एनटीपीसी NTPC 40 YEARS OF SUSTAINABLE DEVELOPMENT

एन टी पी सी लिमिटेड
(भारत सरकार का उद्यम)
NTPC Limited
(A Govt. of India Enterprise)

कायमकुलम /Kayamkulam

संदर्भ/Ref:1034/EMG-14/2016-HR02 **तारीख/Date:18.10.2016**

To
THE DIRECTOR (S)
Ministry of Environment & Forests
Regional Office (South Zone), IVth Floor, E&F Wings,
Kendirya Sadan, 17th Main Road, IInd Block,
Koramangalam, Bangalore, Karnataka.
India – 560034

आदरणीय महोदय / **Respected Sir,**

विषय : एन टी पी सी - कायमकुलम : अर्धवार्षिक पर्यावरणीय मंजूरी का अनुपालन रिपोर्ट और पर्यावरण निगरानी डेटा / Sub: NTPC Kayamkulam - Half Yearly Compliance Status Report of Environmental Clearances and Half Yearly Monitoring Data.

राजीव गांधी कम्बाइनड साइकिल पावर प्रोजेक्ट (एनटीपीसी कायमकुलम) Stage-I (350MM) के लिए अर्ध वार्षिक (अप्रैल से सितम्बर 2016 तक) पर्यावरणीय मंजूरी का अनुपालन रिपोर्ट और पर्यावरण निगरानी डेटा, इस पत्र के साथ संलग्न है। / Please find enclosed herewith the Half Yearly Compliance Status Report of Environmental Clearances and Half Yearly Monitoring Data of Rajiv Gandhi Combined Cycle Power Project (NTPC Kayamkulam), Stage-I (350MW) for the period April to September 2016.

उपरोक्त दस्तावेजों को भी अपने ईमेल reddyks99@hotmail.com और roszmon@yahoo.in लिए भेजा जाता है। / The above documents are also sent to your email reddyks99@hotmail.com and roszmon@yahoo.in

यह आपकी जानकारी के लिए है / For ~~your~~ kind information, please.

भवदीय / Yours faithfully,

कबीर पाशा.बी / Kabir Pasha.B
डी.जी.एम– ई.एम.जी / DGM (EMG)

Enclosure: As mentioned above.

राजीव गाँधी कोम्बिनेद साइकिल पॉवर प्रोजेक्ट, चूलाठेरुवु (पोस्ट), अलाप्पुल्हा (जिला) केरला – ६९०५०६
Rajiv Gandhi Combined Cycle Power Project, Choolathereuvu (P.O) Alappuzha (District) Kerala – 690506
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पंजीकृत कार्यालय : एन टी पी सी भवन स्कोपे काम्प्लेक्स, ७ ईन्स्टितुतिओनल एरिया, लोधी रोड, नई दिल्ली ११०००३
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STATUS OF COMPLIANCE
OF
ENVIRONMENETAL CLEARANCE
For

RAJIV GANDHI
COMBINED CYCLE POWER PROJECT
STAGE-I (350MW)

October 2016

The environmental clearance for Kayamkulam Coal-based Power Plant has been accorded by MOEF vide letter dated 16.4.92. Subsequently, it was decided to implement a Combined Cycle Power Plant (CCPP) with Naphtha as fuel and environmental clearance for CCP was obtained from MOEF vide letter dated 04.01.95.

❷ **As per MOEF Office Memorandum dated 04.01.95, all conditions contained in Office Memorandum dated 16.04.1992 shall be implemented. The matter regarding deletion / modification of stipulation in Office Memorandum dated 16.04.1992 not applicable to CCP were taken up with MOEF.**

❸ **MOEF Subsequently vide letters dt. 16.09.1998, 02.11.1998 and 23.05.2001 have amended / modified the conditions of the environment clearance.**

❹ **Status of implementation of stipulations as on date applicable to CCP are enclosed.**

STIPULATION	STATUS AS ON 30.09.2016
2. i) A multifuel boiler should be installed in which coal or gas or oil may be used in any proportions.	The proposal envisages a combined cycle power plant (CCPP) with Naphtha as a fuel. The GT's are also equipped with provision for firing natural gas if necessary.
ii) A single stack having bi-flues of height not less than 220 m should be provided for both the units.	MoEF vide letter dated 16.09.1998 has modified this condition. 4 no Stacks of height 70mts have been erected. 2 no main stacks 2 no by-pass stacks
iii) Electrostatic Precipitators (ESP) with operational efficiency of not less than 99.5% should be provided. The particulate emissions from the stacks should not exceed the prescribed standard of 150 mg/Nm3 and in the event of emissions exceeding the prescribed limit, the plant will have to be shut down.	Not Applicable for CCPP. MOEF vide letter dated 16.09.1998 informed that this condition is deleted. NTPC Kayamkulam is Gas (Naphtha) based power project.
iv) A minimum of 100 meters of distance must be left on the front side from the Kayal and on the remaining three sides, the distance equivalent to the width of the Kayal should also be left as per the provisions of the Coastal Regulation Zone. The stipulation and restrictions as per the Coastal Regulation Zone should be complied with strictly in respect of the above stretches of land coming under the proposed project site. The area so left all around the Kayal should not be used for any other purposes except for raising green belt.	A 100 m width of land has been left on western side towards main Kayal. The width of kayal on other three sides is a maximum of 35 m only and accordingly 50 m width of land has been left on three sides which is more than the width of the kayal on the respective sides. An extensive afforestation programme has been implemented at the project site in a phased manner. More than 100,000 saplings have been planted till September 2016. Additional plantation will also be done during subsequent years. The main species planted include local trees like Konna, Korangati, Tamarind, Rosewood, Kumbit Veng, Neeli, Neem and coconut.

v) In the first instance, all efforts should be made to acquire fill material from outside such as by transporting fly ash from the nearby places, excavation of soil, dredging of sea etc. If it is not feasible, dredging of the Kayal could be undertaken in those stretches which are not involving nursery grounds for fishes and where the biological productivity and diversity are comparatively less. Dredging of the Kayal, if it has to be undertaken, should be completed in the shortest possible time not exceeding one year in any case and theft material should be obtained for raising only that portion of the proposed site where Stage-I units are to be located. The remaining portion of the site required to be raised should be done at a later stage by using fly ash as the fill material after the Stage-I units are commissioned. **This condition has been Modified as follows:-** 2(v): MOEF has no objection if in addition to the area required for stage-I main plant, the areas of stage-II which will serve as a common facility for both these stages, are filled up together, excluding those areas which are identified for filling up at a later stage.	Arranging fly ash as fill material from outside is not possible because there is no coal-based TPP in Kerala. Excavation of soil for obtaining earth for backfilling the proposed plant site was explored by NTPC in areas near Nuranad, Charonood, Chunakara, Thamarakulam, Palamel and Adoor etc. These areas are undulated terrain with thick plantation cover of Coconut, Rubber, Pepper, Tapioca, Cashewnut, etc. The fill material has, therefore, been generated through dredging of kayal. The permission of State Irrigation Deptt. has been obtained in this regard. Dredging activity has been completed.

vi) While dredging the Kayal, necessary precautionary measures should be taken to avoid occurrences of hydrostatic pressure imbalances and adverse effects likely to be caused on sustenance fisheries and inshore fisheries. A detailed environmental management plan dealing with the dredging of Kayal, the amount of fill material to be obtained, area of the site to be raised,point and non-point sources of pollution during the construction phase along with preventive measures etc. should be prepared and submitted to this Ministry for approval within a period of six months.	Environmental Management Plan (EMP) dealing with the dredging of kayal has been submitted to MOEF on 29.02.1996. The EMP for other areas related to air pollution control, water pollution control, noise, afforestation etc. were submitted to MOEF on 27.08.1992.
vii) A plan for full utilisation of ash (starting with utilisation of at least 25% of the ash) should be prepared in consultation with the State Government and submitted to this Ministry within six months.	Not applicable for CCPP. MOEF vide letter dated 16.09.1998 informed that this condition is deleted.
viii) The requirement of land for ash disposal should be based on ash utilisation plan and not more than 350 acres of land should be acquired for emergency ash disposal purposes. **The ash pond should be lined to avoid any ground water contamination. Sea water should not be used for ash handling and disposal. Effluents from the ash pond should conform to the standards as laid down by the State Pollution Control Board.** ****This condition has been Modified as follows:** 2(viii): the sea water could be used for ash disposal provided necessary precautions are taken for treatment of the water before it is disposed off so as to ensure that this does not pollute the agricultural fields and ground water.	MOEF vide letter dated 16.09.1998 informed that this condition is deleted.

The decision in regard to lining of ash pond may be taken on the basis of a scientific study on the likely impacts of leachates.	
ix) Affected families should be properly rehabilitated in consultation with the State Government.	A detailed R&R plan has been prepared for the affected families. Site R&R and Corporate R&R are effectively implementing the R&R Plan under regular supervision of World Bank.
x) Barest minimum area for the colony, ash disposal and for other purposes should be used to restrict the displacement of local people to the extent possible. There is a possibility that the vegetation in the area, especially the coconut trees, might be affected by SO2 and SPM concentration. In case this happens, compensation would have to be paid to the affected families.	The land acquired for main plant is Govt. land. Since this is a CCPP, there will be no ash disposal area. The land required for colony for a CCPP is much less than coal based plant. Since this is a CCPP there will not be much particulate emission and SO_2 emission level is also absolutely low. Hence there will not be any effect on coconut trees.
xi) The State Government should formulate a regional plan for the area to ensure that industrial and urban growth occurs in a planned manner, so that its environmental impacts are minimised.	The regional development plan has been formulated by the State Govt. and has been submitted by Kerala Govt. to MOEF on 1.06.96.
xii) The NTPC should prepare a plan for the green belt and submit for approval within 3 months.	A green belt development plan was submitted to MOEF on 27.08.1992. An extensive afforestation programme is being implemented at the project site in a phased manner. More than 100,000 saplings have been planted till September 2016. Additional plantation will also be done during subsequent years. The main species planted include local trees like Konna, Korangati, Tamarind, Rosewood, Kumbit Veng, Neeli, Neem and coconut.

xiii) A base line health survey, especially for pulmonary functions should be done in the region, and this should be followed by periodic tests after the commissioning of the power station in order to monitor the impact, if any, on the health of the local inhabitants.	Since this is a CCPP, there will be no particulate emission. Therefore, there is no possibility of pulmonary diseases due to operation of CCPP. RGCCPP has carried out this study from April to Dec 2006 at a cost of Rs10.42 lakhs through M/s Pollucon Laboratories, Surat. Salient features of this study are mentioned below • Conducted the study based on USEPA guidelines. • Area within 10 km of radial distance from plant chimney is covered. • Total Population covered = 2,66,000 (20 Villages) • Epidemiological observations in 10 km area around the plant reveal that no prevalent disease found due to the pollutants emission from the plant. **Conclusion:** There is no significant association found between the reported/ detected health abnormalities and emission from the power station. A similar study, HHRAS-2015, was taken up in 2015 and the final report was submitted in March 2016. **Conclusion:** It is evident from above study that the operation of Rajiv Gandhi Combined Cycle Power Plant (NTPC Kayamkulam) causes no risk on Human Health.
xiv) 'Zero discharge' concept with respect to liquid effluents should be followed to the extent possible. Liquid effluents should be treated to conform to the standards of SPCB before discharging in the water bodies. Treated liquid effluent should be used/recycled in the plant/irrigation of the green belt to the extent possible.	In order to reduce effluent discharge from the plant, water systems has been optimised. Condenser cooling is through closed recirculating system with cooling tower. Further, to reduce blow down, the system is designed with 3 Cycles Of Concentration (COC) operation, but CWS is maintained at COC 12-14. Clarified sludge treatment facility has been provided with dewatering equipment like thickeners, centrifuges etc. and decanted water is recycled back to the raw water intake. Gravity filter back wash waste is also recycled back to the raw water intake. Liquid effluents are treated to confirm KSPCB standards before discharge. Sanitary effluents after treatment will be used for afforestation to the extent possible except during monsoon.

xv) Adequate measures for control of noise should be taken so as to keep the noise levels below 85 db in the working environment.	Adequate measures have been taken at design stage so as to keep the noise level below 85 db (A) from the individual equipment. In the operational areas, where it would be not feasible to keep the noise level below 85 dB(A), operating personnel are provided with PPE like ear plugs or ear muffs. An acoustic enclosure is also in place for carrying main plant operation activities.
xvi) At least six air quality monitoring stations should be set in consultation with the State Pollution Control Board for estimation of SO2, NOx and SPM. The exact location of the monitoring station should be decided based on meteorological conditions, human settlements, vegetation etc. Stack emission should be monitored by setting up of automatic stack monitoring units for SO_2 and SPM. The data on stack emission and ambient air quality should be submitted to the State Pollution Control Board once in three months and to this Ministry once in six months along with the statistical analysis.	Six ambient air quality monitoring stations have been finalised in consultation with Kerala State Pollution Control Board. The monitoring was started in the month of July'99 prior to the operation of the plant. The report are being sent to KSPCB every quarterly and to MOEF Regional office Bangalore every Six months. Presently, environmental parameters are monitored at three locations in NTPC Kayamkulam as per KSPCB consent. The monitoring is carried out by laboratory approved by KSPCB and is under progress. Analysis reports are submitted as per KSPCB consent. Online monitoring for stack emissions and ambient air quality monitoring at three stations are in place. Online data of AAQMS is displayed on the electronic display board located in-front of the approach gate.
xvii) Thermal discharge of effluents from the condensers should not be put in the Kayal; instead it should be discharged in the sea, the temperature of which should not exceed the standard of 5 C over and above the ambient temperature of the receiving water.	Closed Cycle Cooling Towers are provided. Blowdown from the cooling towers will be from the cold side. Annual average difference in temperature of ETP treated water is observed as $0.13^{O}C$ during 2015-16.
xviii) Air and Water Quality standards as prescribed under the Environment (Protection) Act, 1986, the Air (Prevention and Control of Pollution) Act, 1981 and the Water (Prevention and Control of Pollution) Act, 1974 should be complied with including the revised standards that may be prescribed in future.	Revised statutory air and water quality standards are complied at NTPC Kayamkulam.

3. The condition stipulated may be varied or new conditions may be added or the clearance revoked, if necessary in the interest of environmental protection, and if there is any change in the project profile non-satisfactory implementation of the stipulated conditions, etc.	All new statutory regulations are complied with.
4. The stipulations will be implemented, among others, under the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, and the Public Liability Insurance Act, 1991.	All Statutory requirements mentioned in MOEF and KSPCB for NTPC Kayamkulam are complied.
5. Necessary funds should be provided in the project for the implementation of the above mentioned conditions and environmental safeguards. The funds earmarked for the environmental protection measures should not be diverted for other purposes and year wise expenditure should be reported to this Ministry.	Necessary financial provision for the above measures has already been made and it forms an integral part of project construction, operation and maintenance. An amount of Rs. 51.32 crores has been kept towards environmental safeguards. The funds earmarked for environmental protection measures are not diverted for other purposes.

STATUS OF IMPLMENTATION OF CONDITIONS STIPULATED IN AMENDMENT TO ENVIRONMENTAL CLEARANCE
NAME OF THE PROJECT: KAYAMKULAM CCPP STAGE-I(400 MW)
LETTER NO.J.13011/18/87-IA. DT. JANUARY 4,1995.

SL. NO.	STIPULATIONS	STATUS as on 30.09.2016
2.	It may also be pointed out that in case it is required to construct a jetty for unloading of the fuel which is said to be imported, NTPC shall examine the various environmental issues associated with it and shall submit an EIA Report for consideration of this Ministry before undertaking any activity in this direction.	No jetty has been constructed at site for unloading at site for unloading the fuel. Therefore, this has not been taken up with MOEF.

STATUS OF IMPLMENTATION OF CONDITIONS STIPULATED IN AMENDMENT TO ENVIRONMENTAL CLEARANCE
NAME OF THE PROJECT: KAYAMKULAM CCPP STAGE-I (2X210 MW)
LETTER NO.J.13011/18/87-IA.II(I) DT. SEPTEMBER 16, 1998.

SL. NO.	STIPULATIONS	Status as on 30.09.2016
2.(ii)	A single stack having bi-flue of height not less than 70 m should be provided for both the units with continuous monitoring system.	This condition has been amended by MOEF vide letter dt. 2.11.98
	Conditions no. (iii) and (vii) may be treated as deleted.	
viii)	Acquisition of area for power plant should be reduced to an extent of about 350 acres which was earlier earmarked for ash disposal.	A total of 317 acres of land has been developed for this project. The details of the land are as follows: plant area : 141 acres township : 109 acres makeup water : 023 acres approach roads : 019 acres naphtha & pipeline : 025 acres Total 317 acres.
x)	The words "ash disposal" should be deleted.	No comment.
xii)	Latest status of afforestation programme should be submitted within 2 months.	NTPC vide letter dated 25.01.1999 submitted the status of afforestation programme. More than 100,000 saplings have been planted till September 2016. Additional plantation will be done during subsequent years.
xiv)	Details regarding waste water treatment and re-use along with the quantity and quality of water discharge outside plant premises should be submitted within 2 months.	NTPC vide letter dated 25.01.1999 has submitted a Write-up on Waste Water treatment facility for the KyCCPP plant. The Waste Water treatment facilities include following: Clarified sludge treatment facility has been provided with dewatering equipment like thickners, centrifuges etc. and decanted water is recycled back to the clarifier. Gravity filter back wash waste is also recycled back to the clarifier. Liquid effluents are treated to confirm KSPCB standards before discharge. Sanitary effluents after treatment will be used for afforestation to the extent possible except during monsoon.
3.	Following additional conditions are stipulated due to use of Naphtha.	
i)	Naphtha should be used at the rate of 0.45 MMTA with sulphur contents not exceeding 0.15%.	Naphtha requirement at 68.5% PLF is 0.45 MMTA. However, naphtha requirement at 80% PLF would be 0.53 MMTA with sulphur content not exceeding 0.15%.

ii)	The NOx emissions would not exceed 75 ppm.	This Condition has been amended vide MOEF letter dated 02.11.1998 and NOx emission has been raised to 100 ppm
iii)	A disaster management plan should be prepared and the heat radiation contours should remain within the plant premises.	A Disaster Management Plan is in line. Risk analysis indicates the heat radiation contours are well within the plant premises.
ix)	Necessary permission should be obtained from the Chief Controller of Explosives and Factor Inspectorate, Nagpur for storage of Naphtha.	Necessary permission has been obtained from MOEF
4.	All other conditions stipulated in O.M. of even number dated April 16, 1992 remain unchanged.	Other conditions are being complied.

STATUS OF IMPLMENTATION OF CONDITIONS STIPULATED IN AMENDMENT TO ENVIRONMENTAL CLEARANCE
NAME OF THE PROJECT: KAYAMKULAM CCPP STAGE-I(2X210 MW)
LETTER NO.J.13011/18/87-IA.II(I) DT. November, 2nd 1998.

SL. NO.	STIPULATIONS	Status as on 30.09.2016
2.(ii)	Two main stacks and two by-pass stacks of height not less than 70 meters should be provided with continuous monitoring system.	The main stacks and bypass stacks are of 70 meters height. The continuous monitoring instruments have been provided in the main stack only.
3.(ii)	The NOx emissions would not exceed 100 ppm.	The NOx emission limit is designed for 100 ppm.
3.	All other conditions stipulated in O.M. of even number dated April 16, 1992 and September 16, 1998 remain unchanged.	Other conditions are being complied.

STATUS OF IMPLMENTATION OF CONDITIONS STIPULATED IN ENVIRONMENTAL CLEARANCE
NAME OF THE PROJECT: KAYAMKULAM CCPP STAGE-I(350 MW)
LETTER NO.J.13011/18/87-IA.II(I) DT. MAY 23, 2001.

SL. NO.	STIPULATIONS	Status as on 30.09.2016
2.	Keeping in view the present status of the project and operation of the plant in combined cycle mode, following amendments are made in our earlier communication of even number dated 2nd November, 1988. - The capacity of the plant may be treated as 350 MW (Stage-I) instead of 2x210 MW.	The capacity of the project is 350 MW only. Continuous monitoring facilities have been provided for the main stacks.

	- Continuous monitoring facilities should be provided in the main stacks only instead of two main stacks and two by-pass stacks indicated earlier at condition No. 2(ii).	
3.	All other conditions stipulated earlier remain unchanged.	Other conditions are being complied.

HALF YEARLY MONITORING DATA

AMBIENT AIR QUALITY MONITORING REPORT

Sampling & Testing done by: M/s. Envirodesign Eco Lab, Kochi *(KSPCB Approved Laboratory.)*

	PLANT					SOUTH BLOCK					PTS				
Month	**SO_2**	**NO_X**	**PM_{10}**	**$PM_{2.5}$**	**O_3**	**SO_2**	**NO_X**	**PM_{10}**	**$PM_{2.5}$**	**O_3**	**SO_2**	**NO_X**	**PM_{10}**	**$PM_{2.5}$**	**O_3**
	µg/m³					**µg/m³**					**µg/m³**				
Apr-16	12.6	9.2	43.6	15.0	BDL	11.3	8.8	41.5	14.8	BDL	10.5	9.0	40.7	13.5	BDL
May-16	10.9	8.5	41.5	15.2	BDL	11.0	9.9	43.2	16.4	BDL	11.4	9.5	39.6	14.3	BDL
Jun-16	9.8	8.7	36.1	13.2	BDL	10.1	9.3	32.5	12.6	BDL	9.5	8.6	34.7	14.1	BDL
Jul-16	8.8	7.2	30.5	12.7	BDL	9.2	8.1	33.6	11.8	BDL	9.0	8.3	31.6	12.5	BDL
Aug-16	9.3	7.5	34.1	11.6	BDL	8.5	7.3	31.5	10.2	BDL	8.7	8.0	37.4	13.2	BDL
Sept-16	8.4	7.1	38.2	15.2	BDL	9.0	6.8	34.4	13.6	BDL	7.8	7.0	30.3	11.4	BDL

DETAILS OF ETP EFFLUENT ANALYSIS

Sampling & Testing done by: M/s. Envirodesign Eco Lab, Kochi. *(KSPCB Approved Laboratory.)*

Date	pH	TSS mg/lt	Res chlorine mg/lt	Phosphate mg/lt	Oil & Grease mg/lt	Amm Nitrogen mg/lt	Nitrate Nitrogen mg/lt	Temp Diff deg C
Limit	**6.5 to 8.5**	**100.0**	**0.5**	**0.2**	**10.0**	**50.0**	**10.0**	**5.0**
21-04-16	7.40	22.00	BDL	BDL	BDL	BDL	0.70	0.10
18-05-16	7.33	23.00	BDL	BDL	BDL	BDL	0.58	0.10
20-06-16	7.29	20.00	BDL	BDL	BDL	BDL	0.60	0.10
22-07-16	7.31	18.00	BDL	BDL	BDL	BDL	0.53	0.10
17-08-16	7.12	20.00	BDL	BDL	BDL	0.30	0.10	0.20
12-09-16	7.20	24.00	BDL	BDL	BDL	0.70	0.12	0.10

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