from Indian origin constructed at same period. Same principle is being followed for establishment of EPR units at Jaitapur site. The discussions between NPCIL and AREVA are in progress, so that the capital cost is optimized by sharing the scope of the responsibilities with regard to construction, erection of the plant facilities by NPCIL.

6.2 KBS Observation:

Another statement which is made in the JNPP-draft EIA is, "The current average tariff of NPCIL is Rs. 2.28 per kWh for all the operating plants." This statement when made in the context of the JNPP is misleading as all current NPCIL operating plants are indigenously manufactured. JNPP however is based on imported nuclear plant. These indigenous plants cannot be equated with imported commercial nuclear plants. It is highly unscientific to base a decision about an imported commercial nuclear power plant on the costs of indigenous nuclear power plants.

Response:

The capital cost optimization will be done to ensure that the unit energy cost is comparable with plant constructed during the same period in nearby locations.

6.3 KBS Observation:

Indigenous NPCIL plants currently in operation have a number of subsidies, being in the government sector. If these subsidies are quantified and calculated on commercial principles and added to the tariff, it will be seen that the actual tariff is higher than Rs. 2.28 per unit. However, this" is not necessary for the present purpose, and we will not perform this analysis, or discuss this issue further here. What is necessary for the present purpose is to correctly estimate the costs and resulting commercial tariff for the Areva EPR commercial imported nuclear power plant of the JNPP.

Response:

The nuclear power plants in India are being operated with the supplies of nuclear fuel by the Government of India from Public Sector Enterprises, like Uranium

Corporation of India Limited (UCIL), Nuclear Fuel Complex (NFC) and Heavy Water Board (HWB), which are essentially operating as commercial establishments. The fuel and heavy water charges are notified by Department of Atomic Energy (DAE), Government of India and charged to NPCIL. These components are the part of the tariff in addition to the other components as given in Response at para 6.4. The tariff is also notified by DAE in consultation with the Central Electricity Authority (CEA) with prevalent guidelines. These tariffs are in public domain. This pertains to draw attention that some of the Indian reactors, as well as imported reactors, have been using imported fuel like TAPS-1&2, Rajasthan Units etc. There has not been any raise in the tariff on this account. It is appropriate to bring out in view of the forgoing that the perception, Indian reactors use subsidy and / or use of imported fuel will result in high tariff is not correct. It is once again re-iterated that the tariffs from Jaitapur plant would be comparable to those of indigenous plants as explained in response at S. No. 6.1.

6.4 KBS Observation:

The capacity charge component of the future tariff can readily be calculated based on information like capex for the plant, debt-equity ratio, permissible ROE, interest rate on loans etc. In the case of nuclear power plants there are additional costs like liability insurance, costs of managing and disposing of nuclear waste, costs of decommissioning, which must also be computed and added to the tariff.

Response:

The nuclear power projects are being implemented by NPCIL based on a Debt to Equity ratio of 70:30 and typical components of tariff in respect of nuclear power are Return on Equity, Depreciation, Interest on Borrowings, Interest on Working Capital, Heavy Water Charges (for PHWRs), O&M cost, Fuel Charges, Decommissioning, and Insurance. It is pertinent to mention here that the cost of waste management is internalized and there is no separate cost towards this in the tariff.

6.5 KBS Observation:

The draft EIA mentions the-so-called levelised lifetime costs. "Levelised lifetime costs have been evaluated at 2005-06 price level. The break even discount rate for nuclear and coal fired power at which levelised costs are equal, works out to be 7.12% and the corresponding levelised cost Rs 1.78 per kWh." This statement is reminiscent of the statements about levelised tariff which were made in the context of the Enron Dabhol Power Project. A great deal of mischief has been perpetrated on the Indian nation and the Indian citizens in the name of fictitious 'levelised tariff' calculated on fictitious parameters.

Response:

In the context of comparative levelised cost of generation, the study carried out by Organization of Economic Co-operation and Development (OECD) published in the year 2005 can be referred, which gives a clear picture about cost competitiveness of nuclear power plant vis-a- vis the other electricity generating technologies. Jaitapur Nuclear Power Project can simply not be compared with Enron Dabhol Power Project as there is no analogy between JNPP and Enron project.

6.6 KBS Observation:

What the nation, its public sector institutions and its citizens have to pay is not levelised tariff, but real tariffs based on actual costs and parameters. We hereby demand that NPCIL make public the actual capex and other parameters which go into the computation of tariff for the first two units of the proposed JNPP.

Response:

The levelized cost is an approved methodology for comparing the efficacy / cost competitiveness of different technologies essentially to bring them on the common footing on life time basis and does not indicate the actual tariff for sale of the electricity from the power generating unit.

All the elements required for computation of the tariff, as explained in the preceding paragraphs would be taken into account so that the final tariff for electricity form JNPP is comparable to the unit energy cost of electricity from other contemporary electricity generating technologies in area around Jaitapur site. The capital cost of JNPP-1 & 2 is under deliberations between NPCIL and M/s AREVA, France.

6.7 KBS Observation:

The Enron experience is pertinent in this context. The Dabhol project began to supply power in 1999. It soon became clear that the actual tariff was much higher than earlier claims. By 2001 MSEB could not make the monthly payments due to lack of funds and power supply was stopped. Had Enron itself hot collapsed and gone bankrupt in September 2001, MSEB would have been bankrupted.

Response:

Jaitapur Nuclear Power Project can simply not be compared with Enron Dabhol Power Project as there is no analogy between JNPP and Enron project.

6.8 KBS Observation:

Even though MSEB escaped bankruptcy due to the collapse of the creditor, the resultant costs of the Dabhol debacle are huge and are of the order of tens of thousands of crores. Our banks like IDBI are sitting on thousands of crores of NPAs. The situation demands that a fresh cost benefit analysis of the Dabhol Project be performed till date. A current Cost-Benefit analysis of the Dabhol Project will show huge negative balance financially, socially and economically. It is being avoided in -the same way that the Kurdukar Commission was scuttled, due to political reasons, by the governments at the State and Centre. We should at least learn from the mistakes of the Dabhol Project and not repeat them with JNPP.

Response:

Jaitapur Nuclear Power Project can simply not be compared with Enron Dabhol Power Project as there is no analogy between JNPP and Enron project.

6.9 KBS Observation:

The Dabhol Power Project was a 2,000 MW project. The JNPP is five times that size. The World Bank had warned that the Dabhol Project was not viable on the grounds that expensive hydrocarbon fuel based power is not a viable option for a base load plant. By the same token, it is very necessary to do correct calculations based on correct data, to calculate the correct costs of power from imported commercial nuclear power plant., and then decide whether this kind of power is a viable option for base load power. Nuclear power can only function in base load configuration. .

Response:

The Jaitapur Nuclear Power Project should not be compared with Enron Dabhol Power Project as there is no analogy between JNPP and Enron project. The viability of nuclear power in India has already been explained in the Response in S. No. 1.12.

6.10 KBS Observation:

It is also relevant to note that according to the World Bank, unsubsidized nuclear power is not commercially viable or bankable. The World Bank has stated: "Bank fending for the energy sector requires a review of sector investments, institutions and policies. Nuclear plants in the power sector would not be economic; they are large white elephants", (World Bank 1992, Guideline for Environmental Assessment of Energy and Industry Projects, World Bank technical paper No. 154 / 1992. Environmental Assessment Sourcebook, Vol III.)

Response:

The nuclear power on commercial basis was introduced to world in as early as 1950/60 since then a lot of experience has been gained globally. Over 13000 reactor years of experience have been gathered, which clearly indicate that nuclear power is highly potent source of clean and sustainable energy. In view of compelling merits of nuclear power in addressing the climate change concerns and also an economic viable source of energy, currently the world is experiencing nuclear renaissance. Currently 438 reactors are in operation with an installed capacity of about 372 GW and 58 reactors are under construction. Over 200 reactors have been planned in 30 countries for next 20 year (Source: WNA). Many such countries, which were not encouraging nuclear power to be deployed as a source of electricity generation, have now decided to deploy nuclear power plant. The cost competitiveness of the nuclear power has been a much deliberated subject globally. In this context, organization of countries for economic co-operation and development (OECD) studies of 2005 can be referred, which is relevant in present scenario. This document gives a clear picture about cost competitiveness of nuclear power plant vis-a- vis the other electricity generating technologies.

6.11 KBS Observation:

There is no information regarding the capital cost of the JNPP in the EIA. However, a similar plant being built in Finland, the Olkiluoto Plant has incurred costs of Euro 5.3 billion till date for 1630 MW. This translates into a cost per MW of Rs 19.5 crores. (See Annexure 6A)

Response:

It may please be noted that the capital cost of EPR unit under construction in Finland should not be compared with similar units in Indian scenario, because one of the major contributor of the capital cost is manpower deployed during manufacturing, construction , erection and commissioning stages of the plant. In case of Finland plant, these costs are based on European indices, whereas in case of EPR units at Jaitapur site, the construction, erection and commissioning will be carried out by Indian entities. Efforts are also being made to localize some of the supply of the equipment and material from the Indian industries for overall optimization of the capital cost of the plant.

6.12 KBS Observation:

The recent Maharashtra Government Economic Survey (2009-10, P. 135) has revealed that the 2 units of JNPP will cost Rs. 60,000 crores. This translates into a cost of Rs 18.2 crores per MW installed. (See Annexure 6B)

Response:

The nuclear power plants in India are established by Central Government under Department of Atomic Energy through NPCIL / BHAVINI. The cost estimation for such plans also falls under the purview of above establishments. The mechanism, by which the figure of 60,000 crores for two EPR units at JNPP site has been arrived, needs to be checked, as the cost of these two units is yet to be fianalised.

6.13 KBS Observation:

The capacity charge component of the tariff can be computed based on certain reasonable assumptions. (Annexure 6G) On this basis the tariff for the first ten years works out to Rs. 9.00 per unit.

Response:

Please refer Response of S.No. 6.1 and 6.4.

6.14 KBS Observation:

The economic consequences of supplying such expensive power in a base load configuration will be severe, and must not be overlooked or underestimated. They will result in an increase of the average tariff of power supplied by NPCIL. This cost will have to be borne by the consumers. Risk of default by consumers, or demand contraction, due to unaffordable power price is not negligible and must be estimated before the decision is taken to go ahead with the project. Having to sell such large quantum of expensive power raises the possibility or prospect of NPCIL becoming destabilized, or else the national exchequer being loaded with huge bail-out costs.

Response:

Please refer Response of S.No. 6.1 and 6.4.

6.15 KBS Observation:

A bankrupt nuclear power project has far worse consequences and hazards than a bankrupt LNG based power plant, because of the serious problem of nuclear waste management which will run into thousands of year.

Response:

As per the provisions of Atomic Energy Act, 1962, the nuclear power plants in India can be set up and operated by the Government of India or its authorized Public Sector Undertakings (PSUs.) All the nuclear material including spent fuel at NPP is the property of Government of India. The safety and security of these materials is ensured by GoI.

Chapter -7
Ecological Impact of JNPP

KBS Observation:

JNPP is planned to be located on the Madban Plateau. For this purpose 690.401 hectare of land has been acquired. Of this 62.074 Ha are classified as under kharif crop, 227.65 Ha as fallow and 400.762 as barren. 90% of the land is considered to be unproductive wasteland and hence it is claimed that excavation of these lands for the erection of the nuclear power plants and the ancillary and other buildings would not have any adverse impact, overlooking the fact that these lands are very rich in biodiversity.

Response:

The proposed plant site is adjoining the sea coast and is mostly a rocky barren stretch of land with patches of grass lands with scrub (Ref. Indian Remote Sensing data, Section 3.7.8, page No. 214-218 of Vol-I, EIA report). The low biodiversity of the project site has been indicated by the study given on pages 28-29 of biodiversity report of College of Forestry, Dapoli (Annexure VII in Volume II of EIA Report). This area does not have plant species or ecosystem which are unique to this area and which are not present at other places in study area. Similar plant species and ecosystems are present throughout the study area. This is very small area as compared to large stretch of land in Ratnagiri District with good biodiversity, thus there will not be loss of biodiversity due to erection of the NPP.

Further, green belt will be developed around JNPP up to 1.5 km area using selected local plant species and the area among them will be kept undisturbed which will have native floral biodiversity. Thus native biodiversity will be maintained around the project site. The detail plan of the green belt development is presented in Section 10.10.3.1.2, page nos. 458 – 464 of Chapter-10 of Vol-I of the EIA report and the work of development of biodiversity rich green belt will be undertaken through College of Forestry, Dapoli.

KBS Observation:

The work of assessing the status of biodiversity was outsourced by NEERI to the College of Forestry, Dapoli directing them "to prepare a detailed report on the status of wildlife and biodiversity at the proposed site of NPP and in 25 km radial data around".

Response:

The College of Forestry, Dapoli has wide experience of studying the biodiversity of the Ratnagiri District as well as in other parts of the country. This college has prepared e-herbarium of the plants for reference purpose during their taxonomical study. The College of Forestry also maintains a 50 ha Biodiversity Park or genomic valley where there is collection of many rare, endangered and medicinal plants. This indicates that the College of Forestry is the competent institution to carry out biodiversity study in the study area of JNPP. Therefore the study of wildlife and biodiversity at proposed project site and within 25 km radial area around the project site was awarded to this college and the Biodiversity Report submitted by them is annexed as Annexure – VII in EIA Report Vol. II.

KBS Observation:

The survey results are presented for five zones 1-5km, 6-10km, 11-15 km, 16-20 km and 21-25km. No data are presented separately for the project site.

Response:

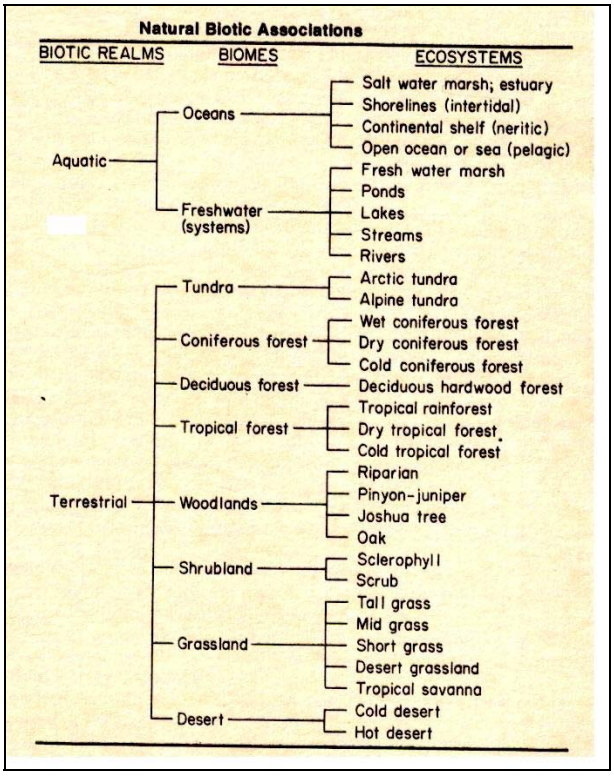
The project site is mostly rocky and barren. Many photographs and remote sensing data of the project site are given in the report. The description of the project site is given on Page 28-29 of the Biodiversity Report of College of Forestry Annexure VII, Volume II of EIA Report. The supplementary information is given in section 4.0 and Table 1, Table 2 and photographs of the project site are given in Plates 1(a) & 1(b) on Pages S-5 to S-8 in Summary EIA of EIA Report Volume 1. More photographs of Project site are given in Plates 2.1 to 2.7 in Chapter 2 in EIA Report Vol. 1. The information is also given in section 3.8.2 on page 234 in Chapter 3 of EIA Report Volume 1 – "The proposed site is adjoining the sea coast and is mostly a barren stretch of land with sparse savanna vegetation. At Project site, only sparse vegetation is present".

KBS Observation:

A standard habitat classification system is not used while presenting the results in the ecological study.

Response:

Standard IUCN habitat classification given by J.G. Rau and D.C. Wooten in their book "Environmental Impact Analysis Handbook" (Publisher: McGraw-Hill, Inc.) (please refer following Table) was used in the study. Accordingly, College of Forestry has classified the Terrestrial ecosystems of the study area as grassland, forest (or woodland), and Aquatic: Oceans: salt water marsh; estuary i.e. mangrove (Section 4.1 of Biodiversity Report of College of Forestry, Dapoli) and the College of Fisheries, Ratnagiri studied Aquatic: Oceans: shorelines (intertidal) ecosystem and coastal ecology (Annexure VIII in EIA Report Vol. II Annexures).



KBS Observation:

Specific study of the lateritic plateau where there will be a near total destruction of the existing rich flora and fauna due to erection of nuclear plants and other buildings does not seem to have been carried out. Consequently data giving attention to characteristic habitat types, its associated flora, fauna, their biological significance and ecological status are lacking.

Response:

Study of the project site and its ecosystem is given in the report. The plateau region is mostly composed of the laterites, which are derived from original basaltic rock (section 3.7.1, page 207 of EIA report) with insignificant bio-diversity as described earlier in the response to the comments of KBS. So the loss of biodiversity due to construction of the NPP will be insignificant. This will be compensated by conservation of grassland ecosystem along with the proposed green belt in the exclusion zone of the JNPP. Moreover the whole Ratnagiri District have laterite plateau ecosystem at various places which will not be affected by the JNPP project activity. The detail information on the flora of project site and residential complex with respect to bagayat, kharip land, varkas land, pot kharaba land is given in Table 1 and Table 2 respectively in Summary EIA. Details of tree vegetation on the land being acquired for plant and residential complex of JNPP is given in Table 3.10.7 on page 324 in Chapter 3 of EIA Report Vol. I. The construction of residential complex will be carried out carefully to avoid unwanted destruction of trees and only the minimum number of trees from the area earmarked for construction will be cut and compensated in the form of green belt around the plant, and all other trees will be maintained as such.

Specific points for which clarification is needed are presented below:

KBS Observation:

1. 29 species of herbs are not identified up to species level in the list on page 27 of the final report. Only genus name is mentioned (referred as sp./spp.). How was their endemic/threatened status decided without complete identification?

Response:

The endemic species are identified based on genera and those which were identified as endemic were studied upto species level. Non endemic genera were not taken up for analysis up to species level.

KBS Observation:

2. There is no proper representation of the lateritic plateau flora (which is characteristically seen on Ratnagiri and Devgad plateaus) in the ecological report. For ex. how is it that common species *Dimeria woodrowii* (an endemic), *Utricularia reticulata* are not included in the species list? The report mentions on page 13 that sampling points have covered predominantly the forest ecosystem. (Section 4.1 of the final report .pdf). Only a list of grasses is provided from the grass covered plateaus. What was the reason for not adequately covering the diversity aspects of these habitats?

Response:

The lateritic plateau is the part of terrestrial environment throughout the study area described in the report. Whole study area had been studied in detail for biodiversity and the results are given in the report.

The purpose of EIA is to have a fair idea about the biodiversity of the area which might get affected by the project activity and the conclusions are based on the taxonomical data/Monographs already generated for the area. Presence of Dimeria woodrowii (an endemic) *and Utricularia reticulate which will be added as secondary information in the final EIA report.*

The study area outside the project site will not be affected by project activity. However, the general environmental management plan will also take care of protecting species like Dimeria woodrowii and Utricularia reticulata, a small plant inhabiting wet soil or pond water.

The list of grasses given is not only for the grass covered plateaus but for the whole study area. The list of trees, herbs, shrubs, climbers and mangroves and their associates in the study area are also covered in other tables in the Annexure VII of Vol II of EIA report.

KBS Observation:

3 What are the references that were followed? Singh et al. (2000) and Flora of Maharashtra mentioned in the text have not been given in full in the references section. Why was the latest Botanical Survey of India publication on threatened plants (Mishra and Singh, 2001) not followed? The quoted literature, Flowers of Sahyadri and further flowers of Sahyadri used is popular handbook and not a standard flora (as published by Botanical survey of India or any other institution reputed in floristics) and is not adequate to identify the specialised ephemeral flora, esp. Eriocaulaceae, Cyperaceae and Poaceae members on the rocky habitats.

Response:

College of Forestry is a renowned Institute in taxonomical study of the plants in the forests. They have rich experience in identifying the taxa and have all the available expertise, reference herbariums, and Biodiversity Park as support. They have used standard taxonomical references as well as the standard books on local plants for identification of the plant taxa. This is the general practice in any scientific study. College of Forestry used the Flora of Maharashtra (2000) of Botanical Survey of India for the analysis of the plant taxa, which is itself enough to identify the plant species. They have also used standard book on taxonomy like Flora of Bombay Presidency Vol I – III (1956) of Botanical Survey of India. In addition, the book "Flowers of Sahyadr" was used as support literature during the study.

The account of threatened and endangered plant species, which is based on standard references, is given in the book of Singh et al. 2000.

The following references in full will be added to the final EIA report in the references section.

- *Singh, N.P.Laxminarasinhan P. karthikeyan S. and Prasanna P.V. 2001. Flora of Maharastra, Vol II, B.S.I. Kolkota*
- *Singh N. P. and Karthikeyan. S. 2000. Flora of Maharasthra. VOL I. BSI, Kolkota*

KBS Observation:

4. Why a standard habitat classification system (for ex. Used by IUCN) not used to classify habitats? It appears that an agricultural land classification was followed, which is unsuitable for ecological studies as it does not have a proper Classification for the habitats seen in the region. It only gives categorization in terms of land-use-leading to the lateritic plateau habitat being referred to as wasteland.

Response:

Standard IUCN habitat classification system is covered in the preceding paragraphs. Agricultural land classification is not followed for habitat classification which is clear from the above mentioned response. For remote sensing data, the land use / land cover classification system standardized by Department of Space for mapping different agro-climatic zones has been adopted in remote sensing study and is used by Maharashtra Remote Sensing Application Centre, Nagpur to classify the land use pattern as per their standard guidelines.

KBS Observation:

5. The landscape in this region is heterogeneous. For adequate sampling of such a landscape, stratified random sampling is a preferred sampling technique. Instead of which random sampling was followed. The survey does not clarify how many sampling points were taken on the lateritic plateau habitats. It is hence necessary to separate data for the lateritic plateaus and analyse it to understand the diversity measures on the plateau in this survey.

Response:

The study area has predominant lateritic plateau area. The study area is undulating plateau but not stratified like vegetation communities on the slopes of very high mountain. So random sampling is the best method to study the study area. Whole study area was divided into 1250 grids with each grid measuring 1km x 1km area and 100 grids were selected for study which contains

KBS Observation:

6. The report mentions lack of sensitive habitats as there are no National parks/sanctuaries in the area, However, it is not necessary that sensitive habitats are present "ONLY" within National parks/sanctuaries. There is enough published literature which designate lateritic plateaus as specialised habitats with high endemism, threatened flora and specialised vegetation type. The report has not taken cognizance of the secondary information about this habitat which is available from Ratnagiri and Sindhudurg districts.

Response:

The Konkan plateau in Ratnagiri is derived from basaltic rocks and extensive spread of laterite is observed throughout the district especially on south Ratnagiri side. *There is mention of sensitive habitat of mangrove ecosystem (section 4.5 on page no. 29 Biodiversity Rport of College of Forestry, Dapoli) as well as the list of rare and endangered species (Page 15-16 in Biodiversity Report of College of Forestry, Dapoli) in this study area consisting of laterite formation.*

KBS Observation:

7. Dipcadi concanense a threatened species is included in the listing but it has not been reported from the 5km radius zone from site, and hence the conclusion given is that it will not be affected. This critically endangered" species is now present ONLY on a few lateritic plateaus in Ratnagiri, Sindhudurg and Goa areas. It is hence necessary to conduct more study on its distribution in the study area to decide whether or not the development of plant and related infrastructure development (like roads, houses, garbage dumps) will affect the existing habitat of the species. It is possible that the already fragmented population will suffer more loss in germplasm if the continuous habitat availability is disturbed.

Response:

The main objective of the report is to describe the impacts of project activity on the local ecosystem. The study area outside the project site will not be affected by project activity. However, the general environmental management plan will also take care of protecting species like Dipcadi concanense.

KBS Observation:

8. The report mentions that sampling was done in monsoon, but the duration and dates of the survey are not reported. The report says that the sampling points were visited once in the monsoon, (final. report. pdf, Chapter 4, 4.1: page 13) The lateritic plateau habitats are colonized entirely by ephemeral fauna which needs frequent and periodical sampling as is documented in relevant literature on the subject (Annexure : Note by Dr. Aparna Watve on Lateritic plateaus). The methodology does not document adequately the special sampling efforts taken to study lateritic plateaus ephemeral flora, which leads one to suspect that special efforts have not been made due to lack of understanding of biological significance of the plateaus.

Response:

Sampling was carried out in monsoon for a continuous period from June to November 2007, during which all the species of ephemeral herbs, climbers and shrubs were developed in the region and were recorded in the report of the College of Forestry, Dapoli. A total number of species of shrubs, climbers and herbs recorded in summer was 24, 23 and 8 respectively while it was 27, 47 and 77 in rainy season indicating a large number of ephemeral species recorded during the study (Section 4.3 on page 27 and Table 4.8 on page 28 in Biodiversity Report of College of Forestry, Dapoli).

KBS Observation:

9. The diversity index H'(Shannon's index) of herbs in summer and monsoon shows hardly any difference in H', and it is difficult to understand the reasons as the diversity of herbs should be much higher (as expected from the increase in species richness).

Response:

The number of herb species recorded in summer and rainy season are 8 and 77 respectively (Table 4.8 on page 28 of Biodiversity Report of College of Forestry), indicating higher species diversity in rainy season. Diversity Index is a statistical estimate of the diversity and evenness of different species in the community size. If the evenness is more the diversity index is more, however if a few species are large in proportion and others are more or less even, then the diversity index is lowered. The value of Shannon Wiener diversity Index (H) values for herbs were 1.4201 and 1.5329 in summer and monsoon respectively, which indicate low number of herb species in summer and the unequal or uneven distribution of herb species in rainy season due to their gregarious nature resulting in lowering of diversity index.

KBS Observation:

10. Generally in herbaceous layer sampling for such habitats, ground cover is to be measured within a grided 1X1m frame. The method applied by the ecological survey may result in under representation of individuals of small ephemeral species, which are typical of the lateritic plateau habitats.

Response:

The same method of 1mx1m grid is followed for studying herbaceous layer of vegetation. There is standard practice of studying herbaceous flora within

1mx1m quadrate taking representative number of quadrates in the area, therefore the herb flora is not underrepresented.

KBS Observation:

11. One third (1/3rd) of grass species in the grassland list are unidentified, hence their endemic status is not considered.

Response:

The endemic species are identified based on genera and those which were identified as endemic were studied up to species level. Non endemic genera were not taken up for analysis up to species level.

KBS Observation:

12. One member of Cyperaceae family (a sedge) is included in the list of grass species. Cyperaceae, Eriocaulaceae members which are common, dominant and characteristic families on rocky areas and especially lateritic plateau are not enumerated adequately in the report.

Response:

The name of family and the habit - sedge in case of Fimbristylis merrillii (sedge) from Cyperceae family will be included in the final EIA report.

Eriocaulon humile, a lone member of Eriocaulaceae has been reported from Khandala in Pune District and Matheran in Raigad District as vulnerable and endemic species (Red Data Book of Plants of India by Nayar & Sastry, 1987-88). This species as well as other species from this family have not been observed by the study team of College of Forestry, Dapoli in the study area and therefore do not find mention in the report.

KBS Observation:

13. Secondary data of reptiles and amphibians, has not been considered, saw-scaled viper a common occupant of plateuas in the area has not been mentioned.

Response:

The data on reptiles and amphibians are mostly based on the information from the local people which is authentic information on the presence of species in the area. Six species of amphibians and 12 species of reptiles are recorded to be present in the area.

KBS Observation:

14. The effect of lateritic habitat fragmentation due to formation of roads, changing of drainage, construction of housing and supporting infrastructure, has not been discussed.

Response:

There is no wild life habitat and migratory path in the 0-5 km area around the project site. So the project activity will not affect any wild life habitat. The development of approach road, interconnecting roads and drainage pattern at project site and residential complex will be implemented in such a way to avoid habitat fragmentation as far as possible.

KBS Observation:

15. The amphibian and reptile diversity is also found to be least explored in the-study. Especially, presence of the nocturnal frogs and toads is to be carefully observed. Wildlife schedule status of reptiles/amphibians not mentioned. Rocky

areas esp. lateritic plateau habitats are well known for endemic herpetofauna (Varad Giri, BNHS) and more care needs to be taken in documentation. An endemic and threatened gecko species has been described from Dorle plateau. This has not been mentioned in the report even as secondary information.

Response:

Reasonably detail salient aspects of biodiversity are included in the report on the basis of which environmental management plan has been prepared which is sufficient enough to protect wild life as well as biodiversity at microscopic level
The wild life status of python and Varanus bengalensis as Scheduled -I species as per Wildlife Protection Act , 1972, amended in 1993, will be added in final EIA report.

KBS Observation:

16. List of floristic subject experts consulted for the area has not been mentioned.

Response:

College of forestry has the team of experts in plant taxonomy viz. Prof. A.D. Rane, Prof. D.N. Mokat, and Prof. V.K. Patil who are assisted by research workers Mr. K.P. Gadekar and Mr. M.M. Naik. The names of the team members is given in the report of College of Forestry, Dapoli at Annexure VII, EIA report Vol II Annexures. The floristic experts from NEERI side are Dr. P.R. Chaudhari, Project Advisor, Dr. J.P. Kotangale, Project Manager, assisted by Mr. Sameer Deshpande, Project Assistant

KBS Observation:

17. Adequate secondary information from marine coastal fauna has not been included in the report.

Response:

The secondary information on marine coastal fauna is given in the EIA report. A list of 85 species of marine fishes along the coastal belt of Ratnagiri district is given in Table 3.8.4 (Source: Department of Fisheries, Ratnagiri), details of marine fishery in Table 3.8.5 and details of inland fishery in Table 3.8.6 (source: Statistic Abstract book, Ratnagiri and Sindhudurg Districts for the year 2003-2004) and local fisheries scenario on page 253-254 (Source: fish landing Centers at Sakharinate and Tulsunde) in Chapter 3 of EIA Report Vol I.

KBS Observation:

18. In the mangroves, occurrence of a patch of Rhizophora apiculata L at village Mirawane is not mentioned. The said species is classified under endangered category (According to the CAMP, Goa report) and which is rare in its distribution along the Maharashtra coast. Presence of Sonerotia alba supporting significant bat colonies (at Dale Jaitapur), which is a unique coexistence for pollination, is also not mentioned. We could observe the sea otters in the forests and interlinking of surrounding deciduous patches by the langoors is also important in the study area. (Dr. Mahesh Shindikar, pers. Comm..)

Response:

Necessary data will be incorporated in the final EIA report. However, the above mentioned area is away from the impact zone of the project as neither the discharged water nor any conventional pollutant is likely to reach this area due to design of proper EMP. Therefore, the existing status of this patch with whatever diversity it has, will remain unaffected.

KBS Observation:

19. In the recommendations, creation of green belt has been proposed, which is totally inappropriate for the habitats involved as .it will drastically modify the lateritic plateau, for which natural vegetation is of ephemerals. The ecology of the rocky plateau is not conducive for tree cover on large scale and extremely intensive habitat modification will be needed in creation of green belt which will lead to further degradation of the habitat.

Response:

The current state-of-the-art technology available for remediation of mines spoil dumps, rocky areas with proper supplementation of soil and bio-fertilizers is available in the country. NEERI has remediated number of spoil areas using this biotechnology. A proper assessment of lateritic soil and its amendment with good soil and bio-fertilizer can be used to create proper greenbelt. This technology is environment friendly and will not endangered the existing habitat.

KBS Observation:

In the absence of basic ecological information that would have brought out the gravity of the damage that the JNPP would perpetrate, observations and knowledge of the Madban residents and the results of the study of lateritic plateaus in Konkan are used as points of reference.

Results of the study by Dr. Aparna Watve "Plant community studies on the rock outcrops in the northern Western Ghats of Maharashtra" are summarized below:

"Vegetation of lateritic plateaus

The vegetation is dominated by low growing herbs. It shows distinct changes in species composition according to the progress of the monsoon. Geophytic Liliaceae *(Dipcadi, Iphigenia),* Orchidaceae *(Habenaria, Peristylus)* start flowering in the early monsoon phase (June-July). Gregarious flowering occurs in the late monsoon period. (August-September) in which *Eriocaulon* spp. together with carnivorous *Utricularia* spp. are prominent. The vegetation growth ends by the flowering of grasses *(Dimeria, Ischaemum, Glyphochloa)* in the post-monsoon phase

Endemism in flora

Abundance and dominance of endemics is an important feature of this habitat. Regional floristic studies have reported presence of many narrow niched endemics and habitat specialist plants from low as well as high-level lateritic plateaus (Bachulkar, 1983; Deshpande et al., 1993; Mishra & Singh, 2001; Yadav & Sardesai, 2002; Gaikwad et al., 2003; Joshi & Janarthanam 2004). A study of palaeotropical ephemera! flush vegetation showed local endemics on Indian laterites (Porembski & Watve, 2005).Based upon primary and secondary data, 134 endemic species have been recorded to occur on lateritic plateaus in the Western Ghats and Konkan region of Maharashtra. Many of these-endemics (viz. Dipcadi concanense, Wiesneria triandra, Camptorrhiza indica, Dimeria woodrowii) show highly restricted geographical distribution and are specific.to microhabitats on lateritic plateaus (Gaikwad et al, 2003) in Konkan-Malabar region. Forty species on lateritic plateaus are listed as threatened according to IUCN criteria by the Botanical Survey of India (Mishra and Singh, 2001). Highly specialized ephemeral vegetation and abundance of endemic species makes lateritic plateau vegetation in Maharashtra globally unique.

Fauna of outcrops

The rock outcrops also support insects, fish, amphibians, reptiles and birds which have adapted to live in the stressful environment. Small mammals like rodents feed on underground parts of the vegetation.

Socio-cultural and economic values

Apart from the biodiversity value, the lateritic plateaus are important for local communities in many ways! They are important as grazing lands for surrounding villages during the monsoon period as they have abundant growth of grasses and forbes. The shrines of deities worshipped by shepherds and places of ancestral worship on these outcrops have a special socio-cultural value for local communities. The rocky plateaus also serve as watershed areas. The hard rocky surface facilitates collection of rainwater into small rivulets, monsoon streams which further join to form waterbodies. Most of the lateritic plateaus have ponds or lakes as the hard rocky carapace allows water storage for a long period. In addition the softer strata below lateritic mantel has underground water channels and hence perennial streams often originate along the edges of the laterites which are extremely important for local people as well as livestock for sustenance,

Lateritic plateaus management and conservation

There is however, a serious lack of awareness in society regarding the biological, social and cultural importance of rock outcrop habitats such as lateritic plateaus. The checklist of endemics on outcrops includes 12 critically endangered, 23 endangered and 10 vulnerable species listed in the recent evaluation of threatened plants (Mishra and Singh, 2001) from Maharashtra. But the dry physical appearance has misled government departments to classify these as wastelands. In old toposheets these areas are marked as sheetrock or scrub or as wastelands. This has led to disastrous results as many activities have been allowed on the lateritic plateaus without adequate Ecological Impact Assessments. Only those outcrops which are present within wildlife sanctuary areas of Chandoli, Koyana, Radhanagari and Dajipur receive some protection. However, none of the Konkan plateaus are within any protected area and hence, they as a habitat are highly threatened. Quarrying for rocks, conversion of land for residential and industrial areas has fragmented and destroyed many of the laterite habitats in Konkan especially in Ratnagiri district. It is thus necessary to take immediate steps towards the preservation of these unique habitats". [Refer Annexure 7A for full text of the said research]

In view of the above, Madban plateau needs to be scientifically studied to understand its unique biodiversity value. Until a thorough ecological investigation of the project site as directed by NEERI is carried out covering the period at least from May to December and the results are evaluated scientifically from conservational angle, decision regarding giving environmental clearance to JNPP should be postponed.

Response:

The data given in the above point is related to the whole Western Ghat and Konkan Region and is useful. It is observed that with a proper EMP in place, a proper greenbelt can be developed on lateritic soils which is a common characteristics of Western Ghat and Konkan region. As the project site comprises a small patch integrating the available information with new biotechnological approach a proper greenbelt ecosystem will be developed on the plant site and also protect the habitat from further degradation. NPCIL is committed to use best of the technology and the available knowledge for protection of environment.

CHAPTER 8
NEERI fails to account for many aspects of risks, safety of NPP and their impacts

8.1 KBS Observation:

NEERl has not carried out an independent examination of the most crucial environmental impacts from the proposed nuclear reactors at Jaitapur, those related to radiation.

The main environmental impact of concern pertaining to nuclear projects is the release of radioactive materials and its effects on public health. The ElA's assertions about expected levels of radioactive discharges following commencement of operations are not based on any independent analysis. There are also numerous claims that cannot be justified through fact or argument. For example, it claims that the actual releases will be far lower than the stipulated limits (p. 351), but there is no way to know that ahead of time. The actual releases will be known only when the reactors start operating. Similarly, on p. 390 NEERl offers the statement: —public domain dose values in case of TAPS, RAPS and MAPS have been reported to be mostly below 50 micro Sievert / year (20 times lesser than stipulated standard) presumably to suggest that the same would be the case at Jaitapur. However, the power rating of the two reactors at MAPS is 440 MW whereas the proposed reactors have a combined output of 9,900 MW, more than 20 times the output of the reactors at MAPS. Prior to the commissioning of TAPS III and IV and RAPS III and IV, the factors by which the capacity of the Jaitapur plants exceeds the outputs of the reactors at those sites are even greater.

Response:

With regard to independent examination of radiological impact by NEERI, Nagpur, this is to mention that they have carried out overall assessment based on the detailed inputs and special study reports as already mentioned in the preceding Response at S. No. 1.3 and 1.6. The authorized limits on the radioactive discharges are stipulated by AERB for the site. The Total Effective Dose to public at Fence Post is far below the maximum permissible by AERB, which are in line with International Commission on Radiation Protection (ICRP). These limits are not depending on the combined electrical out- put of the NPPs at the site. The limits take into considerations all the power producing units as well as other radiological facilities at the site.

The environmental survey data at various operating nuclear power plant sites of NPCIL, where multi units are under operation with varying capacity shows that the radiation dose to the members of the public due to released radioactive elements subsequent to the operation of nuclear power plants is only a fraction of AERB dose limit or background radiation levels. In line with this, for, JNPP, the design of the project will be such that the radiation dose to the members of public from all the routes is restricted to 100 µSv/y per unit. The details are presented in Annexure-IX (d), of Voli-II of EIA report.

8.2 KBS Observation:

The draft EIA underestimates the risk of accidents that could result from an earthquake at the Jaitapur site.

The reason to be concerned about earthquakes is that they simultaneously affect large parts of the nuclear power plant, thereby increasing the likelihood of accidents. The draft EIA says that the — site area is in zone-III as per the seismic zoning-map of Indian and — there is no earthquake activity around Jaitapur site in a radius of 39 km (pp. 209-

210). But, because of various uncertainties, it is difficult to have high confidence in assertions about the likelihood of earthquakes.

To start with, it is neither easy nor foolproof to forecast when an earthquake would occur or how intense it would be at any given site. Typically, this is done by classifying areas into seismic zones, with zone numbers varying from I to V, with a higher number implying a higher likelihood of a more damaging earthquake. However, these seismic zone classifications are revised from time to time as more understanding is gained about the geological features, in particular the tectonic aspects, and any seismic activity (Murty 2004). Future events may cause revisions of one's assessment of the likelihood of earthquakes at a site. For example, following the September 2001 earthquake that struck various parts of Tamil Nadu, the Geological Survey of India decided that peninsular India might have to be :

categorised as zone III instead of zone II (Subramanian 2001). More dramatically,

two major earthquakes, at Koyna (1967) and Latur (1993), occurred in areas categorized as zone I, supposedly the safest, causing these areas to be revised to zone IV and III respectively (Murty 2004).

The second source of uncertainty is how a nuclear reactor will behave in the event of an earthquake. Take, for instance, what happened to the Kashiwazaki-Kariwa nuclear power station due to the earthquake that struck Japan on July 16, 2007. Though the full impacts are still unclear, the known results of the earthquakeincluded a fire and leaks of radioactivity (Ban and White 2007). During the earthquake that hit on July 16, when the peak ground acceleration was 2.5 times greater than what was assumed for the most extreme case considered in the safety studies for the reactor.[1]

The larger implications and cause for concern came from a host of small failures that were completely unexpected (Ramana and Kumar 2007). One example of a completely unexpected event was how radioactive water was released to the environment from the reactor. The earthquake caused underground electric cables to be pulled down by ground subsidence, creating a large opening in the outer wall of the basement of the reactor - a so-called —radiation-controlled area that is to be completely shut off from the outside environment (Miura 2007). In the words of an official from the Tokyo Electric Power Company, —It was beyond our imagination that a space could be made in the hole on the outer wall for the electric cables.

To summarize, therefore, constructing such a large number of high capacity reactors in an area marked off as zone 3 is dangerous.

1 —Seismic acceleration 2.5 times reactor's specs, Kyodo News, July 31, 2007.

Response:

NPPs built all over the world, including those which are built in a highly earthquake prone country like Japan, are designed considering seismic effects specific to the site.

Nuclear Power Plants, whether located in active tectonic region or in stable continental region, are designed for earthquake resistance. Jaitapur Site is located in stable continental region and is 1600 Km away from the active tectonic region of Himalayas. Even for such stable continental regions, the plants are designed for a 6.5 magnitude (Ritcher scale) earthquake (intra-plate earthquake of Koyna).

There is no earthquake activity around Jaitapur site in a radius of 39 Km. This is based on the earthquake data collected from Koyna Bandkam Vibhag and MERI from 1973 till date, as well as from NPCIL's own micro earthquake recorders installed by NGRI, Hyderabad around Jaitapur site which have not recorded any

event of a micro earthquake or major earthquake within a distance of 39 Km around Jaitapur.

Conventional plants like thermal power plants, hydro power plants, and chemical industries are designed for earthquake loading using the seismic coefficient method described in the seismic design standard IS 1893 in terms of acceleration in the zone in which the plant is located. As per the standard, the country is divided into various seismic zones and for each seismic zone a seismic coefficient is specified for design. Compared to the seismic coefficient method followed for seismic design of conventional power plants & industries, the seismic design of Nuclear Power Plants are carried out for site specific ground motion. For this, detailed geological & seismological studies are conducted with different scales of field check, such as upto 5 km radius, 50 km radius, and 300 km radius, around the plant site.

The active faults within the region are confirmed by experts from Geological Survey of India after carrying out field checks. The status of the faults is then reviewed by independent national experts to arrive at the maximum earthquake potential of these faults. The values so arrived at are generally enhanced by one magnitude over the maximum magnitude of the recorded earthquake in the vicinity of the active fault. Such enhanced magnitude earthquake is then assumed to be occurring on a fault closest to the plant site. The peak ground acceleration (PGA) at the plant site is then arrived at for such enhanced magnitude and reduced epicentral distance. Using this PGA, a Site Specific Ground Motion (SSGM) is generated, for which the nuclear plant structures, systems and equipment are designed by detailed analysis and testing.

The Nuclear Power Plants at Kashiwazaki-Kariwa witnessed a 6.8 magnitude earthquake with an epicenter at 16 Km from the plant site on July 16, 2007 .In spite of such large magnitude earthquake experienced at Kashiwazaki-Kariwa NPPs, the major damage was only a fire to one of the electrical transformers. The safety systems of the plants functioned as per design intent and the reactors were brought under safe shut down condition. The transformer, which caught fire, was on a raft foundation with piles underneath it, whereas the bus bars connected to the transformer bushings were resting on a foundation which was resting on backfilled soil. On account of vigorous ground shaking, the back fill soil got compacted/consolidated resulting in ground subsidence. This consolidation /subsidence led to the foundation of the bus bar settling down with respect to the raft foundation of the transformer and this differential settlement caused the weight of the foundation of the bus bar & the bus bar to come on to the transformer bushings. This, in turn, resulted in breakage in the bushing, leakage of transformer oil and the oil catching fire due to electric sparks caused by short circuit and eventually the transformer catching fire. Such an incident is not expected to occur at Jaitapur site, as the plant structures will be located on hard rock strata (which do not suffer from consolidation settlement in the event of vibratory ground motion). .

The other incident quoted is related to leakage of water containing some traces of radioactivity into the sea via a non-controlled area. This was caused due to sloshing of water in the spent fuel pool and the resultant splash over of water into the non-controlled area via electrical cable conduit opening on the floor. The water flowed into a sump located at a lower elevation. When the water level in the basement increased over the set level, the water from the sump was pumped out by the sump pump. The dose level due to this release was far less than an

average annual dose to a person from natural sources. Such incidents are not expected to occur at Jaitapur site as the plant structures will be located on hard rock and also as the site is not expected to experience the large magnitude of ground motion as that experienced at Kashiwazaki-Kariwa NPP Site.

The incident related to the failure of cable penetration opening occurred on account of subsidence of soft soil on account of the exceptionally strong vibratory motion. Such incidents are not expected to occur at Jaitapur plants as the structures will be located on hard rock.

Jaitapur site is located in a stable continental region and is situated away from active tectonic faults. The foundation strata for the NPP structures will be hard rock with shear wave velocity V_{s30} of 2000 m/sec and above. In contrast the Kashiwazaki-Kariwa plants are founded on soft soil with shear V_{s30} of 400 m/sec. It is well known that during an earthquake, the displacements on soft soil is higher compared to hard rock and such large displacements cause more damage to structures, systems and equipment. Furthermore, because of a peculiar local geological condition, one of the plants of the Kashiwazaki-Kariwa witnessed a PGA of 0.68g. In comparison, the expected PGA for plants located in stable continental region and hard rock (such as at Jaitapur) is less than 0.2g. It is pertinent to note that even for a 0.68g PGA earthquake, the plants were shutdown without any difficulty and there was no damage to the reactor core as well as to the structures, systems and equipment important to safety.

As indicated above, one of the units of Kashiwazaki-Kariwa NPPs experienced a PGA of 0.68g which was 2.5 times higher than the design PGA of 0.273g. Even for such a large acceleration of 0.68g, the plants could be shutdown, demonstrating that all the reactor equipment, shutdown system, control and electrical equipment performing safety functions have functioned normally during and after the earthquake. Other plant systems and equipment have also performed well without any damages (except for the damage to the transformer mentioned above) and damage to the penetrations in the civil structure below the ground level in the soil.

The above confirms that, generally, the NPP designs have inherent design margins for dynamic loads such as earthquakes.

8.3 KBS Observation:

The draft EIA has not discussed the known safety problems with the EPR design. For example, in 2009, according to—the trade-publication *Uranium Intelligence Weekly*, the United Kingdom's safety regulatory agency was concerned that the EPR's control and instrumentation C & l systems were interconnected when they should be independent of each other. Another concern was the lack of safety display systems or manual controls capable of carrying out a reactor shutdown, either remotely at an emergency remote shut down station. Another problem that has been identified by Electricite de France (EDF), the main utility in France, is related to the ejection of control rods.

http://www.pei.org/html/print.php?sid=8106

Response:

It may please be noted that EIA study report does not call for detailed elaboration of design aspects of nuclear power plant. Accordingly, such issues have not been addressed in the subject report as they are reviewed assessed and approved by AERB before implementation of the plant.

The detailed design of the nuclear power plant will be reviewed by NPCIL and submitted to AERB for review and approval. The issues as outlined above along with other issues will be addressed adequately.

8.4 KBS Observation:

The ElA's neglects the radiation dose that would result from reprocessing. The Department of Atomic Energy (DAE) has adopted reprocessing as the way to deal with radioactive spent fuel discharged by nuclear reactors. This is typically done on site. The DAE has argued in favour of smaller plants co-located with the reactor in order to avoid transportation of spent fuel, which is seen as both expensive and a safety hazard (Srinivasan 1985). We now consider the potential radiation dose from such a facility at Jaitapur.

According to the draft EIA, 241 fuel assemblies are loaded in each reactor core. At the end of 18-24 months, 33% of the fuel assemblies are transferred to spent fuel storage bay. In other words, about 40 to 60 fuel assemblies are transferred every year. Each fuel assembly contains roughly 0.5 tonnes of uranium, which will be converted into radioactive spent fuel as the reactor is operated. Therefore, the spent fuel generation rate is roughly 25 tonnes/year per reactor. Assuming that six 1600 MWe reactors are built, the total spent fuel generation rate is about 150 tonnes/year. If all of this were to be reprocessed at a La Hague type facility built on-site, then it would generate roughly 0.75 GBq/y of lodine-129, 2300 GBq/y of Carbon-14, 35,000,000 GBq/y of Kr-85 (the largest component of the noble gases released during reprocessing) and 9000 GBq/y of H-3.[3] These are much larger than the annual releases presented on page 353 of Chapter 4 from the reactor. Now, if the radiation dose commitment from noble gases released by the reactor is 0.06 mSv/year, then the corresponding dose from just Kr-85 from the reprocessing plant would exceed the Atomic Energy Reguiatory Board (AERB) dose limit. According to the AERB, the —dose apportionment for a fuel reprocessing plant will depend on the process used, the plant capacity, and the mode of processing of liquid and air-route discharges. For Jaitapur, a value in the range 0.05 - 0.10 mSv /a may be assumed (draft EIA, Annexure IX, Dose Apportionment, p. 5). This is based on scaling down life discharges from the La Hague reprocessing plant as reported in (Van der Stricht and Jansenns 2005). The annual amounts of spent fuel reprocessed at this facility are given in Schneider and Marignac (2008, p.**21).**

Response:

At present, the Fuel Reprocessing unit is not considered at the Jaitapur site. However, it may be noted that the provision has been kept for other future facilities. While designing the respective facilities, the dose apportionment will be guiding principle for the design and the appropriate EIA study will be taken up before implementation. The preliminary dose apportionment for Jaitapur site has been presented in Annexure-IX(d) of Vol –II of the EIA report, according to which dose apportionment provision has been made for fuel reprocessing plant. Thus the radiation dose to the public from the site, even after establishment of reprocessing plant, will be well within the stipulated AERB limit.

8.5 KBS Observation:

The EIA makes the environmental impact of nuclear power seem much more benign than is really the case. For example, the draft EIA (Chapter 8, p. 428) claims that the annual fuel requirement for each unit of 1650 MWe (LWR) power station is.40 Tonnes and compares this to the fuel requirement of coal plants. However, this is misleading

because of two reasons. First, the uranium that is used in a LWR is enriched in the Uranium-235 isotopic component. In nature, the U-235 fraction is only 0.07 percent, whereas the EPR reactor design requires that this fraction is roughly 5 percent of the total. This means that the uranium-235 content has to be increased by roughly 70 times. Second, unlike coal, uranium ore is usually found only in very low concentrations. In the best uranium deposits in Jaduguda in Jharkand, for example, uranium concentrations are less than 0.067 percent (Sarkar 1984, p. 193). This means that for each tonne of uranium that is to be enriched; roughly 1500 tonnes of uranium ore has to be mined.

Response:

The life time fuel supply will be included in the scope of the contract with the supplier (in this case AREVA) along with the supply of the EPR NPP units. So, the mining of uranium ore and its enrichment in India for JNPP is not envisaged.

8.6 KBS Observation:

The draft EIA does not take into account the potential health impacts of routine radiation and other releases from nuclear reactors. There is a history of epidemiological studies that demonstrate increased risk of various diseases, especially cancers, amongst people who live near nuclear facilities. Among recent studies, one widely cited one is a meta-analysis of 17 research papers covering 136 nuclear sites in the UK, Canada, France, the United States, Germany, Japan, and Spain that offered evidence of elevated leukemia rates amongst children living near nuclear facilities (Baker and Hoel 2007). Elevated leukemia rates amongst children was also found in a recent study that looked at areas around all 16 major nuclear power plants in Germany (Spix et al. 2008).

Response:

Epidemiological Studies have been carried out at various sites of NPCIL by Tata Memorial Centre (TMC) Mumbai and other local medical colleges. The conclusion drawn is that the cancer prevalence in radiation workers was not different from the prevalence seen in non-radiation workers.

Response:
Response with respect to article of Dr. A. Gopalakrishanan, published in Frontline (Vol-16, No. 06, March 13-26, 1999) is given below:

Volume 16 - Issue 10, May. 08 - 21, 1999
India's National Magazine
from the publishers of THE HINDU

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Response

An alarmist view on nuclear safety: NPC speaks

It is clear from the article by Dr. A. Gopalakrishnan, titled "Issues of nuclear safety" (Frontline, March 26), that the author's main objective is to induce changes in the Atomic Energy Act, 1962 and the powers of the Atomic Energy Regulatory Board (AERB). However, in his attempt to do so, he has made several comments about safety issues at the nuclear power stations operated by the Nuclear Power Corporation (NPC) at Tarapur, Maharashtra; Rawatbhatta, Rajasthan; Narora, Uttar Pradesh; Kakrapar, Gujarat; Kalpakkam, Tamil Nadu; and Kaiga, Karnataka. The comments are not based solely on fact; in fact, they seek to create an alarmist view regarding a national programme as important as the nuclear power programme, which has a tremendous role to play in achieving self-reliance in the energy sector.

At the outset, the NPC wants to set the record straight by pointing out that safety is of the utmost concern to it. Its expertise in this regard is internationally acknowledged. In fact, NPC engineers have shared their expertise internationally by participating in safety reviews and inspection of reactors in other countries conducted by the World Association of Nuclear Operators (WANO) and the International Atomic Energy Agency (IAEA). We are continuously updating our safety systems and procedures even at the cost of short-term economic benefit. Besides, all our plants are designed, constructed, commissioned, operated and maintained under the strict supervision of the AERB. The regulatory agency has pointed out from time to time various safety-related improvements that the NPC should make with regard to systems and operating procedures as a matter of abundant caution. The NPC has been abiding by these directives in letter and spirit. Whenever the AERB's experts have made a suggestion for improvement to the NPC directly, it has taken steps to implement it. We do not consider the AERB, the NPC, various undertakings under the Department of Atomic Energy (DAE) and even the experts in the various Indian Institutes of Technology and other academic institutions in India as being adversaries. We are all part of a single scientific fraternity that has

been mandated by the founding fathers of the nation to develop and deliver the numerous benefits of nuclear energy to the nation in an economical and safe manner.

It has been the practice of the AERB to bring to the notice of the Station Directors and other executives of the NPC any lapse or scope for improvement in safety procedures. Such directives have been immediately attended to. In fact, as the licensing authority the AERB has the power to shut down any reactor at any time if it deems it necessary. Dr. Gopalakrishnan deviated from all these practices just before his term ended as Chairman, AERB and came out with a list of 130 "safety issues" and submitted it to the Atomic Energy Commission. The Commission asked the NPC to reply to this report. The NPC found that 95 of the 130 "safety issues" concerned its area of operation and submitted a report to the AEC. Out of the 95 "safety issues", 78 have been implemented and the remaining 17 are under various stages of implementation. Some of them are of a medium- and long-term nature. The AERB has not come under any pressure from the DAE to suppress this report; instead, it has overseen the time-bound implementation of the report.

There are a number of vested interests internationally who are running down India's self-reliant achievements in nuclear energy and have been periodically using the international media to create fear psychosis. "Another Chernobyl in the making", "Sitting on a volcano" and so on have been the refrains, which are nothing but half-truths and motivated lies. It is clear that these international quarters are in no way interested in nuclear safety, but are bitten by the old colonial bug of "white man's burden". Unfortunately, the author's refrain of "130 safety issues" has added grist to the mill.

In order to clear some misplaced doubts raised in the article, the following information is presented:

- *The NPC's reactors have worked at plant load factors of 60 per cent (1995-96), 67 per cent (1996-97), 71 per cent (1997-98) and 75 per cent (1998-March 1999) and are yielding a handsome return on investment to the government, with net profits of Rs.152 crores, Rs.253 crores, Rs.265 crores and Rs.326 crores (till March 1999) during the respective periods. No doubt the NPC is the envy of any power utility company in India, whether in the private sector or the public sector.*
- *The article states: "TAPS-1 and 2 (reactors at Tarapur) should have been shut down long ago." Although these reactors are over 25 years old, their life has been extended; even the parts which the author claims are "uninspectable nor do Indian scientists have the tools or technology for doing this" have been inspected, using sophisticated robots*

developed by the DAE, and the reactors have been found to be safe. The two reactors are working at above 100 per cent capacity (160 MWe, derated from 210 MWe owing to the non-availability of secondary steam generators) and produced over 2.3 billion units of power in the last 12 months. This, incidentally, is sold to electricity boards at an attractive price of 82 paise a unit. It is a boon in power-starved India.

- *Regarding the Rajasthan reactors, the coolant channels at RAPS-2 have been replaced under the strictest international norms of quality control and tested to the satisfaction of the AERB before restart-up. Now this unit is running well. It is an important feat achieved by NPC engineers. During the same operation, a high-pressure injection core cooling system was introduced. A similar operation of re-tubing and connecting the high pressure emergency core cooling system will be carried out at RAPS-1 as well during a planned shut-down.*
- *The MAPS reactors are being continuously monitored for any sagging in the coolant tubes and on the basis of the Rajasthan experience there is a plan to re-tube them as well. Currently they are being operated in a safe manner and in the past year they have supplied over 2.2 billion units of electricity to the grid.*
- *GEC, the designers of the turbines at Narora, found that owing to poor water chemistry, the turbine blades had developed small cracks in other installations worldwide. GEC recommended first inspection of blades after 20,000 hours of operation and thereafter every 5,000 hours until the blades were modified. The NPC was planning to carry out the work accordingly. However, the blades failed, leading to a fire after only 16,000 hours of operation. Later it was found that wide-ranging frequencies in the Northern Grid had led to the failure. Thus it was a situation beyond the control of the NPC. However, the fail-safe systems built into the reactor worked, the operators took timely action and there was no nuclear accident. Since then, not only at Narora but at Kaiga, Kakrapar, Madras and Rajasthan, the blades have been modified as a measure of abundant caution though they had thousands of hours more to go. It is not true, as was mentioned in the article, that Narora was on the brink of a core meltdown. Indian reactors are safe against such an eventuality of a fire incident and they will go into a safe subcritical mode in case of a station black-out.*
- *After the unfortunate delamination in the inner containment dome at Kaiga-1 during its construction, a stringent design review was carried out to the satisfaction of the AERB. Redesigned domes with high performance M-60 concrete (used for the first time in India) have been built in Kaiga and Rajasthan. These projects are nearing completion after a*

delay of three years caused by the redesign process. All pre-commissioning tests are being conducted at the sites under the supervision of the AERB.

- *The NPC has not only considered safety to be a paramount requirement but has tried its best to inform and educate the public through its Department of Health, Safety, Environment and Public Awareness headed by an executive at the level of a director. An informed public will support this national endeavour and not panic owing to scare-mongering by misinformed Indians or motivated foreigners when anti-science and irrationalism are on the rise worldwide. The Directorate publishes a large amount of literature, conducts exhibitions, organises seminars and so on to raise the scientific temper in the country. Most of this information is available in the magazine NuPower which is produced by the NPC and distributed freely. Recently the NPC's Web site (http://www.npcil.org) was launched. Anyone who needs more detailed or technical information regarding health and safety at the NPC, its financial performance and so on may contact the NPC's offices. They can also be put on the mailing list for NuPower.*
- *We are extremely sad that Dr. Gopalakrishnan, an erudite and knowledgeable engineer himself with whom we have had a long association, is now tilting at windmills. If he wants to educate parliamentarians about the need for a new law or any other matter of public interest, he should use means other than misdirected scare-mongering.*

M.Das
Chief Engineer, Health, Safety & Public Awareness
NPC, Mumbai

Annexure-XV

Response to the representation from Mr. Mangesh Chavan
Chapter - I

A **Observation** :

In Madban village itself from the lands acquired an annual harvest of 150 metric tonnes of paddy is reaped in addition to more than a 1000 metric tonnes of straw as feed for cattle, thatch roofs and packing material for Alphonso Mangoes. Having natural soil cover as against reclaimed paddy fields on laterite table top the state government is guilty for not developing the ground and surface water sources and storage capacities to increase '**CROPPING** INTENSITY' and 'Area Sown More than Once' of the area by facilitating cultivation of Pulses in Rabi Season and Oil Seeds and Vegetable Cultivation in Summer. Most of the land is grassland, as has been mentioned in the report of the College of Forestry is also grazed upon by the 1200 odd cattle from Madban. Natural grasses as is known are perennial. NEERl has chosen to misguide the MOEF by showing in the EIA photographs taken in the summer. This has been the standard practice of those preparing EIA since 1993 case of the Dabhol Power Project.

In order to avoid displacement of local population, the entire project has been cunningly located in the No Development Zone of the Coastal Regulation Zone under the garb of requiring foreshore facilities when none in fact have been mentioned in the EIA other than withdrawal and release of sea water which does not come under a facility requiring sea front. **The report does not justify the presence** of **the entire project in the CRZ.**

As such now the Exclusion zone of 1 mile around the project shall include 1 mile of sea as **a** 'no fishing zone' without having to **compensate the local fisherman or the community. The report is silent on this count.**

Response

As per the joint valuation of the landed assets on acquired land by District Authorities for the purpose of payment of land compensation and study report by Indian Remote Sensing centre Nagpur indicate the land use pattern of the same accordingly, 8.99% (62.04 Ha) land is kharip, 32.96% is varkas, and 58.05% is pot kharaba for the total land of 690.401 Hectares from village Madban for project site. As per revenue record (Copy enclosed as Annexure-XV-A at page 183) from district authorities for few villages of Jaitapur circle (Madban is part of this circle), the production of paddy per Ha is average 23 kg and straw 28 kg for Kharip season 2009. Based on this input and above pattern of land use, the figures of paddy production and other product as indicated in the observation above are exorbitantly high and not supported by any revenue records in his submission.

MCZMA, Maharashtra has granted NOC and CRZ Committee of MoEF has given in principle clearance for the project under CRZ-1991.

AERB has stipulated an area around Nuclear Power Plant with no permanent habitant and called as "Exclusion zone". In line with the above, JNPP will also have a specific 'Exclusion Zone' of 1.6 km. Being a coastal site, some of the area of 'Exclusion zone' will fall on sea front. From security point of view and being a prohibited area, no unauthorized person is envisaged to be allowed to enter in this zone on land as well as sea front. The expected exclusion zone area under sea from shoreline may vary from 500 metre to 1 km. approximately. Accordingly, the entry of fisherman in this zone will be restricted and regulated. Beyond this zone, there will be no restriction of fishing.

B Observation :

Local community actively depend on the sea for their livelihood and nutritional security. As per the ordinary calculation derived based on the figures quoted in the EIA and the summery the quantum of water to be taken and released at higher temperature is 17.6 times Mumbai daily water supply. And a per second suction and release translates to 6 lakh litres, per second. Since all the power generating stations proposed on the Konkan Coastline proposed to take in sea water for cooling their power stations and releasing water at higher temperatures into the sea, in most cases near the ecosensitive mouths of estuaries (since all power generation project are coming up on the ecosensitive mouths of the estuaries.) A cumulative impact assessment was required to be addressed on cumulative impact on the marine ecology.

As focused upon by Al Gore, the Former US Vice-President and Nobel Award Winner for his pioneering work on 'Global Warming and Climate Change', the warming of the sea around the Coastal stretches of the USA have been primarily responsible for the increasingly frequent cyclones, tornadoes and hurricanes hitting the American Coastline with increasing intensity and ferocity.

Response:

A detailed 2D mathematical model studies for dispersion of condenser cooling water discharges from the proposed Nuclear Power Plant at Jaitapur, Ratanagiri has been carried out by CWPRS, Pune, in 2008 (The CWPRS report is attached as Annexure- V(b) of Volume –II of the EIA report). Further, NEERI, Nagpur has carried out detailed marine ecological studies for the Jaitapur coast including a specialized study on Baseline Marine Ecological Assessment of sea coast around the Jaitapur site through College of Fisheries, Ratnagiri (The report from College of Fisheries is enclosed as Annexure-VIII of the Volume –II of the EIA report). These studies have concluded that the marine aquatic food chain organisms will not be affected by the predicted maximum temperature rise of around 5 ^{0}C, which will be confined to a limited area of 0.28 sq.km, when all the six units are under operation and ocean currents are under transition (October/February), which is the most severe condition during the year. At this range of temperature rise above ambient temperature of water, most of the organisms are either not affected or get benefit of stimulation of metabolic activity. The details are presented in Section 4.2.2.1.4, of Chapter-4 of Volume – I of the EIA report.

It is envisaged that the localized small change in sea water temperature for tropical regions will not be responsible for cyclones etc.

C Observation :

All tremors emenating from Koyna are felt in Madban recently on October 2, 2009 crivices of the length of ____and breadth ____and _____metres _____ deep developed in the village of _____in Taluka Rajapur, _____kilometres from the project site,. when there was a earthquake which measured____in the richter scale.

Response:

The question lacks specific data regarding the location and other physical characteristics of the phenomenon being referred. Hence a specific response is not possible.

However, the general information about the design of the plant incorporating the safety with respect to earthquakes is given below:

NPPs built all over the world, including those which are built in a highly earthquake prone country like Japan, are designed considering seismic effects specific to the site.

Nuclear Power Plants, whether located in active tectonic region or in stable continental region, are designed for earthquake resistance. Jaitapur Site is located in stable continental region. Even for such stable continental regions, the plants are designed for a 6.5 magnitude (Ritcher scale) earthquake (intra-plate earthquake of Koyna).

There is no earthquake activity around Jaitapur site in a radius of 39 Km. This is based on the earthquake data collected from Koyna Bandkam Vibhag and MERI from 1973 till date, as well as from NPCIL's own micro earthquake recorders installed by NGRI, Hyderabad around Jaitapur site which have not recorded any event of a micro earthquake or major earthquake within a distance of 39 Km around Jaitapur.

D Observation;

No Impact Assessment on the lands that shall have to be acquired for laying of towers and high tension lines.

Response:

The erection of transmission lines will be carried out by a separate agency, for which the required studies and clearances from the regulating agencies will be obtained by the implementing agency.

E Observation :

The Assessment has very cleverly referred to 10 year old data to show low population density, but has steered clear from mentioning the actual gram panchayat wise population in the 10 kilometre radius.

Response

The village wise population data is presented in the EIA report as obtained from the concerned Government Department based on 2001 census (refer Table no. 3.10.2 on Page No. 315 to 320 of EIA report Volume-I). However, during the execution of the project, the latest census data will be utilized for the overall planning and implementation of the project.

F Observation

But the Assessment does not address the additional land that shall be required for expansion of existing roads.

Response

The road expansion / improvement program needed for project implementation will be undertaken through PWD, state government.

G Observation:

No detailed impact assessment of the jetty in the EIA.

No separate proposal before the MOEF committee for ports, jetties harbours and miscellaneous projects

Response

As described in Section 4.5.5.2 of Chapter-4 of the Vol-I of the EIA report, a RORO jetty is proposed to be developed in the sheltered area of the breakwater. The proposal was granted NOC by MCZMA and in principle clearance by the CRZ Expert Apprisal Committee, MoEF under CRZ Notification 1991.

H Observation:

The project site is grass land with paddy field. Showing dried up portion of land in the summer does not make it rock and barren. There are 12 varieties of mangroves in village Madban and substantial mangroves in the Jaitapur and and Vijaydurg creeks. The mangroves in the Jaitapur creek fall within the 5 km sterilization zone.

The village of Sakhari Nate falls within the 5 km sterilization zone where a few hundred migrant labours work seasonally in Alphonso Mango Orchards and in the fishing industry. The rules governing sterilization zones prohibit unnatural growth of population as such this socio-economic impact has not been studied or even mentioned in the report.

Response

As per the survey carried out by NEERI as well as College of Forestry, Dapoli, there is no mangrove vegetation in village Madban and the mangrove vegetation in Jaitapur & Vijayadurg creeks is beyond 5 km.

As explained in Section 4.4.3.1 of Chapter - 4 of Vol -I of the EIA report, in the sterilized zone (annulus between 1.6 km to 5 km radius from the reactors), natural growth is permitted, but new expansion of activities which lead to enhanced population growth are regulated. This does not include the migrant population as it does not contribute to the population growth. Hence, the seasonal activities being carried out in the sterilized zone will not be disturbed.

I Observation:

"This is environmental conservation by the local communities which coexist with nature and maintain the delicate ecological balance between nature and human livelihood activities. Surely local communities cannot be punished for this by thrusting a potentially hazardous and dangerous nuclear facility on them against their wishes.

Response

The project has an effective environmental management plan (please refer table 5&6 at Page no. S-51 to S-56 of Vol-I EIA report) which ensures no adverse impact on the environment. Additionally, green belt development in the exclusion zone based on the new biotechnological process and native plantation will be implemented. This will enhance the bio-diversity around the project site.

J Observation:

The blatantly false statements which have been addressed hereinabove have been repeated in the para above just that the Population density has jumped from 78 persons /square kilometre to 150 persons /square kilometre

Response

As presented in Section 1.2 (vi) of Chapter - 1 of Vol- I of the EIA report, the figure of average population density of 78 persons / sq km in the area around 10 km of the project site is worked out by NEERI based on the population of villages falling within 10 km radius area. Subsequently in section 1.2.1, the population density is estimated for land portion coming in the 10 km radius from project site (which is approx 50% of total area, rest falling in sea) which is calculated to be 150 persons /sq km.

The population density has been worked out on the basis of total population of all the villages falling within 10 km radius of project site as per Census -2001.. The area considered excludes the area falling in sea

K **Observation:**

As mentioned in the notification and the regional development the area has been notified for industrial purposes. That industrial development which shall facilitate and bring about development of the district.

Ratnagiri District Generates several times more than it consumes. District consumes - Mw and generates almost 12 times.

How can more power bring about development of the region?

The district definitely does not need this project and does not further aims and objectives of the Regional Development Plan of planned development.

As such the said notification has been misused since the notification is for industrial development of the region based on the natural resources of the region such as agriculture, horticulture, fisheries, forest produce etc.

As mentioned in the notification and the regional development the area has been notified for industrial purposes. That industrial development which shall facilitate and bring about development of the district.

As such the notification No. TPS 1290 / CR -120 / UD-12 dated June 2. 1995 of the Urban Development Department, Government of Maharashtra under Maharshtra Regional and Town Planning Act 1966 cannot apply to JNPP. A project specific notification is required with justification as to how JNPP fits into the needs of Balanced Sustainable Regional Development of the District and how output from this project shall further sustainable development of the region. We maintain the notification has been misused and does not apply to the said project.

Response

The site for JNPP is in line with the approved land use plan of the Government of Maharashtra as per Notification No. TPS 1290 / CR-120/UP-12 dated Jun2, 1995. The Clause No. (C) of the said Notification envisages a nuclear power station in the regional plan.

L **Observation:**

Population density 78, 150 now 96.

Response

The figure of 96 persons/sq km as population density of the area around Jaitapur was picked up from the site selection committee's report. This data will be corrected to 78 persons/sq km in line with section 1.2 (vi) of Chapter 1 of Vol 1 of draft EIA report.

M **Observation:**

Green Belt shall consist of what? tree planting or lawn creation. All land with top soil except agricultural land is saturated with natural vegetation. Only laterite soils which are bereft of top soil are available for tree planting of any kind. For tree planting in laterite can only be done the way Alphonso Mango trees are planted on laterite by

1. Blast the soil using geletine sticks to create the crater.
2. Clear the Crater of the laterite soil since it is not useful! for refilling the crater.
3. Import top soil to fill the crater and then plant the tree.
4. There is no detailed plan for this and there is a massive cost to tree planting on laterite which is then part of project costs.

Response

Jaitapur site specific greenbelt development plan has been presented in Section 10.10.3.1.2 of Chapter 4 of Vol-I of the EIA report. Also, please refer our response at S. No. I above.

Chapter - II

Diversion of Impact Assessment to AREB Norms and Standards

1. **Observation:**

What are the limits? There is no mention. Shall limit for a 540 MWe be the same as for 1650 MWe units

Response

The authorized limits on the radioactive discharges are stipulated by AERB for the site. The Total Effective Dose to public at Fence Post is far below the maximum permissible limit of 1000 µSv/y by AERB, which are in line with International Commission on Radiation Protection (ICRP). These limits are not depending on the combined electrical out- put of the NPPs at the site. The limits take into considerations all the power producing units as well as other radiological facilities at the site.

The environmental survey data at various operating nuclear power plant sites of NPCIL, where multi units are under operation with varying capacity shows that the radiation dose to the members of the public due to released radioactive elements subsequent to the operation of nuclear power plants is only a fraction of AERB dose limit or background radiation levels. For JNPP, the design will be such that the radiation dose to the members of public from all the routes is restricted to 100 µSv/y per unit. The details are presented in Annexure-IX (d), of Vol-II of draft EIA report.

2. Observation:

No regulatory requirements given. Have the regulatory requirements have they been updated in light of bigger units and much larger plants. NEERI does not assess this in the EIA. What are the latest international safety requirements, the EIA has no mention.

Are European & American safety standards recently adopted applied to the project and what are those the EIA does not mention.

The EIA does not perceive terrorist attack which the American Law has now made mandatory.

Response

The design safety requirements of NPPs are defined in various safety codes of AERB which are in line with the requirements specified by International Atomic Energy Agency (IAEA). Accordingly, the design of the NPPs in India is carried out to meet the requirements as specified in the above mentioned safety codes. In the case of Jaitapur, NPPs constructed will be as per the EPR technology from M/s AREVA, France. It is pertinent to mention here that as per policy of NPCIL, any imported technology for NPPs should be licensable by the regulatory body of the country of origin. The EPR has been licensed for construction in France, Finland and China. The EPR technology has evolved on the basis of best safety features from current operating French N-4 and German Konvoi reactors.

The regulatory consenting process for NPPs in India is governed by AERB Guide No. AERB/NPP & RR/SG/G-1, which envisages five major consenting stages, viz, siting, construction, commissioning, operation and decommissioning. At each stage, review is carried out by AERB before granting of consent. The environmental impact assessment study carried out by NEERI, Nagpur has suggested suitable environmental management plan for JNPP keeping in view

that NPCIL will obtain the various regulatory clearances from AERB at appropriate stages of the project.

Adequate measures are in place for ensuring security of NPP units in India by security agencies of Government of India. Based on need, the Central Industrial Security Force (CISF) is made responsible to provide specialized security to industrial installations in the country including NPPs. The CISF functions under the Ministry of Home Affairs of Government of India.

All Nuclear Power Stations of NPCIL are provided security cover by specially trained CISF personnel. Based on the location of NPP in the country and security threat perception, required defense cover is also provided. The design of Physical Protection System of NPP is carried out on the basis of design basis threats. The physical protection system is subject to review and approval by AERB.

3. Observation:

Preliminary Safety Analysis Reports (PSAR) are yet to be submitted to AERB for approval and construction of JNPP. Then how can the EIA be finalized**.**

Response

Please refer the response at S. No. 2, para no 2 above. The consent by AERB at the second stage, namely, construction involves the review of the design safety aspects and issue of construction consent. Preliminary Safety Analysis Report (PSAR) submitted by NPCIL is reviewed by AERB at the stage of consent for construction.

4. **Observation:**

No document in the EIA to show what upgradation to the design has been done to the Safeguard buildings and Sheild Buildings

Response

External hazard protection is provided by designing the outer structural members to resist effects of the indicated external hazards (For design features, please refer sections, 2.6.2.1 page no. 50 & 2.6.4.1 page no 53 to 54 of Chapter 2 of Vol I draft EIA report).

5. **Observation:**

What are the IAEA and AERB requirements for spent fuel storage. The EIA does not specify.

Response

The spent fuel assemblies, after discharge from reactor, are stored in the spent fuel pool, as an interim storage facility, with adequate shielding for a minimum cooling period of 5 years. This spent fuel will remain under continuous surveillance of NPCIL in line with AERB standard / IAEA requirements.

6. **Observation:**

Domestic Solid Waste Management Scheme is yet to be prepared

Response

The domestic solid waste management plan / scheme is presented in Section 10.10.3.1 of Chapter-10 of the Vol-I of EIA report.

7. **Observation:**

Power Evacuation Scheme and its Land Requirement for laying High Tension Lines and the Exclusion zone around the towers and lines has not been assessed.

Response

The erection of transmission lines will carried out by a separate agency, for which the required studies and clearances from the regulating agencies will be obtained by the implementing agency.

8. **Observation:**

What are AERB requirements. What are permissible radioactivity discharges. Are total radioactivity discharges for a 500 MW units equivalent to a 10,000 MW plant.The AERB requirement or standards were required to be assessed by NEERI in that light which has not been done.

Response

The authorized limits on the radioactive discharges are stipulated by AERB for the site. The Total Effective Dose to public at Fence Post is far below the maximum permissible limit of 1000 µSv/y by AERB, which are in line with International Commission on Radiation Protection (ICRP). These limits are not depending on the combined electrical out- put of the NPPs at the site. The limits take into considerations all the power producing units as well as other radiological facilities at the site.

9. **Observation:**

Akin to a Disaster Management Plan has not been brought into public domain and has neither been kept available for inspection or has been discussed with the public, a major requirement for environmental appraisal of the project. Who will coordinate in case of an emergency has not been disclosed.

This means there is no 'approved' emergency preparedness plan.

Response

The Section 4.4 of Chapter-4 of the Vol-I of the EIA report presents the Emergency Response system. Based on this a detailed plan will be prepared, which will be put up for approval of AERB and State Government before the consent for operation of the plant is granted by AERB. For all operating stations of NPCIL, approved off-site emergency plans exist and are also available with respective District Authorities. The coordinating agencies, in case of emergencies, are mentioned in the emergency plans.

10. **Observation:**

Codes, standards and nuclear safety regulations not given in EIA and assessed

Response

The relevant codes and regulations are presented in Table 1.2 (a to d) and Table 1.3 of the Chapter-1 of the Vol-I of the EIA report.

11. **Observation:**

NEERI makes a statement of authority. Has it assessed the current environmental impacts of nuclear power plants in India? If no, the statement has been made to create a bias in favour of NPCIL and the JNPP

Response

NEERI has utilized the authentic radiological data of HPD, BARC during EIA studies. BARC has established Environmental Survey Laboratories at every

nuclear power plant in India to carry out radiological observations. Further, the experience at other Nuclear Power Plants in India has been described with respect to radiological dose to public at NPP fence, which is presented in the report at Fig. 8, page S-29 of Summary EIA.

12 **Observation:**

Impact zone of 1.6 kilometres for maximum how many MW units. Once again NEERI has failed to assess if 1.6 km is okay and on what basis does it say that for a 10,000 Mwe plant the impact zone would not be beyond 1.6 km.

On what basis is an area of 16 km considered as emergency planning when the exclusion zone for the Chernobyl plant was 50 kilometres.

Response

As per the guidelines of AERB, ''Code of Practice on Safety in NPP Siting'; for nuclear power plants, the 'site' include the area surrounding the plant enclosed by a boundary, which is under effective control of the plant management. Mandatory requirement of AREB siting code is that an exclusion zone of 1.6 km radius around the plant is to be established and this area should be under the exclusive control of the station where public habitation is prohibited.

The exclusion zone boundary does not depend on the electrical output of any NPP unit at the site. The emergency planning zone of 16 km is based on infrastructure required to effectively implement the emergency measures such as sheltering, evacuation, communication, etc., which are vital during emergency condition.

For the Chernobyl plant, the original exclusion zone was as intended in the design. It is noted from the published information that a town named Prpyat, which lay at 3 km from the plant, was evacuated after the Chernobyl accident. Subsequently, as a part of effective emergency planning measures, a zone of 30 km around the plant was maintained under access control. However, in case of JNPP, accident like Chernobyl is not possible because of several safety features and exclusion zone of 1.6 km as per AERB stipulation will be maintained.

13. **Observation:**

Are the safety limits specified for a 10,000 mw power plant has AERB limit been updated in the regard.

The area imports labour for its fisheries and horticulture sector. Much needed electricity for whom (Madban, Rajapur Taiuka, Ratnagiri district, Maharashtra For whom. For neither Madban, Rajapur Taiuka or Ratnagiri District or Maharashtra need this 'Base Load Power[1]) and at what price.

NEERI should demonstrate by what it was convinced that the nuclear cost of electricity generation is comparable.

Response

The limit on the radioactive discharges are stipulated by AERB for the site which are in line with the recommendations of International Commission on Radiation Protection. These limits do not depend on the combined electrical out- put of the NPPs at the site. The limits take into considerations all the power producing units as well as other radiological facilities at the site. The overall impact of installation of 6 units of 1650Mwe each EPR units has been considered for all environmental issues.

The project will contribute to meet the much needed electricity requirement of the Konkan region, Maharashtra State and the country.

The nuclear power on commercial basis was introduced to world in as early as 1950/60 since then a lot of experience has been gained globally. Over 13000 reactor years of experience have been gathered, which clearly indicate that nuclear power is highly potent source of clean and sustainable energy. In view of compelling merits of nuclear power in addressing the climate change concerns and also an economic viable source of energy, currently the world is experiencing nuclear renaissance. Currently 438 reactors are in operation with an installed capacity of about 372 GW and 58 reactors are under construction. Over 200 reactors have been planned in 30 countries for next 20 year (Source: WNA). Many such countries, which were not encouraging nuclear power to be deployed as a source of electricity generation, have now decided to deploy nuclear power plant. The cost competitiveness of the nuclear power has been a much deliberated subject globally. In this context, organization of countries for economic co-operation and development (OECD) studies of 2005 can be referred, which is relevant in present scenario. This document gives a clear picture about cost competitiveness of nuclear power plant vis-a- vis the other electricity generating technologies.

14. **Observation:**

There is no socio economic profile or baseline data of the sampling area as indicated in the Comprehensive EIA. So this is a public hearing of a incomplete EIA from which vital information is missing.

As reported in the summary EIA Work is in Progress' then why the haste for the public hearing.

Response

The baseline socio –economic profile of the study area is presented in Section 3.10, page no. 287 to 326 of Chapter-3 of Vol of EIA report. The base line socio-economic as mentioned in Section 6.1 of Summary EIA will be for the Project Affected Families (PAFs) to be carried out by an independent agency appointed by the State Government.

15. **Observation:**

Vague Statements regarding - No quantitative values given to judge validity of this claim

Response

The paragraph referred, briefly describes the mechanisms for radioactive waste management. The quantitative values are given in Section 4.2.1.3, 4.2.2.2.1 and 4.2.3.2 of Chapter-4 of Vol-I of EIA report.

16. **Observation:**

Vague Statements - No quantitative values given to judge validity of this claim

Response

The paragraph referred, briefly describes the mechanisms for radioactive liquid waste management. The quantitative values are given in Section 4.2.2.2.1 of Chapter-4 of Vol-I of EIA report.

17 & 18 No Observation

19. **Observation:**

Has this EIA been veted by the AERB?

Response

The dose limits specified by AERB are mandatory. The design of plant is carried out to meet the AERB requirements. The EIA report for JNPP is prepared as per approved Terms of Reference (TOR) by MoEF for environmental clearance for JNPP.

20 **No Observation**

21. **Observation:**

Where is the permanent depository for nuclear waste? Or does AERB have no requirement in this regard. Does NEERI know of permanent depositories of nuclear sites?

Response

At present no reprocessing facility is envisaged at JNPP Site. The establishment and management of reprocessing facility of spent fuel falls within the purview of DAE and the same will be addressed suitably. It may be noted that the requirement of reprocessing of the spent fuel will arise only after 12 years as the reactor will be under construction for 5-6 years followed by another 5-10 years for the cooling of spent fuel. Therefore, it is evident that there is sufficient time for the government to decide upon the establishment of reprocessing facility. The requirement of permanent repository will be only after reprocessing plants are commissioned.

22. **Observation:**

Where is the emergency response plan?

Response

The Section 4.4 of Chapter-4 of the Vol-I of the EIA report presents the Emergency Response system. Based on this a detailed plan will be prepared, which will be put up for approval of AERB and State Government before the consent for operation of the plant is granted by AERB. For all operating stations of NPCIL, approved off-site emergency plans exist and are also available with respective District Authorities.

23. **Observation:**

Vague Statements - No quantitative values given to judge validity of this claim

Response

The quantitative values are given in Section 4.2.2.2.1 of Chapter-4 of Vol-I of EIA report.

24. **No Observation**

25. **Observation:**

What is the impact on public health if it exceeds limit For example in case UK EPR plant of similar type the exposure of specific segment like fishermen is estimated to much higher than these limits.

Response

During normal operating conditions, the releases permitted are such that impact on public health will be negligible and surveillance is such that the corrective actions are taken much before the stipulated limits are reached.

26. **No Observation**

27, 28 & 29. **Observation:**

For nuclear power plant of what size? Is this updated for 10,000 mw plant. No mention

Response

The authorized limits on the radioactive discharges are stipulated by AERB for the site. The Total Effective Dose to public at Fence Post is far below the maximum permissible limit of 1000 µSv/y by AERB, which are in line with International Commission on Radiation Protection (ICRP). These limits are not depending on the combined electrical out- put of the NPPs at the site. The limits take into considerations all the power producing units as well as other radiological facilities at the site.

30. **Observation:**

This means there have been instances of **radiation levels which cause serious injurious to persons receiving acute whole-body radiation exposure. Give details.**

Response

No incidence of high radiation level causing serious injury to public due to NPPs in India has occurred.

Safety guides are prepared considering all the postulated scenarios.

31. **Observation:**

Emergency planning and preparedness program is not yet prepared forget getting it approved by AERB. 'In complete EIA'

Why is it not a part of the EIA and available for public scrutiny?

This is grossly inadequate in view of Chernobyl where the current exclusion zone extends to more than 50 kms. The radiation accumulation is much more than Chernobyl considering the size of the plant.

Response

The Section 4.4 of Chapter-4 of the Vol-I of the EIA report presents the Emergency Response system. Based on this a detailed plan will be prepared, which will be put up for approval of AERB and State Government before the consent for operation of the plant is granted by AERB. For all operating stations of NPCIL, approved off-site emergency plans exist and are also available with respective District Authorities.

For the Chernobyl plant, the original exclusion zone was as intended in the design. It is noted from the published information that a town named Prpyat, which lay at 3 km from the plant, was evacuated after the Chernobyl accident. Subsequently, as a part of effective emergency planning measures, a zone of 30 km around the plant was maintained under access control. However, in case of JNPP, accident like Chernobyl is not possible because of several safety features and exclusion zone of 1.6 km as per AERB stipulation will be maintained.

32. **Observation:**

No specific values given.

Response

The impact assessment due to conventional waste is covered in Section I of Chapter 4. For radiological releases, the quantitative values are given in Section 4.2.1.3, 4.2.2.2.1 and 4.2.3.2 of Chapter-4 of Vol-I of EIA report.

33. Observation:

All unverified claims taken on faith about monitoring of activity levels in air and water environent.

Response

All the requirements of monitoring are based on AERB guidelines.

34. **Observation:**

By pointing to AERB the EIA is being secretive about treatment and disposal of radioactive waste.

35. Observation:

No permanent and safe solution to date devised by the nuclear establishment for the disposal of radioactive waste.

36. Observation:

There is no fool proof technology to adopt and the statement is unscientific.

37. Serial Number missing in the submission

38. Observation:

Act of faith on behalf of NEERI. 'Never be crossed' means Zero probability which is totally unscientific

39. Observation:

Act of faith on behalf of NEERI.

Response (34, 35, 36, 38 and 39)

The NPP unit is so designed that activity releases to the environment are through pre-designated release points. These radioactive effluent releases to the environment through the designated release points are continuously monitored and controlled. The minimum sensitivity of the monitoring instruments is such that even a sufficiently small fraction of the releases, which leads to dose consumption in the public domain, can be measured.

Presently, the low and intermediate radio- active solid / solidified wastes are stored in Near Surface Disposal Facility (NSDF). They are stored under ground at a depth of maximum up to 4 m either in trenches / RCC vaults / tile holes depending upon the surface dose rate of the waste. The solid waste disposal site is fenced and designed to store waste for an active control (monitoring, surveillance, remedial work) period of 100 years followed by passive control (land use control) period of 200 years.

The above facility has sufficient number of bore-holes all around at definite intervals. Ground water samples are collected from these bore-holes on regular basis to check the activity in ground water.

However, in case of Jaitapur EPR, the low and intermediate radioactive solid / solidified waste is designed to be stored in the radioactive waste storage building, where solid waste storage will be above ground as an improved design feature.

The radioactive waste storage building is planned to store low and intermediate level radioactive solid / solidified waste having half life less than 30 yrs. The total storage time envisaged for this waste is 100 years active control period followed by passive control period of another 200 years. Hence in the design an active storage period of 100 years is considered. After 300 years of storage (with ten or more half lives), the total radioactivity of the material will be almost negligible.

Waste storage facility is a seismically qualified structure. Solid / solidified waste is always stored inside the building with multiple barrier concepts. The stored

solid waste will never come in contact with ground water during its operational life.

Radiation dose to the general public from all exposure pathways of solid / solidified waste stored in waste storage facility will not exceed the limit (0.05 mSv in a year) as prescribed by AERB.

40. Observation:

Emergency Plan yet to be made.

The security requirements should be stated explicitly

Response

The Section 4.4 of Chapter-4 of the Vol-I of the EIA report presents the Emergency Response system. Based on this a detailed plan will be prepared, which will be put up for approval of AERB and State Government before the consent for operation of the plant is granted by AERB. For all operating stations of NPCIL, approved off-site emergency plans exist and are also available with respective District Authorities.

The Design Basis Threats (DBTs) and various other security arrangements are regularly under review by various government bodies. Security organizations have been functioning at various levels at DAE, AERB and NPCIL. The security audits/inspections are regularly carried out to ensure compliance of security provisions. Over and above, an independent review of nuclear security related issues is in place by national regulators i.e. Atomic Energy Regulatory Board (AERB). It may be noted that each NPCIL plant has Multi-tier physical barriers with intrusion detection systems which are in place with isolation zone.

Entry to all the points of personnel and vehicle access into protected areas is based on laid down procedures. Identification of personnel and vehicles are made and authorization is checked at each of the access control point. Access to certain vital areas of the plant is limited to individuals who require such access in order to perform their duties.

41. No Observation

42. Observation

Does the AERB require the waste to be stored and disposed in the CRZ.

Response

Please refer Response to serial no. 34, 35, 36, 38 & 39.

43. Observation

An emergency condition in case of the nuclear power plant is the uncontrolled release of radioactive substances into the atmosphere. As such the emergency response plan should be a necessary part of the EIA and there must be a public hearing of the Emergency response plan In every habitated center in the radius of atleast 150 kms (considering 1000 mw Chernobyl power plant had a exclusion zone of 50 km radius.)

Response

Safety studies are carried out for nuclear power plants to evaluate all the safety features required to keep the plant safe for all the Design Basis Accident (DBA) scenarios. The analysis assumes the occurrence of the DBAs and predicts its consequences to enable the design to build in all the safety features necessary to cope up with these scenarios and to keep the plant in the safe condition at all times.

As per the guidelines of AERB, ''Code of Practice on Safety in NPP Siting" AERB/SC/S, for nuclear power plants, the 'site' include the area surrounding the plant enclosed by a boundary, which is under effective control of the plant management. Mandatory requirement of AREB siting code is that an exclusion zone of 1.6 km radius around the plant is to be established and this area should be under the exclusive control of the station where public habitation is prohibited. The exclusion boundary is relevant from the point of view of dose limits to public. The exclusion zone boundary does not depend on the combined electrical output of the NPPs at the site. The emergency planning zone of 16 km is based on infrastructure required to effectively implement the emergency measures such as sheltering, evacuation, communication, etc., which are vital during emergency condition.

For the Chernobyl plant, the original exclusion zone was as intended in the design. It is noted from the published information that a town named Prpyat, which lay at 3 km from the plant, was evacuated after the Chernobyl accident. Subsequently, as a part of effective emergency planning measures, a zone of 30 km around the plant was maintained under access control. However, in case of JNPP, accident like Chernobyl is not possible because of several safety features and exclusion zone of 1.6 km as per AERB stipulation will be maintained.

44. Observation:

What shall be the mitigation measure in case of contamination. We find contamination of ground water in Dabhol Power Project with no mitigation measures.

Response

In case of Jaitapur EPR, the low and intermediate radioactive solid / solidified waste is designed to be stored in the radioactive waste storage building, where solid waste storage will be above ground as an improved design feature.

Waste storage facility is a seismically qualified structure. Solid / solidified waste is always stored inside the building with multiple barrier concepts. The stored solid waste will never come in contact with ground water during its operational life.

It is also mentioned that conventional pollutnats will not be emitted by JNPP.

45. Observation:

With a 10,000 mw even member of the general public within the sterilized zone would have to go through mandatory checkups.

Response

The authorized limits on the radioactive discharges are stipulated by AERB for the site. The Total Effective Dose to public at Fence Post is far below the maximum permissible limit of 1000 µSv/y by AERB, which are in line with International Commission on Radiation Protection (ICRP). These limits are not depending on the combined electrical out- put of the NPPs at the site. The limits take into considerations all the power producing units as well as other radiological facilities at the site.

The environmental survey data at various operating nuclear power plant sites of NPCIL, where multi units are under operation with varying capacity shows that the radiation dose to the members of the public due to released radioactive elements subsequent to the operation of nuclear power plants is only a fraction of AERB dose limit or background radiation levels. For JNPP, the design will be such that the radiation dose to the members of public from all the routes is

restricted to 100 µSv/y per unit. The details are presented in Annexure-IX (d), of Vol-II of EIA report. As the doses received by public residing beyond fence post in sterilized zone will be insignificant and within the limits prescribed by AERB, medical checkups of the general public is not needed.

46. Observation:

Our Objection to AERB standards:

Current Operational Units range from 160 to 540 Mwe so all AERB

1. Safety Codes/Guides for Regulation of Nuclear and Radiation Facilities.
2. Safety Codes/Guides for Operation of Nuclear Power Plants.
3. Safety Codes/Guides for Quality Assurance

Are for small units in comparison to a 1650 Mwe unit and the highest installed capacity is Tarapur (TAPS (Unit 3 and 4) 2 X 540 Mwe while JNPP is 6X1650 Mwe

The EIA has no mention of the above codes/guides only their reference numbers have been given in the EIA the have the above been updated to accommodate units which are thrice in size and where the installed capacity shall be ten times current installed highest capacity power plant.

The emergency response plan yet to be made should have been ready with feedbacks of all places of human habitation in 150 km radius. (Chernobyl with a 1000 Mwe plant now has an exclusion zone of 50 kms a radius of 150 kms has been calculated on this basis). But is not yet ready.

The EIA should have been first cleared by the AERB as well as Ministry of Defence before putting it up before the public.

The EIA is non transparent, incomplete, total failure and has been rendered redundant on this vital count and cannot be called an EIA. The EIA cannot be considered either by the public or the MoEF in the absence of this vital impact assessment by NEERI.

Response

The design safety requirements of NPPs are defined in various safety codes of AERB which are in line with the requirements specified by International Atomic Energy Agency (IAEA). The relevant codes and regulations are presented in Table 1.2 (a to d) of the Chapter-1 of the Vol-I of the EIA report.

These limits specified in the above codes of AERB are not depending on the combined electrical out- put of the NPPs at the site. The limits take into considerations all the power producing units as well as other radiological facilities at the site.

The regulatory consenting process for NPPs in India is governed by AERB Guide No. AERB / NPP & RR / SG / G-1, which envisages five major consenting stages, viz, siting, construction, commissioning, operation and decommissioning. At each stage, review is carried out by AERB before granting of consent. Thus, the environmental impact assessment study carried out by NEERI, Nagpur has suggested suitable environmental management plan for JNPP keeping in view that NPCIL will obtain the various regulatory clearances from AERB at appropriate stages of the project.

NEERI's EIA report has been prepared, complying to the provisions given in Environmental Impact Assessment Notification, 2006 issued vide no. S.O. 1533(E), dated 14th September 2006 and its amendment vide no. S.O. 3067(E) dated 1st December 2009 and based on the guidelines on EIA methodology by CPCB / MoEF. NEERI has also involved the appropriate agencies to address specific issues related to environmental impact on horticulture, agriculture, fisheries as well as radiation effects through specialized agencies like College of

Forestry, Dapoli / College of Fisheries, Ratnagiri, CWPRS, Pune, and BARC, Mumbai. The EIA report envisages to identify potential impacts which in this case are considered as ecological impacts, impacts on fisheries, impact on human being, impacts on agriculture and vegetation. The impacts are to be quantified by superimposing the change which is likely to be contributed by the proposed activity on the baseline data and suggest mitigation measures to prevents / minimize the impacts using the existing available control technologies. In the instant case, this has been meticulously followed by carrying out detailed study on all the issues viz ; radiation levels prediction by BARC - ESL, dispersion study of hot water discharge by CWPRS, the impact on fisheries indicated through a study by College of Fisheries, and impact on horticulture/agriculture studied by College of Forestry. The above organizations are professional and reputed in their area of work and possess immense experience & expertise. The report prepared by NEERI also summarize data on existing level of radiations at the fence post of operating plants viz. Tarapur, Rawatbhata, Kalpakkam, Narora, Kakrapar, Kaiga to substantiate the predicted values in the instant case. Thus the EIA report for JNPP is prepared as per approved Terms of Reference (TOR) by MoEF. The clearance granted by MoEF will be submitted to AERB.

Observation:
Section 3.7.2
EIA savs:-Page **217**
3.7.9 Land use Pattern based on Remote Sensing Data
Plate 3.7.2
It is the colour-coded output of supervised classification with colours assigned to various classes for proposed Site at Jaitapur, Ratnagiri district Maharashtra. In this image, colours are assigned to various classes as given in legend .The landuse / landcover classification indicates half of the portion of study area covered by Ocean/River and it covers 54.24% area. It is assigned by dark blue color. **{Table 3.7.16).**
Six different classes are identified, along with corresponding area. Water bodies are indicated by light blue colour, covers 0.01% area. Vegetation, which is spread all over area cover 14.46% and it, is assigned by light green color. Sand/Bare soil covers 0.26% and it is assigned by white color and 30.43% area covered by wasteland. Mangrove that is present near the river and seacoast covers 0.60% area and it is assigned by dark green color. Further
Table: 3.7.16
Inventory of Landuse / Landcover within the Study Area (21 -Dec-2005)

S. No.	Landuse / Land Cover Classes	Area (sq. km)	Area in (%)
1	Ocean / River	1064.394	54.24
2	Water bodies	0.263	0.01
3	Vegetation	283.811	14.46
4	Waste land	597.189	30.43
5	Sand / Bare soil	5.017	0.26
6	Mangrove	11.826	0.60

Our Objection :-
The above data is misleading and does not give a idea about livelihood activities by human. Intensity of fishing activity in the region is concealed by such methods. For eg several barren lands in Nate are used for drying fish and the same is exported to Western Maharashtra as raw material for poultry feed. So can we say the land is useless. All sloping so called wastelands are being developed for the World Famous Alphonso Plantations on a massive scale currently plantations on 100 acres is being developed by several farmers across the creek in a nearby village called Dhaulwalli coordinated by progressive farmer Mr Ashok Ranade whose own EUREPGAP certified Alphonso Plantation with a stated productivity of 10 tonnes per hectare and under ORGANIC Conversion is within the sterilized zone.
With reference to 30.43 % waste land kindly refer to the note - *A brief note on lateritic plateaus of Konkan, Maharashtra, India*
Sweeping Statements without basis ment to create bais in favour of the project

Response:
The referred land use table within the study area has been prepared on the basis of remote sensing data whereas the demographic information about various activities in study area is given in socio-economic component in Section-3.10 of Chapter-III of EIA Report Volume-I. The referred waste land area in village Nate and Dhaulwalli are not acquired for the project and therefore all the activities like drying of fish, alphanso plantation etc can be carried out by the villagers in all areas except the land acquired for project.

Observation:
Table 3.8.8

Plantation of Commercial Crop Plants Under Horticultural Practices in Rajapur, Ratnagiri (values in ha).

Our Objection

Actuai areas under crop their annual production and production value has not been given.

Response

The land area under various horticultural crops like mangoes, chashewnut, coconut and others for the year 2000-01 to 2005-06 are given in table 3.8.8. The actual production will depend on various factors, natural as well as human induced. Similarly the production value will also depend on the production as well as the market rates at various times.

As per the joint valuation of the landed assets on acquired land by District Authorities for the purpose of payment of land compensation and study report by Indian Remote Sensing centre Nagpur indicate the land use pattern of the same accordingly, 8.99% (62.04 Ha) land is kharip, 32.96% is varkas, and 58.05% is pot kharaba for the total land of 690.401 Hectares from village Madban for project site. As per revenue record (copy enclosed as Annexure-XV-A at page no. 183) from district authorities for few villages of Jaitapur circle (Madban is part of this circle), the production of paddy per Ha is average 23 kg and straw 28 kg for Kharip season 2009.

Observation:

3,9.1 Methodology and Baseline Environmental Status

The objective of survey of noise pollution around proposed atomic power project near Jaitapur, Maharashtra was to assess the existing levels of noise, and the impact of proposed project on the human settlements in 25 km radial area.

To assess the existing levels of noise Impact of Proposed Project on human settlement in 25 km radial area is irrelevant from the point of view of assessing impact of a activity on its nearby environment.

Response

Impact Assessment is carried out as per standard methodology of EIA, and MoEF, guidelines upto 25 kms which also includes all the nearby settlements, facilities and other establishments like school, temple etc.

Chapter - IV Impact of Construction Activities and Labours

Observation:

Page 86

EIA savs; -

2.10 Proposed JN-PP Residential Complex -

2.10.2 Details of Residential Complex

There are no industrial establishments near the site. The whole area is plain area. The Residential Complex is being constructed to support maximum total population of 5500 persons, for planned strength of 0 & M manpower of 1100 persons per set of two units required for proposed type of NPP units. The Residential Complex will have residential quarters & other common facilities as per the tentative details given below, which may undergo few changes due to plant requirements:

1. Residential Quarters:

B Type -108 houses

C Type - 648

houses D Type -

210 houses E

Type - 52 houses

F Type - 2 houses

a) Sub - Total 1020 x 5 persons / house = 5100 persons

2. Service Personnel Hostel (48 x 5) = 240 persons
3. Senior Hostel = 24 persons
4. Junior Hostel = 48 persons
5. Officer's Hostel = 48 persons
6. Guest House = 40 persons

b) Sub- Total = 400 ersons

Total (a + b) = 5500 ersons.

Objection :-No Plan Outlay or justification for 245 hectares of land is given.

Response

The area earmarked for residential complex will have residential quarters, and other common facilities as given in the Section 2.10.2 of the Chapter-2 of the Vol-I of the EIA report. The area requirement of 245 Ha. is arrived at based on floor space requirement of these facilities, the basic movement requirements of personal and public vehicles and the separation between this facilities. The estimate is also backed-up by DAE's earlier experience of setting up such residential complexes. The outlay and the plan for residential complex will be prepared at the appropriate time.

Observation:

Further on Page 120 EIA says

3.2.2 Construction & Commissioning

The construction of the power plant will have no significant impact due to various project activities such as transportation, excavation, construction and fabrication works. These impacts would be of localized nature and would be for period of construction. However, there will be positive impact in terms of more direct and indirect job opportunities for the local people. Some of the activities taken up during this phase such as development of the green belt, increased job opportunities will have positive impacts on local ecology and environment after the plant comes to operation. Marginal impacts are also anticipated on aesthetic environmental components. However, even during this phase a suitable environmental management plan will be implemented to maximize the positive impacts and minimize the negative impact.

Objection :-

Type of housing has been concealed.

No details of Construction labour, their colonies and the social impact of their number has been or assessed. Does it mean that the above personnel will also double up as Construction labourers in the construction phase.

As against this the Environment Impact Assessment Comprehensive Report July 1994 of Dabhol Power Project has this to say in its report Page 42 4.2.2, Construction Report

.....A change in the demographic profile will be observed as early as the initial phase of construction

Because of the influx of the construction workersthe current sex ratio will change. At present the sex ratio is baised in favour of the females. Also the age composition will change. Caste and religious composition will be more heterogenous. These changes in construction phase would be temporary because construction labour will be contractual and normally moves out with the contractor when the work is finished. **(As per JNPP EIA construction activity will go on for 15 to 18 years)** Health problems are also likely to be experienced in the area as a result immigrants being careless about personel hygiene resulting in mosquito and fly borne infectins prevalent in the area

The construction phase may also witness some social problems such as crime, alcoholism, gambling and prostitution, typical of any development project site. **(JNPP is a ultra mega project site hence crime, alcoholism, gambling and prostitution, the impact would also be in the scale of the project. But this possible impact has been discounted.)**

During the peak of Construction, about 4000 manual labourers and 500 non-manual professionals will be engaged. The total population of the five surrounding villages is 4681 (1991 census).

This influx will lead to an additional potable water requirement...

.....Additional people in commerce, business, transport and service sectors moving into the area will have to provide for these facilities on their own. **(Will all this not lead to shortages of existing resources and lead to increase in the local cost of living incase of the immediate villages surrounding the JNPP since this has happened in the affected villages of Dabhol Power Project.)**

The culture of the migrants may be alien to the local population. Therefore whenever thei values come in conflict clashed can be expected. This may lead to a feeling of insecurity among the local people number of females, children and old people in the composition of local people is high, while the migrants would be mainly adult males in the 18-40 years agegroup

4.2.3 Operation Impact

..... The problems namely petty crimes, alcoholism, drugs, prostitution and gambling may appear."

Increased human activity result In increased pressure on green cover of a area and the fauna based on it. No such impact has been assessed by NEERI for JNPP

Response:

The construction work force will preferably be inducted from the local population around the plant / region except for some specialized trades. The work force of construction personnel, which will be coming from outside will be housed in the temporary labor colonies established on the land acquired by NPCIL. These colonies will be provided with appropriate civic amenities like water supply, electricity, sanitation and fumigation etc. The labor work force will be under the control of major construction companies under the supervision of NPCIL

The colony housing plan shall be prepared at appropriate time

NPCIL has sufficient experience of constructing multi Unit sites. The number of people required for construction of a plant does not vary in direct proportion with the plant capacity. NPCIL has got the well set systems and procedures for management of construction activities and work force and all the associated issues like safety and

security. NPCIL will ensure that the construction activity will have minimum adverse impact on the surrounding villages and population and will take help of state authorities as and when necessary.

The desalination unit will be established at JNPP site for meeting the potable water requirements of plant and colony. Once the desalination unit is commissioned, there will not be any load on the local potable water resources on the account of plant and residential complex.

Chapter – V
Ecological Impact

Observation:

EIA says: -

2.10.7 Status of Flora and Fauna

The ecological fragility of the region as brought by the study (preliminary **and not** detailed) by the College of forestry has been delibertely down played in the ElA, not mentioning the endangered or rare species occuring in the area. Also what has been deliberately omitted the Only flock of White Backed Vultures found in the District inhabiting the project site at Madban (Photographs attached). There is no mention of Great Indian Hombtlls, White Bellied Sea Eagles and other Mammals species occuring in the area. A few hundred peacocks also inhabit the project area at Madbaan in the monsoons. The list compiled by the forestry college are preliminary and not final and detailed. No consultajk>n \ with the lo^als_has_taken_pjace. Yet the prelimiary lists are^J2ai^tive.bijt_±iave^jngt been includedjn the main report.

In Monsoon, a total of 47 climber species were recorded.
The 77 herb species were recorded
Threatened Species
In this flora the following recorded species were found to be placed in Red List under different threat categories as indicated against them (After Singh *et al.* 2000}-
Kokan dipkadi *Dipcadiconcanense* ~ Critically Endangered
Karete *Cueumis setosus* — Endangered
Dhal terda *Impatiens pulcherrima* - Vulnerable
Phonda terda *Impatiens tomentosa* — Vulnerable
Raan halad *Curcuma amada* - Vulnerable
Dudhi *Euphorbia*

4.3 Seasonal Variation in Diversity of Forest Flora

There was a marked increase in species richness during the monsoon sampling in case of herbs (890%), shrubs (11%) and climbers (51%). Furthermore, a high diversity of grasses (36 species) was observed in the entire study area and also in the grassland ecosystem surrounding the project site. The diversity indices in case of herbs, shrubs and climbers also increased in monsoon depicting that these emerged in the monsoon period.

4.5 Mangrove Ecosystem

Mangrove patches were distributed along the coasts of the project site. These ecosystemsare rich with 12 mangroves and mangrove associates. (Table 4.10), are dominated by *Aegiceras corniculatum* (34.22) and co-domoinated by *Rhizophora mucronata* (31.52) and *Sonneratia caseolaris* (20.89). The mangrove forests are located along the edges of the creeks in the study area. Their value as habitat of wildlife is immense and they support a variety of wildlife as will be clear from the discussion in the chapter on Faunal Investigations.

4.6 Grassland Ecosystem

The grassland ecosystem around the project site contained 36 speceis of which *Arundinellametzii, Glyphocloa acuminata, Glyphocloa ratnagirica, Glyphochloa santapaui, Ischaemum diplopogon, Ischaemum impressum and Icshaemum kingii* are endemic to this region.

The dominant species around the actual plant site are *Apluda mutica, Ischaemum imprexsum.Themeda triandra.* The local people use these grasses commonly as fodder for cattle. The other uses of these species include thatching of huts and rabing (burning dry plant material at nursery of paddy crop).

Our Objection :-

Consolidated Bio Diversity as per report of College of Forestry and College of Fisheries
All in all. in one years time
270 botanical species
170 faunal species - Animals, Birds, Reptiles and Butterflies
(recorded by college of forestry) 45 Marine Faunistic Species of Jaitapur-Madban Coast
22 Species harvested from trawlers from the sea

407 floral and faunal species on preliminary survey do not make the project area a ecologically poor area as NEERI has made it out to be.

This has not included the species of cereals, pulses, oilseeds and vegetable species grown in the region neither are the horticulture varieties of trees considered. Within the animal species cattle, goat and hen species as also pet animals have been excluded. A major ommission. Once again Criminal Negligence or fraud.

This ecolgical richness has been down played in the main report again to create a bias in favour of.the project. The flora and fauna are always under stress with increase human activity and this impact NEERI has failed to assess again a case of criminal negligence/fraud | by deliberate concealment.

Plate 3.8.2: Wildlife Habitats beyond 5 km from the project site and upto 25 km study area from the project site

1. Wetland habitat in Creeks - Available in Madban Village and within 5 kilometres sterilized zone.
2. Stretches of Grassland - are in Madban on the plant site.
3. Moist Deciduous Forest - Within Sterilized zone
4. Long Semi-Evergreen Forest - Within Sterilized zone
5. Coastal vegetation - Right below Plant sighting and within Exclusion Zone.

Wetland habitat in Creeks Typical Hornbill Nest-site
Roosting & Nesting places for Whitebellied
Sea-Eagle
Casuarina trees - nesting sites of Whitebeiiied
Sea-Eagle

Plate 3.8.2: Wildlife Habitats beyond 5 km from the project site and upto 25 km study area from the project site

Increased Human Activity puts pressure on the territorial ecosystem resulting in loss of green cover and increased displacement pressure on the flora and fauna of the region. Thi ipact has not been considered. So Naive of NEERI to do that

Response

The College of Forestry has not downplayed the ecological fragility of the region but whatever they have recorded during the one year study period in 30 KM radial study area around Project site are reported in the report. It has been observed that the far away areas on landward side were having rich biodiversity and biodiversity was observed to be decreasing towards the project site due to rocky landscape. At the same time rare and endangered plant species as well as the wildlife from different schedules have been given in the report. Many birds are occasional visitors to different area as per availability of nutrients, food and other requirements in that area. Therefore the vultures/peacocks might not be present in the study area at the time of survey.

College of Forestry not only referred the list of wildlife given by Forest Department, but, also made consultations with villagers about the sighting of wildlife in their area and accordingly maps of the sighting of wildlife have been included in the report. The biodiversity study carried out by College of Forestry and College of Fisheries was adequate enough to assess the impact of Project and suggest mitigation measures which will well be applied to other species which might have been recorded if the study period might have been extended.

Response to Section 4.3, 4.5 and 4.6

EIA report did not say that biodiversity is less in the study area. Biodiversity is good at distant places in study area and decreases towards Project site. The maximum diversity index across the categories viz. trees, shrubs, climbers & herbs gradually decreases from the distant zone to the nearest zone due to the rocky topography near coastal area (P.28-29 of Report on Status of Biodiversity, Annexure VII).

Biodiversity of crop and horticultural plants are reported in the report and was very well considered for biodiversity assessment which contribute to higher biodiversity at distant places and low biodiversity near project site due to gradual change of land to rocky land. However, biodiversity of crop species and horticultural plants on regional basis is maintained more or less constant by human efforts, as they are the sources of food for human community. It will not change significantly during the course of time. The biodiversity of crops and horticultural plants is more at distant places and less near project site.

The ecosystems mentioned in Plate 3.8.2 will not be affected by JNPP. The exclusion zone is proposed to be maintained with green belt, plantation and natural vegetation growth which will be helpful in strengthening the biodiversity of the study area.

Chapter-VI
Impact on Marine Ecology

Observation: Mangroves in Madban, thick vegetation and Mangroves in Jaitapur creek

Response

As a part of EIA study, NEERI, Nagpur has carried out detailed marine ecological studies for the Jaitapur coast and through College of Fisheries, Ratnagiri, a specialized study on Baseline Marine Ecological Assessment of sea cost around the Jaitapur site. The impact on marine ecological studies are based on a detailed 2D mathematical model studies for dispersion of condenser cooling water discharges from the proposed Nuclear Power Plant at Jaitapur, carried out by Central Water Power Research Station (CWPRS), Pune, in 2008. The CWPRS report is attached as Annexure- V(b) of Volume –II of the EIA report. The report from College of Fisheries is enclosed as Annexure-VIII of the Volume –II of the EIA report. These studies have concluded that the marine ecology will not be affected by the predicted maximum temperature rise of around 5 ^{0}C, which will be confined to a limited area of 0.28 Km2, when all the six units are under operation and ocean currents are under transient state, which is the most severe condition though out the year. At this range of temperature rise above ambient temperature of water, most of the organisms are either not affected or get benefit of stimulation of metabolic activity. The details are presented in Section 4.2.2.1.4, of Chapter-4 of Volume –I of the EIA report.

Observation:

A. Issues related to Project Sighting, Storage of Radioactive hazardous waste in Coastal Regulation Zone Page 407-408 of the Comprehensive EIA Volume I

4.5.4 Project Facilities Located in CRZ

The lay-out of 6 X 1650 MWe units indicating all the buildings, structures and other facilities of the project superimposed on HTL demarcation is presented in **Fig. 6** & **Fig. 7** of the **Summary EIA** of this report. From the study of the **Fig.** 6 & **Fig.** 7, it is inferred that the following essential main plant buildings will be located in CRZ.

i Reactor Buildings
ii Safeguard Buildings
iii Fuel Buildings
iv Nuclear Auxiliary Buildings
v Diesel Buildings
vi Radioactive Waste Processing Buildings
vii Electrical Buildings
viii Turbine Buildings
ix Pump House Buildings
x Health Physics Buildings
xi DM Water Plant
xii Desalination Plant.
xiii Fire Fighting Pumping Stations
xiv Oil and Grease Storage
xv Plant service Workshop/Ware-house
xvi Interim storage for Solid Rad-Waste
xvii Technical Services Building.

It is mentioned that some of the above mentioned buildings / facilities are common forall the units.These buildings are required to be constructed, on sea shore because of requirements offoreshore / water front facilities as well as in view of economic viability of the project

4. 5.5 Assessment of impact on CRZ 4. 5.5.1 Impact on Coastal Line

The Jaitapur Nuclear Power Park (JNPP) **requires water front and foreshore facilities for drawing and discharging condenser cooling sea water. Accordingly, the segment of coastal line of project site around 3 km length is required for constructing the intake water structures and associated break wall structures.** In addition, the project will also require the construction of under sea bed condenser cooling water discharge tunnels of varying lengths from 1.5 km to 2.5 km. Therefore, the natural coastal area will have some of project structures. As the existing coastal line is elevated and rocky, it functions as a natural barrier to the ocean currents and waves. However, the proposed break water wall will also act as barrier to the sea waves and will not affect the natural function of the coastal line.

The COASTAL REGULATION ZONE (CRZ) Notification Number S.O. 114 (E) and dated 19th February, 1991 (As amended upto 25.01.2005) read as follows:

2. Prohibited activities:

The following activities are declared as prohibited within the Coastal Regulation Zone, namely:

(i) [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]

(ii) manufacture or handling or storage or disposal of hazardous substances as specified in the Notifications of the Government of India in the Ministry of Environment & Forests No. S.O. 594(E) dated 28th July, 1989, S.O. 966 (E) dated 27th November, 1989 and GSR 1037(E) dated 5 'December 1989 [except transfer of hazardous substance from ships to ports, terminals and refineries and vice-versa, in the port areas] ;

3. Regulation of Permissible Activities:

All other activities, except those prohibited in para 2 above, will be regulated as under:

(2) The following activities -will require environmental clearance from the Ministry of Environment & Forests, Government of India, namely:

(i) Construction activities related to projects of Department of Atomic Energy or Defence requirements for which foreshore facilities are essential such as slipways, jetties, wharves, quays; except for classified operational component of defence projects for which a separate procedure shall be followed, (Residential buildings, office buildings, hospital complexes, workshops shall not come within the definition of operational requirements, except in very special cases and hence shall not normally be permitted in the CRZ)] ; Considering the above 3(2)(i) only slipways, jetties, wharves, quays are permissible not an entire nuclear power plant with storage of radioactive waste which is the most hazardous form of waste with a life of approximately 50,000 years. Secondly what is . permitted is 'a classified operational component of defence projects for which a separate procedure shall be followed.' The JNPP is not a classified operational component of defence projects but a civilian nuclear facility as such the plant cannot be sighted in the CRZ by any stretch of imagination. The no 'very special case' has also been made out for the entire project siting to be in the CRZ And the EIA ought to be rejected on this ground. Just how could NEERI the leading Environmetal Engineering Institute in the country perpetuate this fraud. NEERI has lost its credibility and standing by being a party to a serious attempt at undermining the Environment Protection Act.

Response

Based on NOC issued by Maharashtra Coastal Zone Management Authority in March 2009 and application from NPCIL, the proposal for CRZ clearance of JNPP was taken up by the CRZ Expert Appraisal Committee, MoEF for review during 74th meeting held on 23rd -24th April, 2009. The committee has recommended CRZ clearance for JNPP and issue of formal clearance by MoEF for same is subject to Environmental Clearance to Main Project, as communicated to NPCIL vide their letter no, 11-24/2009-IA.III Dt. 24.06.09.

The details of the Assessment and Prediction of Impact under CRZ are presented in Section III of Chapter -4 of Main EIA Report.

This is also to confirm that all the provisions, prevailing as on date, under applicable notifications by MoEF are complied with by NPCIL.

Observation:

Page No. 925 3.8.6. Riverein vegetation

Objection: By misusing the acceptance given to Projects of Department of Atomic Energy in the Prohibited Activities in Para _____ of the Coastal Regulation Zone Notification dated February 19, 1991. NEERI and the project Proponents are in reality diluting the said Notification and seek to weaken the Environment Protection Act. As can be seen from the above that the entire project construction is in the CRZ primarily in the No Development Zone of the CRZ III. The only fore shore facilities that have been shown are drawing and discharging **condenser cooling sea water. This does not require the project to be located in the CRZ since** drawing and discharging **condenser cooling sea water can also be done by locating the project outside the CRZ as has been done in case of the Dabhol Power Plant also located in a similarly elevated coastal area at Village Anjanvel, Taluka Guhagar in the same District. Here too the project draws and discharges condenser cooling sea water but the project is located on the landward side of the CRZ. Several other thermal power plants are either under construction or are proposed close to the sea coast in District Ratnagiri. All of them shall be** drawing and discharging **condenser cooling sea water. If the this project is allowed to come up in the CRZ only on the ground that** Jaitapur Nuclear Power Park (JNPP) **requires water front and foreshore facilities for drawing and discharging condenser cooling sea water then it shall set a dangerous precedent and all these proposed projects shall seek similar concessions from the Central Government, just in order to manipulatively reduce land requirement and related cost so as to "improve the economic viability of their respective projects" as NPCIL seeks to do in this case, As such in order to prevent this project from endangering the CRZ notification and seeking to weaken the Environment Protection Act the current sitting ought to be rejected.**

Response

Based on NOC issued by Maharashtra Coastal Zone Management Authority in March 2009 and application from NPCIL, the proposal for CRZ clearance of JNPP was taken up by the CRZ Expert Appraisal Committee, MoEF for review during 74th meeting held on 23rd -24th April, 2009. The committee has recommended CRZ clearance for JNPP and issue of formal clearance by MoEF for same is subject to Environmental Clearance to Main Project, as communicated to NPCIL vide their letter no, 11-24/2009-IA.III Dt. 24.06.09.

The details of the Assessment and Prediction of Impact under CRZ are presented in Section III of Chapter -4 of Main EIA Report.

This is also to confirm that all the provisions, prevailing as on date, under applicable notifications by MoEF are complied with by NPCIL.

Observation:
Page No. 926

Jetty
The jetty which has been shown in 'Figure 6 Tentative Plot Plan for Six Unit' has not even been mentioned above, The jetty is a permissible activity in the Coastal Regulation Zone but in the case no permission seems to have been sought. Approach roads to the jetty, hill cutting that shall have to be done to connect the jetty, the reclamation that shall have to be done to construct the jetty and the structural design find no mention in the report. While the jetty is a permissible activity no permission seems to have been sought and the impact of the jetty has been concealed constituting fraud on part of NEERI and NPCIL B. On Page S-20 of the Summary the following table has been setout:
In the study of the marine ecology in the Conclusion on page 15 mangroves have been falsely reported as far away from the site. Reporting none within Madban Village
No consultation has taken with Fishermen Cooperative Societies about the impact on marine ecology.

Response
As described in Section 4.5.5.2 of Chapter-4 of the Vol-I of the EIA report, a RORO jetty is proposed to be developed in the sheltered area of the breakwater. The proposal was granted NOC by MCZMA and in principle clearance by the CRZ Expert Apprisal Committee, MoEF, under CRZ Notification 1991.

Observation:
Page No. 926 Condenser Cooling Water

Table 3
Sea Water Requirement for Each Unit of 1650 MWe Jaitapur Nuclear Power Park

Sr. No.	Category of Sea Water	Supply (m3/day) / unit	Discharges (m3/day) / unit
1	Sea water for condenser cooling	86, 40,000	86, 40,000
2	Sea water for desalination plant*	20, 000	13,350
	Total sea water	86,60,000	86,53,350

Source: Areva, France

* The proposed capacity of desalination plant for one unit is planned to deliver 6650 m3/day of fresh water.
At 86,40,000 (m3/day) / unit it translates to 519 Lakh (m3/day) for six units, le 17.6 times Mumbai one days water supply (2950 million litres per day, Source : Understanding our Civic Issues, Mumbai's Water Supply, Bombay Community Public Trust, Surekha Sule).
This translates to a intake of six lakh litres per second. As such the impact of such a huge intake of sea water and release at such a massive speed has either not been studied or has been deliberately concealed constituting either criminal negligence or fraud. It is And Jaitapur bay which comes within the sterilized zone.

Response:

The breakwater, to be constructed to form the intake channel, will isolate the sea from the intake pump house. Besides, the width of the channel will be kept such that a low water velocity of 0.2- 0.3 m/s is maintained in the channel zone. In addition, the sea water retaining structures consisting of gates and screens of various sizes will be installed to further minimize entry of marine organisms. Thus, the tranquil water basin and above system, which will exist in front of the pump house intake bay will minimize the impingement and sucking of marine organisms.

Observation:

Page No. 927 Top Para

In the study of the marine ecology in the Conclusion on page 15 mangroves have been falsely reported as far away from the site. Reporting none within Madban Village

Response

The mangroves vegetation is present in the creeks beyond 5 kms distance from the project site and hence will not be disturbed or felled for the project activity.

Observation:

Page No 927. Inadequate Study of Impact on Costal Ecology

NEERI has ignored the recommendations of Expert Committee headed by Dr Swaminathan on amendment of CRZ 1991 Notification,

To elaborate, following facts are mentioned. They are:

1) The CRZ 1991 is on the anvil for strengthening through amendment and MoE&F has already put CRZ 2010 - a concept note on the website, to be responded by stake holders(public) before 30th May 2010. The recommendations of Swaminathan's Committee formed in 2004 by MoE&F are accepted in principle by the GOI and form the basis of CMZ 2008 and now proposed CRZ 2010. They recommend two important parameters (Now included by MoE&F in the concept note) which are of importance in the case of location and layout of a Nuclear Power Plant. They are
   1) Set back Line
   2) Inclusion of aquatic part.

   SET BACK LINE: Now in all developed countries, the hazard potential on seashore (both manmade and natural) is determined by demarcation of a line along sea shore called Setback line . The line is demarcated using satellite data, tidal data, 100 years projected erosion of shore and similar.The seaward side of this line is kept free of any important structure etc because it has a higer probability of mishap. For a project of such a magnitude (10,000 MWe and nuclear in nature) such a study is of paramount importance. Hence the impact study on Costal Ecology is inadequate.

   Inclusion Of Aquatic Part : This is a scientific method proposed by Dr Swaminathan in his report and accepted in principle by the GOI for protection of seashore from pollution.

   Here 12 nautical miles seaward is included in CRZ I/ CMZ . Proposed CRZ 2010 includes this aspect. Hence now the impact on seashore to be studied up to 12 nautical miles in the sea. Thus the EIA report requires discussion about 1.6 KM in sea as exclusion zone and about the sterilization zone etc. Hence the study of impact on Coastal Ecology is inadequate.

Response

i) The MoEF notification in-force does not define set back line, hence not applicable.

ii) NPCIL has addressed all the issues of impact on the aquatic/ marine environment around JNPP site by conducting specific analysis by NEERI,

Nagpur, based on specific studies by CWPRS, Pune and College of Fisheries, Ratnagiri wherein it is concluded that there will be no adverse impact on ecology.

Observation:

Page No. 928

Defense and Security

Defence and Security Very Vital Aspect Missing from the E!A. Security threat from the sea not been addressed. Has Ministry of Defence and the Navy studied the siting and approved it. Nothing in the EIA mentions this. Will not the Ministry of Defence and the Navy in particular declare an additional exclusion zone in the sea.

From Plant security point of view what shall be the no fishing zone. Has Ministry of defence Determined that.

Response

All the security measures for the plant both from land side as well as from sea side will be designed in consultation with national defense and security authorities in line with existing power plants of NPCIL.

AERB has stipulated an area around Nuclear Power Plant with no permanent habitant and called as "Exclusion zone". In line with the above, JNPP will also have a specific 'Exclusion Zone' of 1.6 km. Being a coastal site, some of the area of 'Exclusion zone' will fall on sea front. From security point of view and being a prohibited area, no unauthorized person is envisaged to be allowed to enter in this zone on land as well as sea front. The expected exclusion zone area under sea from shoreline may vary from 500 metre to 1 km. approximately. Accordingly, the entry of fisherman in this zone will be restricted and regulated. Beyond this zone, there will be no restriction of fishing.

Chapter-VII

Cumulative Impact Assessment of All exiting and proposed Power Projects on Marine and Terrestrial Ecology

Observation:
Page No. 930

The state government has announced a number of power generating stations in the district all along the CRZ and close to esturial areas in the district. All thermal power generation stations propose to use seawater to cool their turbines and realse the same into water.

NEERI is aware of this fact since it is involved with EIA of atieast two of these projects.

The cumulative impact of such a large intake and release of seawater along the Ratnagiri coastline on the coastal ecology ought to have been studied jointly by the State and NEERI but such a vital study has not been done nor has been assessed the impact on the terrestrial ecology of diversion of more than 20,000 hectares of land for power plants, lands required for evacuation of power, expansion of roads, diversion of lands for nonagriculturai activities Increase in levels of human activity exert pressure on flora and fauna of the region causing direct displacement and population loss. The Western Ghat have been identified as one of the 34 Global Bio Diversity Hotspots for conservation of which the Ministry of Environment forest and / the CMZ notification 2010 too envisage forming com/ittee of experts.

As such the following cumulative impact is missing from the report.

The impact of large and substantial intake and release of sea water on the marine ecology has not been.

Since all projects are located near ecologically fragile esturial areas, the impact of displacement on flora terrestrial flora and fauna should have Been studied but has been not.

The proposed power generation in the district is as follows:-

Response

The EIA has been carried out as per the guidelines of MoEF and additional TORs specified by MoEF for JNPP. The assessment of impact on sea water temperature due to JNPP is already covered in EIA (please refer 2- D Mathematical Model Studies for Thermal Dispersion of CCW, Annexure-V, Volume-II of EIA Report) .AS such there is no adverse impact on acquatic life due to JNPP.

Further, proposal for CRZ clearance of JNPP has also been reviewed by Expert Apprisal Committee of CRZ, MoEF in 74th meeting dated 23-24April, 2009 and in principle clearance has been accorded.

Chapter-VIII
Socio Economic Survey - Resettlement & Rehabilitation (R&R) Plan

Observation:
Page No. 932
Page 3.182 of Volume I of the Comprehensive EIA
Fig. 3.10.1: Sampling Locations for Socio-economic Study in the Study Area
This is a map that shows that some 60 odd villages have been marked for sampling locations. Not remotely connected to the project affected villages. This is being deliberately done since Yashada has not been able to conduct the necessary surveys in the Project Affected Villages due to vehement and popular opposition to the project. Project affected communities fear that YASHADA may fabricate a report just as in the case of Enron' Dabhol Power Project where TISS had tabled a report fabricated in connivance with Enron to show that socio economic profile was collected from the project effected villages when in fact no surveys were conducted and no TISS personnel had ever visited project affected villages of Anjanvel and Veldur.
It may be noted that Rs 70 crore a part of the capital cost of the project was set aside for development of the local communities. This money was in fact grossly misused to break the popular local opposition to the project and purely for money laundering. For eg music concerts of Pandit ShivKumar Sharma and Hariprasad Chaurasia in Chiplun town, 60 kilometres from the project. District Level Ganpati Decoration Competition. Central and State Ministers had then attended the Prize Distribution Ceremonies. Just how does this bring about development of the Project Affected Communities the state nowought to justify since they were the ones who imposed Enron and its white eliphantine project on the iocai community and the state crushing objections to the project. And for this now the people of Maharastra, Agriculture Sector and Industry and Business pay by sufferring load shedding from 5 hours to 12 hours.
Coming back to JNPP no socio economic study has to date been initiated by YASHADA in the region as such Socio economic profile of the area is missing from the EIA. It may be noted that the area especially that coming within the steralized zone of kms around the plant is a net importer of labour in its fisheries and horticulture sector . Where labour is imported from outside the state. These vital facts which bring out the vibrancy of the local economy have been deliberately suppresed once again constituting fraud on the part of NPCIL and NEERI.
That only natural growth of population shall be allowed in the sterilized zone implies that the fisheries and the hortiulture sector cannot employ the migrant imported labour that they do this vital impact has not been assessed and addressed in the EIA. Ability of Project Proponents

Response

MOU is under conclusion between NPCIL and State Governemnt for Rehabilitation package for Project Affected Families (PAFs) of JNPP. In addition to compensation for acquired land, NPCIL has proposed interim R & R package for PAFs of JNPP in line with the best of the provisions of National Rehabilitation & Resettlement Policy -2007 vis – a- vis Maharashtra Project Affected Families Act -1999. The details are presented in Section 7.3 of Chapter-7 of Vol-II of the EIA report.

YASHADA, has tried to carry out the survey, but some people in the villages around have not allowed them to carry out the survey. NPCIL will provide all the support needed to complete the study and implement its recommendations with the approval of the State Government.

As explained in Section 4.4.3.1 of Chapter - 4 of Vol -I of the EIA report, in the sterilized zone (annulus between 1.6 km to 5 km radius from the reactors), natural growth is permitted, but new expansion of activities, which lead to enhanced population growth are regulated. This does not include the migrant population as it does not contribute to

the population growth. Hence, the seasonal activities being carried out in the sterilized zone will not be disturbed.

Observation:
Page No. 933
Page 19 of Summary EIA
6.0 *Resettlement & Rehabilitation of Project Affected Families of JNPP*
"... Almost all the Project Affected Families (PAFs) and other people in the study area have been addressed through various Public Awareness Programs, organized by NPCIL in local villages as well as by taking group of people to some of the existing NPP sites, thusjhey have the fair knowledge about the land acquisition for setting-up of NPPs, resulting in to the development of the area around."
None of the concerns of the Project affected persons have been addressed especially their active dependence on the project area and the permanent loss of food and nutritional security. Ecological sensitivity of the region(since it is esturial area) has been deliberately concealed in the EIA. Study of the terrestrial ecology is incomplete and even that does not reflect in the main EIA. Convinced about the safety threats in the areas around the nuclear power projects with respect to radioactivity people are opposed to the project tooth and nail as can be found from the regular protests in the region.
EIA says: -
6.1 Resettlement and Rehabilitation Plan
"Based on National and State Policy on Resettlement & Rehabilitation for Project Affected Families,
the Maharashtra State Government has constituted "State Rehabilitation Authority" at state level
under State Government Resolution dated 17.03.2006.
In line with provisions under above resolution, the NPCIL has signed a MOU with the rincipal
Secretary, Relief & Rehabilitation, Department of Revenue and Forest, Government of Maharashtra on 25m September, 2006, covering following aspects;
1. *Baseline Socio-Economic survey of the families affected by land acquisition will be carried out by an independent agency, to be appointed by State Govt to prepare base line,, data for all Project Affected Families. This includes land owners as well as those people, who had their livelihood from above land.*
2. *Total loss of the land for all the PAFs and its impact upon their livelihood will be ascertained by above agency. Based on above survey and assessment, a proper resettlement and rehabilitation plan will be jointly prepared and agreed by NPCIL and State Government The above plan wiil be approved by State Rehabilitation A uthority for its implementation.*

The above plan will be implemented by NPCIL through State Administration. The Yashwantrao Chavan Academy of Development Administration, Pune has been appointed by State Government in Feb, 2007 for the purpose. The survey work is in progress under the supervision of District Collector, Ratnagiri."

Objection ;-
This is a misstatement and constitutes fraud.
Kindly report the progress in the matter.
The not too distant record of the State Government is far from satisfactory and they shall be playing similar roles in case of JNPP as in the case of Enron's Dabhol Power Project. And it may be noted that this is not just past record but the current record in the present when the project afected families have been left high and dry on several fronts having to agitate for more than a

decade for what the High Court Ordered be given to the Project affected Families by way of a Rehabilitation Package. The High Court Appointed Rehabilitation Committee has abandoned the PAPs of the Dabhol Power Project on several counts. Sadly the high Court Appointed Committee is headed by Current District Collector.

A 'Back Door Nationalized' Project Enron's Dabhol Power Project is now Ratnagiri Gas and Power P Limited. India's Only Public Sector Undertaking of the 21st century created out of a unholy alliance between Enron Corporation (now defunct), Government of India, Government of Maharashtra and the State Electricity Board. One of the recent stands taken by the new owners RGPPL that the Rehabilitation Package ordered by the Mumbai High Court in 1994 was the liability of the Enron Corporation and is not applicable to the new owner. It has refused to take the liability similar to the refusal by DOW Chemicals which took over Union Carbide India Limited and refuses to accept UCIL's liability of the Bhopai Gas Tragedy.

Considering the disastrous ecological and economic impact of Enron's Daboi Power Project on the State of Maharashtra and the similarity of roles of the GOI and the state government, the unsound economics of the two projects a comparison becomes necessary all the more since Several Constitutional Agencies such as regulatory authorities CEA, FIPB, State Electricity Board, State and Central Government, Ministry of Environment and Forests and Institutions of Repute such as Tata Institute of Social Sciences have dirtied their hands by facilitating the Enron project and are directly responsible for the dire situation in which the Maharashtra State is today.

The Justice Kurdukar Commission which was appointed by the Viiasrao Deshmukh Government to enquire into the wrong doing of the above was under pressure from the Government of India wound up in a hurried manner and not allowed to complete its enquiry. As such the guilty have gone unpunished while the people of Maharashtra are punished with Load Shedding ranging from 5 to 12 hours adversely affecting domestic life, agricultural, business, industrial activity in the State.

There are several similarities between Enron's Dabo! Power Project and the JNPP the first major similarity being that

1. **Both are misconceived flagship project with high economic destructive potential.**
   Enron's Dabol Power Project was Purported Flagship Private Foreign Direct Investment in Power Sector. JNPP is Flagship Imported Plant in nuclear power generation.
2. **Base Load Plants** - World bank too had rejected DPP as Base Load, JNPP too being Base
   Load is irrelevant to the states power needs since state shortages are only Peak Load.
3. Enron was **Based on unsound economics** and so too is the JNPP with unsound economics and a estimated project cost of 1,80,000 crores with several costs externalised.
4. **Fradulent ElAs** - Enron's Dabhol Power Project came up in Ecologically fragile area near
   Dabhoi Estuary by preparing **fradufent ElAs,** JNPP too is doing the same,
5. **Use of Sea water for cooling water blowdown.** While Enron's Dabhol Power Project's
   usage was One Lakh Twenty One thousand cubic metres of sea water, At 5.19 crore cubic metres dailt intake and release of sea water it translates to 17.6 tmes Mumbai's daily water supply.
6. **Role of State Government** - In case of Enron's Dabhol Power Project the state government fradulently Facilitated Land Acquisition under Maharashtra Industrial Development act against local dissent and steamroled public opinion and objections to the project. Forced MSEB to sign a disastrous Power Purchase Agreement. **In case of JNPP** too the state has failed to convince its people that the

project is of any benefit to Maharashtra or the region. In fact the project is of no consequence to Maharashtra. It is a recipe for a major ecological disaster and the biggest ecological threat the region has ever faced, considering the stategovernments penchant for mal-administration. The state has facilitated Land Acquisition fradulently applying Urgent Land Acquisition under Section 17 of theLand Acquisition Act in order to avoid a Public Hearing under the Land Acquisition Act. It may be noted that opposition of the Affected Land Holders is total and not even 1% of the land owners have accepted the compensation announced. The meagre quantum of compensation declared by itself is the biggest joke of the 21st century. Where the value of land is equal to the price of rice harvested at one time from an acre. It such accepting compensation for land is as good as not accepting or the other way around. - That apart after the EIA THE THREAT PERCEPTIONS OF THE LOCAL COMMUNITY HAVE BEEN CONFIRMED BY THE EIA AND THEIR OPPOSITION IS ENHANCED AND ABSOLUTE.

7. The peoples opposition to Enron has been vindicated with time and the Power sector in Maharashtra has still to recover from the setback received to MSEB since it beganpurchasing costly Enron Power. It has now been proved that such project based on unsound economics are in fact based on political considerations and priorities rather than national prioroties of furthering public interest. The Enron Saga has proved that concerned citizens know 'better' than the government. Post Enron Maharashtra state reals from Loadshedding ranging from 5 to 12 hours having setback the Maharashtra Economy. What shall be impact of JNPP on the Nations economy in case of failure which the global nuclear industry has always suceeded in achieving. The not so distant record of the state government in the field coordinating rehabilitation in case of Enron Corporation's Dabhol Power Project at Anjanvel, Taluka Guhagar, the so called flagship foreign direct investment in the power sector needs to be seen in proper light. All the more since the state government had steam roiled all objections to the project and has in turn brought the people of Maharashtra and state electricity board in tremendous difficulty in terms of power availability where loadshedding ranges from 5 to 12 hours.

Response

The Jaitapur Nuclear Power Project should not be compared with Enron Dabhol Power Project as there is no analogy between JNPP and Enron project. The nuclear power on commercial basis was introduced to world in as early as 1950/60 since then a lot of experience has been gained globally. Over 13000 reactor years of experience have been gathered, which clearly indicate that nuclear power is highly potent source of clean and sustainable energy. In view of compelling merits of nuclear power in addressing the climate change concerns and also an economic viable source of energy, currently the world is experiencing nuclear renaissance. Currently 438 reactors are in operation with an installed capacity of about 372 GW and 58 reactors are under construction. Over 200 reactors have been planned in 30 countries for next 20 year (Source: WNA). Many such countries, which were not encouraging nuclear power to be deployed as a source of electricity generation, have now decided to deploy nuclear power plant. The cost competitiveness of the nuclear power has been a much deliberated subject globally. In this context, organization of countries for economic co-operation and development (OECD) studies of 2005 can be referred, which is relevant in present scenario. This document gives a clear picture about cost competitiveness of nuclear power plant vis-a- vis the other electricity generating technologies.

The Jaitapur Nuclear Power Project should not be compared with Enron Dabhol Power Project as there is no analogy between JNPP and Enron project. However, NPCIL's point wise response is as follow:

1. *JNPP will contribute to meet the much needed electricity requirement of the Konkan region, Maharashtra State and the country and it will boost the development in the area around.*

2& 3. *Pl refer response at Para # above.*

4. *NEERI's EIA report has been prepared, complying to the provisions given in Environmental Impact Assessment Notification, 2006 issued vide no. S.O. 1533(E), dated 14th September 2006 and its amendment vide no. S.O. 3067(E) dated 1st December 2009 and based on the guidelines on EIA methodology by CPCB / MoEF. NEERI has also involved the appropriate agencies to address specific issues related to environmental impact on horticulture, agriculture, fisheries as well as radiation effects through specialized agencies like College of Forestry, Dapoli / College of Fisheries, Ratnagiri, CWPRS, Pune, and BARC, Mumbai. The EIA report has considered the ecological impacts, impacts on fisheries, impact on human being, impacts on agriculture and vegetation and others and suggested suitable measures to minimize the impact on these environmental components.*

5. *Sea water and fresh water requirement for the project will be met from sea.*

6. *JNPP is being estabilished as per the approved land use plan of the Government of Maharashtra as per Notification No. TPS 1290 / CR-120/UP-12 dated Jun2, 1995. The Clause No. (C) of the said Notification envisages a nuclear power station in the regional plan. Subseqently, Central Government had given in principle approval for the project in October, 2005. The land acquisition for the project has been carried out as per Land Acquisition Act, 1894. MOU is under conclusion between NPCIL and Government of Maharashtra with regards to Rehabilitation of Project Affected Families (PAFs). In addition to compensation for acquired land, NPCIL has proposed interim R package for PAFs of JNPP in line with the best of the provisions of National Rehabilitation & Resettlement Policy -2007 vis – a- vis Maharashtra Project Affected Families Act -1999. The details are presented in Section 7.3 of Chapter-7 of Vol-II of the EIA report.*

7. *Nuclear Power provides long term economy of power generation, whether based on imported or indigenous fuel. This is due to fact that the fuel requirements for per unit of power generation is much lower in case of nuclear power plants compared to coal requirement for the same in case of thermal power. In case of nuclear power plants is located away from coal mines, the economic advantage of nuclear power further gets enhanced due to huge transportation cost required for transportation of coal for thermal power plants located at the same location.*

As a principle, the capital cost of all imported NPP units in India should be such that the unit energy cost from above plants is comparable with prevailing tariff from power plants from Indian origin constructed at same period. Same principle is being followed for establishment of EPR units at Jaitapur site. The discussions between NPCIL and AREVA are in progress, so that the capital cost is optimized by sharing the scope of the responsibilities with regard to construction, erection of the plant facilities by NPCIL.

Observation:

PAGE NO, 936

In the writ petition number 2735 of 1994 filed in the Mumbai high court by Ganpat Dhondu Bhuwad and others versus State of Maharashtra and others. The High Court had unilaterally passed a rehabilitation scheme while dismissing the petition challanging land acquisition. A rehabilitation committee was ordered ordered as follows:

1. Collector of Ratnagiri District (Chairman)
2. Representative of MIDC (Member)
3. Representative of respondents.(Member)
4. General Manager of District Industries Centre. (Member)
5. Civil Surgeon of Ratnagiri District (Member)
6. Deputy Director of Education. (Member)
7. Deputy Director of Technical Education (Member)

The committee was also ordered to submit yearly report to the court.

Under the Package the following was ordered and agreed to upon by the respondents:

1. Creating of jobs for one person from every 700 affected families. 200 in the plant, 200 in the ancillliary industries in Ml DC and rest in the other industries that would grow in the area.

The purported Maharashtra Industrial Development Corporation industrial estate was just a farce to acquire land, the Maharashtra Industrial Development Act was only used to facilitate land acquisition (since it contemplate acquisition with the use of necessary force). Minutes of the meeting between the then district collector and Enron officials presented before the Mumbai High Court are a clear evidence. There was never any scope for any 'Ancillary Industries' and none have been setup in the last 16 years in the area.

2. Pipeline drinking water supply to al! affected villages in the next three years.

it has taken 16 long years, several agitation and unlimited follow up right up to the ministerial level for this pipeline to culminate.

During this period the Construction faults in the foundation of the cooling towers contaminated the drinking water wells of Anjanvel village with oil and saline water since commissioning of the plant in the late nineties.

The pipeline to intake saline water from the sea and release the same after using the same in the cooling towers has developed several leakages and has contaminated several natural ground water sources with saline water such as the community tank in the Kataiwadi Devraai. The Anjanvel Gram Panchayat is in correspondence with the authorities in the matter and we understand that anotherwater supply scheme is being conceptualised.

3. School and other educational facilities. School from nursery to Xth Standard and ITI. Constructed by Dabhol Power Company and run by the State government through a educational trust.

While the ITI started after 14 long years. The school was built at a location isolated from all the affected villages and never started in these 16 long years. From the grandest school construction in the district it doesn't look like a school for the children of project affected families. No industrial project in India has ever constructed such a fancy building for project affected communities. PAPs allege it was a premium paid facility for the elite.

4. Construction of Hospital - 50 bed hospital will be run by the State government. Cost borne by the Dabol Power Company.

The hospital has closed from 2002 and is deserted with no staff. The hospital was hever run by the state government but by a Pune based trust with no exclusive benefit to the project affected persons. In fact the project affected families allege the facility always charged commercially.

5. Supply of fuel wood and standing timber on 10 acres by the Maharashtra Industrial Development Corporation.

No such facility in 16 years. Infact the project affected persons have also filed writ petition in the matter and the courts ordered Rs 500 per month per family in the year but no action on that too.

6. Ex- gracia of Rs 5,000 per acre to land owners rendered landless or marginal.

Local allege some 300 still to receive the same afer 16 long years. In the mean time no annual reports were ever filled on the progress by the state government as instructed by the High Court.

All in all it is a case of forgotten and broken promises and was the responsibility of the state government to ensure that the Rehabilitation Package was properly implemented.

But the state government as a prime guardian of public interest in the state abdicated this responsibilities just as it had abdicated a host of other responsibilities in the Enron matter. With this background in mind and the ability and track record of the state government needs to be seen in proper light. In case of the JNPP the state government has not on one occasion reached out to the public with any stated benefits of the project. Probably because it is not convinced either. Or it is neither interested in being convinced nor interested in convincing the affected public. Looking at the irresponsible conduct of the state government in the matter In this light it can now be safely said that there are parallels to be drawn of proposed JNPP with Enron Corporation Dabhol Power Project in that the DPP was conceived purely on international poiiitica! considerations and not on sound economic or environmental principles and so is JNPP. The state government has not applied its mind as to whether this project is of any consequence to the state in terms of the power demand or whether the project will further regional development orsubvert regional development already achieved, whether JNPP will maintain or enhance the prevailing ecological balance of the region or disturb it with disastrous environmental consequences.

Whether the state governemtn is a responsible trustee or an irresponsible one. In light of the above the question can be validty raised whether the state government has the credential to play the vital roles as perceived by the project proponent in the EIA.

Response

JNPP is being estabilished as per the approved land use plan of the Government of Maharashtra as per Notification No. TPS 1290 / CR-120/UP-12 dated Jun2, 1995. The Clause No. (C) of the said Notification envisages a nuclear power station in the regional plan. Subseqently, Central Government had given in principle approval for the project in October, 2005. The land acquisition for the project has been carried out as per Land Acquisition Act, 1894. MOU is under conclusion between NPCIL and Government of Maharashtra with regards to Rehabilitation of Project Affected Families (PAFs). In addition to compensation for acquired land, NPCIL has proposed interim R package for PAFs of JNPP in line with the best of the provisions of National Rehabilitation & Resettlement Policy -2007 vis – a- vis Maharashtra Project Affected Families Act -1999. The details are presented in Section 7.3 of Chapter-7 of Vol-II of the EIA report.

Conflict of Interest

Observation:

PAGE NO. 941

Jaitapur Nuclear Power Park is a project of the government of India. NEERI which has been engaged to critically evaluate the Environmental Impact of the Project and conduct various studies and surveys for the purpose. The **Prime Minister is the President of NEERI and the Minister of Department of Science and Technology is its Vice President, as such there is a conflict of interest. AH critical evaluation has been avoided. In fact NEERI has become willing party to the fraud that the proposed seeks to perpetuate. This has reflected in the Environment Impact Assessment which is short on impact assessment, does not project any negativities has either neglected several vital fact about the local environment or has deliberately concealed them to facilitate environmental clearances to the Project Proponent Nuclear Power Corporation of India Limited.**

What competence does NEERI have in the field of nuclear energy whether NEERI is an authority competent to prepare the first Nuclear Project EIA since it has never done so before.

This can be seen on several instances of the EIA where they have just accepted NPCIL stands at face value and failed to critically evaluate suffiency of measures, risks and responses.

On several occassions NEERI has been making 'SWEEPING STATEMENTS' without any scientific study in order to create a bias in favour of the project constituting fraud.

- Emergency response plans are not yet ready.
- Plant designs are yet to be approved by AERB,
- Socio Economic Profile of the region is not yet ready,
- AERB and Ministry of Defence in particular the Navy has not yet studied the EIA and Project Report.
- Ecological Fragility of the area has been down played,
- Peoples dependance on the land especially in Madban has either not been studied or it has been deliberately concealed.
- Project siting has been critically wronged in order to avoid displacement and push the exclusion zone into the sea under the garb of requiring water front facilities when in fact none have been demonstrated.
- Sakhari Nate which comes into the steraiized zone is a net importer of labour for its horticulture and fisheries sector and is one of the busiest fish landing centers in the Konkan Region. The impact of exclusion zone and sterilized zone into has not been assessed/has been concealed.
- The fishing economy, agriculture and horticulture economy in the region has not been assessed/ has been concealed.

  With the above NEERI is either guilty of criminal negligance or has committed fraud by purpose fully concealing the above. The affected families in light of the above intend to criminally proceed against NEERI and the college of fisheries in the matter.

Response

The EIA report for JNPP is a detailed comprehensive document prepared in the most scientific and orderly manner by NEERI, Nagpur, one of the most reputed institute, under Ministry of Science & Technology, Govt. of India. The report is based on the

studies carried out by professional experts of NEERI, Nagpur as well as the special studies by the following organizations:

- *"Pre-operational baseline radiological survey of the area around JNPP site"- by Health Physics Division (HPD), BARC, Mumbai.*
- *"Status of biodiversity study of the area around JNPP site" – by Collage of Forestry, Agricultural University, Dapoli through NEERI, Nagpur.*
- *"Thermal dispersion studies for Condenser Cooling Water (CCW) discharges" - by Central Water and Power Research Station (CWPRS), Pune.*
- *"Marine ecological studies" –by Collage of Fisheries, Ratnagiri, Agricultural University, Dapoli, through NEERI, Nagpur.*
- *"HTL, LTL and CRZ demarcation Study"- by National Institute of Ocean Technology (NIOT), Chennai.*

The above organizations are professional and reputed in their area of work and posses immense experience & expertise. Based on the specialized studies carried out in a scientific manner & as per standard methodologies by the above organizations, including their own study & assessment, NEERI, Nagpur prepared the EIA report. The subject report addresses all the issues elaborately covering relevant aspects of environment.

NEERI, Nagpur routinely carries out EIA studies for various industrial projects including number of nuclear power projects (NPPs) all over India and hence possess vast experience and expertise for carrying out environmental impact assessment studies. Based on such studies, NPCIL has been granted environmental clearance in recent past by MoEF, New Delhi for these projects.

- *Emergency preparedness plans are prepared for each and every nuclear power plant and submitted at appropriate stage to AERB for its approval which is mandatory.*
- *There is a specified stage wise procedure for obtaining AERB approvals for nuclear power plant designs. The process of seeking approvals has already started and will follow its due course. The approvals are stage wise and any work on the next stage can be started only after approval of AERB for the same.*
- *The socioeconomic profile of the 32 km radius study area has been prepared by NEERI and presented in EIA report (Vol., I section 3.10 in Chapter no. 3).*
- *As explained above the process of AERB approvals had started. With regards to security as explained earlier, the mechanism will be worked out in collaboration with national defense and security agencies.*
- *Please refer the response to point no. 2.10.7 of Chapter V.*
- *Dependence of people on land from Madban area is appropriately covered in Section 3.10.2 .3 and Table 3.10.2 in Chapter 3 of Vol. I of EIA report.*
- *The site has been selected by the site selection committee appointed by Govt of India based on various standard criteria described in section 2.0 on page S-4 & S 5 of summary EIA report.*
- *As explained in Section 4.4.3.1 of Chapter - 4 of Vol -I of the EIA report, in the sterilized zone (annulus between 1.6 km to 5 km radius from the reactors), natural growth is permitted, but new expansion of activities, which lead to enhanced population growth are regulated. This does not include the migrant population as it does not contribute to the population growth. Hence, the seasonal activities being carried out in the sterilized zone will not be disturbed.*
- *Detailed information about fishing, agriculture and horticulture is given in EIA report. The detail on fishing activity is given in Section 3.8.13, Table 3.8.4, 3.8.5, 3.8.6 of Vol. I of EIA report. Agricultural and horticultural aspects are given in Section 3.8.14 and Table nos. 3.8.7, 3.8.8 & 3.10.7 in Chapter-3 and Table -1 & 2 of Summary EIA.*

Chapter –IX

Contracting to Academic Institutions

Observation (Page No-944)

NEERI has got the Dr Balasaheb Sawant Konkan Agricultural University, Dapoli through its College of Forestry and College of Fisheries to conduct studies on vital issues concerning the project. It be known that this is the first instance of the said colleges being involved in such exercises and the Vice Chancellor of the University in several meetings with farmers has categorically stated that it has given no opinion on the Jaitapur nuclear power project. Since being an academic institution it does not have the required competance. While the study of the College of Forestry is measured carefull not to give any opinion. The report falls short on several counts in that it is not a detailed study. It is difficult to miss on the project site the only colony of white backed vultures in the district could be in the Konkans too.

The study of fisheries college raises several issues. The role of the university on this count is suspicious since the purported studies carry several statements of praise about nuclear energy this when the university has had no avenue to study nuclear energy in its area of operation. Professors of the University have spoken for NPCIL on a public forum without having any exposure in the field of nuclear power generation.

Response

The study was entrusted by NEERI to the Institutes of Dr.Babasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli in order to get the participation of local Institutions of excellence as well as to get benefit of their vast and specific knowledge about the local environment.

College of Forestry and College of Fisheries affiliated to Dr.Babasaheb Sawant Konkan Krishi Vidyapeeth carried out the study in the biodiversity and marine ecology respectively in which they are competent. College of Forestry and College of Fisheries were given primarily job of studying, interpreting and reporting terrestrial and marine biodiversity respectively. These colleges have done their job in sufficient details of biodiversity and rare & endangered species.

The College of Forestry, Dapoli has wide experience of studying the biodiversity of the Ratnagiri District as well as in other parts of the country. This college has prepared e-herbarium of the plants for reference purpose during their taxonomical study. The College of Forestry also maintains a 50 ha Biodiversity Park or genomic valley where there is collection of many rare, endangered and medicinal plants. This indicates that the College of Forestry is the competent institution to carry out biodiversity study in the study area of JNPP.

College of Fisheries also gave their inputs on the basis of literature survey about the impact of thermal pollution on fish and marine organisms which was included in the report.

Both the Colleges are competent in these fields and have completed their job with best of their ability.

Chapter –X

Conclusion

Observation:

"Presently, Nuclear Power Corporation of India Limited, under the Department of Atomic Energy, is operating 17 Nuclear Power Reactors with installed capacity of 4120 MWe: The present share of nuclear power of 4120 MWe is expected to increase to 7280 MWe by December, 2010 on completion of 6 projects under construction including one 500 MWe FBR type nuclear power plant by BHA VINI under Departm entofA tomic Energy.".

Current project is 2.5 times current cumulative NPCIL generation.

In conceiving this project does NPCIL have the ability to manage a project whose capacity is 2.5 times the sum total of 8 plants with a total cumulative capacity of 4120 MWe

Table 1.1

Indian Nuclear Power Programme

Category of Units	Capacity (MWe)	Cumulative Capacity (MWe)
Operational Units		
Tarapur (TAPS) (Unit 1 and 2)	2x 160	320
Rajasthan (RAPS) (Unit 1 and 2)	1 x 100+ 1 x200	620
Kalpakkam (MAPS) (Unit 1 and 2)	2x220	1060
Narora (NAPS) (Unit 1 and 2)	2x220	1500
Kakrapar (KAPS) (Unit 1 and 2)	2x220	1940
Rajasthan (RAPS) (Unit 3 and 4)	2x220	2380
Kaiga(KGS)(Unit1,2and3)	3x220	3040
Tarapur (TAPS (Unit 3 and 4)	2 X 540	4120

As such JNPP is a overambitious project being thrust on the region and the state ***'horribly misconceived'*** based on international political consideration and furthering the interest of the US and the European Nations at the cost of the Indian Public, State of Maharashtra and the Affected Communities of Jaitapur region.

Can a psu whose largest plant capacity is 1080 MW be trusted to safely and effeciently run and manage a plant which is 9 times bigger. A nuclear power plant carry a very high risk quotient to the environment and public safety and which the technology exporting nations are fighting and struggling to address these risks in their own countries.

A comparison again needs to be drawn, the Dabhol Power Project 14 years after it commissioned is yet to achieve its stated power generation capacity. During this period the Maharashtra Government could not commision even a single power generation facility since all its funds were blocked in this project.

The economic viability of the Dabhol Power Project was never demonstrated by the stake holders. None other than the World Bank had said that the project would break the 'Back of Maharashtra's Economy'. The economics of the project was always shrouded in secrecy and non application of mind. Objections of the Public were never addressed. The rest is history and the state has still to get out of the mess that it created. The project is proving to be a quagmire sucking vital resources of the state, center, SEB and financial institution and banks such as IDBI and State Bank of India

Enron was a Rupees 9,000 crore investment, JNPP is slated to cost upwards of Rupees 2,00,000 crores. In light of above the risk assessment of economic failure of JNPP also needs to be undertaken. Economically too we have a major responsibility fo ensure the the Enron history does not repeat. We as affected persons of JNPP and concerned citizens of the nation are worried that so far the JNPP scripts is following the Dabhol Power Project script and in several measures even surpassing it. As such let not the regulatory authorities repeat the mistake of turning a blind eye to peoples valid objections and concerns regarding JNPP.

Response

NPCIL till date has constructed 19 reactors of various capacities (from 220 MWe to 1000 MWe) and has mastered all the disciplines of the nuclear technology like design, construction, operation and maintenance. It has got complete expertise in these fields as well as in the fields of siting, erection, quality assurance, commission and safety analysis. In fact NPCIL is one of the unique organization in the world which posses end to end capabilities in one single organization. The expertise of NPCIL as well as its blemishless track record of operating its power plants in the safe way for more than 320 reactor years has earned world wide acclamation many times over. NPCIL participates in international nuclear fora and is a responsible member of IAEA.

In view of this abundant expertise and experience, NPCIL is capable of taking the challenge of constructing 6 units of 1650 MWe EPRs over a span of about 15 years.

Observation:

Concluding Statement

Based on the issues raised herein above this a blatantly incomplete EIA from NEERI.

Absence of asessment by AERB and Ministry of defence,

Ultra Hazardous nature of the project.

Its unsound economics as demonstrated in submissions by Indian School of Social Science.

Lack of credentials of the state government to do justice to affected people

And the total opposition of the affected peole to the project.

This EIA ought to be outright rejected and may be done so.

Response

Concluding Statement:

The points noted in the concluding remarks are all addressed in detail above.

Observation:

JNPP is planned to be located on the Madban Plateau. For this purpose 690.401 hectare of land has been acquired. Of this 62.074 Ha are classified as under kharif crop, 227.65 Ha as fallow and 400.762 as barren. 90% of the land is considered to be unproductive wasteland and hence it is claimed that excavation of these lands for the erection of the nuclear power plants and the ancillary and other buildings would not have any adverse impact, overlooking the fact that these lands are very rich in biodiversity.

Response:

The proposed plant site is adjoining the sea coast and is mostly a rocky barren stretch of land with patches of grass lands with scrub (Ref. Indian Remote Sensing data, Section 3.7.8, page No. 214-218 of Vol-I, EIA report). The low biodiversity of the project site has been indicated by the study given on pages 28-29 of biodiversity report of College of Forestry, Dapoli (Annexure VII in Volume II of EIA Report). This area does not have plant species or ecosystem which are unique to this area and which are not present at other places in study area. Similar plant species and ecosystems are present throughout the study area. This is very small area as compared to large stretch of land in Ratnagiri District with good biodiversity. and thus there will not be loss of biodiversity due to erection of the NPP.

Further, green belt will be developed around JNPP up to 1.5 km area using selected local plant species and the area among them will be kept undisturbed which will have native floral biodiversity. Thus native biodiversity will be maintained around the project site. The detail plan of the green belt development is presented in Section 10.10.3.1.2, page nos. 458 – 464 of Chapter-10 of Vol-I of the EIA report and the work of development of biodiversity rich green belt will be undertaken through College of Forestry, Dapoli.

Observation:

The work of assessing the status of biodiversity was outsourced by NEERI to the College of Forestry, Dapoli directing them "to prepare a detailed report on the status of wildlife and biodiversity at the proposed site of NPP and in 25 km radial data around".

Response:

The College of Forestry, Dapoli has wide experience of studying the biodiversity of the Ratnagiri District as well as in other parts of the country. This college has prepared e-herbarium of the plants for reference purpose during their taxonomical study. The College of Forestry also maintains a 50 ha Biodiversity Park or genomic valley where there is collection of many rare, endangered and medicinal plants. This indicates that the College of Forestry is the competent institution to carry out biodiversity study in the study area of JNPP. Therefore the study of wildlife and biodiversity at proposed project site and within 25 km radial area around the project site was awarded to this college and the Biodiversity Report submitted by them is annexed as Annexure – VII in EIA Report Vol. II.

Observation:

The survey results are presented for five zones 1-5km, 6-10km, 11-15 km, 16-20 km and 21-25km. No data are presented separately for the project site.

Response:

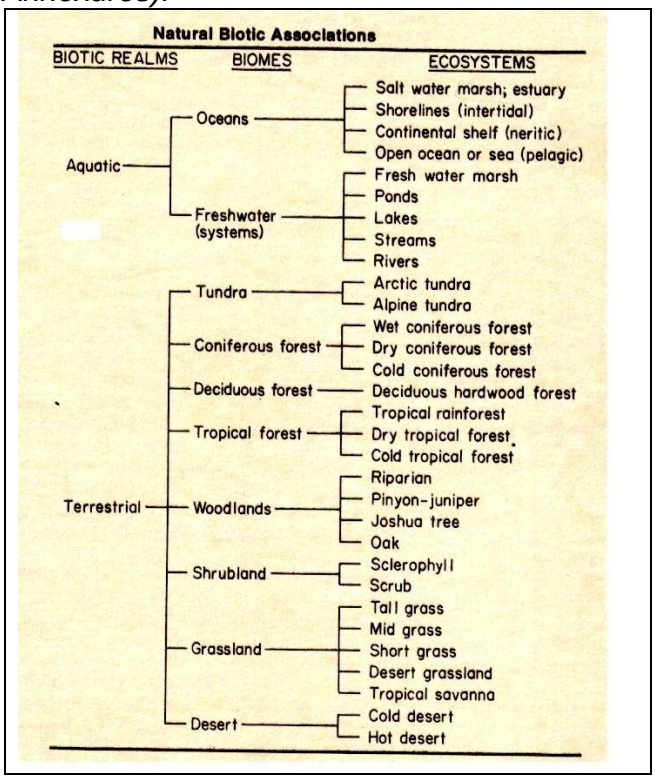
The project site is mostly rocky and barren. Many photographs and remote sensing data of the project site are given in the report. The description of the project site is given on Page 28-29 of the Biodiversity Report of College of Forestry Annexure VII, Volume II of EIA Report. The supplementary information is given in section 4.0 and Table 1, Table 2 and photographs of the project site are given in Plates 1(a) & 1(b) on Pages S-5 to S-8 in Summary EIA Volume 1. More photographs of Project site are given in Plates 2.1 to 2.7 in Chapter 2 in EIA Report Vol. 1. The information is also given in section 3.8.2 on page 234 in Chapter 3 of EIA Report Volume 1 – "The proposed site is adjoining the sea coast and is mostly a barren stretch of land with sparse savanna vegetation. At Project site, only sparse vegetation is present".

Observation:

A standard habitat classification system is not used while presenting the results in the ecological study.

Response:

Standard IUCN habitat classification given by J.G. Rau and D.C. Wooten in their book "Environmental Impact Analysis Handbook" (Publisher: McGraw-Hill, Inc.) (please refer following Table) was used in the study. Accordingly, College of Forestry has classified the Terrestrial ecosystems of the study area as grassland, forest (or woodland), and Aquatic: Oceans: salt water marsh; estuary i.e. mangrove (Section 4.1 of Biodiversity Report of College of Forestry, Dapoli) and the College of Fisheries, Ratnagiri studied Aquatic: Oceans: shorelines (intertidal) ecosystem and coastal ecology (Annexure VIII in EIA Report Vol. II Annexures).



Observation:

Specific study of the lateritic plateau where there will be a near total destruction of the existing rich flora and fauna due to erection of nuclear plants and other buildings does not seem

to have been carried out. Consequently data giving attention to characteristic habitat types, its associated flora, fauna, their biological significance and ecological status are lacking.

Response:

Study of the project site and its ecosystem is given in the report. The plateau region is mostly composed of the laterites, which are derived from original basaltic rock (section 3.7.1, page 207 of EIA report) with insignificant bio-diversity as described earlier in the response to the comments of KBS. So the loss of biodiversity due to construction of the NPP will be insignificant. This will be compensated by conservation of grassland ecosystem along with the proposed green belt in the exclusion zone of the JNPP. Moreover the whole Ratnagiri District have laterite plateau ecosystem at various places which will not be affected by the JNPP project activity. The detail information on the flora of project site and residential complex with respect to bagayat, kharip land, varkas land, pot kharaba land is given in Table 1 and Table 2 respectively in Summary EIA. Details of tree vegetation on the land being acquired for plant and residential complex of JNPP is given in Table 3.10.7 on page 324 in Chapter 3 of EIA Report Vol. I. The construction of residential complex will be carried out carefully to avoid unwanted destruction of trees and only the minimum number of trees from the area earmarked for construction will be cut and compensated in the form of green belt around the plant, and all other trees will be maintained as such.

Specific points for which clarification is needed are presented below:

1. **Observation:**

   29 species of herbs are not identified up to species level in the list on page 27 of the final report. Only genus name is mentioned (referred as sp./spp.). How was their endemic/threatened status decided without complete identification?

   Response:

   The endemic species are identified based on genera and those which were identified as endemic were studied upto species level. Non endemic genera were not taken up for analysis up to species level.

2. **Observation:**

   There is no proper representation of the lateritic plateau flora (which is characteristically seen on Ratnagiri and Devgad plateaus) in the ecological report. For ex. how is it that common species *Dimeria woodrowii* (an endemic), *Utricularia reticulata* are not included in the species list? The report mentions on page 13 that sampling points have covered predominantly the forest ecosystem. (Section 4.1 of the final report .pdf). Only a list of grasses is provided from the grass covered plateaus. What was the reason for not adequately covering the diversity aspects of these habitats?

   Response:

   The lateritic plateau is the part of terrestrial environment throughout the study area described in the report. Whole study area had been studied in detail for biodiversity and the results are given in the report.

   The purpose of EIA is to have a fair idea about the biodiversity of the area which might get affected by the project activity and the conclusions are based on the taxonomical data/Monographs already generated for the area. Presence of Dimeria woodrowii (an endemic) *and Utricularia reticulate which will be added as secondary information in the final EIA report.*

   The study area outside the project site will not be affected by project activity. However, the general environmental management plan will also take care of

protecting species like Dimeria woodrowii and Utricularia reticulata, a small plant inhabiting wet soil or pond water.

The list of grasses given is not only for the grass covered plateaus but for the whole study area. The list of trees, herbs, shrubs, climbers and mangroves and their associates in the study area are also covered in other tables in the Annexure VII of Vol II of EIA report.

3. **Observation:**

What are the references that were followed? Singh et al. (2000) and Flora of Maharashtra mentioned in the text have not been given in full in the references section. Why was the latest Botanical Survey of India publication on threatened plants (Mishra and Singh, 2001) not followed? The quoted literature, Flowers of Sahyadri and further flowers of Sahyadri used is popular handbook and not a standard flora (as published by Botanical survey of India or any other institution reputed in floristics) and is not adequate to identify the specialised ephemeral flora, esp. Eriocaulaceae, Cyperaceae and Poaceae members on the rocky habitats.

Response:

College of Forestry is a renowned Institute in taxonomical study of the plants in the forests. They have rich experience in identifying the taxa and have all the available expertise, reference herbariums, and Biodiversity Park as support. They have used standard taxonomical references as well as the standard books on local plants for identification of the plant taxa. This is the general practice in any scientific study. College of Forestry used the Flora of Maharashtra (2000) of Botanical Survey of India for the analysis of the plant taxa, which is itself enough to identify the plant species. They have also used standard book on taxonomy like Flora of Bombay Presidency Vol I – III (1956) of Botanical Survey of India. In addition, the book "Flowers of Sahyadri" was used as support literature during the study.

The account of threatened and endangered plant species, which is based on standard references, is given in the book of Singh et al. 2000.

The following references in full will be added to the final EIA report in the references section.

- *Singh, N.P.Laxminarasinhan P. karthikeyan S. and Prasanna P.V. 2001. Flora of Maharastra, Vol II, B.S.I. Kolkata*
- *Singh N. P. and Karthikeyan. S. 2000. Flora of Maharasthra. VOL I. BSI, Kolkata*
-

4. **Observation:**

Why a standard habitat classification system (for ex. Used by IUCN) not used to classify habitats? It appears that an agricultural land classification was followed, which is unsuitable for ecological studies as it does not have a proper Classification for the habitats seen in the region. It only gives categorization in terms of land-use-leading to the lateritic plateau habitat being referred to as wasteland.

Response:

Standard IUCN habitat classification system is covered in the preceding paragraphs. Agricultural land classification is not followed for habitat classification which is clear from the above mentioned response. For remote sensing data, the land use / land cover classification system standardized by Department of Space for mapping different agro-climatic zones has been adopted in remote sensing study and is used by Maharashtra Remote Sensing

Application Centre, Nagpur to classify the land use pattern as per their standard guidelines.

5. **Observation:**

The landscape in this region is heterogeneous. For adequate sampling of such a landscape, stratified random sampling is a preferred sampling technique. Instead of which random sampling was followed. The survey does not clarify how many sampling points were taken on the lateritic plateau habitats. It is hence necessary to separate data for the lateritic plateaus and analyse it to understand the diversity measures on the plateau in this survey.

Response:

The study area has predominant lateritic plateau area. The study area is undulating plateau but not stratified like vegetation communities on the slopes of very high mountain. So random sampling is the best method to study the study area. Whole study area was divided into 1250 grids with each grid measuring 1km x 1km area and 100 grids were selected for study which contains

6. **Observation:**

The report mentions lack of sensitive habitats as there are no National parks/sanctuaries in the area, However, it is not necessary that sensitive habitats are present "ONLY" within National parks/sanctuaries. There is enough published literature which designate lateritic plateaus as specialised habitats with high endemism, threatened flora and specialised vegetation type. The report has not taken cognizance of the secondary information about this habitat which is available from Ratnagiri and Sindhudurg districts.

Response:

The Konkan plateau in Ratnagiri is derived from basaltic rocks and extensive spread of laterite is observed through the district especially on south Ratnagiri side. *There is mention of sensitive habitat of mangrove ecosystem (section 4.5 on page no. 29 Biodiversity Rport of College of Forestry, Dapoli) as well as the list of rare and endangered species (Page 15-16 in Biodiversity Report of College of Forestry, Dapoli) in this study area consisting of laterite formation.*

7. **Observation:**

Dipcadi concanense a threatened species is included in the listing but it has not been reported from the 5km radius zone from site, and hence the conclusion given is that it will not be affected. This critically endangered" species is now present ONLY on a few lateritic plateaus in Ratnagiri, Sindhudurg and Goa areas. It is hence necessary to conduct more study on its distribution in the study area to decide whether or not the development of plant and related infrastructure development (like roads, houses, garbage dumps) will affect the existing habitat of the species. It is possible that the already fragmented population will suffer more loss in germplasm if the continuous habitat availability is disturbed.

Response:

The main objective of the report is to describe the impacts of project activity on the local ecosystem. The study area outside the project site will not be affected by project activity. However, the general environmental management plan will also take care of protecting species like Dipcadi concanense.

8. **Observation:**

The report mentions that sampling was done in monsoon, but the duration and dates of the survey are not reported. The report says that the sampling points were visited once in the monsoon, (final. report. pdf, Chapter 4, 4.1: page 13) The lateritic plateau habitats are colonized entirely by ephemeral fauna which needs frequent and periodical sampling as is documented in relevant literature on the subject (Annexure : Note by Dr. Aparna Watve on Lateritic plateaus). The methodology does not document adequately the special sampling efforts taken to study lateritic plateaus ephemeral flora, which leads one to suspect that special efforts have not been made due to lack of understanding of biological significance of the plateaus.

Response:

Sampling was carried out in monsoon for a continuous period from June to November 2007, during which all the species of ephemeral herbs, climbers and shrubs are developed in the region and are recorded in the report of the College of Forestry, Dapoli. A total number of species of shrubs, climbers and herbs recorded in summer was 24, 23 and 8 respectively while it was 27, 47 and 77 in rainy season indicating a large number of ephemeral species recorded during the study (Section 4.3 on page 27 and Table 4.8 on page 28 in Biodiversity Report of College of Forestry, Dapoli).

9. **Observation:**

The diversity index H'(Shannon's index) of herbs in summer and monsoon shows hardly any difference in H', and it is difficult to understand the reasons as the diversity of herbs should be much higher (as expected from the increase in species richness).

Response:

The number of herb species recorded in summer and rainy season are 8 and 77 respectively (Table 4.8 on page 28 of Biodiversity Report of College of Forestry), indicating higher species diversity in rainy season. Diversity Index is a statistical estimate of the diversity and evenness of different species in the community size. If the evenness is more the diversity index is more, however if a few species are large in proportion and others are more or less even, then the diversity index is lowered. The value of Shannon Wiener diversity Index (H) values for herbs were 1.4201 and 1.5329 in summer and monsoon respectively, which indicate low number of herb species in summer and the unequal or uneven distribution of herb species in rainy season due to their gregarious nature resulting in lowering of diversity index.

10. **Observation:**

Generally in herbaceous layer sampling for such habitats, ground cover is to be measured within a grided 1X1m frame. The method applied by the ecological survey may result in under representation of individuals of small ephemeral species, which are typical of the lateritic plateau habitats.

Response:

The same method of 1mx1m grid is followed for studying herbaceous layer of vegetation. This is standard practice of studying herbaceous flora within 1mx1m quadrate taking representative number of quadrates in the area, therefore the herb flora is not underrepresented.

11. **Observation:**

One third (173rd) of grass species in the grassland list are unidentified, hence their endemic status is not considered.

Response:

The endemic species are identified based on genera and those which were identified as endemic were studied up to species level. Non endemic genera were not taken up for analysis up to species level.

12. **Observation**:

One member of Cyperaceae family (a sedge) is included in the list of grass species. Cyperaceae, Eriocaulaceae members which are common, dominant and characteristic families on rocky areas and especially lateritic plateau are not enumerated adequately in the report.

Response:

The name of family and the habit - sedge in case of Fimbristylis merrillii (sedge) from Cyperceae family will be included in the final EIA report.

Eriocaulon humile, a lone member of Eriocaulaceae has been reported from Khandala in Pune District and Matheran in Raigad District as vulnerable and endemic species (Red Data Book of Plants of India by Nayar & Sastry, 1987-88). This species as well as other species from this family have not been observed by the study team of College of Forestry, Dapoli in the study area and therefore does not find mention in the report.

13. **Observation:**

Secondary data of reptiles and amphibians, has not been considered, saw-scaled viper a common occupant of plateuas in the area has not been mentioned.

Response:

The data on reptiles and amphibians are mostly based on the information from the local people which is authentic information on the presence of species in the area. Six species of amphibians and 12 species of reptiles are recorded to be present in the area.

14. **Observation:**

The effect of lateritic habitat fragmentation due to formation of roads, changing of drainage, construction of housing and supporting infrastructure, has not been discussed.

Response:

There is no wild life habitat and migratory path in the 0-5 km area around the project site. so the project activity will not affect any wild life habitat. The development of approach road, interconnecting roads and drainage pattern at project site and residential complex will be implemented in such a way to avoid habitat fragmentation as far as possible.

15. **Observation:**

The amphibian and reptile diversity is also found to be least explored in the- study. Especially, presence of the nocturnal frogs and toads is to be carefully observed. Wildlife schedule status of reptiles/amphibians not mentioned. Rocky areas esp. lateritic plateau habitats are well known for endemic herpetofauna (Varad Giri, BNHS) and more care needs to be taken in documentation. An endemic and threatened gecko species has been described from Dorle plateau. This has not been mentioned in the report even as secondary information.

Response:

Reasonably detail salient aspects of biodiversity are included in the report on the basis of which environmental management plan has been prepared which is sufficient enough to protect wild life as well as biodiversity at microscopic level The wild life status of python and Varanus bengalensis as Scheduled -I species as per Wildlife Protection Act , 1972, amended in 1993, will be added in final EIA report.

16. **Observation:**

List of floristic subject experts consulted for the area has not been mentioned.

Response:

College of forestry has the team of experts in plant taxonomy viz. Prof. A.D. Rane, Prof. D.N. Mokat, and Prof. V.K. Patil who are assisted by research workers Mr. K.P. Gadekar and Mr. M.M. Naik. The names of the team members is given in the report of College of Forestry, Dapoli at Annexure VII, EIA report Vol II Annexures. The floristic experts from NEERI side are Dr. P.R. Chaudhari, Project Advisor, Dr. J.P. Kotangale, Project Manager, assisted by Mr. Sameer Deshpande, Project Assistant

17. **Observation:**

Adequate secondary information from marine coastal fauna has not been included in the report.

Response:

The secondary information on marine coastal fauna is given in the EIA report. A list of 85 species of marine fishes along the coastal belt of Ratnagiri district is given in Table 3.8.4 (Source: Department of Fisheries, Ratnagiri), details of marine fishery in Table 3.8.5 and details of inland fishery in Table 3.8.6 (source: Statistic Abstract book, Ratnagiri and Sindhudurg Districts for the year 2003-2004) and local fisheries scenario on page 253-254 (Source: fish landing Centers at Sakharinate and Tulsunde) in Chapter 3 of EIA Report Vol I.

18. **Observation:**

In the mangroves, occurrence of a patch of Rhizophora apiculata L at village Mirawane is not mentioned. The said species is classified under endangered category (According to the CAMP, Goa report) and which is rare in its distribution along the Maharashtra coast. Presence of Sonerotia alba supporting significant bat colonies (at Dale Jaitapur), which is a unique coexistence for pollination, is also not mentioned. We could observe the sea otters in the forests and interlinking of surrounding deciduous patches by the langoors is also important in the study area. (Dr. Mahesh Shindikar, pers. Comm..)

Response:

Necessary data will be incorporated in the final EIA report. However, the above mentioned area is away from the impact zone of the project as neither the discharged water nor any conventional pollutant is likely to reach this area due to design of proper EMP. Therefore, the existing status of this patch with whatever diversity it has, will remain unaffected.

19. **Observation:**

In the recommendations, creation of green belt has been proposed, which is totally inappropriate for the habitats involved. As .it will drastically modify the lateritic plateau, for which natural vegetation is of ephemerals. The ecology of the rocky plateau

is not conducive for tree cover on large scale and extremely intensive habitat modification will be needed in creation of green belt which will lead to further degradation of the habitat.

Response:

The current state-of-the-art technology available for remediation of mines spoil dumps, rocky areas with proper supplementation of soil and bio-fertilizers is available in the country. NEERI has remediated number of spoil areas using this biotechnology. A proper assessment of lateritic soil and its amendment with good soil and bio-fertilizer can be used to create proper greenbelt. This technology is environment friendly and will not endangered the existing habitat.

Observation:

In the absence of basic ecological information that would have brought out the gravity of the damage that the JNPP would perpetrate, observations and knowledge of the Madban residents and the results of the study of lateritic plateaus in Konkan are used as points of reference.

Results of the study by Dr. Aparna Watve "Plant community studies on the rock outcrops in the northern Western Ghats of Maharashtra" are summarized below:

"Vegetation of lateritic plateaus

The vegetation is dominated by low growing herbs. It shows distinct changes in species composition according to the progress of the monsoon. Geophytic Liliaceae *(Dipcadi, Iphigenia)*, Orchidaceae *(Habenaria, Peristylus)* start flowering in the early monsoon phase (June-July). Gregarious flowering occurs in the late monsoon period. (August-September) in which *Eriocaulon* spp. together with carnivorous *Utricularia* spp. are prominent. The vegetation growth ends by the flowering of grasses *(Dimeria, Ischaemum, Glyphochloa)* in the post-monsoon phase

Endemism in flora

Abundance and dominance of endemics is an important feature of this habitat. Regional floristic studies have reported presence of many narrow niched endemics and habitat specialist plants from low as well as high-level lateritic plateaus (Bachulkar, 1983; Deshpande et al., 1993; Mishra & Singh, 2001; Yadav & Sardesai, 2002; Gaikwad et al., 2003; Joshi & Janarthanam 2004). A study of palaeotropical ephemera! flush vegetation showed local endemics on Indian laterites (Porembski & Watve, 2005).Based upon primary and secondary data, 134 endemic species have been recorded to occur on lateritic plateaus in the Western Ghats and Konkan region of Maharashtra. Many of these-endemics (viz. Dipcadi concanense, Wiesneria triandra, Camptorrhiza indica, Dimeria woodrowii) show highly restricted geographical distribution and are specific.to microhabitats on lateritic plateaus (Gaikwad et al, 2003) in Konkan-Malabar region. Forty species on lateritic plateaus are listed as threatened according to IUCN criteria by the Botanical Survey of India (Mishra and Singh, 2001). Highly specialized ephemeral vegetation and abundance of endemic species makes lateritic plateau vegetation in Maharashtra globally unique.

Fauna of outcrops

The rock outcrops also support insects, fish, amphibians, reptiles and birds which have adapted to live in the stressful environment. Small mammals like rodents feed on underground parts of the vegetation.

Socio-cultural and economic values

Apart from the biodiversity value, the lateritic plateaus are important for local communities in many ways! They are important as grazing lands for surrounding villages during the monsoon period as they have abundant growth of grasses and forbes. The shrines of deities worshipped by shepherds and places of ancestral worship on these outcrops have a special socio-cultural

value for local communities. The rocky plateaus also serve as watershed areas. The hard rocky surface facilitates collection of rainwater into small rivulets, monsoon streams which further join to form waterbodies. Most of the lateritic plateaus have ponds or lakes as the hard rocky carapace allows water storage for a long period. In addition the softer strata below lateritic mantel has underground water channels and hence perennial streams often originate along the edges of the laterites which are extremely important for local people as well as livestock for sustenance,

Lateritic plateaus management and conservation

There is however, a serious lack of awareness in society regarding the biological, social and cultural importance of rock outcrop habitats such as lateritic plateaus. The checklist of endemics on outcrops includes 12 critically endangered, 23 endangered and 10 vulnerable species listed in the recent evaluation of threatened plants (Mishra and Singh, 2001) from Maharashtra. But the dry physical appearance has misled government departments to classify these as wastelands. In old toposheets these areas are marked as sheetrock or scrub or as wastelands. This has led to disastrous results as many activities have been allowed on the lateritic plateaus without adequate Ecological Impact Assessments. Only those outcrops which are present within wildlife sanctuary areas of Chandoli, Koyana, Radhanagari and Dajipur receive some protection. However, none of the Konkan plateaus are within any protected area and hence, they as a habitat are highly threatened. Quarrying for rocks, conversion of land for residential and industrial areas has fragmented and destroyed many of the laterite habitats in Konkan especially in Ratnagiri district. It is thus necessary to take immediate steps towards the preservation of these unique habitats". [Refer Annexure <> for full text of the said research]

In view of the above, Madban plateau needs to be scientifically studied to understand its unique biodiversity value. Until a thorough ecological investigation of the project site as directed by NEERI is carried out covering the period at least from May to December and the results are evaluated scientifically from conservational angle, decision regarding giving environmental clearance to JNPP should be postponed.

Response:

The data given in the above point is related to the whole Western Ghat and Konkan Region and is useful. It is observed that with a proper EMP in place, a proper greenbelt can be developed on lateritic soils which is a common characteristics of Western Ghat and Konkan region. As the project site comprises a small patch integrating the available information with new biotechnological approach a proper greenbelt ecosystem will be developed on the plant site and also protect the habitat from further degradation. NPCIL is committed to use best of the technology and the available knowledge for protection of environment.

Consolidation Statement of Yield and other Information for the villages selected for C.E.S.

District - Ratnagiri Crop - Paddy Plot Size - 10 x 5 Mt

Draige Ratio - 0.9388 Season - Kharip 2009

Taluka	Rajapur		Rajapur		Rajapur		Rajapur		Rajapur		Rajapur	
Circle	Jaitapur		Jaitapur		Jaitapur		Nate		Nate		Nate	
Village	Shirase		Gothivare		Chouke		Vadabharadi		Varchi Guraowadi		Avalichiwadi	
Name Of Farmer	Manohar Balchandra Gulekar	Chandrakant Tukaram Parakar	Shankar S. Avasare	Anant P. Karanjakar	Shivaji Dhakatu Chindarkar	Dhasharath Pandurang Chindarkar	Dattatrya Vitthal Hardikar	Yashavant Bhiva Jadhav	Dattaram Shivaram Gurao	Maroti Govind Gurao	Tukaram Vishram Bharati	Rajashri Vijay Radye
Sr.No/Pot Hissa No	56/1+6+7	8/64	116/1	122/53+6	728	156	11/2	9/20	56/31	59/39	17/1	16/1
Soil Type	-	-	Light	Light	Medium	Medium	Medium	Medium	Medium	Medium	Heavy	Heavy
Date of Sowing and Sowing Method	19/06/2009	24/06/2009	27/06/2009	02/07/2009	16/06/2009	14/06/2009	26/05/2009	25/05/2009	08/06/2009	10/06/2009	02/06/2009	22/06/2009
Seed Type and Variety	Panaval	Jaya	Ratna	Jaya	-	-	R-24	Karjat	R-24	R-24	Suvarna	Karjat-3
Plant Protection Method												
Seed Rate perKg/ Ha.	45.000	45.000	45.000	45.000	40.000	40.000	100.000	100.000	100.000	100.000	35.000	35.000
Mannures Type	FYM	FYM	FYM	FYM	FYM	FYM	FYM	FYM	FYM	FYM	FYM	FYM
Qtls Per ha rate	10.000	10.000	10.000	10.000	20.000	20.000	-	-	-	-	10.000	10.000
Fertilizers Type	Suphala	Suphala	Suphala	Suphala	Suphala	Suphala	Urea	Urea	Urea	Urea	Urea/Suphala	Urea/Suphala
Kg Per ha rate	200.000	200.000	200.000	200.000	50.000	50.000	150.000	150.000	150.000	150.000	100.00 / 100.000	100.00 / 100.000
Irrigation if Yes no of Irrigation	-	-	-	-	-	-	-	-	-	-	-	-
Date of Crop Cutting	16/10/2009	16/10/2009	16/10/2009	16/10/2009	25/10/2009	28/10/2009	14/10/2009	14/10/2009	15/10/2009	15/10/2009	03/11/2009	04/11/2009
Result of crop Cutting Expt.												
Weight of Straw Kg	20.600	22.800	35.000	32.000	62.500	80.400	12.000	8.800	5.200	10.100	45.500	48.500
Weight of Grains Kg	23.500	24.400	22.600	20.400	28.200	30.200	14.000	17.700	14.200	14.400	14.600	22.500
If Mix crop Name	-	-	-	-	-	-	-	-	-	-	-	-
Ratio as per Table No-1	-	-	-	-	-	-	-	-	-	-	-	-
Ratio as per Table No-2	-	-	-	-	-	-	-	-	-	-	-	-
Yield of Crop as per Mix Crop Ratio	-	-	-	-	-	-	-	-	-	-	-	-
Hybrid Irrigated	-	-	-	-	-	-	-	-	-	-	-	-
Rainfed	-	-	-	-	-	-	-	-	-	-	-	-
Local Irrigated	-	-	-	-	-	-	-	-	-	-	-	-
Rainfed	-	-	-	-	-	-	-	-	-	-	-	-
Yield in Qtls as per Nazarandaj	22	24	20	18	24	25	30	28	29	30	40	45
Name and Designation of Superisory Officer	S.T.Gayakwad, A.S.		R.B.Sakate, Extn.Off.		B.B.Sawant.TAH		Kodalkar, Extn.Off.		No Supervision		Namadao Langhi, BDO	
Remark	VLC Present		VLC Present		VLC Present		VLC Present		VLC Present		VLC Present	
Driage Details												
a. Fresh Weight in Kg	-	-	5.200	5.250	28.200	30.200	-	-	-	-	-	-
b. Dry Weight in Kg	-	-	4.800	4.850	28.000	30.050	-	-	-	-	-	-
Circle Abstract												
Total Yield in Kg						149.300						97.400
Total experiments						6						6
Av Yield per Plot in Kg						24.883						16.233
Av Yield per Ha in Kg						4976.667						3246.667
Dry Yield Kg/ha						4672.095						3047.971
Yield of Rice Kg. / ha.						3224						2103

Annexure-XVI

Response to Shri Ranjinikant Shroff

1. Observation:

As a part of. Corporate Social Responsibility, what are NPCIL's plans towards development in near future

1. Are these plans included in your R & R Policy?
2. What will 'be the' model for ensuring that the above plans are expected in time and which agency shall monitor the execution and operation?

Response

As a part of Corporate Social Responsibility, NPCIL propose to contribute in different welfare measures for the benefit of Project Affected Families (PAFs) and. people of local area around Jaitapur Nuclear Power Project (JNPP) in following fields:

i) Assistance in educational welfare measures.
ii) Assistance in health care measures.
iii) Assistance in community welfare measures.
iv) Assistance in development of Fishermen's welfare measures.

All these activities are part of approved Rehabilitation Package (by State Rehabilitation Authority, Maharashtra) for PAFs of JNPP. However, in addition to Rehabilitation cash compensation to each owner (depending on quantum of land acquired), the following additional. specific provisions exists in subject Rehabilitation Package.

a) Provision for spending an amount of Rs. 2·Crores/per affected village by NPCIL for upgrading existing civic amenities and establishing new amenities in these villages as per requirement decided in consultation with Local Pachayat I Zilla Parishad.

b) Provision for spending Rs 25 Lakhs/village per year by NPCIL to upgrade I maintain such facilities as mentioned (a) above.

c) Provide one time cash compensation of Rs. 3 lakh to all such land looser, in case their ward is not in position to be provided direct employment in JNPP due to not -qualifying the recruitment process or non availability of ' vacancies in JNPP.

2. Observation:

Whether, NPCIL has plans to promote education upliftment of the area. What is the road map and which will be the monitoring agency?

Response

Already covered in Answer to Q-1. NPCIL has plans to establish infrastructure facility for education facility near JNPP Residential complex, for benefit of local people of area around JNPP.

3. Observation:

Whether the plant design is able to keep the operating station as safe, even in the worst possible earthquake condition?

Response

All Nuclear Power Plants (NPPS) are designed to operate in 'failsafe modes i.e under any emergency condition, plant comes to safe shut-down state without human intervention. Specially EPR, NPP Units proposed at Jaitapur site has inherent, latest safety features in the design and considered most safe. Theplant will also be designed to qualify the seismic requirement of Jaitapur site under all

operating and emergency conditions.

4 Observation:

As we understand you have 5 km radius drawn for sterile zone. 10 to 15 km radius is under observation and monitoring for radiation fall out .if this is true. Can we expect the population living in these zone to get medical educational and allied facilities to be offered in acceptable term please clarify your plans as corporate responsibility?

Response

The Pre-operational and post operational survey and monitoring of environment far any radioactive releases is performed an regular basis by Environment Survey Laboratory -(ESL) of Health Physic Unit of BARC. The ESL is established, 18-24 months before starting the operation of the plant. The Laboratory will collect samples of air, water, sail, eatable, marine products etc. within a 30 kms radius from the NPP on regular basis.

With respect to assistance to health care, suitable medical. facilities are planned to be made available to all the residents of village around JNPP within 5 kms.

5. Observation:

Can we expect your corporate Responsibility come closer. to social Enterprise to get maximum facility of Health, Educational ,Good Roads, Energy, Communication, water & allied infrastructural facilities offered to these area within 15 km to reduce gap between super developed NPCIL colonies & rural areas in a round Atomic Power plant & Colonies out of profits generated from this plants? .

Response

NPCIL's first endeavor is to ensure implementation of approved Rehabilitation package far the project in time. Subsequently and in due course of time, as project activities progresses, the assistance to the welfare requirement of the people of the area in all the field, as mentioned above will be implemented. During operation phase of the plant too, the assistance far the welfare and development of the area in the various field as mentioned above will continue, as a part of Corporate Social Responsibility.

6. Observation:

Please do not allow any plots to be offered by state Govt.) to project affected people within 5 km sterile zone.

Response

Basically this aspect does not fall in the purview of NPCIL. This activity will be the responsibility of District Administration as per the provision of relevant notification under Atomic Energy Act.

7. Observation:

All the facilities to be offered by NPCIL to the adjoining rural areas should be directly under control of NPCIL and through state governments

Response

All the assistance by the NPCIL, as a part of social welfare and community development will be directly executed by NPCIL, based an needs and

requirement to be decided in consultation with local bodies i.e. Panchayats and Zilla Parishad.

Annexure-XVII

Response for Single Page Representation

Page Nos. of Individual Letters :- 146, , 255, 299, 301, 302, 307, 309, 310, 311, 376, 380, 381, 382, 378, 385, 386, 394, 393, 395, 406, 407-411, 415, 418-426, 428, 429, 548, 549, 562, 572, 574-577, 648-687, 689-707, 713-715, 742, 743, 746, 747

1. Salient Observation :

EIA has not been received in respective Gram Panchayat

Response

Public hearing process needs to be organized as per the requirements of Environmental Impact Assessment Notification, 2006 issued by MoEF vide no. S.O. 1533 (E), dated the 14th September, 2006 and its amendment vide No. S. O. 3067 (E) dated 1st December, 2009. The clarifications given below demonstrate the compliance with the above:

The MoEF, New Delhi in May, 2009 (after initial review of EIA study report including Terms of Reference (TORs) for EIA study) directed NPCIL to get public hearing conducted. In line with above, NPCIL submitted the application to the Sub-Regional Officer, Maharashtra Pollution Control Board (MPCB), Ratnagiri for organizing Public Hearing for JNPP on 17th March, 2010, The application contained 10 hard and 10 soft copies of EIA report in English and 10 hard and 10 soft copies of the Summary EIA report in both English and` Marathi language. The above submission was in compliance with the provisions of clause No. 2.2 of Appendix- IV of the above mentioned Notifications, which infers that the EIA report in English and Summary EIA report in both English and in local language (i.e. Marathi), need to be submitted to SPCB and to other designated offices.

The office of MPCB, Ratnagiri notified ,on 15th April, 2010 ,the date of Public Hearing for Environment Clearance of JNPP as 16-05-2010 at JNPP Project Site in news papers etc.

Further, it has been confirmed that Sub-regional Office of MPCB, Ratnagiri delivered one copy of the Summary EIA report in English and Marathi and EIA report in English for perusal of the public to all the designated offices between 13-15 April, 2010, including the office of Zila Parishad, Ratnagiri and complied with the provisions of the subject Notification and amendment dated 1st December, 2009. (The Notification stipulates that one set of EIA documents need to be submitted to either Zila Parishad or Muncipal Corporation or Panchayat Union).

It is understood that MPCB,Ratnagiri, over and above the provisions of the aforementioned Notifications from MoEF, to facilitate the people of all the project affected villages around JNPP, the EIA documents, i. e. one copy of the full set of EIA report in English and Summary EIA report in English and Marathi was placed with Gram Panchayat, Madban, Tal. Rajapur, District Ratnagiri, the village from where maximum land for the project has been acquired and other affected villages being in close proximity.

Page Nos. of Individual Letters -250, 253, 259, 260, 261, 264, 268, 27i, 275, 290, 295, 298, 300, 303, 308, 251, 252, 294, 296, 297, 383, 384, 387, 355, 357, 364, 365, 366, 367, 368, 375, 379, 388, 389, 390, 391, 392, 398, 400, 402, 405, 404, 430, 431,

441, 442, 443, 330, 333, 334, 338, 340, 344, 531, 533, 534, 542, 544, 553, 560, 561, 563, 564, 569, 571, 573, 578, 579, 580-586, 626, 627, 632, 633, 688, 716, 718, 727, 732, 737&739

2. Salient Observation

Growing of fruits, Food processing activity

Response

There will not be adverse impact on normal activities such as growing of fruits, food processing etc. due to project as the releases of conventional pollutants form NPPs will be insignificant and also the radiological releases will be much below the stipulated limits of AERB as well as background radiation levles.

Page Nos. of Individual Letters - 304, 305, 312, 316, 319, 320, 356, 361, 362, 371, 374, 401, 403, 405, 432, 434, 436, 437, 444, 329, 346, 532, 537, 539, 540, 543, 552, 554, 555, 559, 600, 603, 604, 606, 610-612, 616, 617, 622, 623, 628-631, 636, 646, 647, 710, 720, 721, 726, 728, 744, 745

3. Salient Observation

EIA doesn't speaks about serious accidents, radioactive release to environment, Transportation of Radioactive materials, Safety, Radioactive Waste Management

Response

Serious accidents

Plant conditions are generally categorized as Normal operation, Anticipated Operational Occurrences (AOO), Design Basis Accidents (DBA) and Beyond Design Basis Accidents (BDBA) based on the frequency of occurrence and consequences. The basic principle followed is that the most probable occurrence should result in the lowest radiological risk and the extreme situations having the potential for the greatest risk should be the least likely to occur.In the plant design, various postulations of initiating events are made and the scenarios are analysed.Defence in depth provisions are made in the design to avoid,prevent escalation or mitigate the consequences

Since extensive analysis of accidents is carried out, the term accident is found frequently in NPP documents, although accident in NPP is very rare.

Radioactive release to environment

Expected annual release through the air and water route are explained in Section 4.2.1.3, page no. 353 and Section 4.2.2.2.1, page no. 362 respectively of Chapter-4 of Vol-I of the EIA report.

The NPP unit is so designed that activity releases to the environment are through pre-designated release points. These radioactive effluent releases to the environment through the designated release points are continuously monitored and controlled. The minimum sensitivity of the monitoring instruments is such that even a small fraction of release, which leads to dose consumption in the public domain, can be measured.

Accordingly, the average dose to the members of the public from all exposure pathways will not exceed 1 mSv in a year by virtue of disposal of liquid, solid and gaseous waste to the environment as stipulated in AERB Safety Manual no. AERB/NF/SM/0-2 (Rev.4)

Transportation of Radioactive materials

Presently, at Jaitapur site, Spent Fuel Reprocessing Plant is not envisaged. However, the spent fuel bundles will be transported to the reprocessing facility for spent fuel reprocessing. The transportation of spent fuel will be in line with approved regulatory procedure as per AERB Safety Code, AERB-SC-TR-1, which is already being practiced for other NPCIL units

Safety

The regulatory consenting process for NPPs in India is governed by AERB Guide No. AERB / NPP & RR / SG / G-1, which envisages five major consenting stages, viz, siting, construction, commissioning, operation and decommissioning. At each stage, review is carried out by AERB before granting consent.

The consent at the first stage namely, siting, involves the review of various site related safety aspects,considering the conceptual design. AERB issues consent for the site for locating the project.

The consent at the second stage, namely construction ,involves the review of the design safety aspects and issue of a construction consent. At this stage Preliminary Safety Analysis Report (PSAR) submitted by NPCIL is reviewed by AERB. The PSAR addresses all credible Postulated Initiating Events (PIEs) for the plant and consequential Design Basis Accidents (DBAs).The PSAR review includes the defense in depth safety provisions in the design to take care of these scenarios. considered.

The consent at the third stage,namely, commissioning,is given in several interim stages/phases of commissioning.The review includes commissioning test results,operating & maintenance procedures, Level 1 PSA etc.

The consent at the fourth stage,namely,operation,is for regular power operation at power levels upto rated power.The consent is granted after review of NPP's performance at rated power.

Radioactive Waste Management

The NPP unit is so designed that activity releases to the environment are through pre-designated release points. These radioactive effluent releases to the environment through the designated release points are continuously monitored and controlled. The minimum sensitivity of the monitoring instruments is such that even a small fraction of the releases, which leads to dose consumption in the public domain, can be measured.

Presently, the low and intermediate radio- active solid / solidified wastes are stored in Near Surface Disposal Facility (NSDF). They are stored under ground at a depth of maximum up to 4 m either in trenches / RCC vaults / tile holes depending upon the surface dose rate of the waste. The solid waste disposal site is fenced and designed to store waste for an active control (monitoring, surveillance, remedial work) period of 100 years followed by passive control (land use control) period of 200 years.

The above facility has sufficient number of bore-holes all around at definite intervals. Ground water samples are collected from these bore-holes on regular basis to check the activity in ground water.

However, in case of EPR design, the low and intermediate radioactive solid / solidified waste has an option to be stored in the radioactive waste storage building, where solid waste storage will be above ground. The technology options will be reviewed by NPCIL for JNPP and final decision will be taken with due approval of AERB, before implementation.

The radioactive waste storage building is planned to store low and intermediate level radioactive solid / solidified waste having half life less than 30 yrs. The total storage time envisaged for this waste is 100 years active control period followed by passive control period of another 200 years.

Page Nos. of Individual Letters -254, 565, 712, 719

4. Salient Observation

EIA does not mention about access to Light house after construction of project.

Response

The access to the Light house will be maintained so that its functioning is not hampered

(Page Nos. of Individual Letters -255, 269, 270, 276, 318, 319, 363, 370, 345, 534, 535, 550, 614, 615, 639, 640, 641, 730, 731, 733-736

5. Salient Observation

Danger of fishing, Corals, Mangroves due to Radiation

Response

The average dose to the members of the public from all exposure pathways will not exceed 1 mSv in a year by virtue of disposal of liquid, solid and gaseous waste to the environment as stipulated in AERB Safety Manual no. AERB/NF/SM/0-2 (Rev.4).

Expected annual release through the air route and through water route are given in Section 4.2.1.3, page no. 353 and Section 4.2.2.2.1, page no. 362 respectively of Chapter-4 of Vol-I of the EIA report.

The NPP unit is so designed that activity releases to the environment are through pre-designated release points. These radioactive effluent releases to the environment through the designated release points are continuously monitored and controlled. The minimum sensitivity of the monitoring instruments is such that even a sufficiently small fraction of the releases, which leads to dose consumption in the public domain, can be measured.

The average environmental radiation dose from NPPs (operating projects) in India is presented in Fig. at page 66 of Vol-IV EIA. It is clear from the figure that the radiation dose to public due to NPCIL's nuclear power plants is observed to be 500 to 24 times lesser than the stipulated dose limit of 1000 µSv/y and 1200 to 48 times lesser than the natural background radiation.

In view of the above, there will not be any adverse impact on marine organisms due radditon.

Page Nos. of Individual Letters -289, 291, 292, 293, 331, 342, 568, 709, 711

6. Salient Observation

Whether access to Madban Beach will be restricted.

Response

The area of acquired for JNPP will only be under restricted access.

Page Nos. of Individual Letters -256, 359, 570, 587-599

7. Salient Observation

Use of word 'Barren land' is not appropriate

Response

The project site is mostly rocky and barren. Many photographs and remote sensing data of the project site are given in the report. The description of the project site is given on Page 28-29 of the Biodiversity Report of College of Forestry Annexure VII, Volume II of Draft EIA Report. The supplementary information is given in section 4.0 and Table 1, Table 2 and photographs of the project site are given in Plates 1(a) & 1(b) on Pages S-5 to S-8 in Summary EIA of Draft EIA Report Volume 1. More photographs of Project site are given in Plates 2.1 to 2.7 in Chapter 2 in Draft EIA Report Vol. 1. The information is also given in section 3.8.2 on page 234 in Chapter 3 of Draft EIA Report Volume 1 - "The proposed site is adjoining the sea coast and is mostly a barren stretch of land with sparse savanna vegetation. At Project site, only sparse vegetation is present"

Page Nos. of Individual Letters -257, 258, 277, 288, 317, 396, 399, 446, 545, 547, 556, 624, 625

8. Salient Observation

Terrorist attack on spent fuel storage facility

Response

Based on the need of the country, a specialized force known as Central Industrial Security Force (CISF) is made responsible to provide specialized security to industrial installations in the country including NPPs. The CISF works under the Ministry of Home Affairs of Government of India.

All Nuclear Power Stations of NPCIL are provided security cover by CISF personnel, who are specially trained. Based on the location of NPP in the country and security threat perception, the required defense cover is provided. The design of Physical Protection System of NPP is carried out on the basis of design basis threats. The physical protection system is subject of review and approval by AERB.

Security organizations have been functioning at various levels at DAE, AERB and NPCIL. The security audits/inspections are regularly carried out to ensure compliance of security provisions. Over and above, an independent review of nuclear security related issues is in place by national regulators i.e. Atomic Energy Regulatory Board (AERB).

It may be noted that each NPCIL plants have Multi-tier physical barriers with intrusion detection systems which are in place with isolation zone.

Page Nos. of Individual Letters - 321, 369, 435, 439, 343, 536, 541, 551, 601, 602, 618 to 621, 643, 645, 744

9. Salient Observation

Earthquake prone area at JNPP

Response

Nuclear Power Plants, whether located in active tectonic region or in stable continental region, are designed for earthquake resistance. Jaitapur Site is located in stable continental region and is 1600 Km away from the active tectonic region of Himalayas. Even for such stable continental regions, the plants are designed for a 6.5 magnitude (Ritcher scale) earthquake (intra-plate earthquake of Koyna).

There is no earthquake activity around Jaitapur site in a radius of 39 Km. This is based on the earthquake data collected from Koyna Bandkam Vibhag and MERI from 1973 till date, as well as from NPCIL's own micro earthquake recorders installed by NGRI, Hyderabad around Jaitapur site which have not recorded any event of a micro earthquake or major earthquake within a distance of 39 Km around Jaitapur.

The active faults within the region are confirmed by experts from Geological Survey of India after carrying out field checks. The status of the faults is then reviewed by independent national experts to arrive at the maximum earthquake potential of these faults. The values so arrived at are generally enhanced by one magnitude over the maximum magnitude of the recorded earthquake in the vicinity of the active fault. Such enhanced magnitude earthquake is then assumed to be occurring on a fault closest to the plant site. The peak ground acceleration (PGA) at the plant site is then arrived at for such enhanced magnitude and reduced epicentral distance. Using this PGA, a Site Specific Ground Motion (SSGM) is generated, for which the nuclear plant structures, systems and equipment are designed by detailed analysis and testing

Page Nos. of Individual Letters - 358, 546, 637

10. Salient Observation

Inadequate EPR experience

Response

The proposed European Pressurized Reactor (EPR) at Jaitapur site is a generation -III Pressurized Water Reactor (PWR). The EPR technology is evolved by European countries specially France and Germany based on the successfully operating power plants French -N4 reactor of capacity 1400 MW and German Konvoi reactor of capacity 1365 MW for several years. The EPR technology is licensed by French, Finland and Chinese regulating authorities and is under implementation in these countries.

Page Nos. of Individual Letters -397, 332, 339, 538, 539, 708, 717, 729, 733-736, 741

11. Salient Observation

Raise in sea water temperature at CCW discharge

Response

A detailed 2D mathematical model studies for dispersion of condenser cooling water discharges from the proposed Nuclear Power Plant at Jaitapur, Ratanagiri has been carried out by CWPRS, Pune, in 2008 (The CWPRS report is attached as Annexure-V(b) of Volume -II of the EIA report). Further, NEERI, Nagpur has carried out detailed marine ecological studies for the Jaitapur coast including a specialized study on Baseline Marine Ecological Assessment of sea coast around the Jaitapur site through College of Fisheries, Ratnagiri (The report from College of Fisheries is enclosed as Annexure-VIII of the Volume -II of the EIA report). These studies have concluded that the marine aquatic food chain organisms will not be affected by the predicted maximum temperature rise of around 5 0C, which will be confined to a limited area of 0.28 sq.km, when all the six units are under operation and ocean currents are under transition (October/February), which is the most severe condition during the year. At this range of temperature rise above ambient temperature of water, most of the organisms are either not affected or get benefit of stimulation of metabolic activity. The details are presented in Section 4.2.2.1.4, of Chapter-4 of Volume -I of the EIA report.

Page Nos. of Individual Letters -268, 315

12. Salient Observation

Constraint on mining of Chira

Response

The Chira mining which is not part of the acquired land will not get affected by the project activities.

Page Nos. of Individual Letters -438, 440, 533, 557, 608, 609

13. Salient Observation

Availability of other option of power and no requirement of nuclear power

Response

The assessment of various energy sources (including conventional and non-conventional) suitable for India has been carried out by Government of India. The report

of this assessment has been issued by Government of India as "The integrated energy policy of India 2005" The role of Nuclear power is clearly defined in this policy and it is envisaged that share of nuclear is to be increased It is planned to have total installed capacity of 63 GWE by year 2032 through nuclear power. JNPP is one step towards achieving the part of the above objective.

Page Nos. of Individual Letters -347, 642

14. Salient Observation

Decommissioning plan does not exist

Response

Decommissioning of the facility is considered as an integral part of the project. In Section 4.3, Page No. 383, Chapter-4, of draft EIA report, the brief write up on impact during decommissioning of the project is presented. Detailed decommissioning aspects are envisaged to be covered in PSAR for JNPP and will be put up for review / approval by AERB before operation of the project. The project decommissioning aspects are already considered in the design stage itself such that decommissioning of the plant will have no adverse impact in the public domain. The cost towards decommissioning is included as a part of unit energy cost.

Page -249

15. Salient Observation

Representation from Bhakati Nefertiti vide her submission dated May 16, 2010 addressed to the District Collector & Presiding Officer, Public Hearing for JNPP, Village Madban, Tal. Rajapur, District Ratanagiri

Response

This is a well known fact in the public domain in the world that the nuclear power is proved to be environmental friendly, low carbon electricity source and is able to meet the huge demand of power by ever increasing developmental activities and population This is being proved by the increasing number of NPPs all over the world and many nations opting for the nuclear energy in future. Therefore, the available option is to develop NPPs for the progress of the nation.

The nuclear power on commercial basis was introduced to world in as early as 1950 / 60 since then a lot of experience has been gained globally. Over 13000 reactor years of experience have been gathered, which clearly indicate that nuclear power is highly potent source of clean and sustainable energy. In view of compelling merits of nuclear power in addressing the climate change concerns and also an economic viable source of energy, currently the world is experiencing nuclear renaissance. Currently 438 reactors are in operation with an installed capacity of about 372 GW and 58 reactors are under construction. Over 200 reactors have been planned in 30 countries for next 20 year (Source: WNA).

Response to letter dated 24th May, 2010 written by Shri. Pradeep Indualkar, directly to the Secretary, MoEF, New Delhi

Annexure-XVIII

Response to letter dated 24th May, 2010 written by Shri. Pradeep Indualkar, to the Secretary, MoEF, New Delhi on EIA report for Jaitapur Nuclear Power Park (JNPP), Ratnagiri, Maharashtra. (Page No. 965 to 971)

The point -wise response on the above subject is submitted below:

1: Observation

Objection on conducting the Public Hearing

Response:

It is understood that the public hearing for JNPP was conducted on 16.5.2010 by MPCB, Ratnagiri complying with provisions of EIA Notification No. S.O. 1533 dated 14th September, 2006 and amendments dated 1st December, 2009 issued by MoEF and not as per Notification No. 318 (E) and 319 (E) dated 10th April, 1997. The Constitution of the panel was in line with the provisions of current Notifications.

2: Observation

Objection on Structure of EIA in point A and B

Response to A

The proposed European Pressurized Reactor (EPR) at Jaitapur site is a generation -III Pressurized Water Reactor (PWR). The EPR technology is evolved by European countries specially France and Germany based on the successfully operating power plants French -N4 reactor of capacity 1400 MW and German Konvoi reactor of capacity 1365 MW for several years. The EPR technology is licensed by French, Finland and Chinese regulating authorities and is under implementation in these countries. The design certification for EPR is under review by US -NRC and UK regulating authorities. It is also submitted that at present, 23 EPR nuclear power projects are under consideration worldwide in seven countries including India.

Response to B :

In India, the sites for location of a Nuclear Power Plant is surveyed, selected and recommended by a Site Selection Committee constituted by Department of Atomic Energy, Government of India. The above Committee has members from various departments including Ministry of Environment and Forest. The above survey is carried out by complying to laid down provisions by AERB for selection of the site covering all the studies, data, parameters which are necessary to meet the requirements to establish a nuclear power plant at a particular site. Based on the recommendation of the site selection committee of DAE and other several factors, Government of India approves the site for setting up a NPP. In line with the above, Jaitapur Site has been approved in principle by Government of India for establishment of 6x1650 MW NPP units. The details are presented in Section 1.2 (page nos 3-6), of Vol-I of the EIA report.

3 Observation

(A1, A2, A3, A4, A5 and A6): On biodiversity of the area around JNPP

Response:

A special comprehensive study of the status of Biodiversity at the proposed JNPP site has been organized by NEERI through College of Forestry, Dapoli,

under Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, District Ratnagiri. The report issued by the above College vide no. CFOR / TBGR / RES/ 240/2008 dated 20th Feb., 2008 is a part of subject EIA study report for JNPP and is appended as Annexure VII, of Vol-II of the EIA Report.

The proposed plant site is adjoining the sea coast and is mostly a barren stretch of land with sparse savanna vegetation. From the project site upto 5 km, only sparse vegetation is present, however, beyond 5 km, a part of land is covered with agriculture and orchards. These areas will not be disturbed by project activities. The project site and surrounding 25 km area and the entire available ecosystems like forest, mangroves, grassland, the creeks have been studied including the project site, the information on project site is given on pages 28-29 of biodiversity report of College of Forestry, Dapoli (Annexure VII in Volume II of EIA Report). Additionally the land use of project site and residential complex was also studied by using improved recent technology of remote sensing data (Feb. 2006) by Maharashtra Remote Sensing Data Application Centre, Nagpur. This study also concludes that project site is mostly barren with sparse vegetation. Thus establishment of JNPP would not affect the green cover of the area on the contrary, JNPP has extensive developmental plan for green belt development and plantation in plant and residential complex area resulting in increase in green cover and biodiversity of plants, birds and other animals in the area apart from creation of beautiful landscape.

A1: Flora

Response:

As per the science of Ayurveda, all the plants are medicinal. Accordingly the study area also contains plants with medicinal property. The IVI values of plant species has no relations with medicinal properties

A2: Threatened Species- Flora

Response:

The habitat of threatened plant species is the forest situated far away from project site and is not affected by the project activity.

A3: Grassland Eco-system

Response:

The grassland ecosystems in 25 km radius area around the project site are not affected by the project activity as they are away from the proposed project area. (Annexure VII, of Vol-II of the EIA Report).

A4: Habitat of Wildlife

Response:

The proposed project will be established on the revenue land which is reserved for industrial purpose as per the developmental plan of the area of Government of Maharashtra (Annexure XIV, Vol II of EIA report), therefore, the habitat of wild life will not be affected by project activities.

A5: Mammals

Response:

The wildlife observed in the study area of 30 kms radius has been listed in schedule I &II in EIA report along with their habitat. The project site is away from forest land. The wild life habitat will not be disturbed due to project activity.

A6: Birds

Response:

The favorite habitats of the birds in study area are grasslands and the forests, creeks, mangrove vegetation, wetlands of rivers etc. which will not be disturbed

by the project activity. These birds are observed at most of places along the Western Ghats. The habitat of endemic and threatened species as well as mammals and birds will not be affected by project activity.
The mangroves are observed in the study area beyond 5 kms from project site however there are no mangroves on the acquired land.

4: Observation

Aquatic Life

Response:

For Jaitapur coast, a special study of mapping of marine bio-diversity has been organized by NEERI through College of Fisheries, Ratanagiri, under Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, District Ratnagiri. The report no. Hydro/02 dated 12 March 2008 issued by the above College is part of EIA study report for JNPP and is appended as Annexure VIII, Volume II of the EIA Report of JNPP. Some of the findings of the study are that the nutrients in coastal sea water especially phosphate and nitrate are very low, which indicate low productivity of the seawater in the study area. Therefore, planktons are very less in amount. The observations on aquatic fish catch shows that the nearby coastal area showed low potential for fish production while the sea beyond approx. 9 km from the coast with depth of sea beyond 15 fa (page 4 and Fig. 1 of report of College of Fishery, Ratnagiri) (Annexure VIII, Vol II of EIA report) was observed to be good for fish catch. Hence the mentioned increase (if any) in the fish catch observed at the mentioned fish landing sites must be due to the deep sea fishing by the fishermen.

5: Observation

Grade Level Elevation

Response:

As presented in the EIA report for JNPP, the recommended safe grade elevation of the JNPP project is 7.0 m with respect to chart datum. However, the final grade level elevation will be optimised in the range of 9 -10 m based on economic considerations. The Impact of cutting of hill is presented in Section 4.5.5.3, page no 409 of Chapter 4 of EIA report. Excavated material is proposed to be used in construction of breakwater and plant and any clay material or silt would be dumped in the sea beyond 20 m depth contour sufficiently away from out fall location. The details of management of excavated material for the proposed JNPP is presented in Section 4.2.3.1, page no. 367 of Chapter 4 under Land Environment

6: Observation

Effect of temperature of discharge of Condenser Cooling Water (CCW) on aquatic as well as surrounding area.

Response:

A detailed 2D mathematical model studies for dispersion of condenser cooling water discharges from the proposed Nuclear Power Plant at Jaitapur, Ratanagiri has been carried out by CWPRS, Pune, in 2008 (The CWPRS report is attached as Annexure- V(b) of Volume –II of the EIA report). Further, NEERI, Nagpur has carried out detailed marine ecological studies for the Jaitapur coast including a specialized study on Baseline Marine Ecological Assessment of sea coast around the Jaitapur site through College of Fisheries, Ratnagiri (The

report from College of Fisheries is enclosed as Annexure-VIII of the Volume –II of the EIA report). These studies have concluded that the marine aquatic food chain organisms will not be affected by the predicted maximum temperature rise of around 5 0C, which will be confined to a limited area of 0.28 sq.km, when all the six units are under operation and ocean currents are under transition (October/February), which is the most severe condition during the year. At this range of temperature rise above ambient temperature of water, most of the organisms are either not affected or get benefit of stimulation of metabolic activity. The details are presented in Section 4.2.2.1.4, of Chapter-4 of Volume – I of the EIA report.

7: Observation

Effect of increased salinity due to discharge of desalination plant.

Response:

Brine generated by desalination plant will have salt concentration typically 2 to 3 times that of intake sea water. To dilute the salt concentration, the brine shall be mixed with condenser cooling sea water before discharging into sea. Because of this mixing with a large quantity of water, the salinity level of the discharge will be comparable to intake sea water levels and hence will not have any impact on sea water due to discharges from desalination plant.

8: Observation

Reclamation in creek and Sea for jetty.

Response:

There will be no reclamation activity either in creek or in sea for Jetty. As described in Section 4.5.5.2 of Chapter-4 of the Vol-I of the EIA report, a RORO jetty is proposed to be developed in the sheltered area of the breakwater.

9: Observation

Dumping and Releasing of Nuclear Waste

Response:

The concern regarding the disposal of radioactive waste is adequately addressed in Chapter 4 of Annexure 13 of this document. The quantitative details are given in Section 4.2.1.3, page no. 351 to 354, Chapter-4 of the EIA report Volume-I.

10: Observation

Social Impact

Response:

Cultural conflict is not envisaged as the west coast area from Mumbai to Goa is beaming with industrial development and local people have absorbed and accommodated the people coming from Maharashtra and other states without affecting their cultural identity. The details are presented in Section 4.2.6 page nos 376 – 382 of the EIA Report.

11: Observation

Other Miscellaneous Objections

Response:

The waste management plan has been already mentioned in responses to earlier points and green belt development plan of the project is designed to enhance the biodiversity of the region.

a) *The project will beautify the landscape by development of greenery and by improvement of infrastructure facilities, which will create favorable conditions for tourism.*

b) *The fish catch in the Jaitapur coast will not be affected by the Jaitapur project.*

c) *The conclusions drawn in the EIA report are based on comprehensive study, enormous data collection, contribution from experts from different fields and related secondary data.Therefore, environmental impact assessment as presented in the EIA report is based on the scientific ground.*