



HALF YEARLY COMPLIANCE REPORT

for the period
October 2017 to March 2018

Environment Clearance of 300 MW Power Plant

Letter no.: SEIAA / 35 dated 15.12.2009



BHUSHAN ENERGY LIMITED

Ganthigadia, Nuahata, Banarpal, Angul, Odisha



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Oct – 2017 to March– 2018

Environment Clearance of 2 x 150 MW power plant
Letter no.: SEIAA / 35 dated 15.12.2009

SL	STIPULATED CONDITIONS	COMPLIANCE STATUS
01	<p>The applicant (project proponent) will take necessary measures for prevention, control and mitigation of Air Pollution, Water Pollution, Noise Pollution and Land Pollution including solid waste management as mentioned in Form-I, final EIA reports and Environment Management Plan (EMP) in compliance with the prescribed statutory norms and standards.</p>	<ul style="list-style-type: none"> • Various control measures have been taken for prevention and mitigation of air pollution, water pollution, noise pollution and solid waste management. The details are as follows: <p>Air Pollution Control:</p> <ul style="list-style-type: none"> • Electro static precipitators (ESPs) are installed in all CFBC boilers. • Pneumatic ash conveying system has been installed followed by 2 numbers of intermediate silos having capacities of 250 ton each and 4 numbers of main silos having capacity of 1000 ton each. • The schematic diagram of pneumatic ash conveying system is enclosed as annexure-I. • 02 numbers of vent filters at intermediate silo and 04 numbers of vent filters at main silo have been provided. • Mechanical road sweeping machines have been deployed to keep roads and shop floor areas neat and clean. • 102 nozzles in dry fog dust suppression system in all 18 junction houses have been installed in entire coal circuit. • Average value of PM₁₀, PM_{2.5}, SO₂ and NO_x are within the prescribed standard. The summarized data for the above is enclosed as annexure-II. <p>Water Pollution Control:</p> <ul style="list-style-type: none"> • Two settling tanks of capacity 138.64 m³ and 128.6 m³ have been provided to allow



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		<p>settlement of suspended solids before taking the waste water to Effluent Treatment Plant (ETP # 1) for treatment and reuse.</p> <ul style="list-style-type: none">• A Sewage Treatment Plant of 3000 KLD capacity has been installed for treating domestic sewage.• The treated water from STP is used for ash conditioning and irrigation of green areas.• The water quality parameters are well within the limit as per the prescribed standard and the summarized data is enclosed as annexure-III. <p>Noise Pollution Control:</p> <ul style="list-style-type: none">• Acoustic enclosures are provided at TG, DG and noise generating points.• Silencers have been provided at all primary air fans, secondary air fans of all the four boilers.• Noise monitoring is carried out regularly at six locations in the work zone. Corrective and preventive actions are taken for high noisy areas.• The work zone noise level varies from 86.0 db (A) to 87.3 db (A). Summary of noise monitoring report is enclosed as annexure-IV.• Sign boards have been provided at high noise areas for awareness.• Ear plugs / muffs have been provided to all employees working in high noise area. It can be noted that employees are not deployed for 8 hrs continuously in high noise area. <p>Solid Waste Management:</p> <ul style="list-style-type: none">• Dry collection and disposal system is adopted for fly ash management.• Two number of fly ash brick manufacturing units are installed in the plant for maximum
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		<p>utilization of fly ash.</p> <ul style="list-style-type: none"> • Fly ash bricks have been utilized in all construction work. • Advertisement issued in local news papers for providing fly ash to individuals, agencies and companies free of cost. • Fly ash is supplied to fly ash brick manufacturing units free of cost for maximum utilization of ash. • Rest of the ash has been disposed at low lying areas, abandoned stone quarries. • A detail report in this regard is enclosed as annexure - V. • All necessary permissions from statutory bodies for laying high concentration slurry disposal system to mine void have been obtained. Work inside the plant area is in progress.
02	<p>The applicant will take necessary steps for socio-economic development of the people of the area Primary Socio Economic Survey of the core area on need based assessment for providing employment, education, health care, drinking water, sanitation, road and communication facilities etc. A detailed report is to be submitted to the proposal to SEIAA on 1st June & 1st December of each calendar year.</p>	<ul style="list-style-type: none"> • The peripheral development is being carried out based on socio-economic survey of the core area on need based assessment. We have provided the facilities of sanitation, drinking water, education, health care, road and communication facilities etc to the surrounding villages. Till now, an amount of Rs. 68.65 crore has been spent on the above activities. • The details are enclosed as annexure- VI.
03	<p>The applicant will comply with the points concerned and issues raised by the people during public hearing on 4th February, 2009 in accordance with the commitments made.</p>	<ul style="list-style-type: none"> • Issues raised during public hearing were mainly related to drinking water, waste water management, employment and peripheral development which have been complied. • The detailed compliance report is enclosed as annexure- VII
04	<p>The applicant will take statutory clearance / approval / permissions from the concerned authorities in respect of the project as and when required.</p>	<ul style="list-style-type: none"> • All the statutory approvals like environment clearance, consent to establish, consent to operate and authorization for hazardous waste management have been obtained and are being renewed well in time.
05	<p>For post environmental clearance monitoring, the applicant will submit half</p>	<ul style="list-style-type: none"> • Half yearly environmental compliance report is being submitted to SEIAA,



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	yearly compliance report in respect of the stipulated terms and conditions of this Environmental Clearance to the State Environmental Impact Assessment Authority (SEIAA), Orissa on 1 st June and 1 st December of each calendar year.	MOEF&CC, CPCB and SPCB, Odisha at stipulated intervals. The last half yearly compliance report was submitted vide letter no. BEL/SEIAA/BE-01/2017-03 dated 18.11.2017.
06	High efficiency Electrostatic Precipitators (ESP's) shall be installed to ensure that particulate emission does not exceed 50 mg / Nm ³ .	<ul style="list-style-type: none"> • Four Electro Static Precipitators (ESP's) with 99.97 % efficiency have been installed to meet the emission level below 50 mg / nm³. • The details of ESPs are enclosed as annexure-VIII. • The summarized data of stack monitoring is enclosed as annexure-IX.
07	The proponent shall treat the flue gas through Flue Gas De-sulphurization (FGD), if SO ₂ emission levels exceed the prescribed norm.	<ul style="list-style-type: none"> • Indian coal having sulphur content less than 0.5% is used. Stack height designed as per specified formula for good dispersion. • Necessary provision will be made to comply with the recent notification..
08	Adequate dust extraction system such as cyclones / bag filters and water spray system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided.	<ul style="list-style-type: none"> • Dust extraction systems (6 bag filters) have been provided at the ash silos. • Effective dry fog system having 167 nos. of nozzles in 26 junction house has been installed in the coal route of BEL.
09	Fly ash shall be collected in dry form and storage facility (silos) shall be provided. 100% fly ash utilization shall be ensured as per fly ash notification of MoEF, Govt. of India. Unutilized fly ash and bottom ash shall be stored in the ash pond separately through high concentration slurry disposal method. Mercury levels along with other heavy metals (Pb, Cr, As etc.) should be monitored in the fly ash bottom ash, leachate and effluents emanating from the ash pond.	<ul style="list-style-type: none"> • Ash is being collected and disposed off in dry form. • Four silos of 1000 MT capacity each and two intermediate silos of 250 MT capacity each have been installed. • 100 % fly ash utilization is ensured as per fly ash notification of MoEF, Govt. of India. • The details of fly ash management are attached as annexure-V. • Leachate characteristics of fly ash and bottom ash have been carried out at IMMT; Bhubaneswar which shows leachate characteristics is well within the USEPA standards. The Leachate characteristics report is attached as annexure- X.
10	The ash pond should be constructed with impervious lining and ash pond embankment should be stone pitched.	<ul style="list-style-type: none"> • Not applicable as ash is being collected and disposed in dry form.

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11	<p>The treated effluents conforming to the prescribed standards shall be re-circulated and reused within the plant. There shall be no discharge outside the plant boundary. Arrangements shall be made so that effluents and storm water do not get mixed.</p>	<ul style="list-style-type: none"> • Waste water is treated in 350 m³/hr capacity Effluent Treatment Plant supported by two settling tanks having individual holding volume of 138.64 m³, and 128.60 m³, respectively. • The treated effluents, conforming to the prescribed standards, are recycled and reused for cooling tower make up, coal washery, dust suppression, ash handling and green area irrigation. • Summarized analysis report is enclosed as annexure-III. • The detailed break-up of reuse of treated water are given as annexure XI. • Three water lagoons of approximate holding volume of 80,000 m³ have been constructed to treat, store and reuse surface run off during excess rain. • Zero discharge of effluent is maintained.
12	<p>A sewage treatment plant shall be provided and the treated sewage shall be used for raising greenbelt / plantation</p>	<ul style="list-style-type: none"> • A Sewage treatment plant of capacity 3000 KLD has been provided for treating domestic sewage and treated water is being reused for green area irrigation and ash conditioning. • Details of STP are enclosed as annexure-XII. • STP in township is of 1000 KLD capacity, which is common for Bhushan Steel Limited and Bhushan Energy Limited, has been established to treat and reuse domestic waste water.
13	<p>Rainwater harvesting should be adopted. Central Groundwater Authority Board shall be consulted for finalization of appropriate rainwater harvesting technology within a period of three months from the date of clearance and details shall be furnished to the SEIAA, Orissa.</p>	<ul style="list-style-type: none"> • To estimate the rain water harvesting potential, a detail study has been completed covering entire plant area and township. • The findings of the study are being evaluated and same will be implemented in phase manner.
14	<p>Adequate safety measures shall be provided in the plant area to check/minimize spontaneous fires in coal yard, especially during summer season. Details of these measures to be taken</p>	<ul style="list-style-type: none"> • 19 numbers of fire hydrants have been provided in the coal yard - 1 and 2 and coal sheds to check / minimize spontaneous fire.

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	along with location plant layout shall be submitted to the SEIAA, Orissa.	<ul style="list-style-type: none"> • 26 numbers of gun sprinklers have also been installed in the yards to keep the surface moist. • The coal piles are leveled by scraping and compacted by rolling. • In coal silos / bins, First in First out (FIFO) principle is applied to avoid spontaneous burning. • Fire tenders will be put into service in case of emergency.
15	Storage facilities for auxiliary liquid fuel such as LDO and/HFO shall be made in the plant area where risk is minimum. On site and off site Disaster Management Plans shall be prepared to meet any eventuality in case of an accident taking place. Mock drills shall be conducted regularly and based on the same, modifications required, if any shall be incorporated in the Disaster Management Plan (DMP). Sulphur content in the liquid fuel will not exceed 0.5%.	<ul style="list-style-type: none"> • LDO is stored in the plant area where the risk is minimum. There is a dyke around the storage tanks to contain LDO in case of any leakage. Detail is enclosed as annexure-XIII. • On- site emergency plan has been prepared to meet any eventuality in case of an accident taking place. • Regular mock drills are being conducted to respond to emergency situations. Last emergency mock drill was conducted on 05.03.2018 and details are attached as annexure - XIV. • As per specification of the supplier, the sulfur content in the fuel varies from 0.25 to 0.5 % by mass. Annexure - XV
16	Regular monitoring of ground water in and around the ash pond area shall be carried out, records maintained and half yearly reports shall be furnished to the SEIAA, Orissa.	<ul style="list-style-type: none"> • Monthly monitoring of ground water in the peripheral villages is being carried out. • The summarized data is enclosed as annexure-XVI.
17	A green belt of adequate width and density preferably with local species along the periphery of the plant & alongside roads etc shall be raised so as to provide protection against particulates and noise. It must be ensured that at least 33 % of the total land area shall be under permanent green cover. The project proponent shall ensure proper maintenance of green belt throughout the year & for this purpose they may engage professionals in this field for creation and	<ul style="list-style-type: none"> • About 3.70 lakh saplings have been planted in and around steel plant complex (including Bhushan Steel Limited and Bhushan Energy Limited) covering about 26.33 % of the total land area. We plan to cover 33% plant area under green cover by 2018-19. • Some photographs of plantation areas are attached as annexure-XVII. • Proper maintenance of the all green areas is being done throughout the year for better growth and survival of plants.

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	<p>maintenance of the green belt. An action plan for this purpose shall be prepared accordingly and submitted to the SEIAA, Orissa.</p>	
18	<p>First aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.</p>	<ul style="list-style-type: none"> • Adequate first aid and sanitation arrangements were made during construction phase of the plant and similar facilities are being maintained during operational phase also for employees and workers.
19	<p>Noise levels emanating from turbines and air compressors shall be limited to 75 dB (A). For people working in the high noise area, requisite personal protective equipments like ear plugs/ear muffs etc. shall be provided. Workers engaged in noisy areas such as turbine area, air compressors etc shall be periodically examined to maintain audiometric record and for treatment for any hearing loss including shifting to non - noisy / less noisy areas.</p>	<ul style="list-style-type: none"> • Acoustic enclosures have been provided for turbines and air compressors to meet the work zone noise standards. • Silencers have been provided at primary air fans and secondary air fans of all four boilers. • Necessary PPEs are being provided to all the workers working in noisy areas and periodic examination is being conducted for the workers engaged in noisy areas. • Noise monitoring is carried out regularly at six locations in the work zone areas. • The summery of noise monitoring report is enclosed as annexure-III
20	<p>Regular monitoring of ground level concentration of SO₂, NO_x, SPM, RSPM and mercury shall be carried out in the impact zone and records to be maintained. If at any stage these levels are found to exceed the prescribed limits, necessary control measures shall be taken immediately. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB, Orissa.</p>	<ul style="list-style-type: none"> • Five ambient air quality monitoring stations have been set up in nearby villages, in consultation with SPCB, Odisha, for measuring the monthly ground level concentrations of PM₁₀, SO₂ and NO_x. • Analysis report is enclosed as annexure-XVIII.
21	<p>Provision shall be made for housing of construction laborers within the site 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</p>	<ul style="list-style-type: none"> • Adequate arrangements for housing of construction workers were made during construction phase of the plant and same facilities are being maintained during operational phase also for employees and workers

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	project.	
22	A separate environment management cell with qualified staff shall be set up for implementation of the stipulated environmental safeguards. A report is to be submitted to SEIAA, Orissa.	<ul style="list-style-type: none"> Environment management department has been established for implementation of stipulated environmental safeguards and control of pollution. Details of department structure, monitoring and analysis facilities are enclosed as annexure – XIX.
23	Half yearly report of the status of implementation of the stipulated conditions and environmental safeguards shall be submitted to the appropriate authorities.	<ul style="list-style-type: none"> Half yearly environmental compliance report is being submitted to SEIAA, MOEF&CC, CPCB and SPCB, Odisha.
24	Separate funds shall be allocated for implementation of pollution control measures along with item-wise break-up. These cost shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year-wise expenditure should be reported.	<ul style="list-style-type: none"> The funds earmarked for pollution control measures are not diverted for any other activity. Total expenditure on pollution control measures was Rs. 21.097 crore during 2016-17 financial year
25	The above mentioned stipulated conditions shall be complied in time bound manner. Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of environment protection (EP) Act, 1986.	<ul style="list-style-type: none"> Compliance to the stipulated conditions is being ensured in time bound manner through continual improvement.