

## **COMPLIANCE TO EC CONDITIONS**

### **MINISTRY OF ENVIRONMENT & FORESTS ENVIRONMENTAL CLEARANCE FOR EXPANSION OF SMELTER PLANT FROM 100 KTPA TO 360 KTPA AND CAPTIVE POWER PLANT FROM 267.5 MW TO 967.5 MW AT HIRAKUD BY M/s HINDALCO INDUSTRIES LIMITED: COMPLIANCE UPTO 31<sup>ST</sup> MARCH 2012**

**J 11011/400/2006-IA II (I), dated: 6 February 2008 & Amendment Letter: J 11011/144/2006-IA II (I), dated 19 October 2009.**

<b>Sl. No</b>	<b>CONDITIONS</b>	<b>STATUS AS ON March, 2012</b>
2	<p>The Ministry of Environment and forests has examined the proposal. It is noted that the proposal is for expansion of smelting capacity of Aluminium metal from the existing 1,00,000 MTA (including 35,000 TPA capacity under trial) to 3,60,000 TPA and Captive Power Plant capacity from 267.5 MW (including 100 MW under trial) to 967.5 MW at the Smelter Plant at Hirakud, Sambalpur, Orissa. The project cost is Rs.5195 Crores, out of which Rs.369 Crores has been earmarked for pollution control measures. This expansion will be undertaken in two phases. In Phase I, 46,000 MTA capacity will be added and in Phase II, the addition shall be of 2,14,000 MTA. Presently, HIL has 468 pots of Soderberge Technology and 164 of Pre-baked Anode Technology (632 pots of 1,00,000 MTA). During Phase-I, the capacity shall be increased to 1,46,000 MTA by changing all (468) Soderberg pots to Pre-Baked ones. Additional 14 pots will be shifted from Belgaum unit and shall also be converted into Pre-Baked. This will result in total of 646 pots of Pre-Baked technology having a capacity of 1,46,000 MTA. During phase II, 232 new Pre-Baked pots with 2,14,000 TPA capacity will be added. The unit has Captive Power Plant of 267.5 MW. 100 MW will be added in phase-I and 600 MW in phase-II, thereby making the final capacity as 967.5 MW. The power plant will be based on CFBC/PFC Boiler. Coal for CPP shall be procured from coal fields 20 km away and transported in covered Volvo trucks which will be later shifted to railway. Most of the other materials will also be transported by railways.</p>	:
3	<p>The Phase-I units will be accommodated</p>	: Will be complied.

within the existing 163.95 ha of land. For Phase-II units, additional 91 ha of land will be acquired. No R&R is involved in the project and no forest land is involved in the project. The site is about 8.5 km away from Sambalpur town. Hirakud reservoir on Mahanadi river is located 1.2 km away from the plant. Small size reserve forests (Laxmi dungri, Ram dungri and Jamraha) are located within 10 km radius of the plant. No ecologically sensitive zone exists within 10 km periphery of the project. The proposed Sambalpur Elephant Reserve falls outside 10 km radius of the plant site and the site does not fall in the elephant movement corridor.

Both Smelter (from 1,00,000 TPA to 1,46,000 TPA) and Power Plant (from 267.5 MW to 367.5 MW) expansion under Phase-I has been accommodated within the existing 163.95 ha of land.

For Phase – II, Smelter Plant up to 2, 35, 000 TPA and and Power Plant (from 367.5 MW to 467.5 MW) expansion is under progress.

- 4 The raw water requirement shall increase : Will be complied.

from 31,955 to 1,01,555 KLD, thereby increase for the expansion project will be 69,600 KLD which will be sourced from the Hirakud reservoir. 14,250 KLD of wastewater will be generated from the expansion project. Wastewater generation shall increase from 8278 KLD to 22,528 KLD thereby increase in waste water generation for the expansion project will be 14,250 KLD .This will be treated in Rotating Biological Contactor and reused with in the plant .Cooling water blowdown from the powerplant will be treated to meet the discharge standards and discharged into Kharjhor nalla. 7650 TPA of solid waste generated from smelter will be disposed off as per CPCB guidelines, in secured landfill site inside the premises. 2.55 million TPA of coal ash generated from power plant will be disposed as dry ash mounds. Coal ash disposal as backfill material in abandoned coal mines has been explored.

Cooling tower blowdown from the power plant is treated to meet the standards before being discharged to Khorjur nallah. Coal ash generated from the plant is disposed dry in ash mound after utilisation in cement plants, brick manufacturing units and low lying area filling.

- 5 The project is listed at 3 (a) in the Schedule of EIA Notification, 2006 and is under category 'A'. The project is also covered under para 2 (ii) of the Notification, 2006. The additional TORs for final EIA/EMP Report were communicated vide even numbered letter of this Ministry dated 15<sup>th</sup> February, 2007. Public Hearing for the project was held on 25.06.2007.

- 6 Based on the information submitted by you, the Ministry of Environment and Forests :

hereby accords environmental clearance to the above project under the provisions of EIA Notification dated 14<sup>th</sup> September 2006 subject to the following conditions.

**A. SPECIFIC CONDITIONS :**

- (i) As stated in the Public Hearing, the new expansion site shall be on the opposite side of the village. : The expansion site is on the opposite side of the village.
- (ii) The expansion shall be based only on Pre-baked Anode Technology and all Soderberge Technology based pots shall be converted to Pre-baked Anode Technology, as per the schedule submitted to the Ministry. The Captive Power Plant shall be based on CFBC/PFC Boiler. : Being Complied.  
The prebake anode technology will be adopted in the expansion. All the soderberg pots have already been converted to prebake.  
Three nos. of CFBC boilers have been Installed in 1 x 100 MW (Unit # 4) under Phase-I expansion. Another two no.s of CFBC boilers in 1 x 100 MW (Unit #5) are expected in September 2012 under Phase – II expansion.
- (iii) The gaseous emissions (SO<sub>2</sub>, NO<sub>x</sub>, CO, HC and Fluoride) and Particulate matter along with RSPM levels from various process units shall conform to the standards prescribed by the concerned authorities from time to time. The State Board may specify more stringent standards for the relevant parameters keeping in view of the nature of the industry and its size and location. At no time the emission level shall go beyond the prescribed standards. On-line continuous monitoring system for particulate emissions, SO<sub>2</sub> and NO<sub>x</sub> shall be provided and shall make necessary arrangements for submission of on-line real time emission data to CPCB website. Interlocking facility shall be provided between pollution control equipment and the process operation so that in the event of the pollution control equipment not working, the respective unit (s) is shut down automatically. In the event of failure of any pollution control system adopted by the unit, the respective unit should not be restarted until the control measures are rectified to achieve the desired efficiency. Low NO<sub>x</sub> burners shall be installed to control the : The standards already stipulated or to be enforced is being followed.  
We are monitoring particulate matter and fluoride from the smelter at FTP (Dry scrubbers) out let and fugitive fluoride from smelter pot rooms.  
Online real time stack data from Smelter and Power plant connected and data transmitted to SPCB Server and CPCB.  
Online Forbes Marshall-Codel make Opacity Monitor (Model No: DCEM-2100) has already been installed and commissioned in Unit # 4 main stack. Further, online Continuous Flue gas Analyser of SO<sub>2</sub>, NO<sub>x</sub> and CO<sub>2</sub> (Model No: GCEM 4000 of Codel make) has also been installed in the Stack.  
Low NO<sub>x</sub> burners have been provided in the boilers to control the NO<sub>x</sub> emissions. The result of monitoring of stack (Unit – 4 of CPP) is enclosed, which shows an average emission of 68.60 mg/NM<sup>3</sup>

- NOx emissions. against the standard of 100 mg/NM<sup>3</sup>.
- (iv) Only 10 new stacks shall be installed for the expansion project– 4 in smelter plant, 4 in anode plant and 2 in casting unit. The scrubbed alumina from Alumina based dry scrubbing system shall be reused in process. Minimum stack height shall be 50 m. The minimum height of other stacks of anode plant and casting plant shall be 35 m, which shall be based on Sulphur content of fuel. 3 new stacks in power plant shall be provided with ESP. : All the ten stacks for smelter plant will be up-coming with phase-II expansion.
- Dry scrubbers will be installed and the alumina from the dry scrubbers will be reused in the system. The stack heights will be complied.
- One new stack of 130 m height has been provided for 1 x 100 MW (Unit # 4 of CPP) under Phase-I expansion. Another two stacks will be up-coming during Phase-II. ESP of efficiency 99.9% has been provided to the Unit – 4 of CPP and similar provision will be made for Phase II expansion.
- (v) Total Fluoride emissions and pitch fumes from smelter and anode-baking unit shall be controlled using alumina based dry scrubbing system to limit Fluorides emissions within 0.8 kg/ton Aluminium produced and SPM within 50 mg/Nm<sup>3</sup>. SPM emissions from Captive Power Plant shall be less than 100 mg/Nm<sup>3</sup>. Forage Fluoride levels of less than 80 ppm for one month, less than 60 ppm for two months and less than 40 ppm for 12 months shall be complied with. Further the pot emissions through fume treatment plant shall not exceed 0.30 kg/ton of Aluminium produced. : Will be complied.
- Alumina based dry scrubbers are existing for the phase-I expansion and the same will be installed for phase-II expansion also to control the fluoride and pitch fume emission.
- The particulate matter, fluoride emissions and forage fluoride are being regularly monitored for the existing line and reported to Board and Ministry in half yearly report. The same will be complied.
- ESPs are designed to meet SPM emission level less than 100 mg/Nm<sup>3</sup>. Stack emission data for Unit – 4 of CPP is enclosed which shows an emission of 68.60 mg/NM<sup>3</sup> far below the standard.
- (vi) Regular monitoring of fluoride content in ambient air, forage fluoride and in ground water shall be carried out and data shall be submitted to State pollution Control Board. : We are regularly monitoring forage fluoride as an indicator of ambient air fluoride and so also fluoride in surface and ground water and the data is submitted to State Pollution control Board in the monthly progress report. We will continue to monitor and report the data.
- (vii) Raw material shall be stored in covered yards. : The coal for Power Plant is transported

Water sprinkling arrangement shall be made in the raw material stock yard to control fugitive emissions. Coal and other raw material shall be transported in covered trucks, containers etc., which shall later be shifted to covered rail wagons.

from captive coal mines at Talabira through covered trucks. Fixed sprinklers have been provided in the coal stock yard to prevent the fugitive dust emission. Transportation of coal through rail is under consideration.

- (viii) In plant control measures for checking fugitive emissions from all the vulnerable sources like spillage/raw materials/coal handlings etc. shall be provided. Further, specific measures like provision of dust extraction and suppression system consisting of water sprinkling, suction hoods, fans, cyclones, bag filters, ventury scrubber etc. shall be installed at material transfer points and other enclosed raw material handling areas. Centralized de-dusting system i.e. collection of fugitive emissions through suction hood shall be provided and subsequent treatment through bag filter or any other device and finally emitted through a stack of appropriately designed height, as prescribed above : Will be complied.
- Dry scrubbers (FTPs), dust collector and bag filters will be provided where ever necessary.
- ESPs are being provided for individual boilers and designed to meet SPM emission level less than 100 mg/Nm<sup>3</sup>
- Further, dust suppression, extraction systems and bag filters have been provided in the coal handling plant and all transfer points. The fugitive emission during the period April 11 to September 11 in the FHP area was found to be 184.77 µg/m<sup>3</sup>, the report of which is enclosed.
- (ix) Fugitive Fluoride emissions from the Pot room shall not exceed 4.0 Kg/Ton of Aluminium produced. Fugitive emissions, especially in the work zone area, product and raw materials storage area etc. shall be regularly monitored and records be maintained. The emissions shall conform to the limits imposed by the State Pollution Control Boards / Central Pollution Control Board. : The fugitive fluoride emission is within 0.4 Kg/Mt. Al.
- We are regularly monitoring fugitive emission through smelter roofs and reporting to State Pollution Control Board. We will continue to monitor and report the same.
- (x) Windbreakers shall be installed to restrict fugitive dust : Will be Complied under Phase-II Expansion.
- (xi) The water requirement for the expansion project shall not exceed 69,600 KLD and shall be sourced from the Hirakud reservoir : In Phase- I expansion about 12,000 KLD water is being used for 1x100 MW CPP. The rest quantity will be used in phase – II expansion. The entire raw water is sourced from Hirakud reservoir.
- (xii) Waste water generation shall not exceed 14,250 KLD for the expansion project. Waste : The present waste water generated from Smelter is being treated in effluent

water generated from smelter shall be treated in Rotating Biological Contactor and shall be reused in the plant. Cooling water blowdown from the power plant shall be treated up to discharge standards and discharged into Kharjhor nalla.

treatment plant and rotating biological contactors and the treated water is reused.

The cooling tower blow-down water is meeting the standards before discharge to Kharjour nalla. Regular monitoring of water quality is being carried out and the water quality meets the prescribed standard.

- (xiii) 7650 TPA of solid waste generated, mainly the spent pot lining from smelter shall be disposed off in a secured landfill site inside the premises. The SLF shall be as per CPCB guidelines. 2.55 million TPA of coal ash generated from power plant shall be disposed as dry ash mounds. However, it shall be ultimately disposed off as backfill material in abandoned coal mines or shall be utilized as per the Fly Ash Notification 5.0.763 (E) dated 14.9.1999 of this Ministry. The proposed Amendment / revision to this Notification shall be applicable for compliance from the Project Authority
- (xiv) Minimum Cycle of Concentration (COC) for the CPP shall be 5.0
- (xv) Minimum of 33 % of total land area shall be developed as green belt with local species in consultation and as per the CPCB's guidelines
- (xvi) All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the Aluminium Sector shall be strictly implemented.
- (xvii) The project authorities shall earmark Rs.369 crores to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purpose
- : We are in the process of implementing a secured landfill for disposal of the waste generated from smelter plant.
- The Fly ash utilization programme is being complied as per the Fly Ash Notification, 1999 and as amended thereof.
- To ensure 100 % ash utilization, a detailed ash utilization program is already in place. During the period Apr 2011 to March 2012, about 3, 69,253 tonnes of ash (from all the units) have been used in different application (cement making, bricks manufacturing and low lying area filling).
- : Being maintained in all the four units (367.5 MW).  
Will be complied in Phase-II expansion also.
- : Will be complied.
- : We will strive to comply with all the recommendation of Charter of Corporate Responsibility for Environment for aluminium sectors.
- : Will be complied.

## **B. GENERAL CONDITIONS :**

- (i) The project authorities shall strictly adhere to : We are adhering to the directions of State

- the stipulations made by the State Pollution Control Board
- Pollution Control Board.
- (ii) No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any. : No further expansion or modifications in the plant shall be carried out without prior approval of the ministry.
- (iii) Regular monitoring of ambient air for SPM, RSPM, SO<sub>2</sub>, NO<sub>x</sub>, CO, HC and Fluoride shall be carried out as per CPCB guidelines. The locations of ambient air quality monitoring stations shall be reviewed in consultation with the State Pollution Control Board (SPCB) and additional stations shall be installed, if required, in the downwind direction as well as where maximum ground level concentrations are anticipated : Presently, the ambient air quality is being monitored at seven locations for Smelter and eight locations for Power Plant respectively.
- (iv) Data on ambient air quality, fugitive emissions and stack emissions should be regularly submitted to the concerned Regional Office of this Ministry and SPCB/CPCB every six months and posted on the Website of the Project Authority : Data on ambient air quality, fugitive emissions, stack emissions and water effluent quality is being regularly submitted to Eastern Regional Office through six monthly compliance reports. The soft copy of the same is also being submitted to the office regularly. The data for the period October 11 – March 12 are enclosed as annexures.
- (v) Industrial waste water shall be properly collected and treated so as to conform to the standards prescribed under GSR422 (E) dated 19<sup>th</sup> May 1993 and 3<sup>rd</sup> December, 1993 or as amended from time to time : Data on water effluent quality is being submitted to the office regularly. All the parameters meet the specified standards.
- (vi) The project authorities shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended in October, 1994 and January, 2000 and Hazardous Waste (Management and Handling) Rules, 1989, as amended from time to time. Authorization from the SPCB shall be obtained : Being Complied.

- for collection, treatment, storage, and disposal of hazardous wastes. All Transportation of Hazardous Chemicals shall be as per the MVA, 1989
- (vii) The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time) : Noise quality is being monitored regularly. All the values are meeting the standard. The noise level data for the period Oct 11 – Mar 12 is enclosed.
- (viii) Occupational health surveillance of the workers shall be carried out on a regular basis and records shall be maintained as per the Factories Act : Occupational health surveillance of all the employees is carried out on a regular basis and records are being maintained.
- (ix) Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis : Regular training is being provided to all the employees on various safety, health and environmental issues.  
Pre-employment and routine periodical medical examinations for all employees are being undertaken on regular basis.
- (x) Usage of PPEs by all employees/ workers shall be ensured : Usage of PPEs by all employees/ workers shall be ensured.
- (xi) The Company shall harvest surface as well as rainwater from the rooftops of the buildings proposed in the expansion project and storm water drains to recharge the ground water and use the same water for the various activities of the project to conserve fresh water : A study had been carried out by the Deptt. of Civil Engineering, A.U College of Engineering, Andhra University, Visakhapatnam (Prof. & Dr. S. Ramakrishna Rao) for development of Rain Water Harvesting at both Plant and Colony. Based on this, a team from the university visited Hirakud during May and June-2007 and initiated the study. Site survey has been carried out for identification of suitable location, geophysical test were conducted at 10 locations, collection of rainfall data and selection of infiltration test wells were carried out. During Feb-2008, the final report has been received which states that the scope for ground water recharge through rain water harvesting in the Hindalco area is very little for the reasons:



- i) Ground water utilization for the industry is very low,  
ii) Due to the presence of shallow water table and  
iii) Hard rock at shallow depth.
- The copy of the above report has already been submitted to your office
- (xii) The project proponent shall also comply with all the environmental protection measures and safeguards proposed in the EIA/EMP report. All the recommendations made in respect of environmental management and risk mitigation measures relating to the project shall be implemented : Will be complied.
- (xiii) The company will undertake all relevant measures, as indicated during the Public Hearing for improving the Socio-economic conditions of the surrounding area. CSR activities will be undertaken by involving local villages and administration : The company is undertaking various socio-economic development projects in the surrounding areas involving local SHG.
- (xiv) The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment. The eco-development plan should be submitted to the SPCB within three months of receipt of this letter for approval : The company is undertaking various community development programmes in and around Hirakud involving local SHG. Various welfare measures are undertaken.
- (xv) A separate Environmental Management Cell equipped with full fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions. : A separate full fledged Environmental Laboratory exist.
- (xvi) The implementation of the project vis-a-vis environmental action plans shall be monitored by the concerned Regional Office of the Ministry/ SPCB / CPCB. A six monthly compliance status report shall be submitted to monitoring agencies and shall be posted on the Website of the Company. : Being complied.
- (xvii) The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/ Committee and may also be seen at Website of the Ministry at <http://envfor.nic.in>. This shall be advertised within seven days from the date of issue of : We have advertised in three local newspapers that are widely circulated in the region namely :
- (1) The Dharitri, Dated 12<sup>th</sup> February, 2008  
(2) The Agnisikha, Dated 12<sup>th</sup> February,

- the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.
- 2008 &  
(3) The Sambad, Dated 14<sup>th</sup> February, 2008,  
This has been also communicated to the Regional Office of MOEF, Bhubaneswar vide our letter of 14<sup>th</sup> February, 2008 along with copies of the news letters.
- (xviii) The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project. : Will be complied.
- 7 The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory. : Agreed
- 8 The Ministry reserves the right to stipulate additional conditions, if found necessary. The company in a time bound manner will implement these conditions. : Agreed

**Amendment Letter: J 11011/144/2006-IA II (I), dated 19 October, 2009**

Sl. No	CONDITIONS	STATUS AS ON September- 2011
1	All the specific and general conditions shall remain unchanged and have to	:

- be complied in toto and pari passu.
- 2 There shall be no change or modification in the ultimate capacity of the Smelter Plant (1,00,000 to 3,60,000 TPA) and Captive Power Plant (267.5 MW to 967.5 MW). :
- 3 All the emissions (ambient air, stack, fugitive and fluoride emissions) shall be within the permissible limit as prescribed in the Environmental Clearance dated 6<sup>th</sup> February, 2008. : All the emissions are within the prescribed standard.
- 4 No additional land shall be acquired. :
- 5 No additional water shall be used. : No additional water will be used.
- 6 A copy of clearance letter shall be sent by the proponent to concerned Panchayat Zilla Parishad / Municipal Cooperation, Urban local body and the local NGO, if any, from whom suggestions / representations if any, were received while processing the proposal. The clearance letter shall also be put on the website of the company by the proponent. : The copy of the clearance letter has already been submitted.
- 7 The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their web site and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MOEF at Bhubaneswar, the respective Zonal office of CPCB and the OPCB. The criteria pollutant levels namely; SPM, RSPM, SO<sub>2</sub>, NO<sub>x</sub> (ambient levels as well as Stack emissions) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at : The status of compliance to the Environment Clearance is being sent to Regional Office of Ministry of Environment & Forests regularly in form of both hard and soft copies. An electronic board has been placed near the main gate displaying environmental parameters.

- a convenient location near the main gate of the company in the public domain.
- 8 The project proponent shall also submit six monthly reports on the status of compliance of the stipulated environment clearance conditions, including results of monitored data (both in hard copies as well as by e-mail) to the regional office of MOEF at Bhubaneswar, the respective Zonal office of CPCB and the OPCB. The Regional Office of this Ministry at Bhubaneswar / CPCB/ OPCB shall monitor the stipulated conditions. : The status of compliance to the Environment Clearance is being sent to Regional Office of Ministry of Environment & Forests regularly in form of both hard and soft copies.
- 9 The environmental statement for each financial year ending 31<sup>st</sup> March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986 as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Office of the MOEF by e-mail. :
- 10 This letter is issued with prior approval from the Competent Authority. :
- 11 This letter shall be kept with the environment clearance issued by the Ministry vide letter No.:J-11011/100/2006-IA.II (I), dated 6<sup>th</sup> February, 2008. :

