

EXECUTIVE SUMMARY

For

**Expansion of Existing Rolling Mill
from 2,14,000 TPA to 3,00,000 TPA**

&

Proposed

Steel Melting Shop (Steel Billets) of 2,45,000 TPA

For

M/s. R R Ispat

(A Unit of Godawari Power & Ispat Ltd.)

**490/1, Urla Industrial Area, District- Raipur,
State - Chhattisgarh**

By:

Pollution and Ecology Control Services

Near Dhantoli Police Station, Dhantoli, Nagpur-12.

pecs_nagpur@rediffmail.com

NABET No. 121

EXECUTIVE SUMMARY

1.0 INTRODUCTION

M/s R. R Ispat (A unit of GPIL), Raipur [C.G.] was a Limited Company, incorporated in May' 1999 by the Registrar of Companies, Madhya Pradesh & Chhattisgarh, Gwalior (M.P.). Consequent upon on the merger of R.R. Ispat Ltd. with Godawari Power & Ispat Ltd. which is an Integrated Steel Plant of Hira Group of Industries of Chhattisgarh) effective from 30.03.2011, the company was renamed as R.R. Ispat (A Unit of Godawari Power & Ispat Ltd.).

R.R. Ispat (A unit of GPIL) is an existing Wire Rod Mill with wire drawing facilities. The Registered Office of RRI is situated at Plot No. 428/2, Phase-I, Industrial Area, Siltara, Raipur (Chhattisgarh).

The Board of Directors of the company comprises; Mr. Biswajit Choudhuri, Mr. Bajrang Lal Agrawal, Mr. Dinesh Agrawal, Mr. Abhishek Agrawal, Mr. Dinesh Kumar Gandhi, Mr. Vinod Pillai, Mr. Shashi Kumar, Mr. B.N. Ojha, Mr. Harishankar Khandelwal & Ms. Bhavna G. Desai. The environmental clearance for the capacity of 2.14 lac TPA was obtained from SEIAA, MoEF, Chhattisgarh vide letter no. 834/SEIAA-CG/SIA/CG/IND/468 dated 19/01/2018.

2.0 PROJECT DESCRIPTION

The proposed project of manufacturing of Expansion of existing Rolling Mill capacity from 2,14,000 TPA to 3,00,000 TPA (1 lakh hot charging and 2 lakhs through re-heating furnace.) & Steel Melting Shop (Billets) with LRF of capacity 2,45,000 TPA. (15 ton x 6) located at Survey No. 490/1, Village- Urla Industrial Area, District- Raipur, Chhattisgarh.

Existing capacities of the Company

Major Existing Plant Facilities

Sr. No.	Plant Details	Units	Existing Units Capacity
1	Rolling Mill	TPA	2,14, 000 TPA

Proposed Expansion Plant Facilities

Keeping in view the rising demand of steel products especially in the construction sector, the company proposes to enhance the existing production capacity of Rolling Mill from 2.14 lac TPA to 3.00 lac TPA on the following justifications:

- Increasing the rolling speed of wire rod mill from 50 Mps to 75 Mps, since existing rolling mill is designed for rolling speed of 75 Mps (Meter per section).
- Section rolled wire rod is of 5.5 mm dia having sectional weight of 186 gm/meter.
- If operated at designated speed of 75 Mps, the increase in total production will be up to 3,00,000 TPA as detailed below :

Sectional weight of 5.5 mtr. wire rod	186 gm / mtr.
Sectional weight in one hour	$186 \times 75 \times 60 \times 60 = 50220000$ gms. or 50.22 tons / hour
Working Hours	21 hours
Total production per day	$50.22 \times 21 = 1054.62$ tons / day
Total working days	330 days
Total production per annum	$1054.62 \times 330 = 3,48,025$ tons / annum
Considering efficiency of 90%, the total production will be	$3,48,024 \times 90\% =$ 3,13,222 tons / annum
Say	3,00,000 tons / annum

- Out of total proposed capacity of 3.00 lac TPA of Rolling Mill, 2.00 lac TPA Billets will be kept in Billet yard for utilization in reheating furnace for manufacture rolled products. (Approx. 30 ton per hour on daily basis.)
- Balance capacity of 1.00 lac TPA will be on hot charging method, where the hot steel Billets will pass through the mill approach table directly from CCM to Rolling Mill. (Approx. 15 ton per hour on daily basis)

Steel Melting Shop

Steel Billets shall be produced through 6 Nos. of Induction Furnaces of 15 ton each with 6000 KW Power for each furnace which can produce about 2, 45,000 MTPA, with main raw-material Sponge Iron.

- Installation of 6 Nos. of Induction Furnace of 15 ton capacity.
- Size of each Induction Furnace will be 1.6 Mtr. inner dia and 2.5 Mtr. outer dia
- Gap between each further will be 5 Mtr.
- Installation of 2 stand billet caster of 30 TPH capacity.

PROCESS DESCRIPTION

Rolling Mill

Qualitative raw materials MS Billets is tested and then pushed in re-heated furnace for reheating upto suitable temperature for rolling. The process involves :

❖ TMT Bars :

The Rolling & Re-rolling Process is age old and adopted by one and all. The TMT Rods are already in the trade and have widely been accepted. All other Products constituting the product mix belong to the family of the conventional Rolled Products. The manufacturing of Binding Wires, an end product in literal terms; is carried out by the process of Wire Drawing.

❖ Block Mill :

The tradition of the first adoption of new Technologies by the “Hira Group” continues at RR Ispat. The most modern State-of-the-Art Block Mill has been installed at RRI. The Block Mill consists of sets of multiple Stands with even number of Rolls. The Block arrangement obviously increases the Mill Speed to a great extent.

❖ Reheating Furnace :

The Raw Material (Billet) is first re-heated prior to Rolling in Reheating Furnace. The Gas Fired Pusher Type Reheating Furnace has been constructed as per the latest Furnace Technology to minimise the heat losses and optimise fuel consumption. The inside dimensions of the Furnace will be modified from 5 meters breadth x 26 meters length to 6.5 meters breadth x 26 meters length. with fire-wool blanket being used as additional insulation material. The Furnace is having heating speed of 18 TPH. Now the heating speed will be increased to 30 TPH to achieve the production of higher capacity.

❖ Roughing Mill

The Roughing Mill is adoptable to raw materials of 130 x 130 mm to 100 x 100 mm billet as per availability in the market. It is having Roughing Mill Stand of Pinion Centre Distance of 510 mm Pinion, driven by 1500 HP 8 pole motor. Through repeated passes, The material is reduced to 65 x 65 / 44 x 44.

❖ Intermediate Mill

The Intermediate Mill is the continuous mill from Roughing Mill. The material from Roughing Mill is introduced in continuous mill having 2 passes where material is further reduced to required size of approx. 28 to 30 mm square / round. All the stands are independent and are run with 400 to 420 mm pinion with motor load in different stands ranging from 300 to 400 KW.

❖ Continuous & Block Mill:

The Continuous Mill comprises of 8 to 10 horizontal stands. From the continuous mill, the output

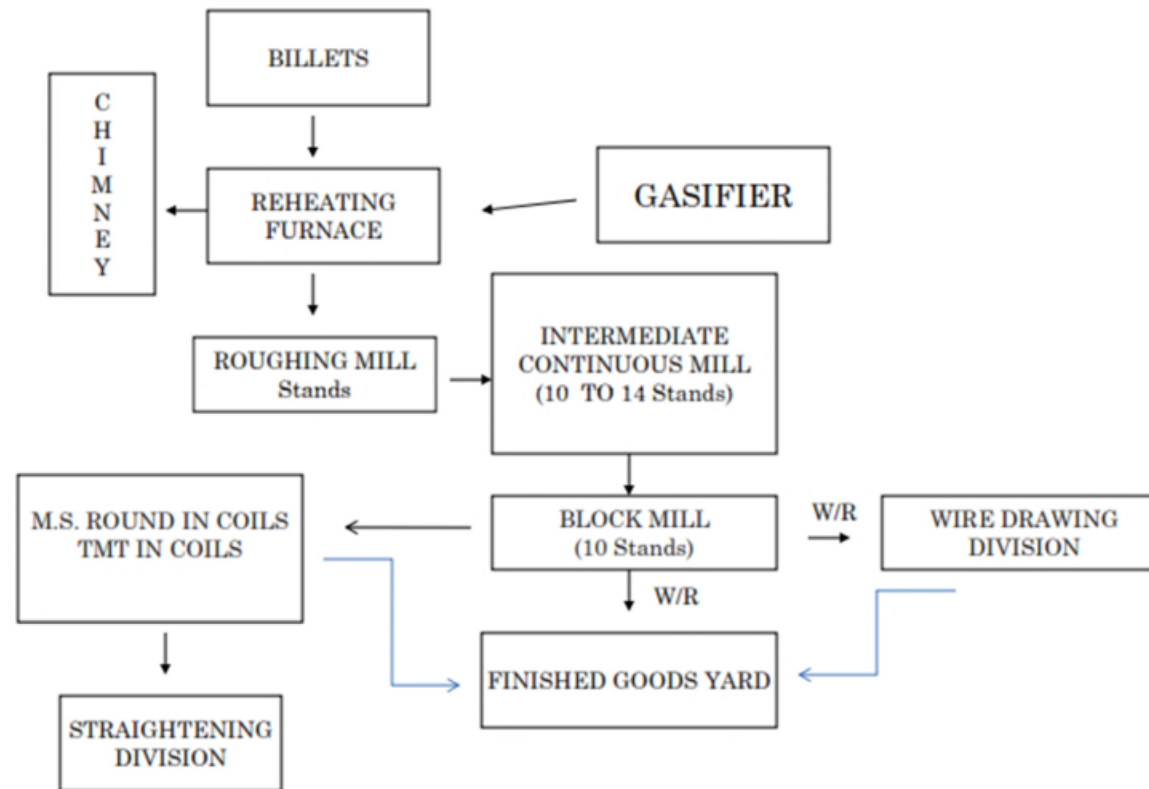
comes out approx. 13 mm square / rounds. From there it passes to the state of art Block Mill with variable speed is 75 m/second. It is being run by two 800 KW DC motors. The speed of the motors is being varied as per the requirement of the product and tonnage of product needed as per section. The output of finishing mill is 5 mm dia to 12 mm dia of wire rods, round in coils, CTD bars / coils, TMT bars / coils.

❖ **Finishing Section**

The Finishing Section consists of Coilers, Coil Pushers, Cooling Conveyors, Cooling Blowers, Cooling Bed to produce wire rods, round in coils, CTD bars / coils, TMT bars / coils.

The pieces of cut rolled product are tested for size, % Elongation, Bend & Re-bend and weight per meter. After visual inspection the bars are bundled and kept in slot for dispatch.

The process flow diagram of the rolling mill is given in following figure



Process Flow Diagram (Rolling Mill)

STEEL MELTING SHOP

In this project, we have considered Induction Furnace for producing billet / ingots and the production of billets to be used for producing structural steel (wire rod / TMT) from the rolling mill. The furnace is run with electric power fed from the furnace transformer. The material kept for charging on the charging conveyor is fed inside the induction furnace and is melted and the same is discharged out of furnace and is poured to the ladle furnace for further processing in the continuous casting machine.

Steel Billets shall be produced through Induction furnaces to con-cast machines; the main raw-material is Sponge Iron. Power shall be internally consumed; additionally Steel Scrap and Ferro Alloys as per the requirement.

Steel melting shop is a department where the metallic scrap and the sponge iron is being melted in induction furnace. The liquid metal thus melted is treated with alloys additions for required final product chemistry and cast in to the Billet through continuous casting machine.

The steel melting shop shall have complete facilities right from Weigh Bridge, Receiving and processing yard for Raw Materials, Charging Bays, Furnace Transformers, Cooling Towers, DM Plant, water softening plant, EOT cranes, storage yards, conveyor systems for feeding, bin weighing system, ladles, ladle preheater, compressor, pumps, electrical power and control system etc.

The charge mix of Sponge Iron, Steel Scrap and Ferro Alloys are charged in Induction Furnace as per required chemical composition in the bottom part of Induction Furnace.

All the raw-materials are melted in the furnace with the help of power and temperature is raised at 1650 to 1680⁰C and liquid metal is tapped in Ladle. The temperature is measured with Pyrometer. The molten steel is tapped in ladle and then fed to CONCAST (Continuous Casting Machine) through Ladle to get the sizes of Billets.

The manufacturing process are described under following heads :

- Raw Material
- Raw Material feeding system
- Induction Furnace
- Ladle Refining Furnace
- Continuous Casting Machine

The sponge iron is fed into the bunkers through the belt conveyor from the sponge iron plant. From the load out center of the sponge iron plant one conveyor belt has been considered to the induction furnace shed and a shuttle conveyor is considered in the shed for filling the bunkers of

furnace. From these bunkers each induction furnace is fed individually through the weight feeders for uniform and regular feeding of the raw material into the furnace and also to have a proper accounting of the sponge iron feeding. And rest of the raw material is fed into the induction furnace by getting it weighed in the platform scale available on the induction furnace platform. The slag produced in the process, after cooling is sent to the slag dump.

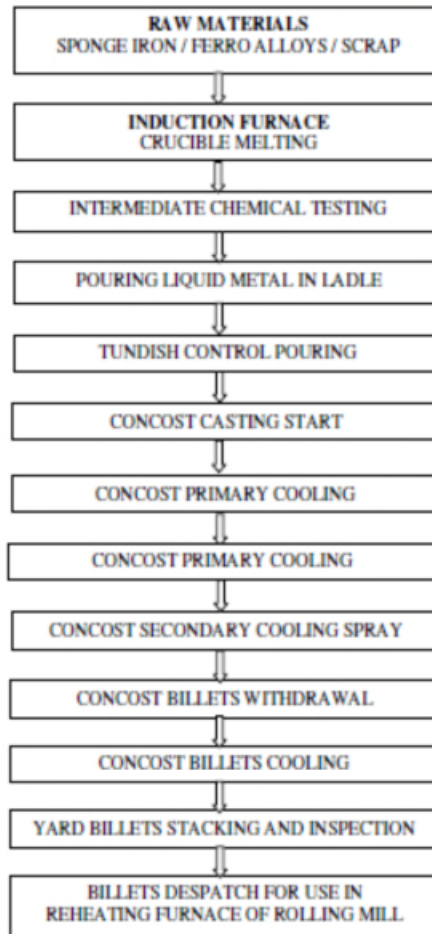


Figure 2.6: Process Flow Chart

3.0 DESCRIPTION OF THE ENVIRONMENT

Air Environment

The ambient air quality monitored at 8 locations selected based on predominant wind direction, indicated the following ranges;

PM ₁₀ :	55.8 to 79.3 µg/m ³ .
PM _{2.5} :	18.0 to 38.3 µg/m ³
SO ₂ :	5.4 to 9.0 µg/m ³
NO _x :	14.8 to 24.9 µg/m ³

Industrial Area Residential, Rural Area (CPCB Norms)	PM ₁₀	PM _{2.5}	SO ₂	NO _x
	100 µg/m ³	60 µg/m ³	80 µg/m ³	80 µg/m ³

The concentrations of PM₁₀, PM_{2.5}, SO₂ and NO_x were found within the National Ambient Air Quality Standards (NAAQ).

Water Environment

A total 11 samples including three surface & eight ground water samples were collected and analyzed. The water samples were analyzed as per Standard Methods for Analysis of Water and Wastewater, American Public Health Association (APHA) Publication.

The data indicates that the ground water as well as the surface water quality are below the stipulated standard for drinking water (BIS 10500 – 2012) except high concentration of total coli form in surface water, which may be due to the human activities.

Noise Environment

Noise levels measured at eight stations are within limit of 55.0 dB (A) for Residential Area or 75.0 dB (A) for Industrial Area as given in MoEF Gazette notification for National Ambient Noise Level Standard.

Area Code	Category of Area	Limits in dB(A) Leq	
		Day time	Night time
A	Industrial Area	75	70

B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone**	50	40

** Silence zone is defined as area up to 100 meters around premises of hospitals, educational institutions and courts. Use of vehicle horns, loud speakers and bursting of crackers are banned in these zones

Land Environment

Four Soil samples were collected analyzed for physico-chemical characteristics at selected locations in the study area to assess the existing soil conditions around the proposed project site. The relevant parameters show the following characteristics.

The characteristics of the soil sample were compared with different depths for respective parameters.

The observations of soil characteristics are discussed parameter wise below;

- a) Texture of soil samples are sandy loam
- b) Colour of soil samples are dark gray in colour.
- c) The bulk density of soil samples are in the range of 1.46 to 1.54 g/cc
- d) pH values of soil samples varied between 7.57 to 8.12.
- e) Soil samples have conductivities between 0.235 to 0.536 mmhos/cm

4.0 Anticipated Impacts & Mitigation Measures

Impact on Air Quality

The impacts on air quality due to source of the air pollutant in the proposed expansion facilities have been identified.

Sources of Emissions

Emissions released from the stack during operation phase will get dispersed in the atmosphere and finally reach the ground at a specified distance from the sources. From the proposed expansion activities the possible environmental impact on air quality has been envisaged due to the following sources.

Raw Material Handling / Transport System

The possible pollutants are fugitive dust emissions from raw materials handling areas viz. loading / unloading, etc. Raw materials will be fed to hopper with the help of pay-loader / tipper.

Mitigation Measures

M/s. RR Ispat (A Unit of GPIL) shall provide dust suction system which will control fugitive emission due to material handling. Dust suppression system will be provided in the form of water sprinklers. All vibrating screens and weigh feeders below the hopper; day bins etc are totally covered to prevent leakages of dust. The entire length of conveyors is covered to prevent dust pollution. All bins are totally packed and covered so that there is no chance of dust leakage. All discharge and feed points wherever the possibility of dust generation is there is provided with dust suppression system. All material transfer points are connected with dust suppression water nozzles to avoid air pollution.

- The raw material handling section is provided with mist system.
- All rotary equipments like fans, blowers, pumps & compressors, rolling mills are being of low noise design. The grouting of this equipment is made free from vibrations.
- Heat recuperator has already been provided.
- Adequate dust suppression system like fog type and water spray system is installed in the material handling system and at transfer points, loading points.
- Good house-keeping practices are adopted in the plant premises.
- Trucks and other vehicles are maintained and serviced regularly to reduce air emissions.
- Usage of respiratory protective equipment by all employees

Noise Levels

During operation, the major noise generating sources are auto loading section, electric motors etc. These sources will be located far off from each other. Under any circumstances the noise level from each of these sources will not exceed 85 dB (A).

Noise levels generated in the project site will be confined to the noise generating plant units hence the impact of noise levels on surroundings will be insignificant

Mitigation Measures

The noise levels stipulated by Central Pollution Control Board at any point of time will not exceed the standards.

- By providing padding at various locations to avoid sharp noise due to vibration.
- Other than the regular maintenance of the various equipment, ear plugs/muffs are recommended for the personnel working close to the noise generating units;
- All the openings like covers, partitions will be designed properly

- Inlet and outlet mufflers will be provided which are easy to design and construct.
- All rotating items will be well lubricated and provided with enclosures as far as possible to reduce noise transmission.
- The insulation provided for prevention of loss of heat and personnel safety will also act as noise reducers.

Impact on Water

The total water requirement for the proposed expansion project is 1510 m³/day. There will not be any impact on the water quality as the water system is in close loop used for cooling rolls in the process. The sewage generated from the proposed expansion facility will be treated in Packaged Type STP.

Impact on Terrestrial ecology

There is no forest patches in the 10 km radius of the proposed expansion project. There is no designated ecological park or Bio Reserve/Wild life sanctuary in the 10 km radius of the proposed expansion project. The impact on terrestrial ecology will be negligible and shall be insignificant.

Solid Waste Generation

The solid waste generation in the existing and proposed expansion activities are given in

Following table

Solid Waste for Rolling Mill

Major solid wastes generated from the rolling mill are mill scale and clinker ash from gasification system, which are being utilized as raw material in other manufacturing units.

Solid Waste Management

	Existing TPA	Proposed TPA	Disposal Method
Mill Scale	4365	6350	Reusable material in our proposed SMS
Clinker Ash	6848	6400	Sale to fly ash brick plant manufacturers and consumption in our associate brick plant.
Tar	736 Kg. Max. per month	736 Kg. Max. per month	Sale to authorized Vendors.

Solid Waste for SMS

The generated solid waste is not a hazardous waste; hence it can be easily disposed to ground filling & road leveling after recovery of metal.

Solid Waste generation	Quantity (TPA)	Method of Disposal
Slag	56,350	Slag is about 23% of billet capacity, where about 8 to 10% of slag recovered as low grade sponge iron and reused in the steel melting shop. Part of the slag will be used for land filling.

Impact on Socio-Economic Environment

The impacts of the proposed expansion project, during its operation, on demography and socio-economic condition can be identified as follows.

- Negative impacts can be depletion of natural resources like water and land, depletion in air quality if proper mitigative measures are not taken.
- Increase in employment opportunities and Reduction in migrants to outside for employment.
- Growth in service sectors.
- During operation phase additional 70 technical and nontechnical people will be employed.
- Increase in consumer prices of indigenous produce and services, land prices, house rent rates and Labour prices.
- Improvement in socio-economic environment of the study area.
- Improvement in transport, communication, health and educational services.
- Increase in employment due to increased business, trade commerce and service sector.
- The overall impact on the socio economic environment will be significant.

The management of M/s. RR Ispat (A Unit of GPIL) has proposed to give preference to local people for recruitment in semi-skilled and unskilled categories.

5.0 Environmental Monitoring Programme

The environmental monitoring is important to assess performance of pollution control equipment installed in the proposed expansion project of M/s. R R Ispat. The proposed expansion project is of expansion of rolling mill from 2,14,000 TPA to 3, 00000 TPA and a new Steel Melting Shop (Billets) with LRF of capacity 2,45,000 TPA in the existing plant premises of RR Ispat. The sampling and analysis of environmental attributes including monitoring locations will be as per the guidelines of the Central Pollution Control Board/ State Pollution Control Board.

Environmental monitoring will be conducted on regular basis by M/s. R R Ispat to assess the pollution level in the proposed expansion plant as well in the surrounding area. Therefore, regular monitoring program of the environmental parameters is essential to take into account the environmental pollutant of the study area. The objective of monitoring is:

- To verify the result of the impact assessment study in particular with regards to new developments;
- To follow the trend of parameters which have been identified as critical;
- To check or assess the efficiency of the controlling measures;
- To ensure that new parameters, other than those identified in the impact assessment study, do not become critical due to the commissioning of proposed facilities;
- To check assumptions made with regard to the development and to detect deviations in order to initiate necessary measures;
- To establish a database for future Impact Assessment Studies for new projects.

The attributes, which needs regular monitoring, are specified below:

- Air quality
- Water and wastewater quality;
- Noise levels;
- Soil quality;
- Ecological preservation and afforestation; and
- Socio Economic aspects and community development

6.0 Environmental Management

The management of the M/s M/s. R R Ispat has taken all the necessary steps to control and mitigate the environmental pollution in the existing project and will continue to do the same in the proposed expansion project. The environmental management plan briefs all the elements of environment pollution controlling systems proposed by the project proponent in operation phase. The environmental management plan describes briefly the action plans to be implemented during the post project monitoring stage as per the Ministry of Environment and Forest (MoEF) New Delhi, Central and State Pollution Control Board guidelines.

7.0 Conclusion

It can be concluded that there would be negligible impact in the buffer zone due to the proposed expansion. The project shall contribute to the socio-economic development, strengthening of infrastructural facilities like medical, educational etc. The plant shall be operated keeping "Sustainable Development" of the region in mind.

Further, management is committed to contribute towards improving socio-economic status of the surrounding local community.

Environmental monitoring is a successful tool for the management for implementation of adequate & effective environmental measures. It also helps the management to take mid- course correction, if required based on the environmental monitoring results. Considering the above overwhelming positive impact on the community, there shall be overall development of the area.