SPEED POST

F. No. J-14011/1/2016-IA-1(N)
Government of India
Ministry of Environment, Forest and Climate Change
(IA Division)

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Dated: 5th August, 2019

To,

Shri B. C. Pathak
Distinguished Scientist, Executive Director (P-PHWR)
Nuclear Power Corporation of India Limited (NPCIL)
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Anushaktinagar, Mumbai- 400094
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Subject: EC for Expansion of Capacity of Unit 5 & 6 (Kaiga 5 & 6), Kaiga Atomic Power Project, Kaiga, Uttar Kannada, Karnataka by Nuclear Power Corporation of India Limited (NPCIL) -reg.

This has reference to your letter no. NPCIL /ED(P)/Kaiga 5 & 6/M/2019/2 dated 07.01.2019 received in the Ministry for Environment Clearance of the above mentioned project proposal in accordance with Environment Impact Assessment Notification (EIA), 2006 issued under the Environment (Protection) Act, 1986.

2. The proposal is regarding setting up of Pressurized Heavy Water Reactor (PHWRs) based Kaiga unit 5 & 6 with enhanced capacity of 2 x 700 MWe, in-place of earlier approved 2 x 235 MWe for which EC was granted by MoEFCC, along with expansion of residential township at Mallapur, Karwar taluk, Uttar Kannada district, Karnataka. As per the schedule of EIA Notification, 2006, the proposed nuclear power **project at Kaiga falls under Sl. No. 1 (e) "Nuclear Power Project and Processing of Nuclear Fuel" of Category "A" and the construction of additional accommodations in the existing township at Mallapur-Virje is under Sl. No. 8(b)** which is Township and Area Development Projects. Accordingly, the proposal was considered for EC during the 37th meeting of EAC (N&D) held on 24th May 2019.

3. The committee noted that the ToR was issued by the Ministry vide OM dated 06.09.2016 on the basis of deliberations in the meeting held on 12.08.2016.

4. As elaborated during the presentation, erstwhile Ministry of Environment and Forest (MoEF) had accorded Environmental Clearance (EC) for setting up of six units (6 x 235 MWe capacity) vide the EC No:J-14011/5/89-IA-I dated 10/01/1992 at Kaiga, Uttara Kannada district, Karnataka. Out of six units sanctioned, four units (Kaiga-1 to 4) of capacity 4 x 220 MWe are implemented by NPCIL and are in operation. The current proposal is for seeking EC for setting up of Kaiga 5 & 6 with enhanced capacity of 2X700 MWe PHWRs in place of 2X235 MWe and expansion of existing Township at Mallapur-Virje about 18 km from project site.

5. As was presented by the project proponent the **major benefit** of the project is generation of 1400 MWe clean power to meet the growing energy demand of the country. There are associated benefits which include industrial growth, direct & indirect employment, infrastructure development of the local areas etc. 50% of the power generated from Kaiga 5 & 6 is for Karnataka.

6. Following was submitted before the Committee by the project proponent during presentation and associated deliberations:

i) **Area of Project Site**

a. No fresh land acquisition for Kaiga 5 & 6 is required.

b. A total of 1665 ha. of land is in possession of NPCIL.

i. 829 ha. (submerged in Kadra reservoir).

ii. 665 ha. (forestland).

iii. 171 ha. (other land)

ii) 120 ha out of 665 ha of forest land diverted for Plant use of Unit 1 to 6 vide order dated 19/02/1988.

i. 65.91 ha. utilized for KGS 1 to 4

ii. 54.09 ha. will utilized for Kaiga 5 & 6

iii) **Township site-** Township is already established in an area of about 95.91 ha. (Non- Forest land) at Mallapur-Virje, out of which, 51.38 ha. already utilized for KGS 1 to 4 township facilities. Remaining 44.53 ha. to be used for township facilities of about 789 employees of proposed Kaiga 5 & 6.

iv) Expected completion cost of the proposed Kaiga 5&6 (completion year 2026) and expansion of township would be around Rs. 21000 Crore.

v) Employment potential is about 789 permanent employees and 4000 contract labours during peak construction.

vi) The site is almost flat topography and surrounded by hill ranges.

vii) The elevation of the site ranges from RL+32m to RL+46m. Full Reservoir Level (FRL) of Kadra dam is RL+34.5m. Minimum finished grade level of RL+41.3m is proposed for Kaiga 5 & 6 with a safe margin of 1.56m.

viii) The site area lies in Seismic zone III in the seismic zoning map of India (IS 1893, 2002). Based on the geological studies of faults/lineaments conducted by GSI in the area around Kaiga site, there is no capable fault within 5 km radius of Kaiga site.

ix) Kadra reservoir and Kali river is a freshwater riverine ecosystem harboring variety of flora and fauna. There is not much anthropogenic activity on the water bodies. The nutrient level is in permissible levels throughout different seasons harboring variety of phyto & zooplanktons, shrimps, prawns, crabs, bivalves, fishes, amphibians, reptiles, avian and mammals.

x) Kali nadi flows from east-west direction in the northern side of the plant boundary. The natural slope of the site is towards Kadra reservoir. Thus the rainwater from the catchment areas within plant and outside plant naturally drains into Kadra reservoir. After construction of the plant also, the rainwater from the site area will be led to Kadra reservoir by construction of suitable rainwater drains. The rainwater presently flowing into plant area from outside catchments will be diverted to Kaiga Hole by providing Cut-off drains/ intercepting drains located within the site area to directly discharge into Kadra reservoir.

xi) Operation of nuclear power plants at Kaiga has very insignificant impact on overall biodiversity of the region.

xii) 17 faunal/avifaunal Schedule-I species are present. The study area did not record the presence of any plant species under Schedule VI and in IUCN red data book.

xiii) The project site is located in the interior part of Western Ghats of peninsular India. Dandeli-Anshi Tiger Reserve (KTR/DATR) extends from NE to NW. The minimum distance observed varies between 718m to 1734m from Kaiga site Exclusion zone boundary.

xiv) State Wild Life Department has recommended Wild Life Clearance vide meeting held on 09/01/19.

xv) About 8700 trees (approx.) will be felled in the proposed project main plant area after obtaining tree felling permission from State Forest Department.

xvi) Compensatory Afforestation for 120 Ha of diverted forest land (identified for Kaiga 1 to 6) was made in 732 Ha of Land at Chamarajanagar and Mandya Districts of Karnataka with the help of Forest Department.

xvii) The results of the environmental surveillance shows that due to operation of KGS 1 to 4, the radiation dose received by a member of public staying at fence post (2.3 km) is 1.3 µSv, which is 0.13% of the annual dose limit of 1000 µSv prescribed by AERB/ICRP and is within statistical variation of the annual average dose of 2400 µSv due to natural radioactivity.

xviii) Radiation release from nuclear power plant at Kaiga is negligible and is only a small fraction of AERB specified limits. The environment around Kaiga (30 km radius) is monitored for radioactivity levels by independent agency ESL, BARC. The results indicate that radiation exposure due to operation of KGS Units 1 to 4 is negligible as compared to AERB dose limit.

xix) Public hearing was held on 15.12.2018 at NPCIL Township and Proceedings of Public Hearing are compiled as in EIA Report.

xx) The documented emergency planning and preparedness program established and practiced for Kaiga site will be revised to include requirements of Kaiga unit 5 & 6 and approval of State Government will be obtained as applicable.

xxi) The study area consists of 50 habited villages having population of 28970. Population density is 36 persons/sq.km

xxii) People's perception regarding the project, in general, is favorable specifically, due to the advantages of local infrastructure development, employment opportunity, area/business development etc. However, some people are fearful about pollution, reduction in agriculture production and increasing in traffic trend.

xxiii) Amount spent so far in CSR activities is Rs. 24.36 crores. Additional Rs. 10 crores per annum will be spent on CSR

xxiv) In Principle approval by DAE (GoI) dated 17th Aug., 2011 is available.

xxv) The existing radioactive solid waste management facility will be used for solid radioactive waste within the project site area conforming to AERB stipulations. The estimated net volume of radioactive solid waste generated after due processing would be disposed-off in the existing Near Surface Disposal Facility (NSDF) is about 257 m^3/year from Kaiga unit 5 & 6.

xxvi) It is estimated that about 2355 kg of additional municipal waste will be generated per day due to the addition of 789 dwelling units of Kaiga 5 & 6 in the township. The domestic waste generated from plant site will be composted and will be used for plantations and gardens.

xxvii) The water requirement for the project will be met from Kadra reservoir, Karnataka Government has allotted 185 cumecs (6,66,000 m^3/hr) of

water for six units of Kaiga. Out of the above allocation, about 2.5 cumecs (9000 m^3/hr) will be used for the proposed units 5 & 6. The existing intake and outfall facilities will be utilized for the proposed units. Additional 0.54 Million Litres per Day (MLD) from Kadra reservoir. Govt. of Karnataka has assured 185 cumecs (6,66,000 m^3/hr) of water for six units of 235 MWe units.

7. As was further Submitted by NPCIL:

i. Forest Clearance, State Wildlife Clearance, State Govt. Clearance for utilization of water from Kali river have been granted.
ii. Application for NBWL clearance is under consideration of the Ministry.
iii. Felling of trees will be carried out in phased manner for which NPCIL has carried out inspection with State Forest Department. As per the green development plan large number of trees will be planted in available open space.
iv. Epidemiological study covering 20km radius around the Kaiga Site has been carried out during the year 2000. Recently another study covering 30km radius around the site has been carried out by Tata Memorial Centre (TMC), Mumbai. The final report is awaited.
v. Monitoring Report from RO, Bangalore has been submitted and it shows compliance to the majority of conditions prescribed by the Ministry in the EC letter no. J-14011/5/89-IA-1 dtd 10.01.1992.
vi. There is minimum impact expected from both radioactive and non-radioactive effluent of the Plant on the Kali River as they will be treated and discharged complying with AERB and SPCB norms.
vii. There is no hazardous waste except used oil that will be generated from the plant, which will be disposed to authorized vendors as per Hazardous Waste Rules, 2016.

8. On the basis of recommendation of the EAC, the Ministry of Environment Forest and Climate Change, in acceptance of the recommendation of the EAC (Nuclear and Defense), hereby accords EC to the above project viz. *"Expansion of Capacity of Unit 5 & 6 (Kaiga 5 & 6), Kaiga Atomic Power Project, Kaiga, Uttar Kannada, Karnataka by Nuclear Power Corporation of India Limited (NPCIL),"* under the provision of EIA Notification, 2006 and amendments thereto and circulars issued thereon, subject to compliance of the following conditions:

Specific Conditions:

i. The project proponent shall obtain the necessary permissions/clearances from the AERB before commencement of the project.
ii. Regular monitoring of radioactive pollutants in the environment shall be ensured by NPCIL as per the AERB standards.

iii. Soil and groundwater samples shall be tested to ascertain that there is no deterioration of groundwater quality by leaching heavy metals, radio nuclides and other toxic contaminants.

iv. The radioactive liquid waste emanating from the plant shall be treated and managed as per the guidelines of Atomic Energy Regulatory Board (AERB)/International Commission on Radiological Protection (ICRP) in this regard.

v. The clearance from NBWL shall be ensured, prior to undertaking any activity under the project.

vi. The radioactive levels in the different matrices of environment including food chain, air, water and soil shall be monitored regularly in the surrounding areas as per AERB standards and records to be maintained.

vii. The conventional pollutants shall also be monitored according to the guidelines prescribed by SPCBs and records maintained.

viii. Periodic health survey of the population residing within 20 km around the proposed plant site shall be undertaken and the activities under the expansion project will be initiated only after availability of positive report from Tata Memorial College (TMC) Mumbai wrt recent health study.

ix. Green belt shall be developed in 33 % area around the project boundary with the native species of adequate density and width. In addition, plantation shall be raised in other vacant areas within the plant site.

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

xi. The Risk Analysis and Probabilistic Safety Assessment reports to be verified by the competent authority in AERB.

xii. Suitable provision shall be made for sewage/waste water disposal and storm water independently.

xiii. Adequate rain water harvesting system shall be put in place.

xiv. The ventilation air shall be released into the atmosphere after necessary control and at adequate height so that the radiation release rate as well as the increase in radiation in the surrounding area above the background levels are within the permissible limits as prescribed by the regulatory agency.

xv. Prior clearance from State Forest Department shall be ensured for felling of about 8700 trees (approx.) in the proposed project main plant area.

xvi. The necessary mitigation measures based on the drainage study shall be undertaken to ensure that there is no impact due to water logging.

xvii. The radioactive liquid waste emanating from the plant shall be treated and managed as per the guidelines of AERB/ICRP in this regard.

General Conditions:

i. Environmental clearance is subject to obtaining all the requisite clearances from the competent authorities and shall strictly adhere to the stipulations of the SPCB and State Government or any other statutory body.
ii. Installation of STP should be certified by concerned Pollution Control Board.
iii. It shall be ensured that the noise levels in the work zone both during construction and operation phase are within permissible limits. For people working in high noise area, requisite personal protective equipment like earplugs/ear muffs etc. shall be provided.
iv. Installation and operation of DG sets shall comply with notified guidelines.
v. The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.
vi. The project proponent shall obtain Consent to Establish/Operate under the Air Act, 1981 and the Water Act, 1974 from the concerned State Pollution Control Board.
vii. The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report and also that during their presentation to the EAC.
viii. Install system to carryout Ambient Air Quality monitoring for common/criterion parameters relevant to the main pollutants released.
ix. The solid wastes shall be managed and disposed as per the norms of the Solid Waste Management Rules, 2016.
x. Any wastes from construction and demolition activities related thereto shall be managed so as to strictly conform to the Construction and Demolition Rules, 2016.
xi. Hazardous waste generated in the plant will be disposed of as per Hazardous Waste (Management, Handling & Transboundary Movement) Rules, 2016.
xii. Provision shall be made for the housing of construction labour with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project and shall be within project area.
xiii. An Environmental Management Cell equipped with full-fledged laboratory facilities shall be there to carry out the environmental management and monitoring function for implementation of the stipulated environmental safeguards.
xiv. The environmental statement for each financial year ending 31st March in Form-V to be submitted by the project proponent to the concerned State Pollution Control Board as is mandated under the Environment (Protection) Rules, 1986.
xv. The non-radioactive waste water generated from the plant premises shall be suitably treated in sewage treatment plant (STP) and the treated

effluents shall be recycled and reused within the plant premises for greenbelt etc.

xvi. Water harvesting System shall be ensured for the residential township to ensure water sustainability of the town.

xvii. Effective municipal Solid waste treatment focusing on segregation and biotic treatment with minimum waste for the landfill to be ensured for the residential township within the norms of the Solid Waste Management Rules, 2016.

xviii. Effective standalone STP to be maintained for treating the effluent from the residential township and the goal should be re-utilization of treated water for various activities as gardening, washroom etc.

xix. The project proponent shall submit six monthly compliance reports on the status of the implementation of the stipulated environmental conditions to the Regional Office, Ministry of Environment, Forest and Climate Change.

(Dr. Shruti Rai Bhardwaj)
Addl. Director/Scientist 'E'

Copy to:

1. The Additional Chief Secretary to Government, Forest, Environment and Ecology Department, Karnataka Government Secretariat, Room No. 447, 4th Floor, Gate No. 2, M. S. Building, Bangalore-56000.
2. Addl. Principal Chief Conservator of Forests (C), Ministry of Env., Forest and Climate Change, Regional Office (SZ), Kendriya Sadan, 4th Floor, E&F Wings, 17th Main Road, Koramangala II Block, Bangalore - 560034.
3. The Chairman, Central Pollution Control Board Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, New Delhi - 110 032.
4. The Chairman, Karnataka State Pollution Control Board "Parisara Bhavan", #49, 4th & 5th Floor, Church Street, Bangalore-560001
5. Guard File/ Monitoring Cell

(Dr. Shruti Rai Bhardwaj)
Addl. Director/Scientist 'E'