

Bhilai Steel Plant

- A jewel in SAIL's crown



MD Mr. R. Ramaraju

Bhilai Steel Plant, a unit of Steel Authority of India Ltd. - a public sector undertaking was conceived under aegis of Indo-USSR Treaty in the 2nd Five year plan. This was in accordance with erstwhile government policy for strengthening economy and self reliance through development of core sector. The plant is located at the central position of India, which is one of the major iron belt of India, and it is about 40 kilometer from Raipur, capital of newly born state Chattisgarh. The captive mines of the plant located at Dalli-Rajahara supplies iron ore and lime stone used to be available from Nandini captive mines. At present lime stone is procured from outside. The other major raw material, coal is purchased from outside either through import or from indigenous market.

Bhilai Steel Plant, an integrated steel works, was commissioned in 1959 with production capacity of 1.0 million tonne of steel. In successive phases, capacity was enhanced to 2.5 and 4.0 million tonne in the year 1962 and 1984 respectively. Figure depicts facilities available with Bhilai Steel Plant for 4.0 mt production. As of now this is the largest steel plant in India with present capacity utilisation more than 100%. Living upto the demand of the growing economy of the country, the plant produces wide range of products. This includes Rails, Wire Rods, Plates and Merchant products. Commitment to quality and customer satisfaction has resulted in consistent R & D efforts culminating in development and commercialisation of distinctive new grades like SAILMA, UTS-90 etc. Bhilai Steel Plant could dream and implement the project of long rail (78 meter and above) inconsistency with its reputation with in-house know-how. This was a basic demand from Indian Railways for enhancement of country's economy. Human resource management is exemplary in Bhilai Steel Plant. It is worthwhile to note that Bhilai Steel Plant registered maximum profit in 2004-05 among all public sector steel plants in spite of coal crises during first six month and

hike in coal price.

Seven - time winner of Prime Minister's Trophy for best Integrated Steel Plant in the country, Bhilai Steel Plant (BSP) is India's sole producer of rails and heavy steel plates and major producer of structural. The plant is the sole supplier of the country's longest rail tracks of 260 meters. With an annual production capacity of 3.153 MT of saleable steel, the plant also specializes in other products such as wire rods and merchant products. Since BSP is accredited with ISO 9001:2000 Quality Management System Standard, all saleable products of Bhilai Steel Plant come under the ISO umbrella. At Bhilai ISO:14001 has been awarded for Environment Management System in the Plant, Township and Dalli Mines and it is the only steel plant to get certification in all these areas. The Plant is accredited with SA: 8000 certification for social accountability and the OHSAS-18001 certification for Occupational health and safety. These internationally recognised certifications adds value to Bhilai's products and helps create a place among the best organisations in the steel industry.

Bhilai steel plant marks 'best ever' performance

Bhilai Steel Plant (BSP) recorded its 'best ever' performance in 2007-08 in the production of hot metal, crude steel and saleable steel, the plant's managing director. 'BSP notched up the best ever performance in just ended fiscal 2007-08, crossing the five million tonne-mark in the production of hot metal as well as in crude steel for the second time,' said R. Ramaraju, managing director. BSP - the flagship unit of the public sector Steel Authority of India Ltd (SAIL) - crossed the 5 MT hot metal production barrier for the first time in fiscal 2005-06. 'During 2007-08, BSP achieved the best ever annual production of 5.268 MT hot metal, 5.054 MT crude steel and 4.427 MT saleable steel. This works out to 112.4 percent, 129 percent and 140 percent of rated capacity respectively,' Ramaraju told at an annual conference at Bhilai. He added: 'BSP surpassed its previous best performance by a good margin. While all previous records of finished rails and plates, merchant products and wire rods production have been smashed, a significant achievement in 2007-08 was the quantum jump in the production of value added

special steel products and development of new product grades.' Ramaraju said that nearly two decades after its last expansion to 4 MT, 2007-08 also saw the ground getting cleared for new structures. He added that the landscape inside the plant was also changing to make way for modern, state-of-the-art blast furnace, steel melting shops and finishing mills as laid out in SAIL's corporate plan.

Raising the bar of performance

In 2005-06, Bhilai became the first steel plant in the country to surpass the 5 million tonne mark in hot metal and crude steel production. In 2007-08, Bhilai surpassed this previous best production by a good margin, producing 5.268 MT of hot metal and 5.054 MT of crude steel. Operating above rated capacity in saleable steel for the 15th year in succession, Bhilai also recorded its best ever saleable steel production of 4.427 MT. The plant also recorded its best ever 3.60 MT of Finished Steel production. While all previous records of finished rails and plates, merchant products and wire rods production have been smashed, a significant achievement in this financial year was the quantum jump in the production of value added special steel products and development of new product grades. The development of as many as 12 new product grades was the result of combined efforts of R & D and modifications made in finishing mills. Special Steel production in Year 2007-08 at 2.17 million tonnes comprised 48.8 % of total Saleable Steel production as compared to 36.6% in 2006-07, signaling a 33 % growth in this category and resulting in appreciable growth in the company's bottom line.

Several strategies were adopted & new initiatives were taken for enhancing performance and to provide a cutting edge to the organization during the year, paving the path for continuous growth and helping in maximizing the Plant's share in the domestic steel market. These include maximizing asset utilization, a higher Finished Steel component in Saleable Steel at 81.6% registering a growth of 6.6% over last year and greater thrust on value addition of products like gradual switch over to higher grade, i.e. Fe-500 for both TMT Bars & Rods. In 2007-08 once again demonstrated Bhilai's ability to aim for and achieve what has so far been considered impossible. Raising the bar of performance much higher than before, the Plant's Merchant Mill, that was commissioned way back in the '60s has surpassed 0.7 MT mark for the first time since inception, against the annual rated capacity of 0.5 MT. Modifications were done in Wire Rod Mill to enable rolling of different TMT profiles simultaneously from different strands, in line with the market demand. The mill that recorded a growth of 14.6% in total wire rod production over last year also fulfilled the market demand for EQ wire rods, recording a 25% growth in this special steel category. The Merchant Mill has recorded a 98.3% growth in production of TMT bars while the Wire Rod Mill recorded a 152.7% growth in TMT wire rods production.

The Plate Mill crossed its Annual Business Plan target of 1.25 MT. This was 1.12 lakh tonnes more than the previous best annual production. The Mill recorded 48.5% and 28.4% growth over last year in production of boiler quality and high tensile plates, both special grade steels. A growth of 143% was registered in

production of HT export plates. Yearly production of Rails too were the best-ever. The plant rolled out more long rails from its state of the art Long Rail complex – 197,708 T of 26 meter rails and 101,104 T of long rails in lengths of 130 m and 260 m. Bhilai's captive mines where the steel making operations have done well and have fulfilled the year's requirements. Iron ore production at 8.27 MT during the year was a growth of 7% over 2006-07. The coke ovens have maintained a healthy pushing rate of 718 equivalent ovens per day throughout the year. The blast furnaces sustained a healthy production rate and also maximized the use of CDI and restarting of Tar Injection. Several strategies like increased sinter percentage in Blast Furnace burden, enhanced usage of auxiliary fuels, reducing the coke screen size etc were taken to offset the disruption in coal supplies in the concluding months of the year. The sinter plants recorded all time high production of 7.23 MT. The ore handling plant handled more material than ever. The refractory engineering and materials department, the engineering and auxiliary shops - all chipped in with their best.

Both the steel melting shops have registered growth in volumes. SMS I has recorded a growth of 87% in production of special grade steels, enabling the Plant to sell more EQ wire rods and produce more TMT bars and rods. The SMS II that is equipped with state of the art secondary refining facilities like the RH Degasser & Ladle Furnace for making the right chemistry of steel for special quality rails fulfilled the enhanced requirement of cast steel for the Rail & Structural Mill and the Plate Mill. The engineering skill and support of the Maintenance organization, a proactive approach of the R & D organization, innovations and alertness of the shop floor operations and maintenance personnel, resourcefulness of the Engineering and Auxiliary shops - all these have contributed to make possible the many records in production that Bhilai has made this year. The mills have undoubtedly set an example. The annual Production of Dalli Mines, Sintering Plant-3, Hot Metal, Steel Melting Shop-2, Total Crude Steel, Cast Slabs, Cast Blooms, Billets, and of all the finishing Mills exceeded their respective rated capacities.

In the area of techno-economics, the Plant recorded the highest labour productivity of 289 Tonnes per man per year. Highest ever individual Converter lining life of 6316 blows was achieved in June '07 in Converter-A against the previous best of 6252 blows in Converter-A in the month of August '06. This is the best ever performance of converter lining life in all the SAIL plants. Having posted profits for 19 consecutive years, Bhilai is once again headed for record profits in this fiscal year as well. We have crossed the Rs 10,000 crore rupee mark in nine-month sales turnover for the period April to December '07.

Steel production in Bhilai Steel Plant, like any other integrated steel works, is highly energy intensive. The gross energy consumption in the plant for the year 2004-2005 is 3688 GCal/Hr. which is approximately equivalent of 3.2 million TOE (ton of oil equivalent) per year. The primary energy input for the year 2004-2005 constitute 3.76 million tonne of Coking Coal, 0.24 million tonne of Boiler Coal, purchased electrical power of 203MW and 12748 kilo litres of petro-fuel. The demand of other energy items,

viz, steam, compressed air, oxygen etc. are completely met by in-house auxiliary units. 40% of the total power demand of the plant is met by captive power plants including power from joint venture. Specific energy consumption, specific power consumption and specific petro-fuel consumption are given in figures attached herewith.

It may also be noted that Bhilai Steel Plant is the only steel plant in India continuing with "Ingot Casting & Soaking Pit with Blooming Mill" route for steel making. About 50-55% of the total steel is made through this route. This route is energy inefficient and consumes about 0.35 – 0.4 Gcal of energy per ton of crude steel. Even after this handicap specific energy consumption per ton of crude steel is best among SAIL plants and Tisco shows the grit and commitment of Bhilai collective towards energy conservation. The annual energy bill for the company is around Rs. 2630 Crores which comprises around 35 % of the total production cost.

The specific energy consumption in last few years registered steady decline. Specific energy consumption of the plant per tonne of cast steel was 7.25 Gcal in 2000-2001 when production target was lowered to cope to the market demand. The year 2000-01 was bad for steel industry in India. The recessionary trend resulted in uneven market demand. This has adversely affected energy consumption figure for the year 2000-01. The same came down to 7.07 in the year 2001-02 and further reduced to 6.844 Gcal/tcs in the year 2002-03 and 6.841 in the year 2004-05. The increase in energy consumption has already been explained and it is due to severe coal crisis. Judicious selection of cheaper fuel over costly fuel, optimum utilisation of available facilities and constant vigil over plant performance indices are few key parameters that are prime reason for reduction of specific energy consumption.

Expansion and Modernisation

The year 2007-08 also saw the ground getting cleared for new structures and the landscape inside the plant beginning to change to make way for new and modern state-of-the-art Blast furnace, steel melting shop and finishing mills as laid out in SAIL's Corporate Plan. The biggest expansion and modernization programme of Bhilai Steel Plant is planned at a cost of about Rs. 12,000 crores, Bhilai entered the third phase of expansion in capacities - one that will strengthen its steel-making capabilities and introduce new products.

The Major Modernisation and expansion Packages are the 7 M tall New CO Battery No. 11 with CDCP & BPP, Installation of 2nd Sinter M/c in Sinter Plant-III (320 m²), New Blast Furnace - 8 (4060 cu. m), Technological upgradation of Blast Furnace – 6, New Steel Melting Shop III (4 MT capacity), 3x160 T

Converters, 2x6 Strand Billet Casters, 1x4 Strand Bloom-cum-Billet Caster, 1x3 Strand Beam Blank Caster, New Bar & Rod Mill (0.90 MT Capacity), New Universal Rail Mill (1.2 MT Capacity), Universal Beam Mill (1.0 MT Capacity), Augmentation of capacity of Plate Mill to 1.42 MT, New Coal Handling Plant, New Ore Handling Plant, Compressed Air Station, Augmentation of MSDSs & Power distribution and New 2x1250 TPD Oxygen Plant on BOO basis.

Rowghat Iron Ore Project: EIA/EMP report, BSI & ZSI report on flora and fauna were prepared and submitted for obtaining forest and environment clearance for Rowghat Project. The mining plan for Rowghat got approved by IBM; Nagpur. The revised MOU for rail link project of Dalli- Rajhara- Rowghat- Jagdalpur is signed. The water and power requirement proposal is awaiting governments nod over the proposed Rowghat mining project. Adoption of Modern Business Tools & IT Solutions: The Project – "UTKARSH" on ERP implementation that was launched is near completion. While the development of Data Centers and Uniform Codification System of related hardware are on the cards. The year 2007-08 saw the Implementation of Stockyard Invoicing and On-Line Spot Invoicing System, Launching of Online Forward Auction System. Supplementary invoice for Railways was implemented within record time of 24 hrs.

Environment and Safety

The company's commitment to Safety and Environment control is of equal importance along with energy conservation. Though energy conservation through technological discipline gives better environment control, company's incessant efforts for green and clean environment was duly recognised. Bhilai Steel Plant is recipient of "Paryawaran Award" for six consecutive years.

Commitment to safety is another prime aspect for Bhilai Steel Plant, Safety Engineering Department under the guidance of Deputy General Manager (Safety) regularly inspect, monitor and ensure implementation of safe working practices in all units of the plant. Structured internal safety audits are conducted twice a year with a view to ensure healthy and safe working environment for employees. Necessary preventive actions are initiated based on the audit findings and yearly mock drill results. The safety points are reviewed through various levels at regular interval which include departmental safety meeting, joint safety committee meeting, zonal safety committee meeting and coordination meeting chaired by ED (Works). In addition to centralised Safety Engineering Department, each department has one nominated Safety Officer for better co-ordination with Safety Engineering Department and to ensure safe working on daily basis.

(Source: Indo Asian News Service, Bhilai Steel Plant)

