



# REPORT 1981-82

GOVERNMENT OF INDIA  
MINISTRY OF  
STEEL AND MINES  
(DEPARTMENT OF STEEL)  
NEW DELHI



# **REPORT**

## **1981-82**



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**MINISTRY OF STEEL & MINES**  
**DEPARTMENT OF STEEL**  
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## PREFACE

This Report is divided into two parts.

**Part I** presents an overall picture of the Department of Steel and India in world Steel.

**Part II** covers the activities and the performance of the organisation/undertakings under the Department of Steel during the Year.

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## ERRATA

Sl. No.	Page	Para	Line	For	Read
1.	9	2.1.1	9	14.6 million	14.7 million
2.	9	2.1.1	11	3.6 million	3.3 million
3.	27	1st foot note Table	below	Rs. 300 crores	Rs. 3.00 crores
4.	29	2.2.4	2	chanalised	channelised
5.	31	2.2.12	4	big	pig
6.	33	Table		7612059	7612057
7.	54	3.5.10	4	construction	constructional
8.	62	Table		( ) 30.97	(—) 30.97
9.	63	3.13.1	9	Through	through
10.	97	5.4.2	14	directed	direct
11.	97	5.4.3	8	tonage	tonnage

**PART I**

## CHAPTER I

# DEPARTMENT OF STEEL—MAIN FUNCTIONS AND ORGANISATIONAL STRUCTURE

### 1. *Main Functions*

1.1 The Ministry of Steel and Mines has two Wings—Department of Steel and Department of Mines. The Department of Steel is responsible for production, distribution, import and export of iron and steel. This encompasses planning and development for the iron and steel industry both in the public and private sectors, the development of essential inputs such as iron ore, limestone, dolomite, manganese ore, chromite etc., the formulation of import and export policies in respect of pig iron, steel and ferro-alloys, and other related functions. The iron and steel industry includes the main integrated steel plants, the electric arc furnace units, re-rolling mills, wire drawing units, producers of cold rolled strips and skelp, tin plate manufacturers, ferro-alloy producers and units making special and alloy steels. A list of subjects allocated to the Department of Steel is given in Annexure-1A.

### 2. *Organisational Structure*

2.1 The Department of Steel has a Secretary, four Joint Secretaries, three Directors, four Deputy Secretaries, seven Under Secretaries and one Deputy Controller of Accounts. The two Departments have a common Financial Adviser of the status of Additional Secretary. A Technical Wing consisting of an Industrial Adviser, an Additional Industrial Adviser, three Development Officers and two Assistant Development Officers assists and advises the Department in technical matters. The size of the secretariat of the Department continues to be small, with a total strength of only 323. A statement showing the representation of women, scheduled castes and scheduled tribes, ex-servicemen and the physically handicapped among the employees is given at Annexure-1B.

2.2 One of the Deputy Secretaries in the Department acts as the liaison Officer for watching the interests of scheduled caste and scheduled tribe employees in service matters. One of the Under Secretaries functions as the Welfare Officer of the Department. There is a Complaint Cell in the Department

which receives public complaints and grievances and ensures that these are dealt with promptly.

2.3 The Department of Steel has only one attached office viz., the Office of the Iron and Steel Controller at Calcutta. The Iron and Steel Controller, who is of the status of a Joint Secretary, is assisted by two Joint Controllers, four Deputy Controllers, seven assistant Controllers, one Industrial Adviser, two Development Officers and one Assistant Development Officer at the head-quarters. He has six regional offices headed by Regional Iron and Steel Controllers at New Delhi, Kanpur, Calcutta, Madras, Hyderabad and Bombay. The main functions of the of the employees of the Iron and Steel Control Organisation are given in Annexure-1D.

2.4 Although the Iron and Steel Control Organisation was initially set up to perform the regulatory functions envisaged in the Iron and Steel (Control) Order, 1956, its responsibilities have expanded over the years. It now plays a very important advisory role, in addition to its regulatory functions, in practically all matters relating to the iron and steel industry. The Iron and Steel Controller monitors the working of the electric arc furnace industry, the secondary producers and tin plate manufacturers, the ferro alloy industry, etc. He heads the Joint Plant Committee which was formed to perform specific functions under the Iron and Steel (Control) Order and to administer various funds such as the Freight Equalisation Fund, The Steel Development Fund, etc.

2.5 In performing the regulatory and control functions assigned to him, the Iron and Steel Controller and his Regional Controllers carry out inspections to check mis-utilisation of iron and steel. A statement showing the number of inspections carried out and punitive action taken by the Iron and Steel Control Organisation during 1980-81 and 1981-82 (April to December, 1981) is attached as Annexure-1E.

2.6 The Department of Steel has several Public Sector Undertakings under its administrative control. A list of such Undertakings is given in Annexure-1F. The Mineral Development Board which is the centralised agency for ensuring systematic, coordinated and integrated development of ferrous and other designated strategic minerals also falls under the administrative control of the Department of Steel.

## ANNEXURE-1A

### MINISTRY OF STEEL & MINES

#### DEPARTMENT OF STEEL

1. Steel Plants in the Public and Private Sectors the re-rolling industry and ferro-alloys including all future development.
2. Development of iron ore mines in the public sector including beneficiation/upgrading of low grade iron ores.
3. Development of other ore mines and coal washeries and mineral processing for the steel plants.
4. Production, distribution, prices, imports and exports of iron and steel and ferro-alloys.
5. Planning, development and control of and assistance to all iron and steel industries.
6. Production, supply, pricing and distribution of iron ore, manganese ore, limestone, sillimanite, kyanite and other minerals and alloys used in the steel industry excluding grant of mining lease or matters connected therewith.
7. All Attached or Sub-ordinate Offices or other organisations concerned with any of the subjects specified in this list.
8. The Mineral Development Board.

# ANNEXURE-1B

Statement showing the number of Employees, number of SC/ST, Physically Handicapped, Ex-service men, Men & Women as on 31-12-1981 in respect of the Secretariat of the Department of Steel.

Group	No. of employees	Men	Women	S.C.	S.T.	Physically handicapped	Ex-Ser-vice-men
A	30	28	2	1	—	—	—
B	87	86	1	7	1	—	—
C	130	99	31	21	1	3	4
D	76	75	1	23	10	—	2
Total	323	288	35	52	12	3	6

# ANNEXURE-1C

Duties and functions of the Regional Iron and Steel Controllers

- To collect factual information regarding the capacities of all iron and steel based units registered with the Iron and Steel Controller and, inter-alia, to monitor particulars of the various inputs, production and capacity utilisation of those units on a regular basis.
- In all cases where import clearance is given by the Iron and Steel Controller, to ensure proper utilisation of imported materials and to report about the actual requirements of raw material, spare parts and other consumables.
- To identify and encourage industrial units taking up programmes of import substitution and also suggest items which need not be imported because of indigenous availability.
- To render assistance to core projects and priority sectors in obtaining their requirements of steel.
- To conduct monthly market surveys and report the overall availability and supply position of iron and steel materials in their regions with particular reference to price trends of critical items.
- To aid, assist and guide the iron and steel based units to increase production by ensuring adequate supply of raw materials and other inputs.
- To inspect iron and steel based units registered with DGTD and also report progress of implementation of Letters of Intent and licences issued by the Government of India so far as they pertain to the iron and steel industry.
- To conduct status survey of the iron and steel industry licenced by the Iron and Steel Controller.

The Regional Controllers also monitor supplies to SSICs by the main producers with a view to ensuring that the SSICs are helped to meet the requirements of small scale units.

# ANNEXURE-1D

Statement showing the number of Employees (Group wise), Number of SC/ST, Physically Handicapped, Ex-servicemen, Men & Women as on 31-12-1981 in respect of Iron & Steel Control Organisation.

	Group	No. of employees	Men	Women	S.C.	S.T.	P.H.	Ex-servicemen
I & SC, Calcutta Regional Offices	A	11	11	—	2	—	—	—
Total	A	15	15	—	—	—	—	—
I & SC, Calcutta Regional Offices	B	26	26	—	2	—	—	—
Total	B	17	17	—	3	—	—	—
I & SC, Calcutta Regional Offices	C	17	17	—	3	—	—	—
Total	C	161	142	19	25	4	4	4
I & SC, Calcutta Regional Offices	D	52	45	7	8	1	—	—
Total	D	213	187	26	33	5	4	4
I & SC, Calcutta Regional Offices	D	57	56	1	12	2	—	1
Total	D	29	29	—	9	—	—	—
Grand Total (A, B, C & D)		86	85	1	21	2	—	1
		342	315	27	59	7	4	5

# ANNEXURE-1E

Statement showing the number of cases of Inspection/Suspensions/Debarments in 1980-81 (April 1980—March '81) and 1981-82 (April—December 1981)

	Inspection		Suspension		Debarment	
	1980-81	1981-82	1980-81	1981-82	1980-81	1981-82
1. Bombay	872	664	122	102	80	54
2. Calcutta	627	279	115	73	95	54
3. Delhi	340	376	135	135	116	103
4. Hyderabad	1,072	616	216	50	226	94
5. Kanpur	536	299	116	98	89	35
6. Madras	1,383	690	162	95	151	58
	4,830	2,924	866	553	757	398

# ANNEXURE—1F

## List of Public Sector Undertakings under the Department of Steel

1. Steel Authority of India Limited.
2. Indian Iron & Steel Company Limited. (Subsidiary of Steel Authority of India Limited)
3. Metallurgical & Engineering Consultants (India) Limited.
4. Hindustan Steel works Construction Limited.
5. Kudremukh Iron Ore Co. Limited.
6. National Mineral Development Corporation Limited.
7. Manganese Ore (India) Limited.
8. Bharat Refractories Limited.
9. Indian Firebricks & Insulation Co. Limited. (Subsidiary of Bharat Refractories Limited)
10. Metal Scrap Trade Corporation. (Subsidiary of Steel Authority of India Ltd.)
11. Ferro Scrap Nigam Limited. (Subsidiary of MSTC)
12. Sponge Iron India Limited.
13. HISCO Stanton Pipe & Foundry Company Limited. (Subsidiary of Indian Iron & Steel Co. Ltd.)

# CHAPTER II

## INDIA IN WORLD STEEL

2.1.1 Steel is today acknowledged as a basic input material for industrial development and its per capita consumption is often regarded as an important indicator of the level of economic progress made in a country. In recognition of its crucial role, therefore, sustained efforts have been made to augment the steel-making capacity in India. From an installed capacity of a mere 1.3 million tonnes of ingot steel and that too in the private sector, during the first Five Year Plan, the country has forged ahead significantly. At present the steel-making capacity stands at 14.6 million tonnes of ingots per year of which 11.4 million tonnes are accounted for by the integrated steel plants and 3.6 million tonnes by the mini steel plants. In 1980 India ranked 16th among the major steel-producing countries in the world.

2.1.2 Though India has a small share of the total world output of crude steel which was of the order of 707.3 million tonnes in 1981, she is a leading steel producer amongst the Third World countries. While the production of crude steel in countries like Belgium, Brazil, Romania, South Korea and Spain was slightly higher than that of India, it was lower in certain other countries like South Africa, Australia, Mexico and the German Democratic Republic. The USSR maintained its position as the top producer with 149 million tonnes, while USA beat Japan for the second place. In spite of a significant increase our steel consumption remained at around 15 kg per capita as against the figure of around 600 kg in the industrially advanced countries of the world.

### Steel in Indian Economy

2.2.1 The massive material use and output supply of steel industry establish the threshold condition for attaining higher activity levels in various sectors vital to the economy, such as mining, machinery manufacture, transport, construction including house building and institutions, energy, agriculture, irrigation etc. which together account for a large quantum of the employment and income accruing to the national economy. An indication of the level of steel-consumption in some of the main sectors over the Sixth Plan period is given on the next page.

### Forward Linkages : Levels of Steel Use

Activity	(Million tonnes)	1979-80	1984-85
<b>I. Machinery Manufacture and Metal Products</b>		<b>4.500</b>	<b>7.022</b>
(i) Transport Equipment		0.726	1.209
(ii) Electric Power Equipment		0.197	0.347
(iii) Industrial Machinery		0.401	0.647
(iv) Other Metal Manufacturers		1.148	1.655
Total—Organised Sector Principal Consuming Industries (i) to (iv)		2.472	3.858
(v) Defence Industries		0.091	0.141
(vi) Other Miscellaneous Steel Consuming Industries		0.503	0.785
(vii) Small Scale Industries		1.394	2.176
(viii) Processing Loss in Wires, Forgings, etc.		0.040	0.062
<b>II. Construction Sector</b>		<b>3.500</b>	<b>5.162</b>
<b>Total Domestic (I+II)</b>		<b>8.000</b>	<b>12.184</b>

2.2.2 The backward linkages for steel-making are equally impressive. For producing one tonne of steel in an integrated steel plant, approximately 3.5 tonnes of input materials including minerals, spares and other consumable are required. Steel also has a high multiplier effect in generating further investments and larger employment which vary from sector to sector and use to use. Generally, it is believed that for every tonne of steel consumed, employment ranging from 4 to 10 persons is created in the downstream sectors. The integrated steel industry itself has a work force of 291,000 in India.

2.2.3 There is another angle to the steel situation, namely the absorptive capacity of the economy to sustain an increased level of steel use. According to a rough estimate, the investment required to effect one tonne of steel consumption varies from about Rs. 25,000 to Rs. 2 lakhs depending upon the nature of industry, as detailed in the Table below.

Industry	Investment needed to effect one tonne of steel consumption
1. Automobile	Rs. 1 lakh
2. Shipping	80,000
3. Railway construction	70,000
4. Construction	25,000
5. Machine tool	50,000 to 2 lakhs
6. Railway wagon building	1 lakh

2.2.4 The investment magnitude presented above, though indicative, is sufficiently revealing to conclude that a higher level of consumption of steel entails a much higher level of investment in a larger number of activities creating employment and increasing income, while satisfying at the same time the needs of the market.

### Steel Plants and their capacity

2.3.1 The table below shows the installed capacity of each integrated steel plant in the country:—

Sl. No.	Name of the Plant	Rated Capacity (in million tonnes)	
		Ingot steel	Saleable steel
1.	Bhilai	2.5	1.96
2.	Durgapur	1.6	1.23
3.	Rourkela	1.8	1.22
4.	Bokaro	2.5	1.97
5.	IISCO	1.0	.8
6.	TISCO	2.0	1.5
Total		11.40	8.7

2.3.2 Of these six integrated steel plants, the first five are in the public sector, owned and controlled by the Steel Authority of India Ltd.; together they account for a capacity of 9.4 million tonnes of ingot steel per year. The product-mix of the integrated steel plants is designed to serve the needs of diverse sectors of the economy and includes blooms, slabs, billets, bars, light, medium and heavy structurals, rails, sleepers, wheels and axles, and galvanised and tin-plated sheets. Approximately 40% of the steel produced by these plants is oriented to meet the demand of civil construction, 50% of engineering industry and 10% of the miscellaneous groups.

### Capacity Build-up

2.4.1 The steel industry in India is poised for substantial growth during the eighties. It is estimated that the demand for steel will go up to 12.7 million tonnes by 1984-85 and to 18.4 million tonnes by 1989-90. The main thrust will be on bars, rods, structurals, plates and hot and cold-rolled sheets. To meet



the upsurge in demand, it is planned to raise the installed capacity of crude steel in the integrated steel plants to nearly 20 million tonnes by 1989-90. This is sought to be achieved through a blend of schemes for modernisation and expansion of the existing units and creation of new capacities at green-field sites. The major schemes among these are the expansion of Bhilai and Bokaro Steel Plants to four million tonne stage each and the installation of Visakhapatnam and Paradip Steel Plant. The Sixth Plan, 1980-85 envisages an outlay of Rs. 3,724.72 crores for steel.

#### *Plan outlays for 1981-82 and 1982-83*

2.5.1 The approved plan outlay for capital schemes of the Department of Steel for the year 1981-82 is Rs. 795.56 crores, with a budgetary support of Rs. 568.96 crores as against the actual plan expenditure of Rs. 767.34 crores during 1980-81. The increase of Rs. 28 crores in the outlay over the previous year's expenditure is mainly due to larger provisions for Visakhapatnam Steel Plant (+ Rs. 77 crores), Durgapur Steel Plant (+ Rs. 39 crores), Rourkela Steel Plant (+ Rs. 14 crores), National Mineral Development Corporation (+ Rs. 6 crores) and Bhilai Steel Plant (+ Rs. 2 crores), off-set by reduction in the allocations for Kudremukh Iron Ore project (—Rs. 66 crores), Salem Steel Plant (—Rs. 34 crores), Bharat Refractories Ltd. (—Rs. 5 crores), Bokaro Steel Plant (—Rs. 2 crores), Sponge Iron India Ltd. (—Rs. 2 crores) and Indian Iron & Steel Company (—Rs. 1 crores). Of the total outlay, Rs. 759.20 crores were for the capital schemes of SAIL, of which Rs. 225 crores were expected to be financed from the Steel Development Fund.

2.5.2 The revised outlay for the Department of Steel for the year 1981-82 has been fixed at Rs. 751.19 crores, the allocation for SAIL being Rs. 694.93 crores. The reduction is partly off-set by increased outlay for Kudremukh Iron Ore Company (Rs. 19.51 crores). Due to the reduction in the outlay, coupled with increased availability of funds from the Steel Development Fund to the extent of Rs. 30 crores, budgetary support to the Deptt. of Steel has been reduced by Rs. 74.77 crores and now stands at Rs. 494.19 crores.

2.5.3 The plan outlay for the Department of Steel for the year 1982-83 has been fixed at Rs. 859.90 crores, with a budgetary support of Rs. 544.55 crores. Out of the extra-budgetary resources of Rs. 315.35 crores, about Rs. 300 crores are expected to be contributed by the Steel Development Fund.

2.5.4 The total outlay for SAIL and its subsidiaries will be Rs. 543.19 crores. The major schemes of SAIL are 4-million tonnes expansion of Bokaro Steel Plant (Rs. 140 crores), 4-million tonnes expansion of Bhilai Steel Plant (Rs. 170 crores), captive power plants of Bokaro, Durgapur and Rourkela (Rs. 49 crores), Silicon Steel Plant of Rourkela (Rs. 20 crores) and Salem Steel Plant (Rs. 10 crores). Outside SAIL, the largest investment will be on Visakhapatnam Steel Plant (Rs. 250 crores). Outlays have also been provided for Kudremukh Iron Ore Company (Rs. 36.67 crores) and for the National Mineral Development Corporation (Rs. 10.14 crores).

#### *Major Capital Schemes*

2.6.1 Some of the major schemes under implementation are the following :

##### *(i) Bokaro Steel Plant—4MT Expansion*

The 4 MT expansion of Bokaro Steel Plant at an estimated cost of Rs. 1,378.33 crores is likely to be completed by July, 1983 and the CRM Complex by June, 1984.

##### *(ii) Bhilai Steel Plant—4 MT Expansion*

Expansion of Bhilai at an estimated cost of Rs. 1,582 crores is now expected to be completed by December, 1982.

##### *(iii) Silicon Project at Rourkela*

The Silicon Steel Project of Rourkela Steel Plant at an estimated cost of Rs. 151.55 crores is expected to be completed by March, 1983.

##### *(iv) Additional Captive Power Plants at Bokaro*

Captive power units (3×60 MW) are under construction at Bokaro. The first unit is expected to be commissioned by May, 1983, the second by September, 1983 and the third by March, 1989.

##### *(v) Captive Power Units at Durgapur*

Scheme for captive power units (2×60 MW) are also under implementation at Durgapur. The first unit is likely to be commissioned by April, 1983 and the second unit by September, 1983.

##### *(vi) Visakhapatnam Steel Plant*

Government have incorporated a new Company named Rashtriya Ispat Nigam for the implementation of Visakhapat-

nam Steel Project. The revised estimated cost of this project is Rs. 2,935.41 crores and the first phase of this project is likely to be completed by early 1986.

(vii) *Kudremukh Iron Ore Project & Mangalore Pellet Plant*

With the commissioning of the mines as well as the pipeline, the Kudremukh Iron Ore Project as visualised earlier is practically complete. However, the Project is languishing for want of adequate outlet for its product because of the developments in Iran. About one million tonnes of iron ore concentrate are being supplied per year to Romania as a part of the award of contract for construction of a 3 million tonne pelletisation plant at Mangalore. The pellet plant is expected to start production by September, 1984.

*Paradeep Steel Project*

2.6.2 Government have decided, in principle, to set up an integrated steel plant having capacity of 1.5 million tonnes at Paradeep in Orissa. Government have further decided to award this work to Messrs Davy McKee of U.K. subject to the final settlement of technical, financial and commercial terms of the contract. This project is to be completed within 4 years from the signing of the contract.

*Production Performance in 1981-82*

2.7.1 The year 1981-82 could verily be characterised as the year of recovery for the Indian steel industry. Production of crude steel at the integrated steel plants increased by 19.7% during April 1981—January 1982 compared to the corresponding period of the previous year. The contribution of mini steel plants during April 1981—December 1981 was 1.53 million tonnes as against 1.47 million tonnes in the corresponding period of the preceding year. The performance of Indian steel industry gains special significance in the background of the declining trend in steel production the world over. In 1980 the world crude steel production was 718 million tonnes as compared to 747.5 million tonnes in 1979. The estimated production of 707.3 million tonnes in 1981 indicates a further drop of 1.4% as compared to 1980.

In the first 9 months of 1981-82, the six integrated steel plants produced 5.19 million tonnes of saleable steel as compared to 4.36 million tonnes in the corresponding period of 1980-81, representing an increase of 19% over the previous

year. The Alloy Steel Plant, Durgapur produced 37,000 tonnes of special steels during April-December, 1981 as against 28,000 tonnes in the corresponding period in 1980-81, thus registering an increase of 32%. The continuing higher trend in production significantly improved the availability of steel and brought down the prices of many categories of steel in the domestic market. The performance of public sector steel plants would have been still better but for the constraints in regard to availability of coking coal, power as well as rail movement.

2.7.2 The extent of increase in production of ingot steel and saleable steel and saleable pig iron during 1981-82 over the previous year is brought out by the following figures. :—

	Production (in million tonnes)		Present Increase	Capacity utilisation	
	1980-81	1981-82		1980-81	1981-82
1. Ingot steel . . .	7.35	8.90	21%	64%	78%
2. Saleable Steel . .	6.28	7.30	16%	72%	84%
3. Saleable Pig Iron .	1.34	1.3	Nil	*	*

\*No Capacity as such.

*Production Plan for 1982-83*

2.8.1 A target of 6.47 million tonnes of saleable steel has been fixed for the 5 public sector integrated steel plants for the year 1982-83. This will mean 90% capacity utilisation for SAIL plants which will be the highest ever achieved so far. Monthly targets of production have been fixed plantwise and details of the infrastructural support that is necessary for achieving these production levels has been worked out. TISCO is expected to contribute 1.55 million tonnes. The mini steel plants are expected to produce about 1.8 million tonnes. Thus the total availability of steel to the economy in 1982-83 is expected to be of the order of 9.8 million tonnes.

2.8.2 An exercise for assessment of demand of different categories of the steel for the coming year has also been made. The product-mix of the plants has been designed keeping in view the demand profile. Even so, there will be surpluses in certain categories and shortages in some others. A plan for export and import has therefore been prepared. The implementation of this plan will be monitored by a committee in the Steel Department. The objective is that a situation of easy availability of iron and steel items should be maintained. This will operate as a healthy restraint on prices and will be in the interest of all steel using industries.

### *Essentials of production*

2.9.1 The production of steel calls for a large number of inputs, the most important being coking coal, iron ore, electric energy and railway movement facilities. About 1.50 tonnes of coking coal and 1.96 tonnes of iron ore go into the production of 1 tonne of ingot steel.

2.9.2 During 1981-82, the integrated steel plants had faced some difficulty due to insufficient availability of power from the public utilities and of coking coal. To bridge the gap between the requirement of coking coal and the indigenous availability, the Steel Authority of India Ltd. has been importing some quantity of high quality low ash coal. Apart from meeting the quantitative deficit, this also enables the steel plants to improve the quality of coal blends. During 1981-82, about 0.83 million tonnes of coking coal will be imported. The requirement of coking coal in 1982-83 has been assessed at 18.4 million tonnes. Between 1.2 and 1.6 million tonnes are expected to be imported and the balance will be met from domestic production.

2.9.3 The power requirement of the public sector steel plants will increase from the existing level of 500 MW to 630 MW in 1982-83. About 230 MW will be available from the captive power units of the steel plants and the remainder of 400 MW will need to be supplied by the public utilities, viz. Damodar Valley Corporation, Orissa State Electricity Board and Madhya Pradesh Electricity Board.

2.9.4 In 1981-82, the Railways are expected to carry about 24 million tonnes of raw materials, excluding coal, to the six integrated steel plants and transport about 8.6 million tonnes of finished products from the steel plants. With the increased production targets fixed for the next year, the inward freight, excluding coal, will be of the order of 27 million tonnes and the outward movement will be over 10 million tonnes. The Railway Board are taking appropriate action to handle movement of this magnitude.

### *Summing-up*

2.10.1 It is encouraging to see that despite global recession, steel production in India has been going up. As mentioned elsewhere, the year 1981-82 has been the year of recovery in the steel industry. The steel plants are now poised for achieving

higher levels of production and capacity utilisation during 1982-83. The foundation now laid for a substantial increase in installed capacity in the steel sector will, hopefully, yield fruit towards the close of the Sixth Plan. The Visakhapatnam Steel Plant has already got off to a good start by completing the foundation for its first blast furnace on schedule. Most of the equipment orders for this plant have already been placed and delivery has already commenced. Negotiations for finalising the contract for the Paradeep Steel Plant are well on the way to conclusion. Substantial progress has also been recorded in the implementation of Bhilai and Bokaro expansions. The steel sector can, therefore, look to sustained growth in the future with reasonable confidence and optimism.

### *Steel Development Fund*

The Steel Development Fund was set up in 1978 to ensure certain minimum and sustained flow of funds for the purpose of modernisation and development programmes of the Steel industry. A surcharge of Rs. 100/- per tonne on non-priority categories of steel was levied from June 1978, to be credited to the Fund. When the prices of iron and steel were revised in April 1979, the increased realisation were also required to be credited to the Steel Development Fund. The coverage of the Fund was widened for financing of capital expenditure on schemes/projects, replacements, renewals, research and development etc. and also for compensating the main steel producers for increases in cost of production. Steel prices were last revised in February, 1981 but in order to simplify operations it was decided that from 1-4-81, (a) S.D.F. should be a source of development finance only (b) no further cost escalation would be payable out of the Fund and the plants be accordingly authorised to retain a portion of the S.D.F. contribution with them towards cost escalation and (c) the total SDF contribution realisable during 1981-82 be spread over the entire saleable steel production.

The S.D.F. contributions received upto 31-12-1981 amounted to Rs. 411.44 crores (excluding Rs. 243.42 crores adjusted towards cost escalations). Out of the above, Rs. 298.90 crores has been advanced as loans (upto 31-12-81) for financing capital schemes and Rs. 44.68 crores as grants towards cost compensation and other dues.

**PART II**

## CHAPTER I

### PLANNING AND DEVELOPMENT IN THE STEEL SECTOR

1. The increase in the steel making capacity in the integrated steel plants over the five year plans has been as follows :—

(In million tonnes)

Five year Plans	Year ended	Installed capacity (steel ingots)
FIRST . . . .	31st March, 1956	1.50
SECOND . . . .	31st March, 1961	6.00
THIRD . . . .	31st March, 1966	8.90
FOURTH . . . .	31st March, 1974	8.90
*FIFTH . . . .	31st March, 1978	10.60

\*The plan was terminated one year early.

2. In the Sixth Five Year Plan period, the main emphasis has been made on quick completion of the expansion programmes, mainly of Bhilai and Bokaro Steel Plants; modernisation of existing steel plants; research and development and technological improvements for higher productivity; adequate availability of physical inputs; monitoring and augmentation of infrastructural facilities, such as power, and setting up of new steel plants at Visakhapatnam and Paradeep.

3. By implementing these development programmes, the production of finished steel, including the output of mini steel plants, is planned to be increased from 7.3 million tonnes in 1979-80 to 11.5 million tonnes in 1984-85 and 17.4 million tonnes in 1989-90. The corresponding demand for finished steel has been projected at 12.7 million tonnes by 1984-85 and 18.4 million tonnes by 1989-90.

4. In the Sixth Five Year Plan, a provision of Rs. 4000 crores have been made for the Iron and Steel sector.

Some of the important schemes under implementation/consideration during the Sixth Plan Period are :

- (i) Expansion of Bhilai and Bokaro Steel Plants to a capacity of 4.0 million ingot tonnes each;
- (ii) Further expansion of Bokaro Steel Plant to a capacity of 4.75 million ingot tonnes;
- (iii) Salem Steel Plant with an annual capacity of 32,000 tonnes of cold rolled stainless steel sheets based on imported hot bands;
- (iv) Visakhapatnam Steel Project of 3.25 million ingot tonnes' capacity, in two over lapping stages;
- (v) A second-shore based steel plant at Paradeep, with an ultimate capacity of 3.0 million tonnes of crude steel;
- (vi) Modernisation of Tata Iron & Steel Co. to increase the existing capacity of 2.0 million ingot tonnes to 2.16 million ingot tonnes;
- (vii) Provision of additional melting facilities at Alloy Steel Plant, Durgapur to increase the capacity from 100,000 tonnes to 160,000 tonnes of alloy steel ingots;
- (viii) A project to produce 37,500 tonnes per annum of cold rolled grain oriented electrical steel sheets and 36,000 tonnes per annum of cold rolled non-grain oriented steel sheets at Rourkela Steel Plant;
- (ix) Modernisation of Bhilai, Rourkela and Durgapur Steel Plants to have increased productivity with minimum investment;
- (x) A Pelletisation Plant of 3.0 million tonnes/annum at Mangalore, based on iron ore concentrate from Kudremukh Iron Ore project;
- (xi) A Direct Reduction Pilot Plant with a capacity of 10 tonnes per day, using solid reductant, i.e. non-coking coal, as an R&D Project of SAIL;
- (xii) Additional power generation capacity at Bokaro (3×60 MW), Durgapur (2×60 MW), Rourkela (2×60 MW), and Bhilai (3×60 MW);
- (xiii) A slag cement plant for production of Portland Blast Furnace Slag (PBFS) cement from Bhilai and Rourkela slag.

5. The progress of capital expenditure scheme-wise in terms of outlay for 1981-82, actual expenditure upto December, 1981 and approved outlay for 1982-83 are given in Annexure 'A'.

6. At the instance of Planning Commission, a Working Group on Iron and Steel has been recently constituted to formulate plans for the development of steel industry upto the turn of the century. The broad terms of reference are proposed to be on the following lines :

- (1) To formulate a perspective plan for the development of steel industry in the country upto the turn of the century, taking into account, among other factors, particularly the following :
  - (i) the demand and its likely pattern;
  - (ii) the need to provide infra-structural support to other sectors of economy;
  - (iii) the infra-structural support, viz. raw materials, power, transportation facilities that would be required and the financial resources necessary for implementation of the steel development plan;
  - (iv) the technological options that may be available and the strategy most suited to Indian conditions.
- (2) To suggest measures that may be adopted for development of such manufacturing, technological and managerial capabilities as may be required for implementing the development plan.



**Progress of Capital Expenditure Scheme-wise**

**ANNEXURE A**

(Rs. in crores)

Sl. No.	Plant/Unit (Scheme-wise)	Approved Outlay 1981-82	Revised Outlay 1981-82	Actuals	
				Upto Dec. 1981	Outlay 1982-83
1	2	3	4	5	6
<b>1. BHILAI STEEL PLANT</b>					
	Dalli Mechanised Mines	0.05	0.40	0.30	0.80
	2nd Sintering Plant	0.60	0.60	0.30	1.20
	4 MT Expansion Township	190.00	193.16	127.17	170.00
	Additions, Modifications and replacements	1.50	1.20	0.32	1.00
	Research & Development	15.00	8.80	2.79	15.00
	(a) Coal Dust Injection	2.80	4.00	1.41	2.50
	(b) Conversion of O.H.F.	2.00	3.50	—	2.00
	(c) Partial Briquetting	2.00	—	—	0.10
	8th Coke Oven Battery	—	0.10	0.07	0.20
	Other Capital Expenditure (Prospecting)	—	—	—	0.11
	Power Plant No. 3	0.10	0.08	0.06	5.00
		—	0.10	—	—
		214.05	211.94	132.42	197.91
<b>2. ROURKELA STEEL PLANT</b>					
	Silicon Steel Project	45.00	37.00	23.70	20.00
	Additional Napha Reforming Unit	0.65	0.70	0.45	—
	Cement Plant	8.00	0.10	—	0.10
	Captive Power Plant	5.00	1.89	0.43	17.00
	Coke Oven Battery 5B	1.50	1.60	1.29	6.00
	Diversification of Fertilizer Plant	1.00	0.05	0.01	0.10
	Modernisation of Steel Plant	0.50	0.20	—	0.10
	Major Completed Items	—	0.21	0.21	—
	Additions, Modifications and replacements	18.00	20.00	16.03	18.00
	Modernisation of HSM	—	1.46	0.34	—
	Township	1.00	1.25	0.48	1.50
		80.65	64.46	42.94	52.80

1	2	3	4	5	6
<b>3. DURGAPUR STEEL PLANT</b>					
	Captive Power Plant	35.00	19.50	8.69	17.00
	Modernisation of DSP.	1.00	0.10	—	0.10
	Additions, Modifications and Replacements	2.20	1.20	0.70	1.20
	(a) Hammer Mills	—	—	—	—
	(b) Coke Cutting Facilities	1.70	2.50	0.97	0.98
	(c) CEM Shop	1.95	1.50	0.93	0.91
	(d) Balancing facilities for Wheel & Axle Plant	1.96	1.50	0.38	1.41
	(e) 68 T Boiler	1.20	0.01	—	0.10
	(f) Additional equipment for BOM	0.60	0.60	0.65	1.00
	(g) Others	8.89	11.19	6.74	12.40
	Township	1.50	1.96	1.28	1.18
		56.00	40.06	20.34	36.28
<b>4. ALLOY STEEL PLANT</b>					
	Stage I Expansion	2.03	1.93	1.30	0.27
	Stage II Expansion	1.00	1.07	0.19	3.00
	Additions, Modifications and Replacements	3.00	1.43	0.63	2.50
	Township	0.97	0.97	0.67	1.00
		7.00	5.40	2.79	6.77
<b>5. BOKARO STEEL PLANT</b>					
	1.7 MT Stage	2.80	2.21	0.69	1.17
	4.0 MT Stage	165.00	146.61	81.21	140.00
	Slag Granulation Plant	0.14	0.50	0.12	—
	4.75 MT Stage	0.61	0.15	—	0.39
	Captive Power Plant	30.00	20.89	6.16	25.00
	Additions, Modifications & Replacements	7.00	8.05	4.31	15.00
	Meghahatuburu Iron Ore Project	15.00	10.60	6.94	20.00
	Kiniburu Expansion	0.90	0.29	0.08	0.55
	Abolition of Contract Labour in Flux Mines	1.00	—	—	—

1	2	3	4	5	6
	Roll Rehardening Shop Test Coke Oven Complex (R&D)	2.50	0.50	0.01	3.00
		0.50	0.20	—	1.00
		225.45	190.00	99.52	206.11
6.	<b>RESEARCH &amp; DEVELOPMENT CENTRE</b>				
	Laboratory complex	3.00	3.50	2.42	3.60
	Direct Reduction Process Development	2.50	2.50	1.34	0.63
	Information & Documentation Centre	—	0.40	0.01	0.50
	Demonstration Plant for Lime Dust Injection at Durgapur	—	0.10	—	1.00
	Experimental Furnace at IISCO	—	0.05	—	0.40
	R&D Works linked to BTEC Programmes	1.10	0.92	0.59	1.25
	Other Capital Expenditure	—	0.13	0.08	0.22
	Township	0.40	0.40	0.12	0.40
	<b>TOTAL</b>	7.00	8.00	4.56	8.00
7.	<b>INDIAN IRON &amp; STEEL CO. LTD.</b>				
	Plant Rehabilitation Scheme	0.30	0.48	0.45	0.61
	10th Coke Oven Battery	3.50	4.60	3.26	3.00
	Departmentalisation of Mines	0.60	0.73	0.70	0.50
	Development of Ore, Mines & Collories	1.50	0.72	0.58	1.50
	Diversification of Kulti Works	0.05	0.02	—	0.01
	Sinter Plant with Ancillaries	0.05	—	—	1.00
	Additions, Modifications & Replacements	6.00	6.61	4.48	6.00
	Township	1.00	1.10	0.37	1.50
	<b>TOTAL</b>	13.00	14.26	9.84	14.12

1	2	3	4	5	6
	<b>SAIL PLANTS &amp; UNITS</b>				
8.	SALEM STEEL PLANT.	23.00	35.00	24.45@	10.00
9.	VIZAG STEEL PROJECT	130.00	120.00	81.52	(\$)
10.	VIJAYANAGAR STEEL PROJECT	0.60	0.90	0.49	1.00
11.	CENTRAL MARKETING ORGANISATION	0.50	1.50	1.12	6.00
12.	CORPORATE OFFICE, MTI & CCSO	0.50	0.51	0.20	0.40
13.	2ND SHORE BASED STEEL PLANT	1.00	1.00	0.10	(@@)
	<b>OTHER COMPANIES</b>				
14.	IISCO STANTON	—	0.50	—	1.00
15.	VISVESVARAYA IRON & STEEL LTD.	0.30	1.70	0.30*	2.80
16.	METAL SCRAP TRADE CORPN.	0.15	0.15	0.02	(\$\$)
	<b>GRAND TOTAL</b>	759.20	695.38	420.61	543.19

@Includes Rs. 300 crores towards margin money for working Capital

\*Actual Release

§Provision has been included against Rashtriya Ispat Nigam Ltd.

@ @ Provision has been included against Neelachal Ispat Nigam.

\$\$Provision has been included separately for Metal Scrap Trade Corpn.



## CHAPTER II

### PRODUCTION AND DISTRIBUTION

#### 2.1 Overall production of Steel in 1981-82

2.1.1 The six integrated steel plants in the country were able to produce 6.319 million tonnes of ingot steel, 5.191 million tonnes of saleable steel during April to December, 1981 as compared to 5.268 million tonnes of ingot steel and 4.367 million tonnes of saleable steel during the corresponding period of 1980-81. This shows an increasing trend of production in 1981-82 as compared to the previous year representing about 20% increase in the production of ingot steel and 19% increase in respect of saleable steel respectively, despite the infra-structural constraints like restrictions on power supply, poor quality as well as inadequate availability of coking coal, transport bottlenecks etc. Keeping in view this rising trend, it is expected that the production of saleable steel from the six integrated steel plants during 1981-82 would be around 7.30 million tonnes, as compared to 6.283 million tonnes in 1980-81. The emphasis this year has been on maximising production and utilizing the capacity at the optimum level. The anticipated production of 7.30 million tonnes in case of saleable steel would mean a capacity utilisation of about 84%.

2.1.2 Production of steel in the integrated steel plants is supplemented by production in 147 mini steel plants which have a total licensed capacity of 3.3 million tonnes of ingot steel. The actual production from mini steel plants during April-December, 1981 was 1.53 million tonnes and the total production during 1981-82 is estimated at 2.82 million tonnes in terms of ingots. The total anticipated production of saleable steel in the country during 1981-82, including the production from mini-steel plants is expected to be 8.1 million tonnes.

2.1.3 Charts showing the production of ingot steel, saleable steel and saleable pig iron in the integrated steel plants during 1976-77 to 1981-82, stocks of major raw materials during the same period and stock of saleables in the public sector steel plants are at Annexures II-1 to II-9.

#### 2.2 Distribution of Steel

2.2.1 The aim of distribution policy is to ensure smooth supply of iron and steel to the consuming sectors. During the year

1981-82 there was considerable improvement in the availability of iron and steel due to increase in domestic production and liberal policy of import. As a result of this many items like billets and other re-rollable straight length rounds and wire rods in coils, CR sheets/coils, HR coils of thickness above 5 mm and skelp were taken out of the distribution procedure. There is no entitlement formula related to capacity, production, off-take etc. governing distribution of these items. In November distribution of HR coils of 5 mm thickness and below was also liberalised.

2.2.2 70 per cent of the steel produced by the main steel plants is supplied to priority sectors like, defence, irrigation, Central Electricity Authority small scale industries corporations, P&T, Railways, engineering export promotion etc. The Iron & Steel Controller and the main producers have a discretionary quota 5 per cent each. Balance quantity of available steel is distributed through stockyards to consumers covered in 'B' (Government Departments & Undertakings not covered by status 'A'), 'C' (Large and medium industries) & 'D' (all other consumers) priority groups in the ratio of 60%, 35% and 5% respectively. These customer groups have to register their demand with the Branch Sales Office of the main producers and they are supplied material on the basis of availability and their inter-se priority.

2.2.3 Compact group units like tube makers, re-rollers, wire drawing units, bright bar manufacturers etc. do not come within priority status groups; they register their demand with the Branch Sales Office and supplies are made on the basis of past off-take and capacity.

2.2.4 As a matter of policy supplies to small scale industrial units are to be channelised through the State Small Industries Corporations. However, small scale units having a quarterly off-take of not less than 200 tonnes (100 tonnes for units in Kerala, Tamil Nadu and Karnataka) can also get their supplies from the stockyard, these units are treated as Category 'C' customers. The effort of the Government has been to increase supplies through Small Industries Corporations. As against 176,000 tonnes despatched during 1977-78, despatches for 1978-79 were about 333,000 tonnes and over 4,50,000 tonnes in 1979-80. The actual supplies in 1980-81 was 4,96,000 tonnes. Against a total allocation of 5,22,000 tonnes to the Small Scale Industries Corporations from indigenous sources during 1981-82, supplies during April-Dec. 1981 were 2,48,300 tonnes and another

1,38,100 tonnes are expected to be supplied during January-March, 1982 from indigenous production.

2.2.5 Besides 40,000 tonnes of structurals and 15,200 tonnes of plates were allocated to the Corporations from Buffer Imports for the year 1981-82.

2.2.6 Pig Iron was in short supply vis-a-vis demand. To meet the deficit, duty free import of Pig Iron was allowed and buffer import of 2 lakh tonnes of pig iron is being made. The Iron & Steel Controller allocated 4,84,000 tonnes of pig iron to SSICs during 1981-82 and actual supplies during April-Dec. 1981 were 2,29,900 tonnes and 80,000 tonnes expected to be supplied during January-March 82. In addition one lakh tonnes of imported pig iron is also likely to be supplied to SSICs between January-March, 1982.

2.2.7 The Small Scale Industries Corporations receive a rebate ranging from Rs. 140/- to Rs. 200/- per tonne for steel supplied through them to cover their handling charges. The rebate is given by the producers who recoup from JPC. No rebate is given for pig iron. Corporations receive pig iron at JPC price and are required to sell it at stockyard price; the price difference of Rs. 93/- per tonne is expected to cover handling charges.

2.2.8 Iron and Steel Controller makes allocation of pig iron to Small Scale Industries Corporations, Railway sleeper manufacturers, spun pipe manufacturers, P&T etc. DGTD units having foundries obtain their requirements directly from the stockyards. Small Scale Industrial units are supplied from the State Small Industries Corporation wherever the Corporation is handling this material. The Iron & Steel Controller makes allocation on the basis of availability and past off-take.

2.2.9 Iron and steel materials are supplied by the main producers/stockyards at a uniform price throughout the country. For this purpose a freight equalisation fund is maintained by the JPC. The standard freight element for steel is Rs. 258/- per tonne and Rs. 215/- per tonne for pig iron.

2.2.10 SAIL has a network of 53 stockyards having 60 delivery points through out the country. In addition TISCO has 11 stockyards and 9 consignment agents. New stockyards are to be opened at Dharamanagar in Tripura and Dimapur in Nagaland to improve the flow of supplies to these regions. Special efforts have been made to meet the requirement of north east

2.2.11 Under the liberalised policy of distribution, builders of residential houses can now get upto 10 tonnes of steel instead of 5 tonnes on production of approved building plan and certificate from chartered engineer/architect. In addition they are also given a rebate of Rs. 50/- per tonne for the first 5 tonnes.

2.2.12 Steel requirements of engineering export units have been given top priority-Engineering exports during the year 1980-81 amounted to Rs. 900 crores for which the total supplies from the main producers was approximately 139,000 tonnes of big iron and 233,500 tonnes of steel. For the year 1981-82 the export target fixed is Rs. 1150 crores. For this a quota of 145,000 tonnes of pig iron and 330,000 tonnes of steel has been allotted from domestic production. From April to Dec., 1981 supplies made to EEPC Sector are 104,200 tonnes of pig iron and 179,400 tonnes of steel. It is expected that the producers will be able to supply a substantial portion of the balance quantity of iron and steel during remaining three months i.e. January to March, 1982.

2.2.13 Distribution of the products of mini-steel plants re-rollers and secondary producers is done by the producers themselves. Similarly alloy steel products are distributed by the producers through their sales network.

### 2.3 Pricing

2.3.1 Pricing policy in respect of iron and steel is kept under constant review and changes are made whenever required. While revising the prices the following main aspects apart from other relevant facts are taken into consideration:

1. Escalations in cost of production;
2. Fair return to producers;
3. Incidence of freight burden on account of increase in railway tariff lead distance over a period of time; and
4. Resources for modernisation, development and rehabilitation of the steel industry to lessen its dependence on budgetary support.

2.3.2 During the year 1981-82, the prices were revised only once as after revising the prices in February, it was decided that against the unexecuted contracts not covered under the price protection schemes of 1978, 1979 and 1981 and subsequent contracts, supplies of steel will be made at international prices after 9-2-81. In order to implement this scheme the Joint Plant Com-

mittee had increased the JPC prices of steel by Rs. 75/- per tonne with effect from mid-night of 31st July/1st August, 1981.

#### 2.4 Imports/Exports

2.4.1 The aim of import policy has been to allow easy import of scarce raw material required by genuine industrial users while ensuring that the imports are not excessive to the detriment of indigenous production. The year 1981-82 started with a legacy of shortages and consequently the import policy was further liberalised to meet domestic requirements. Carbon steel items like bars, rods and billets IS 2830/2831 were allowed to be imported by all persons under OGL; other items like H.R. coils in specific size range, CR sheets of DD/EDD quality and wire rods were importable by the actual users (industrial) under OGL. With the improvement in domestic production during the first six months of the year, availability of most items had improved considerably necessitating change in the import policy. In November-December, sheets in deep drawing and extra deep drawing quality, billets, bars and rods including wire rods, squares, hexagons, HR coils etc. were taken out of OGL and put in the canalised list. The procedure for direct allotment of the canalised items by the canalising agency did not undergo a change during the year. The canalising agency continued to enjoy the facilities for import of canalised items under the OGL; the flexibility arrangement within the policy to facilitate import of even banned items subject to fulfilment of policy conditions, prevailed.

2.4.2 SAIL continued to be a canalising agency for the canalised items of prime steel. Stainless steel plates, sheets, strips and coils continued to be canalised through MMTC. MSTC continued to be the canalising agency for import of steel melting scrap as well as old ships for breaking.

2.4.3 The import plan for the year 1981-82 envisaged import of about 1.4 million tonnes of steel by SAIL. Of this, the buffer content was originally 1.04 million tonnes reduced to 0.95 million tonnes subsequently. The plan for back to back import was only indicative, the magnitude of import depended upon the indenting by the actual users. The buffer import programme during 1981-82 covered only two items, viz., structural and plates in carbon steel grades. These imports were exempted from customs, auxiliary and additional duties.

2.4.4 To meet the shortages of pig iron, import of 2 lakh tonnes with duty exemption has been allowed under the buffer

import programme. Buffer imported materials are supplied to the consumers at the same price as for indigenous materials. Subsequently pig iron was exempted from payment of import duty. With this, casting units and other users of pig iron can maximise their production using even imported pig iron.

2.4.5 During April-November, 1981, SAIL imported (shipment from abroad) 4,38,716 tonnes of steel valued at Rs. 160.04 crores under the back to back arrangement and 3,52,892 tonnes of steel valued at Rs. 104.92 crores under the buffer programme making a total of 7,91,608 tonnes valued at Rs. 264.96 crores. The imports were mainly flat products, semis, structurals, bars and rods. The ordering during April-November, 1981 by SAIL has been for import of 683,316 tonnes of iron and steel valued at Rs. 227.45 crores.

2.4.6 Export of iron and steel is canalised through SAIL. Ferrous scrap export is canalised through MSTC. During the year 1981-82, exports have been negligible.

#### IMPORT OF IRON AND STEEL\*

(Quantity in tonnes and value in Rs. '000)

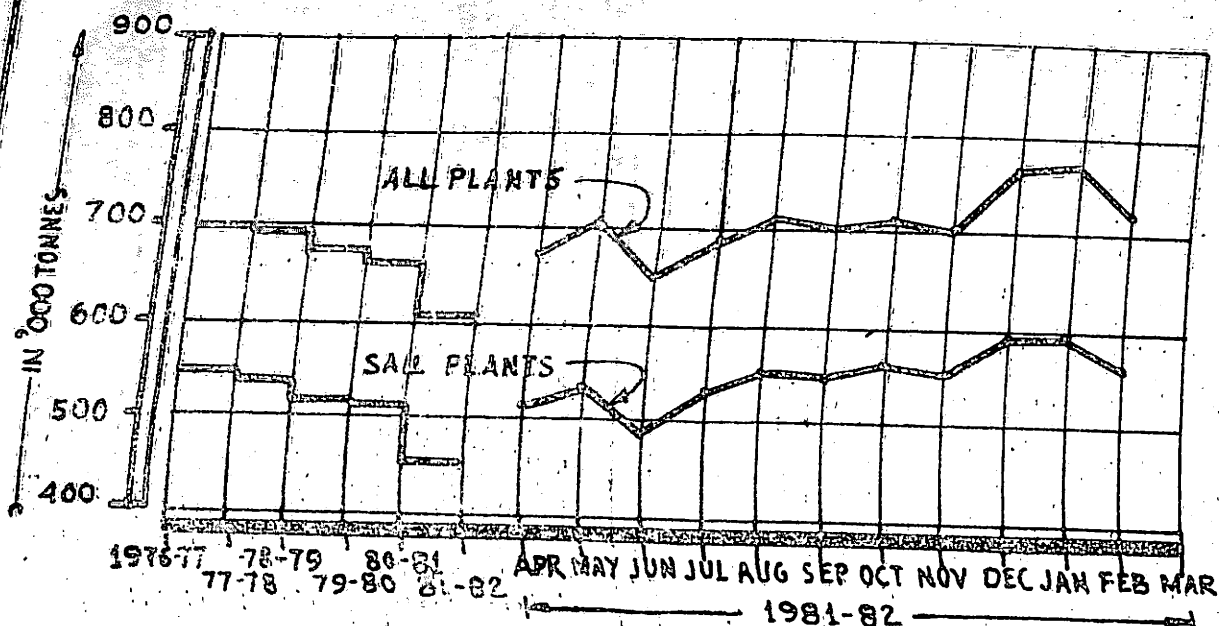
Category	1979-80	1978-79	1977-78
	Quantity		
1. Pig iron, Sponge iron etc.	1422	879	1054
2. Ferro alloys	4497	5172	1060
3. Carbon Steel	1699193	795369	321936
4. High Carbon Steel	188620	90037	47998
4. Alloy Steel	458681	164968	38378
6. Rails and Rly. material	155474	4947	7118
7. Iron & Steel Scrap	147355	206476	56342
TOTAL	2655242	1267848	494071
	Value		
1. Pig iron, Sponge iron etc.	6070	4666	5203
2. Ferro alloys	120591	60930	22394
3. Carbon Steel	4048538	2386286	1097321
4. High Carbon Steel	804007	357344	194492
5. Alloy Steel	2133399	796536	459430
6. Rails and Rly. material	209676	35348	56536
7. Iron and Steel Scrap	289776	237875	120705
TOTAL	7612059	3878985	1956081

\*Irons appropriate to the Department.

Source : DGCIS.

# PRODUCTION OF INGOT STEEL

CHART-II-1



# PRODUCTION OF SALEABLE STEEL

CHART-II-2

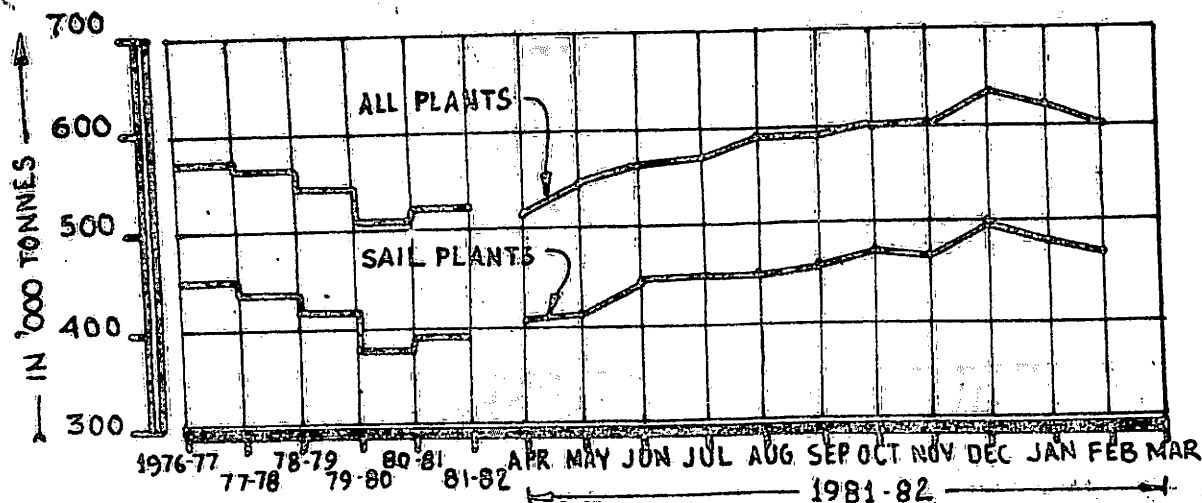


CHART - II - 3

# PRODUCTION OF SALEABLE PIG IRON

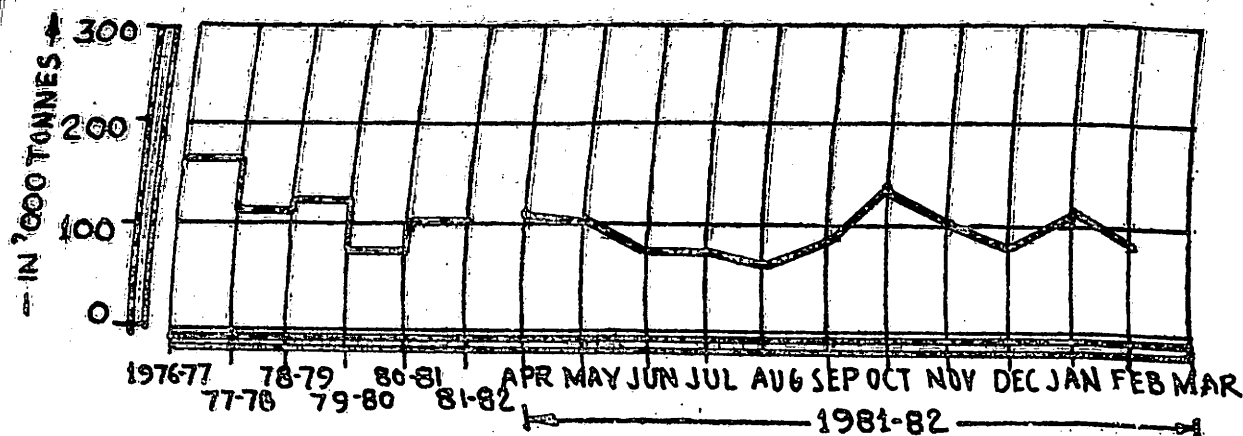


CHART - II - 4

# STOCK OF INGOT STEEL

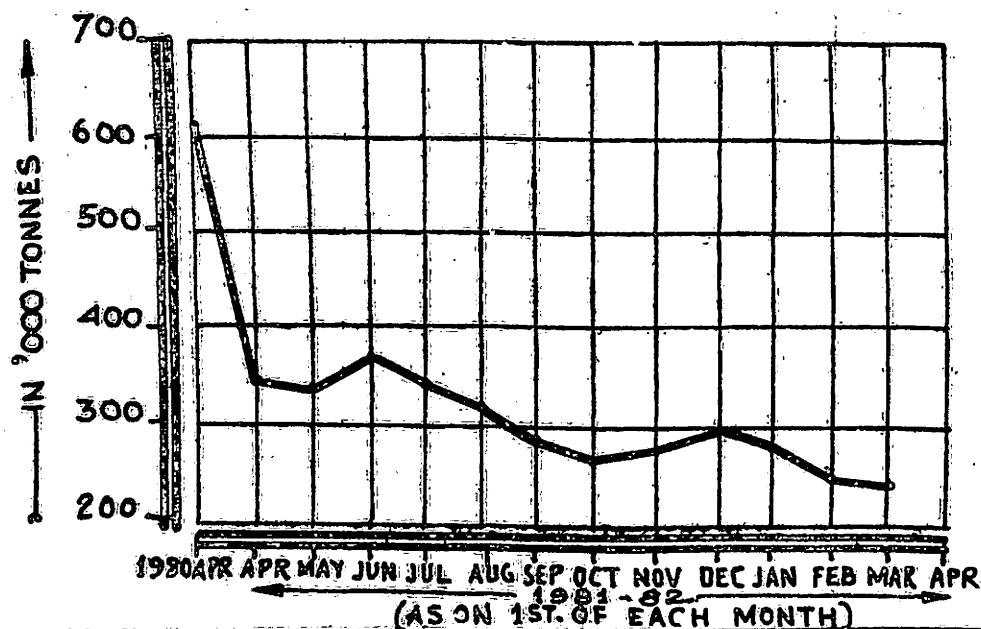




CHART-II-5

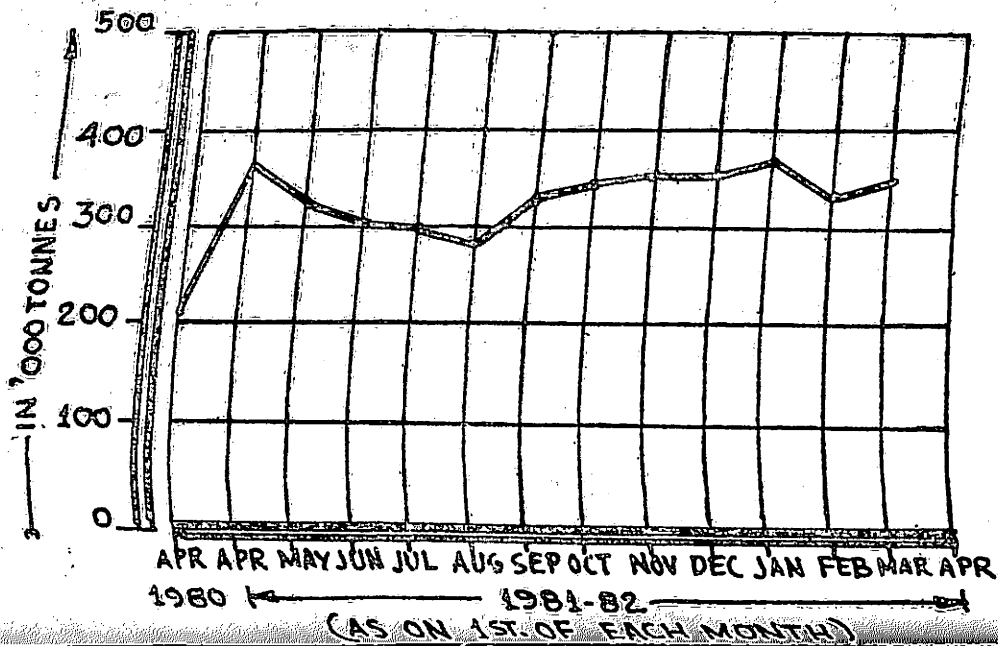
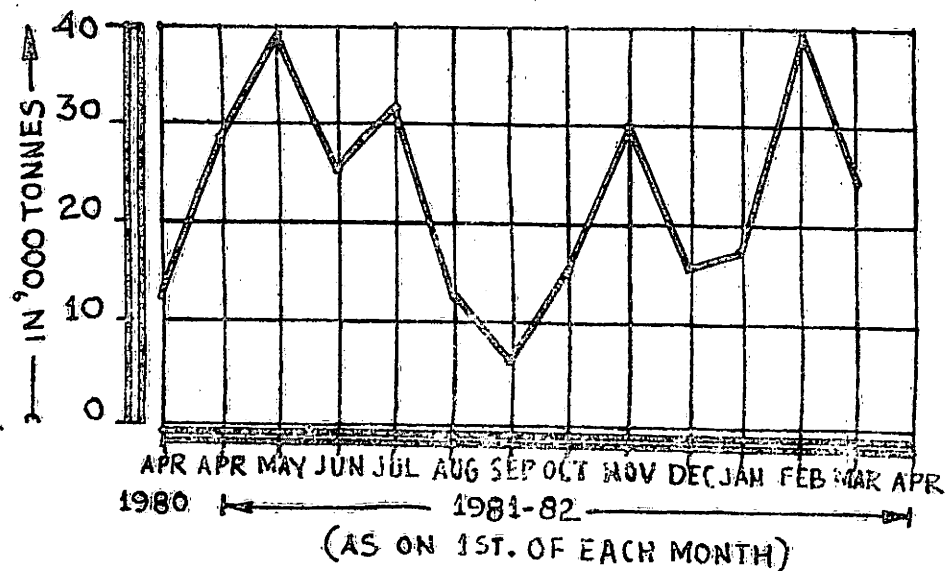
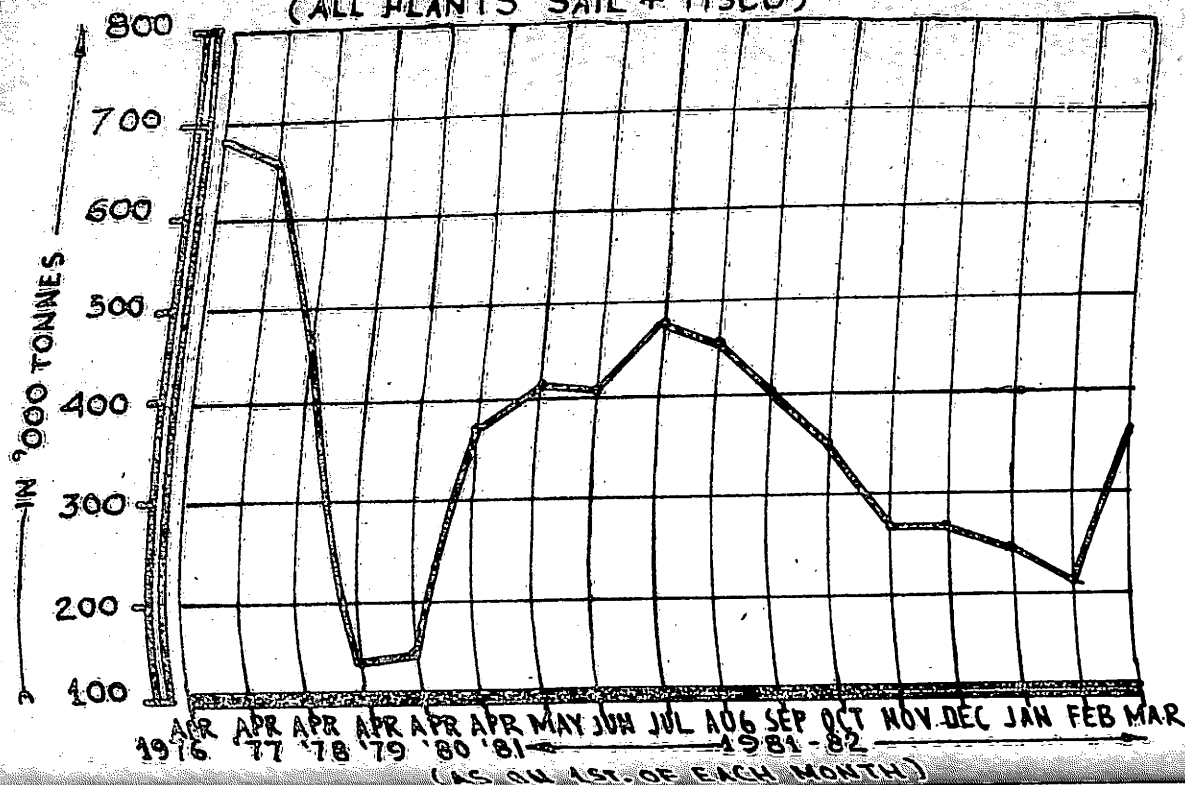
STOCK OF SALEABLE STEEL

CHART-II-6

STOCK OF SALEABLE PIG IRON

# **STOCK OF COKING COAL INDIGENOUS** (ALL PLANTS SAIL + TISCO)

CHART-II-7



# **STOCK OF IRON ORE (B.F.)**

CHART-II 8

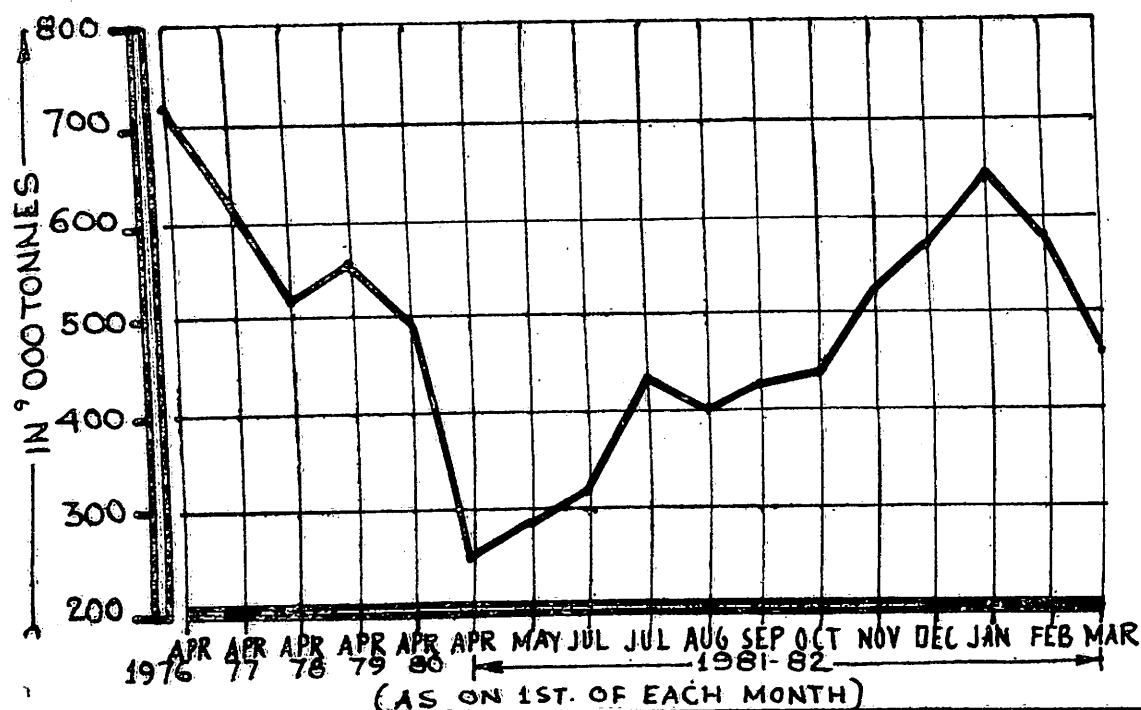
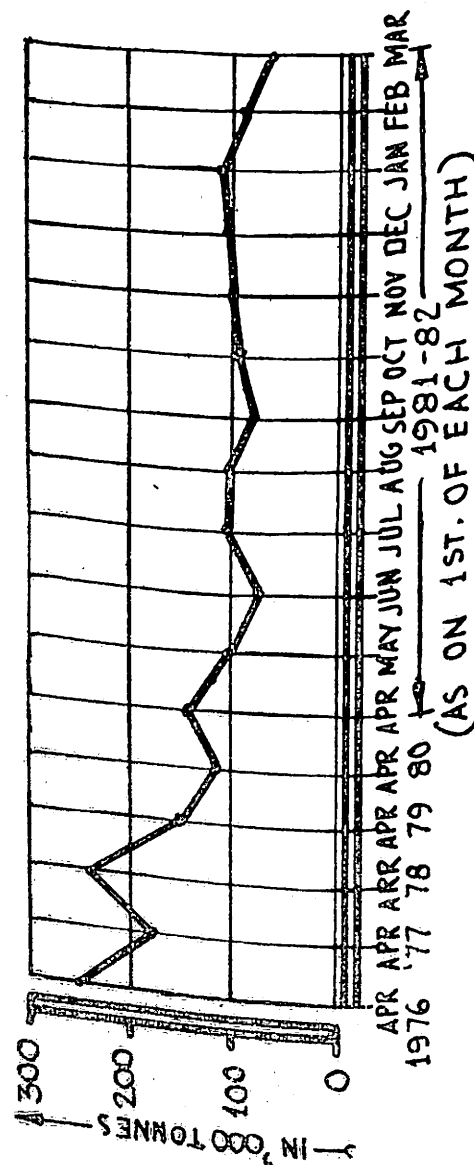


CHART - II - 9

**STOCK OF LIMESTONE (B.F.)**

### CHAPTER III

#### THE PUBLIC SECTOR

##### 3.1 STEEL AUTHORITY OF INDIA LIMITED

3.1.1 In the steel sector, Steel Authority of India Ltd. (SAIL) is the premier industrial enterprise. It is a fully owned company of the Government of India. The company is responsible for the management of 5 public sector integrated steel plants located at Bhilai, Rourkela, Durgapur, Bokaro and Burnpur. At present the annual rated capacity of these plants is 9.4 million tonnes of ingot steel and is expected to be stepped up to 12.4 million tonnes by 1984-85. Besides these plants, SAIL has two alloy steel plants at Durgapur and Salem. Durgapur Alloy Steels Plant has an annual capacity of 1 lakh tonnes while the corresponding capacity for Salem is 32,000 tonnes of stainless steel. Development in iron and steel technology being a continuous process, SAIL has developed comprehensive research and development facilities at its Research and Development Centre, Ranchi.

##### 3.2 FINANCE

3.2.1 The authorised capital of the Company was raised from Rs. 3,000 crores to Rs. 4,000 crores during 1981-82. The paid up share capital of the Company as on 31st March, 1981 was Rs. 2733.25 crores, excluding share money of Rs. 68.46 crores pending allotment, as against Rs. 2434.13 crores (excluding Rs. 56.62 crores pending allotment) on the 31st March, 1980.

3.2.2 In 1980-81, SAIL secured a loan of Rs. 298.98 crores from the Government. The total Government borrowing as on 31st March, 1981 was Rs. 1017.51 crores, as against Rs. 718.53 crores on the 31st March, 1980. In addition, the Company also received a loan of Rs. 2 crores from the Steel Development Fund. The total borrowings from the Steel Development Fund as on 31st March, 1981 were Rs. 160 crores. An amount of Rs. 1.50 crores was paid by the Government as grant in aid in 1980-81 for research and development schemes.

3.2.3 The Company's investment position on the 31st March, 1981 was as under:—

Subsidiaries	Rs. in crores
(i) Indian Iron & Steel Company Ltd.	71.28



(ii) Metal Scrap Trade Corporation Ltd. 0.38

**Other Companies**

(i) Visvesvaraya Iron & Steel Ltd. 15.78

(ii) Indian Potash Limited 0.02

(iii) Belphar Refractories Ltd. 1.12

(iv) Almora Magnesite Ltd. 0.28

3.2.4 The gross turnover of the Company during the year 1980-81 was Rs. 2,005.72 crores, the comparable figure for 1979-80 being Rs. 1,873.79 crores. The gross profit before providing for interest on fixed loans (chargeable to revenue) and investment allowance reserves was Rs. 61.19 crores, as against Rs. 82.52 crores in the previous year. The net profit of the Company amounted to Rs. 1.01 crores in 1980-81; the net profit in 1979-80 was Rs. 8.35 crores. The working results of the units of the Company in 1980-81 are shown below:

	Rs. in crores
(1) Bhilai Steel Plant	(+) 17.84
(2) Durgapur Steel Plant	(-) 8.44
(3) Rourkela Steel Plant (including Fertilizer Plant)	(+) 13.97
(4) Bokaro Steel Plant	(-) 17.30
(5) Alloy Steels Plant	(-) 4.51
(6) Central Coal Washeries Organisation	(+) 1.27
(7) Provision for Contingencies etc.	(-) 1.82
Net	(+) 1.01

3.2.5 In the first 9 months of 1981-82, SAIL could earn a net profit of Rs. 15 crores.

**3.2.6 Public Deposit Scheme**

With a view to mobilising additional resources, Steel Authority of India Limited, with the permission of the Government, started accepting from July 1, 1980 deposits from the public under the Companies (Acceptance of Deposits) Rules, 1975, under the following two schemes:

- Fixed deposits for one-year, two years and three years.
- Cumulative deposits for three years.

The net amount received under these schemes upto 31st March, 1981 was Rs. 10.90 crores. The total deposits amounted to over Rs. 21 crores at the end of December, 1981.

**3.3 Production Performance**

3.3.1 The table below indicates the capacity and actual production of the various units of the Company (including IISCO) in 1980-81 and 1981-82:—

(Unit '000 tonnes)

Plants	Rated Capacity	Actual 1980-81	1981-82 Annual Plan (Revised)	Actual April-Dec. 81
<b>Ingot Steel</b>				
BSP	2500	2041	2414	1555
DSP	1600	741	1142	698
RSP	1800	1165	1646	887
BSL	2500	923	2050	1291
IISCO	1000	609	758	445
<b>TOTAL</b>	<b>9400</b>	<b>5479</b>	<b>8010</b>	<b>4876</b>
<b>SALEABLE STEEL</b>				
BSP	1965	1818	1965	1310
DSP	1239	598	910	576
RSP	1225	985	1225	788
BSL	1971	844	1600	1074
IISCO	800	523	600	362
<b>TOTAL</b>	<b>7200</b>	<b>4746</b>	<b>6300</b>	<b>4034*</b>
<b>SALEABLE PIG IRON</b>				
BSP	—	430	680	360
DSP	—	102	188	63
RSP	—	12	10	55
BSL	—	730	600	340
IISCO	—	64	82	40
<b>TOTAL</b>	<b>—</b>	<b>1338</b>	<b>1560</b>	<b>858</b>
<b>ASP</b>				
Ingots	100	70	110	66
Saleable Steel	60	42	61	37
<b>RFP</b>				
CAN	459	143	300	188

\*Excluding transfer of slabs/HR Coils from BSL to RSP.

- (ii) Promotion of rehabilitation of victims of accidents and occupational hazards through provision of artificial limbs, retaining and offering alternative employment.

The plant level safety campaigns and annual competitions conducted under the auspices of the Standing Committee on Safety have been of great help in improving the safety conscious among the steel workers. The steel plants provide safety appliances free of charge to workers and they are required to wear these appliances while on duty. Each steel plant has a safety engineering department for providing safety training for workers, arranging safety seminars and safety competitions, accident investigations and follow-up measures etc. Joint Safety Committees have been constituted in different departments which also have representatives of workmen as members. The comparative position of accidents in steel plants during 1980 and 1981 is given below:—

Details	1980	1981
No. of reportable accidents	1,556	1,652
No. of fatal accidents	11	22

#### 3.4.4 Workers' Participation in Management

The Steel Plants have established joint machineries at the plant and shop levels to secure closer association of employees in decision-making on matters of mutual concern such as, improvement in production and productivity, welfare, safety, etc. These participative forums help to create the proper climate for peaceful industrial relations as well as production in the steel plants. By and large, the workers' participative forums have been working smoothly as a large number of recommendations have been processed through these forums at different levels and unanimous recommendations are generally accepted by the management.

### 3.5 CAPITAL SCHEMES

#### 3.5.1 Growth Strategy

The expansion programme envisages a major step-up in the capacities which would fructify towards the later part of the Sixth Plan period and in the Seventh Plan. In arriving at the relative investment priorities greater stress had been laid on completion of continuing schemes as also on modernisation and rationalisation programmes.

#### 3.5.2 Progress of Commissioning of Units

At Bokaro under the 4 MT expansion programme, the 5th battery of coke ovens and the fourth Blast Furnace were com-

missioned in 1981. The tar distillation plant at Bokaro and the Second Naphtha Reforming Unit of 180-tonne capacity per day at Rourkela were commissioned. The modernisation of Hot Slabbing Mill was also completed. At Bhilai, the Second Sintering Machine of the Second Sinter Plant was commissioned. The second Alloy Steels Plant in the public sector at Salem was commissioned on the 13th September, 1981 and stainless steel coils rolled in the plant are already moving into the domestic market. At Alloy Steels Plant, Durgapur, trial production from furnace No. 8 under Stage I expansion was started in September, 1981.

#### 3.5.3 Bokaro Steel Plant

##### 4 Million tonne Expansion of Bokaro Steel Plant

4 million tonne expansion of Bokaro Steel Plant at an estimated cost of Rs. 1296 crores is under implementation. Against a revised provision of Rs. 146.61 crores for 1981-82, the actual expenditure during April-December, 1981 was Rs. 81.21 crores.

##### (i) Progress of Construction

S. No.	Item	Total Qty.	Progress up to 31-3-81	Annual Plan	Performance during April-Dec. 81
1.	Concrete (M <sup>3</sup> )	1118010	828777	156973	T 152610 A 104560
2.	Str. Er. (t)	166022	108175	25165	T 21597 A 11354
3.	Ref. Er. (t)	149850	108441	26485	T 11247 A 6884
4.	Eqpt. Er. (t)	214902	105023	46355	T 23634 A 14359

- (ii) Promotion of rehabilitation of victims of accidents and occupational hazards through provision of artificial limbs, retaining and offering alternative employment.

The plant level safety campaigns and annual competitions conducted under the auspices of the Standing Committee on Safety have been of great help in improving the safety conscious among the steel workers. The steel plants provide safety appliances free of charge to workers and they are required to wear these appliances while on duty. Each steel plant has a safety engineering department for providing safety training for workers, arranging safety seminars and safety competitions, accident investigations and follow-up measures etc. Joint Safety Committees have been constituted in different departments which also have representatives of workmen as members. The comparative position of accidents in steel plants during 1980 and 1981 is given below :—

Details	1980	1981
No. of reportable accidents	1,556	1,652
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### 3.5 CAPITAL SCHEMES

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#### 3.5.2 Progress of Commissioning of Units

At Bokaro under the 4 MT expansion programme, the 5th battery of coke ovens and the fourth Blast Furnace were com-

missioned in 1981. The tar distillation plant at Bokaro and the Second Naphtha Reforming Unit of 180-tonne capacity per day at Rourkela were commissioned. The modernisation of Hot Slabbing Mill was also completed. At Bhilai, the Second Sintering Machine of the Second Sinter Plant was commissioned. The second Alloy Steels Plant in the public sector at Salem was commissioned on the 13th September, 1981 and stainless steel coils rolled in the plant are already moving into the domestic market. At Alloy Steels Plant, Durgapur, trial production from furnace No. 8 under Stage I expansion was started in September, 1981.

#### 3.5.3 Bokaro Steel Plant

##### 4 Million tonne Expansion of Bokaro Steel Plant

4 million tonne expansion of Bokaro Steel Plant at an estimated cost of Rs. 1296 crores is under implementation. Against a revised provision of Rs. 146.61 crores for 1981-82, the actual expenditure during April-December, 1981 was Rs. 81.21 crores.

##### (i) Progress of Construction

S. No.	Item	Total Qty.	Progress up to 31-3-81	Annual Plan	Performance during April-Dec. 81
1.	Concrete (M <sup>3</sup> )	1118010	828777	156973	T 152610 A 104560
2.	Str. Er. (t)	166022	108175	25165	T 21597 A 11354
3.	Ref. Er. (t)	149850	108441	26485	T 11247 A 6884
4.	Eqpt. Er. (t)	214902	105023	46355	T 23634 A 14359

## (ii) Commissioning Schedule

S. No.	Major Unit	Approved Schedule	Likely commissioning date
1.	Raw Material Handling System	September 1978	June 1982
2.	Sinter Band-3 complex	September 1978	February 1982
3.	Coke Oven Battery	May 1978	July 1982
4.	Coke Oven Battery No. 7	December 1978	November 1982
5.	Blast Furnace—5	December 1978	July 1983
6.	SMS—II	June 1979	March 1983
7.	CRM Complex	December 1982	June 1984

## (iii) Reasons for slippages

- (a) Slippages in the supply of critical items of equipment, both by indigenous as well as foreign suppliers.
- (b) Inadequate and non-sequential supply of structurals by HSCL.
- (c) Inadequate mobilisation of resources by the contracting agencies.

## 3.5.4. Captive Power Plant

## (i) Progress of Construction

Sl. No.	Item	Total Quantity	Progress upto 31-3-81	Annual Plan	Performance during April-Dec. 1981
1.	Excavation (M <sup>3</sup> )	450000	231250	218750	T 176300
2.	Concrete (M <sup>3</sup> )	47350	15179	30226	A 94450
3.	Str. Er. (t)	4751	78	4735	T 19430
4.	Eqpt. Er. (t)	16885	1	2682.5	A 10851
					T 3315
					A 1009.5
					T 1181.60
					A 177.5

## (ii) Commissioning Schedule

Unit	Contractual	Likely
Unit—I	December 1982	May 1983
Unit—II	June 1983	September 1983
Unit—III	December 1983	March 1984

## (iii) Reasons for slippages

- (a) Delay in supply of equipment for Unit I by M/s Elektrim of Poland.
- (b) Progress of structural fabrication and erection work is unsatisfactory because of inadequate mobilisation of resources by M/s Desein.
- (c) Inadequate mobilisation of resources by HSCL for civil & structural work.

## 3.5.5 Bhilai Steel Plant

## 4 MT Expansion

## (i) Progress of Construction

S. No.	Item	Total Quantity	Progress upto 31-3-81	Annual Plan	Performance during April-Dec. 1981
1.	Concrete (M <sup>3</sup> )	1384301	1056098	322810	T 218810
2.	Str. Er. (t)	133041	77065	35184	A 200730
3.	Eqpt. Er. (t)	176134	39071	92955	T 27555
					A 11668
					T 69986
					A 28780

## (ii) Commissioning Schedule

S. No.	Unit	Target date	Likely commissioning date
1	2	3	4
1.	Convertor Shop	March 1981	August 1982
	LD I & II	March 1981	June 1983
	LD III	September, 1981	October 1982—
2.	Continuous Casting Shop		June 1983

- (ii) Promotion of rehabilitation of victims of accidents and occupational hazards through provision of artificial limbs, retaining and offering alternative employment.

The plant level safety campaigns and annual competitions conducted under the auspices of the Standing Committee on Safety have been of great help in improving the safety conscious among the steel workers. The steel plants provide safety appliances free of charge to workers and they are required to wear these appliances while on duty. Each steel plant has a safety engineering department for providing safety training for workers, arranging safety seminars and safety competitions, accident investigations and follow-up measures etc. Joint Safety Committees have been constituted in different departments which also have representatives of workmen as members. The comparative position of accidents in steel plants during 1980 and 1981 is given below :—

Details	1980	1981
No. of reportable accidents		
No. of fatal accidents	1,556	1,652
	11	22

#### 3.4.4 Workers' Participation in Management

The Steel Plants have established joint machineries at the plant and shop levels to secure closer association of employees in decision-making on matters of mutual concern such as, improvement in production and productivity, welfare, safety, etc. These participative forums help to create the proper climate for peaceful industrial relations as well as production in the steel plants. By and large, the workers' participative forums have been working smoothly as a large number of recommendations have been processed through these forums at different levels and unanimous recommendations are generally accepted by the management.

### 3.5 CAPITAL SCHEMES

#### 3.5.1 Growth Strategy

The expansion programme envisages a major step-up in the capacities which would fructify towards the later part of the Sixth Plan period and in the Seventh Plan. In arriving at the relative investment priorities greater stress had been laid on completion of continuing schemes as also on modernisation and rationalisation programmes.

#### 3.5.2 Progress of Commissioning of Units

At Bokaro under the 4 MT expansion programme, the 5th battery of coke ovens and the fourth Blast Furnace were com-

missioned in 1981. The tar distillation plant at Bokaro and the Second Naphtha Reforming Unit of 180-tonne capacity per day at Rourkela were commissioned. The modernisation of Hot Slabbing Mill was also completed. At Bhilai, the Second Sintering Machine of the Second Sinter Plant was commissioned. The second Alloy Steels Plant in the public sector at Salem was commissioned on the 13th September, 1981 and stainless steel coils rolled in the plant are already moving into the domestic market. At Alloy Steels Plant, Durgapur, trial production from furnace No. 8 under Stage I expansion was started in September, 1981.

#### 3.5.3 Bokaro Steel Plant

##### 4 Million tonne Expansion of Bokaro Steel Plant

4 million tonne expansion of Bokaro Steel Plant at an estimated cost of Rs. 1296 crores is under implementation. Against a revised provision of Rs. 146.61 crores for 1981-82, the actual expenditure during April-December, 1981 was Rs. 81.21 crores.

##### (i) Progress of Construction

S. No.	Item	Total Qty.	Progress up to 31-3-81	Annual Plan	Performance during April-Dec. 81
1.	Concrete (M <sup>3</sup> )	1118010	828777	156973	T 152610 A 104560
2.	Str. Er. (t)	166022	108175	25165	T 21597 A 11354
3.	Ref. Er. (t)	149850	108441	26485	T 11247 A 6884
4.	Eqpt. Er. (t)	214902	105023	46355	T 23634 A 14359

## (ii) Commissioning Schedule

S. No.	Major Unit	Approved Schedule	Likely commissioning date
1.	Raw Material Handling System	September 1978	June 1982
2.	Sinter Band-3 complex	September 1978	February 1982
3.	Coke Oven Battery	May 1978	July 1982
4.	Coke Oven Battery No. 7	December 1978	November 1982
5.	Blast Furnace—5	December 1978	July 1983
6.	SMS—II	June 1979	March 1983
7.	CRM Complex	December 1982	June 1984

## (iii) Reasons for slippages

- (a) Slippages in the supply of critical items of equipment, both by indigenous as well as foreign suppliers.
- (b) Inadequate and non-sequential supply of structurals by HSCL.
- (c) Inadequate mobilisation of resources by the contracting agencies.

## 3.5.4. Captive Power Plant

## (i) Progress of Construction

Sl. No.	Item	Total Quantity	Progress upto 31-3-81	Annual Plan	Performance during April-Dec. 1981
1.	Excavation (M <sup>3</sup> )	450000	231250	218750	T 176300 A 94450
2.	Concrete (M <sup>3</sup> )	47350	15179	30226	T 19430 A 10851
3.	Str. Er. (t)	4751	78	4735	T 3315 A 1009.5
4.	Egpt. Er. (t)	16885	1	2682.5	T 1181.60 A 177.5

## (ii) Commissioning Schedule

Unit	Contractual	Likely
Unit—I	December 1982	May 1983
Unit—II	June 1983	September 1983
Unit—III	December 1983	March 1984

## (iii) Reasons for slippages

- (a) Delay in supply of equipment for Unit I by M/s Elektrim of Poland.
- (b) Progress of structural fabrication and erection work is unsatisfactory because of inadequate mobilisation of resources by M/s Desein.
- (c) Inadequate mobilisation of resources by HSCL for civil & structural work.

## 3.5.5 Bhilai Steel Plant

## 4 MT Expansion

## (i) Progress of Construction

S. No.	Item	Total Quantity	Progress upto 31-3-81	Annual Plan	Performance during April-Dec. 1981
1.	Concrete (M <sup>3</sup> )	1384301	1056098	322810	T 218810 A 200730
2.	Str. Er. (t)	133041	77065	35184	T 27555 A 11668
3.	Egpt. Er. (t)	176134	39071	92955	T 69986 A 28780

## (ii) Commissioning Schedule

S. No.	Unit	Target date	Likely commissioning date
1	2	3	4
1.	Converter Shop LD I & II LD III	March 1981 March 1981 September, 1981	August 1982 June 1983 October 1982— June 1983
2.	Continuous Casting Shop		

1	2	3	4
3. Plate Mill Area—I		June 1981	June 1982
4. Plate Mill Area—II		August 1981	October 1982
5. Plate Mill Area—III		December 1981	December 1983
6. Oxygen Plant I & II		March 1981	June 1982— June 1983
7. Power Plant		March 1981	March 1982— August 1982
8. Blast Furnace No. 7 and CO Battery No. 9 complex		June 1983	December 1983

### (iii) Reasons for slippages

- Inadequate resources with HSCL for civil works, structural and equipment erection.
- Considerable rectification work had to be done on equipment supplied by HEC and USSR.
- Shortage of cement-allocations have been 70% of requirement. Situation expected to improve during IVth quarter of 1981-82.
- Delay in supply of equipment by USSR, HEC, BHEL, NGEF.

### 3.5.6 Rourkela Steel Plant Silicon Steel Project

The Silicon Steel Project at an estimated cost of Rs. 150.10 crores is under implementation. It is expected to produce 37,500 tonnes of cold rolled grain-oriented sheets and 36,000 tonnes of cold rolled non-grain-oriented sheets.

#### (i) Progress of Construction

S. No.	Item	Total Quantity	Progress upto 31-3-81	Annual Plan	Performance during April—December 81
1.	Concrete (M <sup>3</sup> )	108660	40160	63500	T 68550
2.	Str. Fab. (t)	11611	9207	2305	A 44195 T 2558
3.	Str. Er. (t)	11611	7616	3995	A 1897 T 3802
4.	Eqpt. Supply (t)	15000	5340	9000	A 2710 6130

### (ii) Commissioning Schedule

The scheme is expected to be completed by September 1982/ March 1983.

### (iii) Reasons for slippages

- Civil work is behind schedule due to delay in finalisation of data and drawing by EPI.
- Delay in supply and erection of critical items of structures by BBJ & HSCL.
- Delay in supply of equipment by MECON, EPI, Jessops have also retarded the progress of work.

3.5.7 The scheme for utilising the in-built potential capacity of synthesis loops and raising the capacity of Ammonia from 463 to 650 tonnes/day sanctioned at an estimated cost of Rs. 3.81 crores has been completed during the current financial year. The work on the second captive power plant at Rourkela with two units of 60 MW sanctioned at an estimated cost of Rs. 79.92 crores and due for commissioning in January/June 1985 has started.

### Durgapur Steel Plant

#### 3.5.8 Captive Power Plant

##### (i) Progress of Construction

Sl. No.	Item	Total Qty.	Progress upto 31-3-81	Annual Plan	Performance during April—December 1981
1.	Excavation (M <sup>3</sup> )	2690000	494200	1810000	T 362700 A 93460
2.	Concrete (M <sup>3</sup> )	34050	2385	19000	T 19985 A 4123
3.	Str. Fab. (t)	9200	466	5400	T 6200 A 1009
4.	Str. Er. (t)	9200	nil	3950	T 3850 A 70
5.	Eqpt. Er. (t)	13400	nil	1200	T 900 nil



### (ii) Commissioning Schedule

The installation of 2x60 MW captive power plant sanctioned for Durgapur Steel Plant and Alloy Steels Plant is being pursued. The first unit is expected to be commissioned in April 1983 and the second unit in September, 1983. The revised estimate of Rs. 80.68 crores is awaiting approval of the Government.

### (iii) Reasons for slippages

- (a) Equipment supply by M/s. Elektrim will be further delayed due to emergency conditions in Poland. Even as per the commissioning schedule submitted by M/s. Elektrim in December 1981, the equipment supply for Unit-I will be completed only by September 1982.

- (b) Inadequate mobilisation of resources by HSCL for civil and structural works.

3.5.9 A number of urgent schemes for addition, modification, replacement and provision of balancing facilities are under implementation. For instance, the scheme for providing balancing facilities in the Wheel and Axle Plant of Durgapur Steel Plant is nearing completion which is likely to increase the capacity of the plant to 50,000 wheel sets. The replacement of two hammer mills by high speed reversible hammers in the coke ovens on which work had been undertaken will be completed this year. The rebuilding of coke oven battery No. 2 at an estimated cost of Rs. 9.67 crores has been completed during the current financial year.

### 3.5.10 Alloy Steels Plant, Durgapur

The plant has an installed capacity of 100,000 tonnes of steel ingots corresponding to 60,000 tonnes of saleable steel consisting of high speed steel, alloy tool and die steel, carbon tool steel, alloy construction steel, case hardening steel, ball bearing steel and stainless steel. In order to increase the production capacity of the plant (Stage I expansion) a 50 tonne electric arc furnace has been set up at a cost of Rs. 10 crores. Trial runs on operation of the furnace has already been made and the furnace is expected to be commissioned shortly. With the installation of this furnace, the capacity of the plant will be enhanced to 160,000 tonnes per annum.

3.5.11 In order to improve the quality of steel as well as to further expand the production capacity, a modernisation-cum-

technological up-dating of the plant was approved (Stage II expansion) at an estimated cost of Rs. 65.98 crores. With the implementation of this scheme, the steel making capacity of the plant will be further increased to 260,000 tonnes of liquid steel (equivalent to 204,000 tonne of steel ingots).

A part of stainless steel slabs produced in the plant will be hot rolled in Bokaro Steel Plant and supplied to Salem Steel Plant for cold rolling into cold rolled stainless steel sheets. This scheme is scheduled for commissioning in January, 1985.

### 3.5.12 Salem Steel Plant

The first stage of the plant to produce 32,000 tonnes of cold rolled stainless steel sheets and coils from imported hot bands was commissioned on the 13th September, 1981. The production is gradually picking up. During the month of January, 1982 it produced 645 tonnes of stainless steels as against 505 tonnes in December, '81. The target of production for the year 1982-83 is 11,000 tonnes. The Skin Pass Mill is likely to be commissioned by the April, '82 and the other lines by June, 1982. The expansion of steel rolling capacity as well as setting up of Iron & Steel making capacity is under consideration.

## 3.6 RESEARCH & DEVELOPMENT

### 3.6.1 R&D Centre at Ranchi

The activities in the R&D Centre at Ranchi have been substantially geared up. The expenditure on R&D Centre in 1980-81 increased to Rs. 2.61 crores from Rs. 1.88 crores in 1979-80 and the capital expenditure in 1980-81 on laboratory complex and sponge iron pilot plant was Rs. 4.08 crores as compared to Rs. 2.47 crores in 1979-80. For planning and implementation of R&D programmes for updating the technology at Bhilai, 16 Soviet experts are presently associated with this Centre.

3.6.2 Many technological developments by the Centre were successfully demonstrated and adopted on commercial scale, some noteworthy ones being production of cold bonded pellets from iron ore fines, lime dust injection through tuyeres of blast furnaces, external desulphurisation and disiliconisation of hot metal outside the blast furnace, beneficiation of iron ore using polymer additive for selective removal of alumina, etc. Lime dust injection through tuyeres of blast furnaces and production of cold bonded pellets are being upscaled to assess their potential advantages in large size blast furnaces.



### 3.6.3 Laboratory Complex

The setting of a laboratory complex at an estimated cost of Rs. 15.10 crores and an Information and Documentation Centre at an estimated cost of Rs. 1.8 crores was cleared by the Government in October 1980. Good progress has been made in the construction work of the Complex with an aim to start it by the end of 1983.

### 3.6.4 R & D Activities

The Research Project pursued by the Centre are (1) General Research Project; (2) Research Project for Plant Modernisation. After the development of technology of high strength low alloy steels at Rourkela and Durgapur, this is being transferred to Bhilai and IISCO so that the entire range of products is covered and matching sections are available to customers. As a substitute to conventional non-ageing aluminium killed deep drawing steel, which is being imported, a new category of stabilised boron treated deep drawing steel has been developed at RSP. After testing its suitability the regular commercial production has been started at RSP and BSL to meet customers' requirements. The technology for production of super basic sinter and its use in LD steel making process in plant scale, both at Rourkela and Bokaro, with definite improvement in LD operation and performance have been accomplished. The use of super basic sinter in LD operation aims at substitution of lime and steel scrap by sinter. Trials at Durgapur with oxygen enrichment of combustion air in the soaking pits have shown possibility of reducing fuel consumption by 10 to 15 per cent. This facility is being extended to all soaking pits. This had already been adopted by Rourkela and is being introduced to DSP. A cooling system for finishing strands of the Wire Rod Mill at Bhilai for fast cooling of wire rods, thereby reducing the scale loss by about 2 per cent, has been developed. This is planned to be installed in all the finishing strands. The Centre has been able to develop at ASP a technology for rolling of large diameter rounds 145 mm which would enable ASP to avoid the forging mill. Planning is in hand for rolling of still larger diameter rounds (175 mm and 225 mm). A new entry roller guide system has been devised and successfully tried at DSP. This would result in increasing the rollers life by 5 to 9 times. A high abrasion resistant material has been developed for hammer of lime stone crushers at the sinter plant of DSP. This would increase the hammer life, lower maintenance cost and reduce machine down time.

### 3.6.5 R&D Modernisation Programme

In association with the steel plant personnel, the Centre undertook the task of technological development through R&D work under the modernisation programme of steel plants. A number of projects identified were taken up at Bhilai in areas like coal and coke, iron making, steel making, mechanical working, etc. and significant achievements made on some of these. Seventy five R&D projects have been identified to be taken up as a part of modernisation scheme for Durgapur.

### 3.6.6 Direct Reduction Technology

Significant progress has been made on installation of the pilot, plant process research and design development for direct reduction technology. The pilot plant is expected to be commissioned during the first half of 1982.

## 3.7 VISAKHAPATNAM STEEL PROJECT

3.7.1 The setting up of an integrated steel plant at Visakhapatnam in collaboration with the USSR, with a capacity of about 3.4 million tonnes of liquid steel was sanctioned in June 1979. During the year work was continued on the preliminary infrastructural and preconstruction activities in respect of Visakhapatnam Steel Plant such as water and power, site levelling, storages, site offices, approach roads, railway siding, etc.

3.7.2 Excavation and foundation of blast furnace No. 1 of VSP has been completed. Concreting work has also been completed on the 26th January 1982. Excavation and foundation for sinter plant is in progress. Division list for equipment and materials for the first stage has been finalised and an agreement for supply of equipment worth roubles 198 million was signed with the USSR in November, 1981. Another contract for supply of equipment worth Rs. 249.53 crores has been signed with HEC, Ranchi.

3.7.3 Government have formed a separate company, known as Rashtriya Ispat Nigam with its own Board, under the administrative control of the Department of Steel for implementing this project.

## 3.8 VIJAYANAGAR STEEL PROJECT

3.8.1 With a view to improving upon the economic viability of the Vijayanagar Steel Project, SAIL had asked MECON to 5-1312Steel/81

study the feasibility of alternative technologies, the product-mix to suit the regional pattern of demand of steel, the latest development regarding sizes of equipment etc. MECON's preliminary report was received by SAIL in March, 1981 and the updated DPR in May 1981. These reports were considered by a Committee of Experts which was constituted by SAIL in June, 1981. The report of the Committee was considered by the SAIL Board at its meeting held on 16-7-81 when it was decided to recommend the proposal for Government approval. Accordingly, SAIL submitted to Government in July, 1981, a proposal based on revised DPR prepared by MECON and employing the conventional Blast Furnace-Basic Oxygen Furnace-Concast Rolling mill route for production of flat products, for the setting up of an integrated steel plant at Vijayanagar having a production capacity of 3.1 million tonnes of liquid steel. The broad indicative 'order of magnitude' cost for the aforesaid integrated steel plant is Rs. 2962.9 crores; this will, however, require firming up after an investment decision has been taken by Government.

3.8.2 The proposal is currently under examination.

### 3.9 PARADEEP STEEL PLANT

3.9.1 In October, 1980, the Government approved in principle the need for the setting up of a steel plant at Paradeep with a first stage capacity of around 1.5 million tonnes of crude steel to be subsequently stepped up to around 3 million tonnes and to the financing of the first stage thereof mainly through an external financial package. With a view to conducting further negotiations with the foreign parties who had made offers of technical and financial collaborations on the project so as to firm up the price as well as other terms and conditions, an Inter-Ministerial Expert Committee with Steel Secretary as Chairman and representatives of Ministry of Finance, Planning Commission, Steel Authority of India Limited and Metallurgical Engineering Consultants (India) Limited was set up on November, 12, 1980.

3.9.2 After considering the report of the Committee, Government have decided to entrust on turn-key basis the work of establishing this plant to M/s. Davy McKee of U.K. subject to the satisfactory settlement of terms and conditions of the contract. A negotiating group has been constituted to negotiate the details of the contract with M/s. Davy McKee. Negotiations are in progress on the conclusion of which a contract would be signed.

### 3.10 METAL SCRAP-TRADE CORPORATION

3.10.1 Metal Scrap Trade Corporation is a subsidiary of Steel Authority of India Limited and is the canalising agency for import of ferrous melting scrap and old ships for breaking. The Company has an authorised capital of Rs. 2 crores and paid up capital of Rs. 56 lakhs of which 84% is held by Steel Authority of India Limited and 16% by Steel Furnace Association of India and Iron & Steel Scrap Association of India.

3.10.2 During the year 1980-81, MSTC imported 35,000 MT of melting scrap valued at Rs. 4.80 crores, and 1,40,000 MT of scrap were imported by electric arc furnace units directly under, NOC procedure. Alloy Steel scrap, including stainless steel scrap, was imported to the extent of 4604 MT. In addition, MSTC imported 35 old ships aggregating 1,28,683 LDT valued at Rs. 19.10 crores. MSTC also imported for the first time 6366 MT of Heavy Melting Scrap on an experimental basis.

3.10.3 The comparative figures for the year 1981-82 (upto December 1981) are as follows :

	Quantity	Value (Rs. in lakhs)
Carbon steel scrap . . . . .	2,47,123	3,771.02
Stainless steel melting scrap . . . . .	5,275	492.87
Ships for breaking . . . . .	30 (1,26,664 LDT)	1,737.26

3.10.4 Further, under the NOC procedure, MSTC have allowed import of carbon steel scrap aggregating to 2,77,105 tonnes (upto December, 1981). MSTC is also the canalising agency for export of ferrous scrap. During 1981-82, as in the previous year, the ferrous scrap export continued to be limited due to demands within the country. During 1981-82 (upto December 1981), 58, 195 MT of surplus items valued at Rs. 90.63 lakhs were exported.

3.10.5 During 1980-81, the Corporation recorded an around growth in its activities and showed a profit of Rs. 69.30 lakhs (before tax) an increase of about 53% over the previous year. In the year 1981-82 (upto December, 1981), the Company is expected to make a profit of Rs. 207.62 lakhs.

### 3.11 FERRO SCRAP NIGAM LIMITED

3.11.1 Ferro Scrap Nigam Limited is a joint sector company in which MSTC has 60% equity participation, the remaining 40% being held by M/s. Harsco Corporation Inc., USA. The Company undertakes recovery and recycling of scrap from the slag/refuse dump in the steel plants at Jamshedpur, Rourkela and Burnpur. During 1980-81, the recovery of scrap was 3,76,876 tonnes and in 1981-82 (upto 31st December 1981) the recovery was 2,74,698 tonnes. The Company made a profit of Rs. 55.28 lakhs (after tax) during the year 1980-81.

### 3.12 INDIAN IRON AND STEEL COMPANY LIMITED

3.12.1 Indian Iron and Steel Company Limited (IISCO), a subsidiary of Steel Authority of India Limited (SAIL), comprises an integrated Iron and Steel Plant of one million tonne of ingot steel capacity at Burnpur, ferrous and non-ferrous foundries and two spun pipe plants at Kulti, collieries at Chasnalla, Noondih, Jitpur and Ramnagore, iron ore mines at Gua and Chiria (Maneharpur) and Phosphate Rock mines at Pathergorah. IISCO also has a subsidiary, namely IISCO Stanton Pipe and Foundry Company Limited at Ujjain (M.P.) which makes cast iron spun pipes.

#### Take over of the management of IISCO by the Government

3.12.2 In view of the continuing decline in the production of steel and mis-management of the affairs of the Company, the management of the Indian Iron and Steel Company Limited was taken over by the Government of India w.e.f. 14 July, 1972, initially for a period of two years, which was later extended to five years. Immediately after take over of the management, a Plant Rehabilitation Scheme (PRS) was launched to restore the technical health of the plant. A ten-year programme of capital reconstruction was also initiated in order to sustain production at the rated level. As these programmes called for massive investment, it was subsequently decided to acquire all the privately held shares of the company, except the holdings of Government Institutions. This was done through the Indian Iron and Steel Company (Acquisition of Shares) Act, 1976 (89 of 1976). This acquisition gave the Central Government a majority holding of the ordinary and preference shares issued by the company. Later, it was decided by the Government that in order to ensure coordinated development of IISCO and for better management of its technical, production and financial problems, IISCO should be amalgamated with the Steel Authority of India Limited like

the other integrated Steel Plants in the public sector. As the first step in this direction, the shares in IISCO held by the public financial institutions, nationalised banks and insurance companies and State Governments were purchased by the Central Government. Full ownership of IISCO was thereafter transferred to SAIL. A proposal to amalgamate the two companies in terms of Section 396 of the Companies Act is presently under consideration of the Company Law Board.

### 3.12.3 Finance

The authorised capital of the Company as on 31-3-81 was Rs. 100.00 crores and the paid-up capital Rs. 87.77 crores. In addition, outstanding Government loans as on 31-12-81 were Rs. 77.82 crores.

### 3.12.4 Capacity utilisation and production

The installed capacities and actual production of ingot steel and saleable steel for the years 1978-79 to 1981-82 (upto December, 1981) are as follows :—

(Unit '000 tonnes)

Year	Ingot Steel			Saleable Steel		
	Installed capacity	Production	% capacity utilisation	Installed capacity	Production	% capacity utilisation
1978-79	1,000	628	62.8	800	481	60.1
1979-80	1,000	565	56.5	800	430	53.7
1980-81	1,000	609	60.9	800	523	65.4
1981-82	1,000	445	60.0	800	362	60.0
April to December)						

3.12.5 The revised production targets for 1981-82 are 758,000 tonnes of ingot steel and 600,000 tonnes of saleable steel. While it may not be possible to achieve these targets, it is expected that the capacity utilisation of about 65% in terms of saleable steel may be achieved during 1981-82. The main reasons for low production are inadequate availability and poor quality of coking coal, shortage of and restrictions on power supply, industrial relations problems etc.

### Working Results

3.12.6 IISCO have suffered heavy losses during the last few year as given below :

Year	Loss (In crores of rupees)
1977-78	(-) 39.13
1978-79	(-) 24.31
1979-80	(-) 34.94
1980-81	(-) 29.78
	(estimated excluding interest on Govt. loans)
1981-82	( ) 30.97 (estimated)

3.12.7 The main reasons for the losses are out-moded technology, lower production, higher incidence of interest charges, higher consumption of stores and spares and high rate of different inputs.

### Industrial Relations

3.12.8 Industrial relations problem is one of the reasons due to which IISCO has suffered set-backs in production. The management has taken a number of steps such as a firm uniform policy in matters relating to all cases of industrial indiscipline, incentive schemes etc. A number of jobs which were earlier being done by contract labour have been departmentalised.

### Schemes under implementation

3.12.9 The Plant Rehabilitation Scheme taken up for implementation immediately after Government take-over of the management of IISCO in 1972, is nearly complete. This is estimated to cost about Rs. 58 crores. Other important schemes under consideration/implementation are the construction of a new coke oven battery, development of the Chasnalla mine, setting up of a sinter plant etc. Studies by Soviet Experts are under way for preparing a development plan for modernisation of IISCO.

### IISCO Stanton Pipe Foundry Company Ltd.

3.12.10 This is a subsidiary company of IISCO in which IISCO holds two thirds of the issued equity capital. This company makes cast iron spun pipes and castings of various dimensions.

3.12.11 During the calendar year 1981, the company produced 44,422 tonnes of pipes as against a production of 36,647 tonnes in 1980. The company earned a profit of Rs. 2.62 crores during 1981 as compared to Rs. 0.54 crores during 1980.

### Manpower Position

3.12.12 During July-September, 1981, there were 1490 Executives and 40,038 non-Executives working in IISCO and IISCO Stanton.

### 3.13 VISVESVARAYA IRON AND STEEL LIMITED, BHADRAVATI

3.13.1 The Mysore Iron and Steel Works, Bhadravati, was started in 1923 as a departmental undertaking of the then Government of Mysore with a small blast furnace to produce about 24,500 tonnes of pig iron annually. It was converted into a company on 30th June, 1961 under the name of Mysore Iron and Steel Limited. In February, 1976, its name was changed to Visvesvaraya Iron and Steel Limited (VISL). It is now jointly owned by the Government of Karnataka and the Government of India (Through Steel Authority of India Limited). It is one of the main producers of alloy and special steels in the country. Other products of the company are mild steel, ferro-silicon, cement, castings, spun pipe and ferro-alloys.

3.13.2 The present authorised Share Capital of the Company is Rs. 75 crores made up of 75 lakhs Equity Shares of Rs. 100 each. The subscribed and paid-up capital of the Company as on 31-3-1981 was Rs. 39.45 crores of which Rs. 23.67 crores (60 per cent) was held by the Government of Karnataka and the balance of Rs. 15.78 crores by Steel Authority of India Limited.

3.13.3 The present installed capacity of the units of VISL are as under :

1. Mild Steel	48,000 Tonnes
2. Special & Alloy Steels	77,000 "
3. Steel Ingots	1,80,000 "
4. Ferro-silicon	20,000 "
5. Cement	96,000 "
6. Ferro-alloys	3,800 "
7. Pig Iron	1,80,000 "
8. Steel Castings	2,500 "
9. Iron Castings	15,600 "
10. Cast Iron Spun Pipes	17,000 "
11. Cast Iron Plate Sleepers	15,000 "
12. Refractories	9,600 "

3.13.4 Actual production in 1980-81 and 1981-82 (upto end of December, 1981) was as under :

Products	Actual Production	(in tonnes)
	1980-81	1981-82 (April-Dec. '81)
1. Mild Steel		
2. Special Steel Met OK		
3. Steel Ingots	24,650	4,256
4. Ferro-silicon	60,273	41,274
5. Cement	94,469	76,854
6. Ferro-alloys	12,465	4,834
7. Pig Iron	75,276	44,495
8. Steel Castings	2,723	2,570
9. Gray Iron Castings	79,008	64,668
10. Cast Iron Spun Pipes	1,545	822
11. Refractories	9,352	7,147
	1,803	7,470
	9,355	5,645

3.13.5 Average percentage of power-cut during the year was 34%. In the first quarter of the year the power cut was however as high as 80%.

3.13.6 For the year ended 31-3-1981, as against a net profit of Rs. 493.48 lakhs during the previous year, the Company had earned a record profit of Rs. 520.20 lakhs. It has wiped off all the accumulated losses and the Company had been able to carry over a net profit to its Reserve Fund. Value of sales turnover reached by Rs. 8,400 lakhs during the year ended 31-3-1981 was a record so far.

3.13.7 In-house research and development work has enabled the Company to achieve significant success in product improvement and operational practices. Some instances are :

- Improvement in the operation of EPIF;
- Development of HSLA (High Strength Low Alloy) Steels;
- Usage of different de-oxidisers to improve cleanliness of steel;
- Improvement in Pit-side practice;
- Production of Special steels in Open Hearth;

- Improvement in quality and yield of High Alloy Steels and High Speed Steels;
- Reclamation of used Blooming Mill Rolls; and
- Process standardisation in the manufacture of Vanadium Pentoxide rich slag and Ferro-Vanadium.

### 3.13.8 Capital Schemes under Implementation

#### (i) Ferro-vanadium Project

The first stage of the Ferro-Vanadium plant for production of 100 tonnes/year of Ferro-Vanadium is under implementation. Fabrication and erection of structurals are in progress. Orders for plant and equipment have been placed and some of the equipment have arrived at site.

#### (ii) Optimisation Scheme

In order to optimise production it is proposed to set up 1 (one) continuous casting machine with auxiliary facilities and 1 (one) oxygen plant at an estimated cost of Rs. 13.9 crores. Orders have been placed for the continuous casting machine. Production capacity will substantially improve after the installation of these facilities.

### 3.13.9 Efforts made towards Cost Reduction

Efforts on the following resulted in cost reduction/savings to the Company :

(i) Use of super grade iron ore in Pig Iron Furnaces achieved better results and charging partially calcined limestone minimised consumption of electricity.

(ii) Percentage of rejection of finished products came down because of better heat and improved pit-side practice in Open Hearth Furnaces for production of Special Steels.

(iii) Standardisation of the manufacture of expensive ferro-alloys like Ferro-Molybdenum, Ferro-Tungsten, Ferro-Titanium etc. Also process for making  $V_2O_5$  rich slag has been standardised.

### 3.14 SPONGE IRON PLANT AT KOTHAGUDEM

3.14.1 The establishment of an alternative route for production of steel otherwise than through the conventional blast fur-



nace route has assumed national importance in view of the limited resources of coking coal in the country. It is estimated that the existing reserves of coking coal may not last beyond another 50 years or so. The alternative presently available is the electric arc furnace.

3.14.2 One of the major constraints in the higher utilisation of the existing electric furnace capacity of over 3 million tonnes is the limited availability of steel melting scrap. Scrap can be supplemented to some extent by sponge iron in the furnace charge. While it may be possible to import sponge iron as is being done presently on a limited scale, it is important that indigenous capacity should be developed in this area. It was in this context that Sponge Iron India Limited, a public sector Company under the Department of Steel, set up a Sponge Iron Demonstration Plant with a capacity of 30,000 tonnes per annum with UNDP/UNIDO assistance at Kothagudem in Andhra Pradesh. The plant employs the SL/RN technology of Lurgi, West Germany, which is based on the use of 100% non-coking coal. A well equipped laboratory has also been set up at the plant site to carry out tests on suitability of various materials for the sponge iron plant. A number of countries have evinced interest in this project and it is expected that they will also utilise these facilities. Sponge Iron India Limited has also been registered as Industrial Consultancy and Test Centre by UNIDO.

#### Finance

3.14.3 The revised project cost of Sponge Iron India Limited is Rs. 16.49 crores. The share capital subscribed by the Govt. of India is Rs. 4.36 crores and that by the Govt. of Andhra Pradesh is Rs. 0.84 crores. Grants from UNDP amount to Rs. 3.70 crores.

#### Production

3.14.4 The Demonstration Plant of Sponge Iron India Limited went into regular operation from 1-11-1980. For the period the plant operated in 1980-81, a production of 9,118 tonnes was achieved against the target of 7,500 tonnes. In the year 1981-82, the plant was expected to achieve capacity utilisation of 75% and a production target of 22,500 tonnes was accordingly fixed. However, in view of the encouraging performance in the first half year of operation, the target was revised to 27,000 tonnes, representing 90% capacity utilisation. The actual production of sponge iron during 1981-82 upto December 1981 was 20,098 tonnes.

3.14.5 The plant operations have demonstrated that quality sponge iron with 88 to 92% metallisation can be produced from Bayyaram iron ore using 100% non-coking coal. The sponge iron so produced has been successfully converted into steel by various mini-steel plants in the country. SIIL is also taking UNIDO assistance in designing equipment to enable continuous feeding of sponge iron into the furnace, as this method of charging gives better results than the intermittent or batch charging technique.

#### Sales and Profitability

3.14.6 Although the product was introduced into the market for the first time in the latter part of the year 1980-81, 7,844 tonnes were sold during the year, realising Rs. 1.07 crores. It is expected that SIIL would be able to sell about 27,000 tonnes of sponge iron valued at Rs. 4.11 crores to the arc furnaces in 1981-82. The Company expects to make a profit of Rs. 0.12 crores (after interest and depreciation) in 1981-82.

#### Impact of quality of inputs on production

3.14.7 The performance of a sponge iron plant depends to a large extent on the quality of feed materials, viz., iron ore and coal. Proper sampling and analysis at the field and plant laboratories are being done to ensure uniform chemical composition of the raw materials.

#### Efforts towards cost reduction

3.14.8 Several steps towards cost reduction have been taken by the Company, such as, reduction in consumption of oil for the initial heating of the kiln (this has been brought down from 12 litres per tonne of sponge iron to 4 litres), extending the campaign life of operation to reduce overhead costs and schemes to utilise plant wastes.

#### Import substitution

3.14.9 Since the critical equipment of the plant were imported, the spare parts for initial operation were also imported. As a step towards indigenisation, indigenous sources are being developed for various consumable items, such as, thermocouples required for the kiln, lubricants, castable refractory lining, etc.

3.14.10 In view of the encouraging performance of the Demonstration Plant, doubling of its capacity is under consideration.

3.14.11 The total number of employees of the Company as on 31-12-81, indicating separately persons belonging to Scheduled Castes, Scheduled Tribes, Ex-servicemen, physically handicapped and Women, was as below :

Group	Total No. of employees	S.C.	S.T.	Ex-servicemen	Physically handicapped	Women
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Group 'A'	60	3	—	—	—	1
Group 'B'	17	1	—	—	—	—
Group 'C'	166	9	7	2	1	13
Group 'D' (Excluding sweepers)	136	29	15	1	3	2
Group 'D' (Sweepers)	3	2	—	—	—	1
Total	382	44	22	* 3	4	17

### 3.15 KUDREMUKH IRON ORE PROJECT

#### Background

3.15.1 The Kudremukh Iron Ore Project situated in the Chickmagalur District of Karnataka State has been implemented on the basis of a Financial Agreement and Sale & Purchase Contract concluded with Iran in November, 1975 for supply of high grade iron ore concentrate to that country. Under the Financial Agreement, the Govt. of Iran had agreed to provide credit not exceeding US \$ 630 million to finance the cost of construction of the Kudremukh Project proper and the infrastructure consisting of development of the New Mangalore Port, construction of power facilities and road connected with the project. The Sale & Purchase Contract envisaged supply to the National Iranian Steel Company of a total quantity of 150 million tonnes of concentrate over a period of 21 years starting from August, 1980 at the rate of 3 million tonnes in the first year, 5 million tonnes in the second year and 7.5 million tonnes per annum from the 3rd year onwards.

3.15.2 Against the credit of \$ 630 million, the total disbursement received from Iran amounts to \$ 255.175 million, including the initial advance of \$ 100 million. There has been no further release of funds from the Iranian Govt. The project, has, however, been implemented with the funds provided by the

Govt. of India. The supply of concentrate would have commenced from the end of August, 1980, as provided in the Sale & Purchase contract, but for the inability of Iran to lift the material. Efforts are being made to settle the matter through negotiation.

#### Progress of Work

3.15.3 The first of the four production lines (Mill line No. 4) of the project together with all the connected facilities was commissioned on 22/23rd August, 1980, i.e. one day ahead of schedule and iron ore slurry was pumped to Mangalore. Mill line No. 3 is now on production run. Installation of major items of the remaining two Mill Lines (1 and 2) have been completed and they will be started shortly.

#### Capacity Utilisation

3.15.4 The Kudremukh Project has been designed for an annual production of 7.5 million tonnes of iron ore concentrate. Because of the uncertainty created by Iran, Kudremukh Iron Ore Co. Ltd. (KIOCL) have been making efforts to locate alternate markets for the concentrate. Romania has agreed to buy about 3.5 million tonnes over a period of about four years. For the present, the production plan of KIOCL is as under :

	1981-82	1982-83	1983-84*
	0.5 M.T.	1.5 M.T.	1.5 M.T.

#### Project Estimate and Expenditure

3.15.5 The sanctioned capital cost of the total project is Rs. 647.33 crores, including Rs. 546.80 crores for the Kudremukh Project proper. The authorised capital of the Company as on 31-3-1981 was Rs. 200 crores. This was fully subscribed and paid up by 31-3-1981. It was subsequently decided to revise the debt-equity ratio of the company from 2 : 1 to 1 : 1. Consequent on this revision, the authorised capital of the company has been increased from Rs. 200 crores to Rs. 300 crores. The Government loan on capital account stood at Rs. 277.97 crores on 30-11-1981. The total expenditure incurred on the project proper as on 30-11-1981 was Rs. 473.59 crores, including Rs. 28.11 crores interest paid on Government loans. The expenditure on development of infrastructure facilities such as road, power and port was Rs. 102.21 crores upto 31-10-1981. The capital budget estimates of expenditure during 1981-82 and 1982-83 of the project proper are Rs. 23.14 and Rs. 5 crores respectively.

**Personnel**

3.15.6 The total number of employees as on 30-11-1981, and the representation of scheduled castes, scheduled tribes and women among them are shown in the table below :

Group	Total No. of employees	Scheduled Castes	Scheduled Tribes	Women
A	294	12	1	5
	+11 (temporary)		+1 (temporary)	
B	88	5	—	2
C	1205	117	12	77
D (excluding sweepers)	197	31	28	10
D (sweepers only)	25	24	—	5

Presently, the company has five and 70 ex-service men in the cadres of executives and non-executives respectively. As suitable candidates are not forthcoming in adequate numbers in categories like Operator-cum-Mechanic, mechanic electrician etc. either through the Employment Exchange or against open advertisement, a scheme to train retiring defence personnel for these jobs is under consideration of the Company.

**Pelletisation Plant**

3.15.7 According to present indications, Iran may eventually take 4.5/5 million tonnes of concentrate out of the annual contracted quantity of 7.5 million tonnes. The commencement of offtake by Iran is, however, uncertain. To find a long-term solution to the problem, Government have sanctioned the setting up of a Pellet Plant at Mangalore of 3 M.T. capacity per year to convert the Kudremukh concentrate into pellets, which have better marketability. The Kudremukh Iron Ore Co. have signed on 12-9-1981 a contract with M/s Uzinexport-import, Romania for the setting up of the plant, which is expected to go into production by the last quarter of 1984. Efforts are being made by KIOCL to locate buyers for the full production of the pellet plant. An understanding has been reached with Indonesia regarding long-term supply of 1 MT of pellets going upto 1.75 MT subject to the establishment of technical suitability and settlement of other commercial terms and conditions.

**3.16 NATIONAL MINERAL DEVELOPMENT CORPORATION LIMITED**

3.16.1 The National Mineral Development Corporation Limited (NMDC) was set up in November, 1958 for exploiting the mineral resources of the country other than coal, oil, natural gas and atomic minerals. Over the years, the responsibility for exploitation of many of the minerals which were initially within the scope of NMDC was entrusted to newly formed public sector organisations, leaving only iron ore and diamonds with the NMDC. NMDC is now basically a producer of iron ore for export with a small diamond mine at Panna. Its investigation and consultancy wings, however, continue to undertake assignments in respect of other minerals.

**Finance**

3.16.2 The authorised capital of the Corporation is Rs. 150 crores. Upto 31st December, 1981, the Government had subscribed equity to the extent of Rs. 78.62 crores. The Government loans outstanding on this date amounted to Rs. 52.93 crores.

**Production**

3.16.3 The Corporation has now three operating iron ore mines viz. Bailadilla-14 mine and Bailadilla-5 mine in Madhya Pradesh and Donimalai mine in Karnataka, and a diamond mine at Panna in Madhya Pradesh. The production from these mines during 1980-81 and 1981-82 is shown below :—

(Iron ore in lakh tonnes) (Diamonds in carats)					
1980-81					
Mines	Lumps	Fines	Total		
Bailadilla-14	26.13	7.90	34.03		
Bailadilla-5	28.83	11.99	40.82		
Donimalai	6.30	6.32	12.62		
Total Iron ore	61.26	26.21	87.47		
Panna (diamonds)	13,713				
1981-82					
Target	Anticipated				
Lumps	Fines	Total	Lumps	Fines	Total
23.00	9.60	32.60	25.00	10.90	35.90
30.00	12.50	42.50	30.50	12.50	43.00
6.00	6.00	12.00	8.00	8.00	16.00
59.00	28.10	87.10	63.50	31.40	94.90
	14,000			14,613	



3.16.4 The Bailadilla mines were developed for supply of lump ore to the Japanese Steel Mills (JSM) under a long term contract. This contract expired on the 30th April, 1980. On negotiation by MMTC and NMDC, JSM agreed to take 59.60 lakh WMT (wet metric tonnes) of lump ore and 8.30 lakh WMT of fines from the Bailadilla sector during 1980-81. The actual offtake in 1980-81 was, however, 49.76 lakh WMT of lumps and 6.44 lakh WMT of fines only. In the year 1981-82, JSM have agreed to take 55.88 lakh WMT of lump ore and 1.02 lakh WMT of fines from the Bailadilla sector and about 11 lakh WMT of lumps and fines from Donimalai. Commitments has also been entered into for supply of 5.54 lakh WMT of Bailadilla ore and 2.70 lakh WMT of Donimalai ore to South Korea and 2 lakh WMT of High Density Aggregate fines from Donimalai to Abu Dhabi. Because of the reduced offtake by the JSM and the saturation of the stock-piles at the mines and the ports, production in the mines during 1981-82 had to be restricted. Nevertheless, the targets fixed at the beginning of the year are expected to be exceeded. Efforts are on to find other markets for the Donimalai ore.

#### *Working Results*

3.16.5 In 1980-81, NMDC suffered a loss of Rs. 9.26 crores. After accounting for the interest subsidy of Rs. 6.20 crores, the net loss for the year was Rs. 3.06 crores. During April-December, 1981, the Corporation made a profit of Rs. 3.89 crores. The Railway freight has been increased by 15% with effect from the 1st January, 1982. This increase is expected to erode NMDC's income by Rs. 10 crores per year on the average. The year 1981-82 is, therefore, likely to close for NMDC with a loss instead of the expected profit.

3.16.6 The losses incurred by NMDC in 1980-81 and previous years were due to the fact that a buyer's market was operating in iron ore because of the recession in the world steel industry. Out of the export price realised, all expenses such as export duty, port charges, railway freight and MMTC's service charges were first met and only the residue was passed to NMDC. The better results during April-December, 1981 are due to somewhat higher prices obtained for the iron ore, a favourable change in the dollar-rupee parity and some reduction in the railway freight. As stated earlier the margin is, however, likely to be wiped out because of the increase in railway freight effective from the 1st January, 1982.

3.16.7 During 1980-81, foreign exchange to the extent of Rs. 103.89 crores was earned through the export of NMDC iron ore, the cumulative foreign exchange earnings up to 31st March, 1981 being Rs. 654.71 crores. During April-December, 1981, the foreign exchange earning was Rs. 97.96 crores.

#### *New Schemes*

3.16.8 The existing Bailadilla-14 mine is expected to last only till about 1991. Apart from maintaining export of iron ore at about the current level, NMDC will also be called upon to supply iron ore to the Vishakapatnam Steel Plant. As Bailadilla-5 mine alone will not be able to meet these demands, it has been decided to develop a new mine in deposit Bailadilla-11-C. The mining equipment and infrastructure available in Bailadilla-14 will be utilised in this project. Pre-production core drilling is in progress in deposit 11-C. The project is scheduled to be completed by May, 1984.

3.16.9 Because of their being no demand for fines, the fines generated in the production of lump ore in the Bailadilla sector were being dumped. Starting from 1980-81, JSM have indicated their willingness to accept some quantity of fines; the Vishakapatnam Steel Plant will also need about 1.90 million tonnes of lump ore and 3.39 million tonnes of fines per year for its production. In order to meet these demands, a proposal has been made by NMDC for reclaiming some quantity of the dumped fines. This scheme is presently under consideration of the Government.

#### *Investigations and Feasibility Studies*

3.16.10 The Corporation has undertaken a number of investigations and feasibility studies in respect of iron ore. The status of the more important studies is indicated below:—

##### *(a) Bababudan Magnetite Deposits*

The report of second phase investigation has been completed. M/s. Bechtel of USA have submitted the feasibility report on slurry transportation of ore through pipe line from Bababudan to Mangalore Port. The report on the pilot plant tests is under preparation.

##### *(b) Ongole Magnetite Deposits*

The first phase of investigation has been completed and a detailed geological report has been prepared.  
6-1312Steel/81

(c) *West Coast Iron Ore Deposits*

The contour survey and geological mapping of Karakurichi deposits are in progress. Beneficiation tests have been conducted to assess suitability of the ore for use in the Visvesvaraya Iron and Steel Limited, Bhadravati.

(d) *Bailadilla-II-B Iron Ore Deposit*

All field work relating to exploration, drilling and engineering survey has been completed. A draft techno-economic feasibility report has been prepared.

(e) *Kumaraswamy Iron Ore Deposit*

Investigation work has been completed and the camp establishment has been wound up.

*Mandovi Pellets Limited*

This is a joint sector enterprise located in Goa in which the Government of India and M/s. Chowgule and Company Private Limited (CCPL) each hold one-third of the shares, the remaining one-third being subscribed by the general public. This company has set up a plant in Goa to produce 1.8 million tonnes of blast furnace grade iron ore pellets per year for export to Japan against a long term contract. On behalf of the Central Government, NMDC has contributed Rs. 2.55 crores towards the equity capital of this Company. Due to recession in the steel industry, the prices of blast furnace grade pellets have fallen to such an extent that Mandovi Pellets Limited found that it could not supply the pellets to Japan in 1981-82 at a competitive price, without incurring substantial losses. The company, therefore, negotiated with the Japanese Steel Mills and secured their agreement to the supply during 1981-82 of 3.6 million tonnes of iron ore lumps and fines in lieu of pellets. This arrangement will enable the Company to meet its fixed and variable costs and also to generate a small surplus. It is expected that production and export of pellets will be resumed in 1982-83.

*Import of Sponge Iron*

3.16.11 In March, 1979 a Memorandum of Understanding was signed with the Government of Indonesia which, among other things, provided for export from India to Indonesia of direct reduction grade iron ore pellets on a long term basis from a pellet plant to be set up in the Bailadilla sector, and import of sponge iron from Indonesia. Because of financial constraints

and the sanction of a pellet plant at Mangalore to be set up by Kudremukh Iron Ore Company Limited, the Government have not so far been able to clear the Bailadilla pellet plant. As the electric furnace units in the country were facing a shortage of steel melting scrap and sponge iron can replace scrap to the extent of 40-50% in the furnace charge, it was decided by the Government that some quantity of sponge iron should be imported. NMDC was nominated as the canalising agency for this import. During 1980-81, NMDC imported 36,329.67 tonnes of sponge iron from Indonesia. It is expected that 92136.47 tonnes will be imported in 1981-82. The imported sponge iron is distributed to the electric furnace units by the Steel Furnace Association of India.

*Personnel*

3.16.12 On the 31st December, 1981, the Corporation had on its rolls 6,156 regular employees as shown below :—

Group	Total No. of Regular Employees as on 31-12-81	No. of Scheduled Caste Employees (out of Col. 2)	No. of Scheduled Tribes Employees (out of Col. 2)	No. of Women Employees (out of Col. 2)
A	494	17	2	12
B	590	30	5	42
C	3283	381	345	100
D (Excluding Sweepers)	1670	290	555	106
D (Sweepers)	119	87	1	29
Total	6156	805	908	289

The industrial relations situation in the Company during April-December, 1981 was peaceful.

3.17 BHARAT REFRACTORIES LIMITED

3.17.1 This Company was earlier a subsidiary of SAIL. Consequent upon restructuring of SAIL in accordance with the provisions of the Public Sector Iron & Steel Companies (Restructuring and Miscellaneous Provisions) Act, 1978, Bharat Refractories Ltd. was taken out of the control of SAIL with effect from the 1st May, 1978. It presently consists of the following units :

- (i) The Bhandaridah Refractories Plant at Bhandaridah near Bokaro Steel City.

### (c) West Coast Iron Ore Deposits

The contour survey and geological mapping of Karakurichi deposits are in progress. Beneficiation tests have been conducted to assess suitability of the ore for use in the Visvesvaraya Iron and Steel Limited, Bhadravati.

### (d) Bailadilla-II-B Iron Ore Deposit

All field work relating to exploration, drilling and engineering survey has been completed. A draft techno-economic feasibility report has been prepared.

### (e) Kumaraswamy Iron Ore Deposit

Investigation work has been completed and the camp establishment has been wound up.

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- The Bhandaridah Refractories Plant at Bhandaridah near Bokaro Steel City.

- (ii) The Ranchi Road Refractories Plant at Marar, near Ranchi.  
 (iii) The Bhilai Refractories Plant at Bhilai.  
 (iv) Sillimanite Mines at Sonapahar, in Meghalaya.

It has a subsidiary company known as India Firebricks and Insulation Company Limited with works at Ramgarh, near Ranchi.  
 3.17.2 The authorised capital of Bharat Refractories Ltd. is Rs. 30 crores and the present paid-up capital is Rs. 20.0895 crores. The cumulative capital expenditure upto 31st December, 1981 was Rs. 53.69 crores.

3.17.3 The production in the various units of the Company as well as in its subsidiary company, IFICO, during 1980-81 and 1981-82 is indicated below :—

Unit	Item	(Quantity in tonnes)			
		1980-81		1981-82	
		Target	Actual	Target	Actual (April-Dec.'81)
(1) Bhandaridah Refractories Plant	Bricks	9,423	6,415	12,391	7,904
	Mortar	3,862	1,444	Nil	2,312
(2) Ranchi Road Refractories Plant	Bricks	5,847	5,147	5,177	3,176
	Mortar	350	228	Nil	10
(3) Bhilai Refractories Plant	Bricks	—	—	9,799	4,042
Total		19,482	13,234	27,367	17,444
(4) India Fire-Bricks and Insulation Company Ltd.	Bricks	36,000	31,079	36,000	23,226
	Mortar	Nil	1,584	Nil	989
GRAND TOTAL		55,482	45,897	63,367	41,659

3.17.4 The main reason for the lower production at Bhandaridah in 1981-82 as compared to the target was the continu-

ing temperature problem in the main tunnel kiln. Specialists from the Polish Company which had supplied the tunnel kiln have recently (February, 1982) arrived in India to study this problem and to suggest solutions. The Ranchi Road unit could not fully keep up to the target for want of sufficient orders. The Basic Shop of the Bhilai Refractories Plant started commercial production in November '81 and has exceeded the proportionate target during the two months of its operation. The India Firebricks & Insulation Co. Ltd. has fallen slightly short of the target because of shortage of inputs, particularly diesel oil.

3.17.5 Bharat Refractories Ltd. incurred a loss of Rs. 109.41 lakhs during April-Dec. '81 as compared to a loss of Rs. 99.95 lakhs during 1980-81. The higher loss was due to the shortfall in production and heavy capital related charges. The subsidiary company, IFICO, which had made a loss of Rs. 6.61 lakhs in 1980-81, made a profit of Rs. 9.67 lakhs during April-Dec. '81. It is expected to close the year with a somewhat higher margin.

3.17.6 Bharat Refractories Limited and its subsidiary had a total personnel strength of 3,542 on the 31st December, 1981. This included 308 employees belonging to Scheduled Castes and 541 from the Scheduled Tribes.

3.17.7 The existing capacity of the Bhandaridah Refractories Plant is 15,000 tonnes of fireclay bricks. The capacity is being expanded to 26,000 tonnes at a cost of Rs. 3.20 crores. This expansion is expected to be completed by June 1982. With the expansion of capacity and solution of the temperature problem in the tunnel kiln, the performance of this Plant is expected to show substantial improvement.

3.17.8 The capacity of India Firebricks & Insulation Co. Ltd. has already been increased from 36,000 tonnes to 42,000 tonnes per annum. This unit has started showing better results, as mentioned earlier.

3.17.9 The Bhilai Refractories Plant which is the latest unit under BRL will have a capacity of 30,000 tonnes of basic bricks, 20,000 tonnes of silica bricks and 60,000 tonnes of fireclay bricks when completed. The sanctioned capital cost of this project is Rs. 37.42 crores. The basic shop has been completed and was put on trial runs towards the end of 1980. This shop has com-

menced commercial production from the 1st November 1981. The silica shop is expected to go into production in April 1982 and the fireclay shop in June 1982.

3.17.10 The basic shop of this plant is presently dependent on market purchases of deadburnt magnesite for its operation. As there is shortage of refractory grade deadburnt magnesite in the country and imported material is prohibitively costly, Bharat Refractories Ltd. have submitted to the Government a proposal to instal a rotary kiln at Dewalthal Bazar in Pithoragarh District of Uttar Pradesh for producing 25,000 tonnes/year of high quality deadburnt magnesite, at an estimated cost of Rs. 14.30 crores. Development of this captive source will ensure regular supply of good quality raw material to the Bhilai Refractories plant for production of magnesite bricks, which are important inputs for the steel industry. This proposal is under consideration of the Government.

### 3.18 MANGANESE ORE (INDIA) LIMITED

3.18.1 Manganese Ore (India) Limited (MOIL) was founded in 1962 with the Government of India and the State Governments of Maharashtra and Madhya Pradesh holding 51% of the shares and the Central Provinces Manganese Ore Company Limited (CPMO), a British company, holding the remaining 49%. The shares held by CPMO were acquired by the Government in 1977 and thereby MOIL became a fully owned Government company. At present, the Central Government holds 51% of the shares in this company and the two State Governments 24.5% each.

3.18.2 MOIL is the biggest producer of manganese ore in the country. Manganese is a strategic metal having wide-ranging applications in metallurgical and chemical industries. The largest consumer of manganese ore in the country is the ferro alloy sector which uses the material for production of ferro manganese. Some quantity of manganese ore is also exported. Considering the strategic nature of the mineral and the limited proved reserves in the country, the Government's policy has been not to permit export of high quality ore and to restrict exports to a minimum level consistent with the need for earning foreign exchange and maintaining employment in the mining industry. Till 1978-79, MOIL's operations were confined largely to Madhya Pradesh and Maharashtra. Since then, however, the company has extended its operations to Orissa, Andhra Pradesh and Karnataka.

### Finance

3.18.3 The authorised capital of the company is Rs. 6 crores of which Rs. 2.15 crores has been paid-up. The Government loans outstanding on the 31st December, 1981 amounted Rs 3.75 crores.

### Production

3.18.4 In 1980-81, MOIL produced from its various mines 443,329 tonnes of manganese ore of various grades. The production target for 1981-82 is 435,000 tonnes. From April to December '81, the company produced 327,074 tonnes which is 75% of the annual target. This target is expected to be achieved, if not exceed. About 145,000 tonnes of manganese ore are expected to be exported during the year realising Rs. 725 crores. Till the end of December '81, 95,671 tonnes, or 66% of the year's target have been exported.

### Working results

3.18.5 MOIL has been consistently making profits and declaring dividends. In 1980-81, the company made a gross profit of Rs. 137.07 lakhs and a net profit after tax of Rs. 32.03 lakhs. It is expected to make a gross profit of Rs. 202.77 lakhs and a net profit of Rs. 41.11 lakhs in 1981-82.

### Capital schemes

3.18.6 The domestic and external demand is only for manganese ore in the form of lumps. The ore fines which are generated in the production process are presently being dumped. It is possible to use such fines for production of ferro manganese if they are beneficiated and sintered. MOIL is accordingly preparing a scheme to beneficiate and agglomerate the manganese ore fines generated in their mines in Madhya Pradesh. A proposal is also being prepared to set up a ferro manganese plant with a capacity of 60,000 tonnes per annum at Balaghat in Madhya Pradesh. The company has also schemes to establish a plant for production of 2,500 tonnes of electrolytic grade manganese dioxide and 1,000 tonnes of manganese metal per annum. Final proposals on these schemes are awaited from the company.



### Personnel

3.18.7 The details of personnel of the company on the 31st December '81 are indicated below :

Group	SC	ST	Others	Total
A				
B	3	2	126	131
C	2	2	68	72
D	207	236	1040	1483
Sweeper	1879	4107	4932	10918
Total	128	—	—	128
	2219	4347	6168	12732

### 3.19 METALLURGICAL AND ENGINEERING CONSULTANTS (INDIA) LTD.

3.19.1 Metallurgical and Engineering Consultants (India) Ltd. (MECON) is the premier consultancy and design organisation in the public sector in the field of ferrous and non-ferrous industry. From its origin as a small design bureau under Hindustan Steel Limited, MECON has grown into a large multi-activity enterprise, providing consultancy services in ferrous and non-ferrous metallurgy, chemical industry, iron ore processing and beneficiation, refractory industry, etc. and designing and supplying equipment for coke ovens, rolling mills, processing lines and chemical plants.

3.19.2 Finance : The authorised capital of the company is Rs. 4 crores. The issued and paid-up equity capital on the 31st March '81 was Rs. 2.02 crores.

3.19.3 Working results : The turn over of the company in 1980-81 was Rs. 43.11 crores and the net profit was Rs. 5.68 crores. The turnover in 1981-82 is expected to be Rs. 49.3 crores and the company is likely to make a profit of Rs. 5.50 crores.

3.19.4 The progress in the more important assignments undertaken by the company is indicated below :

#### (a) Bokaro Steel Plant

MECON is the principal consultant for the expansion of Bokaro Steel Plant to the 4-million tonne stage. Satisfactory progress has been made in the preparation of civil, structural, technological and electrical working drawings for the expansion.

Detailed engineering is almost complete except for the cold rolling mill complex. MECON is also providing detailed engineering and consultancy services for the expansion of the Bhavnathpur limestone mine, the Benzol Plant and the new captive power plant.

#### (b) Bhilai Steel Plant

MECON have already completed a substantial portion of the detailed engineering work for phase I of the four million tonne expansion of Bhilai steel plant. Detailed engineering for phase-II consisting of the seventh blast furnace complex with cast house and slag granulation plant and coke oven and by-product plant is under progress. The feasibility study for modernising and up-dating technology in the existing 2.5 million tonnes stream so as to increase the capacity of the plant beyond four million tonnes is under preparation.

#### (c) Rourkela steel plant

Rebuilding of coke oven battery No. 1 B is in hand. MECON is also providing technical consultancy and engineering services in a number of other areas.

#### (d) Durgapur steel plant

Coke oven batteries 2A and 2B of the plant have been rebuilt as per MECON's design. MECON is also involved in the modernising and up-dating of technology for this plant, in respect of which some reports have already been prepared and submitted.

#### (e) Kudremukh Iron Ore Company Limited

MECON has been entrusted by KIOCL with the detailed engineering and consultancy work for the pellet plant which is being set up at Mangalore.

#### (f) Bharat Aluminium Company Limited

As the prime Indian consultant for the Korba Smelter and Fabrication Complex, MECON continued to render technical consultancy and detailed engineering services to BALCO. Four electrolytic cell houses have already been commissioned and the remaining four are ready for commissioning. Some units of the fabrication complex have also been commissioned. MECON was retained by BALCO for revamping the 200,000 tonnes year alumina plant at Korba. The detailed engineering work and site supervision for this project is in progress. MECON have com-

pleted the feasibility report for development of Gandhamardan Bauxite deposit which will feed the Korba plant and is presently providing detailed engineering services for development of mine.

*Design and Supply, Erection and Commissioning of Rolling Mills and Auxiliary Equipments*

3.19.5 For the Bokaro Cold Rolling Mill Complex under the four million tonne expansion programme, MECON is designing and supplying a five stand tandem Cold Rolling Mill, twin stand DCR/temper mill and a single stand Skin Pass Mill. All these mills are four high and provided with hydraulic automatic gauge control. Equipment delivery for these mills has already commenced and more than 50% of the mechanical equipment has been delivered at site. It is expected that by June, 1982, all equipments will be delivered. Besides the above, MECON is also designing and supplying a two high skin pass mill for Bokaro to be installed in its new Hydrochloric Acid Pickling Line. MECON is designing all the processing and finishing lines like pickling, continuous coil galvanising, continuous annealing, shearing and slitting lines for the CRM complex of Bokaro. Equipments are being manufactured in India and abroad and per manufacturing drawings prepared by MECON. MECON is designing and supplying a sophisticated four high reversing cold rolling mill for the CRGO (silicon steel) project of Rourkela steel plant. MECON has also taken up the complete erection of mechanical equipment and auxiliary systems for this mill. Most of the equipment has already been supplied and erection work has commenced. MECON is designing and supplying the hydraulic and lubrication systems for the 3600 mm plate mill of Bhilai. MECON has designed and supplied a sophisticated two high hydraulic temper mill for the Stainless steel plant at Salem. The mill has already been erected and commissioned.

3.19.6 MECON has designed, supplied, erected and commissioned one Bar Rolling Mill and one Wire Rod Rolling Mill for Mishra Dhatu Nigam Ltd. (MIDHANI). A two high reversing blooming mill for M/s. Guest, KEEN, Williams Ltd. designed and supplied by MECON has been successfully commissioned. MECON has also received orders for a four high reversing narrow cold rolling mill from M/s Tube Products (India) Ltd., and for a four high/two high rolling mill for Defence Metallurgical Research Laboratory (DMRL), Hyderabad.

*Design & Engineering of Coke Oven Projects*

3.19.7 MECON has been setting up coke oven batteries of its own design and engineering in various public sector steel plants. MECON has entered into a Licence Agreement with V/O Tiaj-promexport of USSR for design and manufacture of seven metre tall coke oven batteries and dry coke cooling plants. Orders have been secured for seven metre coke oven batteries and associated dry coke cooling plants from Visakhapatnam steel project and for coke oven batteries only from Bhilai steel plant.

*Chemical projects*

3.19.8 Assignments with MECON in respect of chemical projects include consultancy, detailed engineering and project supervision services for TIO<sub>2</sub> project of KMML and consultancy and detailed engineering services for Carbon Black Project of M/s. CACIL and Calcium Carbide Project of APIDC in the joint sector.

*Foreign assignments*

3.19.9 MECON continued to render technical consultancy and project monitoring services to the Delta steel plant of the Federal Government of Nigeria in connection with their 1.0 m.t. direct reduction based integrated steel plant being constructed near Warri in Nigeria. The Agreement has been further extended upto December, 1982, and the scope of services to be rendered by MECON to Delta Steel Company has also been extended.

3.19.10 MECON continued to render project management and technical services for the second integrated steel plant of 1.3 m.t. capacity being constructed at Ajaokuta in Nigeria. MECON received this major contract along with Pan-African Consultancy Services (Nigeria) Ltd. (PACS) of Nigeria from the Federal Government of Nigeria in May, 1981.

3.19.11 Feasibility report for setting up a Bar Mill in Sokoto State in Nigeria was submitted to Sokoto Investments Company, Sokoto State, Nigeria. MECON is presently rendering pre-construction engineering services for this project under an assignment received from the Government of Sokoto.

3.19.12 MECON received an assignment from the Federal Government of Nigeria for preparation of a feasibility study for setting up a Rail and Heavy structural mill. A draft Report has already been submitted to the Government of Nigeria as per schedule.

3.19.13 MECON received two assignments from P. T. Krakatau Steel, Indonesia for preparation of (i) a feasibility study for setting up a workshop for manufacture of industrial equipment and (ii) a market survey report for assessing the demand of hot rolled sheets and structures in Indonesia. Work on these two reports is progressing as per schedule.

#### Personnel

3.19.14 The total number of employees of MECON as on 31-12-1981 including the number of employees belonging to Scheduled Castes and Scheduled Tribes and the number of women employees and ex-servicemen is given below :—

Group of posts	Total No. of employees	S.C.	S.T.	Women	Ex-servicemen
'A'	1694	36	16	16	4
'B'	380	3	16	14	—
'C'	850	89	137	90	10
'D' (Excluding Sweepers)	474	63	224	20	164
'D' (Sweepers)	87	58	27	27	—
TOTAL	3485	249	420	167	178

3.19.15 The industrial relations situation during the year was normal.

#### 3.20 HINDUSTAN STEELWORKS CONSTRUCTION LIMITED

3.20.1 Hindustan Steelworks Construction Limited (HSCL) was formed in June, 1964 with the object of creating in the public sector an organisation capable of undertaking complete construction of modern integrated steel plants from the stage of site investigation to commissioning. Starting with site levelling, civil engineering and structural work for the first stage of Bokaro steel plant, the company has expanded its activities to cover such diverse fields as fabrication and erection of technological structures, erection and repair of metallurgical equipment, construction of dams, bridges, silos, power plants, industrial plants, mining complexes, townships etc. It has built up considerable expertise in these fields and has a core of highly skilled and trained engineers and technicians. It has emerged as the largest construction organisation in the public sector.

#### Finance

3.20.2 The authorised capital of the company is Rs. 20 crores of which Rs. 14.50 crores has been paid-up. Government loans outstanding on the 31st December '81 amounted to Rs. 9.11 crores.

#### Works in hand

3.20.3 The company has a number of on-going construction projects, the more important of which are the following :—

##### In India

##### Bokaro steel plant

##### Bhilai steel plant

##### Durgapur steel plant

##### Rourkela steel plant

##### Indian Iron and Steel Co. Limited.

##### Salem steel plant

##### Visakhapatnam steel plant

##### Mysore Power Corpn.

##### National Thermal Power Corporation

##### Uttar Pradesh Electricity Board.

##### Bharat Coking Coal Limited

##### Hindustan Copper Ltd.

##### Metro Railway, Calcutta

##### Overseas

##### Libya

##### Iraq

Expansion to the 4 million tonnes stage; captive power plant and Benzol rectification plant on turn-key basis.

Expansion to 4 million tonnes stage. Re-building of coke oven battery No. 2; captive power plant.

Capital/running repairs to coke oven battery; structural work for silicon steel plant; civil works for ferro alloy stores.

Hot repairs and commissioning of coke oven batteries No. 7 & 8.

Cold Rolling Mill Complex; township. Site levelling and civil engineering for blast furnace No. 1.

Construction of concrete dam at Supa.

Site levelling, grading and water circulation system for super thermal plant at Singrauli; site levelling and coal handling plant for super thermal power plant at Korba; 220 meter high R.C.C. Chimney for Korba power plant.

Site levelling and R. C. C. Chimney for super thermal power plant at Anpara.

Coal preparation plant at Moonidih.

Civil and structural works for crushing & screening plant at Malanjhand.

Subway structures.

Construction of 104 school buildings and ancillaries, valued at Rs. 110.38 crores.

Water Research Centre at Baghdad, valued at Rs. 8.26 crores. This work has since been surrendered to the Engineering Project India Limited, who are the main contractors, for completion.



### Turnover and working results

3.20.4 The company's turn-over in 1980-81 was Rs. 156.08 crores. The budgeted turn-over in 1981-82 is Rs. 174.77 crores. The total value of works in hand in India and abroad on the 31st December '81 was Rs. 388 crores.

3.20.5 The company has been incurring losses because of a large surplus labour force at Bokaro, increase in costs which could not be recovered from the clients in terms of existing contracts and other adverse factors. The loss in 1980-81 was Rs. 20.22 crores as worked out by the "simple accrual method". The loss in 1981-82 is likely to be around Rs. 11.2 crores. As the company is facing a number of problems, Government, in consultation with the management of the company, is giving serious consideration to the measures that should be taken to improve the performance of the company and its liquidity position.

### Personnel

3.20.6 The personnel position as on the 31st December '81 is indicated below :

Category	Total No. of employees	S.C.	S.T.	Ex-service men	Female employees	Physically Handicapped Persons
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Group A	1910	28	10	17	5	1
Group B	630	38	4	3	7	1
Group C	16270	1825	890	191	110	27
Group D (Excluding sweepers)	5703	1259	2316	4	1298	6
Group D (Sweepers)	162	85	20	Nil	32	Nil
TOTAL	24675	3235	3240	215	1452	35

## CHAPTER IV

### PRIVATE SECTOR

#### 4.1 Tata Iron & Steel Co. Ltd.

4.1.1 The industrial complex of Tata Iron & Steel Co. Ltd. (TISCO) consists of the integrated steel plant at Jamshedpur, captive collieries at Sijua, Jamadoba and West Bokaro and an iron ore mine at Noamundi. The TISCO Steel Plant is the oldest in the country and has presently an installed capacity of 2 million tonnes/year of steel ingots equivalent to 1.5 million tonnes of finished steel. The Plant produces a number of semi-finished and finished steel items.

#### Production

4.1.2 The Steel Plant has been operating at over 90% of installed capacity for several years. The production during the last 3 years and the current year is indicated below :—

	Steel ingots	Saleable Steel
	('000 tonnes)	
Capacity	2,000	1,500
1978-79	1,866	1,516
1979-80	1,779	1,448
1980-81	1,875	1,537
1981-82 (April-December 1981)	1,444	1,159

4.1.3 TISCO expects that the production in 1981-82 of saleable steel will be around 1.55 million tonnes, i.e. 103% of capacity.

#### Financial Performance

4.1.4 TISCO has reported a profit of Rs. 46.60 crores (before tax) for the half year April-September 81. The profit for the corresponding period of 1980 was Rs. 18.12 crores on a comparable basis.

## Important Capital Schemes

### (a) Five Year Programme

4.1.5 The Company has undertaken a 5-year Capital expenditure programme for major replacement, repairs and additions in order to maintain operational efficiency. The programme envisages an expenditure of Rs. 213 crores. The two major projects included in the programme are the West Bokaro Colliery expansion and increase of captive power generation by 25 MW. The former, which will ensure self-sufficiency in coking coal, is expected to be completed in March 1982. The expansion of power generation capacity is due for completion in the second half of 1983-84.

### (b) Modernisation Programme

4.1.6 TISCO has also undertaken a modernisation programme at a total cost of Rs. 203 crores. Under this programme, half of the steel making capacity will be replaced by a new steel melting shop employing the modern oxygen process. With this replacement, the liquid steel output is expected to increase from 2 million tonnes to 2.16 million tonnes per year. In terms of saleable steel, the capacity will increase from 1.524 to 1.740 million tonnes. The modernisation is expected to be completed by March, 1983.

### 4.2 Mini Steel Plants

4.2.1 Apart from the integrated steel plants, the electric arc furnace units (popularly known as mini steel plants) along with the rerolling mills constitute an important segment of the steel industry in the country. The integrated steel plants primarily produce mild steel in bulk through the blast furnace route, using iron ore and coking coal. The electric furnace (EF) units, on the other hand, produce alloy and special steels, in addition to mild steel, using steel scrap and sponge iron.

4.2.2 At present, there are 157 EF units in the country having Industrial/COB licences, letters of Intent or registration with the Iron and Steel Controller for production of steel ingots/billets. The total licensed capacity of these units is about 3.5 million tonnes of steel ingots/billets per year. Out of these 157 units, 144 with a capacity of about 3.3 million tonnes per year have already started commercial production. Besides these units, there are about 50 other EF units licenced for production of steel castings. These units also produce some quantity of steel ingots.

4.2.3 The production of ingots from the electric furnace units during the last three years is indicated below :—

Year	(In million tonnes)
1979-80	1.664
1980-81	2.000
April 1981—September 1981	0.981
1981-82 (Estimated)	2.020

4.2.4 The average capacity utilisation of the electric furnace units has been between 65 to 70%. A higher capacity utilisation could not be achieved because of inadequate availability of the main inputs, viz. melting scrap and electric power. The assessed indigenous availability of domestic scrap can meet the requirement of the electric furnaces upto a level of 1.7 million tonnes of liquid metal per year.

4.2.5 In order to improve the capacity utilisation of the EF units and their economic viability, they have been given the following facilities :—

- Liberal import of ferrous melting scrap as well as sponge iron, without payment of import duty;
- Free diversification into production of all grades of carbon and alloy steels, including stainless steel;
- Installation of captive Rolling Mills, provided the interest of the neighbouring small scale rolling mills are not adversely affected;
- Addition of balancing facilities, like continuous casting machine, heat treatment furnaces, conditioning facilities, quality control and testing equipment for improving quality as well as production.

4.2.6 With these facilities, it is expected that the mini-steel plants will achieve a production level of about 2.6 million tonnes by 1984-85 subject to adequate availability of power, which has been a major constraint.

### 4.3 Rerolling Industry

4.3.1 The rerolling industry came into existence in the thirties. Over the last 50 years, the industry has grown into a major component of the steel sector. Its growth, however has been haphazard. From about 400 units in 1966, the number of rerolling mills has increased to over 1,100. There are about 900

rerolling mills in the small scale sector registered with the Directorates of Industries. In the organised sector, there are 233 units. The major raw materials for the industry are billets, blooms, slabs, defectives, untested rails etc. from integrated steel plants and rerollable scrap. The re-rolling industry meets about 70% of the domestic demand for bars and rods and almost the entire demand for light structurals and special sections.

4.3.2 A technical committee was appointed in September, 1978 to make an in-depth study of the re-rolling industry. The committee assessed the maximum capacity of 1044 units reviewed by it at about 18.8 million tonnes per year. It estimated the average capacity utilisation at 17%. The Committee also suggested various measures for regulating the future growth and development of the industry and rationalisation of sections for rolling between integrated steel plants and rerolling mills. The recommendations of the Committee were accepted by the Government. The Government have decided that with effect from 18-8-1981, all rerolling mills, including small scale units, will be under the Central Sector and will operate only under licence to be issued under the Industries (Development and Regulation) Act, 1951.

4.3.3 In addition to the existing independent rerolling mills, licences/letters of Intent have been given to 65 electric furnace units to install captive rerolling mills. Of these units, 49 have already installed rolling facilities and have started production of rolled steel.

4.3.4 The production from the rerolling mills registered with the Iron & Steel Controller, during the last 3 years was as under:—

Year	(million tonnes)
1979-80	1.225
1980-81	1.338
April—Sept. 1981	0.710
1981-82 (Estimated)	1.450

#### 4.4 Steel Wire Drawing Industry

4.4.1 There are 72 steel wire drawing units in the organised sector, with a licensed capacity of 0.83 million tonnes per annum. 70 units, with a capacity of 0.829 million tonnes, are already in production. About 600 units are reported to exist in the small scale sector.

4.4.2 During the previous years, inadequate availability of raw materials had adversely affected the operation of the wire drawing units. In order to augment supply of raw materials, Government have allowed import of carbon steel wire rods under Open General Licence during the licensing period 1981-82. The availability of high carbon wire rods from domestic production has now increased sufficiently to meet the requirement of the wire drawing industry.

4.4.3. In order to give more flexibility to the indigenous wire drawing units, Government have permitted them to diversify their production to all grades of carbon and alloy steel wires within their licensed capacity, except mild steel wires of sizes thicker than 12 SWG.

4.4.4 Production of the steel wire drawing units in the organised sector during the last three years was as under:

	('000 tonnes)
1978-79	363.7
1979-80	337.6
1980-81	332.0
April—September 1981	156.0
1981-82 (Estimated)	320.0

#### 4.5 Tin Plate Industry

4.5.1 Apart from the Rourkela Steel Plant which has an installed capacity for 150,000 tonnes/year of electrolytic tin plate, there are two tin plate units in the private sector with a total licenced capacity of 220,000 tonnes per annum. Both the units are in production. Indigenous availability is considered sufficient to meet the domestic demand except for some special types like OTSC tinplate and tin free steel sheets, which are in the stage of development. The two private sector units mainly use imported tin mill black plate, except for a small quantity supplied by Rourkela Steel Plant. In the past, due to shortage of raw material, production from these units had suffered to some extent. The Government have recently exempted imported tin mill black plate from import duty. It is expected that this concession will revitalise the tin plate industry and that production from these units will increase.

4.5.2 The production of tinplate during last three years was as shown below :

	('000 tonnes)
1979-80	45.0
1980-81	50.0
April to Sept. 1981	34.0
1981-82 (estimated)	50.0

#### 4.6 Steel Strip Manufacturing Industry

4.6.1 There are presently 30 units in the country which produce cold rolled steel strips from hot rolled coils. The total licensed capacity of these units is 0.25 million tonnes per year. Of these, 27 units, with a capacity of 0.21 million tonnes, are already in production. In order to augment the availability of raw materials to the cold rolling units, Government have allowed import of hot rolled steel strips under Open General Licence during the licensing period 1981-82.

4.6.2 The production of the cold rolling units during the last 3 years was as under :

	('000 tonnes)
1979-80	127.9
1980-81	120.0
April—Sept., 1981	68.0
1981-82 (estimated)	138.0

#### 4.7 Ferro Alloy Industry

4.7.1 The ferro alloy industry plays a complementary role to the steel sector in as much as it provides one of the essential inputs viz. ferro alloys. At present, there are 23 licensed units having a total licensed capacity of 0.48 million tonnes per year for producing ferro-manganese, ferro-silicon, ferro-chrome, ferro-vanadium, ferro-titanium, ferro-molybdenum etc. 18 units with a capacity of 0.38 million tonnes are already in production. 7 more units have been registered for manufacture of different types of ferro-alloys under the Liberalised Industrial Licencing Policy.

4.7.2 Being a power-intensive industry, optimal performance of the ferro-alloy units depends to a great extent on availability of sufficient power. During the last two years, the production of ferro-alloys was seriously affected due to power shortage, particularly in Orissa and Karnataka. The power situation has

since improved and production of ferro-alloys has also registered an upswing. In 1981-82, the production of ferro manganese, ferro silicon and high carbon ferro chrome has been substantially in excess of domestic requirements and the surplus is being exported.

4.7.3 The production of ferro alloys by the units registered with the Iron and Steel Controller, during the last three years is indicated below :—

Year	('000 tonnes)
1979-80	234.6
1980-81	270.7
April—Sept. 81	154.5
1981-82 (estimated)	310.0

#### 4.8 Sponge Iron

4.8.1 Sponge iron is used as a partial substitute for steel melting scrap in the electric furnaces. At present, the demonstration plant of Sponge Iron (India) Limited (SIIL) at Kothagudem with a capacity of 30,000 tonnes/year is in production. Besides this, three more units in the State sector with a total capacity of 0.51 million tonnes/year have been granted industrial licence/ Letters of Intent for production of sponge iron. The Orissa Sponge Iron Limited, a State Government enterprise, is putting up a 300,000 tonne plant in collaboration with M/s Allis Chalmers of USA. The first stage of this plant for a capacity of 150,000 tonne is expected to be commissioned by March 1982. IPICOL, Orissa proposes to set up another unit of 90,000 tonne capacity in Orissa with indigenous knowhow. The Bihar State Industrial Development Corporation has been given a Letter of Intent for a unit of 120,000 tonnes' capacity.

#### 4.9 Pig Iron

4.9.1 In addition to the integrated steel plants, there are two units which are engaged in the production of pig iron. Their total licensed capacity is 0.13 million tonnes per year. The production of the two units during the last 3 years was as under :—

Year	('000 tonnes)
1979-80	106
1980-81	99
April—September 1981	48
1981-82 (estimated)	100

## CHAPTER V

### MINERAL DEVELOPMENT BOARD

#### *Role and Functions of the Board*

5.1.1 The Government of India decided to set up the Iron Ore Board as a society registered under the Societies Registration Act, to create a centralised agency for ensuring systematic, co-ordinated and integrated development of iron ore deposits within the country and to act as an advisory body on all aspects of development of iron ore resources. The Board came into existence on the 20th January, 1973. Its functions included conservation and optimum utilisation of iron ore.

5.1.2 In 1978, after a review of the working of the Iron Ore Board during the six years of its existence, the Government of India decided to enlarge its scope and functions to include other minerals of strategic importance to the steel industry. To reflect this change in position, the Iron Ore Board was renamed as the Mineral Development Board (MDB) from the 15th June, 1979. Subsequently, in consultation with the Department of Steel/Mines, the area of operation of the Mineral Development Board has been extended further to cover certain other minerals as well. MDB is concerned at present with the following minerals:

#### *Minerals entrusted by Deptt. of Steel*

1. Iron Ore
2. Manganese
3. Chromite
4. Vanadium
5. Titanium
6. Nickel
7. Molybdenum
8. Tungsten
9. Kyanite
10. Sillimanite

11. Magnesite
12. Tin
13. Tantalum
14. Columbium
15. Cobalt
16. Fireclay

#### *Minerals entrusted by Deptt. of Mines*

17. Asbestos
18. Bayrites
19. Fluorite
20. Graphite
21. China Clay
22. Quartz/Quartzite
23. Silica Sand
24. Mica
25. Dolomite
26. Calcite
27. Calcareous Sand

5.1.3 Apart from functioning as Adviser to Government on such aspects of mineral development as may be specified from time to time, the Board is engaged also in preparing perspective plans for resource development and conservation, remedying the information gap by undertaking/sponsoring exploration, analysis, market surveys or other special studies, promoting economic utilisation of mineral resources ensuring adequate supply of these resources to the indigenous industry and advising on steps necessary for promotion of export of these minerals in a manner so that the mineral resource development stays on an even keel, both spatially and in harmony with the infrastructural facilities. Being a resource Board and fully realising that resource is a two dimensional concept, which includes the know-how and the knowledge aspects of utilising the available physical resources, MDB has directed its efforts towards extending the knowledge about physical resources in all their quantitative and qualitative aspects as well as in establishing threshold conditions necessary for the acquisition of new methods, processes, techniques and technologies of resource conversion and utilisation.

### *Composition of the Board*

5.2.1 The constitution of the Board provides for a total membership not exceeding 15 including the Chairman and the Member-Secretary, all nominated by the Government of India. The Board as constituted at present has a whole-time Chairman and 12 Members representing the Departments of Steel, Mines, Commerce, Shipping and Transport, the Planning Commission, the Railway Board, the Steel Authority of India Ltd., the Geological Survey of India, the National Mineral Development Corporation and the Minerals and Metals Trading Corporation of India Ltd. as well as two mining experts from the public and private sectors in mining industry. The Board's expenses are met entirely by grants from the Central Government.

### *Activities of the Board*

5.3.1 With full positioning of staff including a whole-time Chairman for a greater part of the year, 1981-82, the Board witnessed a big spurt in its activities and intensification of efforts as well as definition of direction in consonance with its objectives. It is hoped that these activities on fructification will augment our resources, specially in Manganese, Tungsten, Vanadium and certain other strategic minerals. It is also hoped that the efforts, if successful, would help in altering the iron-making processes, conserving resources, effecting economy in investment, enabling greater regional spread in location and providing better raw mineral base to foundry units in the country. A brief resume of the schemes/studies undertaken by the Board in regard to various minerals is given below:

#### *Schemes and studies*

##### *Iron Ore*

5.4.1 On a request made by the Committee of Secretaries on Iron Ore and Coal Exports, MDB conducted a study in 1980 on the Profitability of Iron Ore Export Operations. An important point that surfaced during the course of the study is that lumpy materials formed barely 50% of the total output from the mines while the rest consisted of sinter-feed materials, materials too fine to be sintered and slimes. The slimes in the case of washed ore were having 55% Fe content.

5.4.2 Realising that this pattern of utilisation of the ores is detrimental to the interests of conservation and in order to

improve the economics of mining and to reduce, if not eliminate, the ill effects of pollution, the Board launched studies that would lead to methods which improve the viability of production and export in iron ore. For this purpose, the Board has commissioned—

- (i) The National Mineral Development Corporation (NMDC) to undertake a study of the recovery of Fe from the slimes; and
- (ii) SALA (International) to undertake a study of the recovery of Fe from the slimes through HGMS (High Gradient Magnetic Separation) process and also to undertake the production of cold-bonded pellets and test their suitability for use in blast furnace and directed reduction.

If favourable results are obtained, the country can recover Fe materials from the slimes and also use the fines (which cannot be sintered) for the production of cold-bonded pellets which could be utilised either in blast furnace or for direct reduction.

5.4.3 The Board had also commissioned two studies for direct utilisation of the fine ores through intensive reduction by a new process called INRED process developed by a Swedish Company, Boliden. The result of these studies would be available during 1982-83 to promote the interests of conservation and optimal utilisation of iron ores. It is also hoped that the new processes of iron making will avoid the criticality of inputs such as coking coal and investment gigantism of large tonnage plants and enable the decision-makers to locate iron making industrial units throughout the country with less inhibition. This is indeed the most important and promising area of study in the MDB at present.

##### *Manganese*

5.5.1 In regard to Manganese ores, information about reserves position is somewhat unsatisfactory for the present and anticipated needs. MDB encouraged GSI to undertake intensive exploration work in Sandur area of Karnataka State. Preliminary information regarding exploration activity promises good results.

5.5.2 Realising that the problem of fines utilisation is also present in regard to Manganese ores, which is adversely affecting

the interests of conservation and optimal utilisation of the existing ore production, MDB has sponsored the testing of the sinter process developed by the Regional Research Laboratory (RRL), Bhubaneswar. It procured high grade Manganese ore fines from various mines in Orissa and got them sintered at the Kalinga Iron Works. The sinter was then tested at the Ferro Alloy Plant of Tatas at Joda. The results have proved very encouraging and now some of the mine owners are offering to set up sintering plants. If these high grade manganese fines are sintered and utilised, the interests of conservation and utilisation of the ore output would become a reality.

5.5.3 Encouraged by the success and wide acceptance of the first project on Modelling Studies in regard to the impact of the quality of Manganese ores on hot metal, MDB has sponsored another project for modelling the Ferromanganese plant processes and the impact of the quality behaviour of Manganese ore on them. The results of this project will be available in 1982-83.

5.5.4 A small project was launched by the Board to study the effects of screening on the quality of Manganese ore. The preliminary test show that the ores from Nishikhal area, when screened, give two fractions—one rich in iron content and the other rich in Manganese content, though the degree of up-gradation is not adequate enough for use in the production of Manganese Dioxide. Further efforts are in progress.

5.5.5 MDB has commissioned the Department of Geology, Utkal University, for studying the nature of Manganese Wads and the possibility of their use.

5.5.6 The efforts of MDB are directed towards identifying technologies, processes and methods of both ore production and utilisation in the interests of conservation, resource augmentation and minimisation of wastage.

#### *Vanadium*

5.6.1 MDB has sponsored a project on exploration, analysis and testing of Khursipar Mangnetite deposits which bear Vanadium. Drilling is nearing completion. After evaluation of the results, necessary steps can be taken to plan the establishment of a Ferro Vanadium plant. The preliminary results indicate that the reserve may be more than what was expected.

5.6.2 MDB has also prepared a Status Report on Vanadium.

#### *Tungsten*

5.7.1 MDB has taken the initiative to accelerate the exploration of all known Tungsten occurrence within the country. It has sponsored a project to undertake large scale drilling and analysis of the material to develop a proper flow-sheet which would enhance the recovery of Tungsten from ROM output. It has also encouraged GSI to undertake the exploration of Sirohi Tungsten deposits in Rajasthan. MDB would be shortly commissioning a project for undertaking the exploration of Tungsten deposits in Almora district of U.P. It has also advocated the re-circulation of Tungsten scrap as a measure of conservation.

5.7.2 MDB has completed a market study on Tungsten, which reveals that the demand would reach a level of 1250 tonnes by 1985.

5.7.3 MDB has also commissioned Golder Moffitt Associates of U.K. to test and analyse the samples from Degana deposits of Rajasthan to develop a flow-sheet for improving the Tungsten recoveries even from the existing run-of-mine output.

5.7.4 Tungsten being a strategic material, it is imperative that a crash programme of exploration and development should be undertaken so that the country avoids not only costly imports but, more importantly, attains a degree of self-reliance in this regard.

#### *Chromite*

5.8.1 MDB has sponsored, through BRL, Bhubaneswar, a study to investigate the possibilities of beneficiating Chromite content in overburden material.

#### *Refractory Materials*

5.9.1 *Kyanite*: As the high grade Kyanite reserves are getting exhausted, there is urgent need to develop beneficiation and agglomeration techniques for utilising the low grade Kyanite materials. The Indian Bureau of Mines has developed a beneficiation process and MDB has sponsored a project with CGCRI (Central Glass and Ceramic Research Institute) to



test the concentrates prepared through IBM process for suitability in the manufacture of refractory bricks.

#### *Others*

5.10.1 MDB has sponsored a study on Employment and Choice of Technology in Iron Ore, Manganese and Mica Production. The project seeks to examine the options before the planner in choosing technologies and maximising the employment potential as well as by transformation of labour from unskilled to skilled categories. The project would be completed towards the beginning of the next financial year.

5.10.2 *Resource Audit* : A new approach is being attempted by MDB in cataloguing the mineral resources of one State, namely, Rajasthan in all its quantitative and qualitative aspects against the background of available infrastructure of the State. These physical resources would be juxtaposed with the state of arts in the production of various metals and minerals to develop a shelf of investment proposals that could be undertaken at will. This resource audit would help in identifying the future needs of exploration and development of mineral resources and, consequently, the needs of infrastructure, R&D and financial investment. The results of this project would be available in early 1983.

#### *Mineral Production*

##### *Iron Ore*

5.11.1 India is well-endowed with resources of iron ore, both in terms of quality and quantity. The iron ore reserves in the country are presently estimated at 13,500 million tonnes, out of which about 10,500 million tonnes are haematite and 3,000 million tonnes are magnetite. The larger deposits are concentrated in five more or less district areas, viz., the Bihar-Orissa belt, the Bailadilla-Dalli-Rajhara area of Madhya Pradesh, the Bellary-Hospet area in Karnatak, Ratnagiri district in Maharashtra and Goa.

5.11.2 The iron ore mines in the country can be classified broadly under three types :

- (i) "Captive" mines owned and operated by integrated steel plants, for their own use;

- (ii) Large mechanised mines owned and operated by public sector organisations, such as, the National Mineral Development Corporation Limited and the State Government undertakings for export and internal consumption; and
- (iii) Smaller mines operated by private individuals or companies on manual or semi-mechanised lines.

5.11.3 In 1980, about 40.9 million tonnes of iron ore were produced in the country, of which 25.8 million tonnes were exported and 14.6 million tonnes were consumed internally. The production in 1981 was at more or less the same level, with an export of 25 million tonnes and internal consumption of 15.8 million tonnes.

5.11.4 Over the last 15 years or so, blast furnaces the world over have taken to greater use of sintered fines and of pellets for the production of hot metal because of the resultant fuel saving. Another recent development is the production of direct reduced iron (sponge iron) from iron ore pellets or calcinated lump ore using a gaseous or solid reductant, and conversion of the sponge iron into steel in electric furnaces. This technology is particularly suited to countries which have cheap fuel, such as natural gas, and electric energy. Because of these developments, a large number of pellet plants have come up in a number of countries. The total pellet capacity in the world in 1980 was around 263 million tonnes. 218 million tonnes for blast furnace grade pellets and the balance for direct reduction grade pellets. The direct reduction (sponge iron) capacity in the world was about 21 million tonnes.

5.11.5 In India, there are two pellet plants in the private sector with a combined capacity of 1.5 million tonnes/year of BF grade pellets. As mentioned earlier, the joint sector company, Mandovi Pellets Limited, has a plant for production of 1.8 million tonnes/year of BF grade pellets. A three million tonne pellet plant for production of DR grade pellets is being set up at Mangalore in the public sector.

##### *Manganese ore*

5.12.1 The recoverable reserves of manganese ore in the country amount to 117 million tonnes. Manganese is a strategic metal and is an essential input in the production of special steels. Because of its importance and the limited reserves, ex-



port of high grade manganese ore has been banned for the last several years. Export of lower grades is allowed within certain quantitative limits.

5.12.2 Manganese ore mining is largely manual. Apart from Government enterprises like Manganese Ore (India) Limited, Orissa Mining Corporation and Mysore Minerals Limited, most of the manganese mines are operated by private parties. In 1980, a total quantity of 1.7 million tonnes of manganese ore was raised in the country of which 1.04 million tonnes was consumed internally and 0.4 million tonnes with internal consumption of 0.9 million tonne and export of 0.5 million tonnes. The fall in internal consumption was due to power restrictions affecting production of ferro-manganese. The main producers of manganese were Orissa, Karnataka, Madhya Pradesh, Maharashtra and Andhra Pradesh.

#### Chromite

5.13.1 Chromite is the ore of chromium which is a very important alloying element in ferrous metallurgy. The known reserves of chromite in the country are estimated at 113 million tonnes. The largest deposits are located in Orissa, which accounts for about 80% of the country's production. As in the case of manganese ore, a restrictive policy is followed by the Government in regard to export of this mineral. High grade chromite has been banned for several years and export of lower grades is allowed within quantitative ceilings. 321,000 tonnes of chromite were produced in 1980 of which 137,000 tonnes were consumed within the country and 174,000 tonnes were exported. Although 323,000 tonnes of ore were produced in 1981, only 72,000 tonnes could be exported and 139,000 tonnes went for internal consumption. The steep fall in exports was largely due to the decline in demand arising from cut-back in stainless steel production in the developed countries and intense competition from other producers of the ore.

#### Companies of the Bird Group

5.14.1 The assets and undertakings of Bird and Company Limited were acquired by the Government under the Bird and Company Limited (Acquisition and Transfer of Undertakings and other Properties) Act, 1980. The administrative control of four companies of the Bird Group has been entrusted to the Department of Steel.

5.14.2 The names of these companies and the Government's shareholding in them are indicated below :—

Name of the Company	Government's share holding (as percentage of total)
1. Orissa Minerals Development Company Limited	47.50
2. Karanpura Development Company Limited	51.53
3. Kumardhubi Fireclay and Silica Works Limited	37.35
4. Bisra Stone Lime Company Limited	40.45

5.14.3 In the Bird Group, there are seven investment companies. It has been decided by the Government to amalgamate these seven companies and to transfer the administrative control of the amalgamated company also to the Department of Steel. Necessary action for amalgamation is under way.

5.14.4 The four companies mentioned above deal in inputs of the steel industry. Thus, Orissa Minerals Development Company Limited is a producer of iron ore and manganese ore and has been supplying iron ore to the integrated steel plants. Its annual production capacity is around one lakh tonnes of manganese ore and 9 lakh tonnes of iron ore. In 1981-82 the company expects to produce 80,000 tonnes of manganese ore and 6 lakh tonnes of iron ore.

5.14.5 Karanpura Development Company Limited produces limestone which it has been supplying to steel plants and cement plants. It has also a small refractory plant with an annual capacity of 6,000 tonnes of fireclay bricks. This company expects to produce about 42,000 tonnes of lime-stone and 2,000 tonnes of refractories during 1981-82.

5.14.6 Kumardhubi Fireclay and Silica Works Limited is one of the major producers of refractories in the country. It has an installed capacity of 135,000 tonnes of refractories but production has been low due to inadequate availability of quality raw materials and adverse market conditions. In 1981-82, the company is likely to produce about 75,000 tonnes of refractories, representing 55% capacity utilisation.

5.14.7 Bisra Stone Lime Company Limited is a major producer of lime-stone and dolomite which it supplies to the steel plants. Its production capacity is 1.5 million tonnes a year. The company expects to produce 1.35 million tonnes in 1981-82, representing 90% capacity utilisation.

## CHAPTER VI

### PROGRESSIVE USE OF HINDI

#### 6. General

6.1 The work relating to the progressive use of Hindi for Official purposes in the Department of Steel is looked after by a Hindi Section consisting of a Hindi Officer, four translators and two typists. The Government's policy relating to the use of Hindi for Official purposes as contained in the Constitution, the Presidential Orders, the Official Languages Act and Rules is being implemented in the Department of Steel. The annual programmes framed by the Department of Official Languages in connection with the progressive use of Hindi for official purposes and the general orders issued by them are also being implemented in the Department. In addition, the non-Hindi employees of the Public Sector Undertakings are provided with incentives for learning Hindi by arranging competitions in elocution contests, drama and essay writing. Suitable awards are given to the non-Hindi speaking employees who fare well in these competitions and tests. Noting and drafting in the Hindi section is done in Hindi. The other sections and the Hindi knowing Officers in the Department are also encouraged to write notes and drafts in Hindi.

6.2 With a view to keeping a proper watch over the implementation of the Official policy in connection with the progressive use of Hindi for official purposes, inspections of the attached and subordinate offices as well as the public sector undertakings are carried out. The inspection reports are forwarded to the concerned offices for suitable follow-up action on the deficiencies pointed out therein. During the year under review inspections were carried out of the Kudremukh Iron Ore Company Ltd., Bangalore, Sponge Iron India Limited, Hyderabad, Steel Authority of India Limited, Corporate Office, Central Marketing Office (Delhi Branch), Regional Iron & Steel Controller, Delhi, Metal Scrap Trade Corporation, Calcutta, Hindustan Steelworks Construction Limited, Calcutta, Iron & Steel Controller, Calcutta, Regional Iron & Steel Controller, Calcutta, Central Marketing Organisation under SAIL, Calcutta, Bolani Ores Limited, Calcutta and National Mineral Development Corporation, Hyderabad.

#### Hindi typewriters and help literature

6.3 There are 15 Hindi typewriters in the Department. Help literature has been provided to officers and staff to encourage them to work in Hindi. In order to create interest among the employees for Hindi, Hindi magazines/newspapers have been provided in the Library.

#### Committees relating to Official Language

##### 6.4 (i) Official Language Implementation Committee

Official Language Implementation Committee is functioning in the Department. The Committee reviews the quarterly progress made in the use of Hindi for official purposes in the Department, its attached/subordinate offices and undertakings and decides on the measures to be taken to accelerate its use. During the year under report, three meetings of this Committee have been held. This effort is backed up by meetings taken by the Secretary himself as and when required.

##### (ii) Hindi Salahkar Samiti

A Hindi Salahkar Samiti has also been set up in the Ministry under the Chairmanship of Minister of Steel & Mines. All the chief executives of the Offices/undertakings of this Ministry are the members of this Committee. This Committee advises the Ministry on matter relating to the progressive use of Hindi for official purposes. So far seven meetings of this Committee have been held.

#### Training in Hindi/Hindi Typewriting/Hindi Stenography

6.5 A time-bound programme has been drawn up for imparting training in Hindi/Hindi typewriting/Hindi Stenography to all the employees for whom in-service training is obligatory.

The position regarding training of Government servants in Hindi/Hindi typewriting/Hindi stenography in this Department is as under :—

<i>I. Hindi Training</i>	
Total number of employees (Group A, B & C)	232
Total number of employees possessing requisite Hindi Qualifications	172
Total number of employees who have passed Prabodh, Praveen and Pragya/intensive course/Special Departmental Examinations etc.	39
Total number of employees under training	2
Total number of employees yet to be trained	21

**II. Hindi Typewriting/Stenography**

	Trained	under training	yet to be trained
Hindi Typewriting . . . . .	5	—	28
Hindi Stenography . . . . .	6	—	30

**Notification of Offices in the Gazette of India**

6.6 Consequent on 80% of the staff having acquired a working knowledge of Hindi, the following offices were notified in the Gazette of India during the current year :—

1. Ranchi Road Refractories Plant under Bharat Refractories Ltd.
2. Bhandari Dah Refractories Plant under Bharat Refractories Ltd.

The number of offices notified so far comes to 29.

6.7 Some statistical details covering the quarters ending 30-6-81, 30-9-81 & 31-12-81 regarding the use of Hindi in the work of this Department are given below :—

- (a) Total number of Hindi communications received from anywhere in this Department . . . . . 1168
- (b) Total number of communications replied to in Hindi . . . . . 679
- (c) Total number of communications replied to in English . . . . . —

**POSITION REGARDING ORIGINATING CORRESPONDENCE**

	Number issued		
	Total	in Hindi	in English
(a) Letters issued by the office to offices in Hindi speaking regions . . . . .	732	116	616
(b) Telegrams sent to offices in Hindi speaking regions . . . . .	2	2	—

**Documents issued both in Hindi and English**

	Number issued		
	Total	in Hindi & English	In English only
1. General Orders . . . . .	364	364	—
2. Resolution & Notification . . . . .	129	129	—
3. Administrative & other reports . . . . .	1	1	—
4. Papers laid before the Houses of Parliament . . . . .	52	52	—
5. Budget Performance of the Department for the year 1981-82 . . . . .	1	1	—
6. Government reviews on the annual reports . . . . .	4	4	—
7. Agenda Notes and Minutes of the meeting of Staff Council and Consultative Committee.	All Agenda papers and minutes of Staff Council & Consultative Committee were normally issued biligually.		