ODISHA POWER GENERATION CORPORATION LTD.
(A Joint Venture of Govt. of Odisha & AES Corp. USA)

Ib Thermal Power Station
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OPGC
Power for Progress

No. ITPS 8649 /we/
Date-30.11.13

The Director (S)
Ministry of Environment & Forests,
Govt.of India,
Eastern Regional Office,
A/3, Chandrasekharpur,
Bhubaneswar-751023.

Sub: Environmental Status Report of ITPS (2 x 210 MW), Banharpali, Dist: Jharsuguda for the period April'13–September'13.

Ref: Environmental Clearance No. 14/13/83-EM-2, Dt. 27 Sept.1984.

Sir,

Enclosed please find herewith the Environmental Status report of IB Thermal Power Station (2x210 MW), Banharpali, Dist: Jharsuguda for the period from April'13–September'13. The soft copy of the report in PDF has been sent through e- mail to mef@ori.nic.in.

Enclosure:

i) Annex -I- Compliance status of Environmental Conditions
ii) Annex -II- CREP Compliance Status.
iii) Annex-III- Ash Utilization report
iv) Annex-IV- Maximum and Minimum of monitoring reports.

Thanking you with regards,

Yours faithfully,

Plant Manager

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OHSAS 18001 BUREAU VERITAS Certification
ISO 14001 BUREAU VERITAS Certification

ANNEXURE-I

ODISHA POWER GENERATION CORPORATION LTD

IB THERMAL POWER STATION (2X210MW)

COMPLIANCE STATUS OF THE ENVIRONMENTAL CONDITIONS

Period – April 2013 – September 2013

Sl. No.	Environmental Conditions	Compliance Status
1.	**AIR POLLUTION**	
a	A common stack height of not less than 200 mtr should be provided for two units of 210 MW. Similarly, for other two units a common chimney of 200-mtr height should be provided. This would help for better dispersion of pollutants.	▪ A bi flue common Stack of height 220 meters has been provided for U#1&2. U#3&4 are yet to come for which a separate stack with requisite stack height has been stipulated by MoEF and is planned accordingly.
b	ESP of having operational efficiency of more than 99.5% should be provided.	▪ ESP of operational efficiency 99.82 %(design value) has been provided for existing Units. The efficiency has been ensured > 99.5%. ▪ ESP internals have been repaired during annual overhauling every year. Routine maintenance practice has been followed for ensuring healthiness of ESP for all time. The following actions have been taken to prevent decrease in efficiency of ESP due to feeding of high ash coal. ▪ Replacement of existing controllers with most advanced controllers (Epic-III of Alstom) in ESPs of Unit-1&2 for further improvement of operational efficiency of ESPs and reduction of SPM emission. ▪ With the objective of achieving particulate emission 50mg/Nm3, so far Unit No 1 collecting & emitting electrodes of the first two ESP fields with associated system have been replaced. Internals of rest of the existing ESP fields as required has already been replaced. Entire duct portion to ESP inlet (from Air pre-heater) & ESP outlet (to chimney) has been changed & modified to connect with the parallel ESP fields. Civil foundation work for the parallel field addition is completed. The entire work will be completed by February 2014. The same work for Unit- II will be completed by end of 2014.

c	Stack and ambient air monitoring should be taken up after the commissioning of the units and the data recorded.	▪ Stack monitoring has been taken up through online continuous emission monitoring system for parameters SPM, SO2, NOx & CO for trend monitoring and taking corrective action so as to keep parameters within prescribed limit. Offline test is being conducted through grab sampling by calibrated portable Stack monitoring kit & Flue gas analyzer on weekly basis. These results are being recorded and reported. ▪ Six permanent ambient air-monitoring stations are installed by OPGC in & around ITPS out of which 03 no stations are placed in Industrial zone & 03 no in Residential zone. Ambient air monitoring has been done regularly for parameters SPM, RPM, SO2, NOx & Noise. ▪ One online ambient air monitoring station has been installed inside plant to monitor $PM_{2.5}$, PM_{10}, SO_2 & NOx. The station is operating now. Another station has been installed in ITPS Colony in June'13. Real time data transmission to the OSPCB server from one ambient air quality monitoring station has been initiated. Rest monitoring station alongwith CEMS will be connected very soon as per the direction of the pollution control board.
		▪ Monitoring reports are being sent to SPCB, CEA every month. Half yearly reports are being sent regularly to MoE&F, Govt. of India, Eastern Regional Office. Maximum, Minimum and Average Emission Data for the period April 2013 to September 2013 is enclosed as **Annexure-IV**
2.	**WATER POLLUTION.**	
a	Liquid effluents emanating from the different plants such as DM plant, Boiler blow down, Ash pond/ dyke, sewage etc. should be properly treated as per the standards stipulated by the State Pollution Control Board.	The plant has been reusing its liquid effluents in its different process after necessary treatment since 28.06.2008. This is in compliance to SPCB's consent condition to reuse all liquid effluents. The details of reuse processes are- ▪ Domestic sewage of Plant has been discharged to soak pits after treatment in septic tanks. Domestic sewage of Colony and Hospital has been treated in STP and treated effluent is being reused for watering the Green Belt and Park at ITPS. ▪ From ash pond no effluent is discharged except seepage. Treated ash water is re-cycled 100% for reuse as make up water in wet ash handling system after necessary treatment. ▪ CW blow down effluent is being reused as makeup water in wet ash handling system. ▪ Boiler and Turbine effluents are being reused as ash handling

		make up after necessary treatment. ▪ D.M Plant regeneration effluent is being reused as Cooling System make up. The system made for gravity sand filter back wash effluent recycling & reuse is not found effective. CT drift water has not also been taken for recycle and reuse. Action plan has been made to recycle back this waste by June 14. The quantity of this water is of very nominal quantity. In abnormal or emergency situation if any liquid effluent discharge situation arises, the industry will ensure the effluents are treated properly (neutralization, settling, equalization, natural cooling and oil removal) and prescribed standard is met before discharged.
b	Hot water coming from the condenser should be properly cooled so as to ensure to keep the temperature of the receiving surface water as per the standard stipulated by the state Board.	▪ Hot water coming from the condenser is being cooled through cooling towers & reused for condenser cooling in close loop. Cooling Water blow down is being reused as make up water in ash slurry discharge system.
3	**SOLID WASTE MANAGEMENT.**	
a	Fly ash and bottom ash should be collected in the ash dykes/ponds. The supernatant water coming out of the ash dyke should meet the standards as prescribed by the State Pollution Control Board.	▪ Part of fly ash is collected from Storage Silo in dry form for ash utilization in manufacturing of cement, ash bricks/blocks and in land reclamation inside plant. Balance quantity of fly ash is collected regularly in Ash pond by wet disposal method. As an environmental friendly ash disposal means, OPGC adopted ash disposal in the form of ash mound making and land scaping. Wet ash from operating Ash Pond A stored through wet disposal means has been transferred to Ash Pond B for dry ash mound making. The ash mounds are capped with soil and grass turfed on entire ash surface after compaction. About 07 lakh MT pond ash has been used so far for mound making on Ash Pond B. This mound formation activity will continue for another 10 lakh MT ash in coming two years period. Required stability & safety study has been carried out by IIT, Madras. ▪ From ash pond no effluent is discharged out side except the seepage water. Treated ash water is being re-cycled 100% for reuse as make up water in wet ash handling system.
b	Green belt should be provided on the ash disposal areas filled by fly ash to check the dispersion of fly ash in the environment.	▪ Grass & weeds growing naturally on the ash disposal area & on the bund has been allowed to survive to prevent ash dispersion & to provide additional strength to the bund. ▪ Dust suppression is being done by water spraying, soil capping & flooding the ash pond by discharging ash water at multiple discharge points by garland discharge method to prevent ash dispersion. HDPE pipe has been laid from the ash water recycling pump house to the ash pond for water sprinkling

		purpose to avoid ash blowing. ▪ Planting tree on the slope of the dyke or on the top of the bund is not now technically acceptable. The same recommendation has also been mentioned in SPCB Consent order.
c	Trees plantation work should be taken up all around the Thermal Power Plant. The species to be planted may be decided in consultation with the Forest Department.	▪ Adequate number of trees of different species has been planted at ITPS. Approximately 43% of the plant area is covered with Green belt and high density trees. Plantation activity is also being taken up every year.

Plant Manager, ITPS

ANNEXURE-II

ODISHA POWER GENERATION CORPORATION LTD
IB THERMAL POWER STATION (2X210MW)
COMPLIANCE STATUS OF CREP GUIDELINES
Period April 2013 – September 2013

Sl. No	CREP Guidelines	Compliance Status/ Steps initiated
1	Implementation of Environmental standards (emission & effluent) in non-compliant power plants	Not applicable being compliant plant.
2	For existing thermal power plants, a feasibility study shall be carried out by CEA to examine possibility to reduce the particulate matter emissions to 100mg/Nm3.	No such guideline has been made for existing units. But initiative has been taken & significant amount of work has already been executed for ESP up gradation to further lower the PM emission.
3	New /expansion power projects to be accorded environmental clearance on or after 1.4.2003 shall meet the limit of 100 mg/Nm3 for particulate matter	Not applicable to existing Units. The condition incorporated in the proposed 2X660 MW expansion units. The specification finalized for the norm of 50mg/Nm^3.
4	Development of SO2 and NOx emission standards for coal based plants by Dec.2003	Not in the purview of the generating company.
	- New/expansion power projects shall meet the limit w.e.f 1.1.2005	Not applicable.
	- Existing power plants shall meet the limit w.e.f. 1.1.2006	To meet the guideline ESP retrofitting work has been taken up in time bound manner.
5	Install/activate opacity meters/continuous monitoring systems in all the units by December 31, 2004 with proper calibration system	Continuous emission monitoring system has been installed since June, 2005. Calibration is done by comparing offline test results tested through calibrated Stack Monitoring Kit.
6	Development of guidelines/standards for mercury and other toxic heavy metal emissions by December 2003	Compliance by other agency/ authority.
7	Review of stack height requirement and guidelines for power plants based on micro meteorological data by June 2003	Compliance by other agency/ authority.
8	Implementation of use of beneficiated coal as per GOI Notification	Not applicable to ITPS (pit head plant)
9	Power plants will indicate their requirement of abandoned coal mines for ash disposal & Coal India/MOC shall provide the list of abandoned mines by June 2003 to CEA	On continuous pursuance from OPGC and with the support of MoEF, Regional Office, Mahanadi Coal Fields Ltd(MCL) had given clearance in the month of May 2007 for back filling of OPGC ash in Lilari OCM void from July 2009. Based on that permission, OPGC had taken immediate step for EIA and feasibility study engaging CIMFR, Dhanbad. But in the month of February 2008, the permission was withdrawn unilaterally by MCL on the ground that the anticipated life of Lilari Mine is extended for ten more years. Since then, OPGC

		is perusing time and again to MCL to provide any other Mine void near OPGC site. In a high level meeting with MCL on 9th February 2011, MCL has agreed to give in principle clearance to OPGC for back filling in Belpahar OCM. The clearance is awaited from MCL, but till date there is no further progress. OPGC seeks support from MoE&F in this regard.
10	Power Plant will provide dry ash to the users out side the premises on uninterrupted access to the users within 06 months.	Complied. OPGC has made 1200 MT/Day dry ash collection facility which is about 40% of its total ash generation quantity.
11	Power Plant should provide dry fly ash free of cost to the users.	Complied.
12	State P.W.Ds/ Construction and Development agency shall also adhere to the specification/ schedules of C.P.W.D. for ash/ ash based products utilization.	Compliance by other agency/ authority.
13	(i) New plant to be accorded Environmental clearance on or after 1.4.2003 shall adopt dry fly ash extraction or dry disposal system or medium (35 to 40%) ash concentration slurry disposal system or Lean phase with 100% ash water re-circulation system depending up on site specific environmental situation.	Condition will be complied for new plant (OPGC 3 & 4).
	(ii) Existing plant shall adopt any of the systems mentioned in 13(i) by December 2004.	Complied. 40% dry ash collection facility has been provided. 100% ash water is being re circulated for reuse in ash handling.
14	Fly ash Mission shall prepare guide lines/ manuals for fly ash utilization by March 2004.	Compliance by other agency/ authority.
15	New plant shall promote adoption of clean coal and clean power generation technologies	Condition has been considered for new plant.

Plant Manager, ITPS

ANEXURE-III

ODISHA POWER GENERATION CORPORATION LTD
IB THERMAL POWER STATION (2x210MW)

ASH GENERATION & UTILIZATION STATUS AT ITPS Period: April 2013 – September 2013							
Ash Generation in M.T	ASH UTILIZATION in M.T						
	OPGC (ITPS) (Ash bricks, blocks, land reclamation)	Cenosphere	Outside Ash Brick Plants	Agriculture	Cement	Ash Dyke raising	Total Utilizati
475389	20150	0	0	0	0	0	20150
% Utilization- 4.24							

Reasons for variation from the target/ Challenges:-

1. No demand of ash off take from Cement Plant. Only one Cement Plant (Ultratech Cement Ltd) has been producing Fly ash Pozzlana Cement in the region. The industry off takes ash from its own group industry M/S Hindalco Power Ltd, Hirakud and partially from nearest industries Sterlite Industries & Bhusan Steel & Power Ltd. OPGC being located at about 50 km away from that Cement Industry is not the preferred site of off take for them.
2. Low demand for ash bricks/ blocks and other ash-based products due to poor acceptance in the area and availability of low strength and low cost clay bricks near the construction sites around ITPS. More over the plant is located at remote place and infrastructure development is taking place at a distance of more than 40 K.M from the plant. Other ash source is available close to the construction sites.
3. Mines Void allotment to OPGC could not happen in spite of strong follow up actions. Please refer point no. 9 of the CREP guideline compliance status.
4. People in the locality are not interested to develop their low lands with filling of ash

Actions to overcome the challenges-

Due to its location disadvantage, ash utilization opportunities are very limited with OPGC. Achieving ash utilization target has become a great challenge before OPGC.

OPGC being a pithead Power Plant, back filling of ash in nearby abandoned open cast mine void is the only major and viable option to achieve the target as lay down by MoEF. OPGC has been putting its best effort to get allotment of mine void from MCL. In this regard, OPGC has been pursuing MCL authority at highest level in getting the allotment at an early date. It has not yet materialized. Once the mine void will be made available to OPGC, ash utilization target as stipulated by MoEF can be achieved within shortest possible time on sustainable basis.

Other initiatives being taken up are:-

Ash brick awareness campaign through street play on Ash Utilization in the field of gainful use of ash brick and land reclamation with ash was organized by OPGC through local artists. Community people's awareness has been observed improving.

OPGC is in touch with FAU, Govt of India, C FARM, various statutory agencies and government bodies for getting updates on new initiatives & developments in the fields of ash utilization

OPGC is in contact with NH Authority for 0.4 million tonne pond ash use in fly over construction at Belpahar and in development of NH-200 road from Belpahar to Kanaktura.

Plant Manager, ITPS

ODISHA POWER GENERATION CORPORATION LTD

IB THERMAL POWER STATION

ENVIRONMENTAL MONITORING REPORTS

Period- April 2013 to September 2013

STACK EMISSION

PARAMETER	NORM	STACK 1			NORM	STACK 2		
		MAX.	MIN.	AVE.		MAX.	MIN.	AVE.
SPM (mg/Nm^3)	100	145	120	132	100	140	122	134
SOx (PPM)	NA	541	506	524	NA	532	510	518
NOX (PPM)	NA	212	165	188	NA	190	163	175

AMBIENT AIR QUALITY

PARAMETER	NORM	MAX.	MIN.	AVE.
PM_{10} (ug/m^3)	**100**	88	67	78
$PM_{2.5}$ (ug/m^3)	**60**	42	26	22
SO2 (ug/m^3)	**80**	15	8	12
NO2 (ug/m^3)	**80**	28	19	24

AMBIENT NOISE

Location	Noise in dB(A)	Noise in dB(A)
STANDARD	**75**	**70**
INDUSTRIAL	**Day Time**	**Night**
Min	56	52
Max	72	65
Avg	65	58
RESIDENTIAL	**Day Time**	**Night**
STANDARD	**55**	**45**
Min	42	38
Max	53	42
Avg	45	40

LIQUID EFFLUENT QUALITY

	UNIT	STANDARD	RESULT	
Date			MAX.	MIN.
Temp (In)	^{0}C	T(O) - T(I) = <5 0C	26.6	23.2
Temp (Out)			29.4	26.6
pH at 25 oC	NA	5.5-9.0	7.62	7.05
Chloride as Cl	PPM	1000max	60.8	26
D. Phos as P	PPM	5.0 max	0.44	0.3
O & G	PPM	10.0 max	0.96	0.58
TSS	PPM	100 max	23.2	14.6
TDS	PPM	2100 max	364	228
Res Chlorine	PPM	1.0 max	nil	nil
BOD	PPM	30 max	6	4
COD	PPM	250 max	42	35.6

Note: *As per Environmental Clearance condition vide letter dt. 27.09.1984, the stack emission norm was stipulated as 150 mg/ Nm^3. Last year OSPCB, during renewal of consent stipulated the emission norm as 100 mg/ Nm^3. The same was also recommended by your good office vide letter no. 101-51/EPE dt. 08.09.2011. After enforcement of CEPI norm action plan had been submitted before Board to retrofit our Unit 1 & 2 ESPs by the end of year 2013 & 2014 respectively for further emission reduction to 50mg/Nm3. Accordingly, work has been started. Unit 1 ESP parallel field addition work is under progress which is will be completed before February 2014. Same way, Unit 2 emission reduction will be achieved by December 2014. As our units are quite old and the work already started is voluminous, high budget oriented and*

20/11-13

Head (EHS)