

## Directors' Report

### TO THE MEMBERS,

The Directors hereby present their Ninety-ninth annual report on the business and operations of the Company and the financial accounts for the year ended 31st March, 2006.

	<b>Rupees Crores</b>	<i>Previous Year Rupees Crores</i>
1. (a) Net Sales/Income .....	<b>15139.39</b>	14498.95
(b) Total Expenditure .....	<b>9207.88</b>	8453.59
(c) Operating Profit .....	<b>5931.51</b>	6045.36
(d) <i>Add</i> : Dividend and Other Income .....	<b>254.76</b>	148.03
(e) Profit before Interest, Depreciation, Exceptional items and Taxes .....	<b>6186.27</b>	6193.39
(f) <i>Less</i> : Interest .....	<b>118.44</b>	186.80
(g) Profit before Depreciation, Exceptional items and Taxes .....	<b>6067.83</b>	6006.59
(h) <i>Less</i> : Depreciation .....	<b>775.10</b>	618.78
(i) Profit before Exceptional items and Taxes .....	<b>5292.73</b>	5387.81
(j) <i>Less</i> : Exceptional items .....	<b>52.77</b>	90.53
(k) Profit before Taxes .....	<b>5239.96</b>	5297.28
(l) <i>Less</i> : Provision for Current Taxation .....	<b>1579.00</b>	1833.66
(m) <i>Less</i> : Provision for Deferred Taxation .....	<b>127.58</b>	(10.54)
(n) <i>Less</i> : Provision for Fringe Benefits Tax .....	<b>27.00</b>	—
(o) Profit after Taxes .....	<b>3506.38</b>	3474.16
(p) <i>Add</i> : Balance brought forward from the previous year .....	<b>1790.21</b>	637.42
(q) Balance .....	<b>5296.59</b>	4111.58
Which the Directors have appropriated as under, to :		
(i) Proposed Dividend .....	<b>719.51</b>	719.51
(ii) Tax on Dividend .....	<b>100.92</b>	101.86
(iii) General Reserve .....	<b>1500.00</b>	1500.00
TOTAL .....	<b>2320.43</b>	2321.37
Leaving a balance of .....	<b>2976.16</b>	1790.21
to be carried forward		

**CHANGE OF NAME**

Pursuant to the shareholders' approval obtained at the last Annual General Meeting, the name of the Company was changed from 'The Tata Iron And Steel Company Limited' to 'Tata Steel Limited' with effect from 12th August, 2005.

**BUSINESS RESULTS**

Globally, steel consumption and production continued to grow and China continued to be the largest contributor to this consumption growth.

Economic conditions around the world have been encouraging. The US saw sustained GDP growth of over 2% throughout the year while Japan moved out of deflationary conditions and even Europe has showed signs of industrial growth and consumption by the end of the last financial year.

During the first half of the year, steel prices rose steeply before coming off during the third quarter and fourth quarter. At the same time, commodity prices reached record highs. Prices of Iron Ore, Coke and Zinc have risen significantly throughout the year.

China along with other developing economies like India are likely to continue to drive demand growth in steel, while Europe and US demand is also likely to remain robust. The outlook for the industry remains positive though rising costs on account of raw materials, freight and energy will keep the margins under pressure.

The Indian economy grew at an estimated 8.1% in FY '06. This includes a strong performance in steel consuming sectors like automobiles, engineering, constructions and white goods. The Government has substantially increased the allocation for various infrastructure projects under the Bharat Nirman program which is expected to be implemented over the next couple of years.

The foreign exchange reserves of the country increased to around USD 150 billion at the end of

the fiscal year. This was primarily on account of significant increase in capital flows from the foreign institutional investors into the Indian equity markets. Consequently, equity markets reflected increased valuations of companies across sectors and the BSE Index increased from 6605 points in April 2005 to 11280 points in March 2006. The Indian Rupee has been volatile throughout the previous year reflecting the global conditions of increased dollar volatility. The Government of India has announced that India would favourably look at capital convertibility of the Rupee in the future.

These factors indicate that India is at the inflexion point of development which bode well for the domestic steel industry in the future. The pace of India's development would depend on the execution of the various infrastructure projects announced by the Government during the year. Your Company too has developed a long term strategy of developing a strong base in India, pursuing the de-integrated production capability of making intermediate steel in low cost geographies and finishing in growing and developed markets. In pursuing this strategy, your Company is developing a strong base in India by further expansion of Jamshedpur operations and planning to build Greenfield Projects in Orissa, Chhattisgarh and Jharkhand in the next decade. Your Company is also working towards ownership and development of additional raw material sources in India and overseas for its enhanced operations. As part of the de-integrated strategy, your Company signed the definitive arrangements on December 15, 2005 with Cementai Holding Thailand for the acquisition of significant shareholding in Millennium Steel Company, Thailand. The transaction was completed on 4th April, 2006. Your Company will continue to explore opportunities to grow through organic and inorganic options to emerge as a global player in

the steel industry. Your Company is pursuing its goal of becoming a 25-30 mtpa company by 2015.

The Net Profit after taxes at Rs 3,506.38 crores was marginally higher in comparison to previous year. Operating profit was marginally lower at Rs. 5,931.51 crores as against Rs.6,045.36 crores in the previous year. Lower levels of debt contributed to a reduction in gross interest charges at Rs. 168.44 crores (2004-05 : Rs. 228.80 crores). Net interest charges were also correspondingly lower at Rs.118.44 crores (2004-05 : Rs.186.80 crores). Provision for depreciation was Rs. 775.10 crores (2004-05 : Rs. 618.78 crores) due to capitalization of 1 mtpa expansion project. After providing Rs. 52.77 crores towards expenses for employee separation compensation (2004-05 :Rs. 119.11 crores), profit before taxes was lower at Rs. 5,239.96 crores (2004-05 : Rs. 5,297.28 crores).

All the Blast Furnaces of the Company performed well during the year. 'G' Blast Furnace which was upgraded and re-commissioned during the year has already achieved the production rate of 2.0 mtpa as against its rated capacity of 1.8 mtpa. The increased hot metal production reduced the dependence on purchased semi finished materials and helped in reducing the cost further.

Your Company achieved significant operational improvements during the year especially in the area of reduction of ash content in domestic coal.

During the year under review, your Company has achieved production of 5 mtpa hot metal for the first time in its history.

Your Company has forayed into organized steel retailing by opening "steeljunction" at Kolkata, a one-stop shop for steel products like pipe, tube, wire, sheet, builders hardware, architectural items, lifestyle products, kitchen products, etc. This will

enable architects, interior decorators and builders in and around Kolkata to easily access steel products for their use. In future, similar hubs may also be set up in other locations.

Your Company has been ranked consecutively for the second time as the Best Steel Making Company by World Steel Dynamics Inc., USA based on study of 22 world-class steel makers.

Pursuant to the Accounting Standard AS – 21 issued by the Institute of Chartered Accountants of India, consolidated financial statements presented by the Company includes financial information of its subsidiaries. The Company has received the exemption under Section 212(8) of the Companies Act, 1956 from attaching the Balance Sheet, Profit and Loss Account and other documents of the subsidiary companies to the Balance Sheet of the Company vide letter No. 47/191/2006-CL-III dated 27th April, 2006 from the Ministry of Company Affairs, Government of India, New Delhi. The Company will make available these documents/details upon request by any member of the Company or subsidiary company.

## **DIVIDEND**

The Board, for the year ended 31st March, 2006 has recommended a dividend @ 130% (Rs. 13/- per share) subject to the approval of the shareholders at the Annual General Meeting. The dividend will be paid on 553,472,856 Ordinary Shares at Rs. 13/- per share (2004-05 : on 553,472,856 Ordinary Shares at Rs. 13.00 per share). The dividend pay out works out to 23.40 % (2004-05 : 23.61%).

## **STEEL DEVELOPMENT FUND**

During the period 1978-1992 the price of steel and distribution thereof were controlled by the Government of India through the Joint Plant Committee (JPC). The JPC in order to facilitate modernisation and technology upgradation of the steel industry in India set up a fund called the Steel

Development Fund (SDF). The fund was administered by JPC and portion of the sale price of steel as directed by the authority was contributed by the major steel producers including the Company to the fund of SDF. The contributions were used for development and modernisation of the main producers including the Company.

Subsequently, in a certain litigation, the Hon'ble Supreme Court held that the monies contributed to the SDF belong to the contributors only. Based on the same view and in view of diverse legal opinion as obtained by the Company, the residual balance in the SDF was claimed by the Company by way of return from JPC and/or SDF. As no favourable response was forthcoming from the Government, the Company was left with no other option but to seek legal remedy.

Accordingly, the Company filed, a writ petition before the High Court at Kolkata on February 26, 2006, claiming inter alia refund of the balance amount lying with SDF, wherein the Hon'ble Court was pleased to pass an Interim Order restraining the Government of India, SDF and JPC from utilizing any amount out of the contributions made by the Company to the SDF, except for the purpose of utilization for its members including the Company. The said Interim Order is subsisting. Accumulated balance together with interest thereon as on 31st March, 2006 was Rs. 1,609.25 crores. The final hearing of the matter is awaited.

#### **INVESTMENT IN MILLENNIUM STEEL PUBLIC COMPANY LIMITED, THAILAND**

In line with the plans of creating a global presence in existing business lines through de-integrated production strategy, the Company acquired 67.11% of equity stake in Millennium Steel, Thailand at a cost of approximately Rs.780 crores.

The investment was completed through a combination of preferential allotment of 24.99% equity shares to the Company and acquisition of

42.12% of equity shares through open tender offer. The investment was made by the Company and its wholly owned subsidiary NatSteel Asia Pte. Limited, Singapore.

On completion of the acquisition, the Board of Millennium Steel was reconstituted with the majority of Directors being the nominees of the Company. Mr. B. Muthuraman, Managing Director has been appointed as the Chairman of Millennium Steel.

Millennium Steel is one of the largest steel companies in Thailand with a capacity of 1.7 mtpa, producing long products for construction and engineering steel for auto industry. It operates through 3 facilities in Thailand.

#### **FINANCE**

In the recent past, the Company has been strengthening its balance sheet by increasing cash flows, reducing interest cost and improving working capital management. With this effort, the Company is in a position to take advantage of growth opportunities in the global steel market.

The Company had taken approval from its shareholders for additional borrowings of Rs. 5,000 crores at the Extra Ordinary General Meeting held on 24th March, 2005. Accordingly, the Company contracted over Rs. 4,300 crores of debt through External Commercial Borrowings during Financial Year 2005-06. While these funds have not been drawn down by 31st March, 2006, the Company has managed to lock in attractive rates and tenor of funds for its planned expansion. Your Company contracted a US Dollar 400 Million loan through the IFC, a US Dollar 500 Million loan Syndicated to commercial banks and two Export Credit Agency (Italian and German) insured loans for Capital Imports totalling to USD 74 Million.

The surplus fund of the Company not required immediately has been temporarily invested in money market mutual funds taking into account risk

adjusted return. The total investment in mutual fund as on 31st March, 2006 stood at Rs. 2,026.63 crores.

Your Company has reduced its net borrowings during the year by Rs. 261.36 crores. Short-term borrowings have increased by Rs. 37.80 crores over the previous year on account of import transaction. Overall borrowings have decreased by Rs. 223.55 crores to Rs. 2,516.15 crores as compared to Rs. 2,739.70 crores at the end of the previous fiscal year. Consequently, the debt: equity ratio has come down from 0.54 at the beginning of the year under review to 0.29 at the end of the year.

### **CAPITAL PROJECTS**

The Company has initiated a program for expansion of crude steel making capacity at Jamshedpur by 1.8 mtpa. The expansion project is expected to be completed by 2008.

The increased requirement of coke would be sourced from Hooghly Met Coke & Power Company Limited, a subsidiary of the Company. The coke making capacity to be set up at Haldia is also being augmented from 0.8 mtpa to 1.2 mtpa along with power generating capacity from 60 MW to 90 MW. The production is expected to commence during 2007.

During the year under review, the Company incurred capital expenditure of Rs.1,527.58 crores.

### **GREENFIELD PROJECTS**

The Company has embarked upon setting up various greenfield projects. The project in Orissa envisages setting up an integrated steel plant of 6 mtpa capacity in two phases of 3 mtpa each at Kalinganagar. The Company has signed MoU with the Government of Chhattisgarh to set up a 5 mtpa capacity steel plant in 2 phases. The Company has also signed an MoU with Government of Jharkhand to set up a 12 mtpa

steel plant in Jharkhand in 2 phases of 6 mtpa each. The above plants would be set up subject to raw materials linkage and receipt of all approvals.

The Company has envisaged setting up a 2.4 mtpa steel plant in Bangladesh. The discussions are continuing with the Government of Bangladesh on various issues including supply of gas, lease of coal blocks and fiscal incentives.

The Company is also exploring the option of setting up of a steel plant in Iran.

### **OTHER PROJECTS**

The Company has signed the Share Subscription Agreement and Joint Venture Agreement with BlueScope Steel Limited, Australia in November 2005, for manufacture of colour coated coils and pre-engineered buildings to be used in building solution business. The manufacturing facility would be set up in Jamshedpur with a production capacity of 2.50 lakhs tpa of zinc and aluminium coated and 1.50 lakhs tpa of colour coated coils. The building solution business would have manufacturing facilities at Delhi, Pune and Chennai.

The Company is setting up a Ferro Chrome Project at Richards Bay, South Africa to produce 1.20 lakhs tpa of high carbon ferro chrome. Your Company has obtained the Environment Clearance for the said project and has also acquired the land at Richards Bay. A subsidiary company in the name of 'Tata Steel KZN Pty. Ltd.' has been incorporated in South Africa.

In order to secure raw materials especially coal in the future, the Company has been evaluating options to acquire strategic stake in coal companies in India and overseas. Pursuant to this, the Company has entered into an agreement with the AMCI (CQ) Pty. Ltd., Australia to secure upto 20% of the coal produced by it.



**CREDIT RATING BY STANDARD & POOR'S**

International Credit rating Agency Standard & Poor's (S & P) upgraded foreign currency rating of the Company to 'BBB' with stable outlook, which is two notches above India's sovereign rating. With this rating, your Company is in the investment grade for any foreign currency debt issuance. According to S & P, the Company is considered well insulated from direct and indirect sovereign risks since it demonstrates moderate leverage, strong free cash flow generation and a competitive business profile.

**INCREASE IN AUTHORISED SHARE CAPITAL**

In order to facilitate the issue of share capital in future, the authorised share capital of the Company is being increased from Rs. 850 crores to Rs. 2,000 crores by creation of 115,00,00,000 Ordinary shares of Rs.10 each.

**SUBSIDIARIES**

The list of subsidiary companies are given on page No. 91.

The gross revenue of the subsidiaries increased to Rs. 5,545.36 crores (*2004-05 : Rs.1,882.95 crores*). Profit after taxes was also higher at Rs. 232.79 crores (*2004-05 : Rs.120.20 crores*).

**IMPROVEMENT INITIATIVES**

Your Company during the year under review undertook several initiatives to enhance its global competitiveness. The ASPIRE programme encompasses improvement initiatives like Six Sigma, Total Productive Maintenance (TPM), Small Group Activities, Suggestion Management involving cross section of employees. A new initiative 'ASPIRE Unlimited' programme based on the Theory of Constraints (TOC) propounded by Dr. Eliyahu Goldratt is the latest challenge undertaken by your Company to achieve excellence in quality. The key to success of this

initiative is to devise business strategies aimed at increasing turnover and profitability through focusing market as the 'constraint'. Various initiatives such as Buffer Management in Supply Chain, Critical Chain Project Management and in Mining, under this programme have been undertaken.

Your Company continues to focus its efforts and investments in Research & Development, Quality, Safety and Environment. As a result of the above initiatives, your Company has been able to achieve various operational improvements including reduction of operating costs and increased branding presence through customer value management.

**SAFETY**

In line with our Corporate Vision to improve the safety and quality of life of employees, your Company has initiated a safety excellence journey under the guidance of DuPont Safety Resources, world-class leader in safety. DuPont has helped to improve the safety performance of many industries across the globe.

The safety programme which began at the Steel Works has been rolled across all locations including mines. These initiatives have shown perceptible change in the behaviour of employees at and outside the place of work. Gains achieved are irreversible. The Company aspires to become world-class in safety.

**HUMAN RESOURCES**

Given the Company's ambitious growth plans in India and overseas, development of human resources assumes an even more important dimension.

To prepare the Company's human resources for future responsibilities in terms of professional skills as well as business skills, several initiatives have

been undertaken, such as rotation policy, leadership development programme, sponsored diploma programme and e-learning.

Since a decade, the employee strength has been reduced from about 78,000 to around 38,000 presently through separation schemes and normal retirement. The Company is investing in the modernisation of the plant and training of manpower for upgrading their skills.

## **DIRECTORS**

Mr. Keshub Mahindra stepped down from the Board with effect from 21st March, 2006. The Board records its deep appreciation of the valuable advice and counsel provided by Mr. Mahindra to the Company and to the Board over a period of 37 years.

Mr. B. Jitender, nominee director of IDBI stepped down from the Board with effect from 22nd March, 2006. The Board places on record its appreciation of the contribution made and value derived in the deliberations of the Board during his tenure as a Director.

The Board, at its meeting held on 18th May, 2006 re-appointed Mr. B. Muthuraman as Managing Director of the Company for a period commencing from 22nd July, 2006 to 30th September, 2009, subject to the approval of the shareholders.

In accordance with the provisions of the Companies Act, 1956, and the Company's Articles of Association, Mr. R. N. Tata, Mr. Suresh Krishna and Mr. Ishaat Hussain, retire by rotation and are eligible for re-appointment.

## **STATUTORY AUDITORS**

Messrs A. F. Ferguson & Co. and Messrs S. B. Billimoria & Co., the existing Statutory Auditors are now part of Messrs Deoitte Haskins Sells (DHS) and it has been decided that DHS would be appointed as the Statutory Auditors of the Company.

Accordingly, Messrs A. F. Ferguson & Co. and Messrs S. B. Billimoria & Co. have expressed their unwillingness to be re-appointed at the conclusion of the ensuing Annual General Meeting. The Company has received a special notice from a shareholder of the Company, in terms of the provisions of the Companies Act, 1956, signifying the intention to propose the appointment of DHS as the Statutory Auditors of Company from the conclusion of the ensuing Annual General Meeting till the conclusion of the next Annual General Meeting. DHS have also expressed their willingness to act as Auditors of the Company, if appointed, and have further confirmed that the said appointment would be in conformity with the provisions of Section 224(1B) of the Companies Act, 1956.

## **ENERGY, TECHNOLOGY AND FOREIGN EXCHANGE**

Details of energy conservation and research and development activities undertaken by the Company along with the information in accordance with the provisions of Section 217(1)(e) of the Companies Act, 1956, read with the Companies (Disclosure of Particulars in the Report of Board of Directors) Rules, 1988, are given in Annexure 'A' to the Directors' Report.

## **PARTICULARS OF EMPLOYEES**

Information in accordance with the provisions of Section 217 (2A) of the Companies Act, 1956, read with the Companies (Particulars of Employees) Rules, 1975, as amended, regarding employees is given in Annexure 'B' to the Directors' Report.

## **CORPORATE GOVERNANCE**

Pursuant to Clause 49 of the Listing Agreements with the Stock Exchanges, a Management Discussion and Analysis, Corporate Governance Report, Managing Director's and Auditors' Certificate regarding compliance of conditions of

Corporate Governance are made a part of the Annual Report. A note on the Company's corporate sustainability initiatives is also included.

### **VOLUNTARY DELISTING OF THE COMPANY'S ORDINARY SHARES FROM CERTAIN STOCK EXCHANGES**

The Company's application for delisting its Ordinary shares is pending with the Calcutta Stock Exchange.

### **DIRECTORS' RESPONSIBILITY STATEMENT**

Pursuant to Section 217 (2AA) of the Companies Act, 1956, the Directors, based on the representations received from the Operating Management, confirm that -

1. in the preparation of the annual accounts, the applicable accounting standards have been followed and that there are no material departures;
2. they have, in the selection of the Accounting Policies, consulted the Statutory Auditors and

have applied them consistently and made judgments and estimates that are reasonable and prudent so as to give a true and fair view of the state of affairs of the Company at the end of the financial year and of the profit of the Company for that period;

3. they have taken proper and sufficient care to the best of their knowledge and ability for the maintenance of adequate accounting records in accordance with the provisions of the Companies Act, 1956, for safeguarding the assets of the Company and for preventing and detecting fraud and other irregularities;
4. they have prepared the annual accounts on a going concern basis.

On behalf of the Board of Directors

Mumbai, 18th May, 2006

RATAN N. TATA  
Chairman



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**DECLARATION REGARDING COMPLIANCE BY BOARD MEMBERS AND SENIOR MANAGEMENT PERSONNEL WITH THE CODE OF CONDUCT**

This is to confirm that the Company has adopted Tata Code of Conduct for its employees including the Managing Director and Whole time Directors. In addition, the Company has adopted the Tata Code of Conduct for Non-Executive Directors. Both these Codes are posted on the Company's website.

I confirm that the Company has in respect of the financial year ended March 31, 2006, received from the senior management team of the Company and the Members of the Board a declaration of compliance with the Code of Conduct as applicable to them.

For the purpose of this declaration, Senior Management Team means the Members of the Management one level below the Executive Directors as on March 31, 2006.

Mumbai  
May 18, 2006

**B. Muthuraman**  
Managing Director

**Annexure 'A' to Directors' Report**

PARTICULARS REQUIRED UNDER THE COMPANIES (DISCLOSURE OF PARTICULARS IN THE REPORT OF THE BOARD OF DIRECTORS) RULES, 1988.

**A CONSERVATION OF ENERGY**

a) ENERGY CONSERVATION MEASURES TAKEN :

- i) Installation and commissioning of new 1 x 100 tonnes per hour by-product gas fired boiler at Power House No. 5.
- ii) Conversion of 2 x 68 tonnes per hour Stoker Coal fired boilers into by-product gas fired boilers at Power House No. 5.
- iii) Installation and commissioning of 30 MW back pressure turbine at Power House No. 5.
- iv) Implementation of energy audit recommendation for electrical energy savings in the Works Division.
- v) Reduction in steam condensate loss and loss due to leakages by improved maintenance practices.
- vi) Augmentation of blowing air efficiency at F Blast Furnaces.

b) ADDITIONAL INVESTMENTS AND PROPOSALS FOR REDUCTION OF CONSUMPTION OF ENERGY :

- i) Modification of four numbers of stoker fired boilers into by-product gas fired boilers at Power House No. 3 to reduce boiler coal consumption.
- ii) Enhancement of LD gas recovery by installation of second LD gas Holder and augmentation of export gas network.
- iii) Installation of Top recovery turbine at 'G' & 'H' Blast Furnace.
- iv) Recovery of sensible heat of coke by installation of Coke Dry Quenching system in Batteries 5, 6 & 7 at Coke Plant.
- v) Installation of Thermocompressor at West Plant Booster House of Coke Plant for recovery of exhaust steam.
- vi) Phasing out of inefficient boilers and replacement of old and inefficient Blast Furnace blowers.

c) IMPACT OF THE ABOVE MEASURES :

Energy Conservation measures during 2005-2006 has resulted in achieving :

- i) Lowest ever Plant Specific Energy Consumption of 6.959 Gcal/tcs.
- ii) Lowest ever boiler coal consumption of 132.32 kg/tss.
- iii) Lower turbo blower steam consumption of 383 kg/thm at Blast Furnaces.
- iv) Lower specific oxygen consumption of 54.88 Nm<sup>3</sup>/tcs at steel melting shops.
- v) Reduction in process steam condensate loss of 23.76 tonnes per hour.
- vi) Higher combine boiler efficiency of 80.03%.

d) TOTAL ENERGY CONSUMPTION AND ENERGY CONSUMPTION PER UNIT OF PRODUCTION:

Form - A enclosed.

**B. TECHNOLOGY ABSORPTION**

- e) Efforts made in technology absorption as per Form B : Form B enclosed.

**C. FOREIGN EXCHANGE EARNINGS AND OUTGO**

- f) Activities relating to exports, initiatives taken to increase exports; development of new export markets for products and services; and export plans } Mentioned in the Directors' Report.

- g) Total foreign exchange used and earned.

	<b>Rs. in Crores</b>
i) CIF value of imports	1747.30
ii) Expenditure in foreign currency	148.71
iii) Foreign exchange earned (includes deemed exports)	2110.19

## Form - A

### Form for disclosure of particulars with respect to Conservation of Energy : 2005-2006

Particulars	2005-2006	2004-2005
<b>A. POWER AND FUEL CONSUMPTION</b>		
1. ELECTRICITY		
a) Purchased		
Units (M. KWH)	1,871.27	1,589.83
Total Amount (Rs. Lakhs) #	50,028.41	44,501.18
Average Rate/Unit (Rs./KWH)	2.67	2.80
b) Own Generation		
i) Through Diesel Generator		
Units (M. KWH)	12.96	10.11
Units per litre of Diesel Oil (KWH)	3.91	3.89
Average Cost/Unit (Rs./KWH)	13.50	12.18
ii) Through Steam Turbine/Generator		
Units (M. KWH)	1,018.88	1,025.48
Units per tonne of Coal (KWH)	1,410	1,408
Average Cost/Unit (Rs./KWH)	1.75	1.64
(*This includes generation of PH 4 in MKwh which is operated on by-product gases upto 95%)	454.99	432.80
2. COAL		
i) Coking Coal & Cookeries		
Quantity (Million Tonnes)	3.65	3.57
Total Cost (Rs. Lakhs)	109,982.50	86,618.76
Average rate (Rs./Tonne)	3,017.19	2,425.39
ii) Blast Furnace Injection Coal		
Quantity (Million Tonnes)	0.38	0.22
Total Cost (Rs. Lakhs)	16,798.99	5,818.33
Average rate (Rs./Tonne)	4,456.57	2,592.32
iii) Middling Coal and ROM		
Quantity (Million Tonnes)	0.64	0.62
Total Cost (Rs. Lakhs)	5,857.00	5,500.45
Average rate (Rs./Tonne)	911.55	891.19
3. FURNACE OIL		
Quantity (Kilo Litres)	11,160.68	10,619.16
Total Amount (Rs. Lakhs)	1,655.92	1,212.15
Average rate (Rs./KL)	14,837.08	11,414.78
4. OTHERS		
L.D.O.		
Quantity (Kilo Litres)	7,093.81	6,642.53
Total Cost (Rs. Lakhs)	1,626.78	1,261.62
Average rate (Rs./KL)	22,932.43	18,993.12
L.P.G.		
Quantity (Tonnes)	3,387.25	2,947.16
Total Cost (Rs. Lakhs)	942.79	690.08
Average Rate (Rs./Tonne)	27,833.47	23,415.12
NG		
Quantity (Tonnes)	2,823.46	3,120.86
Total Cost (Rs. Lakhs)	244.08	283.22
Average Rate (Rs./ Tonne)	8,644.72	9,075.08

# Excludes electricity duty paid on purchases

### Form for disclosure of particulars with respect to conservation of energy : 2005-2006

#### B. CONSUMPTION PER UNIT OF PRODUCTION

Particulars	Steel (per tonne)	Tubes (per tonne)	Bearings (per no.)	F.A.M.D. (per tonne)	Rings & Agrico (per no.)	Growth Shop (per tonne)	CRC West (per tonne)	Wire Div. (per tonne)	CRM SISODRA (per tonne)
Electricity (KWH)	425.00 (414.00)	96.00 (117.00)	0.72 (0.79)	3829.00 (3828.70)	1.20 (1.19)	813.02 (506.89)	159.97 (158.38)	211.94 (213.34)	323.23 (330.41)
Furnace Oil (Litres)						16.24 (8.23)		23.58 (22.76)	
Coking Coal (Tonnes)	0.82 (0.87)								
Others :									
Light Diesel Oil (Litres)	0.71 (0.58)						9.00 (10.84)	8.19 (9.15)	44.69 (46.25)
L.P.G. (Kgs.)							13.05 (13.42)	9.23 (7.04)	1.07 (0.58)
N.G. (Kgs.)								24.26 (25.41)	

(Previous year's figures have been given in brackets and modified wherever necessary)

## Form - B

Form for disclosure of particulars with respect to Technology Absorption : 2005-2006.

## RESEARCH AND DEVELOPMENT

## 1. SPECIFIC AREAS IN WHICH R &amp; D WAS CARRIED OUT BY THE COMPANY

Research was carried out in the areas of raw materials including iron ore, coal, coke, ferro chrome and titania, sinter quality and blast furnace productivity, product development, process improvement, energy utilization, energy conservation and waste utilization.

## 2. BENEFITS DERIVED

Some of the important benefits from R&D projects are listed below.

A new technology was developed in collaboration with Central Leather Research Institute, Chennai, for reducing hexavalent chromium to parts per billion level in chrome ore concentrate. This will ensure that the Company's product meets stringent international specification on hexavalent chromium. A patent has been filed on the new process.

Galvannealed coated steels have been established for fuel tank application in the automotive industry. This product replaces imported tern coated steels and has been accepted by a number of auto manufacturers such as Bajaj Auto Limited, Hero Honda Motors Limited, Honda Motorcycles And Scooters India Pvt. Limited, TVS Limited etc.

Corrosion resistant hollow structural tubes have been developed and launched under the "STRUCTURA" brand, which have double the corrosion resistance of ordinary tubes.

A new process has been established for which patent has been filed for the production of hydrogen gas in using waste heat of steelmaking slag.

A new formulation has been developed in collaboration with IIT Kharagpur and implemented for rubber rolls used in various sections of the cold rolling mill. The life of these rolls has increased from an average of around 10 days to currently in excess of 100 days. This exceeds Nippon Steel Corporation's performance of 90 days.

Besides the above, a large number of projects were completed many of which have given benefits in terms of increased productivity (such reducing reheating time of slabs of interstitial free grade of steels), reduced cost and enhanced product quality with customer support.

## 3. FUTURE PLAN OF ACTION

Establish flow sheet and design equipment for 1.5% Al<sub>2</sub>O<sub>3</sub> in fines.

Establish 8% ash in coal with high yield at pilot scale.

Establish the use of 7-hole lance in steelmaking for better dephosphorisation.

Reduce slag volume in blast furnace.

Pilot scale demonstration of high strength (greater than 1000 MPa yield strength), high ductility (50% elongation) steel for automotive applications.

Reduce electricity consumption in the production of ferro chrome.

Commercialize use of LD slag as soil conditioner.

4. Expenditure on R & D	<b>Rs. Crores</b>
(a) Capital	4.14
(b) Recurring	20.84
(c) Total	24.98
(d) Total R & D expenditure as a percentage of total turnover (%)	0.15

## TECHNOLOGY ABSORPTION, ADAPTATION AND INNOVATION

## 1. Efforts made :

## On the Process Front ...

## Steel Making / Slab Casting Area

**Vessel lining:** One LD vessel at LD2 & Slab Caster was tried with Mag-Carbon lining resulting in doubling of the vessel life from 1650 heats (with Tar-Dolo lining) to 3284 heats.

**Ladle lining:** Use of Alumina-Magnesia-Carbon brick in steel ladle has resulted in ladle life improvement from 70 heats (with Tar-Dolo brick) to 82 heats.

**Vanadium addition:** Introduction of Nitrovan-Vanadium as a substitute of Fe-V has helped in reduction of Vanadium requirement by 20%.

**Caster productivity:** Modification of primary and secondary cooling in two curved mould casters (Caster B and C) has resulted in about 15% increase in productivity.

## Hot strip mill

**Auto surface inspection:** VAI Surface Inspection System for on-line defect monitoring of HR Coils has been installed and is being stabilized.

**Coil conveyer line:** Addition of new coil conveying line at 'C-1 Yard' has resulted in minimised multiple handling.

**Paint marking machine:** Installation of on-line Robo-Tech Paint Marking machine of Tebulo make has improved HR Coil identification.

**DWH:** Upgrading of HSM Data Warehouse is being carried out with respect to capacity & software.

## Cold Rolling Mill

**RCL-1:** Entry and exit mandrels have been fabricated by TGS to prevent coil slip problem.

**RCL-1 entry:** Coil loading sequence system has been automated fully.

**CPL:** Additional cradle rolls have been installed in two stations, for better handling.

System upgradation in dispatch section: Intelligent zoning system has been developed by CTTS, for the mapping of entire dispatch yard and easy stacking of coils.

**Wagon loading:** After modification, coil tracking and wagon loading is now completely automatic. A Patent has been filed for this application.

**CGL-1:** The problem of premature pot failure due to fast erosion of pot surface thereby leading to production loss has been overcome by incorporation of a Stainless steel pot (AISI 316L).

**CGL-2:** Process Improvements in the heating and drying system of CGL-2 have resulted in conservation of steam

**CGL-2:** Laser technology for air-knife distance adjustment in CGL-2 has resulted in conservation of zinc / material inputs.

## LD Shop-1

Heat size increased from 130 to 150 tons

93% heats routed through ladle furnace after LF2 commissioning

Casting of 150 mm sq billets introduced

High speed casting at CC2 – more than 3.5 m/min

Calibrated Nozzle Changer introduced

Casting stabilization of stick electrode grades through LF to attain low phosphorus

Increased % of hot metal from torpedos to 30 %  
 New porous plug introduced in ladles  
 High flow rate oxygen blowing lances tried in BOF  
 Multi hole bottom stirring elements introduced  
 Mag Carbon refractory lining in BOF tried  
 LF roof modified to reduce leakage  
 In-house development of auto blowing of vessel  
 Installed wire feeder at OLP  
 BOF hood gas analyzer installed  
 Developed new dummy bar attachment  
 Modified DRT drive system at CC1  
 Third drum filter started with in-house modifications  
 Flux addition system relay logic converted to PLC logic  
 Modified TOCB hydraulic circuit at CC1  
 Modified equalizer shaft of TOCB at CC1  
 Ergonomic fixing of CNC at CC2

#### **Merchant Mill**

Installation of pinch roll to reduce the speed of the back end of the rebars.  
 Introduction of forward cascading of mill stand motors.  
 Upgradation of rotary shear to cut sections above 28 mm.

#### **Wire Rod Mill**

Mill automation upgradation for reliable operation of shears in the mill.

#### **New Bar Mill**

Automated billet yard management system.  
 Walking beam type reheating furnace.  
 Mill configuration having Horizontal-Vertical-Combination rolling stands.  
 Compact housing less stands with multi groove design and fast and accurate pass changing facility.  
 Up-loopers between successive stands in intermediate and finishing stands.  
 Rolling with slitter pass and power slitter for higher throughput rate.  
 TMT cooling system (HYQST arrangement) featuring fully automatic separate cooling controls for each slitted line.

#### **G' Blast Furnace**

The state-of-the-art rolled Copper staves from GHH and special 3rd generation cast iron NSC staves; make this furnace refractory-less from bosh to stack. This technology learnt and adapted with following advantage :

Consistent surface profile throughout the campaign.  
 Increase in campaign life from 10 years to >14 years.  
 Reduced chances of build-up.  
 Saving in annual gunning cost.  
 Increased furnace availability on account of avoidance of shutdown for gunning.

#### **A-F Blast Furnaces**

D Blast Furnace in its 12th campaign has completed 4.0 million tonnes of hot metal throughput, the highest ever since inception. To enhance its campaign tonnage a technique of

HEARTH CAPPING AND STACK REPAIRING was adopted during D Blast Furnace major shutdown in November '05. The technique reuses the carbon hearth and allows replacement of stack and throat bricks. This technique of repair has added new life to D Blast Furnace and it is now ready for another 4.0 million tonnes production of hot metal.

The Company has pioneered this technique in India.

#### **Sinter Plant**

Thermo vision camera for thermal imaging and control of uniformity of –

Permeability across the width of the pallet at SP#3

Pre-palletizing of Electro Static Precipitator dust for improved permeability at SP#3

Measurement of individual raw materials' moisture for green mix moisture control at SP#3

700 mm bed height of sinter machine at SP#3

LCI drive for 8.4 MW waste gas fan motor at SP#3

40M span Barrel Reclaimer at RMBB(N)

#### **Technology Absorption, Adaption and Innovation**

In Tubes Division the following efforts are made to improve operational efficiency :-

##### **a. Tube bundle weighing system in PT Finishing :**

Weight of tube bundles were calculated theoretically before despatch. Tube weighing system has been installed. Each bundle is weighed and the information is captured on SAP system online. To reduce the project cost, weighing platform has been designed and manufactured in house.

##### **b. Design of Roll profile :**

New tube sizes are required by the customers. For rolling a particular tube size, a set of rolls are used. These roll sets are different for each size of tube. Set of rolls if procured from outside is very costly. Rolls designed in-house and manufactured in Machine Shop for the tube sizes 60 mm X 40 mm X 1.6 mm for the PT Mill, 60 mm X 40 mm X 2.9 mm and 115 mm X 69 mm X 3.15 mm for HFIW Mill

##### **c. Modified tube oiling system for new CT Mill :**

Oiling is done on black tubes before despatch. In-house and manufacturing of oiling system has been done. Design of nozzles have been changed to avoid clogging of oil/dust. This will help in trouble free operation of the oiling unit.

##### **d. Modernisation of compressed air system :**

Compressed air was generated from age old Broomwaide compressors. These compressors were maintenance intensive and inefficient. These have been replaced with energy efficient compressors. This will result in generation of compressed air with less power consumption.

##### **e. Modernisation of drives in PT Mill :**

Existing drives of PT mills were old and maintenance intensive. This resulted in frequent breakdown in mills. To overcome this problem and reduce down time, digital drives have been installed in forming mill, sizing mill, leveller, pinch roll of 3" ERW mill, accumulator. Forming mill, sizing mill of 2" PTM and in normalising furnaces.

##### **2. Benefits :**

Efforts have led to improved efficiencies, cost competitiveness and enhanced product range.



**3. Particulars of technology imported during last five years :**

<b>Steel Division</b>	<b>Year of Import/ Absorption</b>	<b>Status of Implementation</b>
a) Utilisation of sensible heat from blast furnace hot stov waste gas at 'G' blast furnace in association with NEDO, Japan	2002	Commissioned
b) Installation of electromagnetic stirrer and submerged entry nozzle in the billet caster of LD#1 (Concast, Switzerland)	2002	Commissioned
c) Installation of probes in 'G' Blast furnace to monitor various parameters carry out intensive R & D activities and thereby acquiring in-depth knowledge of in-furnace phenomena (Paul Warth, Luxembourg)	2002	Commissioned
d) Electrolytic cleaning line (SMS Demag, Germany)	2003	Commissioned
e) Upgradation of 'G' blast furnace (SMS Demag, Germany)	2004	Commissioned
f) Upgradation of HSM	2004	Commissioned
g) Upgradation of billet caster - 1 at LD1 (Concast, Zurich)	2004	Commissioned
h) Ladle furnace-2 at LD1(SMS Demag, Germany)	2004	Commissioned
i) New Rebar Mill (Morgan, USA)	2004	Commissioned
j) Upgradation of caster at LD2 (Voest Alpine, Austria)	2004	Commissioned
k) Imported design and engineering for hot metal desulphurization unit at LD1 (Kuettner GmbH)	2005	Commissioned
l) Supply of imported engineering for new induced draught fans, electrics & accessories for the LD Converter GCP at LD1 (Ebara Corporation)	2005	Commissioned
m) Adequacy checking BOF converters for augmentation of heat size at LD2 (SMS Demag, Germany)	2005	Commissioned
n) Imported design and engineering for upgradation of Caster 2 & 3 at LD2 (VAI, Austria)	2005	Commissioned
o) Imported design and engineering for hot metal desulphurisation unit 2 & 3 at LD2 (Kuettner GmbH)	2005	Commissioned
p) Imported design and engineering for capacity increase of slab reheating furnace nos. 1 & 2 of HSM (Techint)	2005	Commissioned
q) Supply of design and engineering and training for 150 tph walking beam furnace to Rebar Mill (Bricmont)	2005	Commissioned
r) Imported design and engineering (Mother well Bridge - Clayton walker)	2005	Commissioned
s) Supply of imported design and engineering for LD gas boosters (Howden Power Ltd. U.K.)	2005	Commissioned
t) Supply of imported design and drawing for Technology control system at HSM (SMS Demag, Germany)	2005	Commissioned
u) Supply of imported design and drawing for Basic level automation at HSM (Alstom, USA)	2005	Commissioned
v) Supply of imported design and drawing for dual zinc pot at CRM (CMI, Belgium)	2005	Commissioned
w) Supply of imported design and drawing for BAF, CRM (LOI, Germany)	2005	Commissioned
x) Supply of imported design and drawing for 4th Stove of 'G' Blast Furnace (Paul Wurth Italia, Italy)	2006	Under Implementation
y) Supply of imported design and drawing for 'H' Blast Furnace (Paul Wurth Italia, Italy)	2006	Under Implementation
z) Supply of imported design and drawing for Sinter Plant No. 4 (Outokumpu Technology, Germany)	2006	Under Implementation
aa) Supply of imported design and drawing for LD2 expansion project. (SMS Demag, Germany)	2006	Under Implementation
ab) Supply of imported design and drawings for convertor gas cleaning plants in LD shop 1 & 2 (SMS Demag, Germany)	2006	Under Implementation

## Annexure 'B' to Directors' Report

### Statement pursuant to Section 217(2A) of the Companies Act, 1956 and the Companies (Particulars of Employees) Rules, 1975

Sr. No.	Name	Age (Years)	Designation/ Nature of Duties	Gross Remuneration	Net Remuneration	Qualifications	Total Experience (Years)	Date of Commencement of Employment	Last employment held Designation – Period for which post held
				Rs.	Rs.				
1.	Bajjal A.D.	58	Vice President (Raw Materials)	62,53,389	27,33,472	B.Sc. Engg. (Met.), P.G.D.B.M.	36	13-12-69	—
2.	Chatterjee Koushik	37	Vice President (Finance)	45,38,955	21,75,350	B.Com., (Hons), F.C.A.	10	01-08-2003	Tata Sons Ltd. - General Manager - Corporate Finance
3.	Chaturvedi U.K.	56	Vice President (Long Products)	61,13,051	26,55,373	B.Sc.	36	25-10-69	—
4.	Chinoy Capt. D.P.*	60	Chief Aviation & Chief Pilot	34,30,382	23,14,548	M.Sc. Junior & Higher Command Course, Air Crew Indoctrination Course, Jungle & Snow Survival Course, Air Line Transport Pilot Licence	44	05-02-90	Indian Air Force, Station Commander, – 2 years
5.	Jha Varun Kumar	54	Vice President (Chattisgarh Project)	36,92,310	16,92,280	B. Tech. (Hons) P.G.D.B.M.	33	03-10-72	—
6.	Kharkar Hemant C.	49	Chief (Coke, Sinter & Iron)	24,10,595	11,52,223	B.E., P.G.D.B.M.	26	22-01-80	—
7.	Mahanty Niroop Kumar	56	Vice President (Human Resources Management)	62,54,889	27,73,475	B.A. (Hons.), M.B.A.	30	18-12-75	—
8.	Makashir WG. CD. S.	59	Chief Aviation	26,63,933	13,18,064	M.Sc. (Defence Studies)	38	02-09-97	Indian Air Force, Wg. Commander – 12 years
9.	Misra Abanindra M.	54	Vice President (Human Resources)	24,74,249	15,15,059	B.E., M.B.A.	32	29-12-73	—
10.	Misra N.K.	50	Chief (Strategic Planning & Finance)	28,34,659	13,96,135	B.Sc., A.C.A.	25	21-02-81	—
11.	Mukherjee Dr. T.	63	Deputy Managing Director (Steel)	1,74,90,116	80,00,241	B.E. (Met.), M. Met. (Sheffield), Ph. D. (Sheffield)	38	17-05-71	British Steel Corpn., Asst. Manager, New Products Dev., – 1 year – 6 months
12.	Muthuraman B.	61	Managing Director	2,20,13,659	98,21,668	B. Tech. (Met.), P.G.D.B.M.	39	14-11-66	—
13.	Nerurkar H.M.	57	Vice President (Kalinganagar Project)	69,54,094	30,60,830	B. Tech. (Met)	34	01-02-82	U.M.I. Ltd., Manager (QC) – 5 years
14.	Prasad Avinash	58	Vice President (Industrial Relations)	30,63,999	14,25,881	B.E. (Met)	34	14-06-71	—
15.	Ranganathan M.	59	Chief (Hot Strip Mill)	25,74,156	12,29,058	B.Sc., Engg. (Elect.)	36	13-12-69	—
16.	Sen Anand	46	Vice President (Flat Products)	45,70,668	21,38,374	B. Tech. (Hons.) MET Engg., P.G.D.B.M.	24	27-07-81	—
17.	Sengupta D.*	60	Vice President (Shared Services)	63,43,833	26,91,386	B.E. (Electrical)	38	30-12-67	—
18.	Sengupta Partha	48	Principal Executive Officer	26,45,338	12,41,990	B. Tech. (Metallurgical)	23	01-08-82	—
19.	Singh A.N.	59	Deputy Managing Director (Corporate Services)	1,34,09,830	59,83,559	B.A. (Hons) Pol. Science	35	05-10-90	Deputy Inspector General of Police, Bihar — 6 years
20.	Singh R.P.	61	Vice President (Engg. Services & Products)	65,36,940	28,48,464	B.Sc. Engg. (Mech.)	40	01-03-96	SAIL & RINL, General Manager (Projects) – 30 years
21.	Venugopal Dr. T.	53	Chief Technology Officer	26,69,456	13,29,882	B.Tech (Met Engg.), M.Tech (Ind. Metallurgy with Metal Casting Specialization), Ph.D (Metallurgical Engg.)	28	04-05-01	Ispat Ind. V.P. (Technical Services) – 4 years

- Notes: (1) Gross remuneration comprises salary, allowances, monetary value of perquisites, commission to the Directors and the Company's contribution to Provident and Superannuation Funds but excludes contribution to Gratuity Fund on the basis of actuarial valuation as separate figures are not available.  
(2) Net remuneration is after tax and is exclusive of Company's contribution to Provident and Superannuation Funds and monetary value of non-cash perquisites.  
(3) The nature of employment in all cases is contractual.  
(4) None of the employees mentioned above is a relative of any Director of the Company.

\* Indicates earnings for part of the year.

On behalf of the Board of Directors

Mumbai, 18th May, 2006.

RATAN N. TATA  
Chairman