Survival of Secondary Steelmaking in Chhattisgarh

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Chhattisgarh is known as RICE BOWL due to highest paddy production in the state. The state is blessed with rich mineral resources. This has attracted many entrepreneurs for investment in steel sector. The growth of economy in state is due to steel, Aluminium, Cement, Thermal Power and mining. Rich mineral resources viz. Iron ore and Coal has attracted for Secondary Steel producers and so the production of steel in the state is more than 10% of entire Indian SSRM. There are more than 75 Sponge Iron and Integrated Steel Plants. Mini Steel Plants with Induction Furnaces are not less than 200, and about 180 rolling mills are in Operation. Ferro alloys plants are approximately 35 in numbers. Abundance of coal and water made the state biggest power generator. More than 500 MW/day power is consumed. Thus making state more progressive.

Indian steel industry is facing acute difficult situation due to adverse market condition and high raw material cost. It has got severe jolt from neighbouring countries. Many secondary steel makers have sold their units as it was not viable to continue production. They are not able to face rising cost of raw material & cheaper cost offered by neighbouring countries. If the situation prevails for a longer period, many more SSRM will see closure. There are only two options for survival. One cost cutting on production and other, to beg a supportive helping hand from Government.

Steel cost, basically constitute, cost of raw material, cost of electricity and man power cost. Cost of raw material viz. iron ore in India is Rs. 4000/ ton, where as it costs Rs.1800/t in International market. Similar is the difference in coal cost. Bringing down cost of coal and iron ore and tax relief by Government will provide oxygen to Yale and pale Steel Industries. Steel making plants have employed more than 1.25 lacs of people in Chhattisgarh. If 50% steel industry witness closure, 60,000 people will starve due to inadequate jobs. Cutting price of coal and iron ore only could provide relief from disastrous state. Hence government should seriously think on these lines.

Demand of steel per capita is quite low compared to other developing and developed countries. Government infrastructure investment can raise steel demand. Honorable Prime Minister's vision "Make India" Housing for everyone, and Smart Cities could raise steel demand and some relief to steel sector. These plans need to be executed at lightning speed and not at creeping speed.

The man power cost will not reduce, however the same can go up by 10% if some reduction does not take place or multi skilling is practiced. Industries in Chhattisgarh are getting double thrash. One due to lower demand of steel and other due to higher cost of electricity. Plants are being shut due to higher tariff although generation cost is low. If tariff remains same more industries may get closed. The government should really declare some relief in tariff for steel companies to breathe in.

In addition to government relief and policies there are other measures for cost reduction to be implemented by steel companies. These are: raw material, process and electricity. Cost of raw material is a major expenditure. Iron ore cost is rocketing high. In this gloomy market situation best way is to use iron ore pellets.

The cost of raw material can be reduced by use of iron fines pellets in place of sized costly ore. Pellets are cheaper than iron ore and suitable substitute for steel making although yield is little less. There are some giant plants like Godavari Ispat, Sarda Energy etc. already producing iron ore pallets. The photograph of pallets is shown in photo1.

1. Required Size 5-18 mm +/- 5%

2. Chemistry

Pellets from Iron Ore Fines

Fe	SiO2+ Al203	S	P	CCS	Tumbler Index	Abrasion Index	Porosity
64%	5.5% Max	0.025 Max	0.05 Max	200kg/cm2 Min	90%Min	6%Max	22-26%

Melters are in habit to add more silica manganese if it is available in abundance. Optimum use of Silica Manganese can also offset steel cost a little. Some of the plants are using mixture of Silica Manganese lumps and fines which also reduces its cost.

Highly reliable alternative to coal gasifier plant is use of pulverised coal injection in reheating furnace. Coal pulveriser plants have established presence in India and abroad. This eliminates cost of gasifier and thus cost of coal for gasifier. Savings in specific fuel consumption is 10-15% and CO2 emission gets reduced by 15%. The system provides solution for using 100% hot combustion air and leads to lesser fuel consumption. Payback period is hardly six months.

The process of steel melting of sponge iron has seen several paradigm shifts due to various raw material issues and emergence of sponge iron from pelletised iron ore fines has been one of the major developments in recent times. The use of pellets in Induction Furnaces has several technical and operational issues like reduced yield, dense and course slag generation and limited usability of pellets.

Iron Reducing Slag has been effective and economical solution. 9-10 Kg of IRS helps in increasing yield by 2%. The slag generated is foamy making slag removal easy. Pellet sponge iron ratio can be increased from 50:50.

Preheating of pellets is another great saving idea. Iron ore pellets before charging to kiln can be preheated by waste heat gases. The emanating flue gases can be utilized for preheating of raw material thus saving electrical energy consumption. This will reduce residence time and cause quicker sponge making/melting.

100 TPD or above rotary kilns are emanating hot flue gases which are cooled down before sending to atmosphere. Now a day's use of heat from emanating hot gases for use in power generation is feasible solution. The power generated through waste heat boilers is cheaper and enables plant for non dependency on State Electricity Boards.

Excess of oxygen ingrace in reheating furnace causes more fuel consumption and more scale formation on billet Oxide in flue gases. There are two sources of Oxygen inlet. One is excess combustion air and other is door opening. This will also cause more Nitrogen Oxide in flue gases. Fuel control minimizes and keeps balance of oxygen inside the furnace. This benefits in two ways: less fuel consumption and less scale formation.

In condition where billets are directly sent to rolling mill for hot and direct charging only 80% billets are rolled because of miss roll caused by less billet temperature and not suitable for rolling. Higher speed of caster will enhance rolling speed due to higher billet temperature. The caster jacket is to be modified and booster pumps are to be installed for faster billet speed so that super heat can be controlled fast, Investment is not much but payback period is only 3 months.

Process improvement will also reduce casting and rolling cost. Reduction in holding time of steel in Induction Furnace, minimization of break outs and ladle return in CCM would give some more cash inflow. In rolling mill reduction miss roll and random length would definitely boost performance and cost cuts.

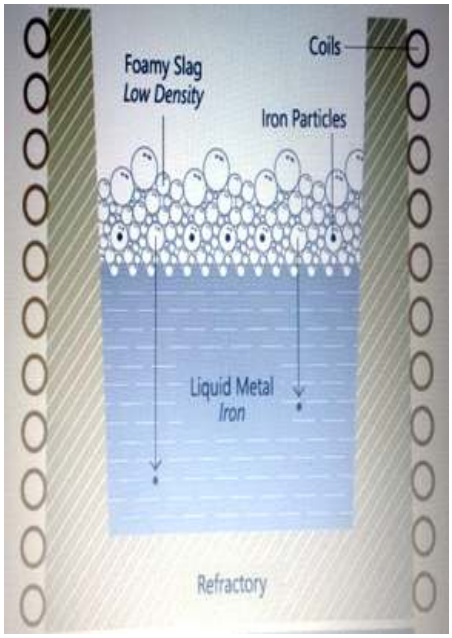
PLC Based Dynamic Load Manager will save electricity demand and saving in electrical cost. Load Manager is used to maintain the constant actual power demand of plant from supply line. If actual KVA tends to exceed the sanctioned KVA, the load manager reduces the power of induction furnace. By using load manager maximum sanctioned KVA can be utilized, which optimizes the overall load factor of the plant.

When more than one furnace is in operation

on a single grid, it can work still more effectively by sharing the total available power. Power to the furnace can be shared through priority selection switches wherein one furnace can be provided full power while other runs at reduced power. Overall productivity of plant will increase because of optimum use of available power. No human intervention is required for monitoring and controlling furnace load.

Mr. Ramesh Agrawal Director Real Ispat and Power limited has opined that there are three issues which needs immediate government attention. One is to improve logistics by rail head at NMDC mines which will reduce cost of ore transportation and thus cost of steel by Rs.1800/ ton. Secondly reduce cost of electricity by 20% as Chhattisgarh state is surplus power state and cost of generation is Rs. 3.40 /Kwh. Thirdly imposition of GST will improve tax liability condition. One can offset some of the taxes which are not possible now.

IRS Slag Process for Pellet Melting



Conclusion

Cost cutting exercise and liberal government policies can only help steel industries to again re-rail on right track. Industries should immediately take steps to implement cost control measures and government should sympathetically agree for policies which may really give concession to steel plants to survive.

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