सत्यमेव जयते
GOVERNMENT
OF INDIA

ANNUAL REPORT
1990-91

DEPARTMENT OF STEEL

MINISTRY OF
STEEL & MINES

REPORT
1990-91

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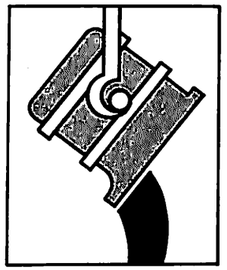
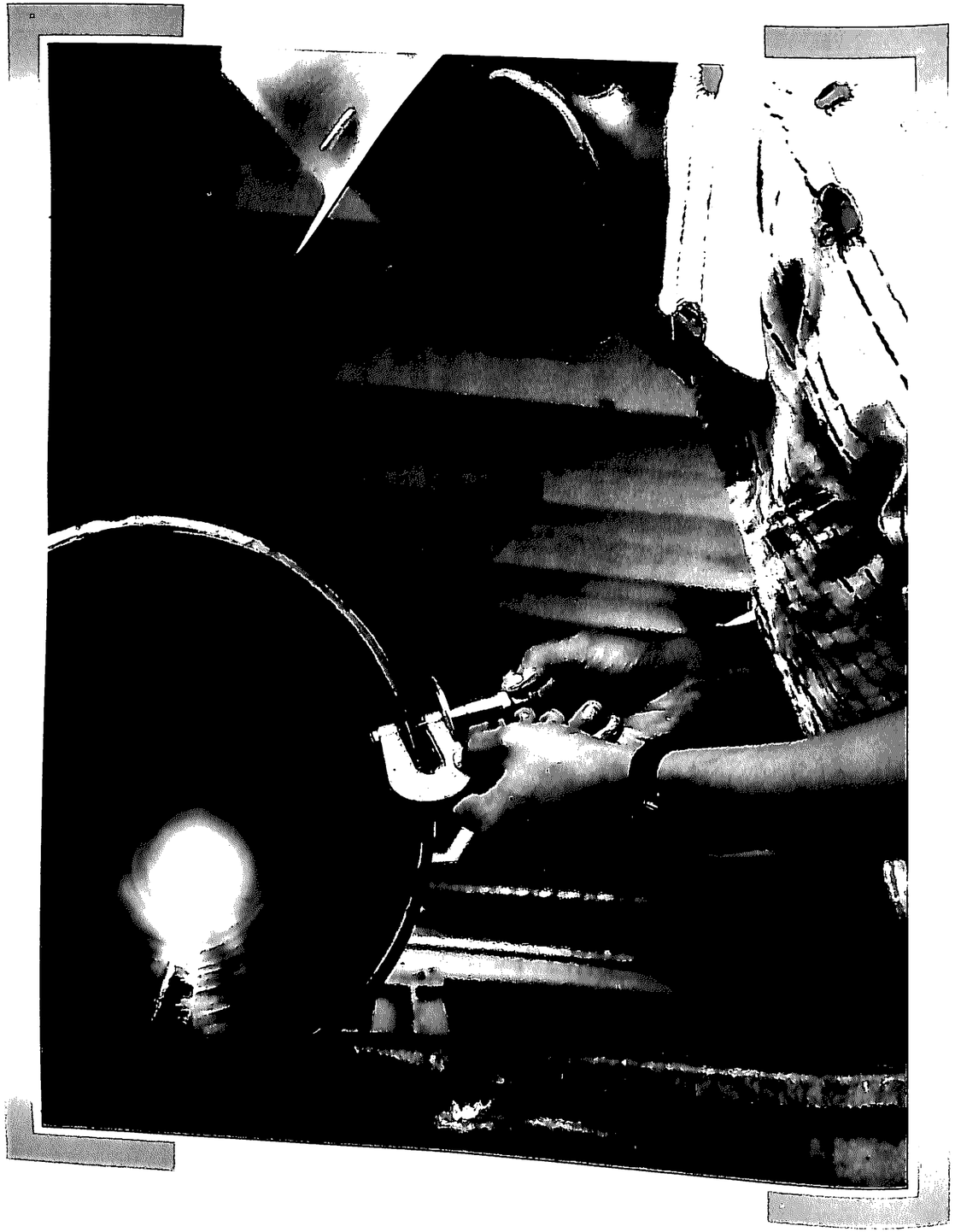
Contents

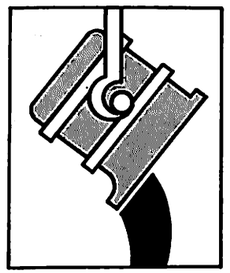
Year's Highlights



* **S**teel Authority of India records a production of 9.8 MT of hot metal in 1990-91 as against 9.6 MT in 1989-90 and 7.36 MT of saleable steel as against 7.06 MT in 1989-90.
* **B**hilai and Bokaro expansion project (4 MT) completed.
* **S**econd Sendzimir Mill at Salem Steel Plant commissioned.
* **V**isvesvaraya Iron & Steel Ltd. gets its first blast furnace sanctioned.
* **B**last furnace 1 at Visakhapatnam Steel Plant, the biggest in the country commissioned on March 28, 1990.
* **F**irst Steel Melting Shop and continuous casting machine commissioned at Visakhapatnam Steel Plant in September, 1990.
* **W**ire rod mill commissioned at Visakhapatnam Steel Plant in November, 1990.
* **V**isakhapatnam Steel Plant produced 6.84 lakh tonnes of hot metal and 5.21 lakh tonnes of pig iron.
* **A** number of enterpreneurs take effective steps to set up Mini Blast furnaces for production of Pig Iron Products.
* **A** new set of licensing guidelines issued for the steel industry to encourage modernisation/expansion of existing units and to permit freely, backward and forward integration.
* **F**or the first time, steel making units through the BF/BOF route with capacity upto 1 MT opened to private/joint/assisted sector.
* **K**udremukh Iron Ore Company Ltd. closed the year with record production 6.01 MT iron ore concentrate and 1.92 MT of pellets, profits touched a record Rs. 58 crores.
* **M**anganese Ore (India) Limited records highest production, turnover and profits since inception, in 1990-91.
* **B**harat Refractories Limited receive their first export order of Slide Gate Plates from Flogates Limited, U.K.
* **B**road Banding introduced in Ferro alloys industry.
* **U**nder the special thrust given for creation of indigenous capacity in ferro-nickle, Letters of Intent were issued for creation of 2 lakh tonnes capacity in ferro nickel.
* **S**ponge Iron production capacity crosses 1 million tonnes in 1990-91.
* **H**ighest production of diamonds at 17441 carats by National Mineral Development Corporation.



The Year at a Glance



1. Production of Steel

The production of saleable steel in the five integrated plants of SAIL during the year 1990-91 (April 1990 to March 1991) was 7.36 million tonnes representing an increase of 4% over the production achieved in 1989-90.

TISCO closed the year 1990-91 with the production of 1.94 million tonnes (provisional) of saleable steel. Production of finished steel in the secondary sector during the year 1990-91 is expected to close at around 6.22 million tonnes from its own production and from semis supplied by the integrated steel plants.

Total production of saleable steel in the country during the year 1990-91 is likely to be around 9.30 million tonnes.

2. Demand and Availability of Steel

According to the estimates of the Joint Plant Committee, the demand for finished steel in the country for the year 1990-91 is around 15.3 million tonnes. Against this the estimated availability of finished steel through indigenous production is expected to be 13.43 million tonnes and of pig iron about 1.57 million tonnes. The gap between demand and availability would be met by imports. It is expected that the physical arrivals during 1990-91 will close at around 1.12 million tonnes of finished steel and 0.10 million tonnes of pig iron.

3. Performance of SAIL

Production of saleable steel in the five integrated steel plants of SAIL for

1990-91 was 7.36 million tonnes representing an increase of 4% over the production in 1989-90. Production of crude steel was 8.76 million tonnes representing a 6% increase over the production achieved in 1989-90. The ratio of standard tested steel in total saleable steel remained at 85%, the same level as the previous year. Energy consumption per unit of production has reduced by 3% compared to 1989-90.

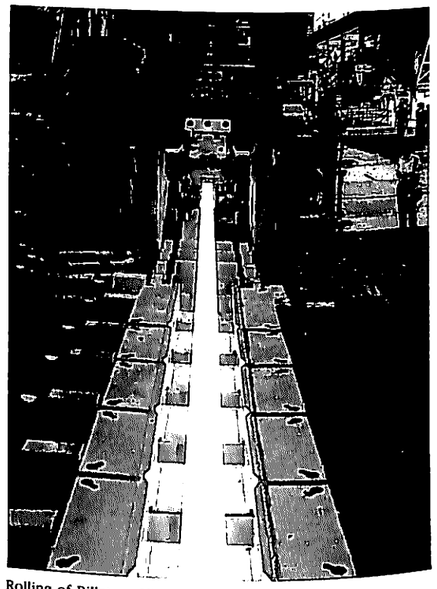
4. Major Construction Projects

(a) SAIL Projects

Two major projects which had been under implementation for many years were completed, namely Bhilai (4 million tonnes expansion) and Bokaro (4 million tonnes expansion). Construction work on the modernisation of the Durgapur Steel Plant is in full swing and the project is expected to be completed by March 1993. The modernisation scheme for the Rourkela Steel Plant was approved in December 1989 and is presently under progress. This project is scheduled to be completed by April, 1995.

(b) Visakhapatnam Steel Project

Many major milestones were achieved in the Visakhapatnam Steel Project in 1990-91. After commissioning of the largest blast furnance in the country on 28th March, 1990, there has been a sequential commissioning of other units such as the steel melting shop,



Rolling of Billets at Visakhapatnam Steel Plant.

continuous casting plant, the billet mill and the wire rod mill. All the units under phase-I have been commissioned except for the Coke Oven Battery No. II and the Bar Mill. It is expected that the Phase I of the plant will be completed by November, 1991 in all respects. The inputs of Phase II of the project would be commissioned by August, 1992. Yeleru canal scheme is also progressing well and would be in a position to supply water on a sustained basis to VSP by mid, 1991.

5. Electric Arc Furnace Industry

At present 206 mini steel plants with a total licensed capacity of about 10 MT per annum have been licensed and out of these units 169 units with a licensed capacity of 6.2 MT have been commissioned. Letters of Intent have been issued for modernisation/ expansion of installed capacity under which the new capacity granted amounts to 3.18 MT.

Production of electric arc furnace units during the last 3 years and for April to September, 1990 is placed below:—

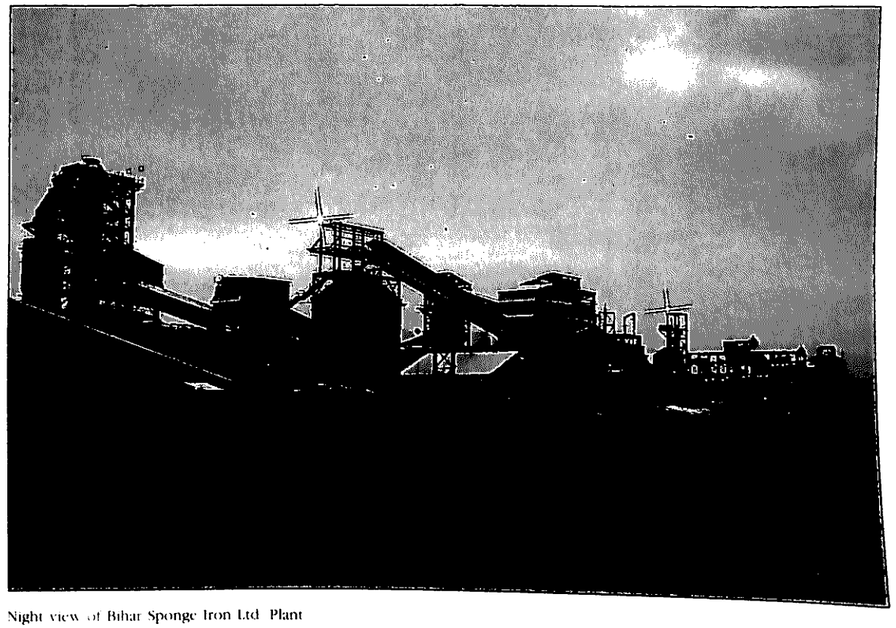
(in lakh tonnes)

Category	1987-88	1988-89	1989-90	April-Sept., 1990
Mild Steel	21.94	20.58	20.41	10.16
Medium and High carbon steel	3.82	4.85	3.94	1.55
Alloy Steels	4.21	5.02	5.33	2.71
Stainless steel.	1.13	1.27	1.53	0.76
Total	31.10	31.73	31.22	15.20

Note: The above figures do not include production of steel by casting units registered with DGTD.

6. Sponge Iron Sector

Sponge iron is a metallic product produced by direct reduction of high grade iron ore or pellets into the solid state. Also known as direct reduced iron (DRI) or Hot Briquetted Iron (HBI), it contains a large percentage of metallic iron. This is a partial substitute for steel melting scrap used by the secondary steel sector. The indigenous availability of metal scrap is very low. Steel scrap abroad is becoming scarce on account of technological advancement in steel production as a result of which the imports are becoming more and more costly. Moreover, most of the imported steel scrap has to be bought in hard currency. Production of sponge iron is, therefore, being encouraged by the Government in order to conserve free foreign exchange. Production of sponge iron has been de-licensed and it is proposed to produce a minimum of 5 MT of sponge iron per annum by the end of 8th plan.



Night view of Bihar Sponge Iron Ltd. Plant

The installed capacity of sponge iron units till 1988-89 was only 3.3 lakh tonnes. This increased to 6 lakh tonnes in 1989-90 and to 14 lakh tonnes in 1990-91. During the year the first large gas-based sponge iron unit with a capacity of 8 lakh tonnes was commissioned by M/s ESSAR Gujarat Ltd. at Hajira on the west coast in Gujarat. The total sponge iron production this year is likely to touch 1 million tonne mark against last year's production of 3 lakh tonnes. The performance of sponge iron units that are commissioned is given below:—

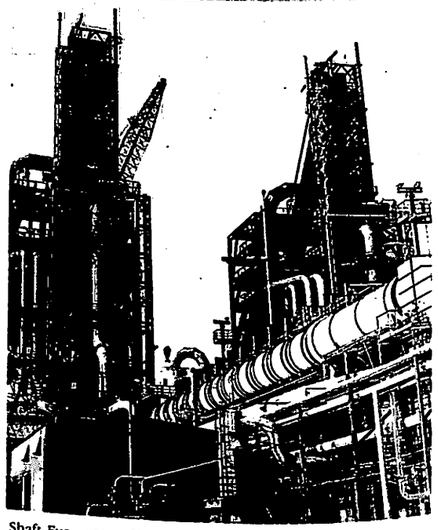
(in lakh tonnes)

Name of the unit	Location	Installed capacity	Production during 1989-90	Production during 1990-91 (provisional)
(a) Sponge Iron India Ltd.	Kothagudam, Distt Khammam, AP.	0.6	0.54	0.47
(b) Orissa Sponge Iron Ltd.	Nayagarh, Distt. Keonjhar Orissa.	1.5*	0.91	0.80
(c) IPITATA Sponge Iron Ltd.	Distt. Keonjhar Orissa.	1.2	0.55	0.62
(d) Bihar Sponge Iron Ltd.	Chandil, Distt. Singhbum, Bihar.	1.2	0.78	1.12
(e) Sunflag Iron	Bhandara,	1.5	0.40	0.79
Sub-total (Coal-based)		6.0	3.18	3.80
Gas-based				
(a) Essar Gujarat Limited	Hazira, Distt. Surat, Gujarat	8.0	Nil commissioned on 30.3.90	4.50
	Total (A + B)	14.0	3.18	8.30

* derated to 1.0 lakh tonnes.

7. Pig Iron Industry

With increased production from VSP and imports under OGL the shortage



Shaft Furnaces of H B I Plant, Essar.

of pig iron exports last year, has been alleviated to an appreciable extent. Further, the Government have taken positive steps to promote establishment of pig iron units in the secondary sector. The production of pig iron has been de-licensed subject to locational conditions. While the major route being encouraged is the mini-blast furnace route (MBF), some entrepreneurs are also pursuing the submerged arc furnace (SAF) route. The response to Government's liberalised policy has been encouraging. So far 11 units with a proposed capacity of 11 lakh tonnes have applied to central financial institutions for credit. As part of this package Government are also encouraging setting up of merchant coke oven batteries in the private sector to cater to the needs of the steel plants. Government are also encouraging steel-making facilities based on the energy optimising furnace (EOF) in which the hot metal produced in the MBF can also be used.

8. Iron Ore Exports:

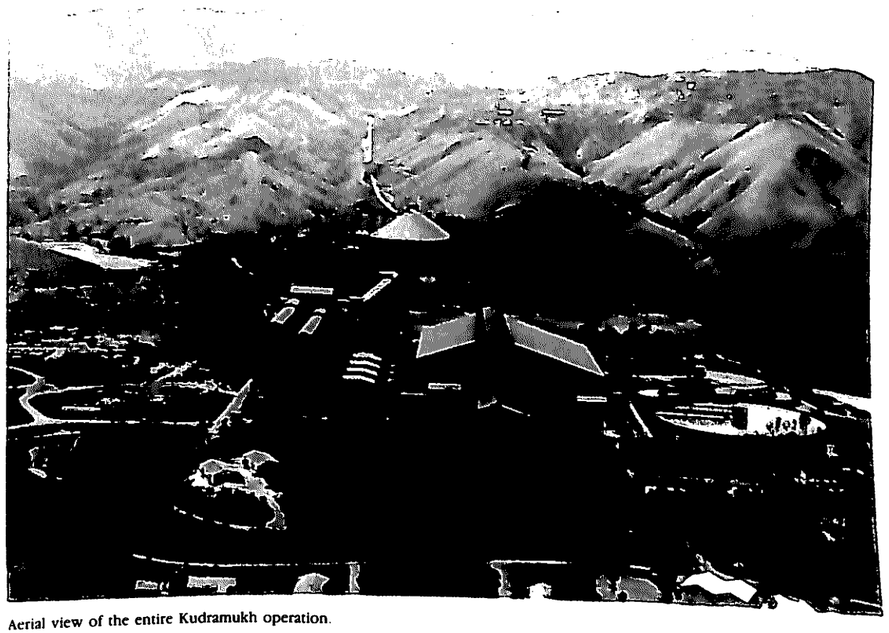
During the year 1989-90 the country exported 33.77 MT of iron ore valued at Rs. 891.12 crores. In 1990-91 exports are expected to touch 32 MT valued at an approximate Rs. 1057 crores. A major sizable portion of the exports has been from the two undertakings of the Department of Steel, namely National Mineral Development Corporation (NMDC) and Kudremukh Iron Ore Co. Ltd. (KIOCL).

9. Export of other Materials

In respect of other minerals the Government policy has been in the direction of substituting value added products like ferro alloys in place of raw ores and promoting greater utilisation of the lower grade ores within the country through beneficiation and other means. In keeping with this policy upward ceilings were fixed on exports of manganese (5 lakh tonnes) and other ores.

10. Ferro Alloys

Besides encouraging the adoption of new technologies for utilising the low grade ores Government formulated policy for creation of fresh capacity in the ferro alloys industry to build up exportable surpluses. It was decided to issue fresh licences for an additional capacity of 5 lakh tonnes. The broad-banding of existing licences was allowed to include almost all ferro alloys so as to provide flexibility to the manufacturing units.



Aerial view of the entire Kudramukh operation.

11. Steel Consumers' Council

The Steel Consumers' Council was established in January 1986 under the Chairmanship of Minister for Steel and Mines to provide a forum for interaction between Government and various sections of steel consumers. The annual meeting of the Council was held in May 1990 at New Delhi, apart from regional meetings at Madras, Calcutta and Chandigarh. These meetings have helped to create a closer rapport between the Government, the producers and the consumers by facilitating a fruitful exchange on all aspects of availability and distribution of iron and steel.

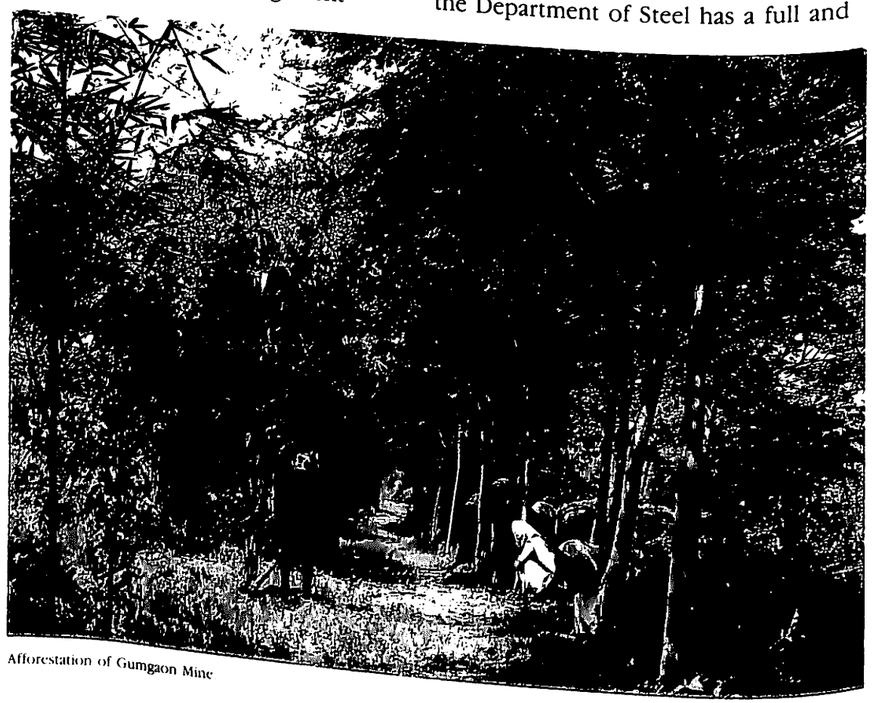
12. Management Information Systems

A special thrust was given on development of the management information systems which were developed and brought into use in the areas of production, licensing, budget and information on public sector units. Other areas identified for development include industry management and approvals, projects, personnel management and use of Hindi.

Staff engaged in computerisation work have acquired a degree of proficiency and knowledge about usage of computers, and are operating the systems with increased confidence. A number of training programmes were conducted with the assistance of the National Informatics Centre.

13. Environmental Protection

Every project taken up for implementation by the undertakings of the Department of Steel has a full and complete environmental management plan as an integral part of the project programme, duly cleared by the concerned Departments and Government agencies at various levels.



Afforestation of Gumgaon Mine

14. Welfare of Scheduled Castes and Tribes and Welfare of Minorities

With a view to safeguarding the interest of minorities and other weaker sections, the representation of the weaker sections and minorities on all Departmental Selection Committees both in the department and the public sector undertakings has been ensured, in line with government policy in this regard. All undertakings of the Department of Steel have been advised to give special considerations to persons from minorities communities and weaker sections of society in recruitment, and also to undertake special training and welfare programmes for their benefit.

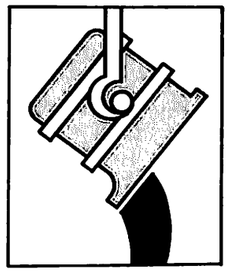
15. Implementation of Official Language Policy

The progressive use of Hindi in the work of the department, its subordinate offices and public sector enterprises has been actively encouraged. During the year, the Committee of Parliament on Official Languages inspected the work of this Department, the office of the DCI&S and public sector enterprises like MECON, BRL and units of SAIL.

Township at Salem Steel Plant.

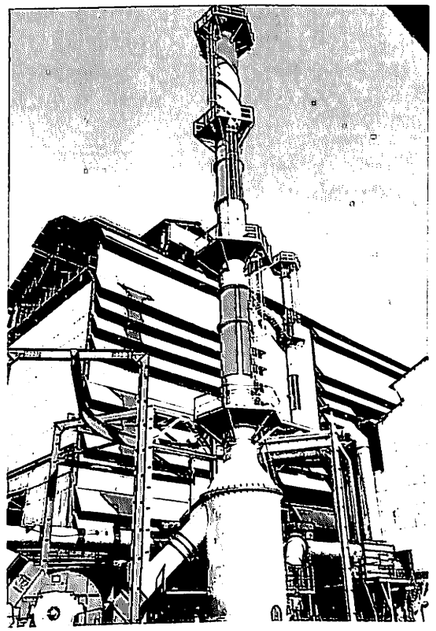
Continuous Casting at Bhilai

A Perspective View



Steel is perhaps the most basic material required for industrialisation and plays a crucial role in the country's economic development. In India, steel production began more than a century ago. Our country is very well endowed with natural resources required for a healthy and vigorous iron and steel industry. Apart from recoverable iron ore reserves of almost 12 billion tonnes, we also have vast reserves of coking coal, manganese ore, limestone and dolomite.

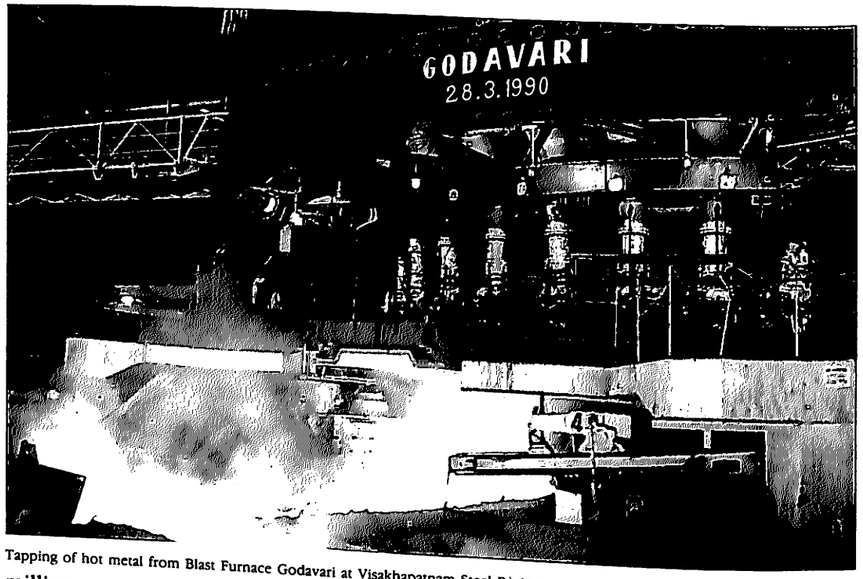
Some of the major steel plants in the country, TISCO, IISCO and VISL, (now a subsidiary of SAIL) were set up in the pre-Independence period. Immediately after Independence investment in the steel sector was prioritised by the setting up of three 1MT steel plants, at Bhilai, Rourkela and Durgapur. The Indian Steel Industry made rapid strides in the 2nd and 3rd Five Year Plans when capacity for crude steel increased from 1.5 MT to 8.9 MT. However, the pace slowed down in the 70s and 80s during which there was long period of stagnation in investment for plant upgradation and modernisation. In the last decade, production of steel has been falling short of the domestic demand necessitating imports to fill the gap. As a result, the per capita consumption is a low 20 Kgs. per person while in neighbouring China it is 65 Kgs per person. In some of the developed countries it varies from 600 Kgs to 700 Kgs per person.



80 tonne EOF at TISCO commissioned recently

As stated earlier, India has most of the raw materials and technical expertise for steel production. In our efforts to augment steel production we have tried to match production to meet domestic demand. The estimation of future demand unfortunately has been based on historical consumption figures to basic industrial raw materials which do not reflect the actual or potential demand but a constrained demand which is the consequence of low domestic production and controlled imports. Our national economy has reached a stage of diversification and sophistication and the demand for steel provided it is made available at reasonable prices and is of an acceptable quality is likely to grow at a much faster rate than before.

Another significant feature has been the almost total absence of public investment in steel for export purposes. Like many developing countries, our exports were directed in favour of primary products and mineral resources. A perusal of global trade statistics revealed that about 100



Tapping of hot metal from Blast Furnace Godavari at Visakhapatnam Steel Project.

million tonnes of steel is internationally traded and steel manufacturing countries have exported around 25% of their production even during recessionary periods. This shows that there is considerable potential for India to export steel provided we are competitive in cost and quality.

Demand and Production

The Working Group on the Iron & Steel Industry for the VIII Five Year Plan projected the following demand and production of finished steel during the current decade:

Financial Year	Assessed Demand	(in million tonnes) Production		
		Main Producers	Secondary Producers	Total Production
1991-92 (Plan)	17.43	8.28	6.44	14.72
1994-95 (Target)	22.00	13.40	9.52	22.92
1999-2000	31.00	15.82	12.38	28.20

Sources of Finished Steel Availability

The break up of the above domestic production of finished steel as projected by the Working Group is given in the following table:

	(In million tonnes)		
	1989-90	1994-95	1999-2000
I. SAIL Plants			
a) BSP	2.13	2.49	2.90
b) DSP	0.54	0.69	0.75
c) RSP	1.08	1.29	2.05
d) BSL	2.60	3.68	3.97
e) IISCO	0.26	0.85	1.71
Total of SAIL	6.61	9.00	11.38

	(In million Tonnes)		
	1989-90	1994-95	1999-2000
II. TISCO	1.35	2.27	2.27
III. VSP	—	2.17	2.17
IV. Secondary Producers	5.66	9.52	12.38
Total	13.62 (13.42)	22.96 (22.92)	28.20 (28.20)

The figures in brackets show the availability of finished steel after inter-plant transfers in SAIL.

1.5 The actual production of finished steel in 1989-90 has been as below:—

	(In million Tonnes)
I. SAIL Plants	
(a) BSP	1.893
(b) DSP	0.518
(c) RSP	1.090
(d) BSL	2.197
(e) IISCO	0.268
Total of SAIL	5.966
II. TISCO	0.933
III. VSP	—
IV. Secondary Producers	6.001
Total Finished Steel	12.900

Some of the major priorities identified in the Working Group Report for the VIII Plan are as follows:-

i) Continue and complete efficiently the massive modernisation programme of the integrated steel plants of Steel Authority of India. Ltd.

ii) Set up additional 3 million tonnes capacity in Visakhapatnam Steel Plant.

iii) Produce a minimum of 5 million tonnes per annum of sponge iron in the country before the end of the Eighth Plan.

iv) Emphasise substantially the production of flat products of high quality for the export sector and consumer durables.

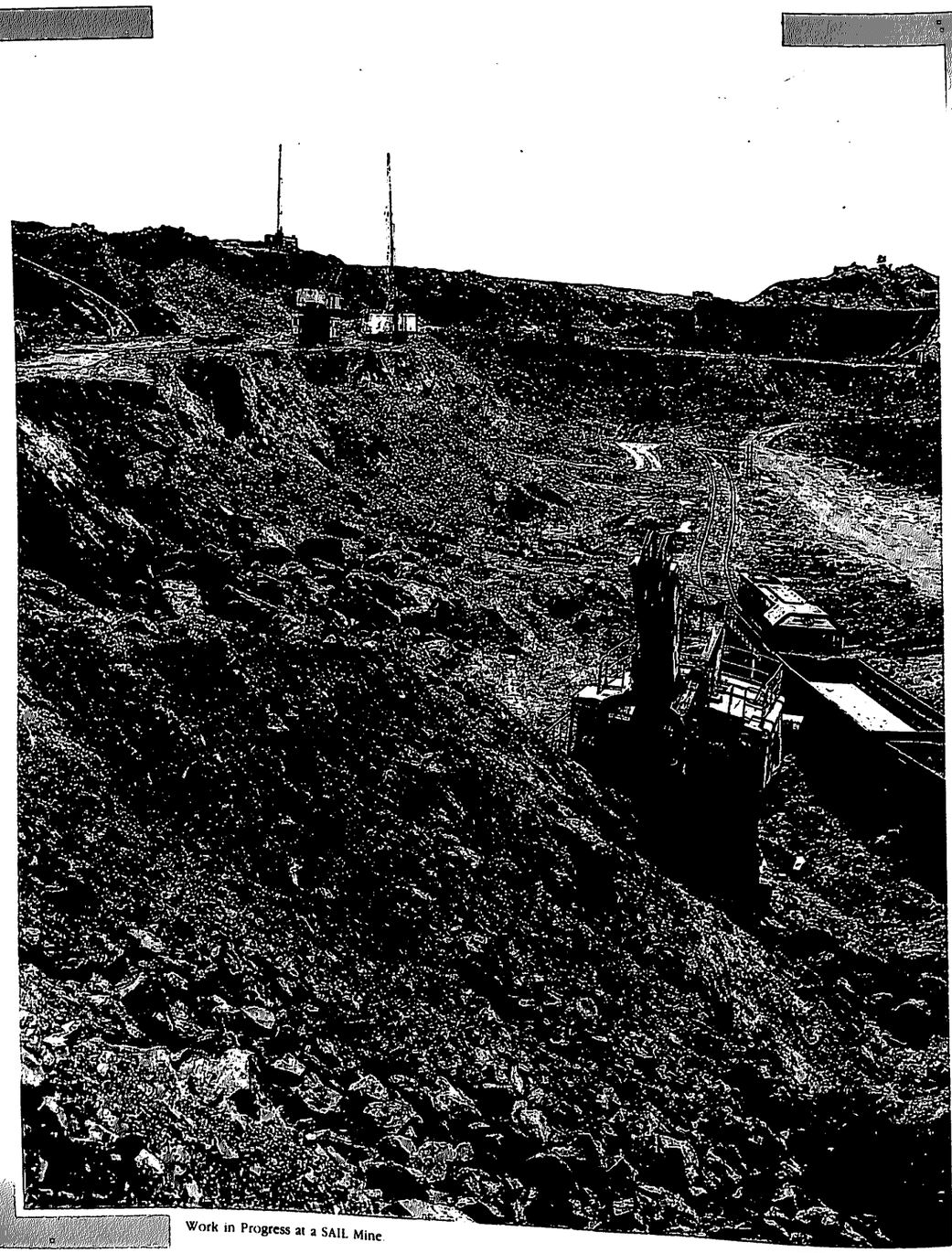
v) Increase significantly domestic production of high quality foundry grade pig iron and give a fillip to export of precision castings.

vi) Devote special attention to manufacturing special and high-tech steels and steel alloys through modern and energy saving secondary refining processes.

vii) Export atleast two MT of steel in the Eighth Plan period and double it in the Ninth Plan period, bringing down the export of iron ore in the process.

viii) Intensify research and development efforts to improve and upgrade the poorer quality raw materials available within the country to make them suitable for steel production.

It is expected that with appropriate and timely investment and imaginative leadership India will be able to emerge by the end of the century as the front-line producer and exporter of steel in the world.



Work in Progress at a SAIL Mine.

Raw Materials

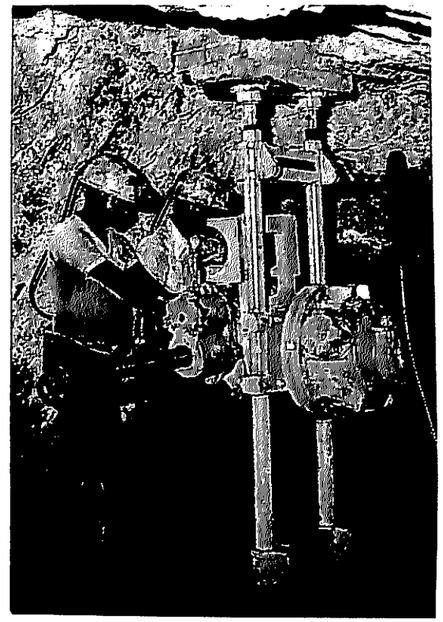
1.0 Iron Ore

India is well endowed with rich resources of iron ore, both in terms of quality and quantity. Production of iron ore in the country is through a combination of large mechanised mines in the public sector and several mines operated on manual or semi-manual/mechanised basis in the private sector. These can be broadly grouped under three categories:-

i) Captive mines, owned and operated by individual steel plants mainly for their own use;

ii) Public Sector mechanised mines owned by State Government undertakings for export and internal consumption of steel plants; and

iii) Smaller mines, owned and operated by private parties mainly by manual and semi-mechanised methods of mining for export and internal consumption.



Exploration work at MOIL.

1.1 Reserves of Iron Ore:

According to the latest indication, the total estimated reserves of haematite ores in the country are 10,267 million tonnes and that of magnetite ores 1710 million tonnes. In addition, the conditional resources of haematite are 164 millions tonnes while those of magnetite are 7,089 million tonnes. The reserves of haematite are located in Bihar, Orissa, M.P., Goa, Karnataka and Maharashtra. Grade-wise, the reserves of + 65% Fe are 900 million tonnes, 62-65% Fe 4,127 million tonnes and + 62% Fe 3703 million tonnes. The reserves of magnetite are located mainly in Karnataka, Goa, A.P. and Kerala. Almost all the magnetite reserves are of metallurgical grade except about 4 million tonnes located in Bihar which are suitable for coal washeries.

1.2 Production and Despatches

The production of iron ore during 1990 is estimated at 53.2 MT which is approximately 6% higher than last year. Goa continues to be the leading producer of iron ore and the reported production during 1989 was around 13 million tonnes. Production from the other principal producing state Madhya Pradesh was 11.7 M.T., Production from Goa and Karnataka is almost all exported while the mines in M.P., Bihar and Orissa cater to the needs of steel plants in those regions. A part of the production is also exported. The despatches during the first 8 months of 1990-91 were 13.86 MT for internal consumption and 20.40 MT for exports.

2.0 Manganese Ore

2.1 Reserves

Reserves of manganese ores as per latest inventory are estimated at 154 million tonnes. These are located in States of Karnataka, Madhya Pradesh, Maharashtra, Goa, Andhra Pradesh, Bihar and Gujarat.

2.2 Production & Despatches

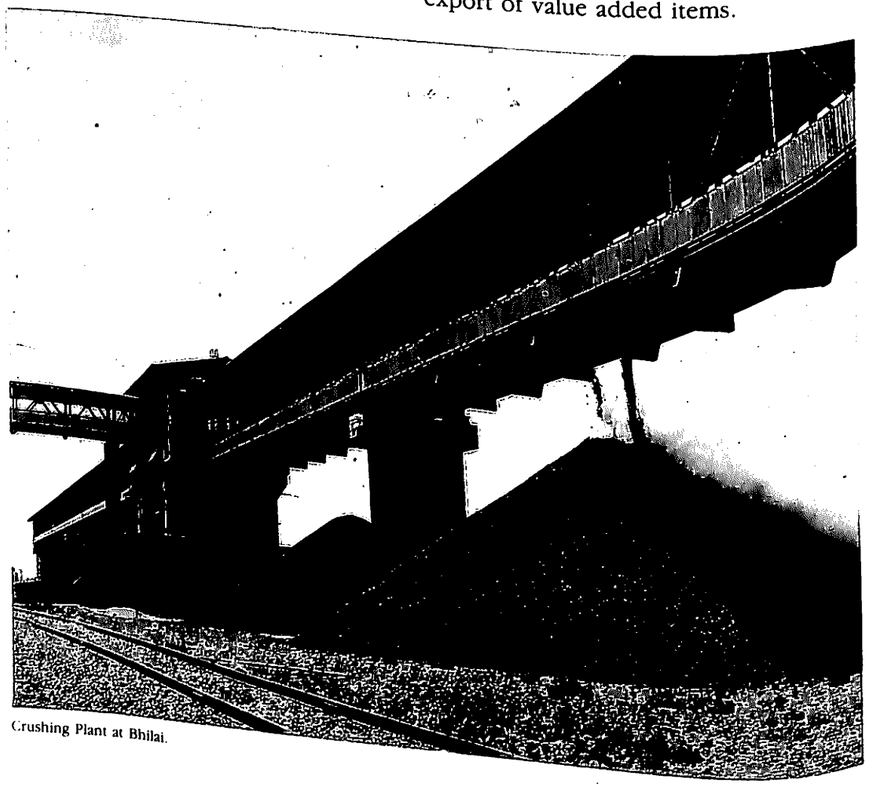
Production of Manganese Ore during 1990 is estimated at 1.4 million tonnes which is somewhat higher than that of the previous year. The principal producing States are Karnataka, Madhya Pradesh, Orissa and Maharashtra. Despatches of Managanese Ore during 1990 are likely to be 1.34 million tonnes.

2.3 Consumption by the Integrated Steel Plants including TISCO

The consumption of Manganese ore by the integrated steel plants during 1990-91 is estimated to be 8.21 lakh tonnes as compared to 7.89 lakh tonnes in the previous year.

2.4 Exports

To preserve the depleting resources in the interest of the domestic industry the emphasis on export of ores is being gradually reduced. In its place, greater emphasis is being laid on export of value added items.



Crushing Plant at Bhilai.

3.0 Chromite

3.1 Reserves

The total estimated mineable resources of chromite in the country are estimated at 126 million tonnes according to latest reassessment of chromite resources. Most of the chromite reserves in the country are located in Orissa. The resources of Ferro Chrome/Chemical grade are 53 million tonnes, charge chrome grade 38 million tonnes, beneficiable grade 28 million tonnes. Only 4 million tonnes are of refractory grade. The end use grade for the remaining 3 million tonnes is not known.

3.2 Production & Despatches

Production of chromite during 1990 is estimated at 1.02 million tonnes as against 1 million tonnes in the previous year. Estimated despatches of Chromite during 1990 is 8.76 lakh tonnes. The main users of this ore are steel plants refractories and the chemical industry.

3.3 Exports

During 1990-91, it is estimated that 3.16 lakh tonnes would be exported. Keeping in view the requirements of the domestic industry export of value added products such as ferro alloys is being promoted in lieu of the mineral ore.

4.0 Ferro Alloys

4.1 Background

Ferro alloys are one of the vital raw material inputs required by the Steel Industry especially in the producion of alloy and special steels.

4.2 Consumption by Steel Plants

Actual consumption of various ferro alloys by the integrated steel plants including TISCO during 1989-90 and 1990-91 are indicated below:

(In lakh tonnes)

	1989-90 (actual)	1990-91 (estimated)
SAIL	1.54	1.83
TISCO	0.42	0.41

5.0 Limestone

5.1 Reserves

India has large reserves of limestone which are spread over almost all parts of the country. However, a very small portion of these are suitable for steel making purposes. The reserves of limestone as per the latest inventory are estimated at 69,354 million tonnes. Principal limestone bearing States are Andhra Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Gujarat, Meghalaya and Himachal Pradesh.

Out of the total reserves of 69,354 million tonnes 47,068 million tonnes are of cement grade, 5,083 million tonnes of blast furnace grade, 4,310 million tonnes of chemical grade, 3,101 million tonnes of SMS grade, 1,568 tonnes of mixed B.F. grade and 916 million tonnes mixed B.F. and cement grade and the balance 7,307 million tonnes are of unclassified grade. Reserves of L.D. grade limestone are very limited.

5.2 Consumption by Steel Plants including TISCO

During 1990-91, the integrated steel plants expect to consume limestone (Blast furnace grade and SMS grade) to the extent of 46.43 lakh tonnes as compared to 46.06 lakh tonnes during 1989-90.

5.3 New Trends

With the technological development in the steel industry, the demand is for low alkali and low silica limestone. Efforts are being made to develop reserves containing limestone with such specifications.

6.0 Dolomite

6.1 Reserves

In the steel industry, dolomite is used both as a flux and refractory material. There are three basic grades of dolomite viz. BF grade, SMS grade and Refractory grade. As per the latest inventory the recoverable reserves of dolomite in the country are assessed at 4,608 million tonnes.

6.2 Consumption by Steel Plants

The estimated consumption of dolomite by integrated steel plants during 1990-91 is 23.7 lakh tonnes as compared to 20.7 lakh tonnes during 1989-90.

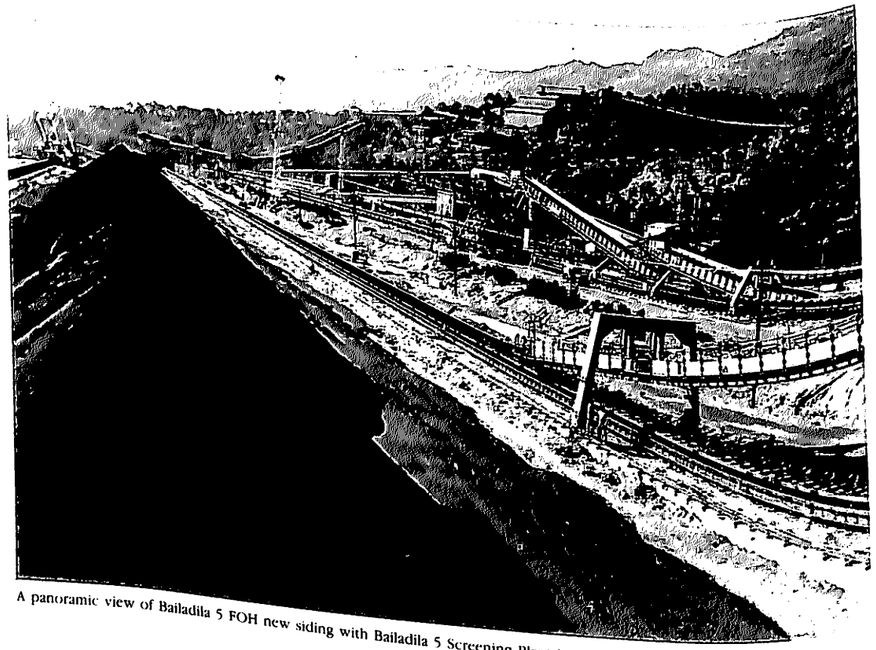
7.0 Coking Coal

7.1 Indian coking coals have a high ash content mainly because of the sedimentary nature of their origin. The total measureable reserves of coking coal are estimated to be 6630 million tonnes.

7.2 During 1989-90, the consumption of coking coal in SAIL steel plants (including IISCO), TISCO and VSP was as under:

Million Tonnes

	SAIL	TISCO	VSP
Captive Mines	0.82	1.7	—
Other domestic resources	8.07	—	0.27
Imports	3.64	0.6	0.21
Total	12.53	2.3	0.48



A panoramic view of Bailadila 5 FOH new siding with Bailadila 5 Screening Plant in the background

The estimated consumption during 1990-91 by these plants is as under:

Million Tonnes

	SAIL	TISCO	VSP
Captive mines	0.89	1.7	—
Other domestic sources	7.43	—	0.37
Imports	4.36	0.6	0.38
Total	12.68	2.3	0.75

8.0 Non-Coking coal

8.1 During the year 1989-90 SAIL steel plants (including IISCO) consumed 3.6 MT of non-coking coal procured from domestic sources. The likely consumption in 1990-91 is 4.2 MT.

8.2 During 1989-90 TISCO procured 1.2 MT of non-coking coal from captive mines and indigenous sources. Expected consumption during 1990-91 is also expected to be of the same order.

9.0 Refractories

9.1 Background

Refractories is a consumable material for the steel plants being used essentially for the lining of various metallurgical furnace and other kilns. Its development is therefore interlinked with the technological changes in the consumer industries.

9.2 Capacity

The present installed capacity is about 1.5 million tonnes spread over 60 units. The annual production of the various categories of refractories has been ranging between 6 to 6.5 lakh tonnes per year. The low capacity utilization is mainly on account of the fact that the envisaged growth in the steel industry did not materialise during the past decade.

9.3 Consumption

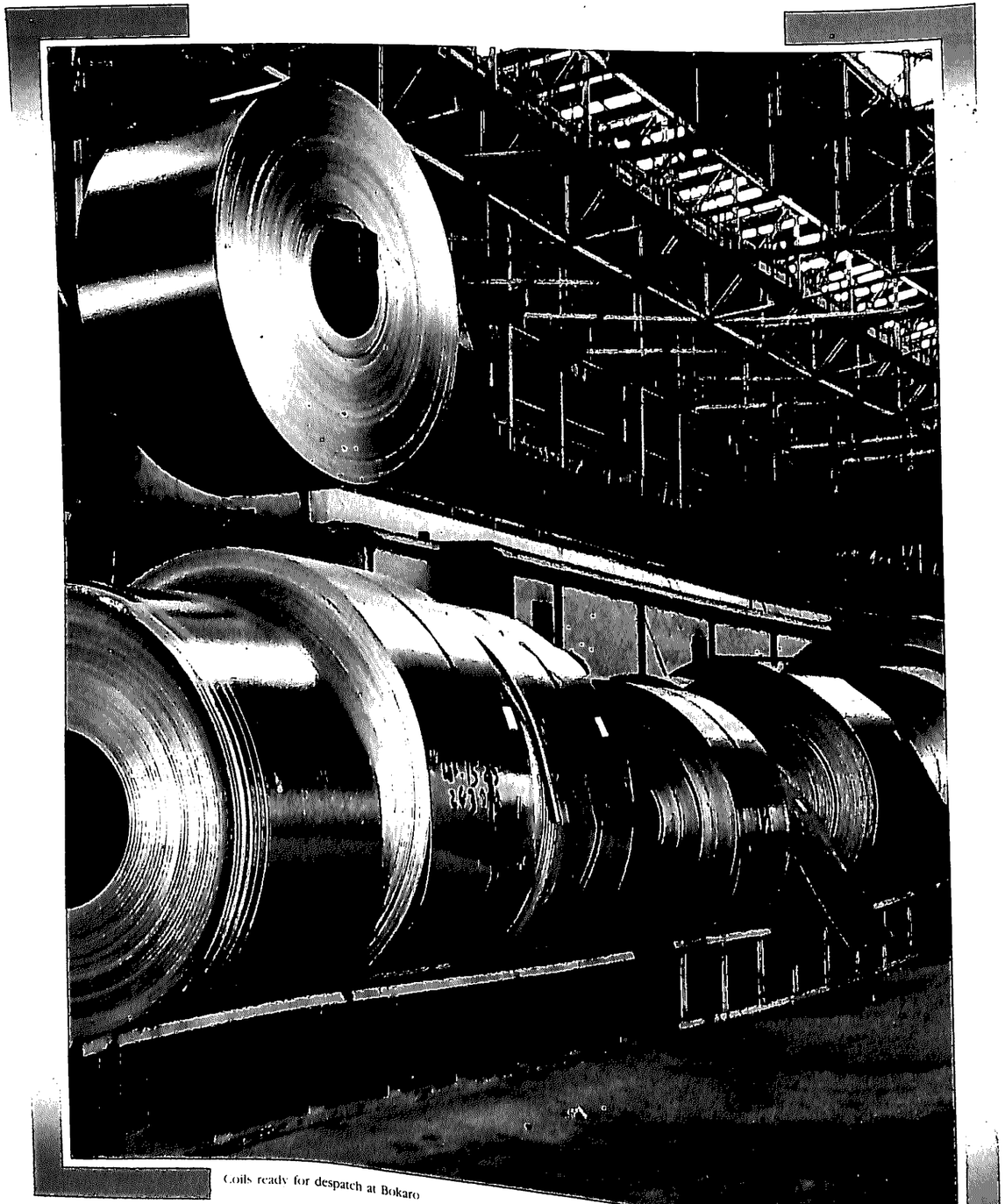
The estimated consumption of various types of refractories by the integrated steel plants during 1990-91 is 5.25 lakh tonnes as compared to about 5 lakh tonnes consumed in the previous year.

9.4 New Trends

With the modernisation and renovation of the steel plants the requirements for various types of refractories have undergone changes. The stress is now on more sophisticated products. The domestic refractory industry, anticipating this change have obtained technical knowhow, and manufacturing capabilities for production of these sophisticated refractories such as Magnesia Carbon Bricks, Slide-gate plate refractories, gunning materials, castables etc. has been installed. Use of such refractories has brought down its consumption of refractories per tonne of steel production. This too has contributed to the low capacity utilisation of the installed capacity.

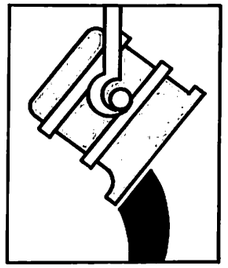
9.5 Export Thrust

The average annual exports of refractories during the past few years has been only 5,000 to 6,000 tonnes per year. This was mainly on account of technological obsolescence. Many units have now imported technology, especially from Japan and have developed facilities to produce specialised hi-tech items. In view of this, greater thrust is being given towards increasing exports.



Coils ready for despatch at Bokaro

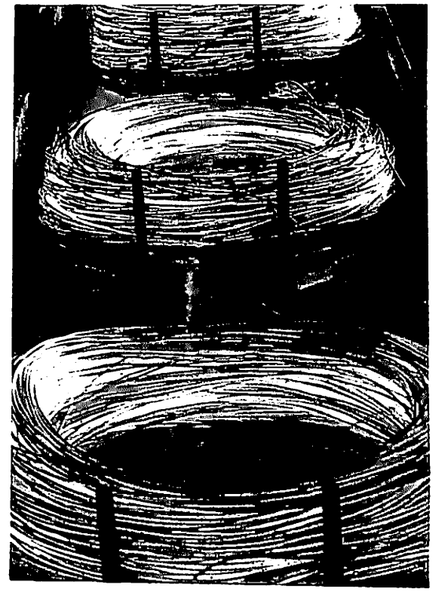
Distribution and Availability



The table below gives the availability of iron and steel in the domestic market during 1989-90 and estimated availability during 1990-91:—

('000 tonnes)

	Pig Iron		Finished Steel	
	1989-90 Estimated	1990-91	1989-90 Estimated	1990-91
1. Production				
a) Main Producers	1246	1473	6995	7223
Secondary producers	92	96	6001	6210
2. Import arrivals	306	90	1497	1117
3. Total (1 + 2)	1644	1659	14493	14550
4. Exports	—	—	254	378
5. Inter Plant Transfers	—	—	189	65
6. Net Availability	1644	1659	14050	14107



2. Distribution of Iron and Steel

2.1 In order to ensure equitable distribution of the available supplies and timely fulfilment of supplies to the priority sector, including the small scale sector, the distribution guidelines framed by the Joint Plant Committee (JPC) of the main producers continued to be in operation. The categorisation of various groups of consumers in different categories have been done keeping in view the inter-se requirements of various consumer groups.

2.2 The demand for steel for the various consuming groups is assessed on an annual basis by the Joint Plant Committee. For the medium and large sectors, this is not done on statewise basis. In the case of small scale units, the demands are raised by each of the State Small Scale Industries Corporations. The allocations are made by the Development Commissioner for Iron & Steel based on such demands, their past performance (offtake) and the general availability indicated by the main producers.

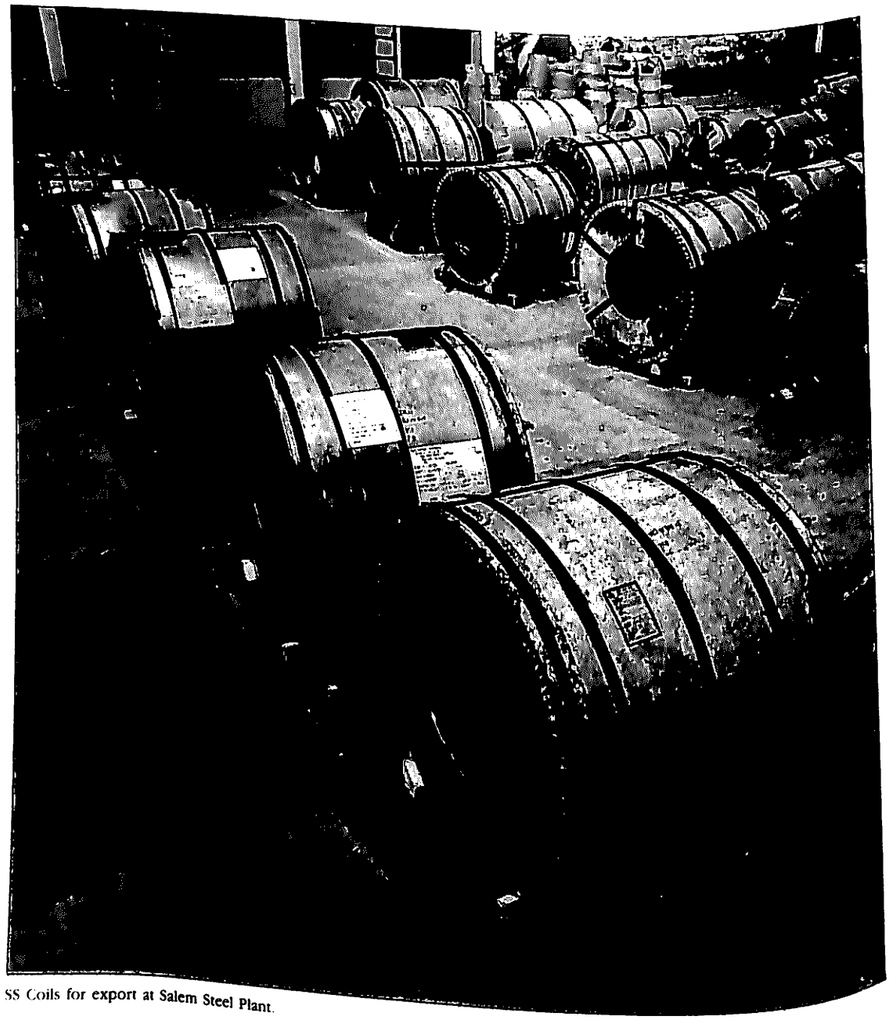
2.3 All categories of industrial units with a common raw material base and producing identical end-products have been classified under a compact group of consumers and are supplied raw materials directly by the main producers in terms of their entitlements, which are based on the best of the last 3 years' offtake, prorated to availability. The guidelines give due weightage to the demands of new units, sick units and those units situated in the backward regions.

2.4 In the case of pig iron, the Development Commissioner for Iron & Steel makes allocations to each of the priority sector consumers, including the State SSI Corporations. Other industrial consumers receive supplies directly from main producers, based on their entitlement.

3. Distribution Network

3.1 SAIL including IISCO have a network of 47 departmental stockyards, 14 consignment agency yards and 140 conversion agencies/twisting yards through-out the country. TISCO has 11 stockyards, 23 consignment Agencies and 65 conversion agents. SAIL has also started operating two extension counters on experimental basis at Varanasi and Bhopal and a third extension counter is ready for operation at Jodhpur.

3.2 The Visakhapatnam Steel Project which commenced production during this year has a net work of 7 consignment Agencies to distribute their products. By the end of the current financial year it intends to open two stockyards and another eight consignment agencies.



SS Coils for export at Salem Steel Plant.

3.3 Considering the special problems in meeting the requirements of consumers in the North-Eastern Region, mainly arising out of transport bottlenecks and logisticks, special efforts are made to ensure that adequate quantities are moved to that region by regular coordination between the producers and the railways. The producers are also reimbursed the actual cost of transportation by alternate routes (road/river) by the JPC.

4. Pricing of Steel

4.1 Prices of different iron and steel products are determined and announced from time to time by the Joint Plant Committee, a body constituted under the Iron and Steel (Control) order, 1956. The Committee is headed by the Development Commissioner for Iron and Steel and the main producers of iron and steel i.e. Steel Authority of India Ltd., Tata Iron and Steel Company Ltd., the Indian Iron and Steel Company Limited, Visakhapatnam Steel Project and the largest single user i.e. The Ministry of Railways are represented on it, as members. The prices announced by this Committee are applicable only to the major items of iron and steel produced by the Integrated Steel Plants in the country. The re-rollers, mini-steel plants and alloy steel producers etc. fix their own prices for their products.

4.2 During the year 1990-91 there has been only one general revision in the prices of iron and steel on 19th September, 1990. This was to compensate for increase in the input costs and the increases in EGEAF and FEF levies. These had the effect of increasing the base prices on an average by 5%. Iron and Steel materials are supplied by the main producers at a uniform price throughout the country, through the operation of Freight Equalisation Fund by the JPC. The average freight element for steel was raised in September '90, to Rs. 866 per tonne for steel and Rs. 585 per tonne for pig iron. In addition to the increase in the base prices of different categories of steel, extras on different accounts were increased from 24th September, 1990. These had remained unchanged since 1985.

4.3 Open market prices vis-a-vis stockyard prices of certain important categories of steel continued to be monitored in the Department through periodical reports obtained from various Regional Development Commissioners for Iron and Steel.

5. Import and Export of Iron and Steel

5.1 The general policy procedure for import of iron and steel, ferro alloys and ferrous scrap is decided by the Ministry of Commerce, as for other non-ferrous items.

5.2 MMTC continued to be the canalising agency for import of iron and steel. Direct imports are also allowed under supplementary licensing. REP and flexibility provisions in the Import Policy. The Development Commissioner for Iron and Steel continued to be the designated authority for clearing requests for imports from the indigenous angle, irrespective of the fact that whether the import is under the canalised procedure or under the supplementary licensing.

5.3 A close watch is maintained on import and domestic availability to ensure that the industrial requirements are met to the maximum extent possible and industrial activity does not get adversely affected due to non-availability of iron and steel.

5.4 Efforts are being made to meet the requirements of engineering exporters from domestic production on priority basis to the maximum extent possible. However, due to inadequate domestic availability of certain items, the engineering exporters are required to avail of other facilities under the Import Policy, like duty free Advance Import and duty free REP etc.

5.5 Keeping in view the domestic demand, exports are being encouraged both by the integrated steel plants and the secondary sector. Currently however, these are confined mainly to the available surplus plates from Bhilai Steel Plant, stainless steel sheets from the Salem Steel Plant, and to some extent bars, rods and light structurals.

6. Functions of Development Commissioner for Iron & Steel

6.1 The Iron and Steel Control Organisation was initially set up to perform the regulatory functions envisaged in the Iron and Steel (Control) Order 1956. Over the years, the responsibility of this Organisation has changed. With the comparatively easier availability of iron and steel, the regulating functions have been considerably reduced and the developmental functions have assumed importance. This Organisation is now required to assist in the development of secondary sector. Some of the other important functions which this Organisation has to perform are:

(a) Import management

(b) Allocation and monitoring of steel items to sensitive areas.

(c) Acting as sponsoring authority for the secondary sector

(d) Facilitating consumers-producers interaction and

(e) Maintaining and processing data.

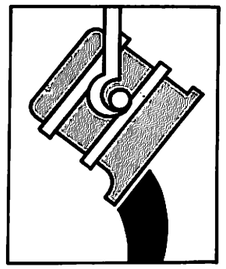
The Organisation also advises the Department of Steel on matters relating to the iron and steel industry.

6.2 This Office still has to perform some residuary regulatory functions particularly relating to misuse of iron and steel. In performing these regulatory functions, the Development Commissioner for Iron and Steel and six Regional Development. Commissioners continued to carry out periodical inspections to check misutilisation of iron and steel.

Statement showing the number of cases of Inspection of units/suspension of supplies/debarment during 1989-90 (April-December, 1990)

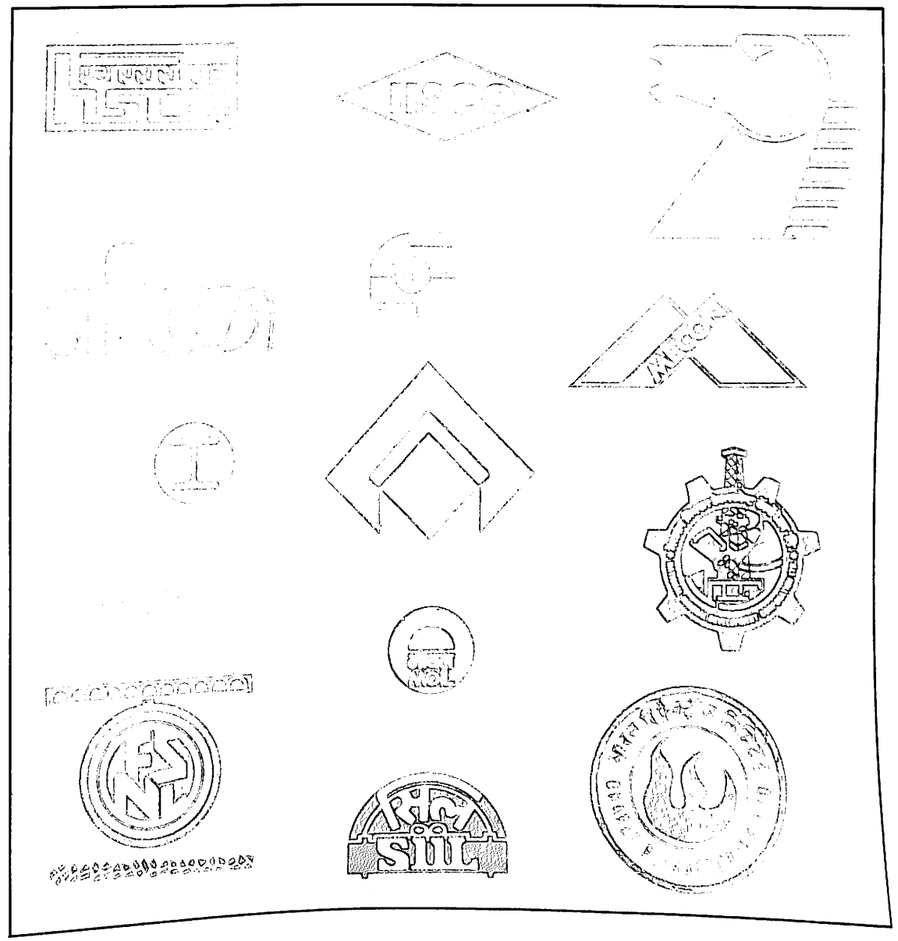
Region	Inspection		Suspension		Debarment	
	89-90	90-91 April-Dec.90	89-90	90-91 April-Dec.90	89-90	90-91 April-Dec.90
Calcutta	307	220	2	—	—	—
New Delhi	249	135	17	15	25	19
Bombay	316	172	20	11	20	5
Madras	151	272	2	15	1	4
Hyderabad	172	59	8	6	12	2
Kanpur	486	59	89	59	60	17
Total	1681	917	138	106	118	47

Public Sector



The Public Sector has been assigned a very important role in the economic development of the country. It was conceived by the planners to attain the commanding heights of Indian economy and this has been amply proved in its size and strength in the steel sector. Over the years, the public sector has increased its areas of activity and today encompasses virtually all segments of steel industry in the country.

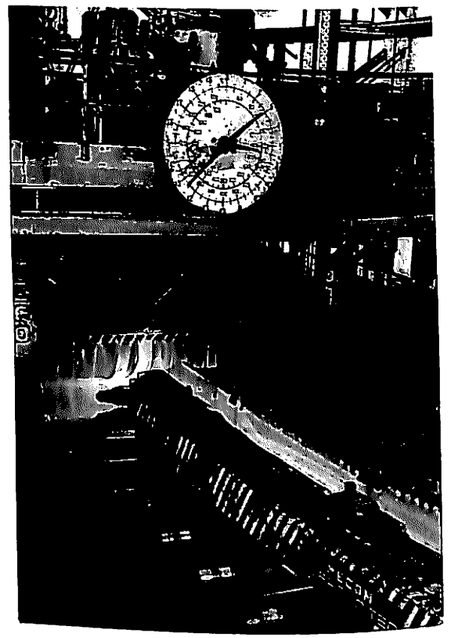
The proposed outlay for the various public sector enterprises and other companies under the administrative control of the Department of Steel for the VIII plan is of the order of Rs. 19488 crores. Break-up of the same is in page 93.



Steel Authority of India Limited

1. General

Steel Authority of India Limited (SAIL) is a company registered under Indian Companies Act, 1956 and is wholly owned by the Government of India. It operates five integrated steel plants at Bhilai (Madhya Predesh), Bokaro (Bihar), Durgapur (West Bengal), Rourkela (Orissa) and Burnpur (West Bengal), the last named being a plant of the Indian Iron and Steel Company Limited, its wholly owned subsidiary. The SAIL group also has four special and alloy steels and ferro-alloys units at Durgapur (West Bengal), Salem (Tamil Nadu), Chandrapur (Maharashtra) and Bhadravati (Karnataka). The plants at Chandrapur and Bhadravati belong to the Maharashtra Elektrosmelt Limited and Visvesvaraya Iron & Steel Limited, respectively which are also subsidiaries of SAIL. Besides, SAIL have three central units located at Ranchi, the Research and Development Centre for Iron and Steel (RDCIS), the Centre for Engineering and Technology (CET and the Management Training Institute. The IISCO—Ujjain Pipe and Foundry Company Limited a subsidiary of IISCO produces cast Iron spun Pipes at its works at Ujjain (MP). The marketing of products of SAIL plants is done through the Central Marketing Organisation, Calcutta which has a country-wide distribution net-work.



2. SAIL (Excluding Subsidiaries)

2.1 Finance

The authorised capital of SAIL is Rs. 5,000 crores. The paid-up share capital of the company was Rs. 3,985.89 crores as on 31st March, 1990, including Rs. 13.41 crores as share money pending allotment.

2.2 During the year the company repaid loans to the Government and to the Steel Development Fund to the tune of Rs. 171.46 crores. The outstanding loans at the end of the year 1989-90 stood at Rs. 392.03 crores from Government of India (against Rs. 438.56 crores at the end of 1988-89) and Rs. 2467.58 crores from the Steel Development Fund (against Rs. 2100.67 crores as on 31st March, 1988).

To meet a part of the capital expenditure, SAIL arranged external commercial borrowings of US$ 139 million and about 4 billion yen from OECF for IISCO's modernisation. Further, SAIL contracted to borrow US$ 340 million to finance the foreign exchange component of its capital schemes.

The company also mobilised deposits from the public to the tune of Rs. 350 crores during 1989-90. The net deposits increased to Rs. 846.78 crores as on 31.3.90.

2.3 Turnover and Profits

The Company recorded its highest ever turnover of Rs. 7420.20 crores during the year 1989-90, an increase of 12% over the previous year. The profit before tax for the year was Rs. 224.96 crores. Out of the profit after tax of Rs. 190.50 crores for the year, a sum of Rs. 94.40 crores has been transferred to Investment Allowance Reserve.

2.4 Capital Expenditure

The overall expenditure on various capital schemes during the year 1989-90 was Rs. 1143.91 crores. A sum of Rs. 201.13 crores was spent on continuing schemes, Rs. 621.85 crores on modernisation and other new schemes, Rs. 279.75 crores on addition and dification and replacement schemes and Rs. 41.18 crores on township, research and development and feasibilities studies.

3. Production Performance

3.1 The Hot Metal and Pig Iron production at the integrated steel plants at Bhilai, Durgapur, Rourkela and Bokaro showed an increase over the last year. Pig iron production increased by 18%. However, there was a drop in crude steel production by 1.1% and of saleable steel production by 1.4% compared to 1988-89. Target fulfilment for hot metal, crude steel, saleable steel, and saleable pig iron for the year were 91.5%, 88.75% and 103.5% respectively.

SAIL

PROFITABILITY

Rs. CRORES

	1984-85	1988-89	1989-90
TURNOVER	3722	6625	7420
GROSS MARGIN	354	1112.4	1063
NET PROFIT (before Tax)	4	358.4	225
CUMULATIVE PROFIT/LOSS	(-)324	237	377

3.2 The main constraints on production during the year were the disturbance of the raw material base at Bhilai steel plant due to industrial relation problems at the Dalli mines, the poor health of two blast furnaces at Durgapur which are due for capital repairs and modernisation, and inadequate and inconsistent supplies of metallurgical coal affecting particularly the productivity of the sensitive large furnaces at Bokaro, coupled with the severe problems of power supply from DVC.

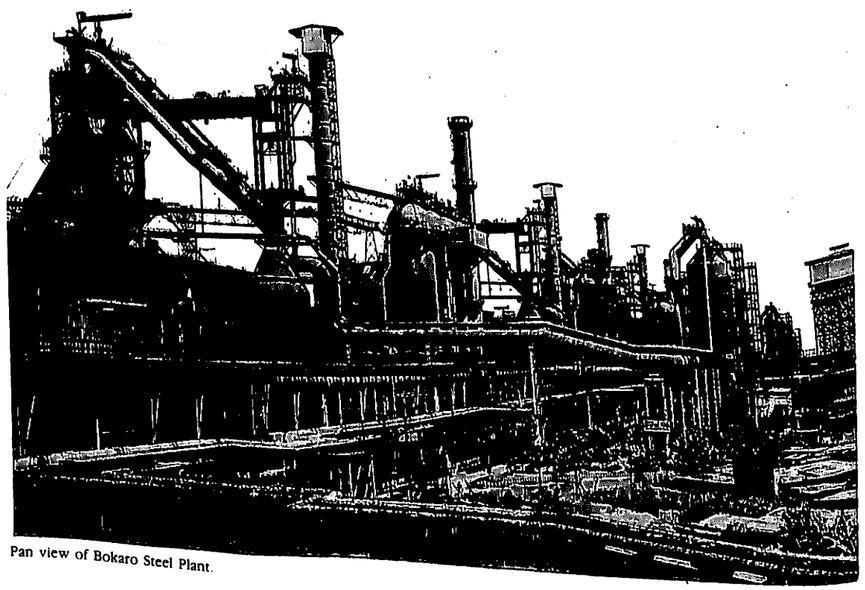
3.3 There were significant achievements in the Field of quality improvement. The production of tested quality saleable steel increased from 80.5 per cent in 1988-89 to 85.5 per cent during the year 1989-90. The production of major value-added and critical steel products, particularly LPG sheets, high strength rails, electrode quality wire rods, thinner guage HR coils and wheels & axles improved significantly. The production of cold-rolled flat products also went up by 9.7%. Inter-plant transfers of rollable steel increased by 18% bringing about greater synergy among SAIL plants and thus higher value addition.

3.4 Energy Conservation

The continuing emphasis on energy conservation measures reduced the energy consumption further by about 2.9% from the previous year's level.

3.5 Equipment Performance

The maintainance of health and equipment continued to be an area of high priority by updating capital repairs of assets in a planned manner. This resulted in better equipment availability. The Computerised Maintenance Management System (CMMS) installed at Rourkela with UNDP assistance is now being extended to other steel plants.



Pan view of Bokaro Steel Plant.

SAIL

SOME PARAMETERS

PRODUCTION (MT)	1984-85	1988-89	1989-90
HOT METAL	7.4	9.6	9.7
CRUDE STEEL	6.3	8.5	8.3
SALEABLE STEEL	5.3	7.3	7.1
CAPACITY UTILIZATION (%)			
HOT METAL	66	73	82
CRUDE STEEL	66	72	76
SALEABLE STEEL	73	80	81
TECHNO-ECONOMIC			
COKE RATE (Kg/T OF HOT METAL)	820	731	728
ENERGY CONSUMPTION (G.Cal/T OF CRUDE STEEL)	11.2	10.2	9.77

3.6 Import Substitution

The continuing import substitution efforts during the year resulted in indigenisation of about 660 items valued at Rs. 14.2 crores. This represents a growth of about 16% over last year.

3.7 Ancillary Industry

More than 2000 small scale/ancillary units were registered with different steel plants at the end of March'90, for meeting the requirement of stores and spares. Purchases from these units during 1989-90 amounted to about Rs. 92 crores.

3.8 Captive Mines

The production of raw materials from captive mines increased to 19.308 million tonnes during 1989-90 as compared to 16.69 million tonnes during the previous year. The purchased material was to the tune of 4.161 million tonnes during the year. The total receipt of material at the plants was 20.601 million tonnes approximately.

3.9 Captive Power Generation

The generation of power from Captive Power Plants increased by 23% over the previous year, reducing SAIL's dependance on purchased power.

3.10 Environment Management

Environment management has been identified as one of the thrust areas in SAIL's corporate strategy. Environment Control Departments have been set up at the plants and at the corporate level, the Environment Management Division has been strengthened. Under

a World Bank assisted project, this area had been studied by M/s. BHPE-Kinhill the Australian Consultants and their recommendations are being progressively implemented.

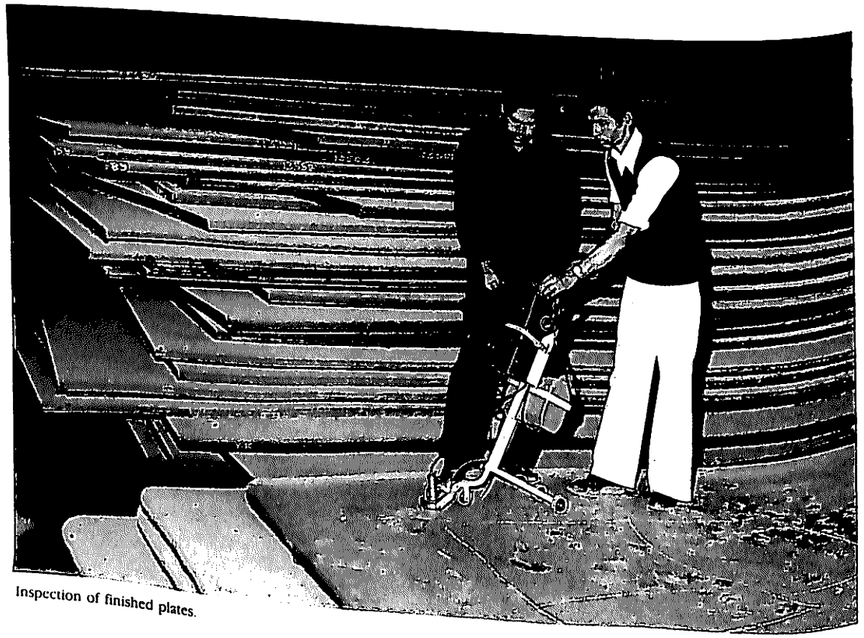
4. Marketing Performance

4.1 The Company supplied 6.17 million tonnes of mild steel and 0.82 million tonnes of pig iron to the domestic market during the year. There was a special thrust on increased supplies to priority sectors where an increase of 7% was achieved. Supplies to SSICs for SSI units and to the engineering exports sector were higher by 16% and 34% respectively compared to the previous year.

4.2 The year also witnessed the highest ever sales of the products of the Alloy Steels Plant at over 103,000 tonnes an increase of 5% over the previous year. The domestic sales of stainless steel from the SSP also increased by 7%.

4.3 The company exported mild steel products valued at about Rs. 105 crores, during the year, representing an increase of 71% as compared to the previous year. In addition, stainless steel valued at about Rs. 10 crores was also exported. Another important development was the recognition of SAIL as a "Trading House".

4.4 The marketing unit for of special steels was reorganised for providing better sales service. Separate headquarters for pipes, electrical sheets, tin plates, alloys and stainless steel were opened. To provide better service to customers, emphasis was laid on intensive contacts with customers including open house meetings for mutual understanding and exchange of views. Extension counters



Inspection of finished plates.

CR Coils at Bokaro.

are being opened to service customers more effectively in the hinterland areas.

5. Capital Schemes

5.1 Bhilai Steel Plant

The 4 MT project of the plant has been completed in 1990-91. During the year 1989-90, three smaller open hearth furnaces installed in the late fifties have been replaced by a new twin hearth furnace. The new furnace has substantially improved the productivity and also resulted in energy savings and reduction in the consumption of refractories. Other important projects completed during the year were the bell-less top charging system and stock house conveyorisation of blast furnace No. 4, modification of water cooled skids for the reheating furnace of the rail and structural mill, and the second cooling bed in the plate mill.

5.2 Durgapur Steel Plant

The modernisation of Durgapur Steel Plant proceeded more or less as per schedule during the year. Basic engineering for major shops were completed and civil works including piling and concreting were started at site. The project, when completed will increase the capacity of the plant to 1.876 million tonnes of crude steel from the present achieveable capacity of 1.15 MT.

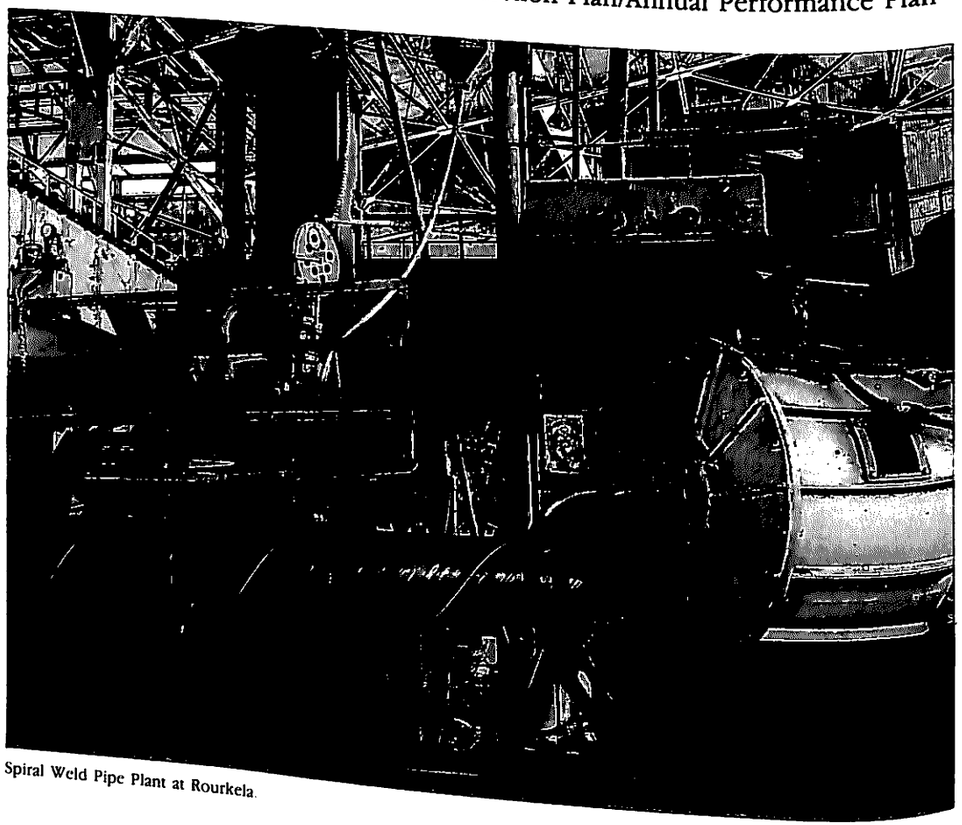
5.3 Bokaro Steel Plant

The main production units of the Cold Rolling Mill Complex-II, viz, tandem Mill, pickling line and hot dip galvanising lines were commissioned during the year 1989-90. With the commissioning of these units, the cold rolling mill capacity increased to 1.66 million tonnes per annum. Bokaro will also be able to produce 1,70,000 tonnes of plain galvanised and corrugated sheets per year. The 4 MT

project as a whole has now been completed in 1990-91. In addition, other schemes like the modernisation of blast furnace No. 4 by incorporating new technologies like bell-less top charging, provision of h.p. heaters and the 7th turbo-blower were also completed during the year 1989-90.

5.4 Rourkela Steel Plant

The Government approved the modernisation of Rourkela Steel Plant at an investment of Rs. 2461 crores. The orders for most of the packages of Phase-I were finalised during the year and for Phase-II, the tendering process was in progress. The project, when complete, will increase the capacity of the plant to 1.9 MT of crude steel from the present achievable capacity of 1.456 MT.



Spiral Weld Pipe Plant at Rourkela.

5.5 Salem Steel Plant

The construction work of the Second 'Z' Mill has been completed in 1990-91, a few months ahead of schedule.

6. Corporate Planning

6.1 The Memorandum of Understanding (MOU) between the Department of Steel and SAIL for the year 1990-91 was negotiated and signed. The MOU inter-alia includes a Performance Evaluation Index with weightages for physical, financial and qualitative performances which would enable more focussed attention towards the objectives of improving production, productivity and profitability. The concept of Annual Action Plan/Annual Performance Plan for all units focussing on qualitative improvements in their performance also helped strengthening the planning process.

RDCIS at SAIL, Ranchi.

6.2 The Company is also pursuing the concept of Joint ventures, as envisaged in their Corporate Plan, with the objective of optimising the utilisation of its own byproducts, equipment and human resources.

7. Research, Development and Design Activities

7.1 The year witnessed the increased participation of SAIL's Research and Development Centre for Iron and Steel (RDCIS) in plant activities. Active involvement of the RDCIS has helped SAIL in reducing the energy consumption by about 3% over the previous year's levels. Various process technologies designed and developed at the Centre have led to substantial benefits in terms of improvement in quality, Productivity and yield.

7.2 The involvement of the Centre for Engineering and Technology (CET) in plant AMR schemes has increased considerably. CET prepared and submitted the feasibility study and project report for a 500 cubic metre blast furnace at VISL. This is the first time in the country when a consultant with totally indigenous design and engineering efforts, provided the complete range of consultancy services for a Small Blast Furnace Project. CET has also been entrusted with the task of developing a master plan for the modernisation of VISL.

8. Human Resources Management

8.1 In its endeavour to improve work-culture, productivity and the general well-being of the organisation. SAIL announced its commitments to the 'Total Quality concept'. The month of April, 1989 was declared as the "Quality Month", in which among others, a number of workshops were arranged in the SAIL plants, which focussed on this concept.

8.2 Manpower Strength

The total manpower of the Company as on 31st March, 1990 was

Subsidiaries

1. The Indian Iron & Steel Company Limited

1.1 The Indian Iron and Steel Company Limited (IISCO), owns and operates an integrated steel plant at Burnpur, captive iron ore mines at Gua and Manoharpur, captive collieries at Chasnala, Jitpur and Ramnagore, a coal washery at Chasnala and a large foundry complex at Kulti. The management of IISCO was taken over by the Government of India on the 14th July, 1972. Shares held by the private parties were acquired by the Central Government on 17th July, 1976. The shares held by the public financial institutions etc., were also purchased by the Central Government and subsequently all these shares were transferred to the Steel Authority of India Limited (SAIL). IISCO became a wholly owned subsidiary of SAIL on 30th March, 1979.

As a part of the physical restructuring of IISCO, the management of Kulti Works and also the collieries and ore mines of the company was taken over by SAIL in January, 1990 in terms of the Power of Attorney executed by IISCO.

1.2 Production Performance

APP targets were exceeded in oven pushing, hot metal and pig iron production, granulated slag and saleable steel production as well as for ingot steel rolling. Quality steel production improved considerably and recorded a growth of 218 per cent. The overall saleable steel yield also went up to 82.5 per cent as compared to previous best of 80.9 per cent achieved in 1983-84. The specific energy consumption also showed a reduction by 2.2 per cent over the previous year. In case of ingot steel production, the achievement was limited to 91.5 per cent due to various operational and technological difficulties especially those experienced in the stabilisation of the KORF process in tilting O.H. furnaces of the plant with air injection.

The spun pipe units at Kulti were affected throughout the year on account of non-availability of adequate orders. In the case of the foundry complex, even though the production marginally missed the APP target (97.8 per cent), more stress was given to off-set the shortfall in volume by producing high value items. During the year, one more big bell and one big bell hopper were supplied to Bokaro and 30 steel slag pots were supplied to Bokaro and Bhilai plants.

The operations at the captive collieries also improved; coal raisings went up by 7 per cent over the previous year's achievement. The captive iron ore mines at Gua and Chiria also produced above the APP targets. However, the disposal problem of iron ore fines from Gua affected the overall performance of the mines.

1.3 Capital Schemes

The balancing facilities for the Chasnala washery were completed and the new modified washery was commissioned in March, 1990. The light castings department of Kulti, duly modernised, was also commissioned in March, 1990.

Progress was made in the enabling works under modernisation of the Burnpur works viz; site levelling, soil investigation, construction power supply, approach roads, railway linkages and net work, environmental

1,94,915 comprising 18,319 executives and 1,76,596 non-executives as against the position on 31 March 1989 which was 1,97,799 comprising of 17,974 executives and 1,79,825 non-executives.

There has been a reduction of 2,884 personnel over the last year of which 2189 were on account of voluntary retirements. The works manpower productivity was 71 ingot tones per man year which was the highest during the last five years. As many as 2051 employees were redeployed during the year.

8.3 Training

The company continued to put special emphasis on training and 74,565 employees were trained under various programmes.

8.4 Work Culture and Employees Welfare

Steps like the substantial reduction of over-time, reduction in shift change-over delays, redeployment of manpower and flexibility in the working system were further strenghthened during the year. There were also concerted attempts at improving the administration of both statutory as well as other welfare facilities. The grievances handling system was further strengthened by emphasising more on informal means and on direct contacts. Considerable efforts were made to improve participation of employees and get them more involved in the over all functioning of the organisation. Meetings at regular intervals were held with various trade unions and officers associations both at the plant and corporate levels on issues relating to production and productivity.

8.5 Safety

The corporate safety department has been further strengthened and the thrust on safety and occupational health continued. The safety and occupational health policy was reviewed and modified in line with changing requirements.

8.6 Schedule Castes & Schedule Tribes

As on 31st December, 1989, Schedule Caste and Schedule Tribe employees were 12.5% and 8.50% of the total manpower respectively. Intake of SC and ST candidates was 15.8% and 17.45% respectively of the total recruitment during 1989. The share of SC/ST employees in promotions was 18.45%. In accordance with Government instructions, special recruitment drives exclusively for SC/ST candidates were undertaken and more than 300 persons were recruited in SAIL plants units through these efforts.

8.7 Industrial Relations

Industrial Relations during the year were generally peaceful except in the Dalli Mines and some sporadic incidents in RSP and SSP.

8.8 Official Language

The Company continues to pursue its efforts in implementing the official language policy of the Government. Liberal incentives given through various schemes have encouraged many employees to switch over to Hindi for official work. An in house scheme for imparting Hindi training to employees was drawn up, and is being implemented from the year 1990-91.

Subsidiaries

1. The Indian Iron & Steel Company Limited

1.1 The Indian Iron and Steel Company Limited (IISCO), owns and operates an integrated steel plant at Burnpur, captive iron ore mines at Gua and Manoharpur, captive collieries at Chasnala, Jitpur and Ramnagore, a coal washery at Chasnala and a large foundry complex at Kulti. The management of IISCO was taken over by the Government of India on the 14th July, 1972. Shares held by the private parties were acquired by the Central Government on 17th July, 1976. The shares held by the public financial institutions etc., were also purchased by the Central Government and subsequently all these shares were transferred to the Steel Authority of India Limited (SAIL). IISCO became a wholly owned subsidiary of SAIL on 30th March, 1979.

As a part of the physical restructuring of IISCO, the management of Kulti Works and also the collieries and ore mines of the company was taken over by SAIL in January, 1990 in terms of the Power of Attorney executed by IISCO.

1.2 Production Performance

APP targets were exceeded in oven pushing, hot metal and pig iron production, granulated slag and saleable steel production as well as for ingot steel rolling. Quality steel production improved considerably and recorded a growth of 218 per cent. The overall saleable steel yield also went up to 82.5 per cent as compared to previous best of 80.9 per cent achieved in 1983-84. The specific energy consumption also showed a reduction by 2.2 per cent over the previous year. In case of ingot steel production, the achievement was limited to 91.5 per cent due to various operational and technological difficulties especially those experienced in the stabilisation of the KORF process in tilting O.H. furnaces of the plant with air injection.

The spun pipe units at Kulti were affected throughout the year on account of non-availability of adequate orders. In the case of the foundry complex, even though the production marginally missed the APP target (97.8 per cent), more stress was given to off-set the shortfall in volume by producing high value items. During the year, one more big bell and one big bell hopper were supplied to Bokaro and 30 steel slag pots were supplied to Bokaro and Bhilai plants.

The operations at the captive collieries also improved; coal raisings went up by 7 per cent over the previous year's achievement. The captive iron ore mines at Gua and Chiria also produced above the APP targets. However, the disposal problem of iron ore fines from Gua affected the overall performance of the mines.

1.3 Capital Schemes

The balancing facilities for the Chasnala washery were completed and the new modified washery was commissioned in March, 1990. The light castings department of Kulti, duly modernised, was also commissioned in March, 1990.

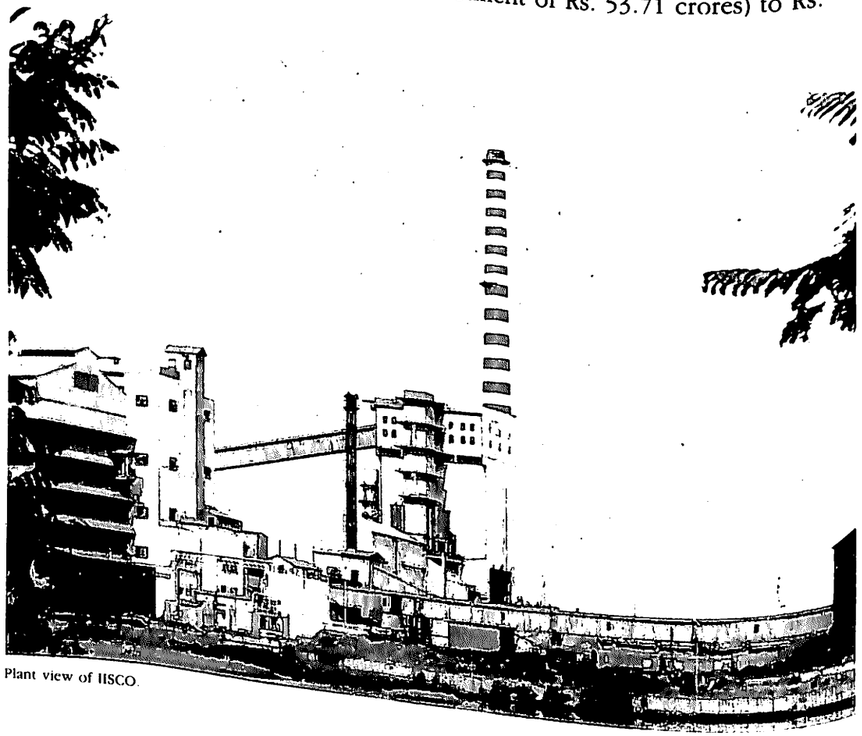
Progress was made in the enabling works under modernisation of the Burnpur works viz; site levelling, soil investigation, construction power supply, approach roads, railway linkages and net work, environmental

study etc. A 33 KV sub-station was commissioned in January, 1990. 316 acres of land have been acquired for the proposed modernisation project.

Revamping of the coke oven battery No. 9 and the by-product plant was under progress during the year and is now completed.

The underground mine development work at Chasnala upper seam is continuing. Production has started and the mine is expected to achieve its rated capacity by March, 1992.

The revised cost estimates for the reconstruction and development of Jitpur Collery is under consideration and a proposal for advance action on reopening the west section of the Chasnala deep mines has been approved by the SAIL Board in 1990-91.



Plant view of IISCO.

1.4 Financial Review

The turnover of the company at Rs. 470.30 crores was lower by 11% over the previous year, mainly due to lower sales volume of steel products and spun pipes. The net loss for the year 1989-90 was Rs. 138.08 crores as against the loss of Rs. 119.55 crores incurred in 1988-89. A substantial portion of the financial benefit arising out of phasing out of old and uneconomic units was off-set due to the cost of re-deployable labour and adverse techno-economic factors particularly in steel making operations.

The share capital of the company increased from Rs. 363.47 crores (including share money pending allotment of Rs. 53.71 crores) to Rs. 381.94 crores (including share money pending allotment of Rs. 18.47 crores) With a view to improving further the capital structure of the Company, the government accorded approval to the writing off of government loans amounting to Rs. 11.55 crores, outstanding as on 31st March 1989, which brought about a corresponding reduction in the accumulated loss of the company.

1.5 Sales & Marketing

Steel sales of 333.3 thousand tonnes during the year was 109% of the target. Pig iron sales of 246.9 thousand tonnes was the highest achieved by the company. Sales of cast iron spun pipes contined to suffer because of funds constraints with certain major customers, and the availability of cheaper substitutes in the market.

1.6 Human Resources and Management Review

The year began with a path-breaking agreement with the five major unions of IISCO, Burnpur on 12th July, 1989, which provides for modernisation of the Burnpur Works, phasing out of uneconomic units, voluntary separation of contract labour, re-deployment and training of deployable employees, elimination of work practices not conducive to a modernised plant and review of agreements arrived at earlier.

The total manpower of the company as on 31st March, 1990 was 36,217 comprising, 1468 executives and 34,749 non-executives. The SC/ST employees constituted 14.9% and 4% respectively of the total number of employees. During the calendar year 1989,of the total recruitment, scheduled caste/and scheduled tribes candidates constituted 20% and 7% respectively.

A total of 1,371 executives and 4,793 non-executives were trained during the year. Special emphasis was placed on multi-skill training for modernisation and training for re-deployment.

The company continued to pursue vigorously the implementation of the official language policy of the Government. To encourage employees to use Hindi progressively in their official work, various competitions workshops including an official language week celebration were organised.

2. IISCO-Ujjain Pipe & Foundry Company

2.1 IISCO, Ujjain Pipe & Foundry Company Limited (STISCON) is a wholly owned subsidiary of the Indian Iron and Steel Company Limited (IISCO). The Company manufactures cast iron spun pipes in the ranges of 80 mm to 350 mm dia sizes in its works at Ujjain (Madhya Pradesh).

2.2 Finance

The Company improved its turnover during 1989-90 to Rs. 2673.32 lakhs which was an increase of 8.53% over the previous year. The company earned a net profit for the year of Rs. 58.05 lakhs as against a net loss of Rs. 19.21 lakhs incurred in 1988-89.

2.3 Production

During 1989-90 IISCO Ujjain produced 35,050 tonnes of cast iron spun pipes as against 30,726 tonnes produced in 1988-89, thus registering a growth of 14% in production

2.4 Sales & Marketing

The recession in the cast iron spun pipes demand in the country continued. In order to satisfy the demand of the consumers for pipes in all size ranges, stress was given to the production of smaller diameter pipes in sizes of 80 and 100mm. Intensive customer contacts and close follow up action helped to improve the order book position. The order bookings during the year rose to 36.035 tonnes as against 34,459 tonnes achieved during 1988-89. Sales despatches however decreased from 35,352 tonnes in 1988-89 to 33,776 tonnes in 1989-90 mainly due to the non-availability of wagons from the Railways.

2.5 Capital Schemes

An Industrial Licence has been issued to the company for the production of mild steel and alloys steel pencil ingots which will help to utilise the spare capacity of the induction furnace.

2.6 Human Resource Management

The total manpower of the company as on 31st March, 1990 was 520, comprising 37 executives and 483 non executives. During the year 86 employees participated in various training programmes. The industrial relations situation in the company remained congenial.

3. Maharashtra Elektrosmelt Limited

3.1 Background

The Company became a subsidiary of SAIL with effect from 18.10.1986. SAIL took over this Company with a view to utilizing some of its facilities for R&D purposes and to maximise the production of ferro-manganese for captive use in SAIL Plants.

Work in progress at IISCO Ujjain.

3.2 Financial & Operating Review

The Company achieved an increased turnover of Rs. 8885.12 lakhs during the year as compared to Rs. 6675.80 lakhs in the previous year registering a growth of 33%. The Company however, incurred a loss of Rs. 210.33 lakhs for 1989-90 as against a profit of Rs. 33.24 lakhs earned in the previous year. The loss was mainly due to the steep escalation in input prices and increased interest charges, without a corresponding increase in sales prices.

3.3 Production and sales

Ferro alloys: There was a record production of 88.7 thousand tonnes of ferro alloys compared to the previous best of 73.8 thousand tonnes in 1988-89, thus registering an increase of about 20%. Production of High Carbon Ferro Manganese was 68 thousand tonnes, that of Silico Manganese was 20.4 thousand tonnes and Medium Carbon Ferro Manganese was 0.3 thousand tonnes.

Sales of Ferro Manganese were 66.4 thousand tonnes during the year as compared to 57.7 thousand tonnes in 1988-89 thus showing a rise of 17.7%. Similarly, sales of Silico-Manganese rose from 16.1 thousand tonnes in 1988-89 to 20.8 thousand tonnes in 1989-90, an increase of 23.8%.

Steel: Production of steel rose from 6.4 thousand tonnes in 1988-89 to 17 thousand tonnes in the year under review. As much as 15.5 thousand tonnes of steel were sold in 1989-90, registering an increase of 82% over the previous year.

3.4 Research and Development

The Company has undertaken the setting up of a high pressure sintering plant and also the pre-heating of the smelting charge for the ferro alloy furnace. This is expected to yield good dividends in the long run. A few other R&D projects in hand include stablizing the tuyer-based combined blowing technology, and trials of post-combustion lance, development of low Ni-High Mn stainless steel and special carbon and low alloy steel.

A Technological break-through was achieved in the bulk production of medium and low carbon ferro manganese by adopting the bottom blow converter process and using liquid high carbon ferro manganese as input raw materials for the convertor. Further a 1.5 tonnes Electic Arc Furnace (EAF) procured from IISCO is being installed to augment the bulk production of this item.

3.5 Conservation of Energy

The Company continued its efforts for conservation of energy. Pre-heating of convertors and ladles with gas generated from the submerged arc furnace (SAF) has resulted in reduction of furnace oil consumption.

3.6 Manpower Review

The manpower strength of the company as on 31.3.90 comprised of 160 executives and 852 non-executives. The percentage of scheduled castes and scheduled tribes as on 31.3.90 was 11.7% and 3.56% of the total number of employees.

Training programmes conducted during the year covered 75% of the employees.

As part of the Government's official language policy, the company conducted various programmes including training programmes in Hindi.

4. Visvesvaraya Iron & Steel Limited

4.1 The Vivesvaraya Iron and Steel Limited (VISL) became a subsidiary of SAIL from 1st August, 1989 when SAIL became 60% shareholders. Earlier the shares of the company has been held in the ratio of 60:40 between the Government of Karnataka and SAIL respectively. The company is a major producer of special & alloy steels, and also produces, ferro alloys and grey iron/steel castings, etc. in its works at Bhadravati in the State of Karnataka.

4.2 Financial Review

The authorised capital of the company as on 31st March, 1990 was Rs. 100 crores of which Rs. 81.92 crores was paid up. SAIL holds 60% of the paid up capital (Rs. 49.15 crores) and the government of Karnataka the remainder 40% (Rs. 32.77 crores). The turnover of the Company was Rs. 129.60 crores for the year 1989-90, registering an increase of 40.8% as compared to the previous year's achievement of Rs. 92.05 crores. The Company's losses reduced dramatically from Rs. 26.22 crores in 1988-89 down to Rs. 2.79 crores in 1989-90.

4.3 In pursuance of Memorandum of Understanding signed amongst Government of India, Government of Karnataka and Steel Authority of India Limited, the principal amount of past loans given to the Company were converted into equity and the interest accrued thereon was waived. This was given effect to during the year, and has increased the equity share capital to Rs. 81.92 crores as on 31st March, 1990.

SAIL provided interest free loans of Rs. 18.25 crores to the company during the year.

4.4 Production

The production of Alloy and Special Steel at about 56 thousand tonnes in 1989-90 recorded a growth of 37.5% over the last year when production was about 41 thousand tonnes. The targets for production of hot metal, liquid steel and ingot steel were all achieved. The production of ferro alloys was also marginally higher than in the previous year.

4.5 Capital Schemes

As a long term strategy, the Company proposes to install a 500 cubic metre blast furnace, one more LD converter, additional continuous casters, an ESR unit, a captive power plant, sinter plant etc. The conversion of one electric pig iron furnace to produce higher value ferro alloys is also being planned. The revamping of the existing plant, a secondary refining unit, water cooled panels for the two electric arc furnaces and revamping of oxygen plant-I are some of the short term programmes which have been taken up.

4.6 Marketing

The market for alloy and special steels in the country continued to be sluggish during the period under review. However, for VISL, the total sales for the year 1989-90 increased by 41% to touch Rs. 129.6 crores, as compared to Rs. 92.04 crores in the previous year. The total sales of alloys and special steels went up from 43 7 thousand tonnes, thus registering an increase of 22% over 1988-89.

4.7 Research and Development

Research and development projects were undertaken in important areas like grey cast iron foundry and EAF steel making. This helped in augmenting of steel making capacity for crank shaft quality steels, resulting in cost reduction and better quality control.

4.8 Industrial Relations

The total manpower of the company as on 31st March, 1990 was 8125, comprising 520 executives and 7597 non-executives. The percentage of SC/ST employees to total employment was 12.24 and 0.82 respectively. The industrial relations remained generally satisfactory during the year.

LD Converter at Visvesvaraya Iron & Steel Plant

Sponge Iron India Limited

1.0 Introduction

1.1 The Demonstration Sponge Iron Plant of the Company with an annual capacity of 30,000 tonnes was set up with UNDP/UNIDO assistance to establish the techno-economic feasibility of producing sponge iron, a substitute material for ferrous scrap used by steel-melting Electric Arc Furnaces, from lump iron ore and 100% non-coking coal. The Unit, designed to use coal from Singareni Collieries Company Limited (SCCL) and iron ores from Bayyaram. A.N. Puram and Veldurthi regions of Andhra Pradesh, which went into regular operation in November, 1980 is designed in such a manner that it can be operated both, on production basis and for R&D work. It is based on the SL/RN Technology developed by Lurgi of West Germany.

1.2 Taking note of the successful operation of the Demonstration Plant, Govt. of India sanctioned in 1982 doubling of the plant capacity from 30,000t to 60,000t per annum through the setting up of a second unit. This unit, which was designed and built by the Company's Engineers incorporating the various modifications carried out to the Demonstration Plant for adapting the technology to Indian conditions, went into regular production from October, 1985.

1.3 The Company has also successfully designed and built a plant for briquetting of Spong Iron Fines (below 6mm size) which were not usable by Electric Arc Furnaces. The Briquetting Plant was commissioned during October, 1987 and is operating to full capacity. Since then the sponge iron briquettes have received wide acceptance in the market.

2.0 Finance

The authorised share capital of the Company stood at Rs. 25.0 crores on 31.3.1990 out of which paid-up capital was Rs. 17.89 crores. Shares amounting to Rs. 17.06 crores are held by the Govt. of India the balance of Rs. 0.83 crores being the share of the Govt. of Andhra Pradesh.

3.0 Production

3.1 The Production and Financial Performance of the Company during the last three years is furnished in the table below:

TABLE

	1988-89	1989-90	1990-91 (Provisional)
Production (t)	51,549	54,030	47,600
Capacity Utilisation (%)	86	90	79
Sales (t)	50,698	50,468	49,000
Turnover (Rs. in lakhs)	1421	1901	1825
Generation of Internal Resources (Rs. in lakhs)	136	304	—
Net Profit (Rs. in lakhs)	10	174	141.68

3.2 The production of 54,030 tonnes achieved during 1989-90 is also the highest production achieved so far.

3.3 As against the target of 53,855t fixed for 1990-91 as per revised Estimates a production of 47,600t was achieved representing 88% of annual target. There is deterioration in the quality of coal supplied by Singareni Collieries, fixed carbon content dropping to as low as 32-34% against a requirement of 42% (minimum). The transportation of iron ore has also been very adversely affected due to shortage of diesel oil.

4.0 Sales and Profitability

Against a target of 55,620t, despatches were 49035t representing 88% achievement.

The operations during 1990-91 have shown a net profit of Rs. 141.68 lakhs, as against the targetted profit of Rs. 228.75 lakhs.

5.0 Cost Reduction

5.1 Through the application of improved techniques, constant efforts are being made to reduce the consumption of the principal input raw materials viz., iron ore, coal and limestone thereby reducing the cost of production. Uses are also being found for waste products like iron ore fines, char and dull coal so that additional revenues can be generated from the sale of waste products.

5.2 A separate project is being set up for effectively utilising the sensible heat in the kiln off-gases for generation of 5 MW of electric power. By doing so the operations of the plant would improve as dependance on external power would be less thus effecting savings in cost of production.

6.0 Efforts made Towards Indigenisation

The Engineering and Projects Division of the Company set up in 1982 has successfully completed the engineering and erection work of the Expansion Unit in 1985. By adopting some improved designs and incorporating some modifications, it was possible to reduce the foreign exchange component (inclusive of duty) to Rs. 0.85 crores as against the original estimate of Rs. 2.20 crores. In the setting up of the Expansion Unit, besides developing indigenous capability for manufacture of major equipment required for commercial sponge iron plants, the Division had also developed indigenous sources of supply for spares and consumables required for day-to-day operations of the existing plant.

The Engineering and Projects Division had also developed basic engineering data/designs for setting up large commercial sponge iron plants relevant to locally available ores and coals. The division has also developed expertise for agglomerating Sponge Iron Fines into high density briquettes, which have received ready acceptance.

7.0 Energy Conservation Measures

The Company had worked out a scheme for utilisation of the Waste Heat from the stack emissions of the Sponge Iron Plant for generation of electric power through a system of Waste Heat Boilers and Steam Turbines. The power generated is proposed to be utilised in a specially designed Submerged Arc Furnace for the production of low phosphorus pig iron using pre-reduced iron ore fines and char from the Plant. These two projects were estimated to cost a total of Rs. 16.20 crores for the generation of 5 MW of power from waste heat and for the production of 45,000 tonnes per annum of low phosphorus pig iron. Besides rendering the sponge iron production process less sensitive to the characteristics of iron ore and coal, this plant is expected to provide an alternative steelmaking route based on usage of 100% sponge iron with little dependance on the external power. Char, presently considered as a waste product, would be utilised in the SAF for reduction of partially

reduced sponge iron, while at the same time improve the carbon content in the product.

8.0 Manpower

The total number of employees of the Company as on 30.11.1990 is furnished below indicating separately, persons belonging to Scheduled Castes, Scheduled Tribes, Ex-Servicemen, Physically Handicapped persons and Women.

Sl. No.	Groups	Total no. of	S.C.	S.T.	Ex-servicemen	PHC	Women
1.	Group (A)	104	10	—	—	—	1
2.	Group (B)	18	1	—	—	—	—
3.	Group (C)	236	32	16	4	6	18
4.	Group (D) (Excluding Sweepers)	220	56	41	1	6	6
5.	Group (D1) Sweepers	6	2	2	—	—	2
Total		584	101	59	5	12	27

9.0 Employees Participation in Management

Pursuant to the directives of the Government of India, a scheme for Employees' Participation in Management has been implemented in the Company. Under the scheme, one Plant Level Committee and three Shop Floor Level Committees have been constituted with representatives of the Management and the Employees and regular meetings are held to discuss various problems and finding solutions internally.

10.0 Hindi Implementation

10.1 The Company continues to lay strong emphasis on increased use of Hindi in its communications both within and outside. During the first eight months of 1990-91, of the 192 communications/documents released, 170 were bilingual.

10.2 During September, 1989 a one day exposition on Rajabhasha was arranged for the benefit of the employees.

10.3 "Hindi Divas" has been observed on 14.9.1990. Elocution, Essay Writing and Quiz competitions in Hindi were conducted and prizes were awarded to the winners. As suggested by the Ministry, 5 Video casettes on efforts for propagation of Rajbhasha were procured and screened through the cable TV at the Company's township. Six Hindi video films were also shown in Company's Township.

10.4 A training class was conducted from 23rd to 31st July, 1990 for Stenographer/Typist level. At this training class, check points to be exercised at Stenographer/Typist level have been devised. Two typists had passed Typewriting examination during half year.

11.0 Anti-Pollution Measures

The plant has anti-pollution equipment for controlling air and water pollution to specified standards. The stack emissions and effluents are regularly analysed to ensure conformity to standards.

However, in view of the power cut imposed in the State by APSEB, operations are carried out restricting the functioning of the pollution control devices only to the extent necessary for fulfilling the relevant environmental control standards.

12.0 Research and Development

12.1 Ileminite

Test work was carried out on the reduction of Ileminite. Based on the results it is confirmed that the iron bearing portion of the material can be separated after reduction. A proposal has been prepared for installation of a Laboratory scale furnace for smelting the pre-reduced material. The Laboratory furnace is expected to be received by January, 1991 under a UNIDO Programme. Meanwhile the Company is associating itself with Regional Research Laboratory (RRL), Trivandrum in the process for evolving an appropriate route for processing raw Ileminite into synthetic rutile.

12.2 VR-DR Process

Further trials on VR-DR process developed by National Metallurgical Laboratory, using SIIL raw materials are proposed. The initial tests although were encouraging, certain parameters, such as metallisation, yield, thermal efficiency etc., are required to be reaffirmed.

12.3 Smelting of Sponge Iron in HB Cupola

Tests on smelting of sponge iron in HB Cupola for production of Grey Iron castings are under-way. The results, if satisfactory, would enable use of sponge iron in cupolas in place of pig iron which is a scarce commodity.

13.0 Engineering/Consultancy Services for New Clients

The Company has entered into an engineering/consultancy agreements with following clients for setting up coal based sponge iron plants based on SIIL Technology.

a) Tamilnadu Sponge Limited — 1 × 30,000 tpa
b) Tamilnadu Steel Limited — 1 × 30,000 tpa
c) Hindustan Electrographites Ltd. (HEGL) — 2 × 30,000 tpa
d) Kumars' Metallurgical Industries Ltd. (KMIL) — 2 × 30,000 tpa
e) Bellary Steel & Alloys Ltd. (BSAL) — 2 × 30000 tpa
f) Raipur Alloy Steel Ltd. (RASL) — 1 × 30,000 tpa

The detailed engineering of Tamilnadu Sponge and HEGL Plant has since been completed and construction work is well under-way. In respect of others i.e., KMIL, BSAL, RSAL, the basic engineering work in in progress.

14.0 UNDP/UNIDO Assignments

14.1 A test work assignment of Ilmenite samples of Egypt has since been completed and report submitted to UNIDO which has since been accepted.

14.2 Another assignment i.e., testing of Red Mud from Hungary for recovery of Iron by reduction process has since been awarded to the Company. The work is in progress.

14.3 Training was imparted to two more batches of Engineers from Vietnam.

Kudremukh Iron Ore Company Limited

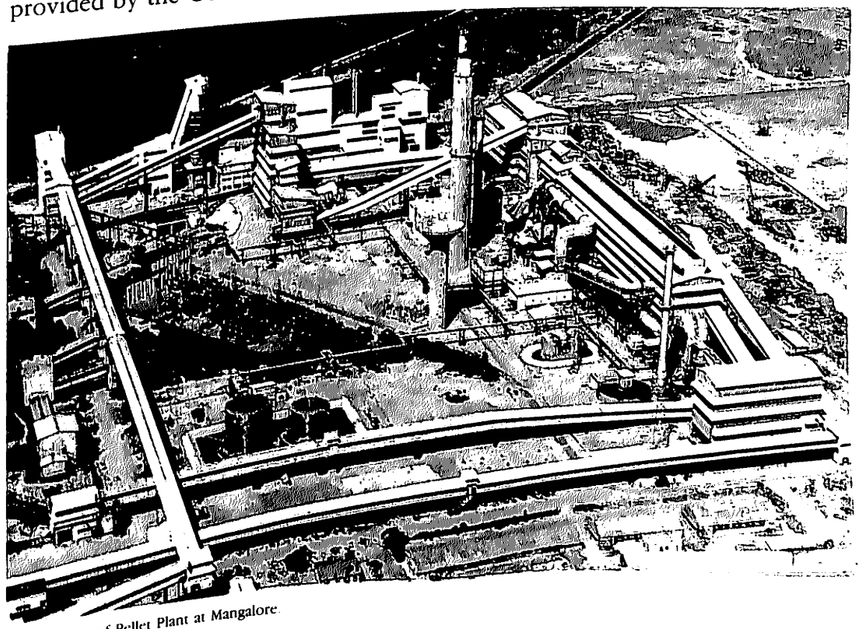
1.0 General

1.1 The Kudremukh Iron Ore Company Limited (KIOCL), which is a wholly owned Government of India Undertaking and the country's largest 100% EOU, was established in April, 1976 to produce iron ore concentrate to meet the long-term requirements of Iran. An Iron Ore Concentrate Plant of 7.5 MT capacity was set up.

1.2 The Sale and Purchase Contract with Iran envisaged the supply of 150 million tonnes of iron ore concentrate over a period of 21 years. Iran also entered into a Financial Agreement with India to extend a loan not exceeding US Dollars 630 million for the construction of the project and the related infrastructure. Against this promised loan, Iran paid only US$ 255 million and then stopped further disbursements. However, the project was completed with the balance funds provided by the Government of India. The total expenditure incurred on the project was nearly Rs. 517 crores.

2.0 Pellet Plant

Keeping in view the uncertainty in the off-take of the materials by Iran, Government sanctioned in May, 1981, a Pelletization Plant of 3 million tonnes per year capacity at Mangalore for conversion of a part of Kudremukh Iron Ore Concentrate into Pellets. This was with a view to diversify the production by adding a value added product, to enable the Company to become a viable unit. The plant started commercial production from April, 1987. The total cost of the Project was nearly Rs. 118 crores. As a result of vigorous marketing efforts to find alternate buyers for its product, the Company has now established itself as one of the major suppliers of good quality Iron Ore Concentrate and Pellets, in the world.



Overall view of Pellet Plant at Mangalore

3.0 Finance

As on March 31, 1991 the paid-up capital of the Company is Rs. 634.51 crores against the authorised capital of Rs. 675 crores.

4.0 Production

4.1 Iron Ore Concentrate

In 1989-90 the Company produced 5.4 million tonnes of iron ore concentrate. In 1990-91, 6.006 million tonnes of iron ore concentrate was produced, representing 92% target fulfillment. As a result of the turn-around plan adopted by the Company in the year 1984-85, the capacity utilisation has been improving year after year.

4.2 Iron Ore Pellets

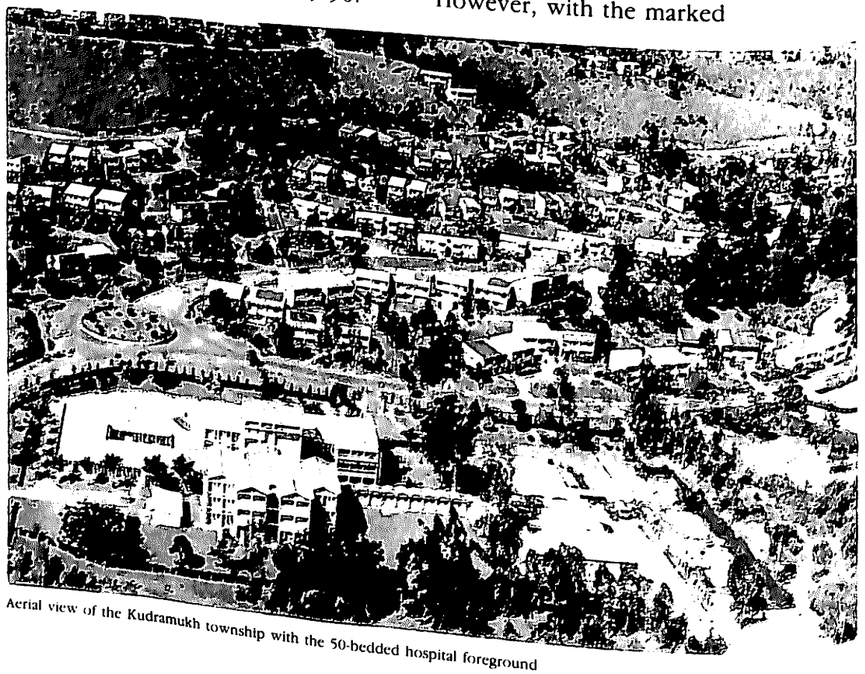
In 1990-91, 1,919 million tonnes of pellets have been produced, compared to 1.98 million tonnes in 1989-90.

5. Exports

As a result of persistent marketing efforts, KIOCL has been able to penetrate more markets for the sale of their products. During 1989-90, 3.40 million tonnes of concentrate and 1.95 million tonnes of pellets valued at Rs. 174.40 crores were exported. There was an increase of about 86% in the rupee value of exports in 1989-90 over the export earnings in 1988-89. During 1990-91 KIOCL had exported 3.906 million tonnes of Concentrate and 1.836 million tonnes of pellets.

6. Working Results

Due to depressed market conditions and on account of failure of Iran to take the contracted delivery of the material etc., the Company had suffered heavy losses in the past. However, with the marked improvement in the demand and price of iron ore in the international market in the recent past, the Company is expected to fare much better in the coming years. In 1990-91, the company earned a net profit of Rs. 63.05 crores as compared to Rs. 24.95 crores earned in 1989-90.



Aerial view of the Kudramukh township with the 50-bedded hospital foreground

7. New Schemes

KIOCL has proposed to invest in the following new schemes:

(i) installation of a captive power plant of 20 MVA capacity in Mangalore to meet the additional power requirements of the existing installations.

(ii) to increase its manufacturing capacity of concentrate from 7.5 to 10 million tonnes and of pellets from 3 to 6 million tonnes.

(iii) to set up a gas based Sponge Iron Plant of 0.75 million tonnes per annum capacity in Mangalore in co-operation with Steel Authority of India Limited.

8. Man Power

As on November 30, 1990 the total number of employees in the Company are as follows:

Group	No. of employees			SC			ST			Ex-Servicemen		
	M	F	T	M	F	T	M	F	T	M	F	T
A	411 + 15tr	15	426 + 15tr	24 + 5tr	1	25 + 5tr	4 + 2tr	—	4 + 2tr	6	—	6
B	109	17	126	6	—	6	1	—	1	3	—	3
C	1368 + 153tr	75	1443 + 153tr	141 + 40tr	3	144 + 40tr	18 + 7tr	—	18 + 7tr	147•	1	148
	164	17	181	37	3	40	26	1	27	4••	—	4
D (sweepers)	29	12	41	26	9	35	3	1	4	—	—	—
	2081 + 168tr	136	2217 + 168tr	234 + 45tr	16	250 + 45tr	52 + 9tr	2	54 + 9tr	160	1	161

tr = Trainees
• Excludes 8 SC employees
•• Excludes 1 SC employees

9. Workers' Participation in Management

The Company has set up 10 shop level councils and 2 joint councils at the apex level. The councils meet periodically to discuss measures for improving production and productivity. Besides, this, the Company has constituted a Works Committee at its Kudremukh and Mangalore establishments comprising representatives of both workmen and management. These Committees deal with matters of general interest and have been functioning effectively.

10. Safety Measures

A Safety Department functions independently in the Company. In addition, there is a Pit Safety Committee which includes representatives of the workers. This Committee meets regularly to discuss safety measures. As a matter of practice, safety rules have been compiled for each work area, considering all safety aspects. All employees have been provided with these booklets. The Company actively participates in the safety week celebrations organised by the Mines Safety Association.

Manganese Ore (India) Limited

1. Background

Manganese Ore India Limited is the largest producer of high grade Manganese Ore in India. When Manganese Ore (India) Limited was formed in 1962, 49% of the shares were held by the Central Province Manganese Ore Co. Ltd. (CPMO) and the remaining 51% in equal proportion by Government of India and State Governments of Madhya Pradesh and Maharashtra. Subsequently, in September, 1977, the shares held by CPMO in MOIL were acquired by Government of India and MOIL became a wholly owned Government Company with effect from October, 1977.

2.1 MOIL is engaged in the production and sale of Manganese Ore of different grades consisting of:

a) High Grade Ores for production of Ferro Manganese:

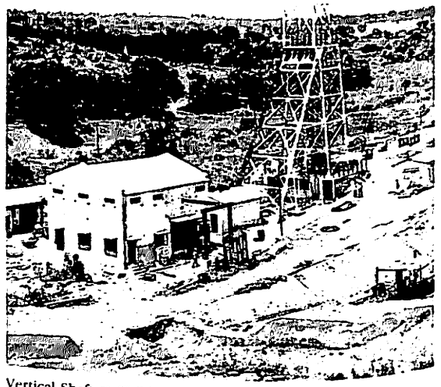
b) Blast furnace grade ore required for production of Hot Metal; and

c) Dioxide Ore which goes into the production of Dry Battery Cells.

2.1.1 The company is also diversifying into the manufacture of Electrolytic Manganese Dioxide.

3. Finance

The authorised capital of the Company is Rs. 30.00 crores and the paid up capital is Rs. 15.14 crores as on 31st October, 1990.



Vertical Shaft at Chikla Mine.

4. Performance

4.1 Operating and financial results

The physical and financial performance of the company during 1989-90 is given below:

(Quantity in lakhs tonnes)
(Value in Rs. Crores)

	Production	1989-90	1990-91 (provisional)
i)	Production	5.11	5.18
ii)	Turnover	36.64	42.77
iii)	Profit before tax	5.49	5.50

Turnover and profit during 1989-90 were highest ever achieved by the Company.

4.2 Productivity

In 1989-90 productivity (input per manshift in tonnes) reached an all time high of 0.229 which the company plans to improve further to 0.239 in 1990-91.

4.3 Conservation of Energy

Consistent with the national policy to conserve energy and also to contain cost of production, the company has embarked upon an economy drive in this sphere, and the consumption of power which stood at 17.96 KWH per tonne of bed ore in 1988-89 has been brought down to 17.45 KWH per tonne in 1989-90 constituting a reduction of about 2.8%. Efforts in this direction are continuing.

4.4 Repayment of Government Loans

During 1989-90 the company repaid to Government of India Rs. 0.72 crores towards plan loans and Rs. 1.20 crores as interest (including Rs. 0.55 crores towards arrears) as per approved repayment schedule. In 1990-91 the company proposes to repay plan loans to the tune of Rs. 0.96 crores and also pay a sum of Rs. 1.46 crores as interest (including arrears of 0.55 crores), as per approved schedule.

5. Capital Schemes

5.1 The position in respect of major capital schemes is given below:

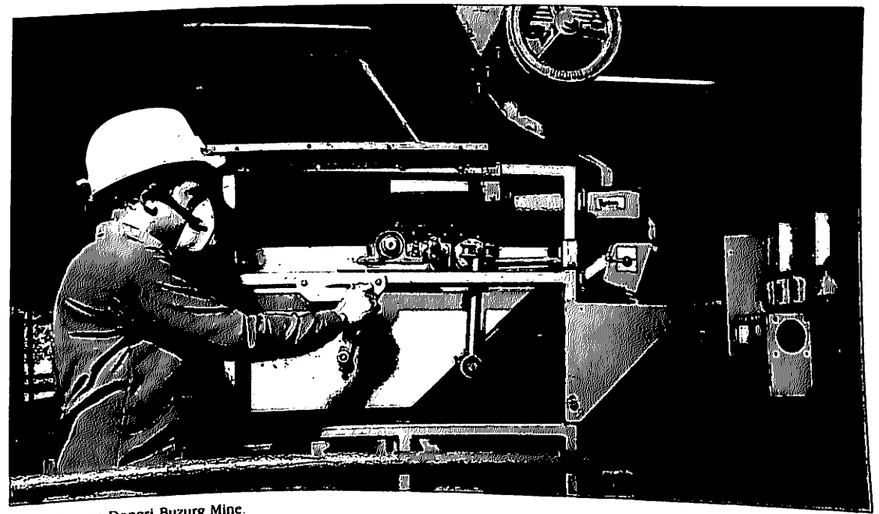
— Work relating to sinking of a Main Hoisting Shaft at Ukwa Mine is in progress.

— The establishment of an Electrolytic Manganese Dioxide Plant (700 TPA) is nearing completion and the plant is expected to be commissioned shortly.

— Sinking of a fill pass from surface to 8th level at Balaghat Mine is in progress and is scheduled to be completed by the end of 1990-91.

6.1 The important areas where R & D studies have been taken up by the Company are as follows:—

i) Beneficiation of medium and low grade ores as well as medium grade Dioxide ores to battery grade.



HIMS Plant at Dongri Buzurg Mine.

ii) Use of cable bolting and steel roof supports in underground mines.

iii) Improvement in mining methods.

iv) Direct utilisation of manganese ore fines without agglomeration in the production of ferro manganese through Plasma smelting technology.

v) Diamond drilling to locate new manganese bearing areas and to prove further reserves in existing areas.

vi) Optimisation of process parameters for Electrolytic Manganese Dioxide Plant.

vii) Dephosphorisation of high phosphorous manganese ore.

6.2 The Company is undertaking exploration by diamond drilling, trenching pitting, underground drivage etc. for locating new manganese ore bearing areas and proving manganese ore deposits in and around its mining lease-hold areas. Premining support by cable bolting and use of steel support in place of timber are being carried out in underground working on an experimental basis. Efforts are also being made to develop processes to set up manganese based industries. The company is setting up a Plant to manufacture Electrolytic Manganese Dioxide, used as a depolariser in dry battery industries.

6.3 The company is also trying to develop benefication processes to upgrade medium and low grade manganese ores to high grade.

6.4 The R & D efforts of the company in improving mining methods has helped in reducing

Pack pillar roof support at Chikla Mine.

timber and power consumption per unit of output, has improved strata control in underground workings, which in turn has resulted in improvement in safety standards in mining. It has also helped in the adaptation and assimilation of High Intensity Magnetic Separation process in the Upgradation of medium grade Dioxide ores to battery grade.

7. Safety Measures

With the gradual depletion of deposits near the surfaces Workings are extending to deeper areas and extraction is increasingly done through underground mining. Deeper working require, extra vigilance with regard to support systems, ventilation and efficient filling of the voids arising out of extraction of ore. Even in respect of opencast workings, depth has increased and hence judicious and selective use of earthmoving

machinery has been resorted to ensure safe and efficient working. Emphasis is laid on training and retraining of employees to face the challenges associated with mining. In addition, mine workings are regularly inspected by members of Pit Safety Committees, Workmen Inspectors, Safety Officers and Chief (Safety). Safety Weeks are observed and exhibitions are held to inculcate safety habits to ensure safe working. Safety Committee Meetings are regularly held during which any unsafe acts committed/observed are discussed to avoid recurrence.

8. Worker's Participation in Management

Works/Canteen/grievance Committees are functioning satisfectorily at each unit. The members of these Committees are from different sections of the employees. An effective mechanism exists for the association of workers representatives right up to the Apex Council which functions at the Corporate level, under the Chairmanship of the Chairman-cum-Managing Director to review and find solutions to major problems. There is a continuing effort to strengthen this arrangement.

9. Environmental Protection

The Company has remained alive to the need to protect environment. Planting of trees in large numbers on the leasehold areas of the company has been taken up besides undertaking environment studies covering different aspects such as impact of manganese on ecology, air and water pollution etc. Large scale plantation of trees at the Company's mine sites has been programmed to be undertaken as an integral part of 8th plan.

10.0 Progressive Use of Hindi

10.1 MOIL attaches importance to the progressive use of Hindi. At the Head Office, the Raj Bhasha Adhikari, assisted by supporting staff, looks after these functions. Periodical meeting with the senior executives of the company are held to review the progress relating to the use of Hindi, HINDI DIWAS/HINDI SAPTAH etc. are periodically organised during which various competitions are also held, and deserving employees are suitably rewarded. A technical seminar relating to mining and related matters was also organised.

10.2 Facilities for learning Hindi have been made available to employees who are not proficient in the language. Employees who pass the prescribed examinations, are given cash incentives in addition to awards under Government Schemes.

11. Social Commitment

Consistent with the national policy to promote social welfare, MOIL has adopted a tribal village-Gondi near Ukwa Mine in Madhya Pradesh, and has undertaken a wide range of development activities such as repairs to roads, construction of houses for homeless tribals, construction of school building to impart education to tribal children etc.

12. Personnel

The compostion of the work force of the company as on 31st October, 1990 was as under:-

Group	SC	ST	Others	Total
A	15	8	184	207
B	8	4	135	147
C	349	425	1203	1977
D	1327	2196	3589	7112
Total	1699	2633	5111	9443

—Out of the total number of 9443 employees 2026 are women

Bharat Refractories Limited

1.0 Brief History of the Company

Bharat Refractories Limited was registered as a Company on July 22, 1974 as a subsidiary of Bokaro Steel Limited with only one unit located at Bhandaridah. With a view to ensuring consistent availability of critical items of refractories to the Steel Plants and coordinated development of specialised high quality refractories at reasonable prices, Bharat Refractories Limited was restructured with effect from May 1, 1978. As a result of the restructuring, the Ranchi Road Refractories Plant at Ramgarh along with its captive sillimanite mines in Meghalaya and Bhilai Refractories Plant in Madhya Pradesh were brought under the control of Bharat Refractories Limited (BRL). India Firebricks and Insulation Company Limited (IFICO) which was a subsidiary of SAIL was made a subsidiary of BRL with effect from 1.5.1978.

2.0 Capital Structure

The authorised share capital of the Company is Rs. 5000 lakhs against which the paid up capital as on 30th November, 1990 is Rs. 4247.95 lakhs. The total outstanding loan together with interest accrued thereon as on 30.11.1990 amounts to Rs. 7,541.95 lakhs.

3.0 Production Performance

The production performance of the various units of the Company as well as the subsidiary, IFICO during 1989-90 and production during 1990-91 is given below:—

4.0 Financial Performance

During the year 1989-90, the Company (BRL) incurred a net loss of Rs. 1003.16 lakhs after providing for interest and depreciation to the tune of Rs. 515.58 lakhs and Rs. 354.11 lakhs respectively. During 1990-91, the Company incurred a net loss of Rs. 1139.71 lakhs after providing for interest and depreciation (including DRE) to the tune of Rs. 608.16 lakhs and 388.84 lakhs respectively.

During 1989-90, the subsidiary company IFICO incurred a net loss of Rs. 16.40 lakhs after providing for interest and depreciation (including DRE) to the tune of Rs. 6.62 lakhs and Rs. 60.13 lakhs respectively.

During 1990-91, the subsidiary Company IFICO incurred a net loss of Rs. 297.25 lakhs after providing for interest and depreciation (including DRE) to the tune of Rs. 135.10 lakhs and Rs. 15.62 lakhs respectively.

Unit — Quantity in M.T. Value Rs. in Lakhs

	1989-91		1990-91 (Provisional)	
	Quantity	Value	Quantity	Value
Bharat Refractories Ltd.				
Bhandaridah Refractories Plant (BHRP)	17745	468.61	17770	668.54
Ranchi Road Refractories Plant (RRRP)	5627	758.68	5664	1074.20
Bhilai Refractories Plant (BRP)	31110	2073.94	28173	2628.64
Total of BRL	54482	3301.23	51607	4371.38
India Firebricks & Insulation Co. Ltd.	29038	1558.54	22469	1935.98

5.0 Foreign Collaboration

5.1 With the shift in demand pattern due to technological innovations in the steel industry and consequential change in the requirements of refractories, the Company decided to embark upon rationalisation of the product-mix at all the units with diversified range of sophisticated refractories conforming to stringent specifications so as to make all the units specialised centres for production of a specific product range. Towards this, the company entered into technical collaboration with Kawasaki Refractories Co. Ltd. (KRC), Japan for the manufacture of certain sophisticated products. The present status of products covered under the collaboration with KRC Limited is as follows:

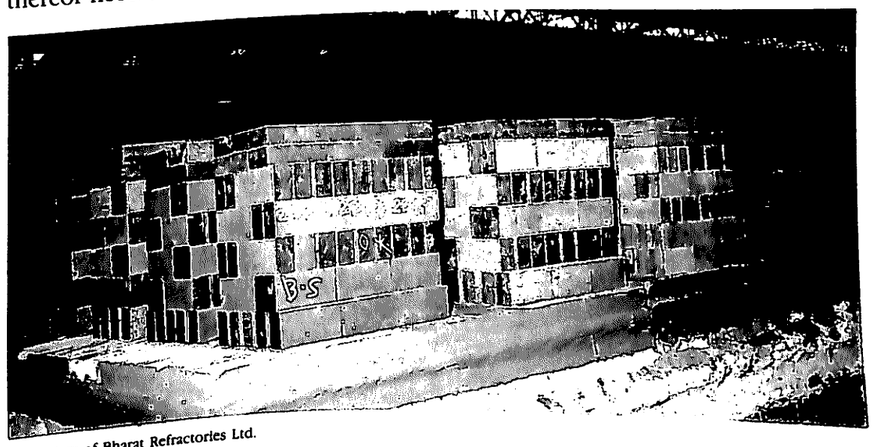
Products like manganesia-carbon bricks, refractories for sliding gate systems, casting mixes for steel ladles, have already been commercialised and are regularly being supplied to SAIL Steel Plants. Though the gunning repair material has been successfully developed and tried, application thereof need to be established.

Coke-oven silica bricks is an item covered under the collaboration agreement with Shinagawa Refractories Co. Ltd. (SRC), Japan. Trials are underway in absorbing the technology appropriately so as to restrict the level of rejection.

6.0 Research & Development

All the units and subsidiary are having laboratories equipped with facilities for testing, quality control and technological improvement. The R & D laboratories of the Company and its subsidiary have been recognised by the Department of Scientific & Industrial Research, Ministry of Science & Technology, Government of India.

In-house R & D efforts are being accelerated to achieve excellence in performance. Some of the products developed by R & D efforts are Well Blocks, High Alumina Checker Bricks for Open Hearth Furnace, Super Dense 54% Alumina Blast Furnace Block, High Alumina Burner Blocks for reheating furnaces, Curb Block, Porous Plugs etc.



Plant view of Bharat Refractories Ltd.

The Company is also pursuing collaborative research with RDCIS, SAIL for development of new products.

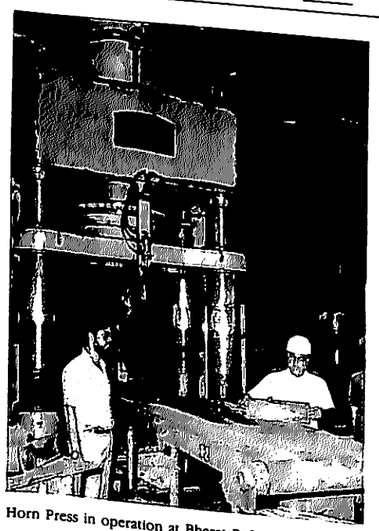
7.0 Industrial Relations

The Industrial Relations in the Company and subsidiary are generally satisfactory.

8.0 Manpower

The manpower position as on 30.11.1990 in different units and subsidiary of the Company was as follows:—

Sl. No.	Name of Unit	Total Manpower	SC	ST	Women	Physically Handicapped
1.	BHRP	882	112	63	80	1
2.	RRRP	359	33	34	14	4
3.	BRP	1642	200	295	18	13
4.	NS MINES	220	2	105	14	1
5.	P M P	21	3	1	2	—
6.	HEAD OFFICE	160	16	6	1	—
	TOTAL	3284	366	504	129	19
7.	IFICO	1120	45	155	35	11
	GRAND TOTAL	4404	411	659	164	30



Horn Press in operation at Bharat Refractories Ltd.

9.0 Safety Measures

Safety measures are being implemented in all the units as per provisions of the Factories Act, 1948 and are periodically reviewed by the Safety Committees appointed in different units and subsidiary of the Company.

10.0 Contract Labour

Contract Labourers are engaged on non-perennial jobs. They are being paid minimum statutory wages. In addition, they are extended other benefits like provident Fund, Medical Facilities, Leave etc.

11.0 Implementation of Official Language

The Company has been vigorously pursuing implementation of the official language policy of the Government. Various schemes have been adopted to motivate employees to use Hindi progressively in their official work. Cash awards and commendation certificates were awarded to deserving employees.

National Mineral Development Corporation Limited

1.0 National Mineral Development Corporation Limited (NMDC) was incorporated on November 15,1958 as a Government Company for developing and exploiting the mineral resources of the country (other than coal, oil, natural gas and atomic minerals).

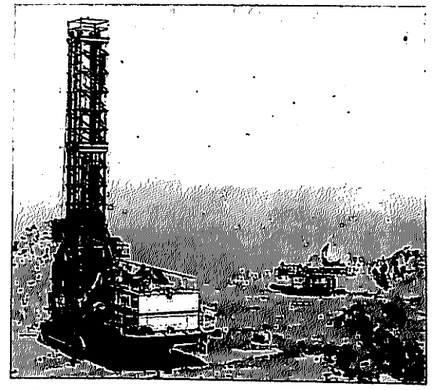
1.1 Presently, on the production side, the activities of NMDC are confined to Iron Ore and Diamond.

The following units are under the control of NMDC.

		State in which located
A.	**Production Projects**	
	Iron Ore	
	Bailadia-14	
	Bailadila-11C	
	Bailadia-5 incl.FOHS	Madhya Pradesh
	Donimalai	Karnataka
	Diamond	
	Panna Diamond Mining Project (Majhgawan)	Madhya Pradesh
B.	**Projects Recently Commissioned**	
	Iron Ore	
	Bailadila-14 Deeper Level Mining	Madhya Pradesh

2.0 Finance

The authorised capital of the Corporation is Rs. 150 crores. The paid up equity capital at the start of the financial year i.e. on 31.3.90 was Rs. 128.36 crores. The Government of India's loan outstanding as on 31.3.90 was Rs. 44.19 crores. The Company repaid an amount of Rs, 7.24 crores to the Government upto 31.3.91. The outstanding amout of loan as on 31.3.91 was Rs. 36.95 crores.



Drilling operation in progress.

3.0 Production

Production in the units of NMDC during 1989-90 and 1990-91 is given below:

	Name of the Project	1989-90 (Actuals)			1990-91 Target for the full years*			1990-91 Actuals for April, 90 to March, 91 (Provisional)		
		Lump	Fines	Total	Lump	Fines	Total	Lump	Fines	Total
A.	**Iron Ore** (In. Lakh Wet Tonnes)									
1.	Bailadila-14/11C	27.00	14.77	41.77	23.00	17.00	40.00	22.06	11.69	33.75
2.	Bailadila-5	22.33	11 48	33.81	24.50	15.50	40.00	20.09	13.83	33.92
3.	Donimalai	12.76	11.63	24.39	13.00	14.00	27.00	13.05	16.06	29.11
	Total Iron Ore (1 + 2 + 3)	62.09	36.39	99.97	60.50	46.50	107.00	55.20	41.58	96.78
B.	Diamond (Carats) Panna Diamond Mining Project	—	—	16071	—	—	16000	—	—	17441

* The targets are as per the Action Plan for the year 1990-91.

@ This is site weight. At the time of pooling of diamond for sale. thee is likehood of a reduction of approx 0.4% on the total site weight for the year.

4.0 Export/Sale

4.1 The quantity of iron ore contracted for export by MMTC is as follows:

(In lakh tonnes)	
1989-90	1990-91
83.07	89.00 (projected)

About 78.47 lakh tonnes of iron ore was despatched for export during 1990-91.

The Corporation has diversified its market for iron ore and is no longer exclusively export oriented. N.M.D.C. has started supplying to local consumers who are setting up sponge iron plants. The Visakhapatnam Steel Plant has also emerged as an important consumer. During the year 90-91 around 18.99 lakh tonnes was sold to domestic consumers.

4.2 18444 Carats of diamond were disposed of through auction/tender sales for a value of Rs. 715.71 lakhs in 1990-91. This compares favourably with 14124 carats for a sale value of Rs. 533.17 lakhs during the corresponding period of last year.

5.0 Operating Results

The Company is expected to earn a profit of around Rs. 32.06 crores before tax in the year 1990-91. In 1989-90 the company earned a record profit of Rs. 38.85 crores (before tax).

6.0 Highlights for the year 1989-90

i) Iron Ore production (lumps & Fines) during 1989-90 99.7 lakh tonnes against the target of 91.4 lakh tonnes, achievement being 109% and higher by 1.6% over the previous year.

ii) Record 133 lakh tonnes RDM feed to crushing Plant was achieved during the financial year against previous best of 109 lakh tonnes achieved in 1986-87.

iii) Total despatches were 101.7 lakh tonnes against target of 91.1 lakh tonnes resulting in achievement of 112% of target. This is a record despatch by NMDC, the last record despatch being 92.1 lakh tonnes in 1986-87.

iv) Total shipment of iron ore - 92.3 lakh tonnes against the target of 83.1 lakh tonnes achieving 111% of the target.

v) Total shipment of fines - 36.6 lakh tonnes. This is a record high, the last record being 30.3 lakh tonnes in 1988-89.

vi) Production of diamonds was 16071 carats sale of diamond amounted to Rs. 533 lakhs, and the highest realisation per carat at Rs. 3,774/- was also an all time high.

7.0 Important Projects

i) Deeper level Mining at Bailadila Deposit No. 14

In order to mine ore at deeper levels from the depleting mine, a scheme has been formulated involving an investment of the order of Rs. 18.97 crs. This was sanctioned on 15.6.88. This deeper level mining at Baialdila Deposit No. 14 is designed for a capacity of 1.74 million tonnes of lumps and fines per year. This project has been completed and is in operation.

ii) Bailadila Dep.-14 Expansion & Modification incorporating

i) Blue Dust Mining Scheme; and
(ii) Fine Ore Handling Scheme

This project is designed to utilise 22 million tonnes of high grade blue dust untapped hitherto. This will have a capacity to mine 0.7 million tonnes of blue dust per year.

The mechanised fine ore handling scheme will be installed to meet the demand for iron ore fines for Visakhapatnam Steel Plant.

The Govt. have approved the project in Feb. 91 at a Capital cost of Rs. 60.65 crores (including Rs. 2.87 crores FE).

8.0 Supplementary Projects Under Consideration/ Construction

i) Tertiary Crushing Plant at Bailadila-5

The Board of Directors has sanctioned on 23.12.89 the proposal for establishing a tertiary crushing plant at Bailadila-5 for production of calibrated ore (NP-67) involving an outlay of Rs. 17.00 crores. The implementation of the Project has been taken on hand.

ii) Recovery of fines out of current slimes at Bailadila-5

This scheme was sanctioned by Board of Directors involving an outlay of Rs. 1.90 crores. This is

A general view of Bailadila 5 FOH new siding.

designed to recover additional fines out of slimes currently produced and to control pollution. The scheme is under implementation. Engineering drawings have been completed. Civil and structural works are in progress. Orders for the equipments have been placed. The project is expected to be completed by May, 91.

9.0 Projects Under Investigation

i) Panthal Magnesite (J&K)

This is a project to be undertaken by the J&K Mineral Development Corporations and a joint venture company where, NMDC and J&K Mineral Ltd. are joint venture partners. The Company was incorporated on 9.5.89. The PIB gave its clearance for setting up a 30,000 tonnes per annum Dead Burnt Magnesite Plant at Panthal J&K at an estimated cost of Rs. 41.98 crores. The mining lease has been sanctioned and the formal clearance of the Department of Environment is awaited.

ii) Low Silica Limestone-Arki, Himachal Pradesh

This limestone can be used as flux in LD- convertors in the Steel Plant 80 million tonnes of reserves of SMS grade limestone have been established in the deposit. The Government has approved Stage-I of the project. A sum of Rs. 2.00 crores has been sanctioned for preparation of feasibility report. This includes Rs. 1.00 crore in foreign exchange for the preparation of DPR.

The mining plan has been submitted to Indian Bureau of Mines and the matter is being pursued with them for approvel. M/s. Engineers India Ltd. have been advised to take up feasibility studies and to prepare the DPR.

iii) Tungsten Deposit

NMDC carried out exploration of Tungsten/Graphite Deposits at Burugubanda and Tapaskonda which are located at 45 kms. and 75 Kms. respectively from Rajahmundry, A.P. Extensive exploration work is under progress in these areas.

10. Environmental Improvements

Long range planning for environmental protection measures has been prepared for the projects of NMDC for four years (1986-87 to 1989-90) based on the assesment studies made at each project on pollution control system and suggestions of expert consultants. The major activities broadly are:

i) Construction of tailing dams, check dams, drain etc. in Bailadila and Donimalai.
ii) Improving dust collection systems at Crushing Plants and Blast Hole Drills and ensuring adequate water sprinkling for dust suppression.
iii) Installing monitoring equipments for recording various parameters on air, water, noise and vibration.

Besides, afforestation programmes at work sites, residential areas and wastelands within lease hold are being implemented on priority. A survival rate of 95% has been achieved in this regard.

11.0 Research & Development

During the year 1989-90 and the current year 1990-91, the R&D Centre of NMDC had undertaken several studies and assignments with a view to meet its own in-house R&D requirements and achieved diversification of its activities as well as meet the requirements of other organisations in the Public and Private Sector, through sponsored assignment.

The scope of these assignments is indicated below:

A. In-House Studies

1. Utilisation of Blue Dust

(a) A demonstration plant for production of ferric oxide suitable for making ferrite components in electronic industries set up with financial assistance partly from the Department of Electronics was commissioned. Evaluation of the Ferric oxide produced in the plant in large quantities is being carried out by various Ferrite manufacturers in India and abroad.

(b) Studies on reduction of the blue dust concentrate by Hydrogen/carbon for production of iron powder are being conducted. The powder being produced are being evaluated by various industries adopting Powder Metallurgical Techniques for production of Automotive parts of complicated design.

(c) Studies on Production of Higher Purity Super Grade Ferric oxide for use by soft ferrite industry are being carried out through Hydro-metallurgical routes.

(d) In view of the high demand for this product and their growing demand in the coming decade, efforts are being made for setting up of a commercial plant in India.

2. Utilisation of Kimberlite Wastes

Studies on utilisation of Kimberlite wastes accumulated during mining of diamond at NMDC's Diamond Mining Project are carried out, salient feature of which are as follows:

(a) Recovery of magnesium as Magnesium Sulphate through Hydrometallurgical Route. Preliminary studies were carried out.

(b) Production of Floor Tiles (Mosaic Tiles) using this waste material as a substitute for cement.

(c) Production of Sintered Tiles.

(d) Use of this waste material as a soil conditioner in acidic soil.

3. Studies on Magnesite Samples

Beneficiation studies on samples of Magnesite from Jammu & Kashmir with a view to reduce Silica and Iron Oxide from the raw magnesite were undertaken to meet the specification of raw material for production of Steel Plant Refractories.

4. Studies on Natural Pellets (Sized Ore)

Systematic studies with different types of ores from Bailadila and Donimalai regions were carried out for

evaluation of their metallurgical characteristics like RDI, Reducibility, Shatter Test etc.

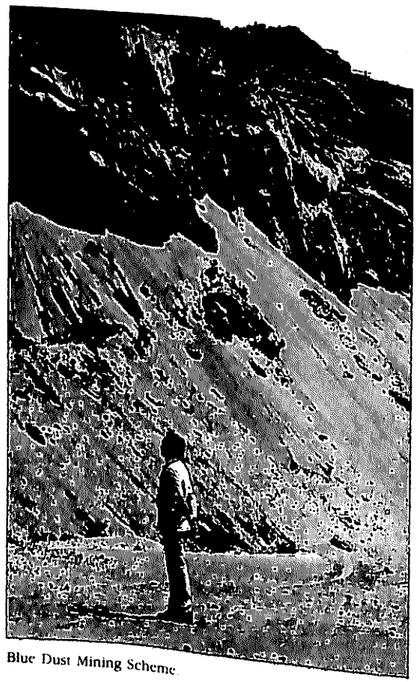
5. Recovery of Graphite & Wolframite from Complex Tungsten Ores of Tapaskonda, A.P.

Laboratory Scale Studies for recoveries of Graphite and Wolframite from Complex Ores from Tapaskonda, A.P., are in progress.

6. Recovery of Ilmenite from Bhimunipatnam (A.P.) Beach Sands

Studies on separation of ilmenite (Fe0 Tio2) from beach sands are in progress.

7. The Drill Core samples from Gua Iron Ore Project are being analysed as a part of DPR preparation.



Blue Dust Mining Scheme

8. Sponsored Assignments

1. NMDC has carried out Beneficiation Studies on Dalli Iron Ore Mines, Redi Mines and Gua Iron Ore Mines on behalf of Bhilai Steel Plants. MMTC & IISCO, Burnpur respectively.

2. Beneficiation Studies with iron ore fines from Bailadila Iron Ore Mines and Metallurgical characteristics on behalf of ESSAR Gujarat Ltd. were carried out.

3. Studies on flowability of iron ore lump and fine samples of Bolani Mine for the design of mass flow bunkers bins were conducted on behalf of HSCL.

4. Studies on flowability of coal samples from LALMATIA were conducted for modification of existing bunkers and chutes to overcome the existing flow problems on behalf of FARAKKA SUPER THERMAL POWER STATION: NTPC, FARAKKA.

With the additional investment of Rs. 117.17 lakhs on mineral processing and quality control equipments during 1989-90, R&D Centre, NMDC has been requested for undertaking a large number of assignments sponsored by various agencies in the country.

12. Training Activities

The Corporation attaches great importance to the development of the skills of its employees through suitable training programmes. These training programmes are designed to meet the needs of the Company. During the period April to October, 1990, 502 employees of the Corporation has gone through a number of such programmes conducted within the Company; as well as outside.

13.0 Personnel

The details of employees in the Corporation as on 1st October, 1990 are indicated below:

Group	Total No. of Regular Employees as on 1.10.90	No. of Scheduled Caste Employees (out of Col. 2)	No. of Scheduled Tribe Employees (out of Col. 2)	No. of Women Employees (out of Col.2)
A	608	30	4	7
B	1015	63	19	38
C	3245	444	576	129
D (Excluding Sweepers)	1828	426	424	163
D (Sweepers)	144	101	6	45
Total	6840	1064	1029	382

14.0 Industrial Relations

The overall Industrial Relations situation in the Corporation during the period (April-October, 90) was peaceful. Eventhough Unions operating at Bailadila Complex and Panna served notices of direct action in August, 90, in support of their demands, they did not resort to any such measure. From October 90, the workmen in general and front line operators in particular of Bailadila-14 resorted to go-slow tactics in support of certain demands. After prolonged negotiations with the Unions, an amicable settlement was arrived at on 19.11.90 and the Project has resumed normal production since then. Similarly, the workmen in general and the front line operators in particular of Bailadila also resorted to go-slow from October demanding revision of their incentive scheme and also some additional demands. The issue has since been settled and normalcy restored.

15.0 Worker's Participation in Management

The Scheme of Worker's Participation in Management is working satisfactorily at all the three levels viz. Shop, Plant (Project) and Apex (Corporate) level.

The meetings of the Joint Councils at various levels take place regularly and follow up action is taken, thus paving way for a two way communication system and valuable exchange of information between the Management and Workers. The last AJC (Apex Joint Council) meeting was held on 21.7.90 at Hyderabad to review the progress in all fields of activities in the Corporation.

16.0 Safety Measures

A part from normal statutory provisions as provided under Mines Act, Mines Rules and Mines Regulations, NMDC is taking specific measures in reducing the occurrence of accidents at all their mines. To achieve the above. the following are being implemented by the Corporation:

a) Organising training at various levels.
b) Acquainting the new appointees with the safety standards.
c) Convening regular Pit Safety Committee meetings.
d) Medical examination.
e) Celebrating Safety Week to create awareness.
f) Providing workers with safety equipments and appliances.

g) Each mine has a separate Safety Officer and Training Officer to look after and train on the safety aspects in the mine. The compliance report on safety aspect is sent to Head Office for review in tripartite meetings. A separate Internal Safety Organisation is working at Corporate Office to monitor the progress in this respect.

h) An Internal Tripartite Safety meeting was conducted at Hyderabad on 23.10.90 to review the progress of implementation of recommendations of the VIIth Conference on Safety in Mines.

17.0 Raj Bhasha

NMDC is continuing the programmes for implementation of Raj Bhasha in compliance with the provisions of the Official Languages Act and Rules thereon to promote use of Hindi in its official work. The Company organised a Raj Bhasha Technical Seminar and Hindi Workshops during the year. Quarterly House Journal, "NMDC News" was brought out in Hindi separately. In addition, Raj Bhasha Magazines were also published during the year.

The Parliamentary Committee on Official Language also visited the Company.

National Awards

Vigorous promotion of Hindi is evidenced by the following awards NMDC has won.

The Company was awarded 'Indira Gandhi Raj Bhasha Shield' for the year 1988-89 by the Hon'ble Vice President on 23.3.90 as the first prize for excellent work done in connection with the use of Hindi amongst all the Public Sector Undertakings situated in Region 'C'. This is a repetition of the award granted for the year 1987-88 for the Company.

The Raj Bhasha Trophy was also awarded to the Company by the Hon'ble Minister of State for Mines on 12.9.1989 on behalf of Department of Steel under the Ministry of Steel & Mines for good performance in the use of Hindi during 1987-88. This is a repetition of the award for the year 1986-87.

18.0 Welfare Measures for People Belonging to SC & ST

The Corporation has on its rolls 6840 employees and out of this 2093 are Scheduled Caste and Scheduled Tribe employees, constituting 30.6% of the total employees.

Concessions are given to these people in direct recruitment and promotions as per Government of India directives.

The Corporation has provided facilities for promotion of education among their children by offering free scholarships in local Kendriya Vidyalayas by providing free educational facilities to children of tribals who seek admission in the project schools. An exculsive school for tribal children had been started in Bailadila Deposit-5. All tribals near the project areas are provided free medical facilities in the project hospitals.

Scheduled Tribes, who are not employees of NMDC, can also avail themselves of the services of project co-operative societies.

In Bailadila project, NMDC has constructed two permanent Community Centres at Kirandul and at Hill Top. Similar Community Centres are there in other projects also. Weekly film shows and other entertainments are arranged. NMDC has provided hand pumps and also dug wells in the nearby villages in order to improve drinking water facilities.

A local market "Haat" is organised in Bacheli where the Adivasis sell their wares.

Mandovi Pellets Limited

1.1 Mandovi Pellets Limited was set up in 1976 in the Joint Sector with National Mineral Development Corporation Limited (NMDC) participating on behalf of Government of India. Originally, SAIL and M/s. Chowgule and Company Private Limited (CCPL) each contributed 1/3rd of the equity capital. The remaining 2/3rd was to be contributed by the general public/Financial Institutions. Subsequently, the shares of SAIL were transferred to NMDC. Mandovi Pellets Limited (MPL) was scheduled to produce 1.8 million tonnes of blast furnace grade iron ore pellets for export to Japan. The plant started production in 1979.

1.2 MPL had entered into a long term agreement with Japanese Steel Mills (JSM) for the export of a total quantity of 18.32 million tonnes of pellets at a rate of 1.82 million tonnes per year over a period of 10 years starting from the year 1978-79. Due to delay in the commissioning of the plant, MPL could not ship any pellets in 1978-79. In the following two years 1979-80 and 1980-81 also, the Company could export only 0.66 million tonnes and 0.88 million tonnes respectively. The main reason for shortfall in production was inadequate supply of power.

1.3 The MPL Plant had to be subsequently closed down in 1981 as the manufacture of pellets became economically unviable due to high price of furnace oil and shortage of power, combined with a steep fall in pellets prices in the international market.

1.4 During the period of shut down, as an alternate arrangement, the Company exported iron ore to the Japanese Steel Mills earning a premium of about $ 5 per ton over the regular export price of iron ore. This special arrangement came to an end in March 1987.

1.5 Efforts were made by MPL through negotiations with SAIL to relocate the plant near Bhilai Steel Plant to convert BSP's iron ore into pellets to be supplied to B.S.P. as blast furnace feed. Though the trials were encouraging, the proposal for financing the relocation of the plant at an estimated cost of Rs. 50 crores was not found acceptable.

1.6 With the turnaround in the global steel industry in the beginning of 1987, the international market for pellets showed an upswing in the late 80s. It was, therefore, decided to reopen the plant as there were good prospects for exports. The Company obtained a letter of intent for conversion into a 100% EOU in February 1989. A rehabilitation package was worked out with the banks and financial institutions and the plant is expected to commence production in mid 1991.

The cumulative losses of the Company as on 31.3.90 stood at Rs. 32.82 crores.

Metal Scrap Trade Corporation Limited

1.0 Introduction

The Metal Scrap Trade Corporation Limited (MSTC), a Government of India Enterprise, is the canalising agency for export of ferrous scrap and import of carbon scrap including sponge iron/hot briquetted iron, re-rollable scrap, pig iron chips and old ships for breaking. The Company also undertakes disposal of ferrous and miscellaneous scrap arisings from integrated steel plants under SAIL and disposal of scrap and surplus stores from other Public Sector Undertakings and Government Departments.

2.0 Activities and Objectives

2.1 The main activities of the company through its two operating divisions, viz. Foreign Trade and Domestic Trade are briefly as follows:—

Foreign Trade

i) Canalising import of carbon steel melting scrap, alloy steel scrap, sponge iron/HBI, rerollable scrap and old ships for scrapping; and

ii) Export of ferrous scrap.

Domestic Trade

a) Disposal of ferrous and miscellaneous scrap from integrated steel plants (under SAIL)

b) Disposal of scrap and surplus stores from other Public Sector Undertakings and Government Departments.

The Corporation also has a Project & Development Division which tries to bring about improvement in the quality of service through its market research and developmental activities.

The main functions of this Division are:—

a) to service the operating divisions by providing regular feed-back about market developments, both short-term and long term, in respect of each item dealt with by the company.

b) to initiate, propose and monitor schemes for diversification/development of projects and implementation thereof; and

c) to service as a data bank.

2.2 Objectives

The main objectives of MSTC are:

i) to promote concerted action in the matter of movement of scrap within India and also its import/export in conformity with the policy of the Government;

ii) to promote and develop measures for increased and improved collection of scrap within the country;

iii) to support, protect, maintain, increase and promote export of scrap;

iv) to ensure supplies of scrap to Indian users on such terms as may be determined from time to time;

v) to undertake manufacturing activities allied to the steel industry.

3.0 Organisational Structure

3.1 The Chief Executive Officer of the company is the Managing Director who functions under the guidance of a part-time Chairman and a Board of Directors. The Managing Director is assisted by General Managers, who are incharge of various functions.

3.2 In order to render better service to customers and also to exploit the indigenous scrap arisings more effectively, the Corporation has three regional offices located at Delhi, Bombay and Bangalore. These are headed by Regional Managers who report directly to the Managing Director.

3.3 The General Managers and the Regional Managers are assisted by professionals in various functional disciplines.

5.0 Special Achievements During 1989-90

1. The profit before tax in 1989-90 was Rs. 13.23 crores as against Rs. 12.19 crores in 1988-89 i.e. an increase of 8.5%. This is the highest profit so far achieved by the company.

2. The turnover has increased from Rs. 646 crores in 1988-89 to Rs. 714 crores in 1989-90 i.e. the Company has registered a growth of 10.5% in 1989-90.

3. The internal resources generated by the Corporation during the 7th Five Year Plan (1984-85 to 1989-90) was Rs. 25.75 crores against a target of Rs. 8.15 crores. This represents an increase of over 300%.

4.0 Physical and Financial Performance

4.1 Physical Performance

Unit '000 Tonnes/LDT

		Actuals		
	1987-88	1988-89	1989-90	1990-91 Provisioal
A. Import of				
i) Carbon Steel Melting scrap/Sponge iron/HBI/ M.S. Skull/Pig Iron	1963	2249	1858	1435
ii) Stainless Steel scrap	6	0.1	—	—
iii) Ships for breaking	149	237	217	—
B. Export of Mill Scale Scrap	46	22	41	45
C. Domestic sales of scrap arising:				
i) Despatches of scrap arisings from steel plants	119	77	22	31
ii) Other Public Sector Under-takings and Govt. Deptts. (Auction/Tender sale) (Rs. in crores)	65.14	100.97	111.35	128.47

4.2 Financial Performance

(Unit Rs. in crores)

i) Total Turnover	399.95	646.66	714.29	480.81
ii) Gross margin before interest & depreciation	10.31	13.59	14.29	12.47
iii) Interest & depreciation	1.87	1.40	1.06	0.87
iv) Profit before tax	8.44	12.19	13.23	11.60

6.0 Employment Statistics

6.1 The manpower employed at MSTC's Head Office in Calcutta and its Regional Offices as on 31.3.90 is given below:—

	Executives	Non-executives	Total
i) Head Office in Calcutta	74	127	201
ii) Regional Offices			
a) Bombay	10	14	24
b) New Delhi	11	13	24
c) Bangalore	9	14	23
iii) Sub-regional Offices			
a) Hyderabad	1	—	1
b) Vizag	1	—	1
c) Madras	1	—	1
Total	107	168	275

7.0 Diversification Plan

The Corporation has decided to set up scrap processing yards at Vizag and Madras for distribution of carbon steel melting scrap amongst the smaller users who are entitled to less than 1000 tonnes per annum. The main objectives of setting up these yards are:—

i) to meet the demand of the smaller consumers who are entitled to less than 1,000 tonnes per annum:
ii) to process over-size scrap to make it conform to the sizes under the import policy:
iii) to take advantage of the low international import price at a particular point of time:
iv) to maintain a buffer stock to avoid seasonal imbalances.
v) to achieve better planning in import of scrap and more effective distribution.

Imported shredded scrap is being transported.

Ferro Scrap Nigam Limited

1.0 Introduction

Ferro Scrap Nigam Limited (FSNL) is a joint sector company under the Ministry of Steel & Mines with a paid-up capital of Rs. 200 lakhs in which the Metal Scrap Trade Corporation Limited (MSTC) holds 60% of the equity shares and the remaining 40% are held by M/s. Harsco Insc. of USA. The Company is thus a subsidiary of MSTC.

2.0 Activities and Objectives

2.1 The Company undertakes the recovery and processing of scrap from slag and refuse dumps in the steel plants at Rourkela, Burnpur, Bhilai and Bokaro. It has recently started work in Visakhapatnam and is about to also commence operations at Durgapur Steel Plant.

2.2 The scrap recovered is returned to the steel plants for recycling/disposal and the Company is paid processing charges on the quantity recovered at varying rates depending on the category of scrap. Scrap is generated both in the Iron & Steel Sections and also the Rolling Mills.

3.0 Organisational Structure

3.1 the Chief Executive Officer of the Company is the Managing Director who functions under the guidance of a Board of Directors. The Managing Director is assisted by one General Manager and four Deputy General Managers who are incharge of activities at the main steel plants.

3.2 The corporate office is situated at Bhilai, and the Corporation has six field units in the steel plants at Bhilai, Burnpur, Rourkela, Bokaro, Visakhapatnam and Durgapur.

4.0 Physical and Financial Performance

4.1 Physical Performance

The production performance of FSNL for the last two years and the projected performance for the year 1990-91 is given below:—

Item	1988-89	1989-90	1990-91 (Provisional)
Recovery of scrap (Lakhs MT)	6.97	8.07	8.19
Market value of production (Rs. in crores)	312.15	354.54	360.36

4.2 Financial Performance

(Unit Rs. in lakhs)

i)	Total turnover i.e. total service charges realised including misc. income etc.	1989.95	3135.43	2879.57
ii)	Gross margin before interest and depreciation	759.85	1589.19	1319.21
iii)	Interest & depreciation	344.93	428.87	477.05
iv)	Profit before tax	414.92	1160.32	713.02

4.3 Sales Realisation

Sales realisation per metric ton for the last two years and estimated sales realisation per metric ton for the year 1990-91 and 1991-92 are indicated below:

1988-89	1989-90	1990-91 (Proj.)	1991-92 (Proj.)
Rs. 283.67	Rs. 384.81	Rs. 349.45	Rs. 364.35

5.0 Future Programme

Keeping in view the availability of scrap arisings in various steel plants as well as large quantitites of iron and steel scrap lying buried in the dumps of RSP and IISCO plants, the Company proposes not only to expand the capacity in its existing units by

augmenting resources in terms of equipment, manpower, etc. but also to take over all the scrap and salvage activities in the other integrated steel plants in a phased manner.

6.0 Modernisation

A detailed propsal for modernisation of plant and equipment in Rourkela and Bokaro is under examination. This plan projects an increase in profitability as well as increase in turnover of Rs. 4 crores. The scheme envisages enrichment of the iron content in scrap upto 90-95%, thus resulting in enchancement of quality as well as higher turnover.

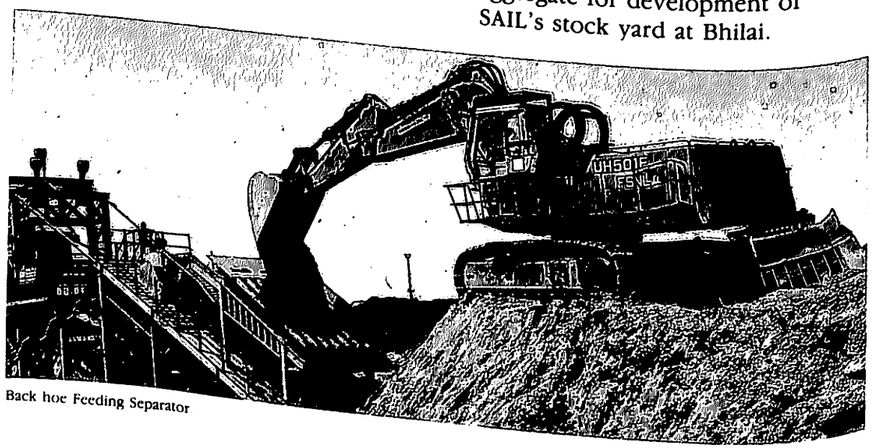
7.0 Effort Made Towards Indigenisation

The following efforts have been made for developing indigenous equipment:—

(a) Magnetic separators have been fabricated with the help of M/s. Mc Nally, Bharat Engineering Company.
(b) A trial order has been finalised for "Slag handling" duty lifting magnets which are presently being imported.
(c) Indigenous replacement assemblies have been procured for the Magnet Controller installed in all types of imported cranes.
(d) Indigenous tyre protection chains have been ordered for performance evaluation for fitment on wheel type loaders.

8.0 Developmental Efforts

(a) The newly acquired magnetic separators have been recovering-10mm fines which chemical analysis has shown can be used in the Sintering Units of the steel plants. This will enable reduction in cost of production of sinter. Rourkela Steel Plant has already started using these fines.
(b) FSNL have contributed to pilot plant experiments at Bhilai Steel Plant in the usage of LD converter slag at the blast furnace as a replacement for limestone.
(c) "Worked through slag" is being used by Bhilai Steel Plant in road making. Discussions have been initiated with SAIL's Marketing Organisation for supply of slag aggregate for development of SAIL's stock yard at Bhilai.



Back hoe Feeding Separator

Metallurgical & Engineering Consultants (India) Limited (MECON)

1. Background

Metallurgical & Engineering Consultants (India) Limited (MECON) is the premier design, engineering and consultancy organisation in the country. Starting with work relating to the Iron and Steel industry, MECON has diversified its services into non-ferrous metals, power plants, chemicals, general engineering, environmental engineering, ocean engineering and defence, MECON has its head office at Ranchi, and site offices at all public sector steel plants and engineering offices at Delhi, Bombay, Calcutta, Bangalore, Hyderabad and Madras.

2. Capital Structure

The authorised capital of the Company is Rs. 4 crores and the fully paid up equity share capital is Rs. 2.0153 crores.

3. Financial Performance

The turnover of the Company during 1989-90 was Rs. 97.55 crores and the profit (after tax) Rs. 4.25 crores. The corresponding figures for 1988-89 were Rs. 89.34 crores and Rs. 6.55 crores respectively.

4. Range of Services

MECON's range of services include:—

i) Planning, analysis and preparation of reports for Projects.
ii) Basic and detailed engineering of projects including infrastructural facilities.
iii) Project and Construction Management.
iv) Procurement and Contract Management.
v) Assistance in erection, commissioning and post commissioning services.
vi) Design and Supply of equipment and systems for Coke Oven. Coke Dry Cooling Plant, Coal Based and other Chemical Plants, Pig Iron Plants, Blast Furnace Plant and Equipment including their modernisation/reconstruction, Converter Gas Cleaning Plant, Rolling Mills and Auxiliaries for Ferrous and Non-Ferrous Metals, Processing Lines for Ferrous and Non-Ferrous Metals, Cement Plants, Refractory Plants.
vii) Design Development.

5. Present Major Assignments

5.1 Engineering Consultancy Services

1. Prime Consultancy, Project and Construction Management Services for the modernisation of Durgapur Steel Plant.
2. In the Private Sector, Consultancy services for M/s Powmex Steels Ltd., Hero Cycles Ltd., Integrated Steels Ltd.
3. In the Non-ferrous sector
   i) Consultancy & Project Management Services for the 105,000 t/yr Lead Zinc Smelter Complex at Chanderiya of Hindustan Zinc Ltd.
   ii) In joint sector for Aluminium Rolled Products Plant in Orissa.
4. Modernisation of Mints at Alipore, Bombay and Hyderabad.
5. Consultancy, Detailed Engineering, Project Management and Construction Management Services for the New Bank Note Presses coming up at Salboni and Mysore
6. In Defence Sector, Consultancy, Project Management Services for

BDL,DMRL, Ordinance Factory Bolangir Project.

7. A number of reports in the field of Environmental Protection and Pollution Control.

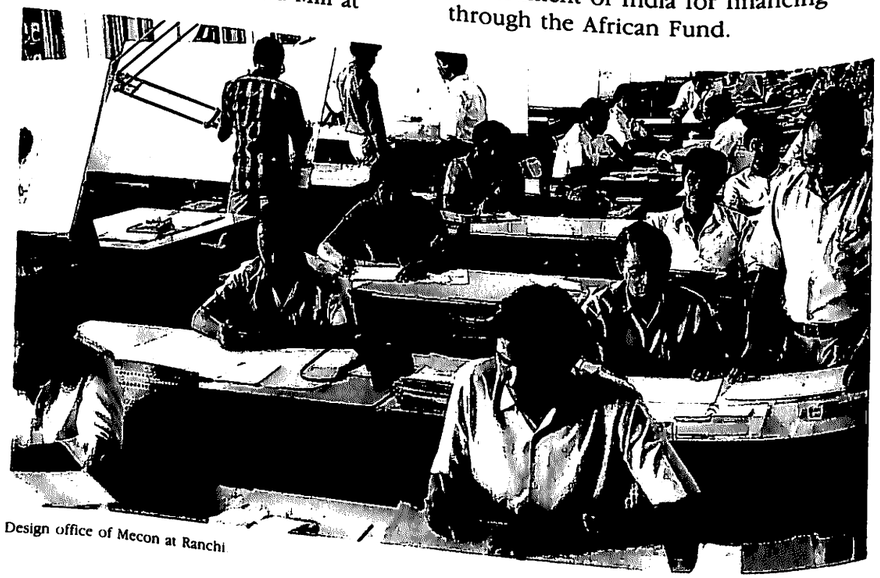
5.2 Design and Supply of Equipment & Systems:

1. Execution of 30,000 t/yr Benzol Plant at Visakhapatnam Steel Project in progress.
2. Upgradation of Blast Furnace Complex at Rourkela Steel Plant on a Temporary basis.
3. Engineering and Design of Pig Iron Plants for Usha Rectifier, Unity Steels, Nova Dhatu Udyog Ltd.
4. Modernisation of Aluminium rolling Mill for BALCO at Korba.
5. Modernisation of finishing end of Section Mill at Durgapur.
6. Cold Rolling Mills for Hero Cycles, Mohta Steels, High Speed Bar Mill for Powmex Steel.
7. Billet Mill of 710,000 t/yr Light and Medium Merchant Mill as well as the 4 Strand Wire Rod Mill at Visakhapatnam has been commissioned.

6. Overseas Assignments

6.1 MECON, in association with PAN African Consultancy Services, is rendering Project Management and Technical Services for setting up of 1.3 MT/yr BF-BOF Based Integrated Steel Plant at Ajaokota in Nigeria. Around 30 MECON Engineers are deputed too Ajaokuta. MECON's Services are being extended for a further period of 3 years from May, 1990.

6.2 MECON has prepared and submitted a Feasibility Report for setting up of a 15000 t/yr Ferro-Silicon Plant in Zambia. Proposal for carrying out laboratory/semi-industrial test for magnesite and preparation of Feasibility Report for Combined Kynite. Calcination, High Alumina & Magnesite Refractory Plant at Zimbabwe is under consideration of Government of India for financing through the African Fund.



Design office of Mecon at Ranchi

7. Technology Development

MECON has developed vast expertise both in consultancy and design. It has contributed in a major way in bridging the technological gap in the country. The Company has entered into basic know-how licence/co-operation agreements with the following foreign companies:

a) Know-how licence agreement with Tiajpromexport of USSR for
   i) Detailed engineering for Metallurgical Industries
   ii) Tall Coke Oven Batteries
   iii) Dry Coke Cooling Plants
b) Know-how licence agreement with United Engineering Inc, USA for Rolling Mills and Auxiliary Equipment.
c) Know-how licence agreement with SMS Schleemann-Siemag, West Germany for Long Product Rolling Mills.
d) Know-how agreement with TUV Rheinland, West Germany for collaboration in the field of Environmental Engineering.
e) Know-how licence agreement with Mannesmann. Demag Huettentechnik, West Germany for new installation, modernisation, reconstruction, revamping and relining of Blast Furnace Plant.
f) Know-how licence agreement with Beijing Centre for Engineering & Research Inc. of Iron & Steel Industry (CERIS), China for Pulverised Coal Injection System in Blast Furnace.
g) Know-how licence agreement with USX Engineers and Consultants INC (UEC), USA for Anhyohons recovery of Ammonia from by-product of Coke Oven Gas (Prusain technology).
h) Krupp Koppers of West Germany for Benzol hydrorefining.

8. Research & Development

The Engineering Research & Development Wing (ER & DW) of MECON is working on the following high technology areas as well as plant oriented technical problems.

i) Testing is in progress on the Energy-denses Flywheel which runs in an evacuated chamber suspended on the magnetic field created on powerful permanent magnets. The magnetic suspension has been successfully tested.
ii) The high pressure hydraulic pump has been assembled and the test rig for conducting pressure trails has been manufactured.
iii) Laser based Gauging System for large plates has been designed and offered to Rourkela Steel Plant.
iv) Erection of the Desicant Cooling System in the Prototype Development Centre has been taken up.
v) Holographic Stress Analysis studies have been offered to NALCO to solve equipment breakdown encountered at the Smelter Plant at Angul.
vi) The Hydraulic Automatic Gauge Control System Test Rig has been commissioned.
vii) MECON participated in an official delegation to USSR to study the Solar Energy System at the Physical Technical Institute, Tashkent. A report has been submitted to the Ministry of Science and Technology to consider setting up of a similar facility in India.

9. Manpower

The total number of employees in the Company in December 1990 is 3840 out of which 440 belong Scheduled Castes and 240 to Scheduled Tribes.

10. Industrial Relation and Workers Participation

The industrial relations during the year were generally cordial. In the areas of employee welfare, health, house allotment, grievance handling and children's education, the Joint. Consultative Committees, in which both management and employees are represented, plays an active role by discussing the day to day problems to arrive at amicable solutions.

11. Cost Reduction Measures

It is the Company's constant endeavour to reduce the costs by adopting various measures such as optimum utilisation of manpower resources and containing recruitment of additional manpower to the extent possible.

12. Social Welfare

Besides paying attention to the welfare of the employees, MECON plays an important role in the all round development of its neighbourhood. At its Head Office, Ranchi, the Company has adopted two Villages around the city and has been extensively helping the Tribals population of these villages in their economic development. Regular scholarships, text books/grants are given by the Company to the needy and meritorious students of the Schools. Family welfare and health schemes are being implemented by organising medical camps regularly. The Company has embarked upon a beautification programme of Ranchi by undertaking development of Chowks, Roads etc.

13. Steps Taken to Improve Performance

i) A study has been initiated in regard to MECON's organisational structure and control systems to meet the requirements of the Company.

ii) Greater thrust is being given to expand MECON's operations abroad.

iii) The Company is playing an active role in the planning process and in the modernisation programmes of steel plants as also in establishment of new iron and steel plants, both in the public and private sectors.

iv) MECON now uses computers extensively for drafting and design work. The Company is engaged in developing a number of computerised Process Control Models for the various areas of Steel Plant operations.

Project Profile

1. Visakhapatnam Steel Plant is the first shore based integrated steel plant being set up in India. The location is advantageous as 20% of its coking coal requirements would have to be met from imports. Exports would also be easier. Being a major producer of quality steel, it would also help industrialisation of the southern region and thus contribute to balanced growth of the different regions of the country.

The plant is designed to adopt some of the most modern technologies, some of which are:

- Selective crushing of coal.
- 7 meter tall coke ovens.
- Dry quenching of coke with auxillary power generation facilities.
- On ground blending of sinter base
- 3200 M^3 Blast Furnace.
- Conveyor charging and bell-less top charging for Blast Furnace.
- Torpedo ladle for Steel Melt Shop in addition to Conventional Mixer.
- Cast house slag granulation for Blast Furnace
- 100% Continuous Casting of Liquid Steel.
- Gas Expansion turbine for power generation utilising Blast Furnace gas top pressure.
- Hot Metal Desulphurisation.
- Extensive treatment facilities for effluents for ensuring proper environmental protection.
- Computerisation for process control.
- Sophisticated high speed and high production rolling mills.

2. Revision of Project Concept and Cost

Visakhapatnam Steel Plant was originally designed to produce 3.4 million tonnes of molten steel. A revised project concept envisaging a production of 3 million tonnes of liquid steel was later adopted for the implementation of this project at a lesser capital cost in order to improve its economic vitality. As against the revised estimated cost of about Rs. 7500 crores (1st quarter 1985 prices) for the approved concept the cost has been reduced to Rs. 6849.70 crores (4th quarter 1987 prices) in the Rationalised Concept. The project is being implemented in two phases. In the first phase, production of 1.5 million tonnes of liquid steel is expected to materialise. The second phase with additional 1.5 MT of liquid steel will mark the completion of the whole project.

The pace of construction in Visakhapatnam Steel project has of late, picked up momentum. The progress in the individual areas such as, structural fabrication and erection, equipment ordering and erection etc. is, by and large, satisfactory. However, the steel plant has had to face certain constraints too. One of the major problems has been the delay in the availability of water from Yeleru Water Supply Scheme which is being implemented by the Andhra Pradesh Government. The delay in the procurement of certain critical equipment from USSR has been another constraint. Every possible effort is being made to get over these problems.

3. Product mix under the Rationalised Concept

3.1 The product mix of VSP is shown in the following table:

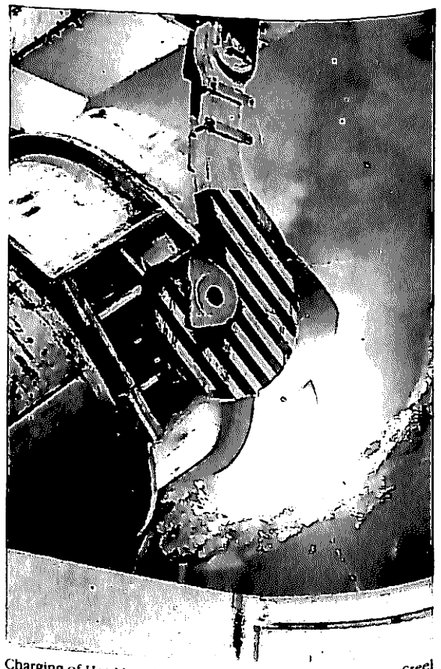
Finished Steel (For Sale)	Tonnes Per Year
Rounds & Bars	1,256,000
Flats	74,000
T Bars	24,000
Equal and Unequal Angles	661,000
Channels	251,000
Beams	144,000
Billets	246,000
Total	2,656,000
Pig Iron for Sale	555,750

4. Progress of Construction and Commissioning

4.1 Commissioned Units

4.1.1 The Raw Material Handling Plant, Thermal Power Plant, Air Separation Units, Coke Oven and By-Product Plant and Sinter Plant had gone on stream in proper technological sequence. Blast Furnace No. 1 christened "GODAVARI", which was ready in position since November, 1989 was finally blown in on 28th March, 1990 after getting adequate water from alternative sources from Andhra Pradesh State Govt., bringing into operation one of the most modern Blast Furnaces incorporating many advanced technologies in the field of iron making such as conveyor charging, bell-less top equipment, pressure recovery turbine (energy saving device), cast house slag granulation, circular cast house, process computers and a large number of other features, "GODAVARI" was dedicated to the Nation by Hon'ble Prime Minister of India of 3rd May 1990. The first despatch of the products of the Blast Furnace i.e. Pig Iron and Granulated Slag flagged off from the Plant on 12th April, 1990 and 30th April, 1990 respectively. The pig iron produced in VSP is of very high quality.

4.1.2 Steel Melting Shop (SMS), next in technological sequence was commissioned on the 6th September, 1990 within five months, of the commissioning of the Blast Furnace. Some of the special features of the Shop include process control computers, dynamic control for blowing of the converter with sublance, converter gas cleaning plant based on suppressed gas combustion system with recovery of the converter gas to be used as fuel and steel teeming ladles with slide gate system.



Charging of Hot Metal into LD Converter at Visakhapatnam Steel Plant

4.1.3 Trial production of billets through break down group of strands of Light and Medium Merchant Mill (Billet Mill) was started on the 28th September, 1990 which the Wire Road Mill was put on hot trial from 21st November, 1990. One of the finished steel products of VSP, wire rod coils was formally released in the market on the 30th November, 1990. The mill is capable of producing Wire Rods to International standards. The quality of wire rod produced by VSP is of very superior quality from the point of view of surface quality, metallurgical properties, percentage elongation, ductility and tensile strength.

4.2 Units under construction

4.2.1 The remaining Units under Stage I and Stage II are likely to be commissioned as follows—

	Stage I	
1.	Coke Oven Battery No. 2	October 1991
2.	LMMM-Bar Mill	November 1991
	Stage II	
1.	Coke Oven Battery No. 3	January 1992
2.	Sinter Plant Structure NO. 3	December 1991
3.	Blast Furnace No. 2	March 1992
4.	Steel Melting No. 2	August 1992
5.	Medium Merchant and Structural Mill	March 1992

5. Progress of External Infrastructural Facilities

5.1 Water

The water requirements of Visakhapatnam Steel Plant are to be met by Govt. of Andhra Pradesh from Yeleru Water Supply Scheme. To expedite completion of the scheme, Govt. constituted a Task Force with wide ranging powers towards end January, 1990. With the timely decision taken by the Task Force, the work picked up upto end April 1990. Meanwhile, the water supplies from Raiwada were augmented by diverting water from the Thandava Reservoir and the Sarada river by implementing alternative schemes. This facilitated commissioning of the Blast Furnace Complex by the end of March 1990. The work on the Yeleru Scheme suffered a serious set-back due to severe cyclonic storm during May 1990 followed by monsoon and the non-cooperative attitude of the agencies working in the critical deep cut and tunnel reaches of the canal. However, with the assistance of the Task Force all out efforts were made to expedite the scheme which is expected to be completed by mid 1991.

5.2 Power

Lack of stable and adequate power supply by APSEB particularly, during the initial months of the financial year created serious operational difficulties for VSP. Efforts are being made to resolve these problems with the help of concerned agencies. For its long term requirements, VSP is planning to add additonal 135 MW captive power in addition to the existing 180 MW. VSP's Captive Power Plant is generating presently around 90 MW of power. All the three turbo generators have since been commissioned and the units are under the process of stabilisation now.

APSEB/NTPC are setting up 400/220 KV Sub-Station near the Plant. The work on this Sub-Station is in progress. While 220 KV Station is expected to be completed by mid 1991, the 400 KV sub-station is likely to be completed in June 1991

5.3 Railways

The facilities for movement of raw materials for the Stage-I have almost been completed by the Railways.

6. Budget and Expenditure

6.1 Budget Provision

The approved plan outlay for 1990-91 was Rs. 566 crores, including an amount of Rs. 18 crores made available to the Project from suppliers/Buyers credit and Rs. 300 crores by way of issue of bonds. The balance amount of Rs. 248 crores was provided as Budgetary support. During the course of the year further funds to the extent of Rs. 200 crores was arranged by way of temporary loan from UTI. Additional budgetary support of Rs. 150 crores would also be made available for the Project construction during the year.

6.2 Expenditure

The actual Expenditure during the year 1990-91 was Rs. 892.41 crores. The cummulative expenditure on the Project upto March, 1991 was Rs. 6725.04 crores.

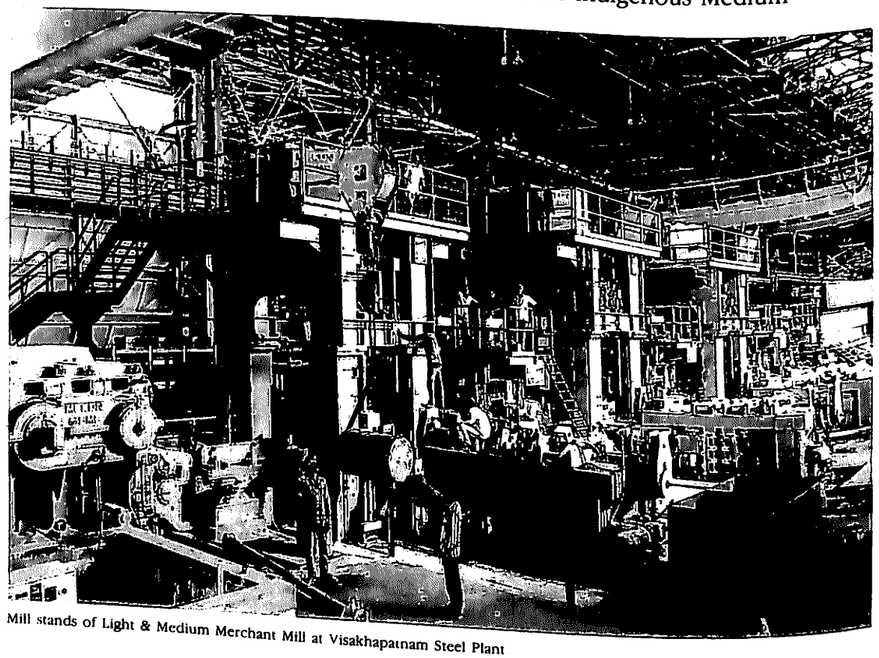
7. Raw Materials

7.1 Iron Ore

VSP's requirement of Iron Ore is being met by NMDC from Bailadila Mines. Against 15 lakh tonnes planned for receipt during the year, actual receipt was about 11.90 lakh tonnes.

7.2 Coking Coal

As per the design, the coking coal blend for VSP should contian 20% of imported Prime Coking Coal, 35% of indigenous Prime Coking Coal and 45% of the indigenous Medium



Mill stands of Light & Medium Merchant Mill at Visakhapatnam Steel Plant

Coking Coal. The indigenous Prime Coking Coal is to be received from Pootki, and Bhalgora washeries which are not yet ready. As such, the entire requirement of Prime Coking Coal is being imported. This will continue till the indigenous washeries are ready. During the year against 6.5 lakh tonnes of Medium Coking Coal planned to be procured indigenously, 5.05 lakh tonnes were received. The receipt of imported prime coking coal during the year was only 5 lakh tonnes fulfilling 77% of the annnual plan. As a result of adequate receipts of indigenous Medium Coking Coal, the pushing rate of Coke Ovens had to be restricted.

7.3 Boiler Coal

VSP is linked to Anants mines in Orissa. Till these mines become fully operational, Boiler Coal is being supplied from other areas like Talcher. Against the plan of 7.5 lakh tonnes for the year, VSP received 6.90 lakh tonnes Short-fall in Boiler Coal supply has resulted in reduced generation of power.

7.4 Dolomite

For SMS grade, VSP is getting the supplies from its captive mine at Khammam. The mine is meeting the quality requirement of VSP. As regards BF grade, supplies are being made by Bisra Stone Lime Company Limited from Birmitrapur Mines in Orissa.

7.5 Lime Stone

VSP has its own mine at Jaggayyapeta in Andhra Pradesh for the BF grade lime stone. The quality requirements of VSP are being met by this captive mine. Supplies are already being made by this source. For SMS grade, VSP is presnetly importing its requirement.

8.1 Production

The annual plan and the actual till December, 1990 and fulfilment percent figures are given below:

	Annual Plan 1990-91	Actual	Fulfilment (%)
8.1 Production			
Oven pushing/day	80	68.8	86
Hot Metal	740	684	92
Liquid Steel	180	112	62
CC Blooms	164	103	63
Billets	128	95	74
Wire Rods	50	20	40
Pig Iron for sale	500	521	104
8.2 Despatches			
Pig Iron	500	500	100
Wire Rods	51	20	39
Granulated Slag	350	270	77
Met. Coke	—	106	—
Nut. Coke	35	39	111
Ammonium Sulphate	11.02	11.4	103
Crude Tar	31	30.5	98

9. Environmental Protection

9.1 Pollution Control Measures

Various pollution control measures have been incorporated to ensure that the environment is properly protected and preserved. Around Rs. 460 crores are being spent towards pollution control measures.

9.2 Afforestation

Massive afforestation programmes have been taken up in a phased manner over an area of about 3,600 hectares. Till December, 1990, 19.04 lakh trees have been planted and at this rate a total of 3 million trees would be planted by 1993-94, making one tree per each tonne of liquid steel capacity installed.

10. Personnel and Manpower

10.1 VSP has been so designed that its various techno-economic parameters would be distinctly superior those of the existing steel plants. For running the sophisticated plant, a comparatively smaller but better qualified and trained manpower is being employed. The total number of employees, when full plant facilities are commissioned is expected to be around 15,000. The labour productivity of 230 t per man year has been planned, which will be almost 3 times the labour productivity being obtained presently in Indian steel industry. To motivate the employees to achieve higher production and productivity levels, a motivational package consisting of production based and commitment linked schemes has been decided to be implemented in phases. A promotion policy for non-executives has been introduced through a settlement with the Union, which while assuring a reasonable growth to employees, will also help establish a multi-skilled and flexible approach to work by all.

10.2 Total number of employees on the rolls of VSP as on 31.12.90 is 13628. This comprises 1698 executives, 379 management trainees, 9050 non-executives and 2501 non-executives trainees. The number of displaced persons employees in VSP is 5176, which includes 656 trainees.

11. Representation of Scheduled Castes and Scheduled Tribes

11.1 As on 31.12.90 VSP has provided employment to 2057 Scheduled Caste persons and 612 Scheduled Tribes persons. Percentage-wise this works out to 15.0% and 4.49% respectively.

11.2 VSP adopted a number of welfare measures for its employees belonging to SC and ST category. A special scheme for grant of scholarships for the children of SC and ST employees was introduced in the academic year 1989-90. There is also a scheme of scholarships to engineering students belonging to SC and ST categories.

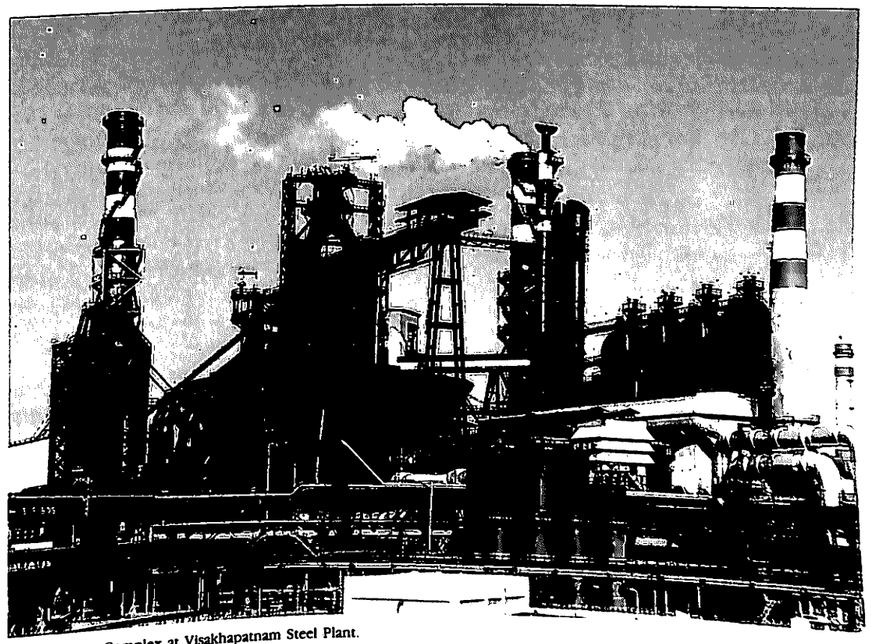
11.3 Special quotas for allotment of residential accomodation is being provided to SC and ST employees.

11.4 The representation of SC/ST, on-servicemen, Physically handicapped persons and women employees in the employment of VSP as on 31.12.90 is as given below:

Group	Total no. of employees	SC	ST
'A'	2077	215	32
'B'	348	41	4
'C'	1569	932	234
'D' (Excluding Sweepers)	1720	287	124
'D' (Sweepers)	104	29	4
Total	11127	1504	398
Trainees	2501	553	214

12. Quality Circles Movement

To improve participation of workmen in enhancing quality of work at the grass-root level, quality circles movement has been launched in the beginning of the year and 50 quality circles are already functioning in VSP.



Blast Furnace Complex at Visakhapatnam Steel Plant.

Neelachal Ispat Nigam Limited

1. In October, 1980, Government decided in principle to set up the second steel plant in Orissa. A Company, Neelachal Ispat Nigam Limited (NINL) was formed in March, 1982 with an authorised capital of Rs. 1,000 crores. On techno-economic considerations, the site of the project which was originally proposed to be near Paradip Port, was changed to another in the Daitari region.

1.1 The total provision inthe VII Five Year Plan for new steel plants was only Rs. 10 crores. With this meagre allocation, it was not possible to take any substantive steps for setting up the plant at Daitari.

1.2 The possibility of including the project in the VIII Plan is being discussed with the Planning Commission.

Vijayanagar Steel Limited

1.0 In April, 1970, Government took a decision in principle to set up a steel plant in Karnataka, so as to utilise the vast deposits of iron ore available in Bellary Hospet area. In December, 1982, a separate Company, Vijayanagar Steel Limited was incorporated for this purpose.

1.1 The total plant provision in the VII Five Year Plan for new Steel plants was only Rs. 10 crores. It was not possible to take any substantive steps for implementing this project in Karnataka.

1.2 The proposal is being reviewed again for possible inclusion in the VIII Plan, subject to availability of financial resources.

Hindustan Steel Works Construction Limited

1.0 Background

Hindustan Steel works Construction Limited (HSCL) was incorporated in June 1964 with the main objective of creating an organisation in the Public Sector capable of undertaking the complete construction work relating to Integrated Steel Plants from the stage of site investigation to the stage of commissioning of the Plant. Pooling up the available expertise and know-how in the various disciplines in the construction industry, the Company today has within its ambit of activities a wide range of specialised works in the steel sector, power plants, dam construction, bridges, coal handling plants, underground comminication and transport systems, industrial and township complexes etc. involving high degree of planning, co-ordination and sophisticated construction techniques.

1.1 Present Activities

HSCL joined the consortium led by M/s Mannesmann Demag of West Germany in four global packages of DSP Modernisation with M/s, Tiazhpromexport of USSR and M/s. Birla Technical Services of Calcutta as other members. HSCL is continuing its association in 3 packages i.e. Raw Material Handling System, Sintering Plant and Reconstruction and Relining of Blast Furnace. The work on indigenous packages such as augmentation of Bolani Iron Ore Mines, Design, Engineering, Manufacture, Supply, Erection and Commissioning including Revamping of Sinter Plant as also other miscellaneous jobs, such as laying of Gasline, certain jobs of Instrumentation, Store etc. are under process.

1.2 The Company has joined hands with various Indian Public Sector Undertakings like BHEL, MAMC, MECON to participate in the modernisation of RSP and IISCO.

2.0 Financial Results

2.1 The authorised and paid-up share capital of the Company as on 31.3.91 was was Rs. 20 crores. The total amount of loan from Government outstanding as on 31.3.91, was Rs. 183.79 crores.

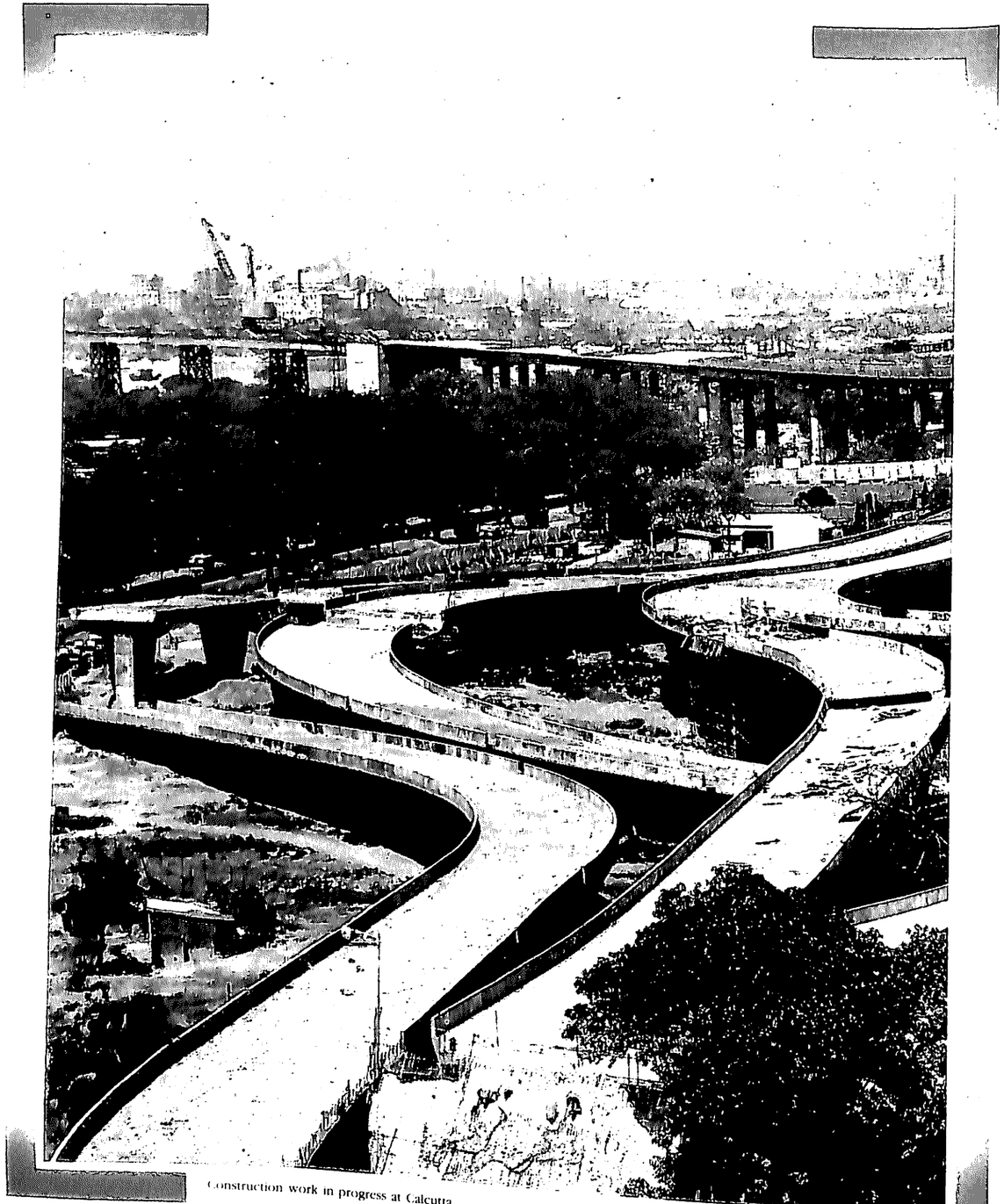
2.2 The Company achieved a record turnover of Rs. 225.00 crores as against the target of Rs. 233.91 crores during 1990-91. The turnover for the year 1990-91 was only Rs. 177.21 crores.

The loss during 1989-90 for works in India was Rs. 54.05 crores including Rs. 32.18 crores towards revision of wages as per HPPC recommendation pending implementation. The loss on Libya works was Rs. 18.94 crores.

Pending decision on waiver of interest, interest on Government Loan (Plan and Non-Plan) was charged in the accounts of 1989-90 amounting to Rs. 27.29 crores.

3.0 Manpower Position

3.1 The Manpower position of the Company as on 1.10.1990 is given below:



Construction work in progress at Calcutta

Group	Total strength	SC/ST	%	Female Employees	Ex-service-men	Physically Handicapped Employees
A	2024	107	5.3	7	5	1
B	834	83	10.0	10	3	1
C	15037	3014	20.0	200	192	35
D	2568	2378	92.6	1200	4	11
Total	20463	5582	27.3	1417	204	48

As compared to the total strength of 20,822 last year, there is a reduction of 359 employees in the Company during this year. The Company has been able to reduce a total of 1981 employees through its Voluntary Retirement Scheme upto 31.3.1991

4.0 Welfare Measures

The Company continued to promote welfare of the scheduled castes and scheduled Tribes through the following activities:—

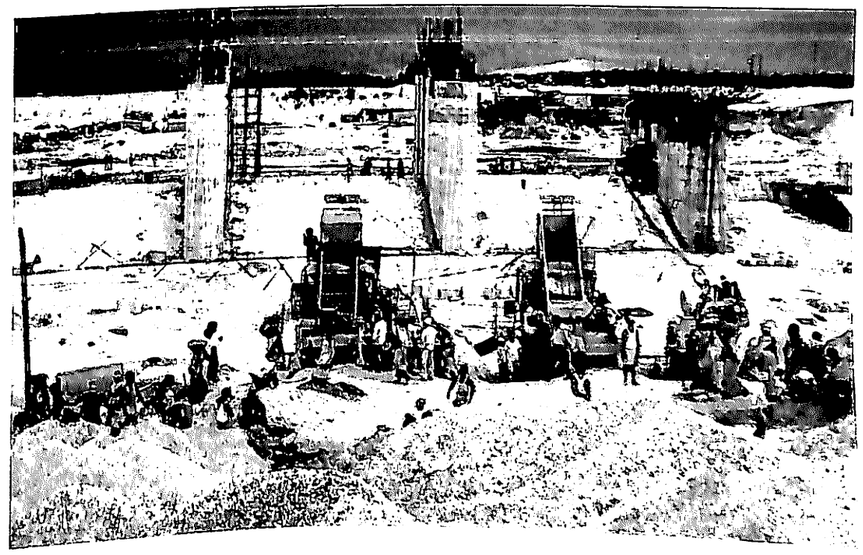
a) SC/ST employees were exposed to various management development and training programmes.

b) Schools have been provided with assistance of the Management in the areas where SC/ST employees reside.

c) Assistance was given for supply of drinking water.

d) Plots were alloted to workers for making hutments in the land alloted at the sites of clients with free electricity, water supply and sanitation arrangements etc.

e) Children of SC/ST employees were given due preference in the matter of schooling at Projects where short term construction works were being under taken.



4.1 In addition to this, the Company continued to implement the following welfare schemes:—

i) Service Linked Advancement Schemes:
It was introduced in May 1987, whereby employees in Workers and Non-Executive categories are given service linked higher grades to avoid stagnation in these categories. However, this scheme has been kept in abeyance due to revision of scales of pay on the recommendation of HPPC.

ii) Employees' Voluntary Welfare Scheme:
A Central Welfare Fund Scheme for all sections of HSCL employees was introduced w.e.f., 1.4.1987. The scheme is intended to provide immediate financial assistance to the dependents of employees in the event of death due to any cause, anywhere, while in services of the Company, by a system of voluntary contribution by employees at the rate of minimum Rs. 2/- per death and maximum of Rs. 10/- in a month. So far 120 nominees of the deceased employees have been benefited under the scheme.

5.0 Workers Participation in Management

The Company has joint councils at Unit level for major units and Shop Councils at Shop level to have participation in economy and cost reduction, wastage control, safety, quality improvement, and improvement in production and productivity etc.

The Company has an Apex Level Joint Forum which has representatives of the management of HSCL and the National level Trade Unions in INTUC, CITU, AITUC, HMS and three independent Trade Unions. From the inception of the Apex Level Joint Forum body in 1981, there have been 25 meetings till 31.10.1990. There is a Sub-Committee of the Joint Forum consisting of five Central Trade Union leaders and the Top Management of the Company.

6.0 Safety Measures

HSCL has formulated its own safety code and for its implementation, the following steps have been taken:

a) Safety Organisations are functioning in all the major units with safety engineers reporting to the respective Head of Units.

b) Contractors/PRWs engaged at various HSCL sites are apprised of the safety measures and implementation of the safety measures are constantly monitored. Employees are educated, advised to use safety appliances which are invariably made available by the Company for execution of hazardous jobs. Periodic seminars are also conducted to acquaint the personnel with latest safety measures and to review the safety requirements of various work sites in HSCL.

7.0 Contract Labour Position

The jobs for which outside agencies are employed are mostly in the Civil Engineering areas. In other disciplines they have been engaged to supplement the work being done by the departmental workers. The engagement of such workers has been necessary to execute the various jobs on Schedule fixed by the clients. The strength of PRWs/Contractor Workers in the Company is around 14,735 as on 1.10.1990.

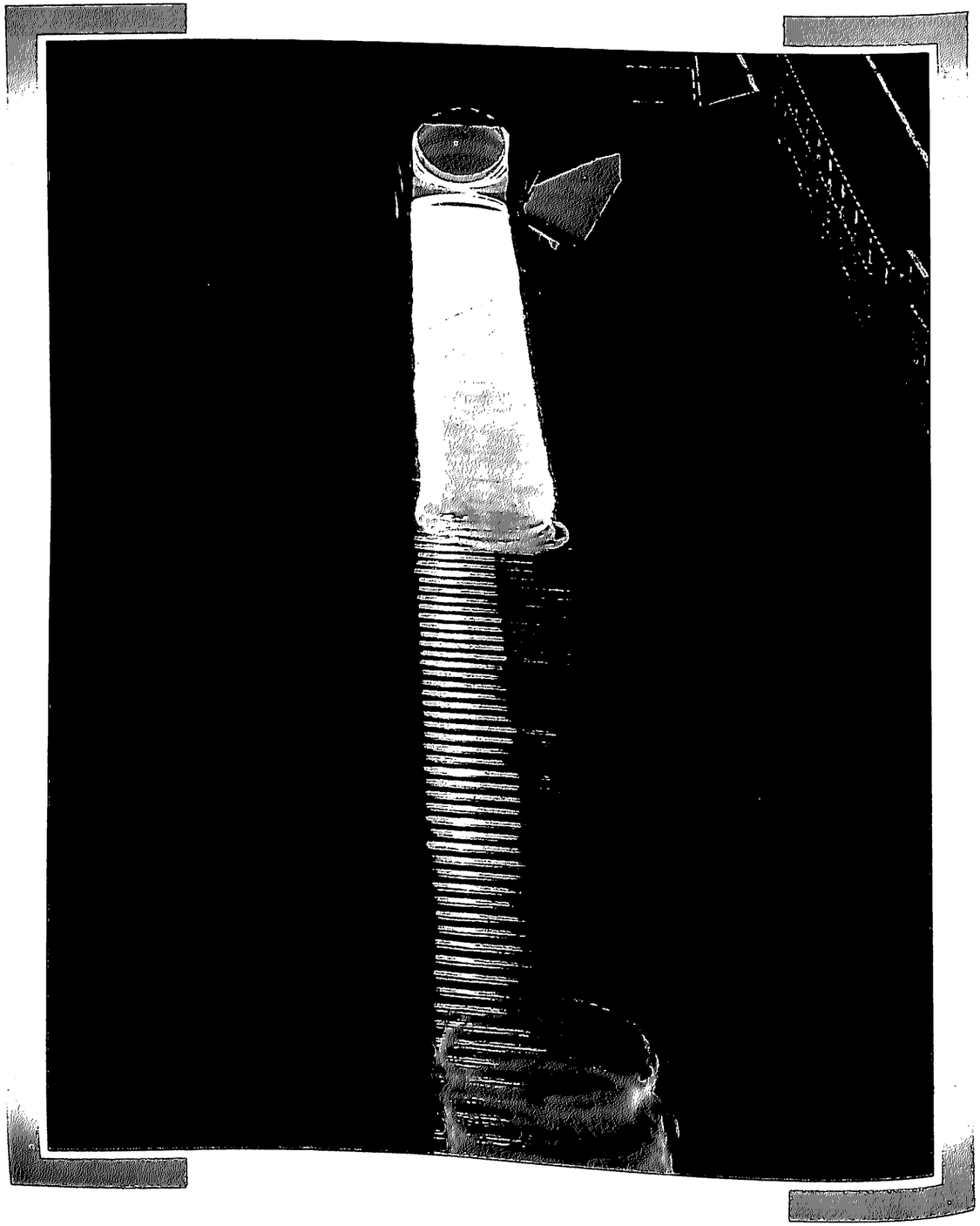
8.0 Measures Towards Improvement

The viability of the Company has been adversely affected by the surplus manpower it had to take and carry on its rolls, low equity base, slackness in the growth of the steel sector, losses incurred in Libyan works, interest burden on Government loans and delay in realisation of dues from the clients especially in the non-steel sector.

9.0 To improve the viability of the Company, the Government have extended financial assistance through plan and non-plan loans.

9.1 The other steps taken for revival of the Company have been:—

1. Identifying areas of specialised capital and repair works in steel plants which would be executed by HSCL.
2. Joining as a member of the Consortium so as to obtain contracts in SAIL modernisation works.
3. Introduction of various economy measures for curbing overhead expenditure.
4. Monitoring and reduction of inventory level. During the last three years' reduction has been of the order of Rs. 2 crores per year.
5. Expeditious settlement of various outstanding issues and claims.
6. Selective undertaking of construction activities in non-steel sector.
7. Implementation of a Voluntary Retirement Scheme.



Background

By an Act of Parliament shares held by the erstwhile Bird Group Company Ltd., stood transferred to the Central Government. The Department of Steel looks after the affairs of some of the companies of the Bird Group as a shareholder on behalf of the President. These are:—

1. Orissa Mineral Development Company Ltd.
2. Karanpura Development Company Ltd.
3. Kumardhubi Fireclay & Silica Works Ltd.
4. Bisra Stone Lime Company.
5. Eastern Investment Ltd.

Scott & Saxby Ltd. is a fully owned subsidiary of the Karanpura Development Company Ltd.

1.1 The Orissa Minerals Development Company Ltd. (OMDC)

It is engaged in the mining of iron ore and manganese ore. The Company is operating in the Barbil area in District Koenjhar in Orissa. Their main customers are the steel plants.

The performance of the Company is given below:-

	Quantity in lakh tonnes Rs. in crores 1989-90	1990-91 (Provisional)
Production	6.30	7.48
Tunover	7.00	7.61
Profit/Loss	0.76	(-)0.63

The Company ran into losses due to reduction in offtake by steel plants. As a consequence funds are not available for investment in the modernisation of the mines. To remedy the situation, following steps have been taken:—

1. Financial assistance is being extended by the Government for meeting capital expenditure in phases. During 1990-91, Rs. 50 lakhs is being given for this purpose.

2. To develop the rich iron ore deposits at the company's mines located at Roida where Fe content is about 65%, a project report for enhancing the mine capacity from the present level of 7 lakh tonnes to 10 lakh tonnes by semi mechanisation is under preparation by M/s. M.N. Dastur and Company. A provision of Rs. 21 lakhs has been kept for the year 1991-92 for this scheme.

3. OMDC has diversified markets outside the SAIL steel plants. Growth of sponge iron industry has provided new marketing avenues. Long term arrangements are being finalised with users.

4. Reduction in work-force has been effected by covering 400 persons under VRS

1.2 The Bisra Stone Lime Company Limited

It is engaged in the mining of lime stone and dolomite, the Company has mining leases in Sundergarh District of Orissa. It supplies lime stone and dolomite to the steel plants.

The performance of the company is given below:—

Quantity in lakh tonnes
Rs. in crores

	1989-90	1990-91 (Provisional)
Production	7.20	7.77
Turnover	11.34	10.27
Profit/Loss	9.00	(-)9.02

Due to development of their own captive mines, by the integrated steel plants, and competition from other mine owners, BSLC's sales were reduced considerably during the last few years. The rehabilitation of the company was subsequently taken up in 1987-88 in consultation with the Government of Orissa. Financial assistance was extended to BSLC to clear its outstanding dues, and to successfully implement a Voluntary Retirement Scheme. A longterm contract was also entered into with Visakhapatnam Steel Project for supply of dolomite. This arrangement would enable the company to turn the corner within the next two years.

During 1990-91, the Company would be given financial assistance of Rs. 118 lakhs, out of which Rs. 100 lakhs will be spent on developing the Patpahar Project for the VSP Plant. In addition, feasibility studies are being undertaken to explore the possibilities of low-alkali limestone availability.

1.3 The Karanpura Development Company Limited

The Company is presently engaged in the mining of lime stone and fire clay in District Hazaribagh, Bihar. During the year 1990-91, it produced 1.17 lakhs tonnes of limestone, as compared to production of 1.0 lakh tonnes of limestone during 1989-90. There was a slight decline in sales since ACC, one of the main customers, had closed its cement units at Khilari. The net loss during 1990-91 is Rs. 16.73 lakhs as against Rs. 23.59 lakhs in 1989-90.

1.4 Scott & Saxby Limited

This Company is a fully owned subsidiary of Karanpura Development Company Limited. Its activities are sinking of deep tubewells, soil testing, supply pumps and spares repairing and maintainance of pumps and tubewells etc.

The performance of the company during 1989-90 and 1990-91 is given below:—

Rs. in crores

	1989-90	1990-91 (Provisional)
Turnover	0.96	1.49
Profit/Loss	0.59	(-)0.32

To improve its profitability the Company is taking on the task of reducing the surplus labour force. Financial assitance to the tune of Rs. 70 lakhs has been extended during 1989-90 towards this purpose.

1.5 Eastern Investment Limited

It is an investment company with income from dividends and interest on its investments. The Company as it exists at present has been formed by amalgamation of six other investment companies of the Bird Group.

1.6 Kumardhubi Fireclay and Silica Works Limited

It is one of the major producers of the refractories in the Country. During 1990-91, the Company has produced 17,536 tonnes of refractories. During 1989-90, the turnover of the Company was Rs. 8.08 crores. The turnover during 1990-91 has been Rs. 7.28 crores. During the year 1989-90, the Company executed the prestigious Hoogoven order of the Bhilai Steel Plant and supplied silica Bricks for the Blast Furnace Stove for the first time in the country.

Recognising the competence of the Company in becoming one of the major suppliers of refractories to the steel plants, a revival plan for making the Company, profitable, has been prepared by an Expert Group and is presently under implementation. Government of India has extended a plan loan of Rs. 70 lakhs for implementing this revival package of the Company during the year. Besides, the Company has also been given Rs. 13 lakhs for various other Capital expenditures.

Department of Steel - Plan Outlays and Expenditure

(Rs. in crores)

S. No.	Name of Public Sector Undertaking	VII Plan Approved Outlay	VII Plan Actual Expenditure	VIII Plan Proposed Outlay
1.	Steel Authority of India Limited.	3575.68	3780.78	13283.00
2.	Rashtriya Ispat Nigam Limited.	2500.00	4583.39	3257.00
3.	Vijayanagar Steel Limited.	5.00	3.11	600.00
4.	Neelachal Ispat Nigam Limited.	5.00	2.06	600.00
5.	Sponge Iron India Limited.	31.80	12.13	93.00
6.	Hindustan Steelworks Construction Limited.	24.66	31.35	40.00
7.	Metallurgical Engg. & Consultants (India) Limited.	8.00	11.18	10.00
8.	Bharat Refractories Limited.	45.99	27.37	195.23
9.	Metal Scrap Trade Corporation and Ferro Scrap Nigam Limited.	10.00	24.93	29.75
10.	National Mission.	—	1.60	200.00
11.	National Mineral Development Corpn. Limited.	145.30	86.97	507.56
12.	Kudremukh Iron Ore Company Limited.	18.45	38.41	554.05
13.	Manganese Ore (India) Limited.	18.80	14.79	48.42
14.	Bird Group.	—	9.60	30.00
		6388.68	8427.67	19448.01

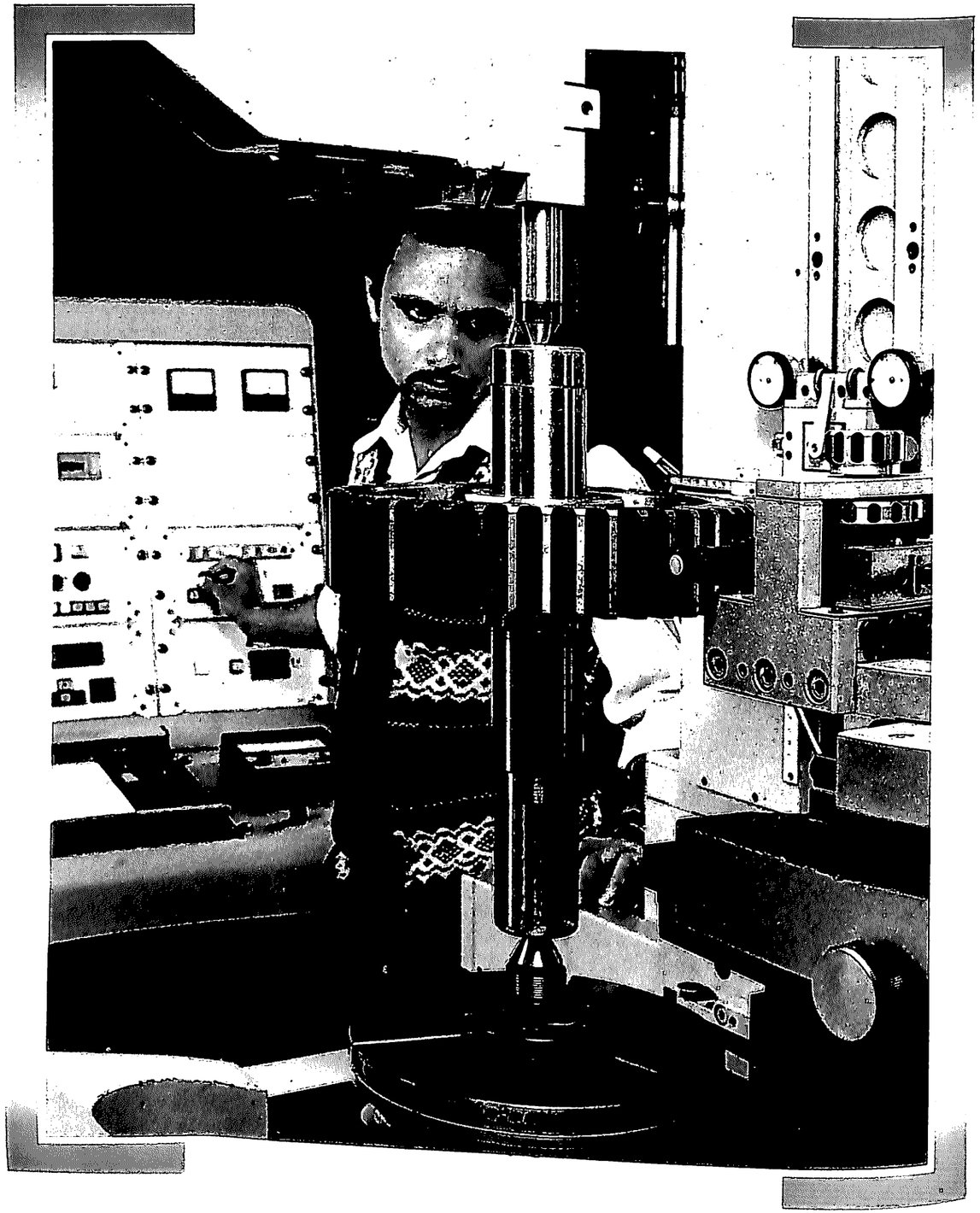
Finances of Public Sector undertakings under Department of Steel for year ending 1990.

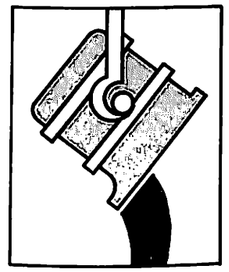
S. No.	Company	Total Capital employed	Net Worth	Net Sales
1.	2.	3.	4.	5.
1.	SAIL	6715.70	4453.45	7420.20
2.	IISCO	22.82	— 225.00	470.30
3.	KIOCL	465.41	405.40	173.80
4.	MSTC	27.00	26.91	709.35
5.	HSCL	282.02	— 209.45	212.36
6.	NMDC	264.71	135.61	129.47
7.	BRL	77.44	3.45	28.43
8.	MECON	47.09	64.73	97.81
9.	MEL	43.77	— 9.91	88.85
10.	MOIL	23.31	20.59	36.64
11.	FSNL	25.58	22.47	31.06
12.	SIIL	22.95	22.40	18.25

Continued.

(Rs. in crores)

Company	Gross profit before depreciation after interest	Gross profit before interest after depreciation	Profits before Tax.	Profits after tax	Divi-dends	Retained Profit.
	6.	7.	8.	9.	10.	11.
SAIL	760.46	527.46	224.96	190.46	0	190.46
IISCO	—115.49	— 129.20	— 138.08	— 138.08	0	— 138.08
KIOCL	47.92	28.61	23.75	23.75	0	23.75
MSTC	13.98	13.54	13.23	6.33	0.22	6.11
HSCL	— 69.49	— 41.94	— 72.99	— 72.99	0	— 72.99
NMDC	52.40	47.03	38.84	36.84	0	36.84
BRL	6.49	4.87	—11.20	—11.20	0	—11.20
MECON	8.72	7.55	7.55	4.19	0.40	3.75
MEL	0.30	— 2.71	— 2.10	— 2.10	0	0
MOIL	2.04	1.59	5.51	4.60	0.92	3.66
FSNL	14.81	12.20	11.60	4.43	0.25	4.18
SIIL	2.72	2.63	1.42	1.42	0	1.42





Tata Iron & Steel Company Limited

The Tata Iron & Steel Company Limited (TISCO), the only integrated steel plant in the private sector, is the oldest plant in the country and consists of an integrated steel plant at Jamshedpur, captive collieries at Sijua, Jamadoba and West Bokaro and Iron Ore mines at Noamundi and Joda in Bihar/Orissa. TISCO embarked on an ambitious modernisation programme in 1980 and commissioned first phase of modernisation in March, 1983. Subsequently, Phase-II of their modernisation programme was implemented. Under Phase-II, TISCO had installed a new bar and rod mill of 3,00,000 tpa capacity.After completion, the saleable steel capacity has increased to 2.1 mtpa from 1.74 mtpa, achieved in Phase-I. TISCO have now received an approval in principle to expand their saleable steel capacity from 2.1 mtpa to 2.7 mtpa, under their modernisation programme Phase-III.

2. Production

Production in the first ten months of the year has been as under:—

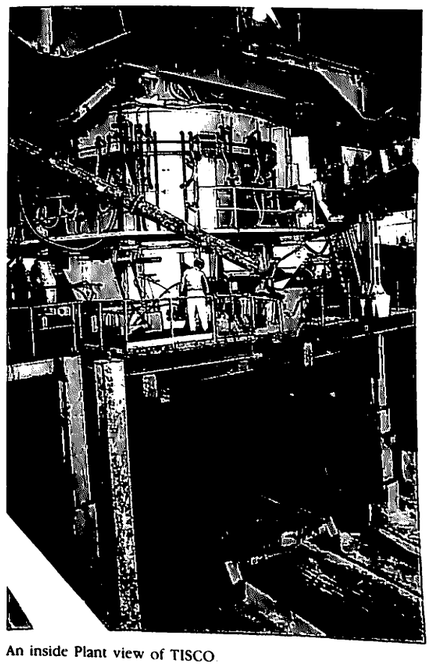
('000 tonnes)

	April '90/ Jan., 91	April '89/ Jan., 90
Hot Metal	1906	1869
Crude Steel	1879	1913
Saleable Steel	1585	1617
Semis % age	53.18	54.23

The production of saleable steel has been lower by 29,000 tonnes mainly because of lower production of crude steel. The operations of the finishing mills were severely constrained due to poor power supply. consequently, the percentage of semis increased from 53.1% to 53.23%. Production was sustained by maximising captive generation and optimal distribution and utilisation of available power.

Subject to availabiltiy of all inputs, particularly power, coal and coke, it is expected that the shortfall in crude steel production will be made up during the remaining months of the current financial year.

While there has been a shortfall in the production of crude steel, the production from TISCO's Blast Furnances has been outstanding primarily due to the availability of imported raw materials such as coal, limestone, dolomite etc., and the production of hot metal has increased by about 30,000 tonnes, as compared to the corresponding period of the previous year.



An inside Plant view of TISCO

3. Performace of various facilities

a) Modernisation Phase I

The performannce of all the major units installed under modernisation Phase I viz., L.D. Shop, Lime Calcining. Tar Dolo, Oxygen Plant and Bar Forgoing unit at LD shop has been adversely affected due to power costrains.

b) Modernnisation Phase II

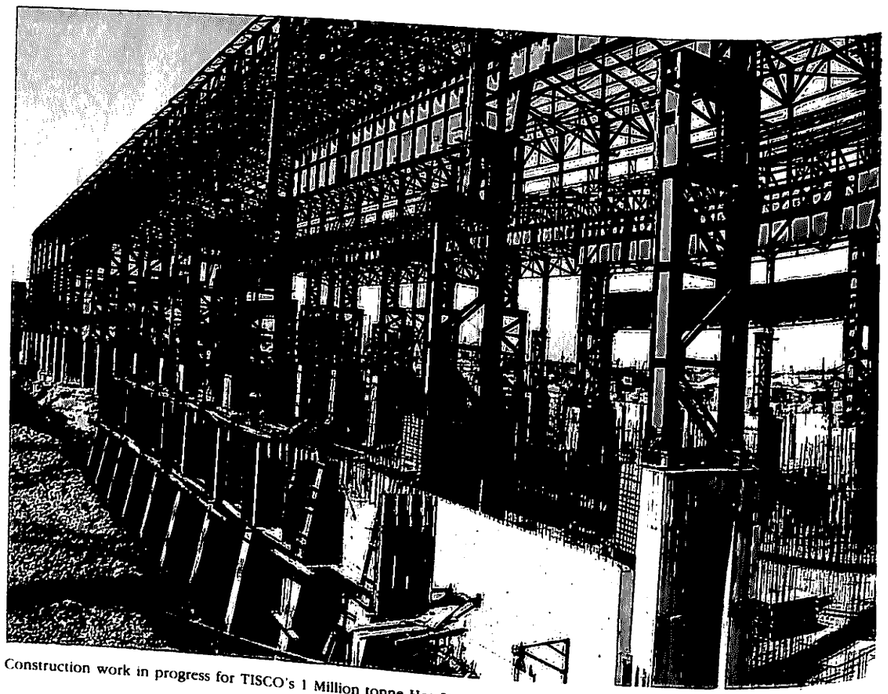
A major facility under Mod. Phase II B & R Mill is now geared up to produce all the grades and sections of products envisaged, with excellent quality, at near rated capacity.

It is worth mentioning that the products of B & R Mill are very well acceptd in the international market.

The other major facilities like Coke Oven Battery No. 7 with stamp charging facility, the new Coal Handling Plant, the Bedding and blending Yard and the Sinter Plant No 2 commissioned year before last are almost fully stabilised in performance. The qualities of coke and sinter produced from Batter No. 7 and the Sinter Plant No. 2 respectively, are showing progressive improvement in productivity and quality. These have helped in reducing the coke rate and in increasing the productivity of Blast Furnaces.

c) New Facility

The largest energy optimised furnace (EOF) of 80 capacity installed at steel melting shop No. 3 on 14.11.90 has already been put on trial run. The



Construction work in progress for TISCO's 1 Million tonne Hot Strip Mill.

teething troubles are being sorted out. The new 6" High Frequency Induction Welding (HFIW) Tube mill commissioned recently and the modernised 4 Hi mill CR Plant at the Tubes Division are at present undergoing trial runs and the initial bottlenecks are being taken care of.

4. Energy Conservaion

At the Blast Furnaces, the coke rate was the lowest ever at 663 kg/t HM which was lower by 38 kg/t HM as compared to the corresponding period of last year and this has helped in containing the specific energy consumption rate.

At the unit level, fuel rates at RMI, MM2, Bar Forge shop, B&R mill, BB & SP, refractory production units have shown improvement.

Despite these improvements, the scenario at the energy front, as compared to the corresponding period of the previous year, has shown an upward trend, mainly due to higher captive power generation to meet the crisis due to inadequate power supply from DVC and BSEB. A 2 × 30 MW TG set with four boilers have been commissioned to augment captive power generation. The various teething problems during commissioning of the units have resulted in lower power cycle efficiency and affected the specific energy consumption rate adversely.

The following factors have also contributed to the increase of the plant specific energy consumption:—

a) Lower power cycle efficiency at the existing PH 3 due to poor quality of boiler coal supplied.

b) Lower steel to iron ratio.

Improvement in the combustion system has been a continuous effort.

New recuperator has been installed at Plate Mill new normalising furnace, instrumentation and controls have been uprated/improved at some pits of rolling mills, one furnace at SMS 3, BF etc., which has resulted in improvement in the thermal efficiency.

Improvement in the specific energy consumption rate of the plant is expected after the EOF gets stabilised.

5. Financial Performance

Financial performance for the period April-September '90 shows profit before tax of Rs. 110.84 crores as against profit of Rs. 78.30 crores for the corresponding period of April-September, 1989. The spiralling costs mostly due to factors beyond control of the company have been absorbed to some extent by well planned operations and sustained cost controls.

6. Safety Activities

During the last few years, efforts to reduce accidents have borne good results and during the period of 1-4-1990 to 31.12.90 the number of last time accidents in TISCO works were 49 including 2 fatal only against 87 including 3 fatal accidents during the same period in 1989. During this period the works have completed 5.62 million accident free man hours which is best ever achieved so far in Tata Steel.

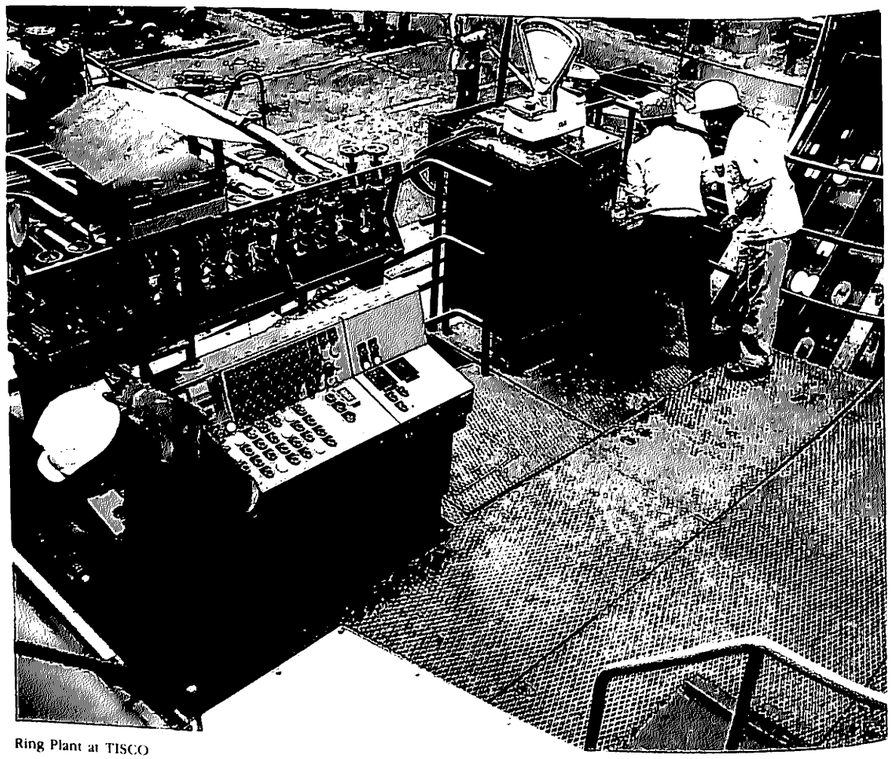
To achieve further improvement, especially to bring down fatal accidents to Zero, the company has embarked on imparting safety training to employees in a big way

Secondary Steel Sector

The Working Group on the Iron & Steel Industry for the VIII Five Year Plan (1990-95) has estimated a gap of about 3 million tonnes by the end of IX Plan period. Due to various constraints in augmenting production in the integrated steel plants, it is expected that this gap will be met by the secondary steel sector. Government have announced various policy measures to encourage the growth of this sector which are summarised below:—

—Existing steel making units are permitted to modernise and expand capacity upto a minimum economic size of 1,50,000 tpa.

— Existing steel making units are permitted to instal facilities for backward and forward integration with an overall ceiling capacity of 2.5 lakhs tpa. New capacities based on small blast furnace/energy optimising technologies are allowed. Establishment of some new Steel making units in the private sector of capacity upto one million tonnes each based on EAF/Energy optimising technologies includidng small blast furnaces has been allowed. Enterpreneurs have the option to decide the plant size, keeping in view the product mix and technology to be adopted.



Ring Plant at TISCO

— Existing units are freely permitted to diversify to all grades, sizes and sections of steel within the same group of industry.

— These liberalised policy measures seek to achieve the following objectives:—

— To permit existing units to achieve viable level of operations.

— To encourage adoption of new technologies.

— To permit units flexibility of size in order to exploit the benefits of energy saving and productivity available in modern technologies.

— To meet the current and projected shortage of steel.

It is expected that the production from the secondary steel sector will be about 6 million tonnes by the end of VIII Plan and 10 million tonnes by the end of IX Plan period. In order to achieve this, the installed capacity of the secondary steel sector by the end of VIII Plan period should be around 8 million tonnes and around 14 million tonnes by the end of IX Plan period.

1. Electric Arc Furnace Industry

1.1 Production of steel by the Electric Arc Furnance (EAF) units, popularly known as ministeel plants, started in India in the early seventies to meet the acute shortages of steel, and presently about 3.2 million tonnes of steel, accounting for little over 30% of India's steel production, is produced through this route. Several factors like comparatively lower and, therefore, affordable capital cost compared to integrated steel plants, lower gestation period, adaptability of production range due to medium capacity of the furnaces and easy integration with downsteam technological developments such as continuous casting and ladle metallurgy practices, favoured the development and emergence of the EAF route for production of steel. Today mini steel plants are producing all grades of steel including alloy, high carbon and special steels.

1.2 The main raw material of mini steel plants is steel scrap. Since the availability of steel scrap in India is limited, Govt. have permitted imports of melting scrap, sponge iron/HBI and heavy melting scrap. However, in order to reduce heavy dependence of the industry on imported scrap, Government have permitted the setting up of new units based on modern technological concepts which include Ultra High Power Furnace, ladle refining, water cooled panels, etc. which are capable of utilising sponge iron to the extent of 30 to 70% as feed material.

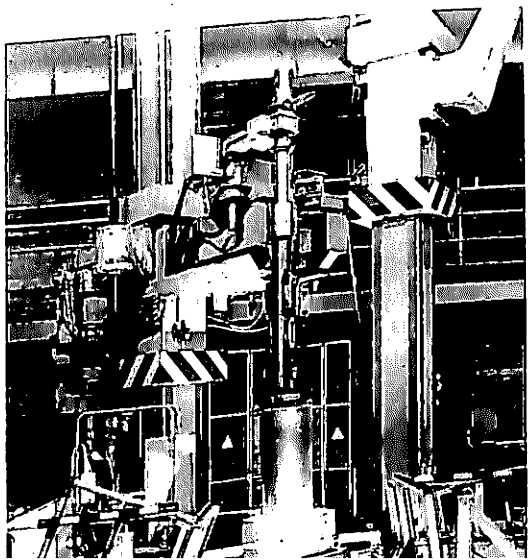
1.3 In order to further reduce dependence on steel melting scrap, new steel production routes like BP-BOF/EOP and other energy optimising technologies have been allowed for the first time in the country in the secondary steel sector. The other constraint on the growth of this sector has been power. Establishment of captive power plants and other energy optimising technologies is, therefore, being encouraged.

1.4 At present there are 206 EAF units with a total capacity of about 10 million tonnes per annum. Out of these, 169 with a licensed capacity of 6.2 million tonnes have already been commissioned. In addition 33 units have been given Letters of Intent for a

4. Cold Rolled Steel Strips Manufacturing Industry

4.1 There are 86 units licensed/granted letter of intent for a capacity of around 2.698 million tonnes. Out of these, 45 units are already in production. 17 units have been granted LOIs to undertake production for captive use for a capacity of 0.56 lakh tonnes per year and 3 LOIs for 100% Export Oriented Units for a capacity of 4,50,000 lakh tonnes per year.

4.2 The production of units for the last 3 years and for April-Sept., 1990 is as follow:



(In lakh tonnes)

Category	1987-88	1988-89	1989-90	April-Sept., 1990
Mild Steel	3.100	4.643	5.572	2.335
Medium Carbon Steel	0.075	0.120	0.142	0.053
High Carbon Steel	0.082	0.106	0.081	0.027
Alloy Steels	0.006	0.016	0.009	0.001
Stainles Steels	0.125	0.069	0.034	0.021
Total	3.388	4.949	5.838	2.437

5. Hot Rolled Steel Strips Units

5.1 Apart from the integrated steel plants at Bokaro and Rourkela, there are 9 licensed units in the private sector for the manufacture of HR sheets/strips with a total licensed capacity of 0.393 tonnes per annum. In addition 12 units have been issued letters of intent for a capacity of 1.062 million tonnes per annum. These units are at various stages of implementation.

5.2 The total production of hot rolled steel strips units during the last 3 years and for April-Sept., 1990 is as under:—

(In thousand tonnes)

Category	1987-88	1988-89	1989-90	April-Sept., 1990
Hot Rolled				

manufacture of GP/GC sheets. Out of these, 15 units with a total licensed capacity of 0.608 tonnes, have been granted industrial licences. Another 12 units are holding letters of intent for a capacity of 0.585 million tonnes and are at various stages of implementation.

6.2 Production of GP/GC sheets during the last three years and for April-Sept., 1990 is as follows:

(In thousand tonnes)

Category	1987-88	1988-89	1989-90	April-Sept., 1990
GP/GC Sheets/ Strips	1.199	1.815	2.136	1.082

There are 2 units which have been granted letters of intent for the production of Zinc-Aluminium Alloy coated sheets/strips (galvalume) with a total capacity of 1,50,000 tonnes.

6.3 Government have also granted 3 Licences for an aggregate capacity of 1,45,000 tonnes for the production of PVC/Vinyl etc. coated sheets/strips. These are at various stages of implementation and have yet to commence commercial production. Since these items are new for the country, the market potential is also not yet established.

6.4 Besides Rourkela Steel Plant, there are two more units in the private sector for production of tinplates. Total capacity of these 2 units is 0.15 million tonnes of electrolytic tinplate per year. All the 2 units use imported tin mill black plates as their raw material.

6.5 Production of electrolytic tinplate of the two units in the private sector during the last three years and for April-Sept., 1990 is as below:—

(In lakh tonnes)

Category	1987-88	1988-89	1989-90	April-Sept., 1990
Oil Can Size	0.458	0.453	0.447	0.180
Non Oil Can Size	0.151	0.331	0.269	0.087
Total	0.609	0.784	0.716	0.267

8. Ferro Alloys

8.1.1. Ferro Alloys is one of the vital input raw material for steel making. At present the total licensed capacity of bulk ferro alloys is 7.52 lakh tonnes. The licensed capacity in the 100% export oriented units is 2.38 lakh tonnes. The installed capacity is 4.62 lakh tonnes in the Domestic Tariff Area and 2.38 lakh tonnes in the 100% EOU Sector. Production during the last 3 years and April-Dec., 1990 is as follows:

(In thousand tonnes)

Category	1987-88	1988-89	1989-90	April-Dec.1990 (Estimated)
Ferro Manganese	180.000	182.000	188.00	160.000
Ferro Silicon	41.000	51.00	55.00	34.00
Ferro Molybdenum	0.234	0.231	0.194	0.037
Ferro Chrome	35	39.00	36.00	27.00
Ferro Tungston	0.013	—	Nil	Nil
Ferro Vanadium	0.064	0.055	0.066	0.026
Ferro Titanium	0.081	0.094	0.072	0.067
Mangnesium Ferro Silicon	0.284	0.014	—	—
Silicon Chrome	3.00	0.652	7.00	0.561
silicon Manganese	17.00	27.00	34.00	19.00
Charge Chrome	—	—	—	—
Ferro Niobium	0.051	0.025	0.039	0.048
Total	276.000	300.000	321.000	240.00

8.1.2 To help meet the increasing demand of Ferro Chrome/Charge Chrome the licensed ferro manganese units have been allowed to diversify into production of these ferro alloys. Broad banding has also been permitted to bulk-ferro alloys and noble-ferro alloys manufacturers.

As per the demand projections by the working group on Iron & Steel Industry for the VIII five year plan there will be a gap of about 2.5 lakh tonnes of various Ferro Alloys by the year 1994-95. Action is being taken to create more capacity in this sector.

9. Production of Pig Iron and Steel by Energy Optimising Processes in the Secondary Sector.

9.1 In order to bridge the gap in the production of Pig Iron in the larger integrated steel plants, the Government is pursuing the policy of encouraging setting up of Pig Iron Production Units in the Secondary Sector. For this purpose, the production of Pig Iron has been de-licensed subject to satisfying locational conditions. The major route being followed by Secondary Producers is of Mini Blast Furnace (MBF). Several technology Collaboration agreements have been approved for this sector. However, apart from the above, some entrepreneurs have taken up production of Pig Iron by Sub-merged Electric Arc Furnace Route. So far, 6 units with a proposed capacity of 7 lakh tonnes have applied to the financial institutions for assistance. The first unit is expected to be commissioned in later half of 1991.

9.1.2 Presently, these units are proposing to use imported Coke. However, the Government is also encouraging setting up of Merchant Coke Ovens batteries in private sector to cater to the requirement of the Metallurgical Coke of the MBFs. It has also been ensured that these furnaces become cost-effective to the extent possible by utilising indigenous raw materials.

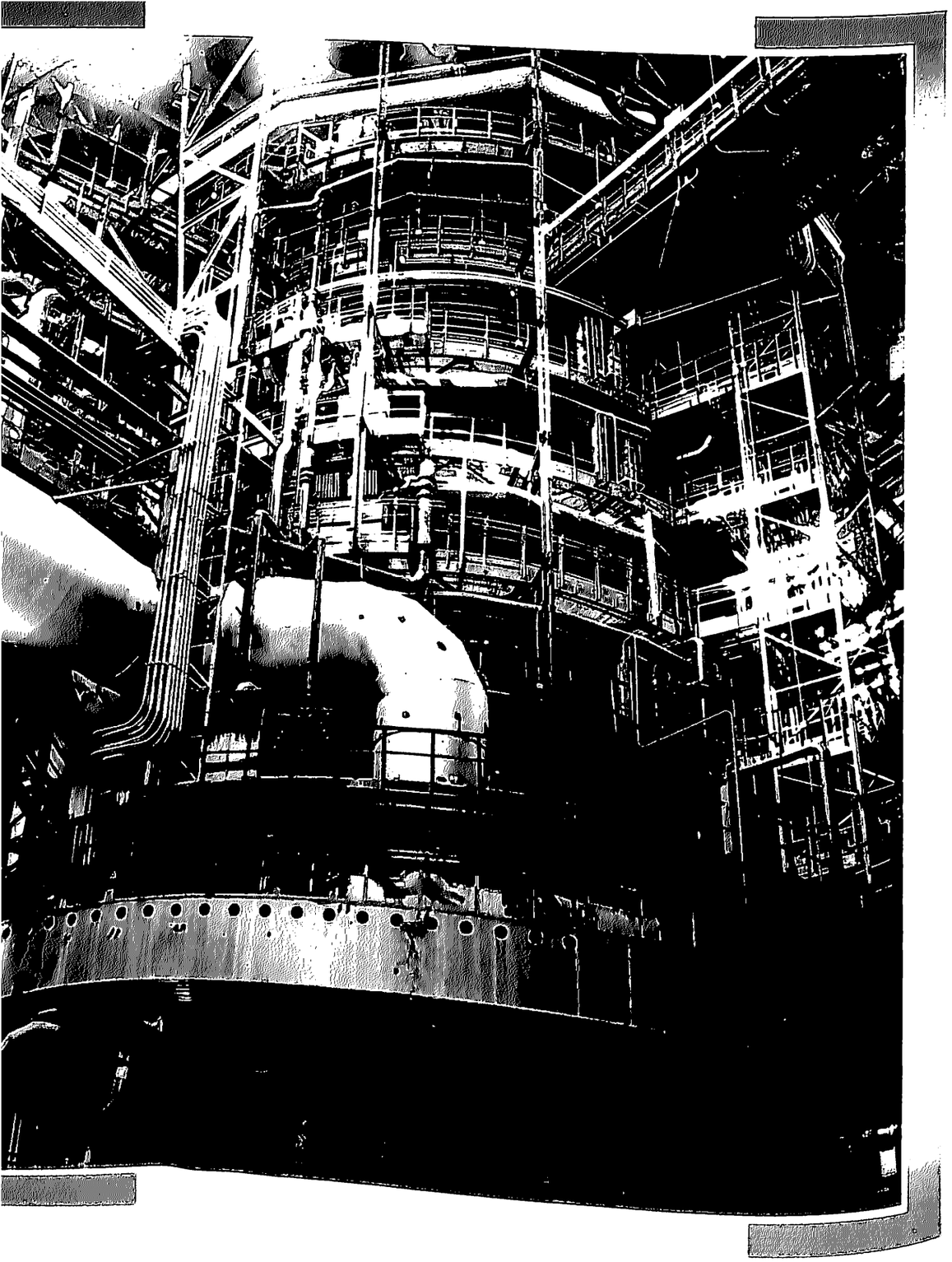
9.1.3 In order to meet the shortfall of availability of steel in the country, the Government is also encouraging setting up of steel making facilities based on Energy Optimising Processes. In these processes, the hot metal obtained from the MBFs may also be utilised for production of steel. Considerable interests is being shown by entrepreneurs in this area.

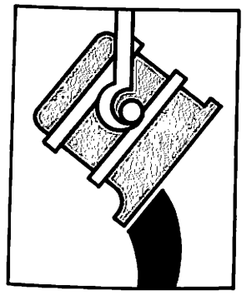
10. Sponge Iron

Manufacturing of sponge iron was taken out of the purview of the licensing provisions of the industries (Development & Regulation) Act in 1985. Since then, a capacity of over 40 million tonnes was registered to be set up. However, while there were only two private sector units in production during 1988-89, the number of such units increased to five in 1990-91. The total installed capacity of these units is around 13.4 lakh tonnes per annum. Some more capacity is expected to become operational in the near future. The production of sponge iron in the private sector from 1987-88 onwards is given below:—

(In lakh tonnes)

1987-88	1988-89	1989-90	1990-91 (estimated)
1.[illegible]	1.94	3.18	8.50





1. Iron & Steel Mission

1.1 The Science & Technology Advisory Committee (STAC) attached to the Department of Steel Continued to guide the Research & Development activities in the Steel Sector. The STAC reviewed the progress of the projects already taken up, some of which are nearing completion. A sum of Rs. 1.8 crores was available for the continuing schemes of the Research & Development projects taken up under the Iron & Steel Mission.

1.2 The structure of the Iron & Steel Mission has been finalised by the STAC. This is now being processed for approval of the appropriate authority in the Government so that the Mission can start functioning and achieve the desired objectives.

2 The Public Sector Undertakings of the Department of Steel and also the steel plants in the private sector continued their R&D activities. Some of the achievements and break-throughs are given below:—

2.1 M/s Kudremukh Iron Ore Company Limited

i) With a view to obtaining better metallurgical grade and to improve recovery of the non-magnetic concentrate, a flotation system is being incorporated in one mill line of the concentrate plant at Kudremukh as an R&D project. Trial runs of the equipment are in progress. Based on the performance of this unit, the incorporation of the system in other mill lines will be considered.

2.2 Tata Iron & Steel Company Limited (TISCO)

i) Sinter making using blue dust: Large deposits of blue dust, a powdery deposit of high grade (Fe content over 68%) and very low alumina (less than 2.0%) iron ore, are available in the captive iron ore mines of TISCO. So far, it was considered a 'waste' material. Extensive R&D studies during the past few years have established the technology of gainful utilisation of blue dust to the extent of 50% in sinter making. Necessary sintering parameters were laid down by R&D work and based on this, commercial sinter production has begun at TISCO in its New Sinter Plant. This has resulted in better furnace productivity, reduction in coke rate and has improved hot metal quality. The project effort costing Rs. 5 lakh has resulted in annual savings of around Rs. 80 lakhs.

ii) R&D efforts established the fact that with the use of proper low ash coal to the level of 20 to 30% of the charge, it is possible to improve the coke properties and increase the blast furnace productivity by about 7%. Accordingly, the project costing Rs. 3 lakhs was taken up and this has resulted in annual savings of Rs. 22 crores.

iii) The stamp charging technique adopted by M/s TISCO to improve the strength of the coke has resulted in saving of coke by 2% and increase in productivity by 3 to 4%. The project costing Rs. 25 lakhs resulted in annual savings of Rs. 4 crores.

—Incorporation of variable speed blower in the soaking pit of BSP has been the prime factor in reducing electrical energy by about 25%.

—The bell-less-top system enabled to decrease the coke rate in blast furnace by about 8-10% compared to conventional charging systems.

—Modified skid system in reheating furnaces in R&S mill at BSP, veneering of the AP line equalising furnace at SSP have resulted in significant savings in energy and fuel consumption.

2.5.3 (a) Mechanical sealing for cooler and modified loading chute for machine No. 3 of sinter plant No. 1 at BSP was done.

b) Incorporation of a computerised blast moisture control system has been carried out at BSL.

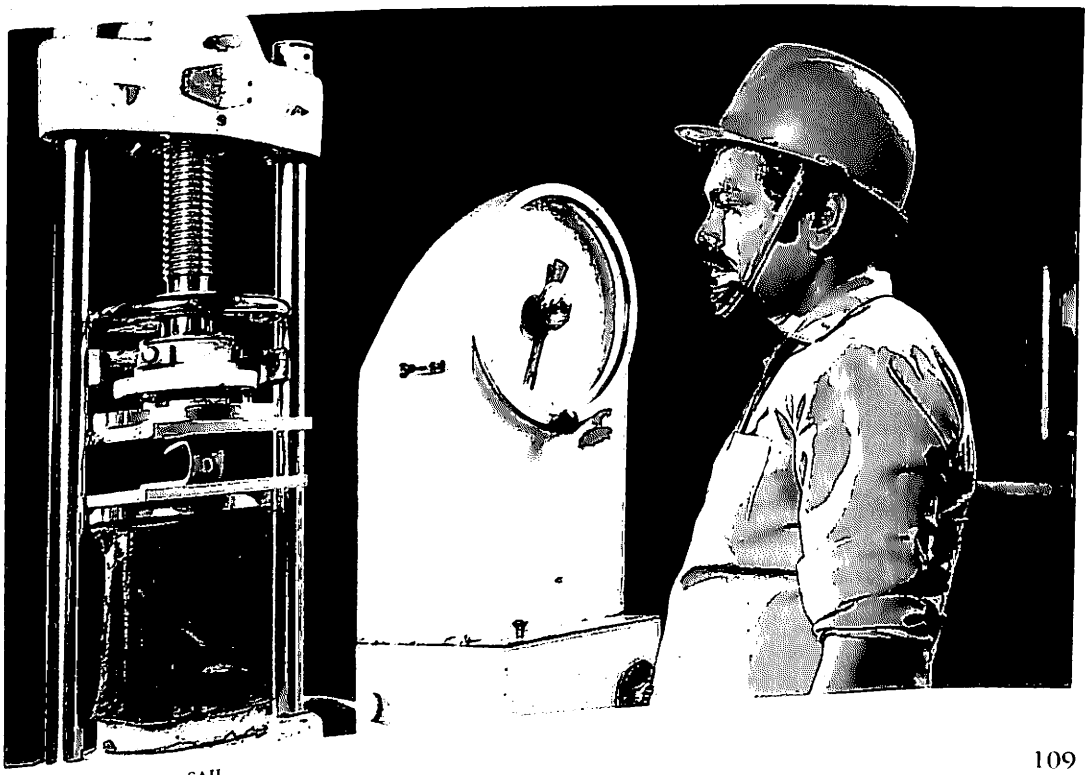
c) Implementation of an improved agitation and filteration system was done at RSP.

These steps have resulted in significant improvement in productivity of the various units of steel plant.

2.5.4 In order to improve the quality, various steps were taken in steel plants by RDCI&S, some of the salient features are as follows:—

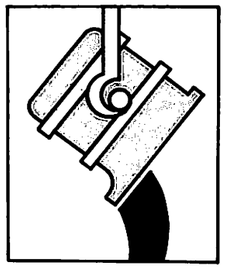
a) Ultra high strength steel bars of Cr-Ni-Si-Mo type for missile, dual phase steel wires for springs and MAF-80 grade micro alloy forging steel for auto components have been developed.

2.5.5 Expertise has been generated in the area of pollution monitoring and control. A new technique has been developed and implemented at IISCO for the first time in the country for monitoring of aromatic hydrocarbons around steel plants.



R & D Laboratory at SAIL

Development of Management Information System



There was a continued thrust to promote on the use of Computers in the Department of Steel. A computer based integrated Management Information System (MIS) has been develped for Department of Steel with the assistance of the National Informatics Centre (NIC) in the areas of Administration, Public Sector Under-takings, Prices, Secondary Producers, Industry Management & Approvals, Projects, Personnel Management and Finance Accounts & Budget. The following area-wise Sub-systems have been developed.

a) Administration
   —Important References & Annual Action Plan Monitoring System.
   —Tracking of Major Policy decisions
b) Public Sector Undertakings
   —SAIL data base on Production, Financial and Technical aspects
   —Data base on Production and Financial aspects for PSUs other than SAIL.
c) Prices
   —Steel Prices Monitoring System
   —Duty Structure Analysis & Tracking System
d) Secondary Producers
   —Data base on Secondary Producers
   —Demand/Supply data base at State Level
e) Industry Management and Approvals
   —Data base on Industrial Licences and Letters of Intent
   —Monitoring of Letters of Intent applications to the pendencies in the IL Section
f) Projects
   —Foreign Exchange Release and Indigenous Clearance monitoring for Projects
   —Monitoring of Projects under construction stage
   —Monitoring of Projects under Pre-construction stage
g) Personnel Management
   —Monitoring of SCs/STs representation in PSUs of Deptt of Steel

   Personnel Information System
   —Monitoring of Board/Non-board level appointments in PSUs of Deptt. of Steel
h) Finance Accounts & Budget
   —Budget Monitoring System
   —Performance of PSUs
   —Plan outlay & Expenditure Monitoring System

—Foreign Exchange Monitoring System
—Loans & Advances Monitoring System

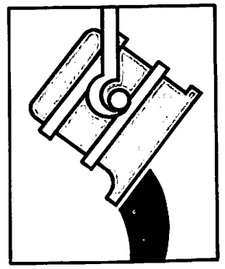
The Computer Centre, which has been established as a central facility, is equipped with following Hardware:

1. Super-AT (HCL & SHIVA) compatibles with 8 MB main memory and two 80 MB, one 300 MB Hard Disks. 2 Nos
2. IBM PC/AT compatible with 3 MB main memory and 40 MB Hard Disks 3 Nos
3. Dot Matrix Printers 7 Nos
4. Line Printer 600 LPM 1 Nos
5. Plotter 1 Nos
6. Super-At terminals 17 Nos

7. Connections to NIC Super Computer is available for the central facility. Terminals of Super-AT in the networking enviroment have been given to all Senior Officers and several sections in the department.

Several training programmes have been conducted by NIC for various levels of staff in the department to get them acquainted with computers in areas like word processing, data entry operations, data processing techniques and package usage training on the sub-systems concerned with their areas.

Organisation Structure



1.1 The Department of Steel has a Secretary, four Joint Secretaries, eight Directors and Deputy Secretaries, seven Under Secretaries, one Senior Analyst and one Deputy Controller of Accounts. In addition, the Department of Steel shares with the Department of Mines, one Financial Advisor in the rank of Additional Secretary, and a Chief Controller of Accounts, equivalent in rank to a Joint Secretary. There is also a Technical Wing comprising an Industrial Advisor, four Development Officers and three Assistant Development Officers, to assist and advise the Department of Steel on technical matters. The total strength of the Secretariat of the Department of Steel as on 31.12.90 is 284. A list of items of work allocated to Department of Steel is given in Annexure-I. A statement showing the representation of Women, Scheduled Castes and Scheduled Tribes, Ex-servicemen and Physically Handicapped persons is given in Annexure-II.

1.2 There is a Vigilance Cell to look into all vigilance matters. One of the Joint Secretaries in the Department of Steel functions as the Chief Vigilance Officer of the Department. Separate vigilance units exist in the Public Sector Undertakings under the Department of Steel. Vigilance inspections of the offices of the Development Commissioner for Iron and Steel and the six Regional Offices are conducted by the Department from time to time.

1.3 In pursuance of the recommendations of the Parliamentary Committee on the Welfare of the Scheduled Castes and Scheduled Tribes, a separate SC/ST Cell has been created in this Department and has been placed under the charge of an Officer of the level of Director.

1.4 In pursuance of the instructions of the Department of Administrative Reforms and Public Grievances and Cabinet Secretary, an officer of the level of Director has been designated Director (Public and Staff Grievances).

1.5 Recognising the special priority given by Government to fight communalism and in pursuance of instructions from the Prime Minister's Office the Secretary (Steel) held a meeting of all officers and staff of the Department of Steel in celebration of the Quami Ekta Week. In this meeting, held on 17.11.90, a pledge was taken by all employees to work towards the strengthening of the freedom and intergrity of the nation.

1.6 The Department of Steel has 18 Public Sector Undertakings under its administrative control. A list of these undertakings is given in Annexure-III.

1.7 The Department of Steel has only one attached office viz., the Office of the Development Commissioner for Iron and Steel at Calcutta. There are also six subordinate offices, each headed by a Regional Development Commissioner for Iron and Steel, at Bombay, Calcutta/New Delhi/Madras/Kanpur and Hyderabad respectively.

At the Head Office at Calcutta, the Development Commissioner for Iron and Steel, (who is of the rank of Joint Secretary to Govt. of India), is assisted by two Joint Development Commissioners, four Deputy Development Commissioners and Seven Assistant Development Commissioners. In addition, an Industrial Advisor (who [illegible]

Officers and one Assistant Development Officer assist him on technical matters. A Research Officer looks into the work relating to the Statistical Division in the Head Office.

The Organisational structure of the Development Commissioner for Iron and Steel and the Regional Offices is given at Annexure-IV. A statement showing the personnel, group-wise and category-wise male/female, SC/ST, physically handicapped, ex-servicemen, in each category in respect of the organisation of Development Commissioner as on 31.12.1990 is given at Annexure-V.

1.8 Essentially a field organisation, the Development Commissioner for Iron and Steel has regulatory and development function. The organisation provides useful feedback which assists the Government in the formulation of policies and in taking executive decisions. Identification of the gap between demand and supply of iron and steel materials, recommending import and export policies, investigation of complaints received from the public, and redressal of grievances of various iron and steel consumers, are some of the important activities of the Organization.

1.9 The Organisation of the Development Commissioner for Iron and Steel has made good progress in the implementation of the Official Language Policy of the Government. Two meetings of the Official Language Implemenatation Committee have been held so far in the current year.

Annexure—I

1. Steel Plants in the public and private sectors, the rerolling industry and ferro-alloys, including all future development.
2. Development of Iron ore mines in the public sector.
3. Development of other ore mines 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 the 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 steel industry, excluding grant of mining leases or matters connected therewith.
7. The Steel Authority of India Limited and its subsidaries.
8. Matters relating to the following undertaking namely:
   i) The Bolani Ores (India) Limited.
   ii) The Manganese Ore (India) Limited
   iii) The Metal Scrap Trading Corporation, and its subsidiary.
9. Other Public Sector Enterprises or undertakings falling under the subject included in this list except such as are specifically alloted to any other Department.
10. All attached or subordinate offices or other organisations concerned with any of the subjects specified in this list.

Annexure-II

Statement showing the number of employees, number of SC/ST, Physically handicapped, ex-servicemen, men and women as on 31-12-90 in respect of the department of Steel (Secretariat)

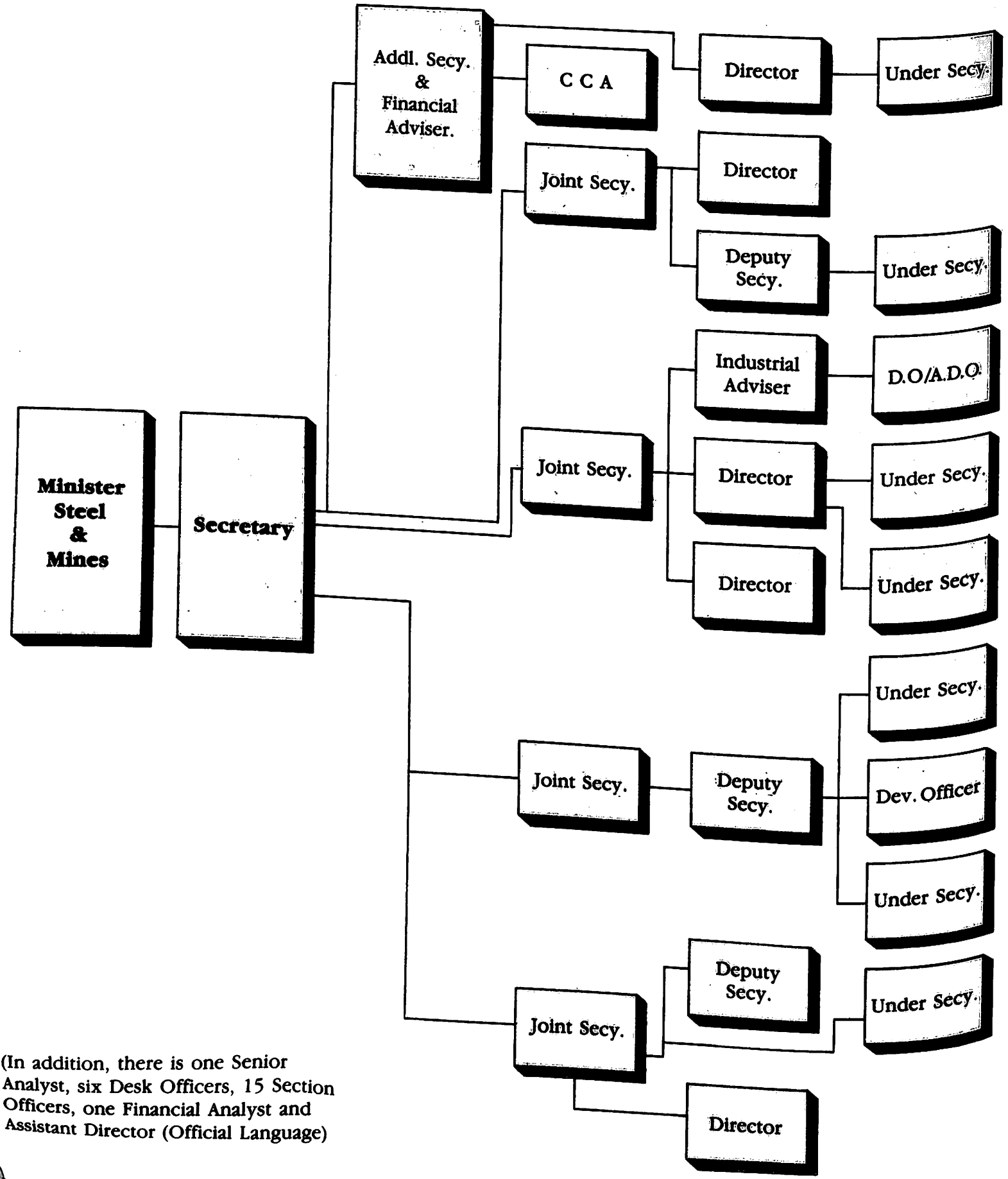
Classification	No. of employees	Men	Women	SC	ST	PH	Ex-servicemen
1	2	3	4	5	6	7	8
Group 'A'	28	26	2	2	—	—	—
Group 'B'	82	70	12	11	2	—	—
Group 'C'	99	69	30	19	5	2	2
Group 'D'	75	72	3	30	9	1	2
Total	284	237	47	62	16	3	4

Annexure—III

List of Public Sector Undertaking under the Department of Steel

1. Steel Authority of India Limited, Ispat Bhawan, Lodhi Road, New Delhi-110 003
2. Metallurgical & Engineering Consultants (India) Limited, MECON Building, Ranchi-834 002
3. National Mineral Development Corporation Limited, Castle Hills, Masab Tank, Hyderabad-500 028
4. Bharat Refractories Limited Sector IV-3 Quarter No. 56 Bokaro Steel City-827 001.
5. Kudremukh Iron Ore Co. Ltd., 11 Block Koramangala, Bangalore-560 034.
6. Manganese Ore (India) Ltd., 3 Mount Road Extension, Nagpur-440 001.
7. Hindustan Steel works Construction, Ltd., No. 1 Shakespeare Sarani, (8th Floor), Calcutta-700 001.
8. Sponge Iron India Limited, NMDC Complex, Khanij Bhavan, 10-3-3 11/A Castle Hills, Hyderabad-500 028.
9. Rashtriya Ispat Nigam Limited, Project Office 'A' Block, Visakhapatnam-530 031 (AP)
10. Neelachal Ispat Nigam Limited, IPICOL HOUSE (4th Floor) Bhubaneswar- 751 007.
11. Metal Scrap Trade Corporation, 225 F, Acharya Jagdish Bose Road, Calcutta-700 020.
12. Vijayanagar Steel Limited, Blue Cross Chambers, III Floor, 'B' Wing, Infantry Road, Bangalore-500 001.
13. Ferro Scrap Nigam Limited, Building No. 54 Old Admn. Office Complex, Bhilai-490 001.
14. India Fire Bricks and Insulation Company Limited, Rly. Station Ranchi Road, P.O. Marar-820 177 District Hazaribagh, Bihar.
15. Indian Iron and Steel Company Limited, Burnpur-713 325.
16. IISCO Ujjain Pipe and Foundry Ltd., Calcutta.
17. J & K Mineral Development Corporation, Srinagar.
18. Visvesvaraya Iron and Steel Limited, Bhadravati

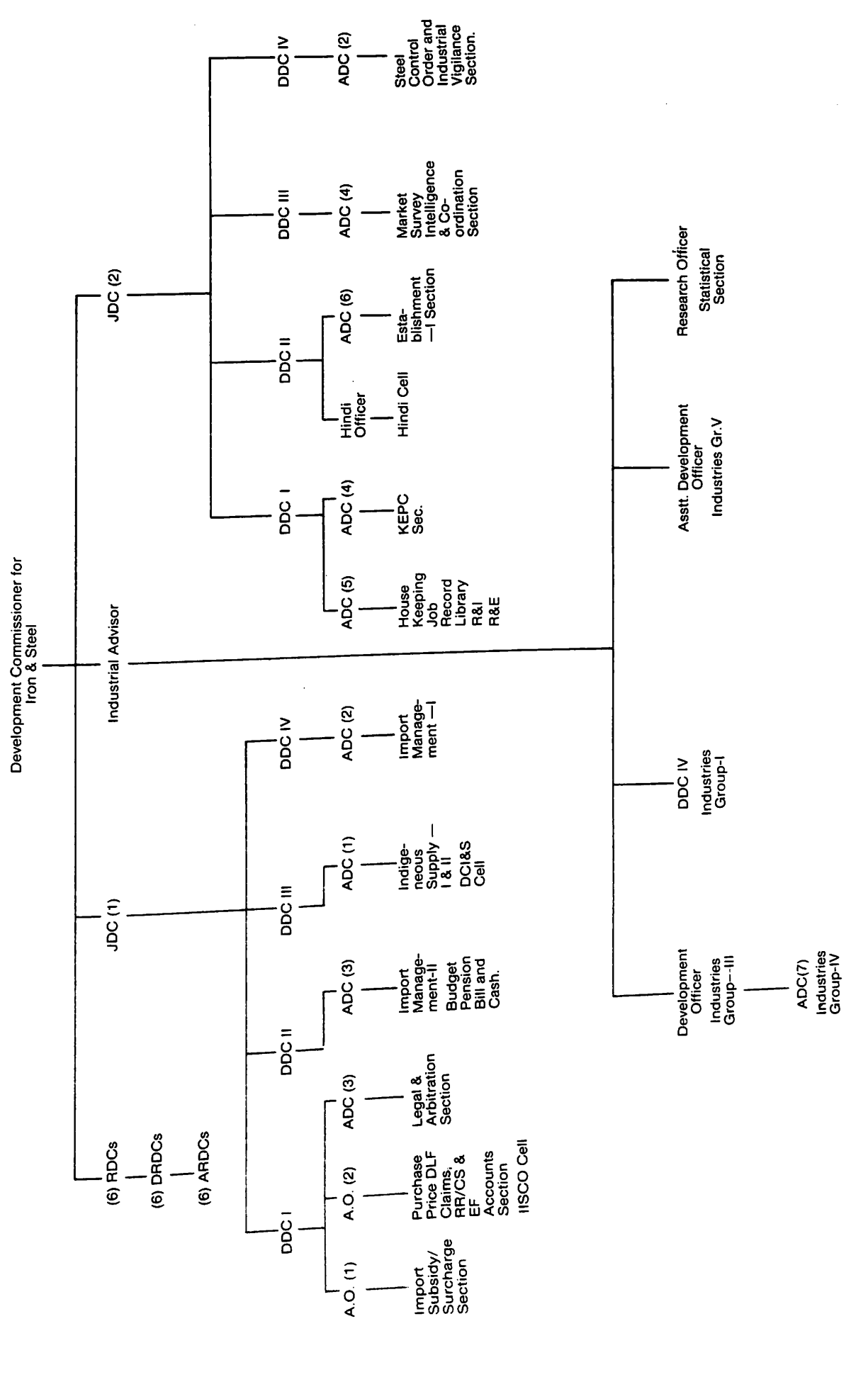
Organisational Chart of the Department of Steel



(In addition, there is one Senior Analyst, six Desk Officers, 15 Section Officers, one Financial Analyst and Assistant Director (Official Language)

Annexure IV

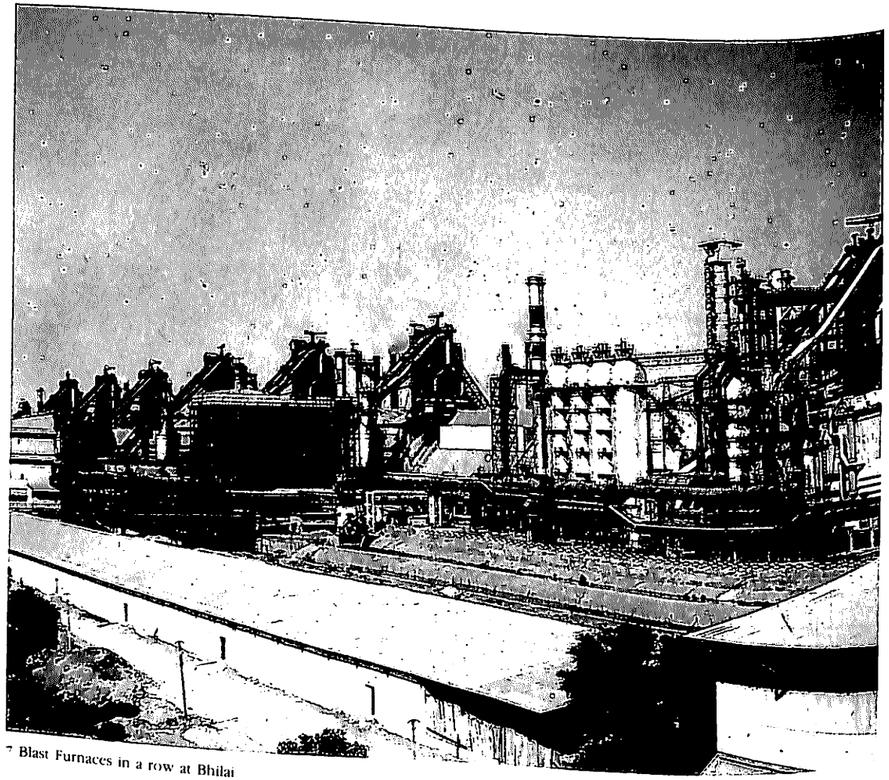
Existing Organisation Chart of the office of the Development Commissioner for Iron & Steel



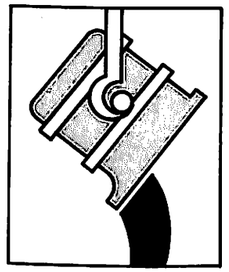
Annexure—V

Statement showing the number of employees of SC/ST, Physically handicaped, ex-servicemen men and women as on 31.12.1990 in respect of the Development Commissioner for Iron & Steel Organisation.

Group of Posts	No. of employees	Men	Women	SC	ST	Physically handi-capped	Ex-service-men
1	2	3	4	5	6	7	8
Group 'A'	23	22	1	1	1	—	—
Group 'B'	30	28	2	12	1	1	—
Group 'C'	171	142	29	36	4	3	6
Group 'D'	80	72	8	24	4	1	1
Total	304	264	40	73	10	5	7



Blast Furnaces in a row at Bhilai



An officer of the rank of Director has been designated as Liaision Officer to look after matters relating to representation of Scheduled Castes and Scheduled Tribes in the Department of Steel, its attached and subordinate offices. The officer also supervises matters relating to representation of Scheduled Castes and Scheduled Tribes in Public Sector Undertakings under the administrative control of the Department of Steel. Periodic reviews and status reports received from PSUs regarding recruitment/promotion of Scheduled Castes/Scheduled Tribes against the vacancies reserved for them are scrutinised in the Department of Steel and appropriate directions issued to the PSUs, as and when necessary.

2. The actual record of performance of some of the major PSUs in respect of representation of Scheduled Castes/Scheduled Tribes during 1990-91 is indicated below:—

(i) Steel Authority of India Limited (SAIL)

The total manpower of the Company as on 31st March, 1990 was 1,94,916. Intake of SC/ST candidates was 15.8% and 17.45% respectively of the total recruitment. The share of SC/ST employees in promotion was 18.45%. As on 31st December, 1990, SC/ST employees were 12.5% and 8.50% respectively of the total manpower. In accordance with Government instructions, a special recruitment drive exclusively for SC/ST candidates was undertaken and more than 300 persons were recruited in SAIL plants/units through these efforts.

The rosters for reservation are being maintained by the steel plants/units separately for each group and in the prescribed form. In order to improve the proportion of SC/ST candidates in the executive cadre, SAIL has been operating a scheme for giving special coaching to SC/ST candidates desirous of upgrading their technical skills. Similarly SC/ST employees are also imparted in-service training to improve the chances of promotion. The SC/ST candidates are also permitted relaxation in prescribed standards in respect of eligibility, experience, written test and interview. A member of the SC/ST community is also associated in Selection Board meetings.

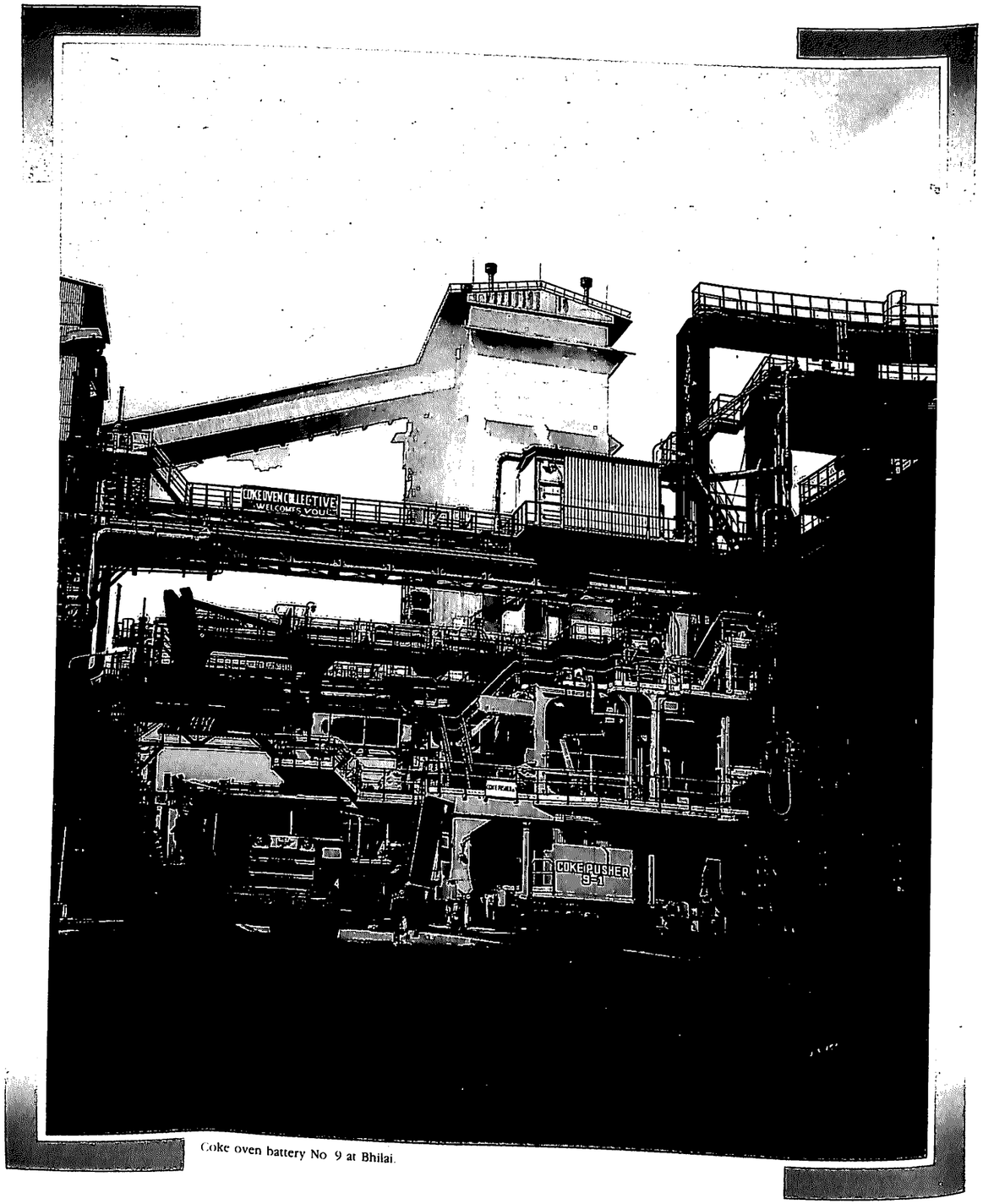
(ii) Visakhapatnam Steel Project (VSP)

The representation of SC/ST in VSP is given below:—

Group	Total Number of employees	SC	ST
'A'	2077	215	32
'B'	348	41	4
'C'	1569	932	234
'D' (Excluding Sweepers)	1720	287	124
'D' (Sweepers)	104	29	4
Total	11127	1504	398
Trainess	2501	553	3

(iii) Bharat Refractories Limited. (BRL)

The Company as on 30.11.90 employs 4400 persons out of which 1070 belong to Scheduled Castes/Scheduled Tribes



Coke oven battery No 9 at Bhilai.

(iv) National Mineral Development Corporation (NMDC)

The total number of employees in NMDC as on 1.10.90 was 6840 out of which 1064 persons belong to Scheduled Castes and 1029 persons belong to Scheduled Tribes.

The group-wise distribution of SC/ST employees is indicated in the following table:—

Groups	Total No. of employees	No. of SC	No. of ST
'A'	608	30	4
'B'	1015	63	19
'C'	3245	444	576
'D' (Excluding Sweepers)	1828	426	424
'D' (Sweepers)	144	101	6
	6840	1064	1029

The Corporation gives facilities for promotion of eduction among the children of SCs/STs by offering scholarships in Local Kendriya Vidyalayas and by providig free educational facilities to children of tribals who seek admission in projects schools. A school exclusively for children of tribals has been started by the Company at their Bailadial-5 Project. All tribals residing in the project area are offered free medical facilities at the NMDC project hospitals. Members of the scheduled tribe communities can also avail of the services of the Projet Co-perative Societies, even if they are not employees of the Company.

At their Bailadila Project, the Company has constructed two Community Centres Weekly film shows and other entertainments are provided at these centres. NMDC provided 14 hand-pumps and also dug 37 wells in the nearby villages in order to improve drinking water facilities for the local residents. A weekly market (Haat) is being organised in Bacheli where the Advasis get an opportunity to sell their wares.

(v) Manganese Ore India Limited (MOIL)

The total number of employees in the Company as on 31.10.90 was 9443 out of which 1699 belong to Scheduled Castes and 2663 belong to Scheduled Tribes. The following table indicates the group-wise distribution of SC/ST employees in the total man-power:

Group	SC	ST	Total
'A'	15	8	207
'B'	8	4	147
'C'	349	425	1977
'D'	1327	2196	7112
Total	1699	2633	9443

(Vi) Metallurgical & Engineering Consultants (India) Limited (MECON)

The total number of employees in the Company as on 31.12.90 is 3840, out of which 440 persons belong to Scheduled Castes ad 240 persons belong to Scheduled Tribes.

(vii) Hindustan Steelworks Construction Limited (HSCL)

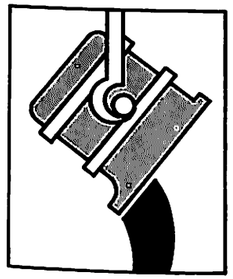
The Company had a total manpower of 20463 in October, 90. The Company continued to lay stress on takig steps for promoting welfare of Scheduled Castes and Scheduled Tribes. The group-wise distribution of SC/ST employees is indicated in the table below:

Group	Total	SC/ST	%
'A'	2024	107	5.3
'B'	834	83	10.0
'C'	15037	3014	20.0
'D'	2568	2378	92.6
Total	20463	5582	27.3

As compared to the total strength of 20, 822 during the last year, there is a reduction of about 350 employees in the Company which includes separation due to retirement, resignation, death, termination etc. and voluntary retirement.

SAIL employees in joyous mood

Progressive Use of Hindi



1.1 The Department continued its efforts for greater use of Hindi in official work during the year 1990-91 in keeping with the Annual Programme prepared by the Department of Official Languages (Ministry of Home Affairs) for implementation of the Official Language of the Union.

1.2 The work relating to the progressive use of Hindi in the Department of Steel is under the administrative control of a Joint Secretary and is looked after by a Deputy Secretary. A Hindi Section consisting of an Assistant Director, a Senior Translator, three Junior Translators, one Hindi Stenographer and three LDCs assist in this work. 27 Devanagari Typewriters, 11 bi-lingual electronic Typewriters, adequate Hindi reading material etc. are available in the Department. Besides, the computer Cell is also being used for Hindi work. A number of measures are being taken for the promotion of progressive use of Hindi in the Department and in the office of the Development Commissioner for Iron and Steel. All communications received in Hindi are being replied to in Hindi.

2.0 Some important items in regard to the use of Hindi in the working of the Department and its PSUs are indicated below:

2.1 House Journals

Almost all the Public Sector Undertakings under the administrative control of this Department are publishing their house Journals in Hindi also. In addition, Hindi magazines and books are kept in their libraries.

2.2 Inspectioon

An Inspection Team has been constituted to oversee the status of implementation of the provisions of the Official Langauge Act/Rules in attached offices and the Public Sector Undertakings under the administrative control of the Department. In the year under review this Inspection Team had made 32 such inspections till the end of January, 91.

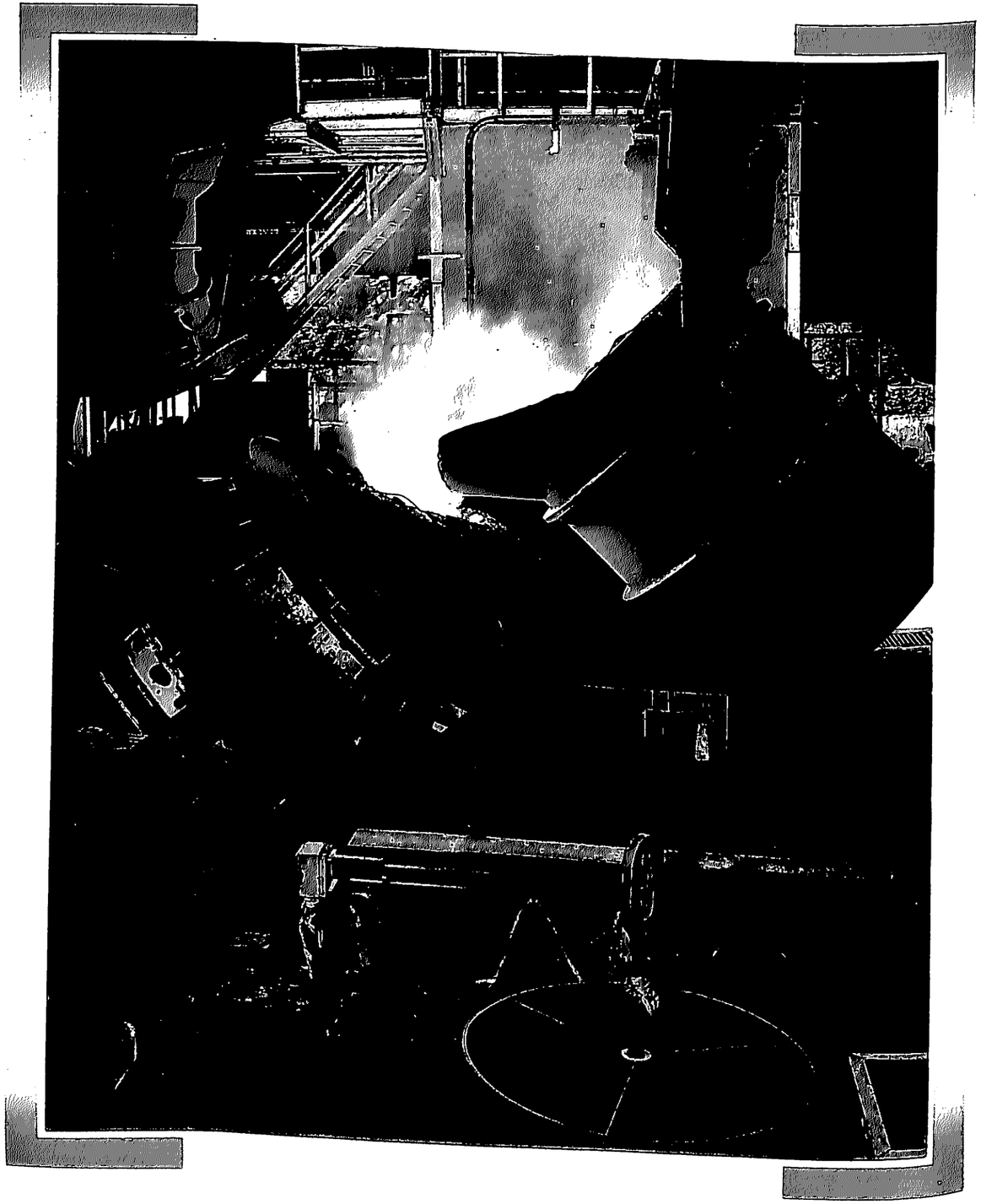
2.3 Official Language Implementation Committee

There is an Official Language Implementation Committee under the Chairmanship of a Joint Secretary in the Department. This committee reviews the progress made in the use of Hindi in the Department, its attached offices and Public Sector Undertakings. Meetings of the Committee are held regularly. This year three such meetings have been held. In each meeting, representatives of two undertakings are also invited by turn and status of the progressive use of Hindi is reviewed.

2.4 Hindi Salahkar Samiti

In accordance with Government instructions, the Hindi Salahkar Samiti of the Department of Steel has been reconstituted in Oct. 1990 under the Chairmanship of Minister for Steel and Mines. Besides, Members of Parliament, senior officers of the Department of Steel and Department of Official Language, Development Commissioner for Iron and Steel, Chairman-cum-Managing Directors of Undertakings a few eminent persons working for the propagation of Hindi are also its members.

The Samiti last met on 15.2.91 in which progress of use of Hindi in the Departmet was reviewed.



2.5 Rajbhasha Shield/Trophies

In order to encourage the use of Hindi in the office and Undertakings under the administrative control of the Department of Steel, a chal Vaijayanti Rajbhasha Shield and two Trophies have been instituted. These are awarded each year to the Offices/undertakings whose performance in this field is rated the best. Besides, a medal is also awarded to the offices/undertakings whose performance in this field is rated the best. Besides a medal is also awarded to the officer/employee of the departmet, whose work in Hindi is rated the best.

2.6 Implementation of Section 3(3) of the Official Language Act

In pursuance of the Official Language Policy of Govt. almost all documents covered under section 3(3) of the Official Language Act are prepared both in Hindi and English. Proformae being used in different Sections of the Department have been prepared in Hindi and English. In order to ensure issue of letters in Hindi to Central Government Offices located in Regions "A" and "B", "Check points" have been identified in the Department.

2.7 Incentive Scheme for Original Work in Hindi

The cash incentive Scheme for original work in Hindi introduced by the Department of Official Language is being implemented in the Department. Almost all sections of the Department have started writing short/routine notes in Hindi. Some officers have also started writing notes in Hindi regularly. Officers have been requested to use Hindi to the extent possible in their work so as to set an example for the staff under them. Five persons have been given cash prizes under the incentive scheme during the year.

2.8 Training of Staff in Hindi/Hindi Typewriting/Hindi Stenography. A programme has been drawn up for imparting training in Hindi/Hindi typewriting/Hindi Stenography to those employees for whom inservice training is obligatory. The position regarding trainers in Hindi/Hindi typing/Hindi Stenography in the Department is as under.

Officers and staff of the attached offices and Public Sector Undertakings are given training under the Hindi Teaching Scheme of the Ministry of Home Affairs, wherever such facilities exist. In other places employees are

		Trained	Under Training	Yet to be Trained
1.	Hindi Typing	5	—	36
2.	Hindi Stenography	16	2	20
3.	Hindi Training (as on 1.12.90)			
	i) Total number of employees (Group A,B & C)	193		
	ii) Total number of employees possessing working knowledge of Hindi	179		
	iii) Total number of employees under training	11		
	iv) Total number of employees yet to be trained in Hindi	3		

encouraged to learn Hindi through correspondence courses conducted by the Central Hindi Directorate. SAIL have initiated their own Hindi teaching programme through correspondence.

The expenditure incurred on such training is borne by the concerned offices.

2.9 Hindi Week

In order to create interest in the use of Hindi in official work among officers/employees of the Department a 'Hindi Week' was observed from 14.9.1990 to 21.9.1990. An appeal was issued by the Hon'ble Minister for Steel and Mines to the staff of the Department and to all the Public Sector Undertakings. During this week, a Hindi essay competition was conducted and prizes were awarded. Apart from this, Hindi typing and Hindi stenography competitions were also conducted and prizes awarded.

2.10 Hindi Workshop

A workshop was organised in the month of September, 1990 for removing the difficulties of staff in working in Hindi. Another workshop for officers of the level of Under Secretary and above was held on 6th March, 1991

Minister of Steel & Mines giving Rajbhasha 'Chal Vajyanty' Shield to the C.M.D of MOIL