

**Ministry of Environment & Forests  
(IA Division)**

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**SUMMARY RECORD OF THE 14<sup>th</sup> MEETING OF EXPERT APPRAISAL COMMITTEE ON ENVIRONMENTAL APPRAISAL OF NUCLEAR POWER PROJECTS**

The 14<sup>th</sup> meeting of the Expert Appraisal Committee for Environmental Appraisal of Nuclear Power Projects was held on 18<sup>th</sup> November, 2012 at Hissar, Haryana. The list of participants is annexed.

The Chairman welcomed the Members and thereafter each of the projects was taken up for consideration seriatim. Chairman and all the Members also appreciated contribution of Dr. S. K. Aggarwal, former Member Secretary of the EAC (Nuclear).

**Item No. 14.01: Confirmation of Minutes of the 13<sup>th</sup> EAC (N) Meeting:**

The minutes of the 13<sup>th</sup> meeting of the EAC (N) held on 30.6.2011 were confirmed as circulated.

**Item No. 14.02: Consideration of Projects:**

**Item No. 14.02.01: Haryana Atomic Power Project (4x700 MWe) at Village Gorakhpur, District Fatehabad, Haryana by M/s Nuclear Power Corporation of India Ltd. (NPCIL)**

The proposal was considered by the Committee and the project proponent made a presentation before the Committee for consideration of the proposal for according environmental clearance. All Nuclear power projects and projects for processing of nuclear fuel are listed at S. No. 1(e) under EIA notification 2006."

The proposal is for setting up of a Nuclear Power Park (4x700 MWe), to be implemented in phases at Gorakhpur, District Fatehabad, Haryana alongwith township for the project. The first phase will comprise of two units of 700 MWe each. The meeting was preceded by a visit to the site by the Committee. It was observed that the project site comprises of mainly agricultural land and non-agricultural land. The plant site have agricultural crops i.e. cotton, bajara, jowar etc. and some trees, mainly of khejari trees, were also seen on the site. During

the visit, no pasture land or grazing land were observed. No river/nallah stream was seen passing through the project site. However, some hutments were seen on the project site. The proponent informed the Committee that these hutments will be displaced and rehabilitated as per State R&R policy of the Govt. of Haryana. The site is adjoining to the Fatehabad Branch Canal on the north. The Kajalheri sub-head works / regulator is very near on the north-west side of the site. The water withdrawal for the project will be from this canal. The site ground elevation varies from RL+ 215 m to RL+218 m. A safe grade elevation as 219.1 m has been recommended. The slope of the project site has been observed towards south, south west side of the site. The ground level of the plant site will be raised by about +1m and the fill material for raising level will be sourced from the project site only. Most of the earth material will be generated while making water storage reservoirs and used in low lying areas and also for the elevation of the level for the plant. Township site, which is at about 5 km away from project site on western side, is a barren land. Deer and Neelgai were seen roaming here and there on the township site. Some trees of Khejari were also seen there. No activity related to construction of colony or plant is initiated so far.

The proposal was considered for 'TORS' in the meeting held on 15<sup>th</sup> June, 2010 and 21<sup>st</sup> September, 2010 and awarded on 13<sup>th</sup> October, 2010. The public hearing meeting was held on 17.7.2012. M/s NPCIL has proposed to set up nuclear power plants (4x700 MWe), Pressurized Heavy Water Reactor (PHWR) type, to be implemented in two phases at Murabba No. 211, Khasra No. 1 to 25 at Village Gorakhpur, Block Bhuna, District Fatehabad, Haryana. A residential township will also be constructed as part of this project. Township will be for 1700 employees. The colony will have 3 storey buildings and all facilities such as Hospital, Community Centre, School and shopping centre etc. Total no. of affected people (Khatedar) due to the project has been reported as 979. Some homesteads are also to be displaced. The proposal has, therefore, been considered as an integrated proposal involving nuclear power plant and township. The land requirement for the project is estimated as 608.48 ha, which includes 533.5 ha for the project and 75.04 ha for township at a distance of about 5.0 km from the plant site. Co-ordinates of the project site are lat: 75<sup>o</sup> 37' 56" E and Long; 29<sup>o</sup> 26' 30" N. No forestland is involved in the project. No industry or place of historical importance is located within 10 km of the site. No national park, wildlife sanctuary, elephant/tiger reserve migratory routes are present within 10 km radius of the site. Rehabilitation and Resettlement of project affected personal (PAP, Total 979) will be carried out as per R & R Policy of Haryana. Approval for the exclusion radius of 1 km has been accorded by the Atomic Energy Regulatory Board (AERB) vide letter dated 3<sup>rd</sup> August, 2010.

Total cost of the project for HAPP I & II is revised from Rs. 14,500.00 Crores to Rs. 23,502.00 Crores (Base cost 2011-12). Rs. 2,399.5 Crores are kept for environmental protection measures including safety aspects.

The project will use Natural Uranium Dioxide (UO<sub>2</sub>) as fuel and heavy water (D<sub>2</sub>O) as coolant and moderator for the reactor with on-power refuelling of reactor. Steam generators supply nearly dry saturated steam to the turbine that would be directly coupled to an electric generator which will produce electricity. State of the art indigenous reactor technology will be used.

Ambient Air quality data was collected during March, 2011-May, 2011 (Summer Season) in 10 km radius at eight locations and data submitted indicated PM<sub>10</sub> (42–87 ug/m<sup>3</sup>), PM<sub>2.5</sub> (22–49 ug/m<sup>3</sup>), SO<sub>2</sub> (4-20 ug/m<sup>3</sup>), NO<sub>x</sub> (5-46 ug/m<sup>3</sup>), O<sub>3</sub> (20-36 ug/m<sup>3</sup>) and are within permissible limits. Base line radiological monitoring has also been carried out during January-March, 2011 in 30 km radius. Data submitted indicates ambient gamma radiation levels (0.07-0.22 uGy/h), beta activity (BDL, 0.007 Bq.m<sup>-3</sup> to 0.017 Bq.m<sup>-3</sup>) and gross alpha (0.002-0.003 Bq.m<sup>-3</sup>). Radioactivity levels in water samples for alpha activity ranged (6.7 mBq.I<sup>-1</sup> to 281.3 mBq.I<sup>-1</sup>) and beta activity (<225 mBq.I<sup>-1</sup> to 332.6 mBq.I<sup>-1</sup>). Higher alpha activities are attributed to higher concentration of Uranium in ground water. Radioactivity levels in soil also indicated that <sup>226</sup>Ra and <sup>238</sup>U concentrations higher. Radioactivity levels (<sup>137</sup>Cs <sup>90</sup>Sr and <sup>40</sup>K) in biological samples were normal. Project proponent confirmed that radiological dose limit at the fence post due to the project will be kept as per the standards prescribed by AERB and the emissions will accordingly be controlled. A dose of 0.40 mSv is apportioned for 4x700 MWe power station at Gorakhpur where as the dose limit norm as set by AERB is 1.0 mSv. In-principle approval of the Govt. of India for the project site for 4x700 MWe has been accorded vide letter no.1/5(1)/2007-Power/5-66 dated 8.10.2009.

No ground water will be used for the HAPP project. The cooling water requirement for the 4 units has been estimated as 320 cusecs, which will be drawn from the Fatehabad Branch of Bhakra canal with consumptive usage of 160 cusecs. Permission for the use of 320 cusecs water has been accorded by the Irrigation Department, Haryana vide letter dated 03.01.2006. The total water requirement for the project including township has been estimated as 783.65 MLD (32,625 m<sup>3</sup>/hr). It was reported that the canal closure is limited to 15 days in 10 years and during this period specific design provision has been made for removal of decay heat during shut down. Close circuit cooling system with cooling towers will be provided. However, total 5,320 m<sup>3</sup>/hr dilution water will be discharged to the Bhakra canal and monitored for radioactivity levels at effluent

discharge point. The liquid waste streams will be segregated at source through Liquid Effluent Segregation Systems (LESS) and collected in collection storage tanks. The cooling water discharge will be in the Fatehabad Branch Canal after secondary dilution.

The domestic waste from the project and township will be suitably treated in Sewage Treatment Plant (STP) and disposed of as per the prescribed norms. The sewage sludge will be used for greenbelt. Radioactive Solid Waste (514 m<sup>3</sup>/yr) will be collected, segregated, treated at source and disposed off with the application of advanced technology as per AERB guidelines in Near Surface Disposal Facility (NSDF) which will be fenced and dose rate will not exceed 0.01 mGy/h. Spent fuel removed from the reactor will be stored in spent fuel storage bay (SFSB) till it cools down to dry storage levels (about 5 yrs.) and will be disposed as per the policy of the Government of India. Hazardous waste like oil, lubricant, scintillation liquids will be incinerated in the incinerator to be operated 2-3 days/month. Flue gases will be passed through 2-stage water scrubber and scrubbed water after solidification/embedment in cement will be disposed in RCC trenches. Continuous monitoring of gaseous emissions will be carried out. Lead acid battery will be sold to registered recyclers.

Acoustic enclosures will be provided to DG sets to control noise levels within 85 dB at a distance of 1 km will be maintained. Community welfare activities in the field of education, health, infrastructure etc. are proposed under Corporate Social Responsibility (CSR). Risk assessment, on-site emergency plans and off-site disaster management plan in consultation with local authorities will be prepared before plant operation. Besides, regular mock drilling will be carried out.

Green belt will be developed in 35 % area. Rain water harvesting will be carried out in township only. No rain water harvesting will be done in plant area to avoid any ground water contamination.

Public hearing meeting was held on 17<sup>th</sup> July, 2012 and the various issues raised included land acquisition, safety, exclusion zone, effluent discharge and its impact, waste management and its disposal, use of fertile land, displacement of people etc. Written representations were also discussed. Point-wise clarifications given to the public were discussed with project proponent at length and found to be satisfactory and are enclosed in EIA/EMP Report. Project proponent informed to the Committee that 97% compensation to the land oustees has already been paid as per the R&R Policy, 2010 of the State Govt. of Haryana. Project proponent confirmed that air quality of the area is within prescribed norms and

except during construction phase, the project activities will not contribute to the conventional pollutants. The radioactive pollutants will be controlled in terms of their emissions from all routes and the dose limit will be maintained as per the AERB standards. The radioactive waste, liquid and solid will be segregated based on their radioactive level and managed as per the guidelines prescribed by AERB.

Based on the presentation made and discussion held, the Committee sought following information:

- (i) Details of environmental parameters in selection of proposed site should be provided.
- (ii) All corner coordinates of plant site, township site, intake and discharge points should be given on toposheet.
- (iii) Topographical information of plant site with map should be furnished.
- (iv) Land use of the project area (plant and township) and the surrounding should be given using the appropriate standard classification of land use.
- (v) Details of the compensation paid and others as part of R&R plan including those landless labourers and artisans. Displacement of Homesteads with their R&R details should be provided.
- (vi) Site plan for the township should be provided.
- (vii) Breakup of land requirement for intake and discharge pipelines including the pipelines to be laid for obtaining water from other sources during the maintenance closure of the canal, if any.
- (viii) Requirement of filling material (in m<sup>3</sup>) and source of material and environmental impact of this digging of soil should be provided.
- (ix) The safeguard measures against flooding of the project area, keeping in view the safe grade elevation as proposed and taking into account the maximum precipitation in the area.
- (x) Details of the site contours and drainage pattern of the plant area and the surrounding should be provided.
- (xi) Impact assessment for construction and operation phases, time schedules and EMPs should be given separately.
- (xii) A written commitment that the dose apportionment shall be as per the AERB limits.
- (xiii) Status of AERB approval for project site, a copy of the same shall be provided.
- (xiv) Actual source of water and water requirement for the project and its break-up activity-wise should be submitted. Water balance should also be provided taking into account the COC and the water to be collected

- by rainwater harvesting proposed in the project. Scheme for rainwater harvesting should be provided.
- (xv) Re-confirmation of water withdrawal permission for the requisite quantity of water from the concerned Department of the State Govt. should be provided.
  - (xvi) Details of Cooling Towers whether it is Natural Draught Cooling or Induced Draught Cooling water system should be provided with COC details. Serious effort should be made to minimize water withdrawal and to enhance water use efficiency by increasing COC, water harvesting, re-use and recycling of water.
  - (xvii) A scheme for disposal / management of radioactive waste should be given. It may clearly be stated whether disposal of solid waste will be above ground or underground. This may be clarified keeping in view the groundwater table.
  - (xviii) Details and capacity of STP in the township.
  - (xix) Scheme for solid waste management in the township.
  - (xx) Ozone data should be rechecked and each site wise values to be provided.
  - (xxi) Details of flora, fauna and biodiversity based on primary survey to be furnished. Rehabilitation and conservation of Schedule-I species of fauna occurring at project site and in the study area to be prepared with appropriate budget provision to ensure their safety and to prevent any undue hardship to them from the impact of the project related activities.
  - (xxii) Details of Public Hearing issues raised, response of the project proponent with financial details and time schedule should be given in the form of Action Plan.
  - (xxiii) Details of green belt development with time schedule, length and width to be covered should be provided.
  - (xxiv) Hierarchical chart of environmental management under Corporate Environment Responsibility (CER) should be given.
  - (xxv) Details of health status of population of the study area should be given.
  - (xxvi) Details of decommissioning of individual facilities and mode of final disposal of different classes of debris and quantities to be provided identifying likely impacts and measures to prevent/ minimize such impacts.
  - (XXVII) Impact of labour required for construction, their fuel, water, housing and waste related aspects to be assessed and remedial measures to be taken should be provided.

- (xxviii) Cumulative impact arising from transport of filling earth and construction materials on air quality, noise and social aspects to be assessed along with remedial measures to minimize such impacts.

It was decided that project proponent may be asked to incorporate above listed issues in the final EIA/EMP and submit to the Ministry for the consideration of the Expert Committee.

**Item No. 14.02.02: Nuclear Power Park (6x1000 MWe), Village Kowada, District Srikakulam, Andhra Pradesh by M/s Nuclear Power Corporation of India Ltd.(NPCIL) – Amendment in project capacity.**

The proposal was earlier considered by the Committee during its meetings held on June 30, 2011 wherein the Committee had prescribed TOR for the project with capacity of 6x1000 MWe. M/s NPCIL has requested for enhancement of capacity of the project from 6x1000 MWe to 6x1594 MWe because site has a full potential of 10,000 MWe capacity and the Reactors of the 1594 MWe capacity are available. It is reported that there will be no change in requirement of land, water, waste disposal. The Committee considered the matter but observed that since a revised proposal for the enhanced capacity has not been submitted by the project proponent, therefore, shown its inability to consider the request and asked the project proponent to submit the following for its consideration

- (i) Revised proposal for enhanced capacity of 6x1594 MWe with revised Form-I & 1A and prefeasibility report for the same.
- (ii) Govt. of India approval for 6x1594 MWe capacity.
- (iii) AERB approval for the site for proposed capacity (6x1594 MWe).

It was decided that the proposal will be reconsidered by the Committee for proposed capacity (6x1594 MWe) as and when submitted along with requisite information as mentioned above. However, the committee has agreed to consider the same baseline data collected for preparation of EIA report for the enhanced capacity.

**Item No. 14.02.03: Kudankulam Nuclear Power project (KKNPP) of M/s NPCIL- Amendment in EC condition.**

M/s Nuclear Power Corporation of India Ltd. (NPCIL) has requested MoEF for the amendment in the environmental clearance accorded to Kudankulam Nuclear Power Project Unit 1 & 2 vide Ministry's letter no. J-14011/1/88-IA-II(M) dated 9<sup>th</sup> May, 1989 in conditions stipulated as:-

- A. Condition no. (II): The temperature of condenser water should not exceed 5<sup>0</sup>C over and above the ambient temperature of the water at the point of discharge in the sea.
- B. Condition no. (VII): The route of the pipeline from Pechiparai reservoir to the power station should preferably be so selected that it does not affect forest areas.

Regarding change in temperature from 5<sup>0</sup>C to 7<sup>0</sup>C, the Committee was briefed that Marine impact studies have been conducted by the Institute of Ocean Management, Anna University (Report submitted in July, 2008) and Engineers India Limited alongwith Central Marine Fisheries Research Institute (CMFRI) and concluded that there will be no impact on the marine ecosystem due to 7<sup>0</sup>C temperature from condenser cooling water (CCW) discharge. The Committee remembered that both the reports were considered in the MoEF while according environmental clearance for the KKNPP Units 3-4 and 5-6 in the EAC (Nuclear) meeting. The Member Secretary confirmed that environmental clearance for Units 3-4 and 5-6 have been accorded on 23<sup>rd</sup> September, 2008 and 31<sup>st</sup> December, 2009 and CRZ Clearance on 25<sup>th</sup> July, 2012 stipulating that the temperature difference of the discharged water with respect to the receiving water should not exceed 7<sup>0</sup>C. It was also informed that TNPCB has issued 'Consent to Operate' for KKNPP Unit 1 & 2 by stipulating discharge limit as 7<sup>0</sup>C in consonance to the notification issued by the Ministry under E (P) Rules in 1998 on 22.12.1998 on 'Standard for the discharge of condenser cooling water from thermal power plant'.

After discussion on the subject, the Committee agreed that condition no. (II) of the environmental clearance accorded vide letter dated 9<sup>th</sup> May, 1989 whereby it was stipulated that "temperature of condenser water (CCW) should not exceed 5<sup>0</sup>C over and above the ambient temperature of the water at the point of discharge in the sea" should be amended as "temperature of condenser cooling water (CCW) should not exceed 7<sup>0</sup>C over and above the ambient



temperature of the water at the point of discharge in the sea" in accordance with the study reports available and Ministry's notification dated 22.12.1998.

Regarding source of water from Pechiparai Dam which was envisaged for obtaining environmental clearance in 1988 had been switched over to setting up of desalination plant at KKNPP, Unit 1 & 2. The project proponent has clarified that it was realized later on that drawl of water from Dam will deplete the scarce natural resource in the drought prone regions of Kanyakumari and Tirunelveli District hampering the irrigation and livelihood of the villages. Besides, land acquisition from the private persons as well as Forest Department involved in the 65 km long pipeline will also be problematic. Keeping these facts in mind, NPCIL decided in 2004 to establish a desalination plant to provide adequate fresh water supply for domestic requirements and for the plant.

The Committee observed that Project proponent has taken a wise decision although late in the interest of local villagers as well as in the interest of plant which needs regular water supply. Keeping above mentioned facts in mind, the Committee agreed and recommended for setting up of desalination plant for the supply of required water instead of sourcing from Pechiparai Dam.

Regarding environmental clearance for the establishment of desalination plant, no environmental clearance is required since it is not listed in the schedule of EIA Notification, 1994 or 2006. However, CRZ clearance for setting up desalination plant will be required to be obtained under CRZ Notification, 2011 as applicable.

The meeting ended with a vote of thanks to the Chair.

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**Annexure**

**List of Participants**

1. Dr. A.R. Reddy - Chairman
2. Shri A.R. Sundararajan
3. Shri U.N. Gaitonde
4. Shri R.K. Garg
5. Shri R. Bhattacharya, AERB, Mumbai
6. Prof. C.K. Varshney
7. Dr. K.K.S.Bhatia
8. Shri S.Krishnan
9. Dr.S.K.Paliwal  
Scientist, CPCB, New Delhi
10. Dr. P.B.Rastogi, Director, MoEF - Member Secretary
11. Shri Om Prakash, Deputy Director, MoEF
12. Representatives of M/s Nuclear Power Corporation of India Ltd.

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