

Directors' Report

TO THE MEMBERS,

The Directors hereby present their Ninety-sixth annual report on the business and operations of the Company and the financial accounts for the year ended 31st March, 2003.

1. Financial Results

	Rupees Crores	<i>Previous Year Rupees Crores</i>
(a) Net Sales/Income	9793.27	7597.07
(b) Total Expenditure	7491.29	6325.89
(c) Operating Profit	2301.98	1271.18
(d) <i>Add</i> : Dividend and Other Income	50.39	85.63
(e) Profit before Interest, Depreciation, Extraordinary items and Taxes	2352.37	1356.81
(f) <i>Less</i> : Interest	304.82	369.75
(g) Profit before Depreciation, Extraordinary items and Taxes	2047.55	987.06
(h) <i>Less</i> : Depreciation	555.48	524.75
(i) Profit before Extraordinary items and Taxes	1492.07	462.31
(j) <i>Less</i> : Extraordinary items	229.57	211.31
(k) Profit before Taxes	1262.50	251.00
(l) <i>Less</i> : Provision for Current Taxation	261.88	15.50
(m) <i>Less</i> : Provision for Deferred Taxation	(11.69)	30.60
(n) Profit after Taxes	1012.31	204.90
(o) <i>Add</i> : Transfer from Debenture Redemption Reserve	—	310.00
(p) <i>Add</i> : Transfer from Investment Allowance (utilised) Reserve	—	75.55
(q) <i>Less</i> : Transfer to Capital Redemption Reserve	—	140.00
	1012.31	450.45
(r) <i>Add</i> : Balance brought forward from the previous year	215.82	214.76
(s) <i>Add</i> : Balance brought forward on Amalgamation of erstwhile Tata SSL Limited	2.33	—
(t) Balance	1230.46	665.21
Which the Directors have appropriated as under, to :		
(i) Interim Dividend on Preference Shares	—	2.07
(ii) Interim Dividend on Ordinary Shares	—	147.11
(iii) Proposed Dividend	295.19	—
(iv) Tax on Dividend	37.82	0.21
(v) General Reserve	590.00	300.00
TOTAL	923.01	449.39
Leaving a balance of	307.45	215.82
to be carried forward		

FINANCIAL RESULTS

The Steel Industry, after several years, emerged from the shadows of a prolonged price recession. Some of the key steel consuming sectors such as Capital goods, Auto and Construction performed much better, a pointer to the continuing industrial recovery in the Indian economy. The Manufacturing Sector doubled its growth from 2.9% in the previous year to 5.8%. The overall GDP growth would have been much higher than the rate of 5.1% estimated for the year, had it not been for the failure of the monsoon and the resultant worst drought in two decades.

The previous year's Annual Report contained the Company's Vision Statement entitled 'Vision 2007', which stated the Company's objective to be EVA Positive by the year 2007. The Directors are pleased to inform that the Company became EVA Positive during the year ended 31st March, 2003 due to better price realisations, higher volumes, richer product mix and branding efforts. It will now be the Company's endeavour to not only maintain, but improve on it in the years ahead.

During the year under review, the Company's operating and financial performance scaled new heights. The company achieved its highest ever turnover and profit after tax during the year. The Company sold 3.905 million tonnes of steel (2001-02: 3.533 mil.) which is the best ever, an increase of 10.5% over the previous year. Total revenues increased by 28% from Rs. 7,682.70 crores to Rs. 9,843.66 crores, on account of better prices, higher volumes, achievement of rated capacity by the Cold Rolling Mill from September 2002 and a consistent improvement in value-added and branded products in the product-mix. Exports received a big push due to strong demand abroad

and export volumes reached a record at 0.654 mil. tonnes. Consequently, export turnover increased substantially by 126% to Rs. 1,313.24 crores (2001-02: Rs. 580.75 crores). Amongst the non steel businesses, sales and profitability of Tubes and Ferro Alloys and Minerals Profit Centres improved due to higher volumes and improved operations.

Gross profit increased by 73% to Rs. 2,352.37 crores as against Rs. 1,356.81 crores in the previous year, despite provision for higher wages under the new wage agreements signed with the Company's Unions covering the unionised employees. The Company's initiatives to lower its borrowing cost is reflected in the substantially lower gross interest charges at Rs. 352.17 crores (2001-02: Rs. 419.16 crores). Net interest charges were also correspondingly lower at Rs. 304.82 crores (2001-02: Rs. 369.75 crores). Provision for depreciation was Rs. 555.48 crores (2001-2002: Rs. 524.75 crores). After providing Rs. 229.57 crores towards expenses for employee separation compensation (2001-2002 : Rs. 211.31 crores), profit before taxes amounting to Rs. 1,262.50 crores (2001-2002 : Rs. 251.00 crores) was the highest ever achieved in the history of the Company. Profit after taxes increased by 394% to Rs. 1,012.31 crores from Rs. 204.90 crores in the previous year.

As required under the new Accounting Standards, segment-wise financial statements, related party transactions, calculation of earnings per share, provision of deferred tax liability, consolidated financial statements of the Company and accounting for the Company's Associates and Joint Ventures are made a part of the Annual Report.

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 made an application to the Government of India seeking 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. In case the exemption is granted by the Government of India, the aforesaid documents relating to the subsidiaries of the Company will not be included in the Annual Report. The Company will make available these documents/details upon request by any member of the Company.

MERGERS

Tata SSL Limited, an erstwhile subsidiary of the Company, was merged with the Company, following the approval of the scheme of merger by the Shareholders of both companies and the Bombay High Court's Order dated 3rd April, 2003. The Appointed date of the merger is 1st April, 2002. Accordingly, Tata SSL Ltd. has become a Division of the Company. The financial results of the erstwhile Tata SSL Ltd., for the year ended 31st March, 2003 are reflected in the Company's accounts for the same period. Apart from enlarging the products and services offered, the merger will strengthen the Company's presence in the western region, which is a key market centre. Pursuant to the merger, the erstwhile shareholders of Tata SSL Ltd., were allotted 12,10,003 Ordinary shares of the Company, which are entitled for full dividend for the year ended 31st March, 2003.

FINANCIAL RESTRUCTURING

The Shareholders, at their Extra-Ordinary General Meeting held on 19th March, 2003, approved the scheme of financial restructuring of the Company's Balance Sheet. The Bombay High Court approved the arrangement by its Order dated 7th May, 2003. Accordingly, an amount of Rs. 967.41 crores (net of deferred tax asset of Rs. 541.22 crores) has been utilised from the Capital Redemption Reserve Account and the Securities Premium Account to adjust the entire balance in the Miscellaneous Expenditure Account as on 31st March, 2003.

DIVIDEND

The Board has declared a dividend on Ordinary Shares @ 80% (Rs. 8.00 per share) for the year ended 31st March, 2003, subject to approval by the Shareholders. The dividend will be paid as follows:

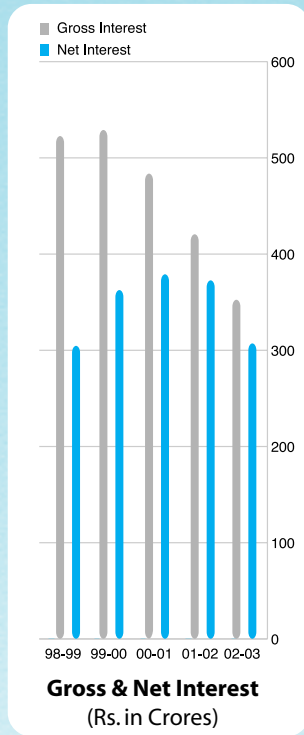
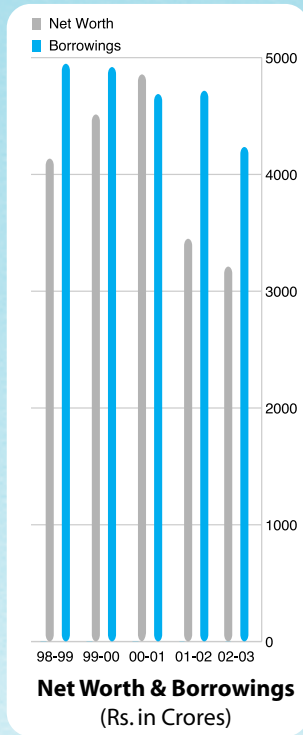
On 367,771,901 Ordinary Shares at Rs. 8.00 per share (*2001-02 : Interim dividend on 367,771,901 Ordinary Shares at Rs. 4.00 per share. No final dividend*).

On 12,10,003 Ordinary Shares at Rs. 8.00 per share, on shares allotted to Shareholders of the erstwhile Tata SSL Ltd., pursuant to its merger with the Company (*2001-02 : Nil*).

In the Finance Bill for the fiscal year 2003-04, the Finance Minister has revived Section 115-O of the Income Tax Act, with the introduction of tax @ 12.5%, exclusive of surcharge, on dividend paid by corporate entities. The dividend is free of tax in the hands of the recipients.

FINANCE

The Government of India has signaled the continuance of the low interest rate regime, by lowering the interest rate on Public Provident Fund



and other small savings schemes etc. by 100 basis points from March 1, 2003. The interest rate on the Special Deposit Scheme (SDS) has also been reduced by 100 basis points from 1st April, 2003.

The Company has progressively retired high cost debt and partly renegotiated others at lower interest rates. In fact, during the year, all the fund requirements were met through internal generation and no fresh borrowings were availed by the Company. Consequently, gross interest charges were substantially lower at Rs. 352.17 crores as against Rs. 419.16 crores in the previous year.

There has been a net reduction in the long-term borrowings outstanding by Rs. 107 crores. Short-term borrowings have substantially gone down by Rs. 372 crores over the previous year. Overall borrowings have, therefore, decreased by Rs. 479 crores to Rs. 4,226 crores as compared to Rs. 4,705

crores at the end of the previous fiscal year.

Working Capital Management

Despite a much higher level of activity in terms of production and sales volumes and increased turnover, total working capital requirement was brought down, reflecting a better management of inventories and debtors. The average working capital was lower at Rs. 2,142 crores as on 31st March, 2003, as compared to Rs. 2,191 crores in the previous year. In terms of number of days' sales, the working capital compares favourably at 90 days' sales as against 103 days in the previous year. Average debtors reduced to 46 days from the previous year's 55 days' sales. Overdue outstandings were brought down from Rs. 490 crores at the beginning of the year to Rs. 466 crores. Stocks of inventory was down to 44 days' sales as against 48 days in the previous year.

Employees' Family Benefit Scheme

The Company had applied to the Central Government, for an exemption to the Employees' Family Benefit Scheme administered by the Company, under Section 58A of the Companies Act, 1956 governing fixed deposits. Under the scheme, in the event of an employee dying in harness or retiring prematurely on medical grounds, the family of the deceased employee or the retired employee, as the case may be, will be paid pension till he would have reached the normal retirement age. However, during the pension period, he is required to keep with the Company his balances in the provident fund and the gratuity fund accounts to become eligible for pension.

In response to an application by the Company, the Central Government has granted exemption from the provisions of Section 58A of the

Companies Act, 1956 read with Rules 3, 3A, 4/4A, 5 to 10 of the Companies (Acceptance of deposits) Rules, 1975 subject to the conditions that (i) the exemption granted will be without prejudice to any legal rights available to any depositor or any shareholder or creditor as per law in force in respect of recovery of any amount which has become due for repayment; (ii) the exemption would be under sub-section (8) of Section 58A of the Companies Act, 1956 only and such exemption would not convey approval of the Central Government under any other provisions of the Companies Act, 1956 or under any other law in force; (iii) the above conditions subject to which the exemption is granted should be indicated in the next report of the Board of Directors; (iv) if any of the conditions attached to the exemption granted by the Central Government under Section 58A (8) of the Companies Act, 1956 is contravened, the exemption will automatically stand cancelled and the Company will become liable for prosecution.

CAPITAL PROJECTS

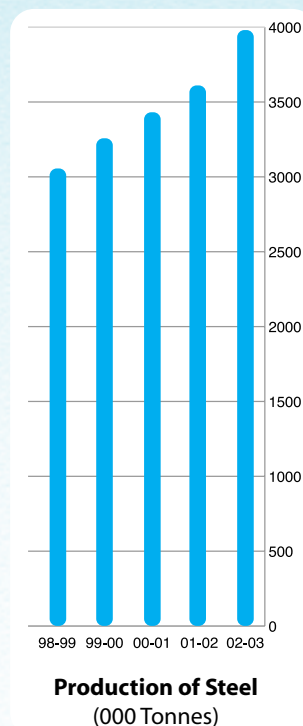
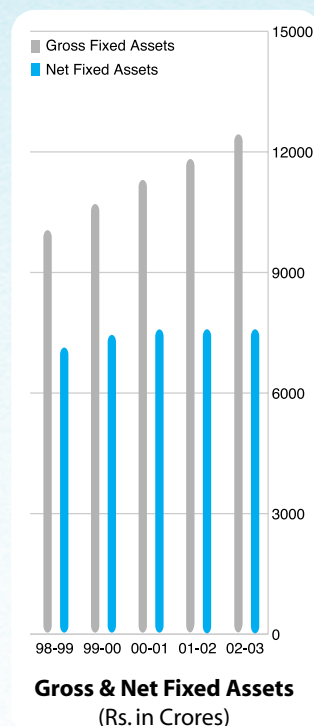
During the year, the Company incurred capital expenditure of Rs. 451 crores. Capital expenditure was restricted to essential items of replacements/renewals.

The Company has decided to embark on a capital expenditure programme to provide balancing facilities, as a result of which the crude steel making capacity will increase by about one million tonnes, from four to five million tonnes. Downstream finishing mill capacities will also be correspondingly increased to make more value added products. The objective would be to make optimum use of the existing facilities and install balancing facilities at minimum cost. The

Programme is expected to cost approx. Rs. 2,000 crores and is slated for completion by March 2006.

The Company's ferro chrome project at Richards Bay, South Africa, to produce 120,000 tonnes per annum of high carbon ferro chrome is progressing as per schedule. The environment impact assessment is in process and is expected to be completed by September 2003. An offer of the requisite land has been received from the Richards Bay Municipality. The project will be implemented as a joint venture with a local partner and is expected to be commissioned in the year 2005.

The Company has launched geological investigations and a feasibility study for its Titania project. A Memorandum of Understanding has been signed with the Government of Tamil Nadu for the project in the districts of Tirunelveli and Tuticorin. The feasibility study will be completed in about 18 months.



SUBSIDIARIES

As of 31st March, 2003, the Company had seven Subsidiaries viz. Tata Refractories Ltd., The Tata Pigments Ltd., Kalimati Investment Company Limited, Tata Korf Engineering Services Ltd., Tata Incorporated, U.S.A., Stewarts and Lloyds of India Ltd. and TM International Logistics Ltd.

ENERGY, TECHNOLOGY & 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.

DIRECTORS

Mr. S.A. Sabavala stepped down from the Board with effect from 1st October, 2002. Mr. Sabavala was the Vice Chairman of the Company between 1985 and 1994. The Board records its deep appreciation of the valuable services rendered by Mr. Sabavala during his long association with the Company.

Mr. Mantosh Sondhi, a Director on the Board of the Company, expired on 28th October, 2002. The Board, while condoling the death of Mr. Sondhi, records its appreciation of the valuable services rendered by him.

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.

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 and Auditors' Certificate regarding compliance of conditions of Corporate Governance are made a part of the Annual Report. A note on the Company's efforts to discharge its social responsibility is also included.

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

The Ordinary Shares of the Company are, at present, listed on the Stock Exchanges at Mumbai, Kolkata, Pune, Cochin, New Delhi, Kanpur, Patna, Ahmedabad and the National Stock Exchange. The shares of the Company are compulsorily traded in dematerialised form.

Specific attention of the Members is drawn to Item No. 6 of the Notice of the Annual General Meeting and the Explanatory Statement attached thereto, whereby the Company proposes to delist its Ordinary Share from all Stock Exchanges excluding The Stock Exchange, Mumbai (BSE) and National Stock Exchange of India Limited (NSE). With the wide and extensive networking of centres of the BSE and NSE, the investors have access to online dealings in the Company's

securities across the country. The trading volumes of the Company's Ordinary Shares on the stock exchanges at Kolkata, Pune, Cochin, New Delhi, Kanpur, Patna and Ahmedabad (hereinafter referred to as "the said Stock Exchanges") are on the decline since the past few years as the bulk of the shares are transacted on the BSE and NSE.

The listing fees paid to the Stock Exchanges do not now offer commensurate benefits to the Company/its investors and the continued listing on the said Stock Exchanges is not considered necessary. The Board of Directors has, therefore, decided to apply for the voluntary delisting under the SEBI (Delisting of Securities) Guidelines 2003, of the Company's Ordinary Shares from all the Stock Exchanges excluding BSE and NSE. Considering that the Ordinary Shares will continue to be listed on BSE and NSE, no Exit Option is required to be offered to the shareholders. The delisting would further contribute to the cost reduction initiative taken across various functional areas of the Company. The delisting of the Company's Ordinary Shares from the said Stock Exchanges will not adversely affect any investors including the Members located in the regions where the said Stock Exchanges are situated.

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 judgements 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, 29th May, 2003

RATAN N. TATA
Chairman

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) Reduction in electrical energy consumption by replacing existing heat exchangers with chilled water direct cooler in 2 x 275 tpd oxygen plant.
- ii) Waste lubrication oil injection in blast furnaces through tuyeres along with coal tar to reduce coke consumption in blast furnaces.
- iii) Reduction in the fuel rate of A-F blast furnaces through improved operating practices.
- iv) Efficient utilisation of by-product gases in the West Plant boilers to reduce middling coal and LDO consumption.
- v) Improved insulation of steam lines, maintenance practices and re-engineering of process steam line to reduce losses on account of condensation and leakages.
- vi) Reduction in process steam consumption at turbo blowers of blast furnaces, coke plants and various canteens of the steel works, by improving the efficiency of turbo blowers, utilisation of waste steam at by-product plant of coke plant and installation of pressure reducing station at canteens.
- vii) Modification in oxygen supply network between A-F blast furnaces and 'G' blast furnace to reduce vent loss of oxygen and improved oxygen supply in blast furnaces leading to higher productivity and lower fuel rate.

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

- i) Recovery of sensible heat of coke by installing coke dry quenching system at Coke Plant.
- ii) Modification of stoker fired boilers for by-product gases firing at BH no. 1 and PH no. 3 to reduce middling coal consumption and enhance by-product gases.
- iii) Waste heat recovery from the 'G' Blast Furnace stove exhaust gases.
- iv) Enhance LD gas recovery.
- v) Recovery of flash steam at PH no. 4 and its use in the deaerators of boilers.
- vi) Installation of 30 MW back pressure turbine.

c) IMPACT OF THE ABOVE MEASURES :

Energy conservation measures during 2002-2003 have resulted in achieving :

- i) Lowest plant specific energy consumption of 6.975 Gcal/tcs – a reduction of 3.93%.
- ii) Lower coal (middlings) consumption of 0.82 million tonnes for steam and power generation – a reduction of 5.09%.
- iii) Lower condensate and other losses of 26.44 t/h in the process steam supply network – a reduction of 17.84%.
- iv) Lowest ever oxygen vent loss of 11.18 t/day – a reduction of 38.94%.

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
- g) Total foreign exchange used and earned (2002-03).

} Mentioned in the Directors' Report.

	Rs. in Crores
i) CIF value of imports	689.89
ii) Expenditure in foreign currency	95.78
iii) Foreign exchange earned (includes deemed exports)	1332.15

Form - A

Form for disclosure of particulars with respect to Conservation of Energy : 2002-2003

Particulars	2002-2003	2001-2002
A. POWER AND FUEL CONSUMPTION		
1. Electricity		
a) Purchased		
Units (M. KWH)	1,540.92	1,371.73
Total Amount (Rs.Lakhs) #	44,075.26	36,446.51
Average Rate/Unit (Rs./KWH)	2.86	2.66
b) Own Generation		
i) Through Diesel Generator		
Units (M. KWH)	8.18	8.10
Units per litre of Diesel Oil (KWH)	3.76	3.63
Average Cost/Unit (Rs./KWH)	8.10	7.32
ii) Through Steam Turbine/Generator		
Units (M. KWH)	992.73	1,077.38
Units per tonne of Coal (KWH)	1,029	897.13
Average Cost/Unit (Rs./KWH)	0.28	1.48
(*This includes generation of PH #4 in MKwh which is operated on by-product gases upto 95%)	309.47	375.76
2. COAL		
i) Coking Coal		
Quantity (Million Tonnes)	3.36	3.32
Total Cost (Rs.Lakhs)	69,243.06	66,454.05
Average rate (Rs./Tonne)	2,057.90	2,002.65
ii) Blast Furnace Injection Coal		
Quantity (Million Tonnes)	0.20	0.14
Total Cost (Rs.Lakhs)	3,919.16	4,052.61
Average rate (Rs./Tonne)	1,999.35	2,951.28
iii) Middling Coal and ROM		
Quantity (Million Tonnes)	0.83	0.86
Total Cost (Rs.Lakhs)	6,059.01	6,437.59
Average rate (Rs./Tonne)	732.56	750.12
3. FURNACE OIL		
Quantity (Kilo Litres)	13,415.62	2,551.67
Total Amount (Rs.Lakhs)	1,553.75	302.62
Average rate (Rs./KL)	11,581.64	11,859.69
4. OTHERS		
L.D.O.		
Quantity (Kilo Litres)	3,533.54	2,957.78
Total Cost (Rs.Lakhs)	522.93	389.68
Average rate (Rs./KL)	14,799.12	13,174.67
L.P.G.		
Quantity (Tonnes)	2,445.56	Nil
Total Cost (Rs. Lakhs)	410.70	Nil
Average Rate (Rs./Tonne)	16,793.70	Nil
NG		
Quantity (Tonnes)	4,811.00	Nil
Total Cost (Rs. Lakhs)	444.42	Nil
Average Rate (Rs./ Tonne)	9,237.58	Nil

Excludes electricity duty paid on purchases

Form for disclosure of particulars with respect to conservation of energy : 2002-2003

B. CONSUMPTION PER UNIT OF PRODUCTION

Particulars	Steel (per tonne)	Tubes (per tonne)	Bearings (per no.)	Ferro Alloys (per tonne)	Rings & Agrico (per no.)	Growth Shop (per tonne)	CRC West (per tonne)	SSL West (per tonne)
Electricity (KWH)	437.00 (464.00)	116.00 (124.00)	1.08 (1.20)	2657.18 (3791.09)	0.85 (0.81)	996.70 (1214.51)	178.93 (199.66)	1788.00
Furnace Oil (Litres)				— (1.20)	0.23 (0.68)	11.36 (20.12)		90.00
Coking Coal (Tonnes)	0.89 (0.95)							
Others :								
Light Diesel Oil (Litres)	0.55 (0.53)	0.05 (0.06)					12.50 (9.30)	
L.P.G. (Kgs.)							12.80 (12.92)	6.00
N.G. (Kgs.)								43.00

(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 : 2002-2003.

RESEARCH AND DEVELOPMENT

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

Research was carried out in the areas of raw materials including coal, coke, energy conservation, waste utilisation, sintering, blast furnace productivity, product development and improvement in life of plant and machinery.

2. BENEFITS DERIVED

Many initiatives have been taken on R & D and some work done in the past are now bearing fruit. A few instances are highlighted below :

Coal briquette making as well as the partial briquette blending techniques developed by R & D in the past have been successfully implemented in the top charged batteries. Addition of 10% coal briquettes to coal charge enhanced the oven throughput by more than 5% and CSR of coke by 1.5 points. Plant trials have shown total 15% briquette addition is optimum; The possibility of reducing captive clean coal ash from 17 to 16% has been successfully explored with West Bokaro and Jharia coal. After implementation, substantial savings are expected; Identified optimum conditions to produce pellets of desired strength (>200 kg/pellet) with blue dust and LD sludge for use in blast furnaces; BF hearth drainage studies for 'G' blast furnace have been carried out. This would improve the hearth drainage efficiency and detect the causes of hearth erosion, thus prolonging the hearth life; A mathematical model of burden distribution incorporating burden trajectory and burden descent has been developed for the recently upgraded 'F' blast furnace; An assessment of the different designs proposed for the vertical slab caster for LD 2 has been made by R & D and the relative merits and demerits have been elucidated through a comprehensive stress and strain analysis; Standardisation of the vacuum and argon gas flow rate profile for the RH degasser through mathematical modeling has been implemented. This has resulted in reduction of decarburisation time by about one minute; A mathematical model for cored wire injection in steel melts has been developed; A model has been developed for predicting tapping temperature for direct heats at LD2 and SC; A thermal model of the ROT was developed for the prediction of CT over the length of the HR coil, benchmarking of coiling temperature of HR coil with the world leader, VAI, Austria, was carried out. Accuracy of ± 15 Mpa over coil length has been achieved; A model has been developed to predict the phase transformation and mechanical property during hot rolling at WRM. This model is under advanced stages of testing in the plant; Hot rolled dual phase steel has been successfully press formed to wheel disc at M/s. WIL, Chennai; Laboratory simulation of CGL #2 heat treatment using Gleeble-1500 has shown the possibility of producing CRDP through CGL #2; CRCA bake hardening steel (BH-210) has been successfully processed through CRM; Low carbon silicon free grade (phosphorous) with watt loss of 5 W/kg (max) has been successfully developed for electrical lamination application. This product is well accepted by major customers like M/s. General Electric, Kirloskar Copeland etc.; Isotropic steel for bearing cages has been made for the first time in India; FEM simulation has been carried out for the forming of compressor shell using ABAQUS/Standard; Thin organic coating (TOC) has been developed for improving white rust resistance of galvanised products for automotive fuel tank applications; Plant trials with recommended process parameters showed an improvement in surface brightness of regular spangled product at CGL #2; A novel ultrasonic technique using surface wave profile has been developed to measure shallow surface crack in TCM rolls of CRM and implemented on shop floor of CRM; A fracture mechanics and NDE methodology was developed to estimate critical disband and surface flows in high speed steel rolls of HSM.

3. FUTURE PLAN OF ACTION

Development of flat products for automobiles; ferro chrome – the total process; increase in blast furnace productivity; dephosphorisation during steel making; lowering coal ash; mega project on recovery of values from BOF slag.

4. EXPENDITURE ON R & D

(Rs. Crores)

(a) Capital	0.35
(b) Recurring	15.98
(c) Total	16.33
(d) Total R&D expenditure as a percentage of total turnover (%):	0.17

TECHNOLOGY ABSORPTION, ADAPTATION AND INNOVATION

1. Efforts made :

Process :

New Recoiling Line at CRM : A new recoiling line (RCL#3) with special features such as scrubber unit and tension levelling has been installed and made fully operational. This has given a boost to product quality in terms of surface cleanliness as well as superior shape control required for critical OE supplies.

Pickled and Oiled skin passed Hot Rolled Coil produced through CRM facilities : There was a demand from auto industry for good quality hot rolled sheets for internal and reinforced parts. The initial supplies had the problems of coil break and waviness in hot rolled pickled material. The problems were taken care of by routing hot rolled coils through PLCTM of CRM for pickling without giving any reduction. The coils are then skin passed and oiled at SPM for despatch. The material has been well accepted by the auto industry.

Rebuilding of the 1958 vintage 'F' blast furnace with contemporary technological features like bell less top, high top pressure, raw material screening and process control system based on artificial intelligence. The technological partners for various parts of the project included M/s. Paul Wurth, Luxembourg, Nippon Steel Corporation and VAI.

Introduction of High Speed Roll at Hot Strip Mill : High speed rolls have been introduced in stand #2 of Hot strip Mill for the first time. This has resulted in 50% reduction in roll changing and dressing, thereby lower roll consumption.

Probing of the blast furnaces using special purpose probes – a multi point vertical probe, under burden probe and tuyere core sampler were commissioned during the year at 'G' blast furnace.

Technical assistance was taken from M/s. Nippon steel corporation to (i) prolong the current campaign of 'G' blast furnace (ii) develop the concept for enlargement of 'G' blast furnace in the forthcoming relining and improving the operations of the Sinter Plants.

Ceramic welding repair of coke oven walls technology sourced from M/s. Fosbel.

2. Benefits :

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

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

Innovation/Technology	Year of Import/ Absorption	Status of Implementation
a) Stamp Charge Battery No. 8 (Saarberg Interplan, Germany)	1999	Commissioned
b) Augmentation of Sinter Production (Lurgi, Germany)	1999	Commissioned
c) Third Converter and gas cleaning equipment at LD 2 (MDH, Germany)	1999	Commissioned
d) Second gas recovery system (MDH, Germany)	1999	Commissioned
e) Second desulphurisation unit at LD 2 (Thyssen, Germany)	1999	Commissioned
f) Installation of third Slab Caster at LD 2 (Davy Distington, U.K.)	1999	Commissioned
g) Electrics and automation for HSM (SMS, Germany)	1999	Commissioned
h) Thyssen bottom metallurgy technology in LD Converters (Thyssen, Germany)	1999	Commissioned
i) Split Blower for Blast Furnaces (GHH, Germany)	1999	Commissioned
j) Development of information system for CRM (Posdata Company Ltd., Korea)	1999	Commissioned
k) Slab yard management system (Posdata Company Ltd., Korea)	1999	Commissioned
l) Coil yard management system (Posdata Company Ltd., Korea)	1999	Commissioned
m) Coil tracking and transportation system (Posdata Company Ltd., Korea)	1999	Commissioned
n) Manufacture of self-aligning clutch release bearing and rear wheel ball bearing (Nachi Fujikoshi, Japan)	1999	Commissioned
o) Stamp Charge Battery No. 9 (Saarberg Interplan, Germany)	2000	Commissioned
p) Ladle Furnace at LD 1 (GHH, MDH, Germany)	2000	Commissioned
q) Capacity increase at WRM (Morgan, USA)	2000	Commissioned
r) Continuous galvanising line no. 2 at CRM (CMI, Belgium)	2001	Commissioned
s) Utilisation of sensible heat from blast furnace hot stove waste gas at 'G' blast furnace in association with NEDO, Japan	2002	Commssioned
t) Installation of electromagnetic stirrer and submerged entry nozzle in the billet caster of LD #1 (Concast, Switzerland)	2002	Commissioned
u) Installation of probes in 'G' blast furnace to monitor various parameters to carry out intensive R & D activities and thereby acquiring in-depth knowledge of in-furnace phenomena (Paul Wurth, Luxembourg)	2002	Commissioned
v) Electrolytic cleaning line (SMS Demag, Germany)	2003	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 Remune- ration	Net Remune- ration	Qualifications	Total Experi- ence (Years)	Date of Commence- ment of Employment	Last employment held Designation – Period for which post held
				Rs.	Rs.				
1.	Baijal A.D.	55	Vice President (Raw Material & Iron Making)	24,64,894	12,51,555	B.Sc. Engg. (Met.), P.G.D.B.M.	33	13-12-69	—
2.	Mukherjee Dr. T.	60	Deputy Managing Director (Steel)	47,92,491	24,25,490	B.E. (Met.), M. Met. (Sheffield), Ph. D. (Sheffield)	35	17-05-71	British Steel Corpn., Asst. Manager, New Products Dev., — 1 year – 6 months
3.	Muthuraman B.	59	Managing Director	54,67,051	27,51,720	B. Tech. (Met.), P.G.D.B.M.	36	14-11-66	—
4.	Nandrajog R.C.	58	Vice President (Finance)	29,61,596	17,24,027	B.Sc. Engg. (Mech.), A.I.C.W.A M.B.A.	36	12-11-66	—
5.	Nerurkar H.M.	54	Vice President (Flat Products)	25,93,431	12,88,524	B. Tech. (Met.)	31	01-02-82	Tata Steel, Asst. Research Engg., — 5 years U.M.I. Ltd. Manager (QC) — 5 years
6.	Sengupta D.	57	Vice President (Shared Services)	24,22,734	11,84,548	B.E. (Electrical)	35	30-12-67	—
7.	Singh A N.	56	Deputy Managing Director (Corporate Services)	47,78,734	24,29,824	B.A. (Hons) Pol. Science	32	05-10-90	Deputy Inspector General of Police, Bihar — 6 years
8.	Singh R.P.	58	Vice President (Engg. Services & Projects)	29,30,441	14,81,190	B.Sc. Engg. (Mech.)	37	01-03-96	SAIL & RINL, General Manager (Projects) – 30 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.

On behalf of the Board of Directors

RATAN N. TATA
Chairman

Mumbai, 29th May, 2003.