SBPIL/ENV/TMT/2024-25/0690 **Date: 27/06/2025**

To,
The Regional Officer,
Integrated Regional Office,
Ministry of Environment and Forest, Climate Change
Ground Floor Aranya Bhavan, North Block, Sec- 19
Atal Nagar, Naya Raipur (C.G.) - 492002

Sub: Submission of Six monthly Compliance Report for the period Oct' 24- Mar' 25..

Ref: Environmental Clearance No. 84/SEIAACG/EC/Raipur/637 dated 06.05.2019 from State Environment Impact Assessment Authority Chhattisgarh (SEIAACG), Govt. of India, Ministry of Environment Forests and Climate Change, regarding capacity expansion of MS Rounds CTD Bars having capacity - 37,500 TPA (Single shift Operation) to 59,500 TPA (Double Shift Operation) at Shri Bajrang Power & Ispat Ltd. (TMT Division), Gondwara, Raipur (C.G.).

Dear Sir,

With reference to above cited subject, please find enclosed herewith Compliance conditions status for the period **Oct' 24- Mar' 25.** as required by your good office in compliance of Environment Clearance granted by State Environment Impact Assessment Authority Chhattisgarh (SEIAACG), Govt. of India, Ministry of Environment Forests and Climate Change (MOEF&CC), vide No. **84/SEIAACG/EC/Raipur/637 dated 06.05.2019** for capacity expansion of MS Rounds CTD Bars having capacity - 37,500 TPA to 59,500 TPA at Shri Bajrang Power & Ispat Ltd. (TMT Division), Gondwara, Raipur (C.G.).

Hope, you will find the above in order.

Thanking you,
For, SHRI BAJRANG POWER & ISPAT LTD., (TMT Division)

Authorized Signatory

Encl: As above Mentioned.

CC-

1. **Regional officer, RO, CECB, New Office Building, Ring Road No.-2, Tatibandh, Dist.- Raipur (C.G.).**
2. **Member Secretary, Chhattisgarh Environment Conservation Board, Paryavas Bhawan, North Block, Sector-19, Atal Nagar, Raipur (C.G.).**

Status of Compliance Condition stipulated in Environment Clearance granted by State Environment Impact Assessment Authority Chhattisgarh (SEIAA, C.G.), Govt. of India, Ministry of Environment and Forest, regarding capacity expansion of MS Rounds CTD Bars having capacity – 37,500 TPA (Single Shift operation) to 59500 TPA (Double Shift Operation) at M/s Shri Bajrang Power and Ispat Limited situated (TMT Division) formerly Known as M/s Bajrang Metallics & Power Ltd. situated at Kh. No. 2/3, Village - Gondwara, Urla Industrial Complex, Raipur 493221 (C.G.)

Ref.: Environment Clearance letter no. 84/SEIAACG/EC/RAIPUR/637 dated 06/05/2019.

Statutory Compliances:

Sr. No.	Conditions	Status as on 31.03.2025
01	The project proponent shall obtain Consent to Establish/Operate under the provisions of the Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the Chhattisgarh Environment Conservation Board (CECB).	We have already granted CTE, CTO and regular renewal of Consent to Operate for MS Round & CTD Bars, etc.- 59,500 TPA for our SBPIL (TMT Division) from the CECB.
02	The project proponent shall obtain all necessary permission from the Central Ground Water Authority, in case of drawl of groundwater/ from the competent authority concerned in case of drawl of surface water required for the project.	We are using Surface water in our SBPIL, Gondwara unit, for Industrial purposes, for which, we have already been sanctioned 1.5 Million meters of cubic water per year drawl permission from Kharun River by Chhattisgarh Government, Water Resource Department, Mantralaya, Raipur (C.G.) Vide their letter No. 5010/302/WR/TECH/03/IWS/D-4 dated 26/10/2004. We have also Granted NOC for withdrawal of 45 KLD Groundwater for domestic purposes from CGWA, New Delhi vide their NOC no. CGWA/NOC/ IND/ REN/1/ 2024/9322 dated: 29/12/2023 Valid till date: 28/12/2026.
03	The project proponent shall obtain authorization under the Hazardous and Other Waste Management Rules, 2016 as amended from time to time.	We have obtained the Hazardous Waste Authorization letter from the board vide letter no. 2651/H.O./HSMD/CECB/2013, dated 16.08.2013 and the latest renewal is vide letter no. 5298/HSMD/HO/ CECB/ 2023, NAVA RAIPUR ATAL NAGAR dated 29.09.2023 valid till 15.08.2028.

Air Quality Monitoring and Preservation

Sr. No.	Conditions	Status as on 31.03.2025
01	The project proponent shall install 24x7 continuous emission monitoring system at process stacks to monitor stack emission with respect to standards prescribed in Environment (Protection) Rules 1986 vide G.S.R 277(E) dated 31st March 2012 (applicable to IF/EAF) as amended from time to time; and connected to SPCB and CPCB online servers and calibrate these system from time to time according to equipment supplier specification through labs recognized under Environment (Protection) Act, 1986 or NABL accredited laboratories	We would like to inform you that our Rolling Mill is based on Direct Hot Rolling Technology, which is completely Eco-friendly process, invented by us. There is neither use of Reheating furnace nor fuel in process, resulting in no Air pollution, hence installation of stack or stack monitoring system condition is not applicable to us.
02	The project proponent shall monitor fugitive emissions in the plant premises at least once in every quarter through laboratories recognized	Fugitive emission monitoring is being carried out by NABL accredited laboratories, in regular interval.

<table>
<tr><td></td><td>under Environment (Protection) Act, 1986 or NABL accredited laboratories.</td><td>Attached as Annexure-1</td></tr>
<tr><td>03</td><td>The project proponent shall make provision for carryout Ambient Air Quality monitoring for common/criterion parameters relevant to the main pollutant released (e.g. PM10 and PM 2.5 in reference to PM emission, and SO_2 and NOx in reference to SO2 and NOx emissions) within and outside the plant area (at least at four locations one within and three outside the plant area at an angle of 120 degrees each) covering upwind and downwind directions.</td><td>Our SBPIL, Gondwara unit is situated at Urla industrial area with other various industries and this Rolling mill is situated at common campus of our SBPIL Gondwara unit with other units, hence Ambient air quality monitoring station (all four locations within plant premises) are common for all established units and monitoring is being carried out by NABL accredited laboratories.
Attached as Annexure-2</td></tr>
<tr><td>04</td><td>The project proponent shall provide adequate air pollution control arrangements at all point and non-point sources. Collecting hoods with bag filters of adequate capacity and high efficiency shall be installed/ upgraded in induction furnace(s) of capacity 1,05,600 TPA with minimum 30 meter stack height to ensure particulate matter emission less than 40mg/Nm3 all the time. The project proponent shall provide leakage detection and mechanized bag cleaning facilities for better maintenance of bags. Project proponent shall install suitable & effective air pollution control equipment at all transfer points, junction point etc. shall be covered. Adequate provision shall be made for sprinkling of water at strategic locations to ensure dust does not get air borne. For controlling fugitive dust, regular sprinkling of water in vulnerable areas of the plant shall be ensured. Proper ventilation shall also be provided in induction furnace plant. All air pollution control systems shall be kept in good running condition all the time and failure (if any), shall be immediately rectified without delay; otherwise similar alternate arrangement shall be made. In the event of any failure of any pollution control system adopted by the project proponent, the respective production unit shall not be restarted until the control measures are rectified to achieve the desired efficiency. As per proposal submitted emission of pollutants from any point source shall not exceed the following limit: -
<table>
<tr><td>Particulate Matter (Induction Furnace(s) of capacity 1,05,600 TPA)</td><td>40 mg/Nm3 (Forty Milligram per Normal Cubic Meter)</td></tr>
<tr><td>Particulate Matter (From other units)</td><td>50 mg/Nm3 (Fifty Milligram per Normal Cubic Meter)</td></tr>
</table>
Project proponent shall provide proper space provision for further retrofitting of air pollution control systems in case of further stringency of particulate matter emission limit. The Height of any other stack(s) shall not be less than 30 Meters.</td><td>Fume extraction systems with movable collecting hoods with 30 meters height stack is installed in induction furnace (s) of our Steel Melting shop unit and maintaining Particulate matter emission well within the prescribed norms. Movable water sprinklers are provided and are being operated for control fugitive dust emission.

Proper ventilations are provided at Induction Furnace (s) Plant.

In this Induction Furnace unit stack emission is being maintained well within prescribe norms. However, PM from other plant stack is being maintained below the prescribed limit of 50mg/Nm3.

The height of other stack(s) is not less than 30 meters.</td></tr>
<tr><td>05</td><td>The project proponent shall submit monthly summary report of continuous stack emission and air quality monitoring and results of manual stack</td><td>Since our Rolling Mill is based on Direct Hot Rolling Technology, complete Eco friendly process, invented by us. There is</td></tr>
</table>

	monitoring and manual monitoring of air quality /fugitive emissions to regional office of ministry of Environment, Forest and Climate Change, Nagpur, Zonal office of CPCB and Regional office of Chhattisgarh Environment Conservation Board (CECB) along with six-monthly monitoring report.	neither use of Reheating furnace nor fuel in process, resulting no Air pollution; hence installation of stack or stack monitoring system condition is not applicable to us. Ambient Air quality & fugitive emission monitoring are being carried out by us as well as NABL accredited laboratories. Reports of same are being regularly submitting with six monthly compliance conditions to Regional office of ministry of Environment, Forest and Climate Change, Raipur Chhattisgarh) (Note: Nagpur office shifted to Raipur Chhattisgarh, hence We are submitting Report to MoEFCC Regional Office Raipur Chhattisgarh instead of Nagpur Office.).
06	Sufficient number of mobiles or stationary vacuum cleaners shall be provided to clean plant roads, shop floors, roofs, regularly.	Plant roads, shop floors of the plant are being cleaned by mechanical sweeping machine on regular basis. Apart from it manual cleaning is also being carried out under good housekeeping practices.
07	Recycle and Reuse iron ore fines and such other fines collected in the pollution control devices and vacuum cleaning devices in the process.	Recycle and reuse of iron ore fines are not applicable for this unit. Other fines like mill scale are being used in our SMS unit.
08	The project proponent shall use mechanically covered leak proof trucks/dumpers vehicles for transportation of raw materials.	Due to non-availability of mechanically covered vehicles in this area, the transportation of raw materials, products (which may have tendency to generate dust while handling/ transportation) fuels and solid wastes are already being carried out properly in tarpaulin covered trucks and also in the meantime we are exploring the availability of this type of special vehicles in coordination with transporters/suppliers etc.
09	At entry and exit point of plant, wheel wash system shall be provided to control wheel generated dust.	Wheel wash system is provided near the main gate of plant.
10	Provision for monitoring of vehicles by installation of closed-circuit cameras (CCTV) at suitable locations i.e. entry gate, weigh bridge, internal parking area etc. shall also be made to ensure the incoming and outgoing vehicles are mechanically covered.	Agreed. We have already installed CCTV cameras at suitable locations. Due to non-availability of mechanically covered vehicles in this area, the transportation of raw materials, products (which may have tendency to generate dust while handling/ transportation) fuels, and solid wastes are already being carried out properly in tarpaulin-covered trucks and also in the meantime, we are exploring the availability of this type of special vehicles in coordination with transporters/suppliers etc.
11	The project proponent shall provide covered sheds for raw materials like scrap and sponge iron etc.	We have provided covered sheds for raw materials like scrap and sponge iron etc.

Water Quality Monitoring and Preservation

Sr. No.	Conditions	Status as on 31.03.2025
01	The project proponent shall provide adequate facility for proper treatment of industrial effluent and domestic effluent. Sewage Treatment arrangement shall be provided for treatment of domestic effluent to meet the prescribed standards. Project proponent shall ensure the treated effluent quality within standard prescribed by Ministry of Environment, Forest and Climate Change, Government of India under G.S.R 277(E) dated 31st March 2012(applicable to IF/EAF) as amended from time to time. No effluent shall be discharged out of plant premises under any circumstances. Any liquid effluent what so ever generated shall not be discharged into the river or any surface water bodies under any circumstances, and it shall be reused wholly in the process / plantation within plant area. Adhere to 'Zero Liquid Discharge'.	In our Rolling Mill unit, water is being used only for cooling purpose in re-circulating manner. No treated / untreated effluent is being discharged in to the river or any surface water bodies. Cooling Tower discharged water is being used for plantation and dust suppression purpose, inside the plant premises. We have Constructed 2 Nos. Sewage Treatment Plant Capacity of 65 KLD & 42 KLD for treatment of Domestic Waste Water. after treatment treated water is being used for dust suppression & Plantation. No effluents are being discharged outside of the factory premises in any circumstances; hence zero discharge conditions are being maintained all the time. The reports of treated water are enclosed.
02	The project proponent shall monitor regularly ground water quality at least twice a year (pre and post monsoon) at sufficient numbers of piezometers/sampling wells in the plant and adjacent areas through labs recognized under Environment (Protection) Act, 1986 and NABL accredited laboratories.	Ground water quality monitoring is being carried out, twice in a year (Pre-monsoon and Post monsoon) by NABL Accredited laboratories. **Attached as Annexure-3**
03	The project proponent shall submit monthly summary report of effluent monitoring and results of manual effluent testing and manual monitoring of ground water quality to Regional Office of Ministry of Environment, Forest and Climate Change, Nagpur, Zonal office of CPCB and Regional office of Chhattisgarh Environment Conservation Board (CECB) along with six-monthly monitoring report.	We are regularly and timely submitting effluent monitoring and ground water quality monitoring reports, carried out by NABL accredited laboratories and Report of same are being regularly submitting with six monthly compliance conditions to Regional office of ministry of Environment, Forest and Climate Change, Raipur Chhattisgarh) (Note: Nagpur office shifted to Raipur Chhattisgarh hence We are submitting Report to MOEFCC Regional Office Raipur Chhattisgarh instead of Nagpur Office.) **Attached as Annexure-4**
04	Garland drains and collection pits shall be provided for each stock pile to arrest the run-off in the event of heavy rains and to check the water pollution due to surface run off.	Garland drains and collection pits are provided all over the plant area to arrest the run-off in the event of heavy rains and to check the water pollution due to surface run off.
05	The project proponent shall practice rainwater harvesting to maximum possible extent.	We have installed 05 Nos. of Rain Water Harvesting Pits inside our plant premises. **Attached as Annexure-5**
06	The project proponent shall make efforts to minimize water consumption in the plant by segregation of used water, practicing cascade use and by recycling treated water.	In our Rolling Mill, SMS unit water is being used for cooling purpose in recirculating manner. Cooling tower blow down is being used for dust suppression while domestic discharge water after treatment from STP is being used for plantation and dust suppression purpose.

Noise Monitoring and Prevention

Sr. No.	Conditions	Status as on 31.03.2025
01	Noise level survey shall be carried as per the prescribed guidelines and report in this regard shall be submitted to Regional Office of the Ministry of Environment, Forest and Climate Change, Nagpur as a part of six-monthly compliance report.	Noise level survey is being carried out by us and authorized agency and records are being maintained and we are regularly and timely submitting six-monthly compliance report along with Noise monitoring report carried out by approved NABL accredited Laboratories to Regional office of ministry of Environment, Forest and Climate Change, Raipur Chhattisgarh. (Note: Nagpur office shifted to Raipur Chhattisgarh hence We are submitting Report to MoEFCC Regional Office Raipur Chhattisgarh instead of Nagpur Office.) **Attached as Annexure-6**
02	The ambient noise levels should conform to the standards prescribed under Environment (Protection) Rules, 1986 viz. 75 dB(A) during day time and 70 dB(A) during night time.	We are maintaining noise levels within the limits to the standards prescribed under Environment (Protection) Rules, 1986.

Energy Conservation Measures

Sr. No.	Conditions	Status as on 31.03.2025
01	The project proponent shall not utilize any solid /liquid /gases fuel such as coal, furnace oil, diesel, producer gas etc. in any form as a fuel. Hot ingot/Billets received through CCM shall be hot charged in the Rolling Mill. No reheating furnace(s) shall be installed for reheating the ingots/billets. No new induction furnace(s) shall be installed and existing rolling mill shall be used to produce 59,500 tons/year Re-rolled products.	Since we have adopted Direct hot rolling technique, invented by us, in our Rolling Mill unit, which is totally environment friendly process. Hence we are not using any solid/liquid/gases such as coal, furnace oil, diesel, producer gas etc. in any form as a fuel. We have not installed any Re-Heating furnace for reheating the ingots/Billets. No any new Induction furnace has been installed and existing Rolling Mill is being used for produce 59,500 tons/year Re-rolled products.
02	Provide solar power generation on roof tops of buildings, for solar light system for all common areas, street lights, parking around project area and maintain the same regularly.	Earlier we have installed and operating a solar plant of capacity 100 kw within our plant. As our SBPIL, Gondwara unit is situated in Urla industrial area with other different industries, especially nos. of rolling mills. Resulting regular and continuous dust depositing on our installed solar panels, which were affecting the performance of solar panels and we were not getting desired power generation. Consequently the solar panel at Gondwara was removed and meanwhile in view of our environment and energy conservation program, on Dec' 2021, we have installed a 38.5 MW solar power plant as state solar policy at Tehsil-Nawagarh, District- Bemetara (C.G.) under captive consumption model to offset CSPDCL grid energy. The solar energy generated is being utilized across all our operational units in Raipur district, including the Gondwara division.

03	The project proponent shall ensure use of LED lights in their offices and residential areas.	We have installed LED lights in our offices and residential area as an initiative to save energy.

Waste Management

Sr. No.	Conditions	Status as on 31.03.2025
01	The project proponent shall take effective steps or safe disposal of solid wastes and sludge. End cutting shall be used as raw material in own Induction Furnace(s) for steel making. Oily sludge shall be sold to authorized recyclers / re-processors for proper disposal through incineration.	We are reusing end cutting as raw material in our own Steel Melting Shop unit situated at our SBPIL, Gondwara unit.
02	Used refractories shall be recycled as far as possible.	As far as possible, most of the usable refractories are being recycled.
03	The waste oil, grease and other hazardous waste shall be disposed of as per hazardous & Other waste (Management & Transboundary Movement) Rules, 2016.	We are disposing waste oil, grease and other hazardous waste as per mentioned conditions in HW Authorization letter granted from H.O.CECB Raipur vide letter no. 2651/H.O./HSMD/CECB/2013, dated 16.08.2013 and the latest renewal is vide letter no. 5298/HSMD/HO/ CECB/ 2023, NAVA RAIPUR ATAL NAGAR dated 29.09.2023 valid till 15.08.2028.
04	The project proponent shall utilize fly ash bricks/ block etc. in all construction activities.	We are using fly ash bricks/ block manufactured in our own Fly Ash Bricks manufacturing unit, in all construction activity.
05	Kitchen waste (if any) shall be composted or converted to biogas for further use.	Kitchen waste from our canteen and mess is being composted, by a well advanced Bio Composter Machine.

Green Belt

Sr. No.	Conditions	Status as on 31.03.2025
01	Green belt shall be developed in an area equal to 33% of the plant area with a native tree species in accordance with CPCB guidelines this monsoon season. The greenbelt shall inter alia cover the entire periphery of the plant. As far as possible maximum area of open spaces shall be utilized for plantation purposes.	We have planted around 18500 Nos. (33% plantation inside the plant in 6.105 Hect. i.e. 15200 Nos. and 7% plantation outside the plant in 1.295 Hect. i.e around 3300 Nos) Species in and around the plant premises. Most of the open space is used for plantation. At Present, we have been developed plantation in 7.4 Hect @ 2500/ Hect. i.e. 40 % area of total plant area.
02	The project proponent shall prepare GHG emissions inventory for the plant and shall submit the programme for reduction of the same including carbon sequestration including plantation.	Agreed and Submitted. **Report enclosed as Annexure 7.**

Human Health Issues

Sr. No.	Conditions	Status as on 31.03.2025
01	Emergency preparedness plan based on the Hazard Identification and Risk Assessment (HIRA) and Disaster management Plan shall be implemented.	Emergency preparedness plan based on the Hazard Identification and Risk Assessment (HIRA) and Disaster management Plan has been prepared and implementing the same.

		Enclosed as Annexure 8.
02	The project proponent shall carry out Heat stress analysis for the workmen who work in high temperature work zone and provide Personal Protection Equipment (PPE) as per the norms of Factory Act.	We have carried out Heat stress analysis for the workmen who work in high temperature work zone and have provided Personal Protection Equipment (PPE) as per the norms of Factory Act. **Enclosed as Annexure 9.**
03	Provision shall be made for the housing of construction labor within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, Occu health care, crèche etc. The housing maybe in the form of temporary structures to be removed after the completion of the project.	Presently there is no construction work in progress in our plant and moreover for instant case capacity expansion is being done by change in shift operation i.e., from single shift to double shift operation of existing plant without any additional construction/plant machinery installation works Hence this condition is not applicable to us.
04	Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	Regular health check-ups of employees is being carried out and records are being maintained, as per Factories Act. Medical Reports of Employee **attached as Annexure-10**

Corporate Environment Responsibility Effluent

Sr. No.	Conditions	Status as on 31.03.2025
01	The project proponent shall comply with the provisions of the Ministry of Environment, Forest and Climate Change, New Delhi OM vide F.no. 22-65/2017-IA.III dated 1st May 2018, regarding Corporate Environment Responsibility. Project proponent shall made CER fund as follows:-	We are compiled all the conditions as mentioned for CER, by the MOEF&CC at Government school, village – Bendri, District – Raipur as follows: 1. Implementation & Maintenance of Rain Water Harvesting – We have constructed 02 Nos. rain water harvesting structure on the buildings of the school. 2. Plantation – We have planted more thn 50 Nos. of Plants within the School boundary. 3. RO based drinking water & Running water Facility in toilet we have provided a new bore well with submersible pump & pipe line connected to 02 nos. overhead tanks for drinking & domestic purpose. For Domestic purpose – We have renovate the toilet with provisions of new doors, flouring, Tapes, water pipe lines along with provision of overhead tank, with running water facilities. For Drinking Water – We have provided one overhead Tank is located at roof of school building with proper connecting pipe lines and RO having storage capacity of 25 LPH is installed inside school building for Drinking Water. 4. We have increased height of school boundary to 7 meter in view of safety. 5. We have constructed platform in school kitchen and a separate washing area for

Amount Proposed & Details for CER Activities (in Lakh)	
Particulars	CER Fund Allocation (Rs. In Lakh)
At Nearby school, Village – Bendri, District – Raipur following activities will be carried out: i.) Implementation & Maintenance of Rain Water Harvesting. ii.) Plantation iii.) RO based Drinking Water & Running Water Facilities in Toilet.	5.0

		cleaning of utensils.
02	The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental /forest/wildlife norms/conditions and /shareholders/ stake holders. The copy of the board resolution in this regard shall be submitted to the Ministry of Environment, Forest and Climate Change, New Delhi/ SEIAA, Chhattisgarh as a part of six-monthly report.	The company has a well laid down environmental policy duly approved by the Board of Directors and submitted to the Ministry of Environment, Forest and Climate Change, New Delhi/ SEIAA, Chhattisgarh as a part of six-monthly report.
03	A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of Senior Executive, who will directly to the head of the organization.	A separate Environment Cell is made with qualified personnel under the control of Senior Executive reporting directly to the head of the organization.
04	Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan	Implementation of EMP and comply of environmental condition are being done. The year wise funds earmarked for environmental protection measures are being kept shall be kept separately and not diverting for any other purpose. Year wise progress of implementation of action plan is being reported to the regional Office, Ministry of Environment, Forest and Climate

	shall be reported to the Regional Office, Ministry of Environment, Forest and Climate Change, Nagpur/SEIAA, Chhattisgarh along with the Six Monthly Compliance Report.	Change, Raipur /SIEAA, Chhattisgarh along with the Six Monthly Compliances Report. (Note: Nagpur office shifted to Raipur Chhattisgarh; hence We are submitting Report to MoEF&CC Regional Office Raipur Chhattisgarh instead of Nagpur Office.)
05	Self-environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.	Annual self-environmental audit is being conducted by us every year and third party environmental audit is being carried out every three years. We have been carried out Environment Audit by authorized third party and report is already submitted to Regional office of Environmental Pollution board.
06	All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the plants (if any) shall be implemented.	All the recommendation made in the charter on Corporate Responsibility for Environment Protection (CREP) for the plants are being implemented. **Enclosed as Annexure 11.**

Miscellaneous Conditions

Sr. No.	Conditions	Status as on 31.03.2025
01	Local persons shall be given employment during development and operation of the plant.	On the basis of qualification and work related experience, local person given employment. More than 70% local employees are working in company as well as in contract basis.
02	The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.	We have already advertised information for grant of Environment Clearance in two local newspapers.
03	The copies of the environmental clearance shall be submitted by the project proponents to the Heads of Local Bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.	We have already submitted environmental clearance to the Heads of Local Bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government.
04	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.	We are uploading the status of compliance of the stipulated environment clearance condition, including results of monitoring data on our website and updated the same on half-yearly basis.
05	The project proponent shall monitor the criteria pollutants level namely; PM10, SO2, NOx (ambient levels as well as stack emissions) or critical sectoral parameters (if any), indicated for the projects and display the same at a convenient location for disclosure to the public and put on the website of the company.	We are monitoring the stack emission, Ambient Air quality and other environmental related parameters and displaying the same, at the main gate of plant and also uploading in the website of the company.
06	The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the	We are submitted the six-monthly reports on the status of the compliance of the stipulated environmental condition on the

	website of the ministry of Environment, Forest and Climate Change at environment clearance portal and at seiaacg.org	website of the ministry of Environment, Forest and Climate Change at environment clearance portal and at seiaacg.org.
07	The project proponent shall submit the environmental statement for each financial year in form – V to Chhattisgarh Environment Conservation Board (CECB) as prescribed under the Environment (Protection) Rules, 1986 as amended subsequently and put on the website of the company. The project proponent shall inform the Regional Office, Ministry of Environment, Forest and Climate Change, Nagpur as well as SEIAA, Chhattisgarh the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.	We are regularly and timely submitting environmental statement for each financial year in **form – V** to Chhattisgarh Environment Conservation Board (CECB) as prescribed under the Environment (Protection) Rules, 1986.
08	The project authorities must strictly adhere to the stipulations made by the Chhattisgarh Environment Conservation Board (CECB) and the State Government.	We are honesty complying all the condition, as and when, prescribed by the Chhattisgarh Environment Conservation Board (CECB) and the state Government.
09	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 State Expert Appraisal Committee.	Agreed and being followed.
10	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change, New Delhi/SEIAA, Chhattisgarh.	We will not do further expansion or modification in the plant without prior approval of the Ministry of Environment, Forest and Climate Change, New Delhi/SEIAA, Chhattisgarh.
11	Concealing factual data or submission of false/ fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.	Agreed.
12	SEIAA, Chhattisgarh may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.	Agreed.
13	SEIAA, Chhattisgarh reserves the right to stipulate additional conditions if found necessary. The company in a time bound manner shall implement these conditions.	Agreed and will implementing the stipulated addition conditions (if any) in given time frame.
14	The Regional Office Ministry of Environment, Forest and Climate Change, Nagpur 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.	We will extend our full cooperation to the officer(s) of the Regional Office by furnishing the requisite data/information/monitoring reports.
15	The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with	Agreed.

	their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India/ High Courts and any other Court of Law relating to the subject matter.	
16	Any appeal against this EC shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.	Agreed.

VIBRANT
"Experience the unimaginable"

TEST REPORT

Annexure - 1

Sample Number:	VTL/FD/01	Report No.:	VTL/FD/2411300005
Name & Address of the Party	M/s SHRI BAJRANG POWER AND ISPAT LTD. (TMT Division), Khasra No.2/3, Village-Gondwara, Urla Industrial Complex, Raipur, Chhattisgarh, 493221	Format No.:	7.8 F 02
		Party Reference No.:	NIL
		Report Date:	05/12/2024
Sample Description :	Fugitive Emission Monitoring	Period of Analysis:	30/11/2024-05/12/2024
		Receipt Date	30/11/2024

General Information:-

Sampling Location	: Near Steel Melting Shop
Sample collected by	: VTL Team
Sampling Equipment used	: HVS
Instrument Code	: VTL/HVS/01
Latitude	: --
Longitude	: --
Meteorological condition during monitoring	: Clear sky
Date of Sampling	: 26/11/2024
Time of Sampling	: 08:30 to 16:30 Hrs.
Ambient Temperature (^{0}C)	: Min. 28°C, Max. 32°C
Surrounding Activity	: Human, Vehicular& Plant Activities
Method of Sampling	: IS-5182 & CPCB Guidelines
Sampling Duration	: 8 hrs.
Parameter Required	: As Per Work Order

Results

S. No.	Parameter	Protocol	Result	Unit	Limit
1.	Suspended Particulate Matter (SPM)	VTL/STP/02/STP/01	530.0	µg/m3	2000

----------End of the Report----------

Checked By

VIBRANT TECHNO LAB PRIVATE LIMITED JAIPUR

RK Yadav
Lab Incharge
Authorized Signatory

Term & conditions PTO

Approved & Certified EPA 1986 Recognised, ISO:9001 and OHSAS:45001 Certified

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TEST REPORT

Sample Number:	**VTL/FD/02**	**Report No.:**	**VTL/FD/2411300006**
Name & Address of the Party	M/s SHRI BAJRANG POWER AND ISPAT LTD. (TMT Division), Khasra No.2/3, Village-Gondwara, Urla Industrial Complex, Raipur, Chhattisgarh, 493221	**Format No.:**	7.8 F 02
		Party Reference No.:	NIL
		Report Date:	05/12/2024
Sample Description :	**Fugitive Emission Monitoring**	**Period of Analysis:**	30/11/2024-05/12/2024
		Receipt Date	30/11/2024

General Information:-

Sampling Location	: Near Brick Plant
Sample collected by	: VTL Team
Sampling Equipment used	: HVS
Instrument Code	: VTL/HVS/02
Latitude	: --
Longitude	: --
Meteorological condition during monitoring	: Clear sky
Date of Sampling	: 26/11/2024
Time of Sampling	: 09:00 to 17:00 Hrs.
Ambient Temperature (^{0}C)	: Min. 28°C, Max. 32°C
Surrounding Activity	: Human, Vehicular& Plant Activities
Method of Sampling	: IS-5182 & CPCB Guidelines
Sampling Duration	: 8 hrs.
Parameter Required	: As Per Work Order

Results

S. No.	Parameter	Protocol	Result	Unit	Limit
1.	Suspended Particulate Matter (SPM)	VTL/STP/02/STP/01	802.0	µg/m3	2000

----------End of the Report----------

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TEST REPORT

Sample Number:	VTL/FD/03	**Report No.:**	VTL/FD/2411300007
Name & Address of the Party	M/s SHRI BAJRANG POWER AND ISPAT LTD. (TMT Division), Khasra No.2/3, Village-Gondwara, Urla Industrial Complex, Raipur, Chhattisgarh, 493221	**Format No.:**	7.8 F 02
		Party Reference No.:	NIL
		Report Date:	05/12/2024
Sample Description :	Fugitive Emission Monitoring	**Period of Analysis:**	30/11/2024-05/12/2024
		Receipt Date	30/11/2024

General Information:-

Sampling Location	: Near Power Plant
Sample collected by	: VTL Team
Sampling Equipment used	: HVS
Instrument Code	: VTL/HVS/01
Latitude	: --
Longitude	: --
Meteorological condition during monitoring	: Clear sky
Date of Sampling	: 27/11/2024
Time of Sampling	: 10:00 to 18:00 Hrs.
Ambient Temperature (^{0}C)	: Min. 28°C, Max. 32°C
Surrounding Activity	: Human, Vehicular& Plant Activities
Method of Sampling	: IS-5182 & CPCB Guidelines
Sampling Duration	: 8 hrs.
Parameter Required	: As Per Work Order

Results

S. No.	Parameter	Protocol	Result	Unit	Limit
1.	Suspended Particulate Matter (SPM)	VTL/STP/02/STP/01	897.0	µg/m3	2000

----------End of the Report----------

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TEST REPORT

Sample Number:	VTL/FD/04	Report No.:	**VTL/FD/2411300008**
Name & Address of the Party	M/s SHRI BAJRANG POWER AND ISPAT LTD. (TMT Division), Khasra No.2/3, Village-Gondwara, Urla Industrial Complex, Raipur, Chhattisgarh, 493221	Format No.:	**7.8 F 02**
		Party Reference No.:	**NIL**
		Report Date:	**05/12/2024**
Sample Description :	**Fugitive Emission Monitoring**	**Period of Analysis:**	**30/11/2024-05/12/2024**
		Receipt Date	**30/11/2024**

General Information:-

Sampling Location	: Near Boiler & CHP
Sample collected by	: VTL Team
Sampling Equipment used	: HVS
Instrument Code	: VTL/HVS/02
Latitude	: --
Longitude	: --
Meteorological condition during monitoring	: Clear sky
Date of Sampling	: 27/11/2024
Time of Sampling	: 11:00 to 19:00 Hrs.
Ambient Temperature (^{0}C)	: Min. 28°C, Max. 32°C
Surrounding Activity	: Human, Vehicular& Plant Activities
Method of Sampling	: IS-5182 & CPCB Guidelines
Sampling Duration	: 8 hrs.
Parameter Required	: As Per Work Order

Results

S. No.	Parameter	Protocol	Result	Unit	Limit
1.	**Suspended Particulate Matter (SPM)**	VTL/STP/02/STP/01	789.0	µg/m3	2000

----------End of the Report----------

Checked By

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TEST REPORT

Annexure-2

Sample Number:	VTL/AA/01-04	Report No.:	VTL/A/2411300005-08
Name & Address of the Party	M/s SHRI BAJRANG POWER AND ISPAT LTD. (TMT Division), Khasra No.2/3, Village-Gondwara, Urla Industrial Complex, Raipur, Chhattisgarh, 493221	Format No.:	7.8 F 02
		Party Reference No.:	NIL
		Report Date:	05/12/2024
Sample Description :	Ambient Air Quality Monitoring	Period of Analysis:	30/11/2024-05/12/2024
		Receipt Date	30/11/2024

General Information:-

Date of Sampling	: 26-27/11/2024
Sample collected by	: VTL Team
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear sky
Surrounding Activity	: Human , Vehicular & Other Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: IS-5182 & CPCB Guidelines
Latitude	: 21.487669
Longitude	: 81.769348
Sampling Duration	: 24 hrs.
Parameter Required	: As Per Work Order

Sr.	Sampling Location	PM 10 (µg/m3)	PM 2.5 (µg/m3)	NO2 (µg/m3)	SO2 (µg/m3)	CO (mg/m3)	HC (mg/m3)
1.	Near Power Plant	82.76	44.18	19.59	10.74	0.61	0.92
2.	Near Rolling Mill	80.96	42.15	21.26	12.35	0.72	0.87
3.	Near Admin Building	65.42	33.91	17.41	9.48	0.59	0.78
4.	Near wire drawing mill	70.29	36.69	18.12	8.96	0.56	0.88
Limit		100	60	80	80	4	--
Protocol		IS:5182 (P-23)2006, RA 2017	IS:5182 (P-24)2019	IS:5182 (P-6)2006	IS:5182 (P-2)2001	IS:5182 (P-10)NDIR	IS:5182 (P-17)

----------End of the Report----------

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Term & conditions: NIL

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TEST REPORT

Annexure - 3

Sample Number:	VTL/W/01-02	Report No.:	VTL/W/2411300003-04
Name & Address of Party:	M/s SHRI BAJRANG POWER AND ISPAT LTD. (TMT Division), Khasra No.2/3, Village-Gondwara, Urla Industrial Complex, Raipur, Chhattisgarh, 493221	Format No.:	7.8 F 01
		Party Reference No.:	NA
		Report Date:	05/12/2024
		Period of Analysis:	30/11/2024-05/12/2024
Sample Description::	Water Sample	Receipt Date:	30/11/2024
Sample Collected by	VTL Team	Sampling Date:	27/11/2024
Preservation:	Refrigerated	Sampling Type:	Grab
Sampling & Analysis Protocol:	IS-10500-2012	Sample Quantity:	2.0 Ltr.

Test Results

S. No.	Parameter	Test Method	Near TG Building	Near Mechanical Lab	Unit	IS: 10500-2012	
						Acceptable Limit	Permissible Limit
1.	pH (at 25 °C)	IS 3025 (P-11): 2022	7.29	7.36	--	6.5 to 8.5	No Relaxation
2.	Turbidity	IS 3025 (P-10): 1984, RA 2017	*BLQ(**LOQ-1.0)	*BLQ(**LOQ-1.0)	NTU	--	--
3.	Total Hardness as $CaCO_3$	IS: 3025 (P-21): 2009,RA: 2019	210.0	232.0	mg/l	200	600
4.	Calcium as Ca	IS: 3025 (P-40): 1991, RA: 2019	52.0	66.0	mg/l	75	200
5.	Alkalinity as $CaCO_3$	IS: 3025 (P-23): 1986,RA: 2019	226.0	275.0	mg/l	200	600
6.	Chloride as Cl	IS: 3025(Part 32):1988, RA:2019	155.0	179.0	mg/l	250	1000
7.	Magnesium as Mg	IS: 3025 (P-46): 1994, RA: 2019	19.50	16.36	mg/l	30	100
8.	Total Dissolved Solids	IS 3025 (P-16): 1984RA: 2017	620.0	649.0	mg/l	500	2000
9.	Sodium as Na	APHA 24th Edition, 3500-Na: 2023	38.57	52.34	mg/l	--	--
10.	Sulphate (as SO4)	IS: 3025(Part 24):Sec-1, 2022	15.6	20.1	mg/l	200	400
11.	Nitrate as (No3)	IS: 3025(Part 34):1988	4.89	5.21	mg/l	45	No Relaxation
12.	Phosphate as (P)	IS: 3025(Part 31):2022	*BLQ(**LOQ-0.01)	*BLQ(**LOQ-0.01)	mg/l	--	--
13.	Iron as (Fe)	APHA 24th Edition, 3111 B: 2023	0.11	0.13	mg/l	1.0	No Relaxation
14.	Potassium as (K)	APHA 24th Edition, 3500 K: 2023	3.78	5.12	mg/l	--	--
15.	Feacal Coliform	IS: 1622:1981 RA 2019	<1	<1	MPN/100ml	<1	>161

Note: - *BLQ-Below Limit Quantification, *LOQ- Limit of Quantification

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TEST REPORT

Annexure - 4

Sample Number:	VTL/WW/01	Report No.:	VTL/WW/2411300002
Name & Address of Party:	M/s SHRI BAJRANG POWER AND ISPAT LTD. (TMT Division), Khasra No.2/3, Village-Gondwara, Urla Industrial Complex, Raipur, Chhattisgarh, 493221	Format No.:	7.8 F 01
		Party Reference No.:	NA
		Report Date:	05/12/2024
		Period of Analysis:	30/11/2024-05/12/2024
Sample Description:	Waste Water	Receipt Date:	30/11/2024
Sample Collected by	VTL Team	Sampling Date:	27/11/2024
Preservation:	Refrigerated	Sampling Type:	Grab
Method of Sampling:	APHA 23RD Edition	Sample Quantity:	2.0 Ltr.
Sample Location:	Plant Discharge Water		

Test Results

S. No.	Parameter	Test Method	Results	Unit	Limits
1.	pH (at 25 °C)	IS 3025 (P-11): 2022	7.16	--	5.5 to 9.0
2.	Total Suspended Solids	IS 3025 (P-17)	36.0	mg/l	100
3.	Oil &Grease	IS 3025 (P-39):2021	5.8	mg/l	10
4.	BOD (3days at 27 °c)	IS 3025(P-44):2023	20.0	mg/l	30
5.	COD	IS: 3025 (P-58): 2023	150.0	mg/l	250

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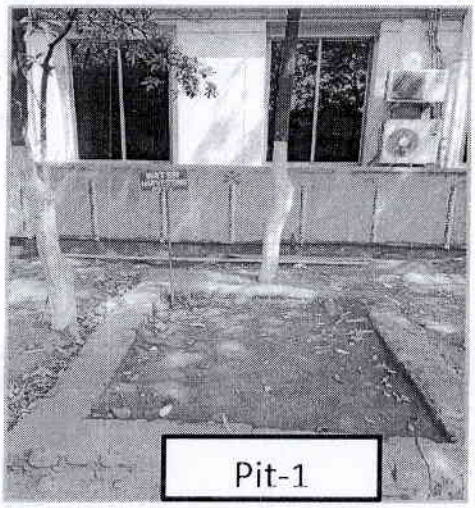
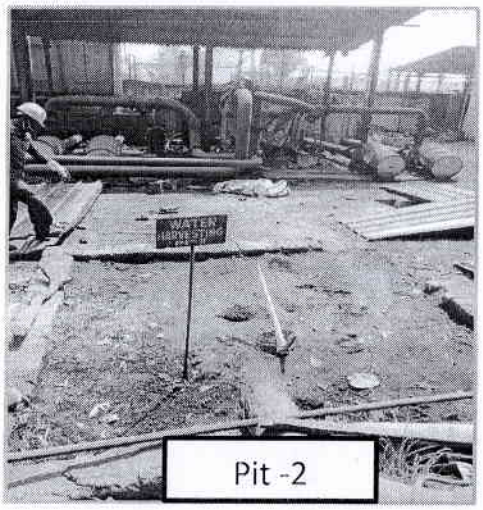
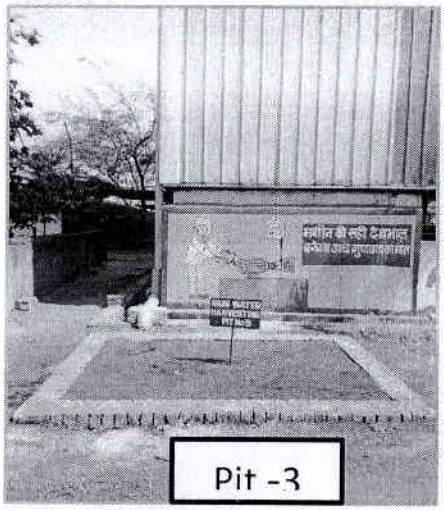
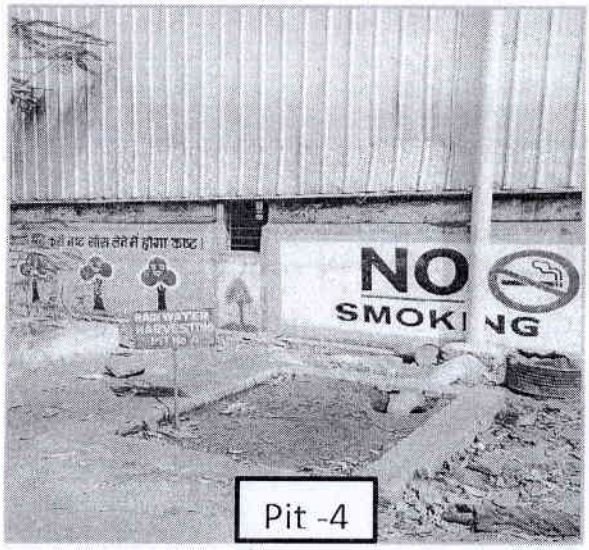
Annexure -5

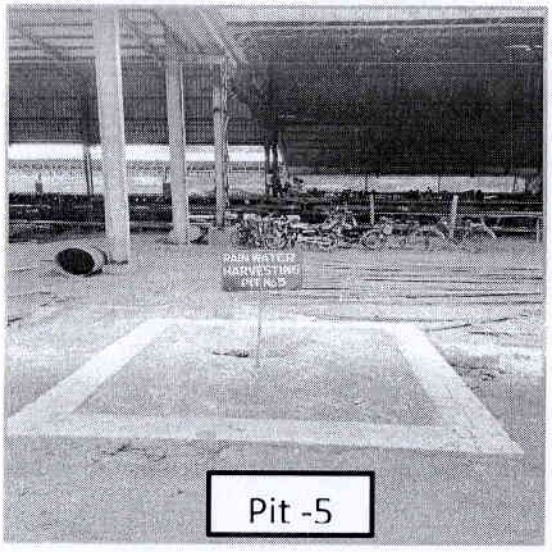
Rainwater Harvesting Photographs _











Rainwater Harvesting Pits, Gondwara

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TEST REPORT

Annexure - 6

Sample Number:	VTL/ N/01-04	Report No.:	VTL/N/2411300005-08
Name & Address of Party:	M/s SHRI BAJRANG POWER AND ISPAT LTD. (TMT Division), Khasra No.2/3, Village-Gondwara, Urla Industrial Complex, Raipur, Chhattisgarh, 493221	Format No.:	7.8 F-04
		Party Reference No.:	NIL
		Report Date:	05/12/2024
Sample Description :	Ambient Noise Level Monitoring	Receipt Date:	30/11/2024

General Information:-

Sample collected by	: VTL Team
Instrument Used	: Sound Level Meter
Instrument Calibration Status	: Calibrated
Instrument Code	: VTL/SLM/01-04
Meteorological condition during monitoring	: Clear Sky
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: IS 9989-1981 RA: 2020
Parameter Required	: As per Work Order

S. No.	Location	Date	Test Parameter	Test Result dB (A)	
				Day Time	Night Time
1.	Near Power Plant	26-27/11/2024	Leq	70.2	63.8
2.	Near Brick Plant	26-27/11/2024	Leq	61.5	52.7
3.	Near Admin Building	26-27/11/2024	Leq	60.3	51.4
4.	Near Boiler and CHP	26-27/11/2024	Leq	58.9	48.2

Category of Zones	Leq in dB (A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6.00 AM to 10.00 PM.
2. Night Time is reckoned between 10.00 PM to 6.00 AM.
3. Silence Zone is defined as an area up to 100 m around premises of Hospitals, Educational and Courts. Use of vehicle horn, Loudspeaker and bursting of crackers is banned in these zones.

Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shal apply

Checked By

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GHG EMISSION

SBPIL has operational control over a source of emissions, SBPIL has accounted for 100% of the scope 1 and 2 emissions. Scope 3 will be included at the later stage of the accounting exercise if required.

Using this operational control approach, this GHG Inventory Report includes emissions from the following operations:

Facility Name	Facility Address
Shri Bajrang Power & Ispat Ltd	KH. No. 2/3 ,Vill. Gondwara Urla Industrial Complex Urla Industrial Area Raipur (C.G.)

1.1. OPERATIONAL BOUNDARY

As per GHG protocol, the Sources of emission for the operational boundaries have been categorized under Scope 1 & 2 as under: -

Scope 1 (Direct Emissions) Include:
(On-site, Owned & Controlled by SBPIL)

1. Stationary Combustion – at Process Units
2. Stationary Combustion – at Captive Power Plant
3. Mobile Combustion – Operational Vehicles
4. Fire Extinguisher refilling

Scope 2 (Indirect Emissions) Include:
(Electricity Consumption)

1. Emissions due to purchased electric consumption from INDIAN Grid

The current GHG Inventory is the second consecutive report compiled by the Shri Bajrang Power & Ispat Ltd , therefore it includes the scope 1 and scope 2 emissions.

Scope I (Direct Emission)

1.Emissions from Power generated from captive plant.
2.Total emissions occurred in refrigerant (R22 gas, R-407C and R-32).
3.Company total coal consumption.
4.Company Owned Vehicles Diesel Consumption
5.Emissions from process

Scope II (Energy Indirect)

Purchased Electricity from INDIAN Grid.

1.2. GREENHOUSE GAS SELECTION

Under the Kyoto Protocol, six greenhouse gases have been selected based on the significant estimated volume in the atmosphere due to anthropogenic activities, and the significant potential for reduction. Countries which ratified the Protocol have committed to reduce the "basket-of-seven greenhouse gases, which include; Carbon dioxide (CO_2), Methane (CH_4), Nitrous oxide (N_2O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) and Sulphur hexafluoride (SF_6).

This report accounts for GHGs considered under the Kyoto Protocol, and the following Non-Kyoto GHG: Hydrofluorocarbons (HFCs) and CFC use in refrigeration.

In this document the results are presented in tCO2e which represents all the greenhouse gases.

Data used for GHG calculation

Scope	GHG Sources	Particular/Fuel Used	Unit
Scope I	Stationary combustion - at Process Units	sponge iron,Pellet, Scrap	MT
	Stationary combustion - at Captive Power Plant	Coal , Dolochar	MT
	Fire Extinguisher usage	Fire Extinguisher	Ton
	Mobile Combustion - Operational Vehicles	Diesel/Petrol	Km/Lit
	LPG Consumption	LPG	Kg
Scope II	Electricity Consumption from INDIAN Grid	Electricity Consumption	MWh

GHG emissions factors

Scope	Category	Emission Factor	Unit	Source
1	Diesel Consumption	2.69	KgCO2/lit	2006 IPCC Guidelines for National Greenhouse Gas Inventories
1	CO2 refill in FEs	0.001	tCO2/MT	
1	LPG consumption	2984.63	kgCO2/t	
1	Iron Ore/Mill Scale	0.037	tCO2/MT	World Steel Association
1	Limestone/Dolomite	0.44	tCO2/MT	
1	Pellet/Iron Ore	0.037	tCO2/MT	
1	Sponge iron	0.037	tCO2/MT	
1	Manganese Ore/ High Mno Slag	0	tCO2/MT	
1	Refill of Refrigerant R22	1810	-	2006 IPCC Guidelines for
1	Refill of Refrigerant R407C	1774	-	

1	Refill of Refrigerant R32	675	-	National Greenhouse Gas Inventories
1	Coal Consumption	2.46	tCO2/MT	
2	Electricity consumed from State Grid	0.79	tCO2/MWh	Central Electricity Authority
3	Electric Arc Furnace (EAF) (tonne CO_2 per tonne of steel produced) **	0.08	tCO_2/MT	Steel Production: Consensus of experts and IISI Environmental Performance Indicators 2003 STEEL (International Iron and Steel Institute, 2004)

Emissions by sources

SCOPE 1					
Category	**Quantity**	**UoM**	**Emission Factor**	**UoM**	**TCO2**
Diesel/Petrol Consumption due to employee commute, Raw material , solid waste and finished product transportation					
A. Owned Car , Bike etc.	51,150	Lit.	2.69	kgCO2/lit.	137.59
B. Raw Material (To and Fro)	3,37,920	Lit.	2.69	kgCO2/lit.	909.00
C. Solid Waste	6600	Lit.	2.69	kgCO2/lit.	17.75
D. Finished Product	3,96,000	Lit.	2.69	kgCO2/lit.	1065.24
CO2 refill in FEs	68	kg	0.001	tCO2/MT	0.068
LPG consumption	285	kg	2984.63	kgCO2/t	0.85
Raw Material					
1. Power Plant CPP 16 MW					
Coal	70000	MT	2.46	tCO2/MT	172200
Dolochar	70000	MT	1.28	tCO2/MT	89600
2. Rolling Mill with Reheating Furnace/ Coal Gasifier					
TMT Bars	150000	MT	0.08	tCO2/MT	12000
3. SMS (Steel melting Shop)					
Ingot /Billet	1,05,600	MT	0.08	tCO2/MT	8448
Total Scope 1 Emissions (tCO2e)					**2,84,378.50**
SCOPE 2					

Electricity consumed from State Grid	47,49,120	kWh	0.79	tCO2/MWh	3751.80
Total Scope 2 Emissions (tCO2e)					**3751.80**

Summary

1	**Total Scope 1 Emissions (tCO2e)**	**2,84,378.50**
2	**Total Scope 2 Emissions (tCO2e)**	**3751.80**
	Total	**2,88,130.30**

AVOIDED EMISSIONS

This section sets out a quantification of the avoided Greenhouse Gas emissions in operational boundary due to the implementation of environmental good practices on site. There are various GHG removals practices that SBPIL implementing on the ground level to minimize GHG emissions. **Error! Reference source not found.** mentioned various improvement practices. The quantified GHG removals is from the electricity generation from Captive Power Plant by using of Dolochar with coal in 1:1 this will help in reducing 82600 TCO_2 .

Elimination of Re-Heating Furnace by direct Charging of Hot Billets from CCM to Rolling Mill

Particular	Production (In MT)	Equivalent FO Saving to Re-Heat Billet (L/T)	Total FO Saved (KL)	Equivalent Saving GHG Emission (tCo_2)
Hot Billets	1,05,600	35	3696	20456.49

***

Waste Oil					
Density (tonnes/litre)		0.0009299	https://www.tradeindia.com/products/furnace-oil-for-industrial-uses-6187781.html		
NCV, TJ/kt		80	IPCC 2006 Vol 2, Chapter 1 (Table 1.2, page 1.18)		
COEFi, tCO_2/TJ		74.4	IPCC 2006 Vol 2, Chapter 1 (Table 1.4, page 1.24)		
OXID %		100%	IPCC 2006 Vol 2, Chapter 1 (Table 1.4, page 1.24)		

SBPIL has planted many trees in 18.28 acres (or 7.2 hectares approximately). Based on the conservative estimation, the plantation initiative by SBPIL has sequestered several tones of CO_2 Avoidance of GHG emission due to carbon sequestration in Greenbelt @average 0.16 T/tree/annum total trees planted 20000 No.s =3200 TCO_2.

Based upon the above figures the net avoided emissions from the processes of Shri Bajrang Power and Ispat Limited are 1,06,256.49 tCO_2e.

The total emissions broken down by Scope are as follows:

Emissions as per Scope 1 and 2

Scope Break Down:		2021-2022
Scope 1	tCO_2e	2,84,378.50
Scope 2	tCO_2e	3751.80
Total Emissions avoided and sequestered	tCO2e	1,06,256.49
Total Gross Emissions	tCO_2e	**1,81,873.81**

MITIGATION MEASURES

Every tonne of steel produced in 2021, emitted an average of 1.85 tonnes of carbon dioxide, equating to almost 8 percent of global carbon dioxide emissions. However, the industry now needs to cope with the pressure to reduce its carbon footprint from both environmental and economic perspectives. Currently, the steel industry is among the three biggest producers of carbon dioxide, with emissions being made in a limited number of locations; steel plants are therefore a good candidate for decarbonization. While the industry must adapt to these new circumstances, it can also use them as a chance to safeguard its license to continue running in the long term.

The following are the mitigation measures implemented by SBPIL to reduce emissions,

1. The commissioning of 50 MW solar project for increasing consumption of Green energy in the operations, thus reducing the emissions under Scope 2

2. The CPPL will also have Energy efficient TG set, thus reducing emissions increasing efficiency

4. Replacement of Small Electric Arc Furnace by bigger capacity (Under Expansion Proposal)

5. We are also implementing PAT Energy efficient measures in the operations to increase energy efficiency

Measures that could be considered for reducing the GHG emissions

Below listed are some of the decarbonization strategies and running pilot plants to assess different production technologies,

Long-Term Strategies for Carbon Neutrality by 2030

- Greater use of electricity produced from renewable sources i.e., up to 60%, could dramatically reduce CO2 emissions from iron and steel production.
- Fossil fuel-based carbon is widely used in iron and steel making in a number of forms, and the replacement of these materials with renewable carbon derived from biomass offers the greatest potential to reduce the greenhouse gas footprint of steel production.
- The steel production using HYBRIT (Hydrogen Breakthrough Iron making Technology), which uses electricity from renewable sources to create the clean-burning gas. With this process, hydrogen replaces fossil fuels both in the manufacture of iron pellets and carbon purification process.

Annexure-8

RISK ANALYSIS FOR POSSIBLE HAZARDS AND PREVENTIVE MEASURES

After studying of process, we found the most dangerous points of possible. Fire and other accidents and listed them below in order of their seriousness. Most dangerous part is Induction Furnace.

RISK ANALAYSIS FOR SMS

S. No.	OPERATION PROCESS EQUIPMENT/ AREAS	POSSIBLE HAZARDOUS	PRECAUTIONARY MEASURES	MEASURE TO BE TAKEN IF HAZARDOUS OCCURS	REMARKS
1.	Induction furnace, CCM, Ladle Preheater and submerged arc furnace	Fire hazard caused by flames, burnt may possible if directly come in contact.	1. Fire suit/Apron provided to workmen, those are working on furnace. 2. Firefighting equipment powder / foam type extinguishers on vehicles and mounted on walls are kept readily available. 3. Hydrant systems provided of conspicuous places. 4. Water hose provided. 5. No smoking zone declared. 6. Furnace operators' staff and labours are trained to fight fire.	1. Stop the power supply of plant area. 2. Fire extinguishers shall Immediately use. 3. Water hose will be operated to set out the fire. 4. Emergency alarm to be put on to signal the accident. 5. First aid shall be rushed to the site by the security staff. 6. Inform the Manager / Director present in the factory. 7. Immediate First Aid should be given to the victims and send to hospital for further treatment.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Leg guard, Nose Mask etc.
	Charging of RM, scrap and other material in Induction, SA Furnace and moving parts of CCM Roller table and other machines	Cut / burnt and fire hazards may possible.	1. Workers are provided with gloves & proper equipments to handle and feed the scrap. 2. Workers charging the materials in the furnace are equipped with fireproof dress and proper equipments to handle the scrap and material. 3. Fireproof system made available and firefighting equipment like extinguisher and water hydrant lines with sufficient number of points easily available. 4. Only trained and qualified people operate the furnace. 5. Only authorized person are allowed in furnace floor area.	1. If any worker will hurt / burnt in plant immediate first aid should be given to the victim by trained person and refer to the doctor/ hospital for further treatment. 2. Information should be given to the Director/HR Dept. 3. First Aid is given to the victim by shift in-charge / trained person and then refer to the Doctor for further treat.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
	Furnace is	In case of	1. Continuous monitoring of	1. Immediately drain out	PPE's will be

	leaked	furnace crack, molten metal may leak causing splash of hot metal.	furnace shall be done to maintain and observed proper temperature. 2. Movement of staff and labours is not permitted near to the furnace. 3. Heat zone sign displayed near to the furnace. 4. GLD system installed in panel room.	the furnace by pouring or tapping out. 2. Molten Slashed Metal is allowed to cool down before removing. 3. Further process is stopped till repairs are conducted. 4. In case of fire, fire fighting equipments to use to set out the fire.	available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
2.	Positioning of Ladle for Slag Raking.	1. Splashing of Metal. 2. Fire hazard. 3. Fall of Raking machine boom/plate in to the ladle. 4. Spillage of Hot Metal/Fire hazard.	1. Operators Cabin to be provided to prevent splashes. 2. Fire extinguishers and water spray systems to be available to extinguish any fire breakout. 3. Ladle to be moved to crane approach after clearing the tracks. 4. Ladle to be evacuated using EOT crane to pour the hot metal into another ladle.	1. Routine inspection & Maintenance of Raking, wire rope condition and crane equipment to be done. 2. Third party inspection.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
3.	Tapping of Molten metal in the Ladle/ moulds/CCM process of continuous casting.	Burn due to Hot metal is possible and sometime explosion may possible.	1. Fire proof system made available. 2. Whole process is operated by trained and qualified person. 3. During tapping entry of other person/ worker is prohibited. 4. During the process of heating & drying entry of other person/ worker is prohibited.	A) Complete process is taken up in presence of shift in-charge and by his. B) Even after if any worker gets hurt then firstly first aid is given & then refer to Doctor / Hospital for further treatment.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
4.	Pouring of Hot Metal from Ladles	Metal spillage due to over flow, Burn Injuries, cuts/ wounds/crush injuries, heat stress, Dust/ fume, fire/ flame, flying graphite Particle, heat exposure, hot metal/ slag splashes	1. Proper Positioning of the HM ladle and controlled mixer tilting to be ensured prevent the spillage / overturning of mixer. 2. Visibility to operator should be ensured. 3. Functioning of Tilt in / out to be checked before pouring hot metal. 4. Mixer lining condition to be checked as per SOP.	1. Level sensors for free board measurement system to be in place (Laser/Camera based) to avoid overfilling. 2. Ladle and barrels should be free from moisture. 3. Fire hydrant and Extinguishers to be kept as standby.	PPE's will be available as per job specific like dust masks/pad, helmet, safety boot, hand gloves, anklet, blue glass, Fire retardant suit/ canvass coat etc.
5.	Hot Metal ladle is lifted by crane.	Liquid metal / slag splashing.	1. Auto / manual Emergency breaks shall be made available in cranes and operators to be trained. 2. Hooter shall be provided to alert persons. 3. Unauthorized Movement of people should be restricted under the crane. 4. Lifted weight tracking	Routine inspection Maintenance of wire rope condition and crane equipment to be done.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.

			ensuring proper draining of the casting ladle during the above-mentioned emergency situations. 2. Proper precautions to be taken by mould operators for preventing fire related hazards during mould overflow, tundish stopper running, mould boil, radioactive hazards when using mould level control system. 3. Slag boxes should be made available for metal. 4. Casting platform & shop floor below the filled tundish movement shall be cleared of personnel for preventing safety hazards. 5. Ladle handling crane shall have inching speed for safe handling. 6. Refractory encasing and plate heat shield shall be provided for protection of all structures. 7. Movement of filled tundish to be handled with crane over & along a free zone area.	& maintenance of mould with radiometric system. 3. Incase of fire availability of firefighting system with fire detection and alarm system.	
11.	Radioactive	Radiation poisoning, Cancer, Immune system suppression, Neurological effects, Environmental contamination, Long-term exposure.	1. Pulsecho system meter is used to detect radiation. 2. Proper ventilation and exhaust system are ensured at the work place. 3. Regular checking of radiation levels and its log book are being maintained every day. 4. Signages board installed in the work area to warn about radiation hazards. 5. We have provided physical barriers to the radioactive source area in order to prevent unauthorized entry. 6. Stored Radioactive material in their designated area 7. We are ensuring threat awareness and training safety standard, response and all personnel with secondary responsibilities for safety purpose. 8. Unauthorized persons are not allowed to enter	1. If any leakage or defect is found immediately will be informed the designated Radiation Safety Officer (RSO) and isolate the affected area by restricting access to authorized personnel only. Establish a safety perimeter and immediate evacuate the affected area. 2. If any employees show signs of radiation exposure, providing immediate medical treatment and Coordinate with local medical facilities and radiation experts to potential cases of radiation exposure. 3. Training of work knowledge and safety measures to concerned employees.	PPE's will be available as per job specific like as Dosimeter, Apron, Respirators with particulate filters, Safety Shoes, Safety Helmet, Safety Goggle, Hand Gloves etc.

			facility crane.		
6.	Shifting of Ladle moulds by crane	Serious injury may cause due to movement of moulds ladle by crane if mould are not fastened carefully.	1. Ladle / mould are placed where tapping is done and after taping shifted to cooling place. 2. Proper monitoring is done by the shift In-charge during the process. 3. Fastening & loosing of moulds from the crane is done by trained person under the guidance of shift in-charge. 4. Crane is not run till line clear is given.	a) The crane movement is done only after obtaining the line clearance. b) If any injury may cause then after giving first aid to person/ worker refer for further treatment to Doctor/ Hospital.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
7.	Tap Hole Opening and Closing	Burn Injury, Respiratory Illness, Heat Stress, Hot metal/ slag Splashes, Flame	1. Ensure dryness of launder. 2. Ensure there is no water in thimble. 3. Use protecting sheet.	1. Maintain good house-keeping. 2. Safety training given.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
8.	Oxygen lancing while ladle not free open	1. Metal Spillage. 2. Fire of Hydraulic line.	1. In-built Flash back arrester in lancing system. 2. Controlling of metal to avoid spillage. 3. Proper shrouding of ladle should be done. 4. Ensuring special high quality (chromite based) sand usage for ladle free open.	1. Regular inspection and Periodic maintenance of all equipment's. 2. During oxygen lancing work operator should away from ladle to avoid any mishap. 3. Uses of good quality lancing pipe.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
9.	Transfer of steel teeming ladle to Caster	Metal spillage. Fire in hydraulic line & system.	1. Ladle should be lifted slowly and very carefully to continuous casting machine. 2. Shop floor below the ladle movement and turret loading area is cleared of any personnel during operation. 3. The pathway for overhead filled ladle movement facilities involving only machinery engagement.	No one should be on pathway during ladle transfer on the pathway of ladle to caster.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
10.	Casting operation related abnormalities & emergency situations	Metal spillage, Fire hazard, Explosion	1. During start of continuous casting operations, Ladle Turret emergency rotation must be checked to ensure proper rotation & safety measures during casting ladle troughs / slide gate failure led slag /metal splashing. Emergency ladle to be positioned at the rear end of the ladle turret prior to start of casting for	1. Tundish shell condition to be monitored with infrared pyrometer for ensuring identification & elimination of hot spots for preventing tundish troughs & metal slag spillage during casting operation. 2. Proper maintenance related procedures to be adhered to while handling	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.

			ensuring proper draining of the casting ladle during the above-mentioned emergency situations. 2. Proper precautions to be taken by mould operators for preventing fire related hazards during mould overflow, tundish stopper running, mould boil, radioactive hazards when using mould level control system. 3. Slag boxes should be made available for metal. 4. Casting platform & shop floor below the filled tundish movement shall be cleared of personnel for preventing safety hazards. 5. Ladle handling crane shall have inching speed for safe handling. 6. Refractory encasing and plate heat shield shall be provided for protection of all structures. 7. Movement of filled tundish to be handled with crane over & along a free zone area.	& maintenance of mould with radiometric system. 3. Incase of fire availability of firefighting system with fire detection and alarm system.	
11.	Radioactive	Radiation poisoning, Cancer, Immune system suppression, Neurological effects, Environmental contamination, Long-term exposure.	1. Pulsecho system meter is used to detect radiation. 2. Proper ventilation and exhaust system are ensured at the work place. 3. Regular checking of radiation levels and its log book are being maintained every day. 4. Signages board installed in the work area to warn about radiation hazards. 5. We have provided physical barriers to the radioactive source area in order to prevent unauthorized entry. 6. Stored Radioactive material in their designated area 7. We are ensuring threat awareness and training safety standard, response and all personnel with secondary responsibilities for safety purpose. 8. Unauthorized persons are not allowed to enter	1. If any leakage or defect is found immediately will be informed the designated Radiation Safety Officer (RSO) and isolate the affected area by restricting access to authorized personnel only. Establish a safety perimeter and immediate evacuate the affected area. 2. If any employees show signs of radiation exposure, providing immediate medical treatment and Coordinate with local medical facilities and radiation experts to potential cases of radiation exposure. 3. Training of work knowledge and safety measures to concerned employees.	PPE's will be available as per job specific like as Dosimeter, Apron, Respirators with particulate filters, Safety Shoes, Safety Helmet, Safety Goggle, Hand Gloves etc.

			radioactive areas. 9. Appropriate personal protective equipment's has been provided to all concerned workers to protect from radioactive radiation at the workplace.		
12.	Tundish	Burn Injury Metal spread during casting.	1. Overflow bucket shall be provided in standby. 2. Condition monitoring of refractory during preheating. 3. Tundish emergency bucket positioning at casting position is mandatory.	Regular inspection and Periodic maintenance of all equipment's.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
13.	Temperature and Sample taking	Heat, Dust, Splashes contact with hot materials.	1. Auto online temperature measurement is taken. 2. Manual sampling with all protective PPE's.	1. Good housekeeping practices at furnace floor is done. 2. Standard distance is maintained during sample taking work.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
14.	End of Casting	Heat Explosion Burn Injury	1. Avoid spraying the water directly on the top of the liquid metal. 2. Water to be sprayed on the mould wall outer face.	1. Face shield to be used by operator as additional safety. 2. Usage of PPE's to be ensured.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
15.	LRF (Ladle Refining Furnace)	1. Fire Hazardous 2. Caused by liquid Hot metal burned may possible if directly come in contact. 3. Molten hot metal may fell on human body.	1. As it is for I/F 2. No manpower movement allowed under Liquid hot metal transfer route. 3. Operating staff provide training for fire fighting. 4. No water use on LHM (Liquid Hot metal) to avoid serious accident. 5. Good Housekeeping in work area.	1. Switch off the System. 2. Immediate use of suitable fire extinguishers. 3. Start Emergency alarm for information about accident. 4. First Aid shall be provided at site. 5. Information to all converted & Higher authorised. 6. Make availability of Ambulance of site to shift persons for treatment if any.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
16.	Slab cutting with torch cutting machine	Torch back fire, Equipment damage due to back flash. Fire in LPG / Oxygen line.	1. Cutting speed to be with respect to casting speed. 2. Regular nozzle cleaning based on Pressure feedback to be done. 3. Edge feelers provided to start auto cutting.	NRV/Flash back arrestor is provided on all gas cutting set.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand

					Gloves, Nose Mask etc.
17.	FO, Diesel Oil etc. Storage & pumping to equipment.	Fire hazard may possible if come in direct contact with fire.	1. Fire proof system made available like Foam, Extinguishers and Hydrant system etc. keep accessible. 2. Stored in MS cylinder tank & kept away from any type of fire causing things.	1. Proper care to be taken in storing and keeping the drum of oil. 2. Precautions should be adopted.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle, Hand Gloves, Nose Mask etc.
18.	Welding & Gas Cutting like Oxygen and LPG cylinder etc.	Fire hazard caused by flames & leakage on inhalation cause damage of nasals system & lungs.	1 Fire suit/Apron have been provided to workmen, those are working welding and gas cutting work. 2.Fire Fighting Equipment's, powder/ Foam type extinguishers on vehicle and mounted on walls are kept readily available. 3. Hydrant system provided at conspicuous places. 4. Fire Fighting man is employed. 5. Precautions to ensure that cylinders are not allowed to clash with each other. 6. Cylinders are handled carefully without dropping or rolling. 7. Sand bed cushion available for the purpose of unloading cylinders and point of transferring. 8. Periodic inspection done to avoid accident of any kind.	Emergency kit is kept ready which consisting of:- 1. Tools stopping leakage through storage tank/ pipe line. 2. Self-contained breathing apparatus must be provided. 3. Detector solution to detect percentage of leakage (available at site). 4. CO Gas detector are installed to detect the leakage as it is poisonous gas. 5. Hydrant point has been provided at the proximity of gas cylinders and also be kept outside the factory too.	PPE's will be available as per job specific like as SCBA, Safety Shoes, Safety Helmet, Face Shield, Apron Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
19.	Furnace transformer	Fire hazard possible	1. Furnace should be operated with prescribed load. 2. Carefully changing of tap on load. 3. Temperature of furnace / transformer should be observed continuously. 4. Furnace oil level / quality monitored regularly. 5. Unauthorized person are restricted no entry boards should be provided.	1. Power line should be immediately put off. 2. Firefighting procedure should be taken to stop fire. 3. Further processing must be stopped till repairing is over.	PPE's will be available as per job specific like as Safety Shoes with fibre tow, Safety Helmet, Face Shield, Safety Goggle, Electrical Insulated Equipment's, Rubber Hand Gloves, Nose Mask etc.
20.	Water tank	Drown of a man is possible.	1. Cooling pond/ water tank should be fenced or covered. 2. Must not be permitted for using the tank/ pond for	Drowned person should immediately be given first aid.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle,

			general utility.		Hand Gloves, Nose Mask etc.
21.	Control Rooms	1.Electrical Shock possible due to leakage. 2. Fire Hazards possible	1. Earth leakage circuit breaker is installed. 2. Electric rubber mats is installed on all panel area. 3. Fire extinguishers installed.	In the event of electric leakage main supply should be immediately shut off.	PPE's will be available as per job specific like as Safety Shoes with fibre tow, Safety Helmet, Face Shield, Safety Goggle, Electrical Insulated Equipment's, Rubber Hand Gloves, Nose Mask etc.
22.	Cooling Tower	Burnt due to returning hot water may possible.	1. All workers are not permitted to near the tank and hot water line. Railing is provided all round the tank. 2. Victims are first aided by trained person and then referred to Doctor/ hospital.	1. Always precautionary measures should be taken and adopted. 2. If any workers get hurt then immediate first aid should be provided to him and refer to the hospital/Doctor for further treatment.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle, Safety Belt, Hand Gloves, Nose Mask etc.
23.	Electrical transformer	1. Electric current leakage. 2. Fire.	1. Shock proof insulated PCC platform. 2. Firefighting equipment's, Sand buckets and Fire extinguisher installed at transformer area.	1. Cut off the power supply treat the injured for electrical shock. 2. Immediately fight fire with available resources summon outside help if necessary.	PPE's will be available as per job specific like as Safety Shoes with fibre tow, Safety Helmet, Safety Goggle, Insulated Rod, Electrical Insulated Equipment's, Rubber Hand Gloves, Nose Mask etc.
24.	Lab Chemicals	In case of spread of hazardous chemical, causes burnt and damage to respirator systems.	1. Well-qualified and trained personnel should be employed in lab and chemical should be handled under his close supervision and guidance. 2. Proper care should be taken while handling the chemicals. 3. First Aid Box should be available at Site with all-necessary and required medicines. 4. Firefighting equipment like Extinguishers, sand buckets should be available every time. 5. Eye shower is installed. 6. MSDS applying for chemical handling.	1. We have provided drenching shower for washing purpose. Apart from it a well-equipped first aid box also provided in the area. 2. Instruction Board to be displaced for knowledge of other workers to take care of the situation in the event of occurrence.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, face shield, Nose mask, acid-proof suit, Rubber hand gloves etc.

GASIFIER- RISK ANALAYSIS & POSSIBLE HAZARDOUS

S/N	OPERATION /PROCESS EQUIPMENT/ AREAS	POSSIBLE HAZARD/EVENTS OR RISK	CONSEQUENCES	PRECAUTIONARY MEASURE PROPOSED	REMARKS
1.	Feed hopper area	• Fire Hazard & Hopper material may be fall down Due to crane failure.	• Explosion, injury to operator. • Burn injury.	• Crane to be operated carefully & bucket should not be overloaded. • Bucket is lifted perpendicularly. • Ensure No Smoking Zone. • Use of proper PPE's. • Checking of Crane rope condition & brake condition. • Installation of Suitable Fire Extinguisher near workplace.	PPE's will be available as per job specific like Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
2.	Fuel preparation and feeding	• Particulate matter exposure • Frequent failure of automated fuel feeding system • Gas leakage.	• Dangerous to Operator, health pollution • Exposure to CO and PM from manual feeding. • Suffocation.	• Mechanical operation should be in- proper supervision, • Ensure No Smoking Zone. • Use of proper PPE's. • Installation of Suitable Fire Extinguisher near workplace. Gas detector system are installed in working areas.	PPE's will be available as per job specific like SCBA Set, Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
3.	Coal Charging Area	• Fire Hazard. • Body Injury.	• Danger to operator health, pollution, gas poisoning and explosions. • Burn Injury.	• To Make Sure Oxygen should not pass into furnace. • Single valve operation at any time. • Ensure No Smoking Zone. • Use of proper PPE's.	PPE's will be available as per job specific like SCBA Set, Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
4.	Poking Area	• Fire Hazard. • Body Injury	• Exposure to CO and PM10 & PM 2.2 from manual feeding • Danger to operator health, pollution. • Burn injury	• Proper distance to be maintained while poking to safeguard in backfire. • Ensure No Smoking Zone. • Use of proper PPE's. • Installation of Suitable Fire Extinguisher near workplace.	PPE's will be available as per job specific like SCBA Set, Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
5.	Ash Tray Area	• Hazardous gas leakage.	• Leakage of Gas hence pollution and harm to	• Maintaining Water label properly.	PPE's will be available as

		• Ash Spreading. • Hot Water leakage.	operator health • Environmental Pollution.	• Ensure No Smoking Zone. • Use of proper PPE's. • Gas detector system are installed in working areas.	per job specific like SCBA Set, Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
6.	Ash conveyor, Feed coal conveyor & Water Seal	• Came in contact with moving Parts. • Body Injury. • Slippery floor.	• Possibility of harm/injury to operator • Dangerous to operator health, pollution, gas poisoning and explosions. • Environmental pollution	• Maintaining Water seal level properly. • Make sure Water level levelled. • Declared as no Welding/Cutting zone. • Ensure No Smoking Zone. • Use of proper PPE's. • Housekeeping to be done on regular basis. • No loosed cloths allowed near conveyor belt area.	PPE's will be available as per job specific like Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
7.	Gasifier Reactor	• Leakages and air penetration during fuel feeding explosions. • Hot surfaces of the reactor Harm to operators. • Gas coatings on doors of the reactor and lock hopper. • Pressure build-ups. • Flames through the gasifier reactor nozzles. • Operator errors with the reactor.	• Environmental pollution and possible fire outbreak • Accident and damage to equipment • Fire Explosion • Explosion, harm to operator • Noise pollution	• Proper Supervision by trained person of Machinery part • Use Safety interlocking system. • Provide Safety training once in week. • Use of proper PPE`s • Maintain standard parameter of flow, temperature, pressure. • Control reactor of gasifier should maintain positive pressure so that the gas during leakage should not enter to control room in case of leakage. • Highly Skilled staff is deputed in operation of gasifier. • More attention has been done. • More automation has been done to avoid causality in worst scenario if it be there. • Any abnormality is to be immediately attended and the change to be coal and charging to be stopped if required pressure release mechanism to be activated.	PPE's will be available as per job specific like SCBA Set, Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
8.	Cyclone and	• Hot Surface	• `Harm to Operator (Scalds	• Proper supervision of	PPE's will be

	gas cooling	• Leakage of dust	and burns), fire hazards • Environment Pollution	Machinery part • Maintain standard parameters of flow, temperature, pressures.	available as per job specific like SCBA Set, Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
9.	Water Scrubber	• Hot Water Leakage • Hot fume leakage. • Hot Surface of the scrubber • disposal of sludge from the scrubber pond	• Irritation, environmental pollution • Partial/permanent injury to operator. • Fire injury to operator (burns and scalds)	• Water Seal level maintain properly. • Schedule preventive maintenance • Timely checking & cleaning pipeline and nozzles. • Allowed only skilled person for operation. • Provided job related training to casual worker. • Job related PPE`s provided to Operator and worker. • Installation of Suitable Fire Extinguisher near workplace.	PPE's will be available as per job specific like SCBA Set, Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
10.	De dusting (filtering)	• Dust fumes • Operator errors (failure to meet instructions)	• Danger to operator health pollution • Leakage of gas hence pollution and harm to operator health	• Use Nose Mask • Install dust monitoring control measure to monitor level of CO, CO_2, PM (Harm full gas Etc.) • Installation of fugitive emission control system.	PPE's will be available as per job specific like SCBA Set, Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
11.	Cooling jacket	• Blasting of pressure vessels • Untrained operator • Slippery Area.	• Partial/permanent injured to operator.	• Placed Water Level Gauge and Pneumatic Safety Pressure release valve in both high- and low-pressure cooling jackets. • Allow only skilled persons for operation • Job Safety Training provided to casual worker. • Job related PPE`s provided to Operator and worker. • Housekeeping to be done on regular basis.	PPE's will be available as per job specific like Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.

12.	Vapour drum	• Blasting of vapour drum • Untrained operator • Hot gas Leakage.	• Burn injury • Partial/permanent injured to operator. • Fire incident	• Placed additional pneumatic safety pressure release valve in the vapour drum. • Vapour drum water level have been provided additionally by incorporating pneumatic control valve. • Job Safety Training provided to casual worker. • Job related PPE`s provided to Operator and worker. • Installation of Suitable Fire Extinguisher near workplace.	PPE's will be available as per job specific like SCBA Set, Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
13.	Gas line (Upstage and down stage)/ Gas headers	• Blasting of gas Pipeline. • Untrained operator. • Gas leakage.	• Burn injury • Partial/permanent injured to operator	• Water seals on both gas lines (upstage and down stage). • Rapture discs have been provided on the gas headers and line up feeding point on different locations. • We have incorporated all the electrical interlocks as required by the system for safe operation. • Only allowed skilled person for operation. • Job Safety Training provided to casual worker. • Job related PPE`s provided to Operator and worker. • Installation of Suitable Fire Extinguisher near workplace. • Gas detector system are installed in working areas.	PPE's will be available as per job specific like SCBA Set, Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.

RISK ANALAYSIS FOR POWER GENERATION

S.	Operation /	Possible	Precautionary	Measures to be taken	Remarks

No.	process Areas	Hazards	measures exiting	if hazards occur.	
1	Boiler Operation & Maintenance	Formation of clinker. Fuel oil leakage. Coal dust leakage. Fire Hazards. Electrocution. Exposure to the hot surface of pipeline or machineries. Slip, trip and fall from height.	Pepper combustion of coal, maintaining access air, periodic inspection of furnace. Maintaining flow and pressure, maintenance of control valves. Combustion Material should not be present in the vicinity /Substitution. Proper isolation from electrical panels use of PPEs. Proper barricading proper guardrails.	A. Regular inspection and Periodic maintenance of all equipment's. B. Proper given work-related training. C. Proper PPEs and use of boiler suits such as gloves.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle, Fire Resistance Suit, Hand Gloves, Nose Mask etc.
2	Turbine Operation & Maintenance	A. Steam Leakage. B. Noise and vibration. C. Overheating of insulation. D. High Vibration causing damage to oil lines. E. Electrocution due, improper isolation of equipment from HT/LT panel. F. Slip and trip Hazard. G. Fall of load /braking of chain / injury due pending effect.	A. Maintenance and inspection / proper insulation. B. Tripping of turbine using governing system/ mechanical tripping using fly ball. C. Use of seal oil system/ proper functioning of DPRV valve /Regular trial of DC seal oil Pump. D. Periodic replacement of insulation and inspection. E. Proper maintenance of shaft and bearing lubrication. F. Proper housing keeping.	A. Regular inspection and Periodic maintenance of all equipment's. B. LOTO system and use of PPEs. C. Proper given work-related training.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle, Hand Gloves, Ear Muff etc.
3	Leakage of steam from pipe line	Leakage of steam may cause superficial burn if victim directly come in contact.	Fire suit/Apron have been provided to workmen, those are working on steam pipe line & there emergency kit is kept ready which consisting of:- A) Tools for stopping leakage through boiler and pipeline. B) The entire pipeline has covered with insulators/piping. C) Detector solution to detect percentage of leakages (available at site). D) Regular inspection and monitoring by trained persons.	In the event of major leakage, the production of steam will be stopped and maintenance of leakage point may carry quickly.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle, Fire Resistance Suit, Face Shield, Hand Gloves etc.

4	Boiler Dryer Generator, Compressor and other machines.	Hurt may possible if come in contact with any moving part.	A) All Machines are compact and whole process is done under consistent watch of supervisors and by adopting all safety precaution and measures. B) All workers are not permitted to come near to the machines. Safety guards & railings are provided all-round the machines. Victims are First-Aided by trained person and then carried to the Doctor.	Even after if any worker gets hurt then First-Aid is given to him and if hurt is serious then is referred to the Doctor /Hospital for further treatment and check-up.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Ear Plug, Hand Gloves etc.
5	Control Room	Electrical shock Possible due to leakage	A) Earth leakage Circuit breaker is installed. B) Shock precaution & treatment chart are displayed. C) Operator is provided with Insulated shoes. D) All instruments are properly earthed. E) Electrification layout & diagram is displayed.	A) In the event of electric leakage main supply should be immediately shut off. B) Shock treatment & medical Aid shall be immediately provided	PPE's will be available as per job specific like as Electrical Safety Shoes, Safety Helmet, Electric Shock Proof Hand Gloves etc.
6	Electrical Maintenance	Electrical Shock, Burn, Flashing & Fire Hazard.	Before starting Electrical work, the Following actions are being taken A) Proper PTW being taken. B) All Electrical points isolated before starting the work. C) Proper PPE's used. D) Lockout &Tag out system adopted.	A) Installation of Fire Extinguisher to take care of fire hazard in the factory area. B) Shock treatment & medical Aid shall be immediately provided. C) Fire Tender with trained firefighters will be deployed.	PPE's will be available as per job specific like as Electrical Safety Shoes, Safety Helmet, Electric Shock Proof Hand Gloves, Face Shield, FR Suit etc.
7	Leakage of CO gas.	Poisoning. Unconscious.	A) Any case of poisoning of CO gas will be given initiate first health treatment. The cause of CO leakage will be detected and eliminated / rectified. B) CO Gas detector and alarm system are installed to detect the leakage as it is poisonous gas. C) Ensure proper ventilation and airflow. D) Maintain and inspect fuel-powered equipment. E) Prohibited the use of fuel- powered equipment in enclosed space.	A) Conduct regular inspection and periodic maintenance of all equipment's. B) Drowned person should immediately be given first-aid.	PPE's will be available as per job specific like as SCBA Set, Respirator Mask, Safety Shoes, Safety Helmet, Safety Goggle, Hand Gloves, etc.

			F) Provided training and awareness programs. G) Emergency response plans have been established.		
8	Working at height	Fall of person. Material fell down.	A) Medical fitness certificate should be submitted, who will work at height. (Above 02 mtr.) B) Hand rail, mid rail and toe guard should be provided on scaffolding. C) Use of jali/gratings for making of platform. D) Adequate access i.e. ladder should be provided on scaffolding/platform. E) Fall arrestor should be provided on ladder for vertical movement. F) Scaffolding should be checked & tagged by competent/ authorized person. G) Horizontal lifeline should be provided to horizontal movement.	In case of emergency, all workmen should be assembled at assembly point without create panic.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle, Safety Belt Full Body Harness with Double Lanyard, Fall Arrester, Hand Gloves etc.
9	Loading & Unloading	A) Failure of Lifting Tools & Tackles. B) Topple of Hydra/Crane	A) Guide rope /Tag line will be used to avoid swinging condition. B) Area will be barricaded to stop unauthorized entry. C) Experience operator will be operating to the crane. D) Only tested lifting tools & tackles will be used. E) Only experienced riggers will be allowed. A) Before hydra/Crane movement, ground condition should be checked. B) Only experienced & certified operator should be allowed. C) During Material lifting, only experienced signalman will be allowed to give signal. D) Inspection will be done on regularly basis. E) Load chart will be available in hydra/crane cabin. F) Don't lift over load material.	A) Only competent and approved operator shall be deployed for lifting operations. B) Equipment's as well as lifting tools to be certified by competent persons before deployment. C) Daily inspection of the equipment should be done by the operator. D) No overloading allowed follow procedures of same handling.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle, Hand Gloves, Nose Mask etc.

			G) Crane/Hydra should be inspected & certified by TPI. H) Before material loading/unloading by crane/hydra, weather condition (wind direction) should be checked.		
10	Storage & Handling of Cylinder	Explosion leakage of gas.	A) Cylinder should be kept in vertical position on trolley. B) Cylinder should not be rolled directly on ground. C) Cylinder storage should be in cover shed. D) Use of fire blanket to cover the cylinder. E) Before starting of gas cutting activity, cylinder should be checked by soap water. F) Cylinder must be kept on suitable place, free from flammable material area.	Storage area should be cleaned from unwanted material/flammable material.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Respirator Nose Mask, Safety Goggle, Hand Gloves etc.
11	Using of Welding & Gas Cutting Set	A) Back Fire B) Burn injury due to molten metal C) Eye injury D) Fire	A) Welding machine should be connected through ELCB. B) Double earthing should be provided with all welding machine. C) Welding cables should be properly routed. D) Use of standard flashback arrester/NRV with cylinder & gas cutting torch. E) During gas cutting job, gas cutter should be used al related PPE's (as like apron, leg guard, leather hand gloves, black safety goggles etc.) F) Area should be barricaded to avoid unauthorized entry. G) DCP fire extinguisher should be available with gas cutting set. H) Surrounding area should free from flammable material. I) Cylinder key should be kept on cylinder. J) Gas cutter should be experienced.	Local exhaust ventilation to be provided in case of confine space.	PPE's will be available as per job specific like as Safety Shoes, Leather Hand Gloves, Safety Helmet, Leather Apron, Leg Guard, Black Goggles, Nose Mask etc.
12	Transportation of raw	A) Physical hazards, spillage	A) Trained drivers to be employed.	All records of raw material transportation properly	PPE's will be available as per

	materials and products	of material. B) Injury due to road accidents	B) Proper first aid kits to be provided in all vehicles. C) MSDS training to be provided for hazardous chemicals. D) Transport Emergency (TREM) cards to be provided to the drivers.	maintained. Safety signage board displayed for speed limit and safe material handling at all vehicle's movement area of plant premises.	job specific like as Safety Shoes, Safety Helmet, Hand Gloves etc.
13	Fire hazards.	Due to leakage of Oil or electrical short circuit.	The system will be shut down and will electrically disconnected till the complete remedy is not done.	a) Switch off the system. b) Information is delivered the Manager/ Director present in the Factory. c) First Aid is given to the victim & carrying to Hospital for further treatment.	PPE's will be available as per job specific like as Fire Resistance Suit, SCBA Set, Safety Shoes, Safety Helmet, Safety Goggle, Hand Gloves, Nose Mask etc.
14	Handling of Sulphuric acid and Hydrochloric acid only these chemicals are being used in power plants.	During handling physical accident can take place. Hurt and minor injury may possible.	Suitable firefighting equipment's has been installed at storage area and concerned employees provided with PPE's. Entry of other person is prohibited and proper watch is kept by officer In-charge.	a) We have provided drenching shower for washing purpose. Apart from it a well-equipped first aid box also provided in the area.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, face shield, Nose mask, acid-proof suit, Rubber Hand Gloves etc.
15	DM Plant-Acid storage tank and Jerry Cane	Due to spillage of acid during loading and unloading.	Any leakage or spillage of chemicals Dyck wall provided and also sand bucket available here.	A) In case of acid spillage, Acid is being collected in collection pit through drains and from collection Drum/Jerry Cane by pump. B) We have provided drenching shower for washing purpose. Apart from it a well-equipped first aid box also provided in the area.	PPE's will be available as per job specific like as Safety Helmet, face shield, Nose mask, acid-proof suit, hand gloves, safety shoes.

RISK ANALAYSIS FOR ROLLING MILL

S. N.	OPERATION / PROCESS EQUIPMENT/ AREA	POSSIBLE HAZARDS	PRECAUTIONARY MEASURES IMPLEMENTED/ EXISTING	ACTION PLAN TO BE TAKEN IF HAZARDOUS OCCURS	REMARKS
CHARGING GRID					

1	Charging Grid Section	Hit by Object	1. Keep away from moving cranes. 2. Effective audible and visual communication devices installed on a crane. 3. Trained and experience operators have been deployed for EOT. crane operations. 4. Unauthorized Entry to be restricted by interlocking system. 5. Crane operators are to be get alert when someone is moving in that area. 6. Use crane fingers while carrying Ingots/blooms/ billets/slabs etc. by using magnetic crane. 7. Battery backup for the magnetic cranes to be ensured.	1. Even after if any worker gets hurt then First-Aid is given to him and if hurt is serious then is referred to the Doctor /Hospital for further treatment and check-up. 2. Periodic Checking and Maintenance work done in all equipment including critical process safety equipment.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle, Apron, Hand Gloves, Nose Mask etc.
		Fall of Material	1. Stacking height should be specified. 2. Maintain floors in proper condition. 3. Stack the material properly without any bloom/billet ends protruding out. 4. Clearly define walkways and proper stacking of material. 5. Ensure regular clearance of debris.		PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
		Slip, trip & fall	1. Regular removal of over length billet cutting pieces (Obstructions). 2. Maintain clean surroundings by housekeeping.		
		Contact with hot billet	1. Entry to be restricted for unauthorized persons. 2. Hard Barricades installed in place. 3. Cautions board display.		
2	Reheating Furnace	Gas poisoning due to leakage of gas.	1. Gas Line, Color coding of pipeline, cautions of gas hazards displays. 2. Fixed Gas monitors surrounding of the furnace. 3. Only authorized movement. 4. Always One person one CO Gas personnel monitor system in place while moving in gas prone area. 5. U-seals are in line always and should be maintained effectively.	1. Regularly checking and maintenance work is done to installed gas detection system. 2. Even after if any worker gets problem from gas leak then immediate shift fresh air & First-Aid is given to him and if serious then immediately referred to the Doctor /Hospital for further treatment and check-up. 3. Emergency Rescue	PPE's will be available as per job specific like as SCBA Set, Safety Shoes, Safety Helmet, Safety Goggle, FR Suit, Hand Gloves, Nose Mask etc.

			6. During shutdown proper protocol to be maintained, blanking, purging, testing, etc.	Team always alert in case of any mishap.	
		Fire/ Explosion hazards	1. Hot work permit system in place. 2. Explosive mixture should be zero before starting any hot job on gas pipeline. 3. Emergency preparedness plan should be in place. 4. Training to employees on Operation and maintenance safety of Mechanical equipment's. 5. Appropriate Firefighting equipment installed. 6. Periodic checking & maintenance work done to all gas line system.	1. Installation of Fire Extinguisher & Firefighting equipment to take care of fire hazard in the work area. 2. Surrounding area cleaned from unwanted material/ flammable materials. 3. Local exhaust ventilation to be provided in case of confine space. 4. Emergency response training has been given to all working persons.	PPE's will be available as per job specific like as SCBA Set, Safety Shoes, Safety Helmet, Safety Goggle, FR Suit, Hand Gloves, Nose Mask etc.
		Burn injury hazards, Exposed to hot flames and hot billets/ingots	1. Ensure Furnace door in closed condition. 2. Entry restricted to unauthorized person. 3. Use standard safety gadgets.		
		Hazards associated with re-lining of furnace with refractory bricks	1. Work permit system to be followed. 2. Task based risk assessment to be done for all the activities involved during relining. 3. Monitor the temperature of area before starting work. 4. 24 V bulbs to be used during repairs in furnace.		
MILL SECTION					
1	Rolling	Caught in between machinery	A) Coupling/Spindle guards to be in place. B) Loose clothes to be prohibited. C) Emergency stop button shall be installed near to major drives/roller table group drive. D) Crossovers to be provided in the mill with wire mesh.	Even after if any worker gets hurt then First-Aid is given to him and if hurt is serious then is referred to the Doctor /Hospital for further treatment and check-up.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle, Hand Gloves, Nose Mask etc.
		Person hit by rolling hot material during cobble.	A) Auto Announcement during pusher/ejector/ roughing operation. B) Proper guards to be provided to avoid material coming in the way of workmen. C) Proper pathways to be provided for safe movement. D) All required safety	Periodic Checking and Maintenance work done in all equipment including critical process safety equipment.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, Apron Suit, Safety Goggle, Hand Gloves, Nose Mask etc.

			Interlocks of the Equipment & Process including auxiliary system for sequencing of operation. E) Provision of Emergency stop of Mill during cobble.		
2	Roll Change/ Pass Change	Fall of object	A) Ensure proper condition and load carrying capacity of slings before use. B) Trained Riggers are deployed. C) Material handling and safety practices training to be given.	A) Only trained and competent workers shall be deployed for roller change. B) Even after if any worker gets hurt then First-Aid is given to him and if hurt is serious then is referred to the Doctor /Hospital for further treatment and check-up.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
		Caught in between objects	A) Permit and LOTOTO procedure to be followed. B) Should see that person should not be at line of fire. C) Only trained/skilled team to be engaged.		
		Burn injury	During Roll Change, Roller's temperature shall be ensured before lifting through temperature gun		
		Slip & Fall from height	A) Suitable platforms are to be provided near roller table for smooth entry of personnel. B) There should be provision for hand railing on platform.		
		Hit by flying object	A) Never use a grinder without the grinding wheel guard which is provided for protection. B) Check the grinding wheel for any kind of crack or damage before using the grinder. C) Check the expiry of grinding wheel. D) Check for RPM of Wheel and Machine. D) Check that the maximum operating speed, dimensions and other specifications of the grinding wheel are correct for the machine where it will be used. E) Use standard Tools during maintenance.	A) Working area restricted to unauthorized entry. B) Firefighting extinguisher available near grinding work place. C) Surrounding area free from flammable materials.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, FR Suit, Safety Goggle, Hand Gloves, Nose Mask etc.
3	Mill maintenance	Slippage of tools	A) Bent-out, open-ended spanners not to be used. B) Use a tool lanyard. C) Ensure use of correct sized tools. D) For safe working, ensure "Power Shutdown," (LOTO) procedure. E) Stoppers are to be	A) All tools and tackles are checked regularly before starting the work. B) Trained and experience operators have been deployed for EOT. crane operations.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, Safety Goggle, Hand Gloves, Nose Mask etc.

			welded on both sides of crane on LT rails.		
		Hazards during Working on EOT. Cranes	All the lifting tools and tackles to be checked every year as per statutory requirement.		
SHIPPING AREA					
1	Material Dispatch	Interface between Loco movement	A) Automatic siren system is to be installed wherein the siren starts as soon as the wagon enters the shed in two places i.e. one at entry of shed and the other inside the shed to caution the movement of wagon. B) Barricading is to be done on both sides of the track. (Access Control). C) Attendant from traffic department is to be ensured along with moving wagons at the front carrying the signal lamp/flag alerting the personnel along the track way. D) Blowing of horn by engine driver for alerting the personnel. E) The maximum safe height of stacking is up-to 2 meters. E) Track maintenance and levelling is to be done regularly by traffic maintenance group to prevent unexpected rolling-over of idle wagons.	Safety signage board displayed for speed limit and safe material handling at all vehicle's movement area of plant premises. All records of material transportation properly maintained.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, Safety Goggle, Hand Gloves, Nose Mask etc.
		Hit by Trailer	A) Loading areas are to be earmarked clearly. B) Systematic distribution of trucks /trailers to various loading points to be ensured to prevent congestion. C) In case of multi-layered loading of trailers, coils are to be additionally secured in place by proper lacing arrangement before leaving the shop floor. D) Ensure that the vehicles move within the safe speed limits in the shop floor as per state specific guidelines. E) Vehicles personnel are not allowed to crowd near the loading points.		PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, Safety Goggle, Hand Gloves, Nose Mask, Reflective Jacket etc.
		Hit by Product/material / object	A) Keep away from moving cranes. B) Effective audible and visual communication		

			devices should be installed on a crane. C) Battery backup for the magnetic cranes to be ensured.		
SHEAR AREA					
1	Shear Area	Cut piece flying away	A) The shears shall have safety cage. B) Maintenance of shear shall be done only after complete shutdown of the shear drive. In hydraulic operated shear, the line shall be depressurized completely. C) Cautions shall be displayed near to the shear. D) The mesh of safety cage shall be less than the minimum size rolled (rod/bar mill).	Emergency stop switch provided in all shearing machine equipment.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, Safety Goggle, Hand Gloves, Nose Mask etc.
OIL LUBRICATION TANK AREA					
1	Oil Lubrication Tank	Fall from opening, Suffocation, Fire, Slip & fall, Electric Shock.	A) Proper Covering of all openings. B) For covers removal, permit should be taken. C) Proper arrangement of lighting in lubrication area. D) Safety guard for rotating parts like coupling Guard etc. E) More than one Entry & Exit in oil lubrication ta. The Entry & Exit should be marked properly for easy escape in case of fire. F) Proper Ventilation system as applicable. G) Proper Firefighting system to be provided for lubrication area to take care any fire accidents. H) Anti-Skid tiles to be provided for flooring to avoid any slipping. I) Sump pump should be installed in tank to avoid any flooding. J) Emergency lights should be in place. K) Emergency plan in place and mock drill shall be conducted. L) Oil tank to be checked every day/week as per checklist for leakages. M) Access control deployment. N) Communication system	A) Appropriate fire extinguisher and Firefighting system provided for lubrication area to take care any fire accidents. B) Proper care to be taken in storing and keeping the tank of oil. C) Untheorized persons entry restricted in lubrication tank area. D) Precautions should be adopted.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Face Shield, Safety Goggle, Rubber Hand Gloves, Nose Mask etc.

			in case of emergency. O) Regular housekeeping.		
YARD MANAGEMENT SECTION					
1	Yard Management	Hazards due to material transfer trolley Hazards in Material handling & stacking area (Loading and unloading point hazards related)	A) Avoid standing or moving near material handling transfer trolley. B) Audio visual hooter shall provide in EOT crane to generate alert during its movement. C) Avoid loose clothing, long hair, jewellery and other loose items near moving equipment/ transfer trolley/Roller tables. D) Emergency "shut-off" devices to be provided. E) Follow lock-out/tag-out procedures for maintenance. F) Unauthorized entry prohibited in TMT storage yards. G) No human interface/ ground movement allowed in yard during material handling with EOT. cranes. H) Only authorized/trained personnel to operate or maintain the yard management section equipment. I) Good flooring and adequate Illumination level to be maintained at material storage yards.	A) Only competent and approved operator shall be deployed for lifting operations. B) Equipment's as well as lifting tools to be certified by competent persons before deployment. C) Daily inspection of the equipment should be done by the operator. D) No overloading allowed follow procedures of same handling.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle, Ear plug, Hand Gloves, Nose Mask Reflective Jacket etc.
GENERAL AREA					
1	Maintenance	If material caught between	A) Follow work permit and positive isolation procedure including all Energy source isolation (fluid energy, gas energy, electrical power etc.) B) No work to be done on roller table/walking while conveyor in running condition. C) Local emergency switch with key arrangements to be operated for approaching roller table /walking beam Conveyor. D) Conveyor guards to be provided on moving conveyor area. E) Siren system prior to restarting walking beam conveyor/Roller table. F) Loose cloths prohibited.	A) Only trained and competent workers shall be deployed for maintenance work. B) Even after if any worker gets hurt then First-Aid is given to him and if hurt is serious then is referred to the Doctor /Hospital for further treatment and check-up.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle, Ear plug, Hand Gloves, Nose Mask etc.

3	Handling of Heavy loads (Mill gear box, Mill motors, Blowers, etc.)	Hit by vehicle, fall of material and object	A) Use appropriate lifting tackles like chain pulley block, hoist etc. to lift heavy spares. B) Use of hydra, cranes, trailers to transport the materials from one place to another place. C) No job should perform under suspended load and maintain safe distance from mobile equipment. D) Guy rope should be used to restrict the swing of materials while handling with cranes.	Regular maintenance should be done of lifting materials in respect of wire ropes, breaks, lifting hook, rails/wheels, electrical system/ motors etc.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle, Hand Gloves, Nose Mask etc.
4	Scrap handling includes A) Handling of scrap bin through EOT crane. B) Handling of scrap coil /pump coil/ transfer bar. C) Trimmed scrap handling. D) Chemical drum handling. E) Sludge and muck handling.	Hit by object, fall into opening, fall of object, splashes of chemicals.	A) Warning bell and Auto Audio alarm while crane running. B) Ensure no pedestrian movement below suspended load. C) Access control deployment in material handling area. D) Trained driver and flagman deployment for mobile equipment. E) Inspection of lifting tools and tackles mobile equipment by competent person. F) Dyke wall provision at chemical drum storage area. G) Fire hydrant and fire extinguisher provision. H) Safety shower provision near chemical drums storage area.	A) If any injury may cause then after giving first aid to person/ worker refer for further treatment to Doctor/ Hospital. B) MSDS available and proper training are being given to workers for handling of chemicals, scraps and other waste materials.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle, Ear plug, Hand Gloves, Nose Mask, Apron Chemical Suit etc.
5	Major Repair Job in Rolling Mill	Fall of object, fall from height, hit by equipment's, electric shock, etc.	A) All the power shutdowns of the required system to be taken as per the dully filled work permit form and necessary clearance from concerned operation and electrical area. B) Ensure that all lifting tools & tackles (winches, hydraulic jacks, Chain Pulley Blocks, slings etc.), EOT. cranes, should be tested by a competent person and certified driver should only operate the mobile equipment. C) For working at height, a "Work at heights pass" to be obtained from safety department and use of appropriate safety harness	A) Personnel involved in plant start-up and control are being warned about any operations to be performed in the enclosed area before starting the machine. B) Emergency response training has been given to all working persons.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle, Ear plug, Hand Gloves, Nose Mask etc.

			G) Area barricading if material is removed from height.		
		Rotating machineries	A) Coupling guards to be in place. B) Loose cloths to be prohibited. C) Only Visual inspection from safe distance may allow in rotating machines. D) Moving equipment potential hazards should display near moving equipment.		
		Electric shock	A) Follow work permit and positive isolation procedure including all Energy source isolation. B) Displaying of "Men at Work" at HT switching on panel. C) Use non-contact type testers to check the residual voltage after isolation of electrical power from main source. D) Ensure Proper grounding of electrical power before executing job on electrical equipment. E) Competent and trained person only allowed to perform job on electrical equipment.		
2	Working on EOT Cranes	Fall from height and caught in between	A) Follow work permit and positive isolation procedure including all Energy source isolation. B) Scotch Block /Stoppers are to be welded on both sides of crane on LT rails to restrict the entry of running cranes in that area. C) Crane under shutdown Red flag to be displayed to alert the other moving crane operators. Indicative barricading (Red tape/Ribbon) to be provided on shop floor to restrict the pedestrian movement below the crane till the shutdown job completes. D) Submit job completion report after repair. E) All the lifting tools and tackles to be checked every year as per statutory requirement.	Routine inspection Maintenance of wire rope condition and crane equipment to be done. Weak wire rope and equipment's shall be immediately replaced.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle, Ear plug, Hand Gloves, Nose Mask etc.

3	Handling of Heavy loads (Mill gear box, Mill motors, Blowers, etc.)	Hit by vehicle, fall of material and object	A) Use appropriate lifting tackles like chain pulley block, hoist etc. to lift heavy spares. B) Use of hydra, cranes, trailers to transport the materials from one place to another place. C) No job should perform under suspended load and maintain safe distance from mobile equipment. D) Guy rope should be used to restrict the swing of materials while handling with cranes.	Regular maintenance should be done of lifting materials in respect of wire ropes, breaks, lifting hook, rails/wheels, electrical system/ motors etc.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle, Hand Gloves, Nose Mask etc.
4	Scrap handling includes A) Handling of scrap bin through EOT crane. B) Handling of scrap coil /pump coil/ transfer bar. C) Trimmed scrap handling. D) Chemical drum handling. E) Sludge and muck handling.	Hit by object, fall into opening, fall of object, splashes of chemicals.	A) Warning bell and Auto Audio alarm while crane running. B) Ensure no pedestrian movement below suspended load. C) Access control deployment in material handling area. D) Trained driver and flagman deployment for mobile equipment. E) Inspection of lifting tools and tackles mobile equipment by competent person. F) Dyke wall provision at chemical drum storage area. G) Fire hydrant and fire extinguisher provision. H) Safety shower provision near chemical drums storage area.	A) If any injury may cause then after giving first aid to person/ worker refer for further treatment to Doctor/ Hospital. B) MSDS available and proper training are being given to workers for handling of chemicals, scraps and other waste materials.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle, Ear plug, Hand Gloves, Nose Mask, Apron Chemical Suit etc.
5	Major Repair Job in Rolling Mill	Fall of object, fall from height, hit by equipment's, electric shock, etc.	A) All the power shutdowns of the required system to be taken as per the dully filled work permit form and necessary clearance from concerned operation and electrical area. B) Ensure that all lifting tools & tackles (winches, hydraulic jacks, Chain Pulley Blocks, slings etc.), EOT. cranes, should be tested by a competent person and certified driver should only operate the mobile equipment. C) For working at height, a "Work at heights pass" to be obtained from safety department and use of appropriate safety harness,	A) Personnel involved in plant start-up and control are being warned about any operations to be performed in the enclosed area before starting the machine. B) Emergency response training has been given to all working persons.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, Safety Goggle, Ear plug, Hand Gloves, Nose Mask etc.

			scaffold to be ensured before executing the job at site. D) All portable electrical equipment, welding machines to be earthed effectively (body earthing). RCCB/ELCB to be checked in all welding machine before the usage. E) Heavy structural member should well be supported and guided by ropes, chains or any other means to prevent its falling or swinging during gas cut or removal from site. F) Suitable fire extinguishers/ Fire tender should be provided at site before executing the maintenance jobs at site. G) Rolling of gas cylinders to be avoided and transferred / shifted by proper trolleys. H) Proper protection to be provided to conveyors and electrical cables to prevent fall of sparks from welding/ gas cutting. I) Isolation of electrical power and written clearance to be obtained from electrical section before start of dismantling operation. J) Adequate illumination to be ensured before starting the job at site. K) Unauthorized entry should be restricted at working site. L) All the openings created during dismantling to be immediately covered/ barricaded. M) Compressed air vessels and pipelines to be de-pressurized before dismantling. N) Combustible/ Inflammable materials should remove from the place where gas cutting/ welding jobs are to be carried out. O) HOT work permit to be implemented during gas cutting and welding in non-designated area.		

			P) A charged water hose pipe may be kept near the place of work.		

RISK ANALAYSIS (De- Mineralization Plant)

S/ No.	Operation Process/ Equipment/	Possible Hazardous	Consequences	Measure proposed to be taken if Hazardous	Remarks
1.	During demineralization of Water process	1. Skin disease. 2. Burn hazards. 3. Eye disease.	• Skin irritation • Skin Allergy • Eye irritation • Environmental damage	1. Only allowed skilled person for operation. 2. Housekeeping is done on regular basis. 3. Proper supervision provided for the job. 4. Job safety training provided to casual worker. 5. Job related PPE's provided to operator and worker. 6. MSDS Applying. 7. First Aid kit is available at site.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, face shield, Nose mask, acid-proof suit, Rubber Hand Gloves etc.
		Hazardous Material: • Spent ion exchange resin	Effect: • Skin irritation • Skin allergy • Eye irritation • Environmental damage	Handling: 1. Pour in Water 2. Collect in closed non-metallic container. 3. Re-use in DM plant as for makeup. 4. Burn in kiln for power generation as per CPCB guideline.	
2.	During Ion Exchange process (Chemical process)	1. Skin disease. 2. Burn hazards. 3. Eye disease.	• Burn injury. • Skin & eye irritation • Body injury during the handling.	1. The MSDS (Material Safety Data Sheet) of all the Acids stored are available at the point of use, and the people are trained in MSDS. 2. Use PVC drum or bottle for storage. 3. Installed Safety shower and eye washer installed near acid storage yard. 4. First Aid kit is available at site.	PPE's will be available as per job specific like as Safety Shoes, Safety Helmet, face shield, Nose mask, acid-proof suit, Rubber Hand Gloves etc.
3.	Control Rooms	1. Electrical shock possible due to current leakage. 2. Fire Hazards may possible due to sort circuit.	• Electrical Shock. • Burn injury.	1. In the event of electric leakage main supply should be immediately shut off. 2. Housekeeping done on Regular Basis. 3. Rubber mat provided in front of charged panel. 4. Electrical wire dressing done properly. 5. ELCB & MCB inspection done	PPE's will be available as per job specific like as Safety Shoes with fibre tow, Safety Helmet, Face Shield, Safety Goggle, Electrical Insulated Equipment's, Rubber Hand

				on regular basis. 6. precaution & treatment chart is displayed 7. Shock Treatment & medical Aid shall be immediately provided. 8. Required PPE's provided to operator. 9. Earth leakage Circuit breaker is installed. 10. All instruments are properly earthed. 11. Suitable fire extinguisher installed near the Charged panel.	Gloves, Nose Mask etc.

Annexure - 9

INDUSTRIAL HYGIENE

09TH May 2024

OCCUPATIONAL HYGIENE SURVEY
AT
SHRI BAJRANG POWER & ISPAT LTD (TMT DIVISION)
Unit – URLA, RAIPUR.

Survey conducted

By

Arvind Industrial Hygiene Consultancy
Raipur (C.G.)

Contents

Ref: No .Ar/2024-25/11 **Dated- 12/05/2024**

To,
Shri. G.R. Telang
AGM (EHS)
Shri Bajrang Power & Ispat Ltd.
Urla, Raipur.

Subject – Comprehensive Industrial Hygiene Survey report.

Reference – Order no. – 222. Dated 07.05.2024

Dear Sir,

With reference to the above order number, a comprehensive industrial hygiene survey had been conducted at different locations of Shri Bajrang Power & Ispat Ltd (TMT Division) on 09th May 2024 general shift of factory working time. The survey work was conducted by our Industrial Hygiene team and coordinated by Shri P.K Rai from Safety department. Please find a report of the survey for your information and necessary action.

Arvind Industrial Hygiene Consultancy
Director

Dr.Avinash Kumar Verma
Director, Competent Person CG Govt.
Arvind Industrial Hygiene Consultancy
Raipur (C.G.)

STUDY AT A GLANCE

Hazard	No.of Samples	Exceeded TLV
Respirable dust (P)	08	01
Noise (A)	10	02
(P)	05	00
Heat Stress	05	00
Illumination	12	03
Gas & Chemicals	03	01
Total	43	07

(P) - Personal Sampling

(A) – Area Sampling

INDUSTRIAL HYGIENE SURVEY REPORT OF Shri Bajrang Power & Ispat Ltd (TMT Division), Urla Raipur.

INTRODUCTION- GOEL GROUP is one of the leading business houses in Chhattisgarh. The Group having diversified business activities, but mainly engaged in manufacturing of Steel and generation of power and has interest in manufacturing of Sponge Iron, Iron Ore Beneficiation, Pellets, Induction/ Arc Furnace with Continuous Casting Machine for production of Steel Billets and Blooms, Hot Re-Rerolled Steel products, Ferro Alloys, Fly Ash Bricks and Captive Power Plant together with their backward and forward integration. The Group is totally integrated to produce finished steel under one roof and selling all products under the Brand Name "GOEL" which is well-established and well-known for its quality products in the steel sector. Presently the company has, 5X6T Induction Furnace though (CTE granted for 6x6T Induction Furnace) for the production of 1,05,600 TPA of Billets, Hot Charging Rolling Mill of capacity 59,500 TPA, Reheating Furnace Rolling Mill with coal gasifier of capacity 1,50,000 TPA, 16 MW power plant, Wire Drawing of capacity 1,25,000 TPA, Fly ash brick plant of capacity 72,000 TPA and Refining Furnace of 3 MVA for refining of MS round and CTD Bars at village Gondwara, in Urla Industrial complex, Raipur.

OBJECTIVE: The objective of this study was to monitor and to assess the Respirable dust concentration, Noise level, Heat Stress, Gas chemicals & illumination intensity in the working environment and to identify the potential hazard and risk arising from the workplace, comparing with permissible exposure limits (TLV) and to suggest remedial measures to make the environment congenial and conducive.

TECHNICAL INFORMATIONS

(a) ***Threshold limit value*** – TLVs refers to airborne concentration of substances for 8 hrs.workdays to which nearby all workers may be repeatedly exposed day after day without having any adverse health effect.

(b) ***TWA***– The time weighted average concentration permit excursions above the limits, provided they are compensated by equivalent excursion below the limit during the work day.

(c) ***Decibel db*** **-** A unit used to express sound intensity. Minimum difference in loudness that is usually perceptible. The general relationship is L = 10 q/qo(dB)

One decibel is one tenth of a bel and it is the preferred unit for noise measurement.

(d) ***Sound pressure level Spl*** – The level in decibel of a sound is 20 times the logarithm to the base 10 of the ratio of the pressure of this sound to the reference sound pressure. The unit gives idea about the effect of noise on ear drum.

(e) ***Equivalent noise exposure Leq*** – Equivalent exposure for extended period of time, provided there is no change in the noise because of the interference. It gives the assessment of noise dose as per ISO -1999, for hearing conservation purpose. Useful for calculating TLV/TWA for noise dose of exposed employees.

(f) ***Sound emission level SEL*** – The unit gives the assessment of noise intensity generating from the source or machine. The parameter is useful for adopting engineering control measures in the work place.

(g) ***Area Monitoring*** – Sampling of the working environment pollutants at the work place.

(h) ***Personal monitoring*** – Sampling of employees exposed to various pollutants by fixing sampler in the breathing zone.

(i) ***Exposure Time*** – The length of individual employees' exposure may be limited as administrative control. There is shorter exposure time for higher sound levels. Permitted noise exposure time or PT can be calculated for the measured sound level and it may be used as an administrative control measure to minimize the exposure level. PT can be calculated from the following formula

$PT = 8/2^{(L-90)/5}$

(j) **Wet Bulb Globe Temperature (WBGT)** – It is the recognized index for monitoring dry & hot atmosphere in industry in compliance with ISO standard

(k) **Respirable Dust (0.1 -5 micron)** – The dust of the above size suspended in the air for prolonged period of time and has a tendency to deposit in the alveoli chamber of the lungs.From naked eye one can see only the dust size of above 7 micron.

MATERIAL & METHODS

An Industrial hygiene survey was conducted at various locations of the plant on 09th May 2024. The instruments used were portable and battery operated with direct reading LCD display type. Different physical hazards were monitored by using area sampling and personal sampling techniques. The identification of the exposed employees was done on the basis of data collection, its analysis and comparison with threshold limit values of respective hazards. All the measurements were used by following the calibration schedule of each instrument. The instruments were properly calibrated before sampling.

RESPIRABLE DUST

The respirable dust concentration was monitored with the help of Personal air sampler (AFC -124 Casella London Make). The instruments were attached in the working locations of the plant. Air containing respirable dust was drawn through the sampling head (Cyclone 225-8-01) at the flow rate of 2.2 ltr/mts.Suction is provided by a pump driven by a D.C. motor from a rechargeable NiMH battery which lasts up to 10 hrs. The breathing zone samples were collected during the normal working hours. of the individual. The instrument was removed after 6-7 hrs. and dust concentration was calculated on the basis of weight difference of the filter paper (PVC Membrane 37 mm diameter). The internationally approved NIOSH method 0600 was used to evaluate the dust concentration in mg/m^3 of air. The same method is approved by the Indian factory act 1948 amended in 1987.

Silica Estimation - For estimation of free silica the collected sample was subjected to HF treatment which was done to see the presence of free silica in the sample. The test was done in the authorized laboratory.

NOISE

Noise level measurement was done with the help of sound level meter Casella 62 X make, Regent house, Kempston, U.K.Parameters like Spl, Leq and SEL were recorded near the different machines following the OSHA guidelines for noise sampling(1 mtr. away from the machine and at the place where worker is sitting during the duty hrs.). Areas of maximum noise and safe zone were identified using

noise mapping technique. Personal noise exposure assessment was done with the help of Noise Dosimeter Leutron DS 2013.

HEAT STRESS

Heat stress was measured in terms of wet bulb globe temperature (WBGT)which is the ISO recognized scale for measurement of heat stress in dry and hot atmosphere. The instrument WBGT heat stress monitor was used for this purpose. Heat stress was measured in the area where workers may at times be exposed to radiant/convective heat. Mean WBGT and relative humidity with air velocity was evaluated using anemometer. The data collected was compared with the threshold limit value of the respective hazards.

ILLUMINATION

Illumination measurement was done with luxmeter which gives assessment of brightness in the unit area of work place in lux. The degree of safety with which a task is performed depends in large part on the quality of illumination and on visual capacities. The visibility of an object can be altered in many ways. One of the most important factors is the contrast of the luminance's due to reflection factors, to shadows or to color of the object itself and to the reflection factors of the color. What the eye really perceives are the differences of luminance between an object and its surroundings. In the night illumination is mostly influenced by the air density, environmental contaminations and quality of lamps. Human eye can accommodate wavelength of 380-760 nm. The data collected was compared with the reference values adopted by ACGIH (American conference of Governmental Industrial Hygienists).

GAS & CHEMICALS

Evaluation of gas and chemicals concentration was done by using gas detector tube of Uniphos make. The length of discoloration gives then concentration of measured gasin the work place.

QUESTIONNAIRE SURVEY

The status of the work place ventilation system & ergonomic issues was checked by conducting structured questionnaire survey, specially prepared for this purpose. The personal interview was conducted for 10 no. of employees including contractor workers, working in different hazardous locations of the plant. The data collected were analyzed statistically to evaluate the findings

OBSERVATIONS -

Table-1
Respirable Dust – Personal Sampling

S.No.	Name	Designation	Location	Dust mg/m^3	TLV mg/m^3
1.	Sanjeev Sahu	Engineer	Power Plant, Boiler Area	1.49	2
2.	Roshan Chandrakar	Manager	Power Plant, CHP Area	1.75	2
3.	Dilip Gupta	Fitter	Gasifier Area	2.63	2
4.	Bhola Ram Sahu	Operator	DM Plant	1.68	3
5.	Kapil Singh	Mech. Maintenance	Rolling Mill	0.35	3
6.	Dinesh Kumar	CCM	Ladle Operator	2.15	3
7.	Jogindar Singh	Melter	Electric Arc Furnace	0.70	2
8.	Santosh Singh	Melter	Electric Arc Furnace	0.82	2

Assigned protection factor for Half face mask – 10 as per OSHA guidelines
TLV IFA – Coal dust 2 Mg/m3, Ash dust/other mineral dust – 3 Mg/m3
Welding fume, Metal fume – 5 mg/m3

Table- 2
Noise level Survey (Area Sampling)

S.No..	Location	Noise dB(A) Spl	Noise dB(A)Leq	Noise dB(A)SEL	TLV dB
1.	TG Hall, CCR Side	82.3	80.2	86.3	85
2.	TG Hall, SMS Side	78.2	76.2	82.1	85
3.	Inside CCR	75.8	73.8	79.9	85
4.	+4 ML Ejector Area	86.7	84.7	90.2	85
5.	Zero ML, Compressor Area	78.3	76.1	82.5	85
6.	SMS, Furnace 1	68.8	66.5	72.8	85
7.	SMS, Furnace 3	66.5	64.9	70.2	85
8.	Rolling Mill, Roughing Stand Area	82.8	80.8	86.5	85
9.	Rolling Mill, Finishing Area	81.4	79.5	85	85
10	Loading Yard	86.2	84.9	90.1	85

Table- 3
Personal Noise Exposure Measurement (Leq)

S.No.	Name	Designation	Location	Noise	TLV
1.	Shankar Kumar	Fitter	Rolling Mill 1	81.5	85
2.	Sanjeev Dulai	Operator	Pulpit Rolling Mill 1	82	85
3.	Laxman Sahu	Mech. Fitter	Roughing Stand, Rolling Mill 2	80.9	85
4.	Sanjay Maurya	Fitter	Finishing Stand, Rolling Mill 2	84.5	85
5.	Sudhir	Barryman	Furnace No. 2	83.4	85

Table- 4
Heat Stress Measurement

S.NO.	Location	Mean WBGT ^{0}C	Radiant heat ^{0}C	% Excess	TLV ^{0}C
1.	TG Hall, Power Plant	24.8	33.2	Nil	29.5
2.	SMS, Furnace No. 1	25.1	34.7	Nil	29.5
3.	SMS, Furnace No. 2	25.9	35.2	Nil	29.5
4.	SMS, Furnace No. 3	24.9	33.5	Nil	29.5
5.	Rolling Mill No. 1	27.8	38.9	Nil	29.5

Relative humidity 67% Air velocity SMS floor – 1.4 m/sec. TLV Reference 50% work /Rest basis. High humidity because of Rain on previous Night.

Table- 5
Illumination level (Real-Time Analysis)

S.NO.	Location	Lux (Present)	Requirement
1.	TG Hall, CCR	70-95	100-150
2	Inside CCR, Power Plant	95-110	100-150
3.	+4ML Ejector Area	85-97	100-150
4.	0 ML Compressor Area	79-90	100-150
5.	RO Plant	115-120	100-150
6.	DM Plant Lab	120-145	100-150
7.	SMS Furnace 1	150-168	100-150
8.	SMS Furnace 2	90-110	100-150
9.	SMS Furnace 3	105-120	100-150
10.	Rolling Mill 1, Roughing Stand	156-180	100-150
11.	Rolling Mill 2, Finishing Stand	177-210	100-150
12.	Loading Yard	150-250	100-150

Required Lux 100 to 150 Lux as per IS 6665 – 1972 for different category of work Indoor.

Table - 6
Gas & Chemical Area Sampling

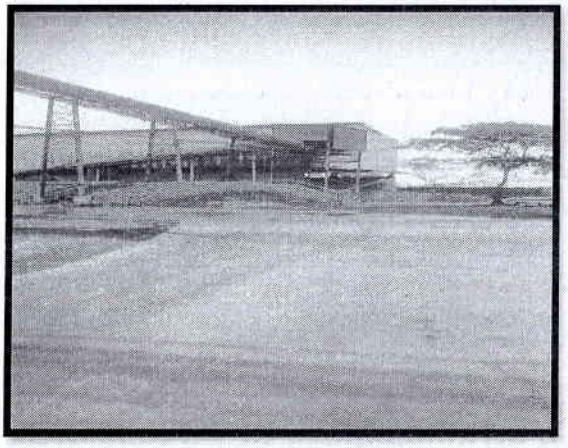
S.NO.	Location	Contaminant	Conc.PPM	TLVPPM
1.	DM Plant	HCl	Nil	5
2.	DM Plant, Storage Tank	Sulfuric acid	Nil	1 mg/m^3
3.	DM Plant	Hydrazine	0.2 PPM	0.1 mg/ m^3

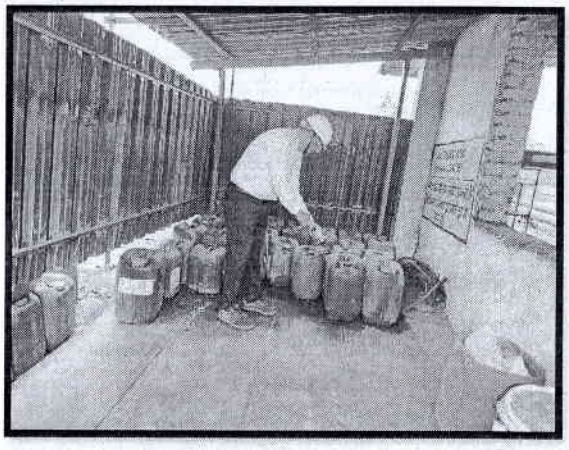
TLV – As per IFA second schedule

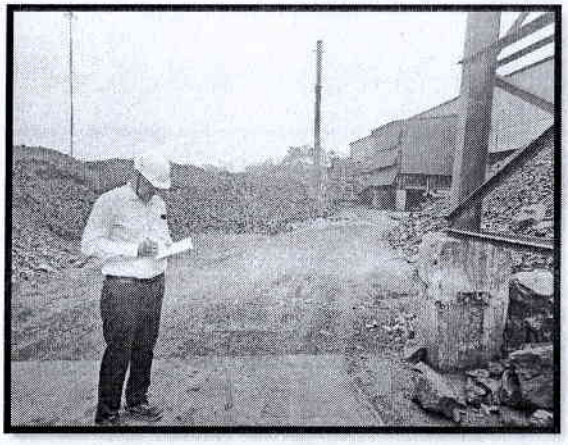
Table – 7
Analysis of Questionnaire on Work Environment & Ventilation System
(N=10)

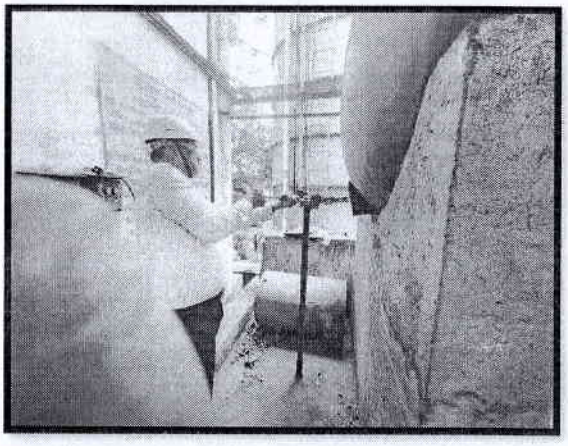
NO.	Symptoms	% Response Yes	% Response No
1.	Environmental Factors Heat, Dust, Noise, Fumes at the work place	90%	10%
2	Ventilation system efficiency is Good?	90%	10%
3.	Use of Dust Mask	80%	20%
4	Use of ear plugs in Noisy area	60%	40%
5.	Health Symptoms (a) Headache (b) Giddiness (c) Nausia (d) Vomiting (e) Breathing difficulty (f) Uncomfortable work place	 10 00 00 00 00 85	 90 100 100 100 100 15

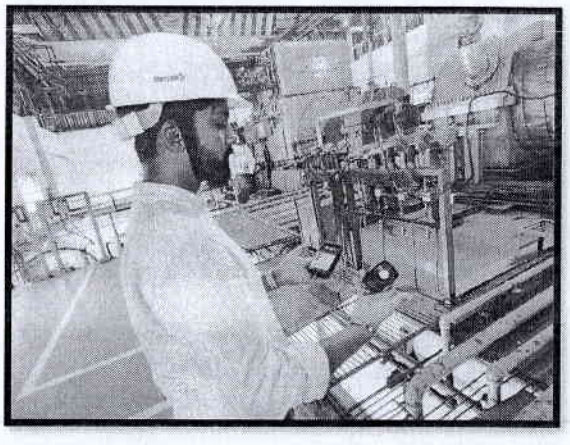
SURVEY PHOTOGRAPHS



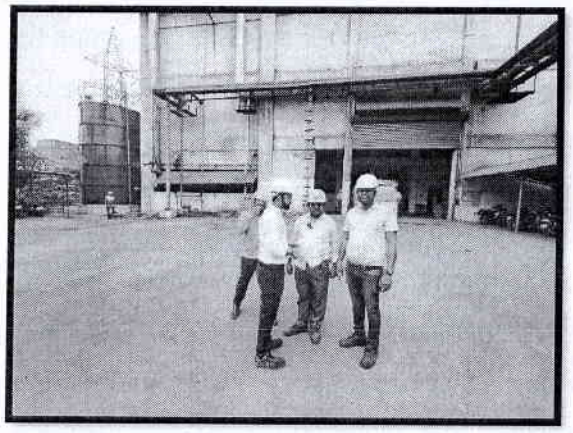


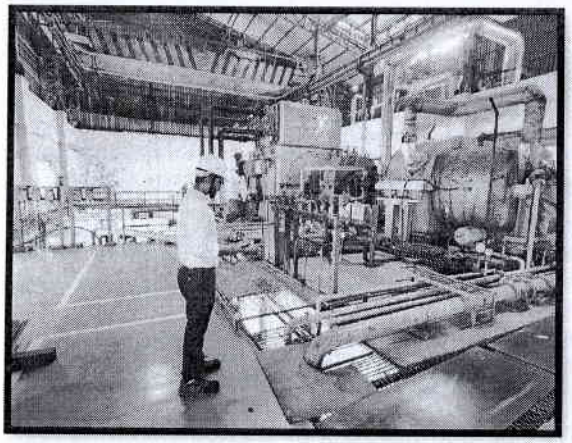


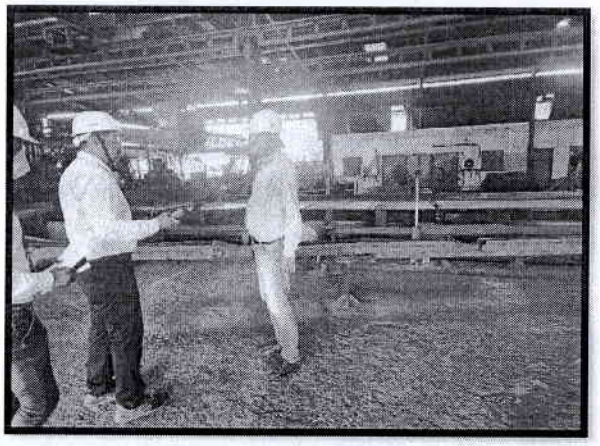


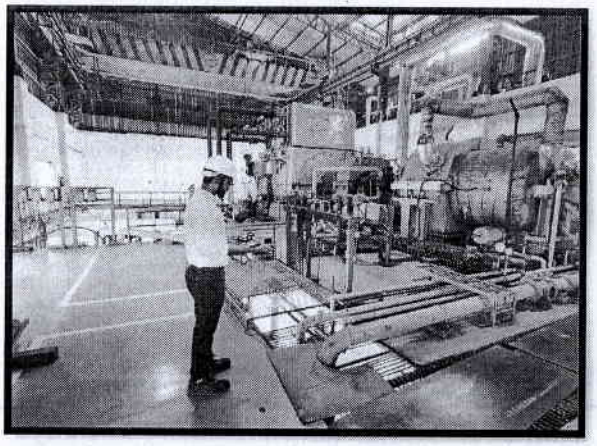


SURVEY PHOTOGRAPHS









RESULTS & DISCUSSION

Shri Bajrang Power & Ispat Pvt Ltd started their journey in 2002 to become a pioneer in steel industry in central India and with the help of latest technology and trusted employees under the guidance of Shri. Suresh Goel, the group has diversified into manufacturing as well as service like iron & steel, mining, power, ferroalloys, fly ash bricks, digital marketing and media. Total 43 analysis had been done on different locations based on different hazards associated to those locations out of which 11 found out to be deviated.

Respirable Dust

Respirable dust at personal level was measured at 8 locations of the plant out of that 1 sample found to be exceeding TLV norms, as mentioned in table no. 1. But the workers were using appropriate PPE mask so the exposure might be reduced due to it. Other than these locations all the area were found to be within TLV norms.

Silica Estimation -

Respirable dust concentration was monitored with the help of personal air samplers using membrane filter and cyclone head as a collecting medium. Sampling was done for 6-7 hrs. in the shift. The sample collected were sent to laboratory for free silica estimation. The membrane filter itself were treated for silica estimation under HF treatment procedure. In this method sample was first treated with HCL to remove easily soluble compound, then with phosphoric acid to break down silicates and finally with hydro fluoric acid to dissolve colloidal silica liberated by the other acids.

Total Respirable Dust – TLV = 30/ % Respirable quartz + 3

Accordingly, TLV value & Percentage silica.

Location	Free silica %	Converted TLV mg/m^3
CHP Area Coal dust	2.87	5.58

NOISE

Noise level survey area sampling was done at 15 locations of the plant for both area and personal. Parameters like SpL, Leq and SEL were recorded as shown in table 2 & 3. All the three parameters have significant role in controlling the

occupational noise hazard in the work place. Out of 15 samples, noise level was observed exceeding at 2 locations. Maximum noise intensity was observed in loading area, +4ML ejector area in power plant and finishing stand in rolling mill 1. In most of the location's workers' exposure were not observed to be continuous for 8 hrs. Noise exposure inside the control room of power plant & Main pulpit of Rolling mill were observed well within the norms but use of ear plugs seems to be less and it needs to be monitored strictly in noisy areas.

Heat Stress

Heat stress was measured in terms of wet bulb globe temperature (W.B.G.T.). Mean WBGT is reported in table No.- 4. Mean WBGT at all the five locations observed below TLV norms .This is because of the rain on previous night and cloudy weather at the time of survey. Radiant heat exceeded up to 38.9 ^{0}C. Air cooling fan was observed in the furnace floor.

Air velocity and relative humidity was also measured and found to be 67 % and 1.4 m/sec at furnace floor. Prolong exposure to radiant heat was not observed at any of the mentioned locations. Heat related precautions such as use of relevant PPEs, facility of cool drinking water, AC and work rest schedule were also found in place and accordingly ensured.

Gas & Chemicals

Gas and chemicals monitoring were conducted at DM plant acid tank area and chemical laboratory. Hydrochloric acid & Sulfuric concentration were found to be within norms. Except in Hydrazine storage tank where a leak was observed in the work place of DM plant. In general water quality testing is done in the laboratory.

ILLUMINATION

General illumination inside the works were found to be average. Illumination survey was conducted at 12 locations, and found to be adequate at most of the locations except TG Hall, +4ML ejector area, & 0 ML area in these 3 locations the illumination needs to be improved.

In CCR of power plant LED lights needs to be place to increase the overall illumination. IS-6665-1972 was referred as required norms for indoor locations.

Questionnaire Survey

Status of personal hygiene, ventilation and ergonomic issues were assessed using a structured questionnaire. The consent of the participants was obtained before filling the forms. Total 10 participants have included in the study from various locations. Their subjective response was recorded on various issues like health problems, availabilities of PPEs, presence of environmental factors, ergonomic issues like work place design, Comfort, Postural problem, in the work place. The data collected were analyzed. Out of 10, most of the participants have given favorable opinion about the various issues like provision of PPE's etc. Rest have given their opinion for improvement in the work place.

RECOMMENDATIONS – On the basis of the above extensive survey of the works area, following recommendations have been suggested:

1. Supervision of PPE's must be implemented for the workers and employees before entering the plant. Mock & Safety drill to be arranged on regular intervals to increase the safety within the plant.
2. In TG Hall exhaust fans needs to be placed for proper ventilation or natural ventilation system in roof can also be installed.
3. Epoxy flooring and exhaust fan to be installed in DM Plant chemical storage area as chemicals are handled there manually.
4. Illumination in chemical storage room of DM plant found to be less, LED lights must be installed to increase the light in the area.
5. Empty and full storage cans of chemicals to be kept separately and in proper manner to avoid any mishappening.
6. MSDS for chemicals use in process must be displayed in large fonts in front of the identified locations like reservoir and mist area.
7. Use of heat protective cotton coat may be checked on regular basis in SMS and rolling mill operators as they are exposed to heat in the stand and coiler area.
8. Safety railing needs to be place in SMS floor as it exposes workers to scrap metals downstairs.
9. Use of Ear plugs must be ensured for the workers working in loading yard as it makes loud impact noise while loading.
10. Safety shoe, gloves, drinking water and rest place must be ensured and monitored on regular basis for the regular & Contract workers working in loading yard.

CONCLUSION - The house keeping of entire plant was found to be good with water sprinklers installed in appropriate places. Use of ear plugs and other PPEs needs to be intensified and supervised as well. Other than these rectifiable issues the plant full fills mostly all criteria in ensuring workers health and safety.

Arvind Industrial Hygiene Consultancy
Director

Dr.Avinash Kumar Verma
Director, Competent Person CG Govt.
Arvind Industrial Hygiene Consultancy
Raipur (C.G.)

Ultimate
ENVIROLYTICAL SOLUTIONS
[illegible]

Name & Address Of The Customer			
To, **Arvind Industrial Hygiene Consultancy** **Raipur (C.G.)**	REPORT NO	UES/TR/24-25/000349	
	LAB REF NO	UES/24-25/MISC/000687	
	SAMPLE COLLECTION DATE	09/05/2024	
	DATE OF RECEIPT	10/05/2024	
	DATE OF REPORT	13/05/2024	
	DATE OF ANALYSIS	START:11/05/2024	END:12/05/2024

SAMPLE DETAILS	
CUSTOMER SAMPLE ID	1 CHP (COAL HANDLING PLANT)
SAMPLE TYPE	MISCELLANEOUS
CUSTOMER REF. NO. & DATE	VERBAL COMMUNICATION, DATED: 09/05/2024
SAMPLE CONDITION AT RECEIPT	OK
SAMPLE COLLECTED BY	CUSTOMER
QUANTITY RECEIVED	APPROX.1 GM
SAMPLE COLLECTED FROM BAJRANG POWER & ISPAT LTD.	

TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	RESULT
				CHP (COAL HANDLING PLANT)
1	Free Silica	%	NIOSH-7500	2.87

Terms & Conditions

- *The above analysis report refers to the particular sample received at our end and and the use of the report for publication, arbitration or as legal dispute is forbidden.*
- *Test sample will be received for 15 days after issue of test report unless otherwise agreed with customer.*
- *This is for information as the party has asked for above test(s) only.*

REVIEWED BY		For ULTIMATE ENVIROLYTICAL SOLUTIONS AUTHORIZED SIGNATORY

----------End of the test report----------

www.casellasolutions.com

CASELLA

Certificate of Conformity and Calibration

Instrument Model Apex2ISPlus

Serial No. 4021886

Firmware Version 209.087.12.00

Applicable Standard :- ISO 13137 :2013 Workplace Atmospheres
Pumps for personal sampling of Chemical and biological agents

Test Conditions

Temperature: - 25.6 °C
Humidity: - 80 %
Pressure: - 98.2 kPa
Test Engineer: - Ghanshyam Kumar
Date Of Issue: - 10/30/2023 Valid Up to: - 10/29/2024

Equipment Used: - Air Flow Calibrator
Air Flow Calibrator:
Type :- ALICAT Flowmeter (2023593)

Declaration of Conformity
This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications.

Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2008 quality procedures. This product is certified as being complaint to the requirements of the CE Directive.

Test and Calibration Results: -
General Tests

Item	Measured Value	Lower Limit	Upper limit	Status
Pump Temperature	32.0	0	45	Pass
Battery Voltage- CELL1(V)	4.17	3.6	4.2	Pass
Battery Voltage- CELL1(V)	4.17	3.6	4.2	Pass
General Hardware	N/A	N/A	N/A	Pass
Bluetooth Communication	Passed	N/A	N/A	Pass

Flow Rate Accuracy Error Limits (%)

Set Flow Point (mL/Min)	Measured Flow Rate (mL/Min.)	Min	Max.	Status
5000	4997	-5%	+5%	Pass
4000	3997	-5%	+5%	Pass
3000	2999	-5%	+5%	Pass
2000	1998	-5%	+5%	Pass

Casella
Regent House, Wolseley Road,
Kempston, Bedford
MK42 7JY
United Kingdom
Tel: +44 (0) 1234 844100

Casella Inc.
415 Lawrence Bell Drive,
Unit 4
Buffalo, NY 14221, USA
Toll Free (800) 366-2966
Tel: (716) 276-3040

Casella, India
1203, Eros Corporate Park,
IMT Manesar-122005
ghanshyamsingh@casellasolutions.com
Tel:-9560375964

www.casellasolutions.com

CASELLA

Certificate of Conformity and Calibration

Instrument Model Apex2ISStandard

Serial No. 4583642

Firmware Version 209.087.12.00

Applicable Standard :- ISO 13137 :2013 Workplace Atmospheres
Pumps for personal sampling of Chemical and biological agents

Test Conditions

Temperature: - 25.6 °C
Humidity: - 80 %
Pressure: - 98.2 kPa
Test Engineer: - Ghanshyam Kumar
Date Of Issue: - 10/30/2023 Valid Up to: - 10/29/2024

Equipment Used: - Air Flow Calibrator
Air Flow Calibrator:
Type: - ALICAT Flowmeter (2023593)

Declaration of Conformity
This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications.

Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2008 quality procedures. This product is certified as being complaint to the requirements of the CE Directive.

Test and Calibration Results: -
General Tests

Item	Measured Value	Lower Limit	Upper limit	Status
Pump Temperature	32.0	0	45	Pass
Battery Voltage- CELL1(V)	4.17	3.6	4.2	Pass
Battery Voltage- CELL1(V)	4.17	3.6	4.2	Pass
General Hardware	N/A	N/A	N/A	Pass
Bluetooth Communication	Passed	N/A	N/A	Pass

Flow Rate Accuracy Error Limits (%)

Set Flow Point (mL/Min)	Measured Flow Rate (mL/Min.)	Min	Max.	Status
5000	4995	-5%	+5%	Pass
4000	3989	-5%	+5%	Pass
3000	2993	-5%	+5%	Pass
2000	2000	-5%	+5%	Pass

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Casella, India
1203, Eros Corporate Park,
IMT Manesar-122005
ghanshyamsingh@casellasolutions.com
Tel:-9560075584

CASELLA

Certificate of Conformity and Calibration

Instrument Model:- CEL-620C1IP

Serial Number 6726857

Firmware revision 031-04

Microphone Type:- CEL-251 Preamplifier Type:- N/A

Serial Number 5869 Serial Number

Instrument Class/Type:- 1

Applicable standards:-

IEC 61672:2013/EN 60651 (Electroacoustics - Sound Level Meters)
IEC 60651 1979 (Sound Level Meters), ANSI S1.4: 1983 (Specifications For Sound Level Meters)

Note:- The test equipment performed in this report are in accordance with the current Sound level meter Standard - IEC61672. The combination of tests performed are considered to confirm the products electro-acoustic performance to all applicable standards including superseded Sound Level Meter Standards - IEC60651 and IEC60804.

Test Conditions:- 22.3 °C Test Engineer:- Nicola Cartwright

43 %RH Date of Issue:- December 23, 2022

994 mBar

Declaration of conformity:-

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications. Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2008 quality procedures. This product is certified as being compliant to the requirements of the CE Directive.

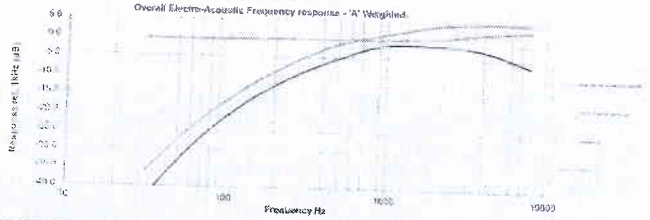
Test Summary:-

Self Generated Noise Test	All Test Pass
Electrical Signal Test Of Frequency Weightings	All Test Pass
Frequency & Time Weightings At 1 kHz	All Test Pass
Level Linearity On The Reference Level Range	All Test Pass
Tone burst Response Test	All Test Pass
C-peak Sound Levels	All Test Pass
Overload Indication	All Test Pass
Acoustic Tests	All Test Pass

Combined Electro-Acoustic Frequency Response - A Weighted

Combined Electro-Acoustic Frequency Response - A Weighted (IEC 61672-3:2006)

The following A-Weighted frequency response graph shows the instruments overall frequency response based upon the application of multi-frequency pressure field calibrations. The microphones Pressure to Free field correction coefficients are applied to pressure response. Reference level taken at 1kHz.



SATYAM CALIBRATION SERVICES
Plot No. 3, Bhawani Niketan Vistar, Nangal Road, Behind Industrial Area Jhotwara,
Near Vishnu Oil Mills, Jaipur– 302012, (Raj), Mob No: 09414062908, 9414062903
Email ID :- [illegible]

(Evaluation Of Measurement)

CALIBRATION CERTIFICATE

Certificate No : SCS/1086
User Name : M/S: ARVIND INDUSTRIAL HYGINE CONSULTANCY
C-19, TAGORE NAGAR, RAIPUR, CHHATTSGARH-492001

Device under Calibration	NOISE DOSIMETER
Make	LUTRON
Range	0 TO 100%
Least Count	0.1%
Instrument Id. No.	---
Instrument Sr. No.	Q662236
Location	---
Visual Inspection	Ok
Material Receipt Date	02.10.2023
Date of Calibration	02.10.2023
Due Date of Calibration	01.10.2024
Issue Date of Certificate	02.10.2023
ENVIRONMENTAL CONDITION	
Temperature	25 ±3 Deg. C.
Humidity	45 to 75% Rh.

Equipment & Master Used For calibration

01. SOUND LEVEL METER

- Make : LUTRON
- Serial No. : 6733JIP
- Certificate No. : NTS/3649
- Next Due Date : 16/05/2024
- Traceability : NENO

OBSERVATION RESULTS

Sl. No.	Set Value in Master (%)	Observed Value in UUC (%)	Error (%)	Expanded Uncertainty (±)
01	10.0	10.3	0.3	---
02	30.0	30.5	0.5	---
03	50.0	50.5	0.5	---
04	80.0	80.7	0.7	---
05	95.0	95.6	0.6	1%

Calibration Procedure Based On : WI-51M

Uncertainty of Measurement : (The reported uncertainty is at coverage factor k = 2, which correspond to coverage probability of approximately 95% of a normal distribution.)

NOTE :-

1. The calibration results reported in this certificate are valid at the time of and the stated condition of measurement.
2. This report should not be reproduced except in full without our prior permission in writing.
3. Calibration certificate without signature are not valid.
4. All our certificates are Traceable to National standard.
5. Statement to the effect that the results relate only to the calibrated items
6. UUC : Unit under calibration , GUT : Gauge under testing.

(R.K. Patel)
Calibrated By:-

SATYAM CALIBRATION SERVICES JAIPUR

Approved By:-
Satya Nand Prasad
(Quality Manager)

CITADEL ENGINEERS PRIVATE LIMITED

71,A/2 ALIPORE ROAD, MANGLAM APARTMENT, KOLKATA - 700027
Phone: 098302 16538, TeleFax: +91-33-24799058, E-mail: citadelengineers@gmail.com
CIN: U35202WB1990PTC048399

LUX METER– Calibration Certificate & Inspection Report

Serial Number: 10056

Unit Type: LUX METER
Measuring Range: 0-50000 Lux

THE ABOVE LUX METER HAS BEEN CALIBRATED AND HAS BEEN FOUND OK

1) SPECIFICATION.....	Results	GOOD
2) APPEARANCE & CONSTRUCTION	Results	GOOD
3) CHARACTERISTICS	Results	GOOD

Remarks:

Does the unit work?	Yes X	NO
Is there any physical damage?	Yes	NO X
Calibration Certificate	Yes X	NO

Final Inspection & Test Results: OK

(Authorised Signatory)

Date: 16.01.2023

DIRECTORATE OF INDUSTRIAL HEALTH & SAFETY

CHHATTISGARH, RAIPUR

2nd Floor, 3rd Block, Indrawati Bhawan, Atal Nagar Raipur

No.DIHS/C.G./RPR/C.C.//4475508836A **Raipur,Dated 14-06-2023**

CERTIFICATE OF COMPETENCY

This is to certify that **Arvind Industrial Hygiene Consultancy, C-19,Tagore Nagar, Raipur** to be a competent person for the purpose of carrying out tests, examinations, inspections and certification for such precautions against dangerous fumes, ventilation system as required under various schedule framed under sec-87, used in factories located in the State of Chhattisgarh **section 36 section 87 under factories act 1948** and the Rules made there under of Factories Rules 1962 To Dr. Avinash Kumar Verma for the period from **23/06/2022** To **22/06/2024**. This certificate is issued subject to the conditions stipulated here under :-

CONDITIONS

1. The examinations and inspections shall be carried out in accordance with the provisions of the Act and the Rules made there under.
2. Tests, examination and inspections shall be carried out under direct supervision of the competent person.
3. Copies of examination certificate issued by you after due examination are to be marked to the Inspector of Factories concerned in all cases where defects are noticed and repairs are ordered or any alterations are imposed on its use.
4. The Chief Inspector of Factories, Chhattisgarh State, Raipur reserves the right to revoke, renew or amend this order at any time after giving opportunity of hearing.
5. All the testing facilities at the disposal of the competent person/institution/Association shall be maintained in good working order.
6. Any change in testing facilities (either addition or deletion) shall be intimated to the Chief Inspector of Factories, C.G. immediately.

AMRIT KUMAR XALXO

Chief Inspector of Factories
Government of Chhattisgarh Raipur

CERTIFICATE

This is to Certify that the
Quality Management System
of

ARVIND INDUSTRIAL HYGIENE CONSULTANCY

C-19, TAGORE NAGAR, RIPUR- 492 001(C.G) INDIA

has been independently assessed and is compliant
with the requirements of

ISO 9001:2015

This Certificate is applicable to the following product or service ranges:

PROVIDING INDUSTRIAL HYGIENE CONSULTANCY
TO INDUSTRIES

:: Certificate No :: IN10511A

Date of initial registration	01 May 2018
Date of this certificate	04 May 2024
Recertification Due / Certificate expiry	30 April 2027

This Certificate is property of Certiva Limited Certifications and remains valid subject to satisfactory surveillance audits

Director

Certiva Limited
3rd Floor, 207 Regent Street, London, W1B 3HH, UK
Tel: +44 203 514 3425 Phone: +44 704 204 2076
Fax: +44 845 874 1820
E-mail: info@certiva.co.uk Web: www.certiva.uk
Company Number: 07991121

For precise and updated information concerning the present certificate visit at www.certiva.uk

Annexure-10

FORM 21
(Prescribed under Rule(19)1
Health Register
(In respect person employed in occupations declared to be dangerous operation under section 87)

Name of Worker..Mr...Harshraj.................. Age/Sex.....38y./m
Name of Company:- ....Bayreuey....Power... Employee Code ....
Nature of occupation .... Date -..11..11.0./.2024

Annexure

PRE-EMPLOYMENT & PERIODIC MEDICAL EXAMINATION

(1) GENERAL EXAMINATION:

Height ......160........ cm, Weight ....50......... kg , BMI ....
Chest Inspiration .....75.... cm, Expiration.........71......cm
Throat ..(N)..... Tongue ..(N)..... Tonsils .....(N)...Teeth ..(N)..
Gums..(N).........Thyroid ......(N).
Lymph nodes:..........................NO....................................
Additional finding: ....NO....................................

(2) CARDIO-VASCULAR SYSTEM:

Pulse: ...76.....mt. Regular/Irregular Peripheral Pulse-felt/not felt
BP ..120/80............ min of Hg Heart Sound : ...NORMAL/ABNORMAL....
Murmur, If any - ...NO.......... Additional finding (s),if any ....NO.....

(3) RESPIRATORY SYSTEM:

Shape of Chest: ...Tubular .... Chest movements: .....Symmetrical...............

Trachea ....Centrally .... Breath sound - Vesicular ....

(5) GASTRO-INTESTINAL SYSTEM:

Liver ....NP...................... Spleen ......NP.........................
Any abdominal lumps: NO/ YES

(6) EXAMINATION OF EYES :.

External Exam -NORMAL/ABNORMAL....Squint: ......YES/NO..........
Nystagmus : ....YES/NO........................ Fundus L / R
Night Blindness ....YES/NO..................
Colour vision - - Normal / Defective
Individual colour identification- Normal / Defective

Distance vision (without glasses) Right ......6/6.........Left ..6/6
(with glasses) Right .... Left ....

Near-vision(without glasses) Right ....N/6............ Left N/6.........
(with glasses) Right .... Left ....

(6) EXAMINATION OF EAR,NOSE & THROAT:

External Examination: ....**NAD**..

(7) GENITO URINARY SYSTEM:

Hernia – .. YES/NO..........Hydrocele - . YES/NO Varicocele - YES/NO
Cryptorchidism- YES/NO......... Phimosis ... ... YES/NO Varicose veins- YES/NO
Signs of STD ... YES/NO......... ..

Other Examinations For Females :

Menarche ....|.......... yr. G. Para .....|.......Menstrual irregularity .....|. if any

IN NS

(8) L tions:

Hae
Bloo B .....Rh factor Negative Hb 13.7 gm%

RBC 4.9 Platelets Count 291 TLC 5500
DLC 64 L 30 E 02 . M 04 . B 00

Ren

Blo 25.0 S. Creatinine : 0.86

He -SGOT 32 SGPT: 35 Alkaline Phosphate : 77 S. Bilirubin

Lipi
Ser 154 Triglycerides 115 HDL 47.0 LDL 84.
Me
Bloc 110 Blood Sugar PP ..... S. Uric Acid 5.5

Uri Nil Sugar Nil Microscopy Nil
Sto

(10) gation

X-I ✓
(In ce in three year), (in case of any abnormality x-ray can be done at shorter intervals)
EC ✓ (In case of any abnormality further test should be carried out)
Ult ole abdomen (in normal person once in three years in case of any abnormality canbe done at shorter interval
✓

Oth

(10) nction Test

	FCV	FEV 1	FEV 1/FVC
PRE	02.08	01.73	83.17
MEA	02.50	02.61	96.40
% O	120	139	116

Ren

(11 examination

P T	t. Ear	16.6	Rt. Ear 13.3
Re	BIL ✓	Hearing Sensitivity.	

PT at frequency 150 ,250,500,1000,2000,4000,8000Cycles/sec

(1? **mination of canteen staff**

(a) tion for venereal disease and routine blood examination
(b examination for worm infection
(c) kin diseases (scabies and others)
(d ner tests for T. B.

I **specific medical examination** carried out asmentioned in the respective schedules of r rules 1962-

DR MANISH KUMAR SHREY
MEDICAL OFFICER
FIT/UNFIT DIVISION)

S date) of
F cal Officer

Dr. Paras Jain
Signature (with date)
Certifying surgeon

Dr. Manish Kumar Shrey
Apollo Diagnostic Centre
RAIPUR (C.G.)

FORM 21
(Prescribed under Rule(19)1
Health Register
(In respect person employed in occupations declared to be dangerous operation under section 87)

Name of Worker. MR. JANKIRAM VERMA ..... Age/Sex. 53Y/M
Name of Company:- .... BAJRANG TMT ..... Employee Code .....
Nature of occupation ..... Date -..11/10/24.....

Annexure

PRE-EMPLOYMENT & PERIODIC MEDICAL EXAMINATION

(1) GENERAL EXAMINATION:

Height ...159..... cm, Weight .....58..... kg , BMI .....
Chest Inspiration .....78..... cm, Expiration .....74..... cm
Throat ...(N)... Tongue ...(N)... Tonsils ....(N)...Teeth ....(N)...
Gums..(N).....Thyroid ..(N).....
Lymph nodes:.....NO.....
Additional finding: .....NO.....

(2) CARDIO-VASCULAR SYSTEM:

Pulse: ...76.....mt. ~~Regular~~/Irregular Peripheral Pulse-felt/not felt

BP .....120/80..... min of Hg Heart Sound : ..~~NORMAL~~/ABNORMAL....
Murmur, If any - ...NO..... Additional finding (s),if any .....NO.....

(3) RESPIRATORY SYSTEM:

Shape of Chest: ...Tubular ..... Chest movements: .....Symmetrical.....

Trachea .....Centrally ..... Breath sound - Vesicular .....

(5) GASTRO-INTESTINAL SYSTEM:

Liver .....NP..... Spleen .....NP.....
Any abdominal lumps: NO/ YES

(6) EXAMINATION OF EYES :.

External Exam ~~NORMAL~~/ABNORMAL....Squint: .....YES/~~NO~~.....
Nystagmus : .....YES/~~NO~~..... Fundus L / R
Night Blindness .....YES/~~NO~~.....
Colour vision - - ~~Normal~~ / Defective
Individual colour identification- ~~Normal~~ / Defective

Distance vision (without glasses) Right .....6/6.....Left 6/6
(with glasses) Right ..... Left .....

Near-vision(without glasses) Right .....N/6..... Left N/6
(with glasses) Right ..... Left .....

(6) EXAMINATION OF EAR,NOSE & THROAT:

External Examination: .....NAD.....

(7) GENITO URINARY SYSTEM:

Hernia – .. YES/~~NO~~.....Hydrocele - . YES/~~NO~~ Varicocele - YES/~~NO~~
Cryptorchidism- YES/~~NO~~..... Phimosis ... ... YES/~~NO~~ Varicose veins- YES/NO
Signs of STD ...YES/~~NO~~..... ..

Other Examinations For Females :

Menarche .....)..... yr. G. Para .....)Menstrual irregularity .....) if any

INVESTIGATIONS

(8) Lab Investigations:

Haemogram
Blood Group O Rh factor Positive Hb 13.2 gm%
RBC 4.9 Platelets Count 341 TLC 8810
DLC :- P 60 L 34 E 01 M 05 B 00

Renal profile
Blood Urea : 29.0 S. Creatinine : 1.0

Hepatic profile - SGOT 23 SGPT 20 Alkaline Phosphate : 82 S. Bilirubin

Lipid profile :
Serum Cholesterol 161 Triglycerides 135 HDL 39.0 LDL 95

Metabolic
Blood Sugar F 125 Blood Sugar PP ..... S. Uric Acid 5.7

Urine: Albumin Nil **Sugar** Nil **Microscopy** Nil
Stool :....

(10) Other Investigation

X-Ray Chest. PA .....
(In normal person once in three year), (in case of any abnormality x-ray can be done at shorter intervals)
ECG- ..... (In case of any abnormality further test should be carried out)
Ultra Sound- Whole abdomen (in normal person once in three years in case of any abnormality canbe done at shorter interval

Other .....

(10)Pulmonary Function Test

	FCV	FEV I	FEV I/FVC
PREDICATED	01.90	01.48	77.89
MEASURED	01.73	01.33	76.88
% OF PREDICATED	091	090	099

Remark-

(11) Audiometry examination

PTA	Lt. Ear	18.3	Rt. Ear	21.6
Remark	BIL		Hearing Sensitivity.	

PTA of both ears at frequency 150 ,250,500,1000,2000,4000,8000Cycles/sec

(12) Medical examination of canteen staff

(a) Blood examination for venereal disease and routine blood examination
(b) Stool and urine examination for worm infection
(c) Screening for skin diseases (scabies and others)
(d) X-ray and other tests for T. B.
(e) **Details of Other specific medical examination carried out asmentioned in the respective schedule of C.G. Factory rules 1962-**

DR MANISH KUMAR SHREY MEDICAL OFFICER SBPIL (TMT DIVISION)

Signature(with date) of Factory Medical Officer

Dr. Manish Kumar Shrey

Signature (with Date) Certifying surgeon

Dr. Paras Jain MBBS, DMR Regd. No.-3850 Apollo Diagnostic Centre RAIPUR (C.G.)

Annexure - II

CORPORATE RESPONSIBILITY FOR ENVIRONMENTAL PROTECTION (CREP) CONDITIONS AND ITS COMPLIANCE

S.NO	POSSIBLE EMERGENCY	PREVENTIVE MEASURES
1.	**COKE OVEN PLANTS** To meet the parameters PLD (% leaking colors), PLL (% leaking lids), PLO (% leaking off take), of the notified standards under EPA within three years by December 2005). Industry will submit time bound action plan and PER Chart along with the Bank Guarantee for the implementation or the time. To rebuild at least 40% of the coke oven batteries in next 10 years (by December 2012).	Not applicable as there is no coke oven plant
2.	**STEEL MELTING SHOP** Fugitive emissions- To reduce 30% by March 2004 and 100% by March 2008 (including installation of secondary de- dusting facilities).	Achieved and being maintained
3.	**BLAST FURNACE** Direct inject of reducing agents by June 2013.	Not applicable since there is no blast furnace
4.	**SOLID WASTE /HAZARDOUS WASTE MANAGEMENT** Utilization of Steel/ Melting shop (SMS)/ Blast Furnace (BF) Slag as per the following schedule: By 2004 - 70% By 2006 - 80% and By 2007 - 100 %.	SMS slag is being sold to outside slag crusher units and if required is being used for by pass/approach roads construction or Low-lying area filling purposes.
	HAZARDOUS WASTES Charge of tar sludge/ ETP sludge to Coke Oven by June 2003. Inventorization of the Hazardous waste as per Hazardous Waste (M& H), Rules, 1989 as amended in 2000 and implementation of the Rules by Dec. 2003. (tar sludge, acid sludge, waste Lubricating oil and type fuel falls in	Hazardous Waste Management Rules 2016 are being followed for only used oil & Resin.

S.NO	POSSIBLE EMERGENCY	PREVENTIVE MEASURES
	the category of Hazardous waste).	
5.	**WATER CONSERVATION/ WATER POLLUTION** To reduce specific water consumption to 5 m^3/t for long products and 8 m^3/t for flat products by December 2005. To operate the Co-BP effluent treatment plant efficiently to achieve the notified effluent discharge standards. – by June 2003.	The plant is based on water consumption of 3.53 m^3/t
6	Installation of Continuous stacks monitoring system & its calibration in major stacks and setting up of the online ambient air quality monitoring stations by June 2005.	Continuous online stack monitoring system for PM/SOX/NOX installed on our major stack
7	To operate the existing pollution control equipment efficiently and to keep proper record of run hours, failure time and efficiency with immediate effect. Compliance report in this regard is submitted to CPCB/SPCB every three months.	We have provided electric meters on all installed pollution control equipment for their running hrs. & Failure time. Compliance report is being submitted to CECB every month and to MoEFCC Regional Office, Raipur
8	To implement the recommendations of Life Cycle Assessment (LCA) study sponsored by MoEF by December 2003.	Being implemented.
9	The industry will initiate the steps to adopt the following clean technologies measures to improve the performance of industry towards production, energy and land environment.	Being implementing
	• Energy recovery of top Blast Furnace (BF) gas.	Not Applicable
	• Use of Tar- free runner linings.	No tar runner linings are proposed
	• De- dusting of Cast house at tap holes, runners, skimmers ladle and charging points.	Dedusting has been provided.
	• Suppression of fugitive emissions using nitrogen gas or other inert gas	Fugitive emission is being controlled by installed bag filters, uses of Mist water spray at all transfer points.

S.NO	POSSIBLE EMERGENCY	PREVENTIVE MEASURES
	• To study the possibility of slag and fly ash transportation back to the abandoned mines, to fill up the cavities through empty railway wagons while they return back to the mines and its implementation.	Slag and Fly Ash is being used for brick making in our own Fly Ash Brick plant situated at same premises, while slag is being supplied to outsider slag crusher units.
	• Processing of the waste containing flux & ferrous wastes through waste recycling plant.	Not applicable to us.
	• To implement rainwater harvesting	Rainwater harvesting structures have been constructed at different locations of plant premises.
	• Reduction Green House Gases by:	Green houses gases are being reduced by adopting Direct Hot Rolling Technology in Rolling Mill, use of Furnace oil as a Fuel.
	➢ Reduction in power consumption	Implemented the energy efficiency measures and over achieved the energy efficiency target.
	➢ Use of by -products gases for power generation	Not applicable for us.
	➢ Promotion of Energy Optimization technology including energy/ audit	We are conducting self-audit for Energy Optimization.
	• Up- gradation in the monitoring and analysis facilities for air and water pollution. Also, to impart elaborate training to the manpower so that realistic data is obtained in the environmental monitoring laboratories.	NABL and MOEF recognized Laboratories are engaged to monitor air and water pollution levels. In house well, equipped Environment Lab is developed with qualified and experienced technical staff.
	• To improve overall housekeeping and Green belt.	Greenbelt has been developed to control fugitive dust and Noise. Good housekeeping is being maintained in the plant.

10	**SPONGE IRON PLANTS** Inventorisation of sponge iron plants to be completed by SPCBs/CPCE by June 2003 and units will be asked to install proper air pollution control equipment by December 2003 to control primary and secondary emissions.As per rebuilding schedule submitted to CPCB/MoEF.	Not applicable as there is no Sponge Iron Plant