GOVERNMENT
OF INDIA

BHILAI STEEL PLANT
SPONGE IRON INDIA LIMITED
DURGAPUR STEEL PLANT
INDIAN IRON & STEEL COMPANY
ROURKELA STEEL PLANT
CENTRAL MARKETING ORGANISATION
VISVESVARAYA IRON & STEEL COMPANY
METALLURGICAL & ENGINEERING CONSULTANTS (INDIA) LIMITED
HINDUSTAN STEELWORKS CONSTRUCTION LIMITED
RESEARCH & DEVELOPMENT CENTRE
ALLOY STEELS PLANT
CORPORATE OFFICE, CET & MTI
METAL SCRAP TRADING CORPORATION
BHARAT REFRACTORIES LIMITED
BOKARO STEEL PLANT
RASHTRIYA ISPAT NIGAM LIMITED
SALEM STEEL PLANT

REPORT

DEPARTMENT OF STEEL MINISTRY OF STEEL & MINES

1988/89

KUDREMUKH IRON ORE CO LTD.
NATIONAL MINERAL DEVELOPMENT CORPN.
MINERAL DEVELOPMENT BOARD
MANGANESE ORE (INDIA) LIMITED

REPORT

1988-89

GOVERNMENT OF INDIA

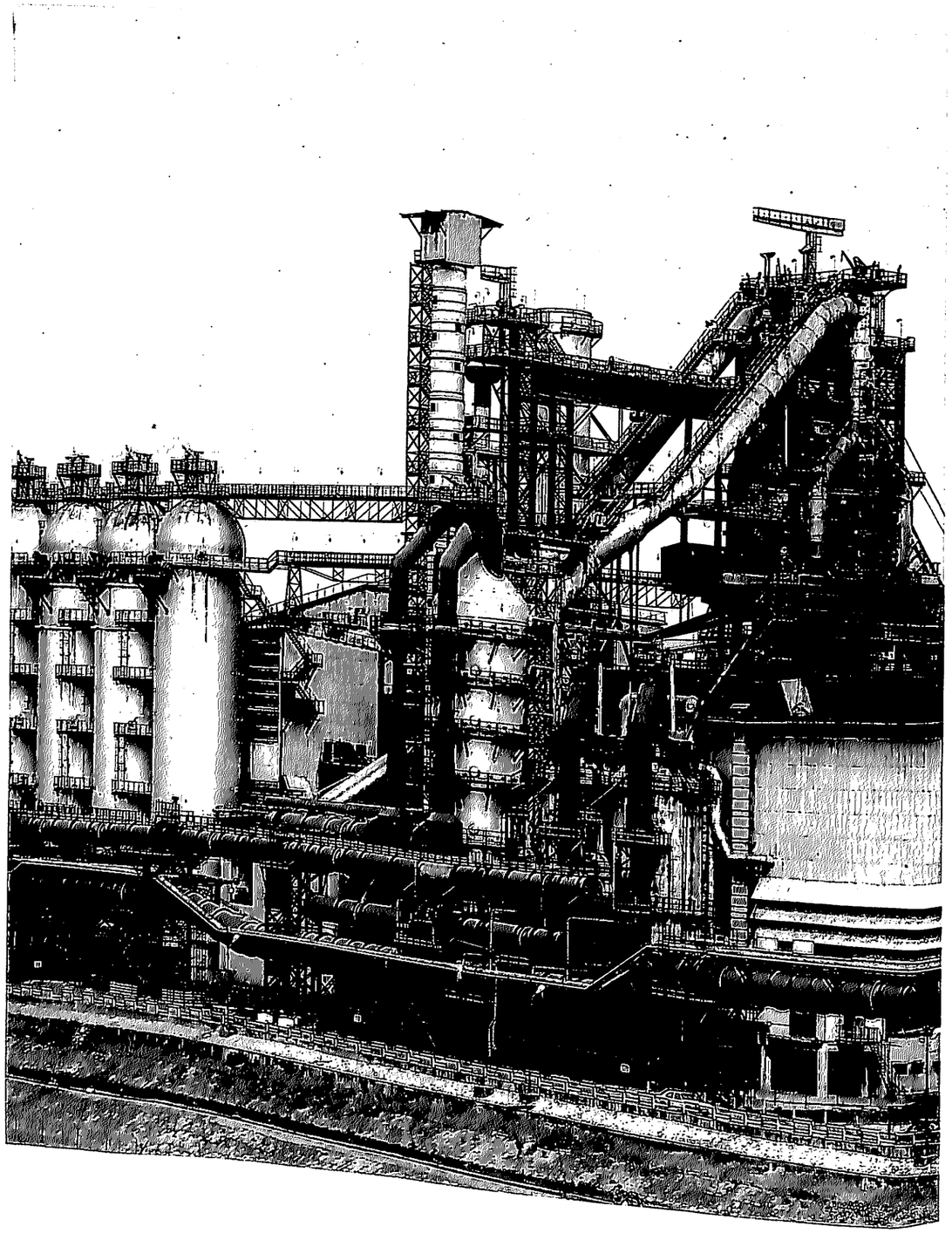
DEPARTMENT OF STEEL

MINISTRY OF STEEL & MINES

Contents:

HIGHLIGHTS

* Crude steel production in SAIL steel plants crossed the 8 million tonne mark for the first time ever.
* 1 million tonne more of crude steel produced by SAIL this year.
* 4 million tonne expansion project for Bhilai Steel Plant completed.
* SAIL poised to register an all time high profit during the current year.
* Modernisation of Durgapur Steel Plant sanctioned at an estimated cost of Rs. 2667 crores. The project is to be completed by December, 1992.
* Detailed engineering studies for modernisation of IISCO plant at Burnpur commenced.
* Salem Steel Plant continues operation at above rated capacity for the second year in succession.
* Licensing policy liberalised to allow setting up of fresh capacities upto 1.5 lakh tonnes per unit for manufacture of hot rolled sheets using sponge iron for steel making.
* Some major users of cold rolled steel sheets/strips (e.g. cycle manufacturers and manufacturers of GP/GC sheets) permitted to set up captive cold rolling facilities.
* Visakhapatnam Steel Plant (Stage I) (i.e. 1.5 million tonnes per year) in final stages of construction prior to commissioning, which has been somewhat delayed.
* Higher prices secured for exports of iron ore by N.M.D.C. and KIOCL, thus reversing a 5 year downward trend.
* Kudremukh poised to cross Rs. 100 crores mark in respect of turnover for the first time ever.



BF at Bhilai

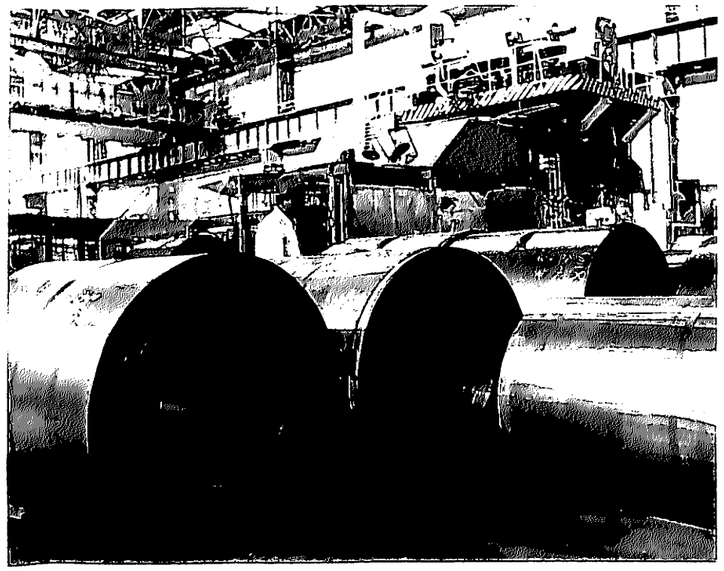
1. The Year at a Glance

1. Production of Steel

The production of saleable steel (i.e. finished steel plus semi-finished which is sold to the secondary sector for finishing) in the five integrated steel plants of Steel Authority of India Ltd. (SAIL) was 5.22 million tonnes during the period April'88 to December'88, as against 4.63 million tonnes during the corresponding period of last year. This indicates a growth rate of about 13%. SAIL has planned to produce 7.36 MT of saleable steel during the full year as against 6.67 MT produced in 1987-88. TISCO is expected to produce about 1.92 million tonnes of saleable steel and another 3 million tonnes is expected to be produced by electric arc furnaces in the secondary sector. Thus, total steel production during the year is likely to be 12.28 million tonnes.

2. Demand and availability of Steel

As per estimates of the Joint Plant Committe, the demand projections for the year 1988-89 are 13.75 MT for finished steel and 1.67 million tonnes for pig iron. As against these estimates it is expected that the availability of finished steel through indigenous production would be around 12.65 million tonnes and of pig iron about 1.35 million tonnes. To meet the gap, it is expected that 1.2 million tonnes of finished steel and 0.2 million tonnes of pig iron would be imported during the year.



Cold Rolling Mill Bokaro

3. Performance of SAIL

During the calender year 1988 SAIL plants rolled out 7.26 million tonnes of saleable steel and produced 9.40 million tonnes of hot metal, thus registering a growth of 7% and 9% respectively over the previous year.

Cumulative production during the first 9 months of 1988-89 was 7.02 million tonnes of hot metal, and 5.22 million tonnes of saleable steel, higher by 9% and 13% respectively over the corresponding period of 1987-88

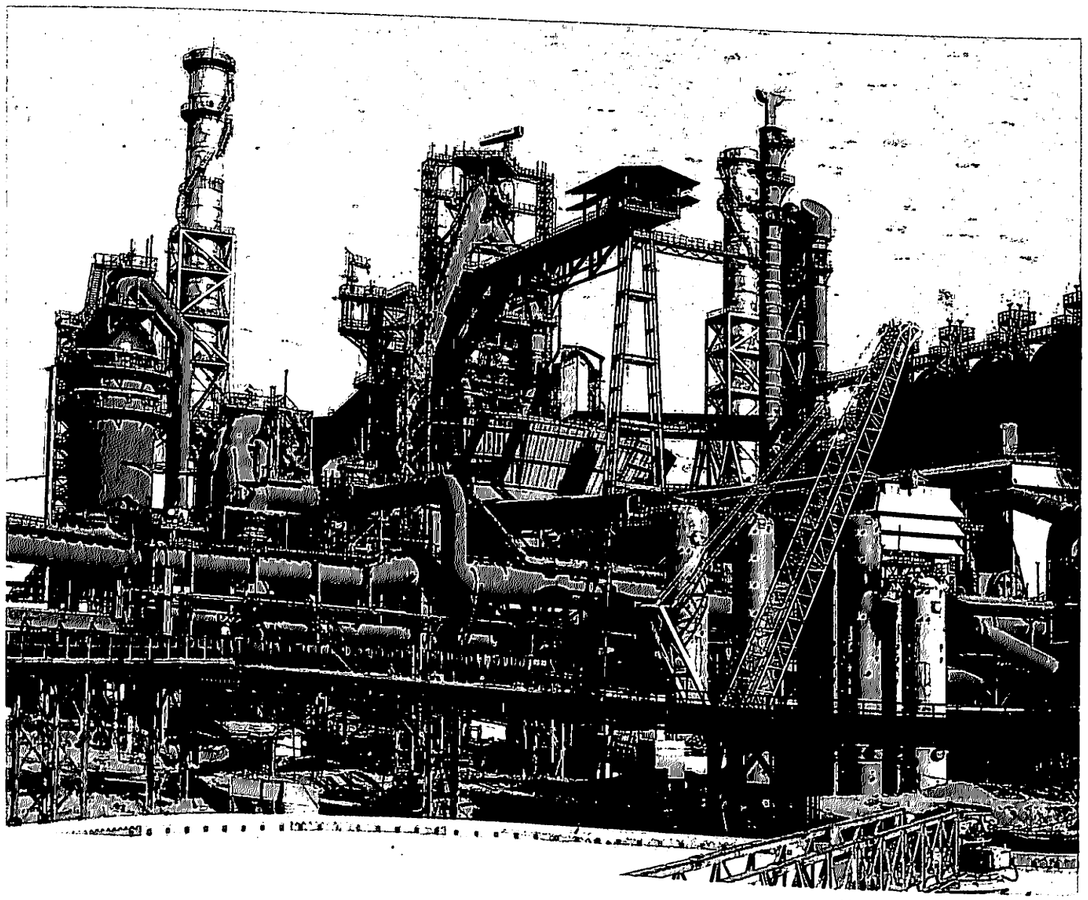
4. Major Construction Projects

(a) SAIL Projects

All major projects, except the Cold Rolling Mill and Power Plant at Bokaro, have been completed. Galvanising line and Tandem Mill at Bokaro is likely to go into production soon. Other projects are generally proceeding as per schedule.

The engineering consultancy service contract in respect of the modernisation programme for IISCO has been signed with Japanese Engineering Companies led by Nippon Steel Corporation. A loan agreement with OECF of Japan for financing the above consultancy contract has also been signed by Government.

Negotiations are in progress for a loan from KFW, West Germany for modernisation of the Rourkela Plant.



View of Blast Furnace at Vizag

(b) Visakhapatnam Steel Project

The brisk pace of construction of the project on site was sustained during the year. New performance heights were achieved in some areas. However, some suppliers/contractors failed to fulfil their commitments and there was some slippage in the work of the Yeleru canal project being undertaken by the State Government, which is to provide water for the steel plant. These have resulted in a slight delay in the commissioning of the first stage of the project. Constant monitoring and follow up is being undertaken to ensure its speedy completion.

(c) Pellet Plant of Kudremukh Iron Ore Company Limited

Construction of this plant has been completed, and commercial production commenced from April, 1987. The total cost of the project was nearly Rs. 118 crores.

In 1987-88 KIOCL produced 0.8 million tonnes of pellets. In the period April-December, 1988, 1.2 million tonnes of pellets have been produced; this figure is expected to exceed 1.5 million tonnes for the whole year, 1988-89. A production of 2 million tonnes of pellets has been planned for the next year.

5. Electric Arc Furnace Industry

At present 173 mini-steel plants, with a total installed capacity of about 5.4 million tonnes per annum, have been licensed and out of these 166 units, with a licensed capacity of 5.24 million tonnes, have already been commissioned. Letters of Intent have been issued to 60 units for expansion of their installed capacity totalling 2.8 million tonnes.

Production of Electric Arc Furnace units during the last three years and for April-September, 1988 is given below:-

(In lakh tonnes)

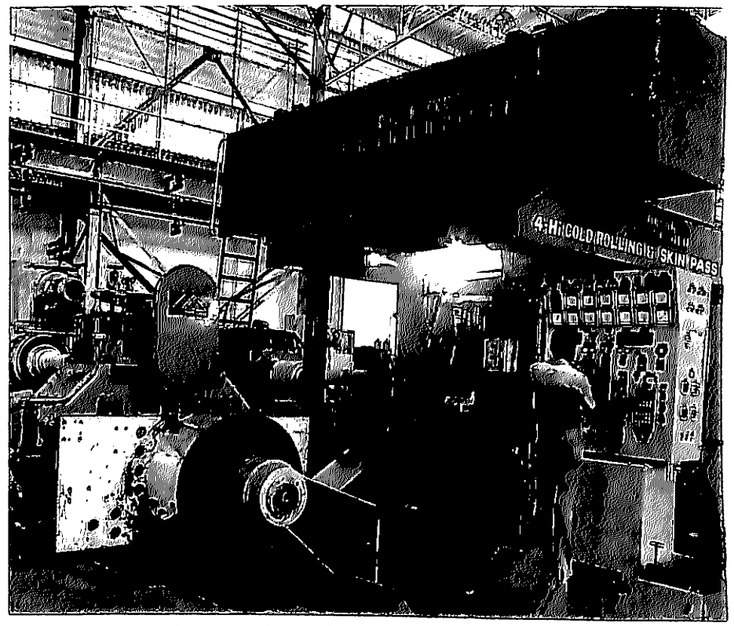
Category	1985-86	1986-87	1987-88	April-Sept.'88
Mild Steel	21.7	22.1	22.0	9.8
Medium/High Carbon Steel	3.1	3.7	3.8	2.2
Alloy Steels	3.7	4.4	4.2	2.0
Stainless Steel	0.9	1.0	1.1	0.6
Total:	29.4	31.2	31.1	14.6

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

6. Sponge Iron Sector

Total registrations has increased to over 30.0 million tonnes capacity. However, the number of operational units remained at 3 i.e. the same level as last year. These 3 units are expected to produce nearly 2 lakh tonnes of sponge iron during the year. Two coal-based sponge iron units-Bihar Sponge Iron Limited (capacity 120,000 tonnes) and M/s Sunflag Iron & Steel limited (capacity 150,000 tonnes) have been commissioned and are expected to go into commercial production shortly.

The Letter of Intent issued to M/s Essar Gujarat Limited for



4 Cold Rolling Mill Complex of Perma Steel Hyderabad designed by MECON

production of 8 lakh tonnes of hot briquetted iron per annum has been converted into an Industrial Licence. Construction of this gas-based sponge iron plant, the first of its kind in India, is in full swing and the unit is likely to go into production by early 1990. A Letter of Intent has also been issued to another gas-based sponge iron unit, M/s. Grasim Industries Ltd., for production of 6 lakh tonnes of hot briquetted iron.

7. Iron Ore for Export

India is expected to export nearly 32.6 million tonnes of iron ore valued at about Rs. 620 crores this year. Out of this nearly 45% is to be exported by two Undertakings of the Department of Steel viz. National Mineral Development Corportion and Kudremukh Iron Ore Company Limited. Exports of ore from NMDC would be worth around Rs. 200 crores and from KIOCL over Rs. 100 crores.

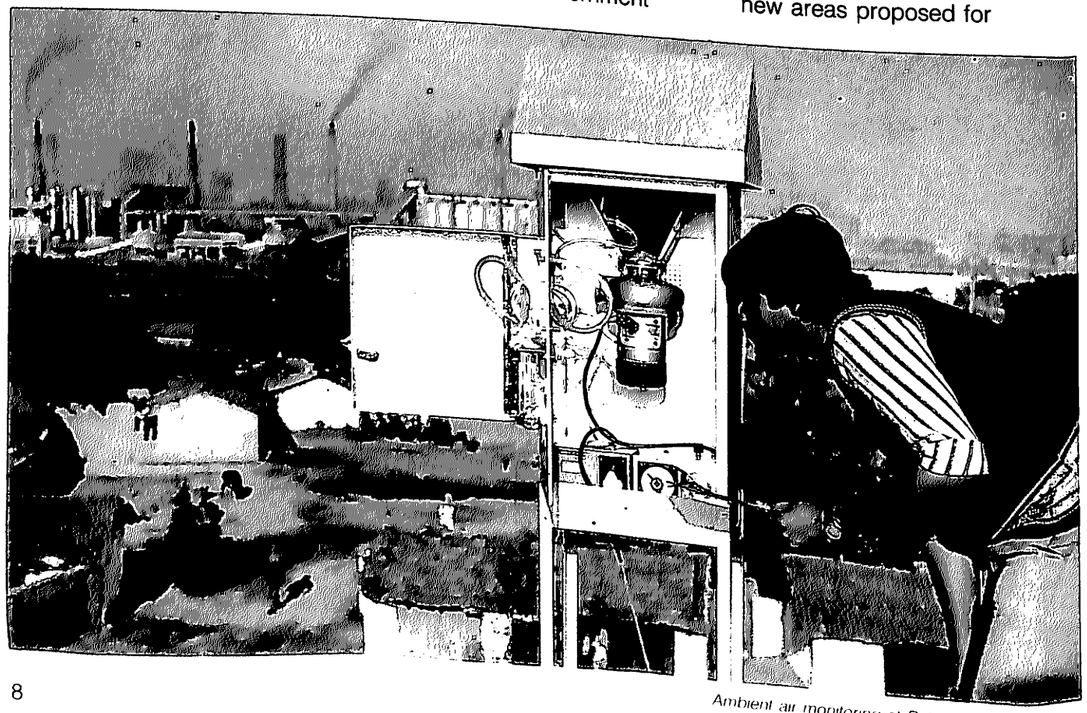
8. Steel Consumers Council

Steel Consumers Council, set up in January 1986 under the Chairmanship of Minister for Steel & Mines, to provide a forum for interaction between Government and various Steel consumers, met for the fourth time at Madras on October 10,1988. These meetings have helped in bringing closer rapport among consumers, producers and Government and have also helped in solving problems relating to the availability and distribution aspects of iron and steel.

9. Management Information System Developed in the Department

With a view to improve the efficiency of decision making in the Department, a Management Information System (MIS) has been introduced. The broad areas covered by this system are Administrative matters, Performance Monitoring of Public Sector Undertakings, Steel Supply, Projects, Finance, Budgeting and Accounts. The new areas proposed for Computerisation are as under:-

- —Secondary Producers
- —Minerals, Refractory and Alloy Steel Products
- —Personnel



Ambient air monitoring at Bokaro Steel Township

10. Environmental Protection

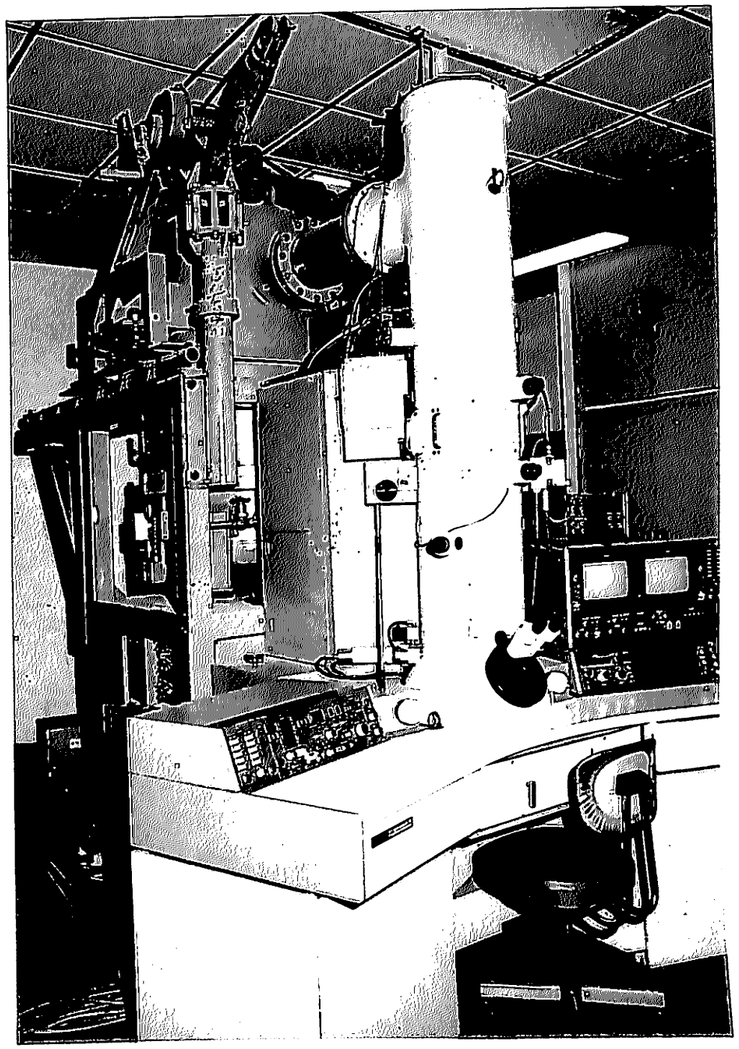
All projects undertaken by Undertakings of the Department of Steel have a full and complete environmental Management plan as integral part of the project programme. Some of the thrust areas in this direction are:

Metalurgical and Engineering Consultants (MECON) have built up a separate Department for Environment Engineering. The company has a tie up with M/s Tuv Rheinland of West Germany, who are world leaders in this field.

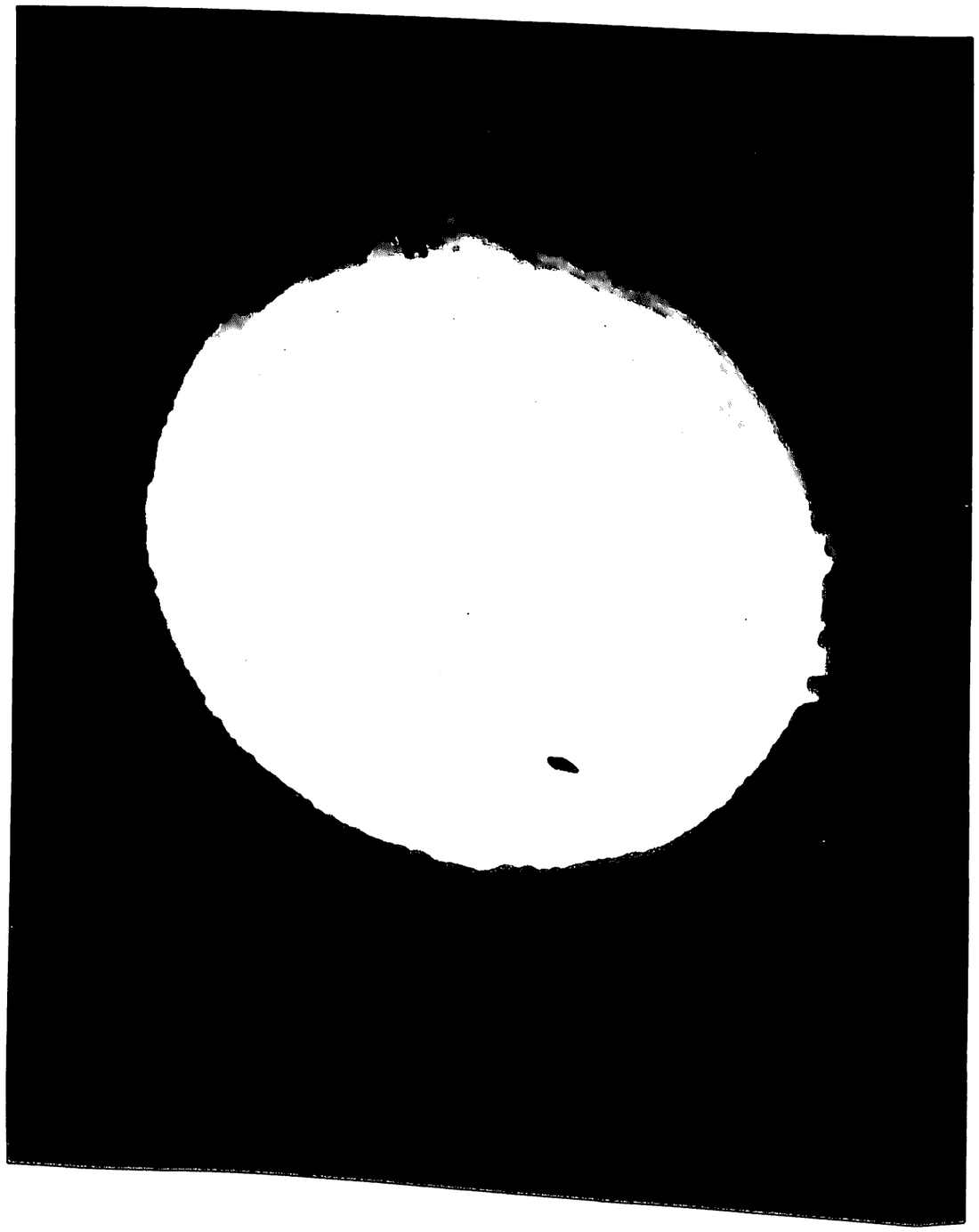
- Besides installation of anti-pollution equipment to handle the wastes sent out by steel plants, massive afforestation have been launched by all the steel plants as well as mining companies under the Department. Nearly half a million trees have been planted during the year by SAIL, VSP, NMDC and MOIL.
- Modern and well equipped Laboratories have been provided in all steel plants to constantly check and monitor the water, air etc. and all effluents being discharged by the plants so as to maintain prescribed levels of pollution control and to prevent environment degradation.

11. Prime Minister's 15-point Directive on Welfare of Minorities

All Undertakings under the Department of Steel have been advised to give special consideration to recruitment from minority communities and members of the weaker Sections of Society, whenever recruitments are made, in accordance with Government directives on the subject. Suitable action is being taken by all Undertakings accordingly.



Electron Microscope



2. A Perspective View

Steel is an essential input towards sustaining growth. It is the basic input for all kinds of economic activities. With the sustained growth of the Indian economy, there has also been a remarkable growth of the steel industry.

2. A study undertaken by the National Council of Applied Economic Research (NCAER) in conjunction with the Joint Plant Committee have made demand forecast for steel availability during the terminal years of the VII Plan, VIII Plan and by the end of the Century. The picture that emerges is as below:

Finished steel **(in million tonnes)**

(Estimated in Aug,'88)

Terminal year of	Demand	Availability	Gap/Surplus
7th Plan (1989-90)	14.2	13.9	(-) 0.3
8th Plan (1994-95)	19.4	20.2	(+) 0.8
9th Plan (1999-2000)	25.7	21.5	(-) 4.2

The demand and availability estimates are based on the following major assumptions:-

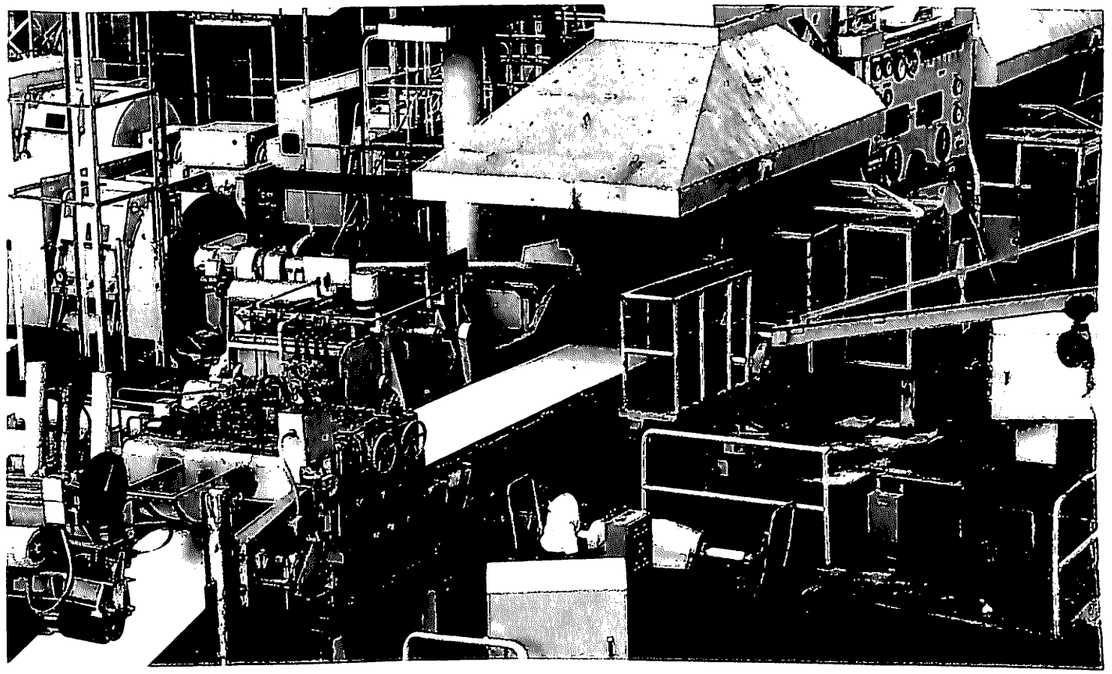
a) NCAER demand projections are based on 4.5 annual growth rate of GNP.

b) Availability of SAIL steel Plants is based on 95% capacity utilisation.

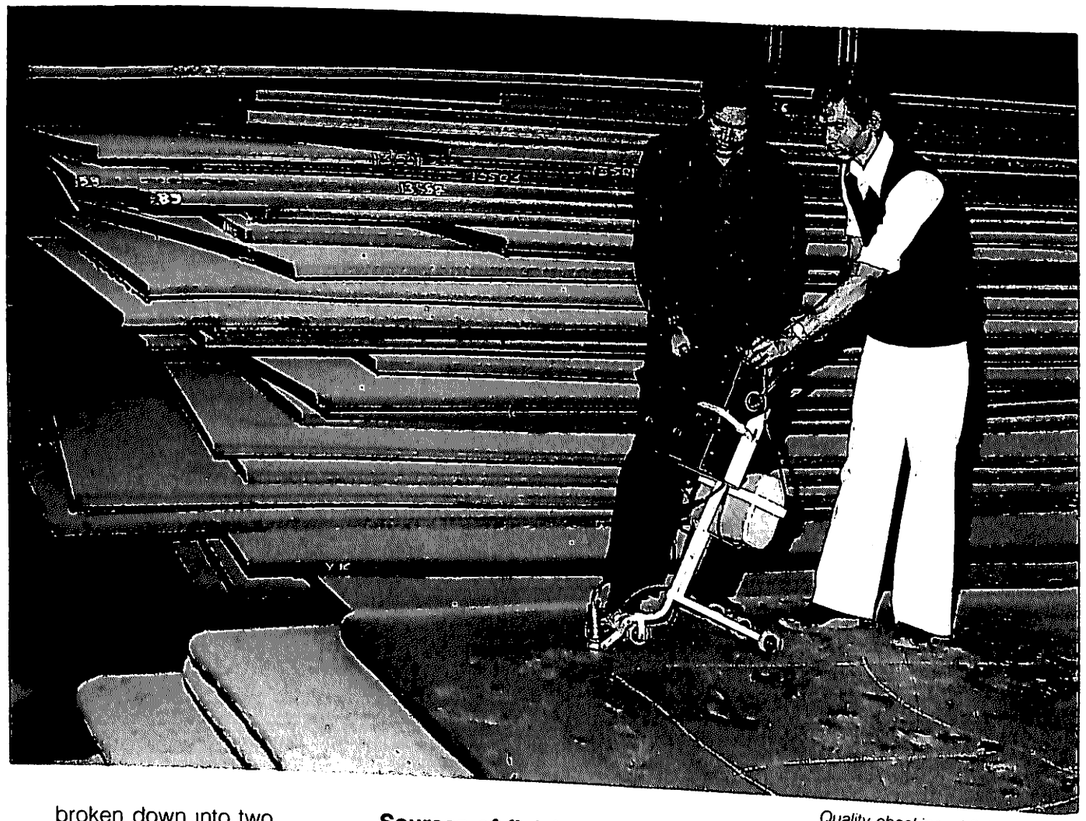
3. Availabiliy of steel from VSP and secondary sector

(1) Vizag availability is as per the latest estimates of the National Council of Applied Economic Research (NCAER)

(2) Availability from secondary producers is



Sendamer Mill Salem



Quality checking of finished plates

broken down into two components:-

a) From the existing units, and

b) From the units which are likely to come up based on an assessment made by the Department of Steel on the basis of LOIs/ILs issued and the estimated production.

1) The plantwise figures of SAIL steel plants for the year 1989-90 and 1994-95 include an extra amount of 0.1 million tonnes and 0.06 million tonnes on account of inter-plant transfer

2) Total includes 0.8, 1.3, and 1.3 million tonnes on account of feed material for CR and galvanising units for 1989-90, 94-95, 1999-2000 respectively.

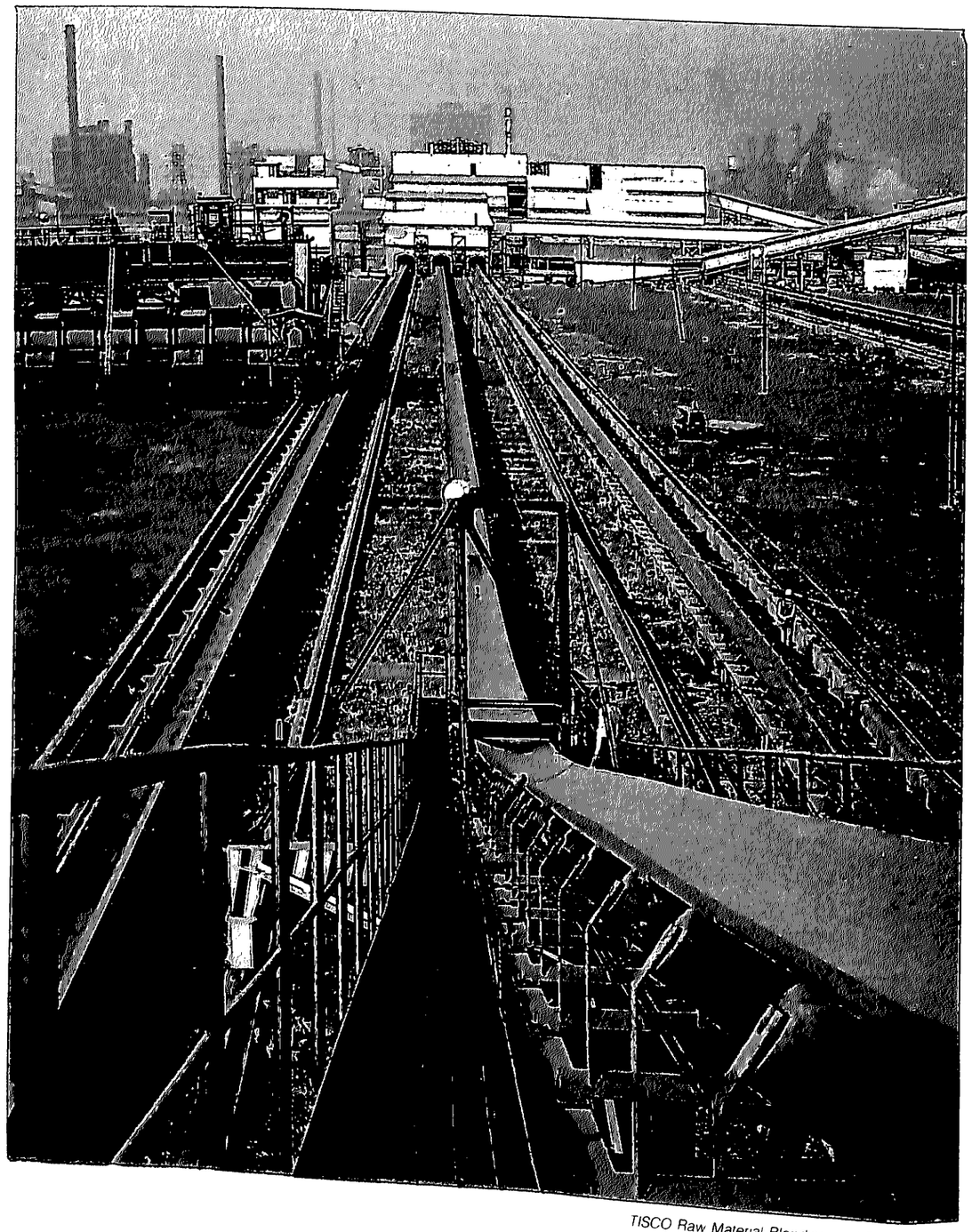
3) Figures in brackets show the net availability of finished steel.

4) The demand, in the coming years, particularly of flat products is going to be more than availability. If the requirements are not to be met by increasing imports, then new capacities will have to be created. Studies of new technologies for steel-making and rolling are of essence now so that right decisions regarding the future investiments are taken.

Sources of finished steel availability

(in million tonnes)

	1989-90	1994-95	1999-2000
I SAIL	7.5	9.2	10.4
a) BSP	2.4	2.9	2.9
b) DSP	0.7	0.7	0.7
c) RSP	1.1	1.4	1.4
d) BSL	2.8	3.7	3.7
e) IISCO	0.5	0.5	1.7
II. TISCO	1.3	2.3	2.3
iII. VSP	0.8	2.2	2.2
IV. Secondary Producers	5.2	7.9	7.9
Total	14.8 (13.9)	21.6 (20.2)	22.8 (21.5)



TISCO Raw Material Blending and Bedding yard

3. Raw Materials

1. 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 smaller 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 and operated by Central and 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.

1.1 Reserves of Iron Ore

According to the latest inventory the total estimated reserves of haematite ores in the country are 10.3 billion tonnes and that of magnetite ores 1.7 billion tonnes.

The reserves of haematite are located in Bihar, Orrisa, Madhya Pradesh, Goa, Karnataka and Maharashtra States. Grade-wise, the reserves of +65% Fe are 0.9 billion tonnes of 62-65% Fe are 4.1 billion tonnes and less than of-62% Fe are 3.7 billion tonnes. The balance reserves are of unclassified and other grades.

The reserves of magnetite are located mainly in Karnataka, Goa, Andhra Pradesh and Kerala. Almost all the Magnetite reserves are of metallurgical grade except the 4 million tonnes located in Bihar which are suitable for coal washeries.

1.2 Production and despatches

The production of iron ore during the year 1988 is estimated at 52.3 million tonnes as against the recorded production of 51 million tonnes in 1987. Goa continues to be the leading iron ore producing State and reported a production of 12.9 million tonnes in 1987, followed by Madhya Pradesh 10.6 million tonnes, Karnataka 9.7 million tonnes, Orissa 8.5 million tonnes and Bihar 8.16 million tonnes.

The despatches of iron ore in 1988 are estimated at 19.6 million tonnes for internal consumption and 29 million tonnes for exports.

1.3 Consumption at Steel Plants

During the period April to November 1988 the Steel Plants of SAIL consumed 4.9 million tonnes of iron ore lumps, 4.7 millions tonnes of iron ore fines and 5.2 million tonnes of sinter. The consumption by TISCO plant for the same period was 1.5 million tonnes lumps, 0.6 million tonnes fines and 0.7 million tonnes of sinter.

2. 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, Orissa, Madhya Pradesh, Maharashtra, Goa, Andhra Pradesh, Bihar and Gujarat.

Manganese is essential to the production of virtually all varieties of steel and it is also important to the production of cast iron. In addition to its general desulphurizing, deoxidizing and conditioning effects such as inhibiting formation of grain boundary carbides, it imparts the alloying effects of strength, toughness and hardness to steel. Manganese is used in the steel industry chiefly in the form of ferro-manganese or silico-manganese.

2.2 Production and despatches:-

Production of manganese ore during 1988 is estimated at 1.32 million tonnes as compared to the recorded production of 1.30 million tonnes in 1987.

Estimated despatches of manganese ore during 1988 are 9.33 lakh tonnes for internal consumption and 1.61 lakh tonnes for exports.

2.3 Consumption of manganese ore at steel plants:-

The consumption of manganese ore at Steel Plants during 1988-89 is estimated at 5.87 lakh tonnes, as compared to 5.15 lakh tonnes last year.

3. Chromite

The total estimated reserves of chromite in the country are 53 million tonnes, most of which are located in Orissa. The reserves of metallurgical grade are 23 million tonnes, charge-chrome grade are 16 million tonnes and only 5 lakh tonnes are of refractory grade.

Estimated production of chromite during 1988 was 7.6 lakh tonnes. Orissa continues to be the principal producer which produced 93% of total during 1987.

Chromite is used mainly in three sectors, namely (i) Steel Industry (metallurgical grade) (ii) Refractories and (iii) Chemicals. Steel Industry uses chromite in the form of ferro-chrome for the production of alloy steels. The usefulness of chromite as a refractory is on account of its high melting point (about 2110^{0}C), moderate thermal expansion, stability of crystalline form at high temperatures and a comparatively neutral chemical behaviour.

4. Ferro Alloys

Addition of ferro-alloys for the purpose of deoxidation or alloying is an integral part of steel making. Integrated steel plants basically use manganese and silicon in the form of several ferro-alloys. These alloys, ferro-manganese, ferro-silicon and ferro-chrome, are called bulk ferro-alloys. Other ferro-molybdenum, ferro-tungsten, ferro-niobium, ferro-nickel are called high value ferro alloys. These minor ferro-alloys are mostly being produced by the alumino-thermic route and other batch type processes.

Actual consumption of the various ferro-alloys at the various Steel Plants during 1987-88 and estimated consumption during 1988-89 is as follows:-

Ferro-Alloys

In Sail Plants (including IISCO)

(in tonnes)

Name of	1987-88 Total consumption	1988-89 Total consumption (Anticipated)
Ferro Manganese	99.679	101.419
Ferro Silicon	14.264	15.896
Ferro Chrome	3.288	3.944
Ferro Niobium	60	113
Ferro Phos phorus	30	75
Ferro Titanium	92	112
Ferro Nickel	1.333	2.027
Ferro Tungsten	20	29
Silico Manganese	10.439	16.010
Others	257	231

In Tisco

(in tonnes)

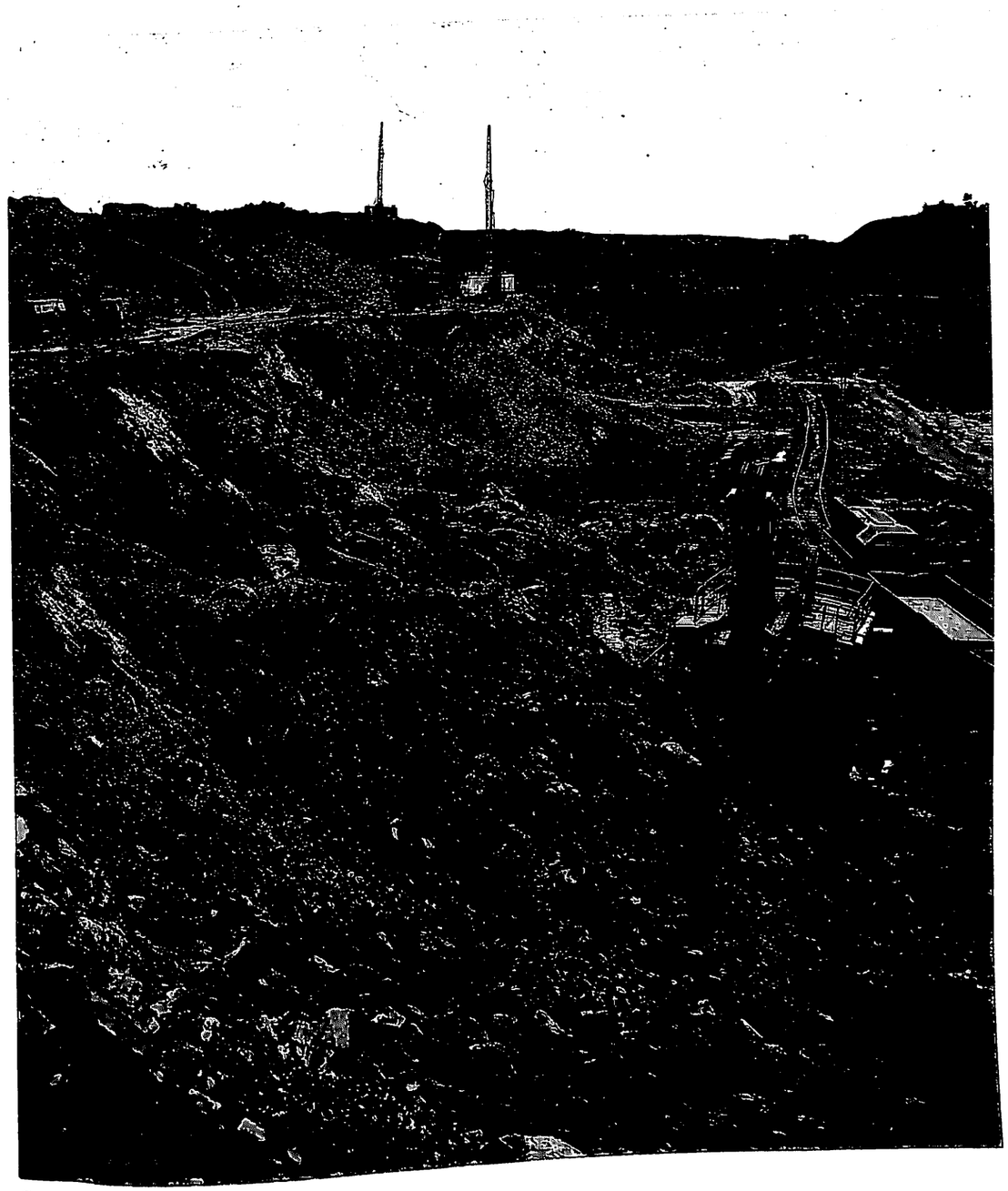
Name of the Input	1987-88 Total Consumption	1988-89 Total Consumption (Anticipated.)
Ferro Manganese	18,652	18,600
Ferro Silicon	—	5,407
Ferro Chrome	—	673
Ferro Niobium	—	46
Ferro Phosphorus	—	527
Ferro Titanium	—	273
Ferro Nickel	—	23.2
Ferro Tungsten	—	0.25
Silico Manganese	—	13,891
Others.	—	—

5. Limestone

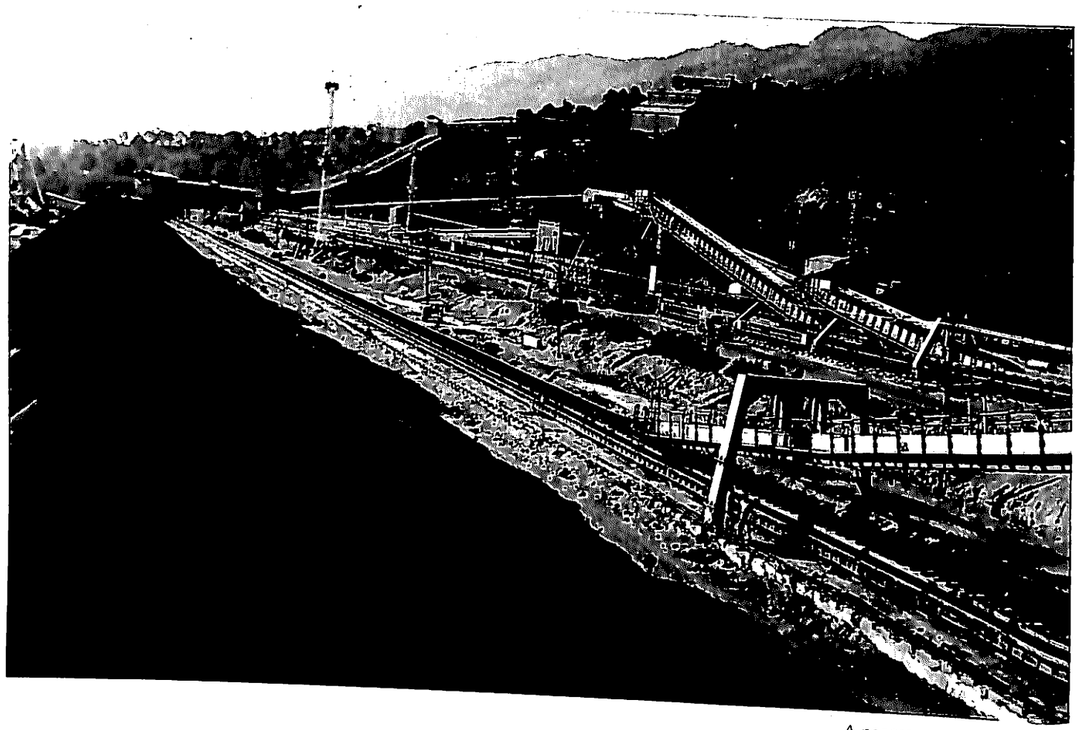
1. Limestone is used as a flux in iron as well as in steel making. India has a good reserve base for the blast furnace grade limestone but the reserves of low silica (less than 0.5% silica) limestone with desired thermal properties suitable for steel making are rather limited. Efforts are being made to assess the short term and long term availability of steel melting grade limestone in the country.

2. During 1987-88 SAIL Steel Plants procured 27.75 lakh tonnes of limestone from their own captive mines and 10.88 lakh tonees from other domestic sources. In addition, as a sweetner, SAIL imported 45,000 tonnes of SMS grade limestone.

3. The consumption of limestone by all the steel plants during 1988-89 is estimated at 52.91 lakh tonnes as



Captive Mine of SAIL



A panoramic view of Bailadila

compared to 48.72 lakh tonnes last year.

6. Dolomite

1. Dolomite finds extensive applications in metallurgical industry as a flux, as a refractory and as a source of magnesia for the production of mangesium metal. In the steel industry it is used as a flux as well as a refractory material. Total reserves of dolomite in the country are estimated at 4.6 billion tonnes.

2. During 1987-88 SAIL procured 13.97 lakh tonnes of dolomites. It is expected that SAIL Plants are likely to procure 14.39 lakh tonnes of dolomite in 1988-89. Dolomite is procured from SAIL's captive mines and other domestic sources.

3. Consumption of dolomite by the steel plants during 1988-89 is estimated at 21.74 lakh tonnes compared to 19.21 lakh tonnes last year.

7. Coking Coal

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

During 1987-88, the consumption of coking coal in SAIL steel plants (including IISCO) and TISCO was as follows:-

	(Million Tonnes) SAIL	TISCO
Captive Mines	0.9	1.94
Other Domestice sources	8.9	0.07
Imports	2.3	0.57
Total	12.1	2.58

During 1988-89, SAIL steel plants including IISCO are likely to use 1.1 mt of coking coal produced from their captive mines, 8.9 mt procured from other domestic sources and 3.4 million tonnes of imported coal. The total consumption of coking coal in SAIL steel plants would thus be around 13.3 million tonnes.

TISCO are likely to procure 1.84 million tonnes of coking coal from its captive mines, 0.06 million tonnes from other domestic sources, 0.7 million tonnes from abroad. The total consumption of coking coal in TISCO's plant is likely to be 2.60 mt during 1988-89.

8. Non-Coking Coal

During the year 1987-88, SAIL steel plants including IISCO consumed 2.9 mt of non-coking coal procured from domestic sources. During 1988-89, the non-coking coal to the tune of 3.2 mt procured from domestic sources is likely to be used in SAIL steel plants.

TISCO procured 0.73 mt of non-coking coal from captive mines and 0.3 mt from other domestic sources during 1987-88. In 1988-89 they are likely to utilise 0.7 mt of non-coking coal from their captive mines and 0.3 mt from other domestic sources. The total consumption of non-coking coal in TISCO during 1988-89 is likely to be 1 mt.

9. Refractories

The Steel industry utilizes a variety of refractories for operating its high temperature furnaces and equipments. The refractory requirements are mostly met through indigenous manufacturing units both in public and private sectors. The quantities of refractories procured during 1987-88 and likely to be consumed/procured during 1988-89 by SAIL Steel Plants and TISCO are given below:-

Steel Authority of India Limited

(in tonnes)

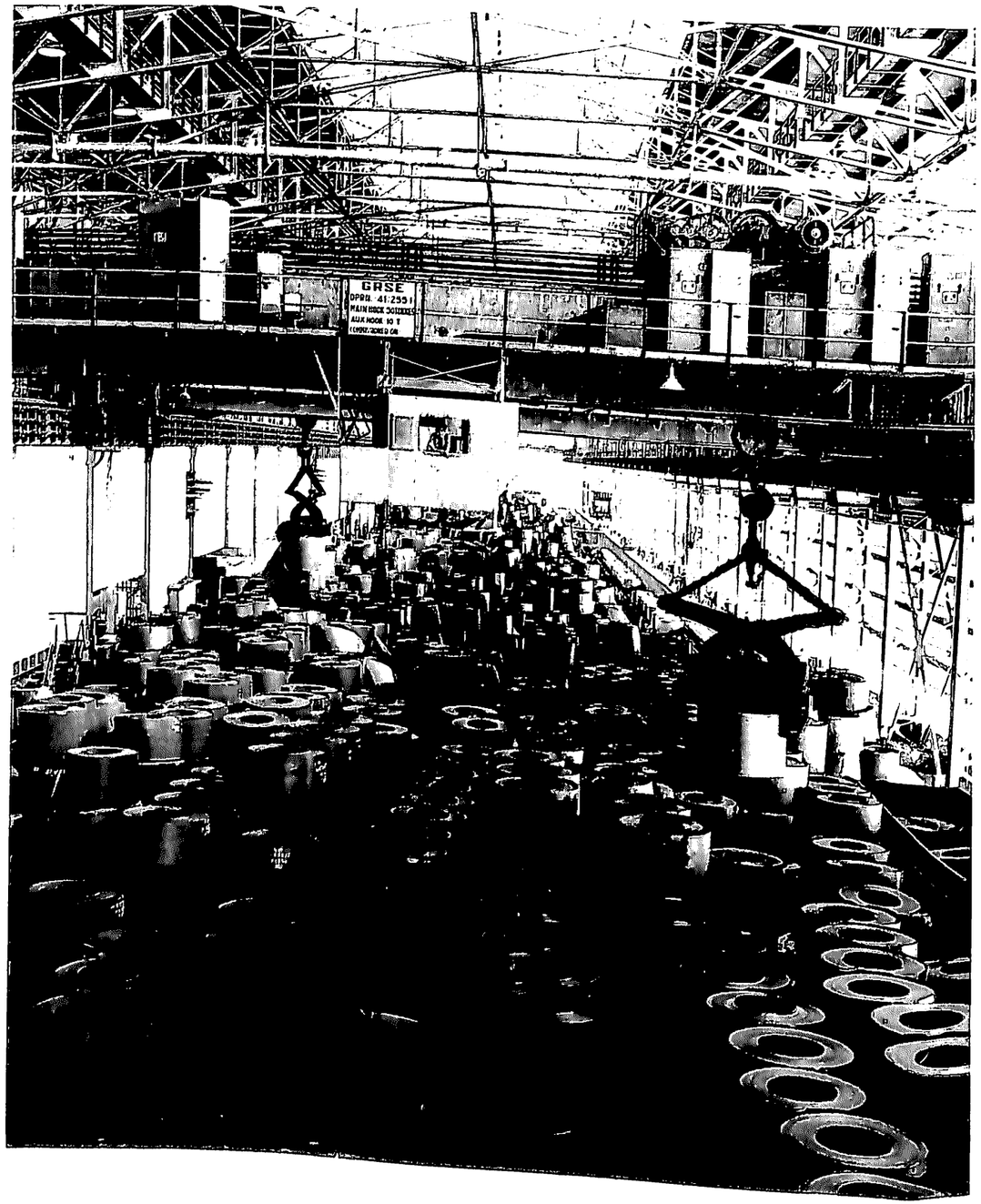
Name of the Input	1987-88 Total consumption	1988-89 Total consumption Anticipated.
Fireclay	142,645	129,527
High Grog	57,770	58,685
High Alumina	7,266	16,114
Silica (Genl.)	13,304	13,081
Silica (coke ovens)	3,721	8,348
Basic Incl.Tardolo Bricks	113,052	108,876
Mortar, Rimming Massess & Others	64,337	71,219

Tata Iron & Steel Company Limited

(in tonnes)

Fire Clay	22,020	18,910
High Grog	13,010	12,610
High Alumina	8,885	7,740
Silica General Purpose	655	430
Silica Coke Ovens	220	105
Basic	30,845	32,215
Insulating	1,175	1,170
Slide Gate	400	290
Other quality refractories	270	305
Mortars, Ramming masses, Castables Gunning materials	25,080	24,680
Fettling material and sea water magnesia.		

Limestone Mine of RSP



HR Coil Yard Bokaro

4. Distribution and Availability

Table below gives the availability of iron and steel in the domestic market during 1987-88 and the estimated availability during 1988-89.

('000 tonnes)

	Pig Iron		Finished Steel	
	1987-88	1988-89 Estimated	1987-88	1988-89 Estimated
1. Production				
a) Main Producers	1.2	1.1	6.6	7.1
b) Secondary Producers	0.1	0.1	5.1	5.6
2. Import Arrivals	0.03	0.2	1.4	1.2
3. Total (1+2)	1.33	1.4	13.1	13.9
4. Exports	—	—	0.04	0.1
5. Interplant Transfers	—	—	0.2	0.2
6. Net Availability (3-4-5)	1.33	1.4	12.8	13.6

Distribution of Iron & Steel

There is no statutory control on distribution of iron & steel.

There are shortages in certain categories of iron & steel material. Therefore, to ensure equitable distribution and fulfilment of supplies to important sectors, the Joint Plant Committee (JPC) have laid down broad guidelines. These guidelines apply only to production from main producers. i.e., SAIL and TISCO. The secondary producers do not have to follow the guidelines.

The main purpose of the guidelines is:

i) to ensure equitable distribution of items under short supply to consumers;
ii) to ensure fulfilment of requirements of the priority sector consumers;
iii) to provide efficient customer service: and
iv) to develop direct relationship between the customers and the producers.

The details of the guidelines are:

i) The consumers are classified under four Status Groups, A, B, C, & D depending upon their priority and requirements.

Status 'A' comprises of those sectors which are of vital importance i.e. Defence, Railway, Power, etc.;
Status 'B' comprises of State Governments, Public Sector Undertakings;
Status 'C' comprises of large and medium scale industries; and
Status 'D' comprises of other consumers.

Special care is taken to meet the requirements of engineering units for exports.

Demand Assessment

The demand of steel by various consuming groups is assessed on an annual basis by the Joint Plant Committee. However, this is not done on state-wise basis.

Supplies to Small Scale Industries Sector

The Development Commissioner for Iron & Steel allocates iron & steel materials to the various Small Scale Industries Corporations. The criteria for these allocations are:

(a) The requirements indicated by the Corporations themselves;
(b) Their past performance in terms of off-take from the main producers;
(c) General availability indicated by the main producers.

Demand of other Consumer Groups

Other consumers of iron & steel register their demands directly with the main producers. They are supplied material directly by the producers depending on availability.

Distribution of Pig Iron

As per the Guidelines, Pig Iron has to be supplied to the following sectors proportionately on the basis of the allocation made by Development Commissioner for iron & Steel (DCI&S):-

i) Defence;
ii) Steel Plants;
iii) EEPC;
iv) Railways.

v) SSICs; and
vi) Other priority sectors/Govt. Deptts.

The Spun Pipe Manufacturers and DGTD Units will receive the material from the stockyards of main producers on the basis of the past off-take. The current guidelines envisage supply of pig iron to SSI units through either of the following channels depending upon their options:-

i) Small Scale Industries Corporations; or
ii) Registered Associations/Co-operatives of Consumers already sponsored by the Dte. of Industries of States/Union Territories concerned.

This will be considered for direct despatches only.

In the matter of supplies of Pig Iron, no SSI Unit will be placed at an advantageous position in quantitative terms by being a member of an Association/Consumer's Co-operative.

Distribution of Materials by other Producers

The distribution of products of mini steel plants, re-rollers, secondary producers and alloy steel producers are done by the producers themselves through their sales network.

Distribution network

SAIL including IISCO have a network of 49 departmental stockyards, 14 consignment agency yards and 117 other conversion agencies/twisting yards throughout the country. TISCO has 11 stockyards, 23 consignment agents and 114 conversion agents/twisting agents. During the year under review SAIL have closed down 3 stockyards in Maharashtra and 2 stockyards in Tamilnadu since it has opened bigger stockyards at Kalamboli in Maharashtra and Manali (Madras) in Tamilnadu. The number of SAIL's (including IISCO) conversion agents has increased from 100 to 104 and that of twisting agents from 8 to 13. Similarly TISCO has opened 4 more consignment agencies during the year; one each at Madras, Vizag, Nagpur and Rajkot. Madras consignment agency is proposed to be closed down from 1st April 1989 as TISCO will be operating its new stockyard at Tiruninravur by shifting it from Madras harbour. The number of its conversion agents and twisting agents has also gone up by 28 and 4 respectively.

Considering the special problems in meeting the requirements of consumers in the North-Eastern Region, mainly arising out of transport bottlenecks and logistics special efforts are being 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 by road/river by the JPC.

With a view to improving customers services, SAIL is considering a proposal to setup Steel Service Centres. Initially they are planning to set up one such centre in the Bombay-Thane region and the other in Delhi/Faridabad/Ghaziabad region. SAIL is also planning to set up extension counters at a few places in the country with a view to extending its distribution network.

Pricing of Steel

There is no statutory control on the prices of iron and steel. These are determined and announced from time to time by the Joint Plant Committee, a body set up under the Iron & 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 Limited, Indian Iron and Steel Company Limited and the Ministry of Railways are represented on it as members. The prices announced by this Committee are applicable only to 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. During the year 1988-89 there has been one general revision in the prices of iron and steel in Jan'89 when the prices of pig iron were raised by about 5.8% and that of steel by 8.6%. On 1st April, 1988 however, an increase was made by Rs. 40 per tonne on steel items and by Rs. 25 per tonne on pig iron due to the increase in railway freight rates. The other increases have been a levy of Rs. 270 per tonne on HR Coils/Skelp and HR Sheets w.e.f. 12/13.10.88 to enable SAIL to meet the full requirements of these categories in the country by supplementing availability from imports and a levy of Rs. 200 per tonne on pig iron w.e.f. 22.12.88 so that SAIL is enabled to make supplies of imported pig iron at the domestic JPC prices. Iron and Steel prices had to be revised again w.e.f. 1st March, 1989 owing to increase in excise duty.

Iron and steel materials are supplied by main producers at a uniform price through out the country, be they directly from the steel plants or through the stockyards. For this purpose, a freight equalisation fund is operated and maintained by the Joint Plant Commitee. Presently the freight equalisation element for steel is Rs.735 per tonne and for pig iron it is Rs.495 per tonne. The question of phasing out the freight equalisation scheme in respect of iron and steel is yet to be considered by the National Development Council. In the meanwhile to facilitate the operation of the scheme in a much more efficient manner it has been extended to cover road movement to overcome the problem of inadequate availability of wagons on piece meal basis to the steel plants for their movement planning.

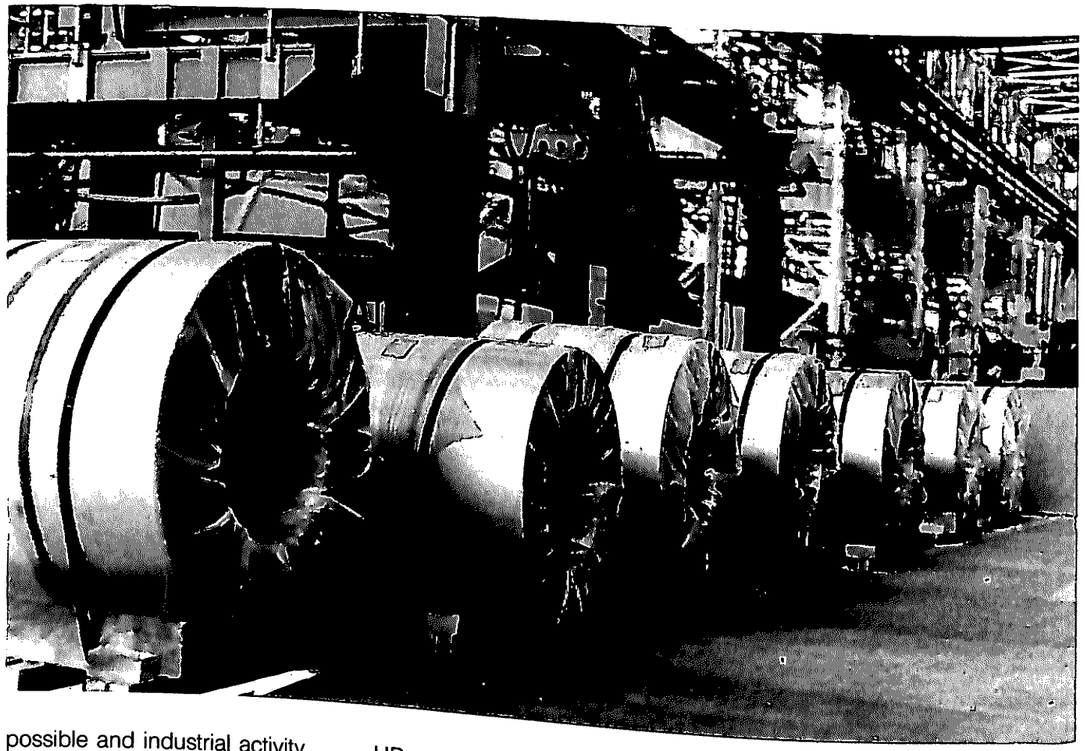
Open market prices vis-a-vis stockyard prices of certain important categories of steel are also monitored in the Department through periodical reports obtained from various Regional Development Commissioners for Iron & Steel. Corrective action is taken wherever necessary.

Import-Export

The general policy procedure for import of iron & steel, ferro alloys and ferrous scrap is decided by the Ministry of Commerce like other non-ferrous items. A new 'three-year' import policy was announced in April, 1988 and the same will be in operation from April, 1988 to March, 1991.

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

3. A close watch is maintained on import and domestic availability to ensure that the industrial requirements are met to the maximum extent



Coils ready for despatch

possible and industrial activity does not get adversely affected due to non-availability of iron and steel. With this object in mind the SAIL has been allowed by the Government to launch a scheme named Full Requirement Scheme for meeting the demand of the user industries of HR coils and pig iron. According to the new scheme SAIL will import HR coils IS-10748 Grade-I or equivalent for supply to the consumers at reasonable price. MMTC will import pig iron of the required specification and make it available to the SAIL at high seas. SAIL has been vested with the responsibility of meeting the full requirement of HR coils of the specific grade and pig iron of the user industries. For this purpose the Deptt. of Revenue has issued ad-hoc duty exemption order for importing of 2 lakh tonnes of pig iron and 1 lakh tonnes of HR coils. The scheme is still in the process of being implemented.

4. A consistent effort is also being made to meet the requirements of engineering exporters from domestic production to the maximum extent possible. Here again due to inadequate domestic availabilities 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. Due to domestic demand, the exports have been confined to mainly the available surplus plates from Bhilai Steel Plant. However, the requirements of the neighbouring countries like Nepal and Bhutan are met to the maximum extent possible. Data on imports and exports of iron and steel form a part of the compilation and publication of Foreign Trade Statistics by the Directorate General of Commercial Intelligence and Statistics, Calcutta (DGC I&S) (Data for the years after 1984-85 have not been published yet.)

Functions of Development Commissioner for Iron & Steel

The iron and steel control organisation was initially set up to perform the regulation functions envisaged in the Iron & Steel (Control Order, 1956,.) Over the years the responsibility of this Organisation kept on changing. With the comparatively easier availability of iron and steel, its statutory functions have considerably reduced; the developmental functions have now come to the fore. 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) keeping statistical data, b) import management, c) allocation to sensitive areas, d) acting as sponsoring authority for secondary sector, and e) agency for consumers-producers interaction. The organisation also plays an advisory role practically in all matters to the Government relating to the iron and steel industry.

However, this Organisation still has to perform some regulatory functions relating to misuse of iron and steel. In performing these regulatory and control functions the Development Commissioner for Iron and Steel and six regional Development Commissioners continue to carry out inspections to check misutilisation of iron and steel. A statement showing the number of inspections carried out and punitive action taken by this Organisation during 1987-88 and 1988-89 (April-December 1988) is given below:-

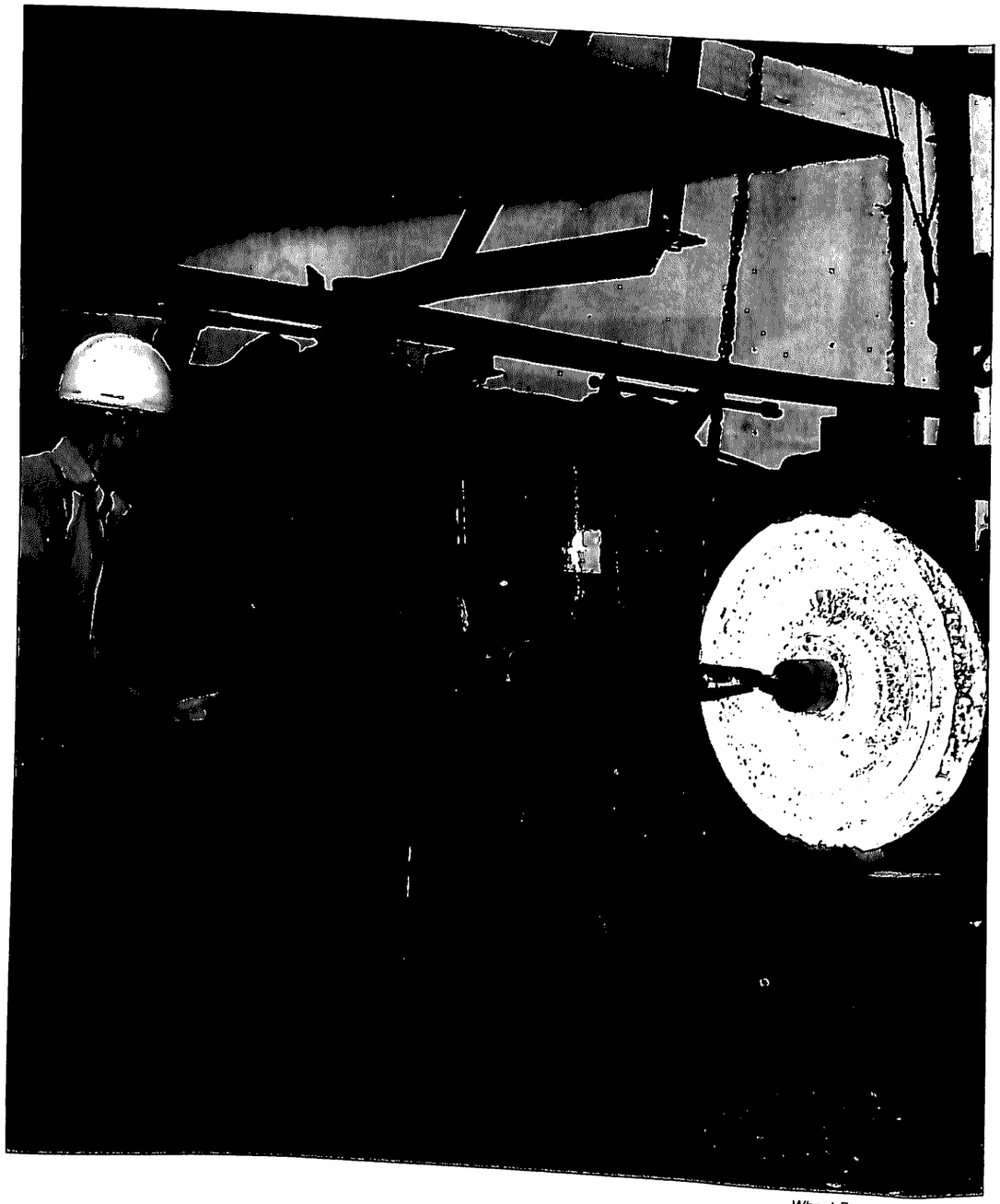
Statement showing the number of cases of inspection of units/suspensions of supplies/debarment during 1987-88 and 1988-89 (April-December '88)

Region	Inspection		Suspension		Debarment	
	1987-88	1988-89 (Apr.-Dec. '88)	1987-88	1988-89 (Apr.-Dec. 88)	1987-88	1988-89 (Apr.-Dec. 88)
Calcutta	395	293	19	6	4	12
Hyderabad	517	219	17	16	7	23
Bombay	401	333	103	21	34	7
Kanpur	386	172	35	27	27	19
Madras	296	80	28	4	27	4
New Delhi	326	73	83	16	83	18
Total	2321	1170	285	90	182	83

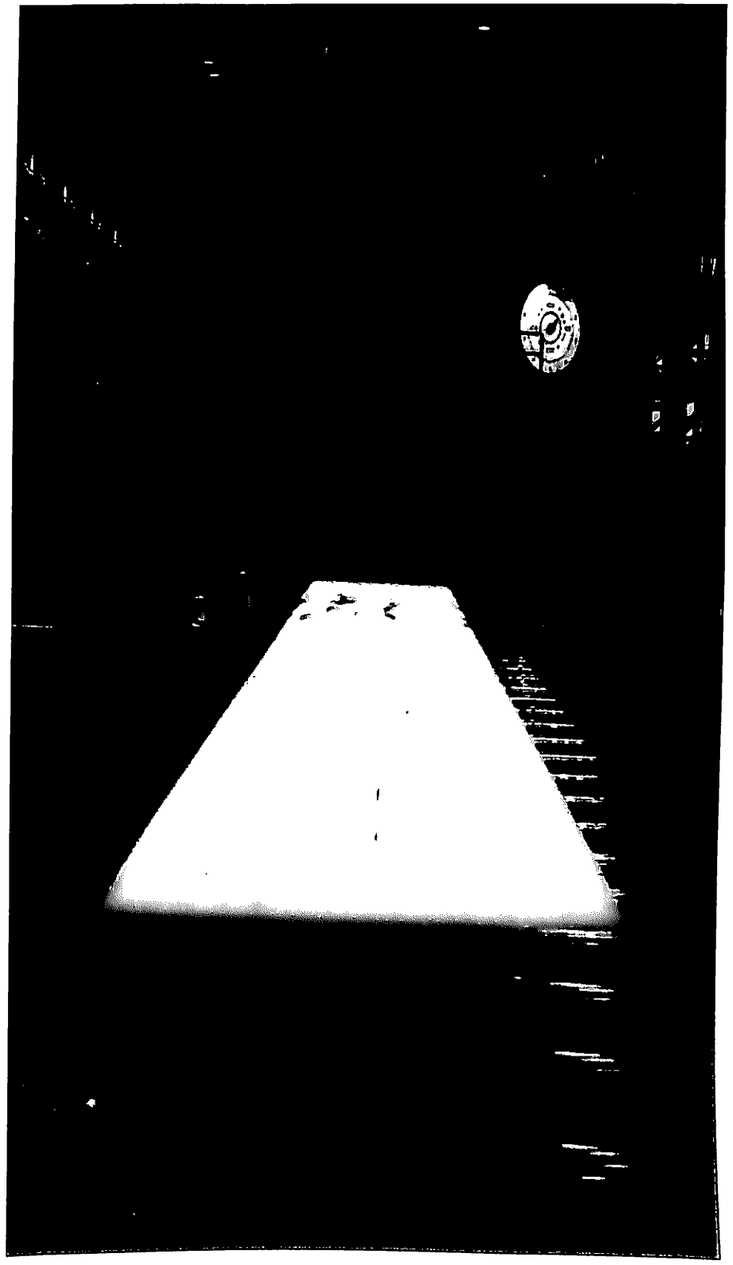
5. Public Sector

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 .

A provision of Rs. 6420.13 crores has been made in the Seventh Five Year Plan for iron and steel sector. Detailed Outlay for various units is shown at page 82.



Wheel Forging at Durgapur



Steel Authority of India Limited

1. General

Steel Authority of India Limited (SAIL) is a company registered under Indian Companies Act, 1956 and is a wholly owned enterprise of the Government of India. It operates and manages five integrated steel plants at Bhilai (Madhya Pradesh), Bokaro (Bihar), Durgapur (West Bengal), Rourkela (Orissa) and Burnpur (West Bengal), a plant of the Indian Iron & Steel Company Limited, a wholly owned subsidiary of SAIL and two special and alloy steels plants at Durgapur (West Bengal) and Salem (Tamil Nadu). In addition SAIL has Research & Development Centre for Iron & Steel, Centre for Engineering & Technology and Centre for Raw Materials & Mines at Ranchi. Maharashtra Elektrosmelt Limited, a ferro-maganese and special steels producing plant at Chandrapur (Maharashtra) and IISCO-Ujjain Pipe & Foundry Company Limited, a subsidiary of IISCO, producing cast iron spun pipes at its works at Ujjain (Madhya Pradesh) are also subsidiaries of SAIL. Marketing of products from SAIL plants is done through the Central Marketing Organisation at Calcutta which has a country-wide distribution net work.

SAIL (Excl. Subsidiaries)

2. Finance

2.1 The authorised capital of SAIL is Rs. 5,000 crores. The paid up share capital of SAIL increased from Rs. 3923.96 (excluding share money pending allotment of Rs. 13.60 crores) to Rs. 3963.48 crores (excluding share money pending allotment of Rs. 9.00 crores) as on 31st March, 1988. Increase in the equity is on account of funds provided by the Government in cash amounting to Rs. 34.92 crores for meeting capital expenditure of IISCO

2.2 During 1987-88, SAIL were sanctioned Rs. 203.85 crores from Steel Development Fund. Government provided loan of Rs., 12.13 crores to SAIL for meeting capital expenditure of IISCO (Rs. 11.55 crores) and IISCO-Ujjain pipe and Foundry Company Limited (Rs. 0.58 crores). Growth of deposits form the public under the Public Deposit Schemes at Rs. 423.43 crores at the end of the year (net of repayment) was 69 per cent over last year. The Company discharged its liability towards repayment of Government loan for Rs. 144.14 crores (inclusive of interest of Rs. 68.61 crores) and SDF loans to the tune of Rs. 50.68 crores (inclusive of interest of Rs. 10.66 crores). After adjustment of payments, total borrowings as on 31st March, 1988, from Government and Steel Development Fund amounted to Rs. 693.81 crores and Rs. 1869.83 crores respectively.

2.3 Turnover and Profits

Turnover during 1987-88 was Rs. 5036.23 crores against Rs. 4282.26 crores in 1986-87, SAIL closed the financial year 1987-88 with a net profit of Rs. 63.27 crores as against a profit of Rs. 52.81 crores in the previous year. Profit before interest and depreciation was Rs. 645.27 crores.

2.4 Capital Expenditure

During the year, SAIL spent Rs. 491.95 crores (on cash basis), inclusive of interest on various capital schemes viz. continuing schemes (Rs. 288.73 crores), new schemes (Rs. 24.02 crores), Additions/Modifications/ Replacements (Rs. 158.75 crores), townships, research and development and feasibility studies (Rs. 20.45 crores). Drawals from the Steel Development Fund coupled with internal generation and other borrowings were utilised for financing the capital expenditure.

3. Production Performance

3.1.1 Production of saleable steel in 1987-88 at 6.13 million tonnes at the four integrated steel plants of SAIL was an all time high figure crossing the earlier best of 5.79 million tonnes achieved in 1986-87. Production of crude steel and not metal at 6.94 million tonnes and 8.03 million tonnes respectively also recorded growth. Production of finished steel as a percentage of total saleable steel production increased from 78 per cent in 1986-87 to 82 per cent in 1987-88. Production of Rounds and Bars, Railway Materials, HR Coils/Skelp and GP/GC sheets went up substantially. Greater emphasis continued to be laid on production of special/critical items for better market satisfication.

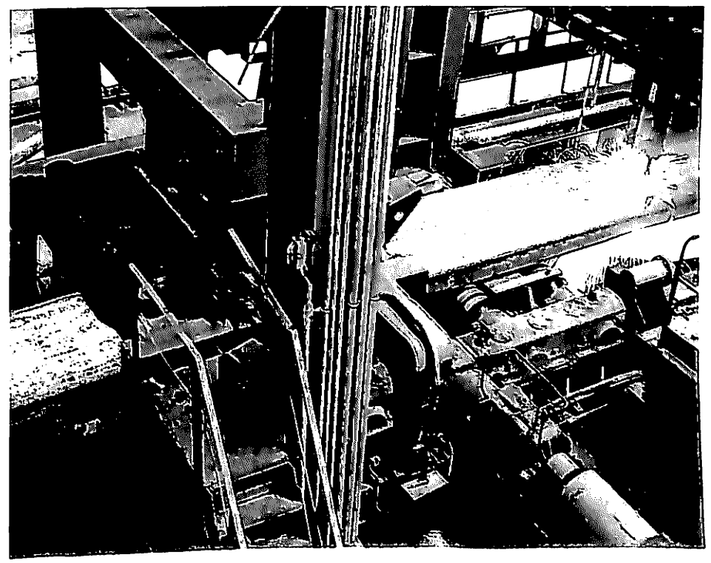
3.1.2 The two special steels plants at Durgapur and Salem also established annual records in their respective production ranges. Salem Steel Plant operated above rated capacity for the second year in succession.

3.2 Energy Conservation

During 1987-88 there was overall reduction in specific energy consumption by 5 per cent from 1986-87 level. Implementation of programmes, such as optimal thermal and oxygen lancing regimes at Bhilai and Durgapur and modified checker system at IISCO contributed significantly towards savings in energy.

3.3 Equipment Performance

Efforts continued to improve health of equipment by undertaking capital repairs of assets in a planned manner. Equipment availability suffered due to unexpected breakdown on many occasions. Steps were taken to introduce "Computerised Maintenance Management Systems" in steel plants in a phased manner with the assistance of UNIDO. During the year a "Strategy Group on Maintenance of Plant & Equipment" was also constituted.



Concast at Bhilai

3.4 Import Substitution

Import substitution efforts resulted in indigenisation of about 900 items valued at Rs. 974 lakhs approximately during the year. Sustained efforts on inter-plant steel standardisation (IPSS) resulted in formulation of 46 additional standards during the year increasing the number of total IPSS standards published so far to 307.

3.5 Ancillary Industry

There are about 1945 small scale and ancillary units supplying spare and store items to the steel plants on a regular basis. Purchases from these units was about Rs. 98 crores against Rs. 51 crores during the previous year.

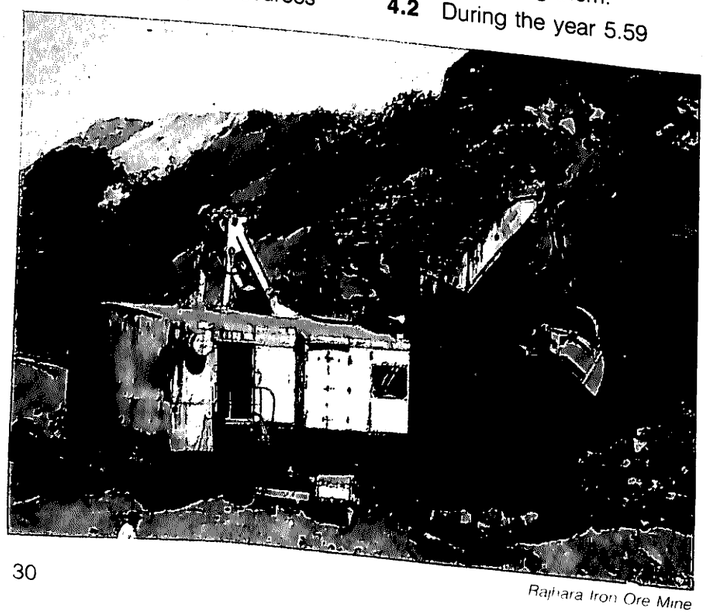
3.6 Captive Mines

Despatches of major raw material from captive sources during 1987-88 increased by 8.3 per cent over last year. Quantities of purchased raw materials were brought down by about 10 per cent. Production of iron ore showed growth of 12.6 per cent over last year.

4. Marketing Performance

4.1 During 1987-88, domestic demand for finished steel was higher by about 7 per cent compared to the previous year. Demand for Company's products other than heavy plates and certain sections of structurals, was good. Product-mix matched the market demand to a greater extent. Better contacts were established with customers to assess their needs and find ways of meeting them.

4.2 During the year 5.59 million tonnes of steel were sold which was over 8 per cent compared to the sales during the previous year. Owing to greater emphasis on production of finished steel, sales of pig iron during the year at 0.98 million tonnes was less compared to 1.12 million tonnes during the previous year. Supplies of saleable steel to priority sectors such as Railways, Defence, SSICs and Heavy Industries were higher by 18 per cent compared to the previous year.



Rajhara Iron Ore Mine

4.3 Sale of tool, alloy and stainless steels from Alloy Steels Plant during the year at 92,600 tonnes was the highest ever registering an increase by 28 per cent over the previous year. Domestic sale of stainless steel from salem Steel Plant at 30,200 tonnes was also an annual record and reflected an increase of 20 percent over previous year's sale.

4.4 Despite the sluggish market, sale of fertilizers during the year 2,27,000 tonnes was 27 per cent higher than in the previous year. Sales of benzol and tar products aggregated to 18 thousand KL. and 60 thousand tonnes respectively.

4.5 SAIL exported 42 thousand tonnes of plates valued at Rs. 18 crores. Further, there were deemed exports of 39,500 tonnes of plates valued approximately at Rs. 16 crores and 8,500 tonnes of large diameter pipes valued approximately at Rs. 7.6 crores. SAIL also exported 4,500 tonnes of stainless steel sheets valued at about Rs. 11 crores.

5. Capital Schemes

5.1 New assets worth Rs. 911.85 crores including Rs. 35.20 crores on social facilities were added during 1987-88 against Rs. 434.31 crores in the previous year.

5.2 Bhilai Steel Plant

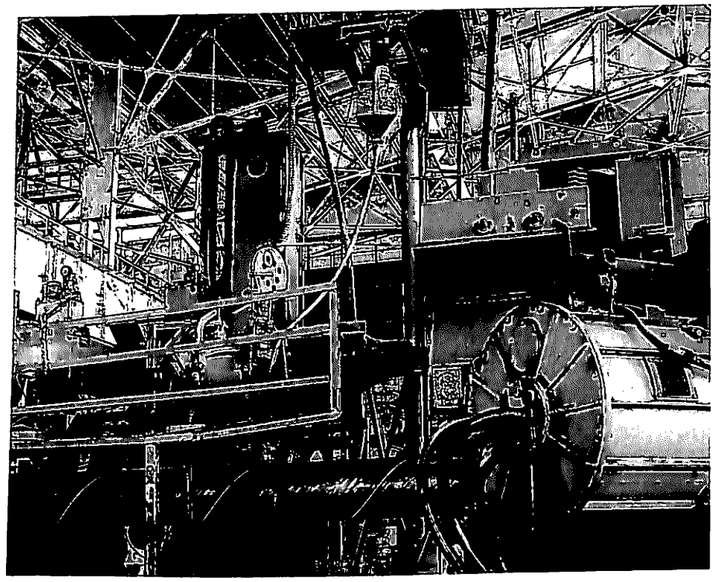
Blast furnace No.7, the first blast furnace in India with bell-less top charging system and computerised control was commissioned in August 1987. With commissioning of coke oven battery No. 9 in March, 1988, the tallest battery in the country having 7 metre high ovens, all the production units originally envisaged and meant for 4 million tonne production capcity of ingot steel were completed.

Durgapur Steel plant

5.3 The modernisation proposal for Durgapur which received Govt.'s approval in September 1987 would be carried out through 16 turn-key packages with in five years with MECON as the prime-consultant. Work for 7 of the indigenous packages and 5 global packages have already been assigned to the successful bidders. Preliminary and enabling works are in advanced stages of completion. Govt. approved the definitive cost estimates for the project of Rs. 2667.6 crores.

5.4 Rourkela Steel Plant

Govt. has approved the modernisation plan of the Rourkela steel plant, in principle and accorded sanction for the first phase of the project, which is expected to cost Rs. 415 crores.



Spiral Weld Pipe Plant, Rourkela

CRGO Stream of the Silicon Steel Project was commissioned in June 1988 and in now undergoing stabilisation. Adoption of KORF technology in open ;hearth furnace and rebuilding of coke oven battery No. 4 were the other two major schemes completed during the year.

5.5 Bokaro Steel Plant

The 4 million tonne expansion of the plant reached an advanced stage of completion. Different sub-units of the last production unit i.e. Cold Rolling Mill Complex-II are in the process of getting commissioned. Continuous 5 stand Tandem Mill and a Hot Dip Galvanising Line are likely to be Commissioned soon.

5.6 Alloy Steels Plant

Stage-II expansion of ASP effecting increase in capacity tc 260,000 tonnes of liquid steel has been completed in March 1988, at a cost of Rs. 113.25 crores. The major facilities installed under this scheme are a 60 tonne VOD unit, a 60 tonne VAD unit and a continuous slab/bloom casting machine.

5.7 Salem Steel Plant

Schemes for expansion of the production capcity of the plant from 32,000 tonnes to 65,000 tonnes per annum of Cold Rolled Stainless Steel Sheets/Coils through installation of second Sendzimir Mill received Government sanction in March, 1988. The scheme has been planned for completion in 42 months.

5.8 Captive Power Plants

The year 1987-88 witnessed near completion of the Captive Power Plants at Durgapur and Rourkela Steel Plants with the second units in both the places having synchronised in March, 1988. In Bokaro Steel Plant, Unit No. 1, which became non-operational due to fire in July 1986, was re-commissioned in December, 1987. Unit No. II has been commissioned in October, 1988 while Unit No. III is planned for commissioning soon. Captive Power generation increased from 163 MW in April, 1987 to 287 MW by March, 1988.

Actions have been initiated for setting up a Central Power Training Institute for training of O&M personnel. This would include the installation of full scope replica simulator of a 60 MW unit.

6. Corporate Planning

6.1 The Company has already brought out the Corporate Plan indicating various objectives, challenges and strategies upto the year 2000 AD. This has been supplemented with a detailed Technology Plant.

6.2 A Memorandum of Understanding incorporating the areas of accountability and confering on SAIL higher levels of freedom and flexibility was signed with the Government and implemented for the year 1987-88. This was supported by Annual Performance Plans for each producing unit. The same exercise has been carried out in a more systematic manner for the year 1988-89 as well.

6.3 An agreement has been signed with the World Bank for providing Technical Assistance Loan of US $ 50 million for financing five consultancy studies and purchase of related equipment. The studies to be financed relate to Productivity Improvement & Planning, Environmental Management and Pollution Control in the steel plants, HRD and Training, Marketing Operations and Technological Upgradation of ASP.

6.4 An economic cell was set up to analyse the macro-economic environment and also to conduct research in diverse economic fields related to steel industry.

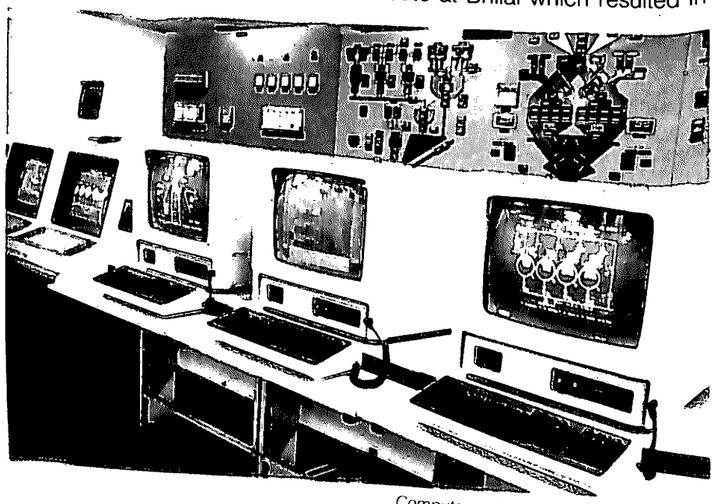
6.5 Major thrust was given to Communication, Computerisation and Controls (CC&C) with a view to bring about quality improvements, cost reduction and higher efficiency in operations.

7. Research & Development Activities.

7.1 59 R&D schemes were implemented in steel plants during 1987-88 giving significant financial benefits. Some of the important activities were: i) Development of technology for cold bonded pellets; ii) Lime dust injection technology; and iii) New runner mass for blast furnaces.

7.2 Development of combined blowing technology and its introduction in a convertor at Bokaro have resulted reduction in consumption of ferro alloys, lime and also improvement in yield and lining life. Significant improvements in the life of ingot mould has been achieved at Rourkela and Bhilai by design and material modifications.

7.3 Production of LPG cylinder grade steel and high strength rail steel have been taken up through LD-concast route at Bhilai which resulted in



Computerised operation of Blast Furnace

improved quality, higher yield, and energy savings. A number of other high value steels were also developed and made available to the market.

7.4 Collaborative research formed important part in the overall activity of RDCIS. Indo-Soviet collaboration, collaborations with National Science Foundation of USA and NKK of Japan, and inter-actions with National Academic Institutions in various areas of iron and steel technology were pursued.

7.5 Centre for Engineering & Technology (CET) played a major role in successfully implementing the KORF technology in two open-hearth furnaces of Rourkela. Its implementation at Burnpur is in progress.

Other major assignments completed by CET include study on requirement of water by 2000 AD for all the SAIL steel plants, adoption of bell-less charging system in blast furnaces, conversion of slab caster to slab-cum-bloom caster at Bhilai, Mechanisation of raw material handling at MEL and Conversion of gas fired furnace to other kinds of fuels at Bhadravati.

7.6 An agreement has been signed with M/S Fosbel of UK for know-how transfer of Ceramic welding Technology for coke oven repairs for improving its life. Studies for adoption of cast-house slag granulation system were carried out and negotiations are in progress for collaboration agreement with M/S Paul Wurth of INBA technology. A detailed study had been carried out for augmentation and modernisation of the rail finishing facilities at Bhilai.

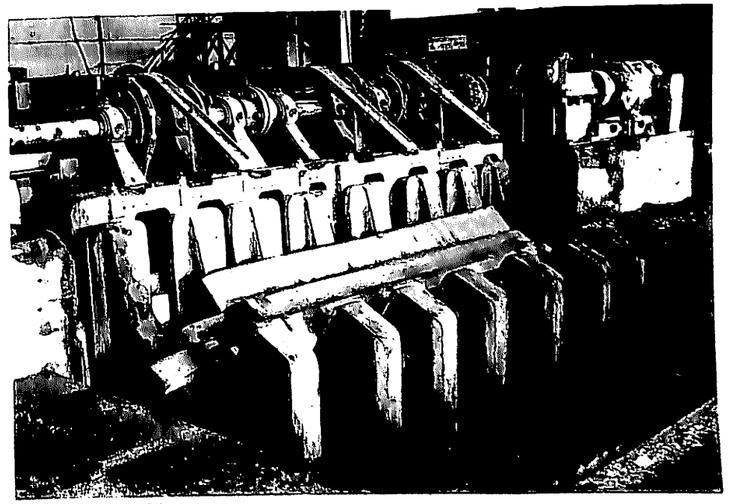
8. Centre for Raw Materials & Mines

8.1 Centre for Raw Materials & Mines (CRMM) updated its Five-Year Plan of major raw materials (other than coal) to bring it in line with the SAIL Corporate Plan upto 2000 AD.

8.2 Exploration in Jaisalmer area confirmed deposit of sizeable LD Grade Limestone. Trials on the same are in progress at the plants. CRMM is now engaged in scouting for refractory grade dolomite in Madhya Pradesh. A report suggesting standardisation of norms of major mining and ore dressing equipment in respect of availability, productivity, safety and strength has been prepared by CRMM.

9. Human Resources Management

9.1 Concerted efforts were made during the year to develop human resources with special emphasis on optimising manpower utilisation, providing specialised training and gearing up the organisation to take up large scale modernisation. The organisation was restructured reducing reporting levels from 9 to 5 thereby helping in speedier communication and decision making. To communicate the message of MOU to the employees a number of workshops were arranged which helped improving general awareness and commitment of the employees to the MOU. Having achieved a good measure of success in the area of human resources, Company now enjoys leadership role in this area.

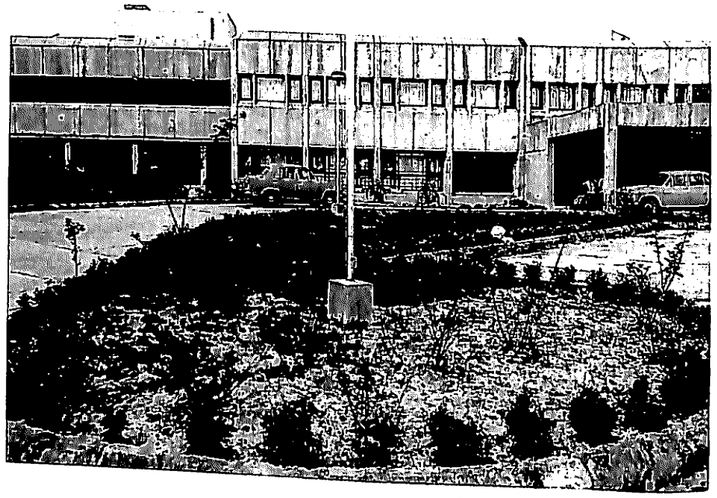


Bloom Bank, DSP

9.2 Manpower Utilisation

The total manpower of the Company as on 31st March, 1988 was 2,01,415 comprising of 17,203 executives and 1,84,212 non-executives. Even taking into account commissioning of new units in some plants and expansion of Alloy Steels Plant the Company operated with lesser workmen compared to 2,05,623 on 31st March, 1987.

Systematic Manpower Planning was introduced aiming at optimum utilisation of human resources by redeployment, creating flexibility in jobs between allied skills and retraining. In 1987-88 about 3,018 employees were redeployed.



Training Centre of SAIL at Ranchi

9.3 Training

The system of recruitment was streamlined. An Approach Plan for training has been developed. The training set up was revamped. The Company conducted training programmes for senior managerial level and for those identified with high potential. In 1987-88, 58,936 employees 18,443 executives and 40,493 workers were trained internally. Employees of captive power plants were also imparted training internally and in National Thermal Power Corporation.

9.4 Work Culture & Discipline

Steps were taken to bring about further improvements in work culture. These resulted in reducing absenteeism, avoiding shift change delays and in general, enhancing standards of personal and organisational discipline. Better teamwork between various departments and unit was evident. A culture committed to treating people with dignity, understanding their problems and helping them has now taken shape.

9.5 Employee Services & Employees Relations

Considerably efforts were made to improve participation of employees and get them more involved in the overall functioning of the organisation. Regular meetings were held with trade unions and officer's associations on issues relating to production and productivity both at plant and corporate levels. Thrust was given to disposal of grievances of employees expeditiously through formal as well as informal channels.

9.6 Industrial Relations

Overall industrial relations situation in the plants/units of SAIL during the year was generally normal. Loss of mandays and saleable steel production arising out of industrial relations problems during the year were lower compared to 1986-87.

9.7 Safety

A number of steps have been initiated to improve safety and occupational health. The steps include appointment of a General manager (Safety), setting up of a Corporate Occupational Health Centre at Bhilai and Occupational Health Centres in other steel plants. Number of accidents during the calender year 1987 was lower as compared to 1986.

9.8 Scheduled Castes & Scheduled Tribes

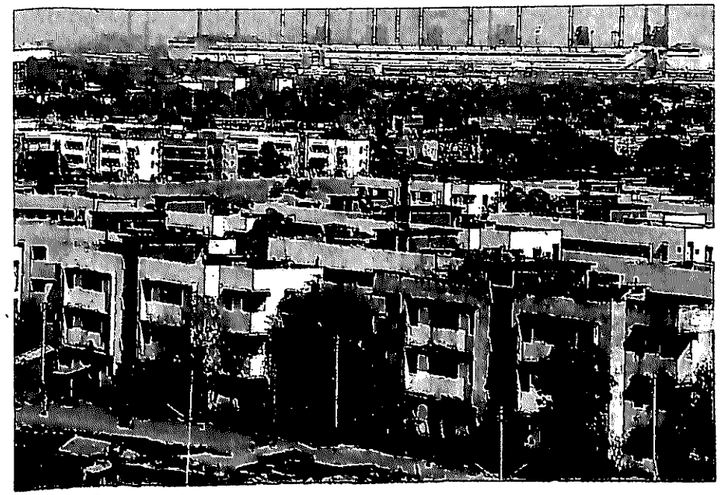
Intake of scheduled caste and scheduled tribe candidates was 20.96 per cent and 14.93 per cent respectively of the total recruitment. The share of scheduled caste and scheduled tribe employees in promotion was 8.83 per cent and 6.26 per cent respectively. As on 31st December, 1987, scheduled caste and scheduled tribe employees were 11.93 per cent and 8.39 per cent of the total manpower respectively.

9.9 Employees' Welfare

The thrust in the area of welfare in 1987-88 was on improving township maintenance and statutory facilities inside the works area. SAIL spent Rs. 35.89 crores for creating new assets in the steel townships against Rs. 25.31 crores in 1986-87. In addition, Rs. 165.86 crores were spent on maintenance of houses, extending medical, educational and other facilities provided by the Company under various welfare schemes. Canteen services were also improved.

9.10 Peripheral Development

On peripheral development activities which includes providing facilities like supply of drinking water, construction of schools, community centres, roads, etc. in areas within 10 Kms. of the steel town-ships, a sum of Rs, 36 lakhs was spent during 1987-88. A sum of Rs. 80 lakhs has been earmarked for expenditure on this account in 1988-89. In additions an amount of Rs. 1.53 crores has been earmarked for providing drinking water in selected areas within 50 KMs radius of steel township under the National Technology Mission during 1988-89.



A view of SAIL Township

(B) Subsidiaries

1. The Indian Iron & Steel Company Limited

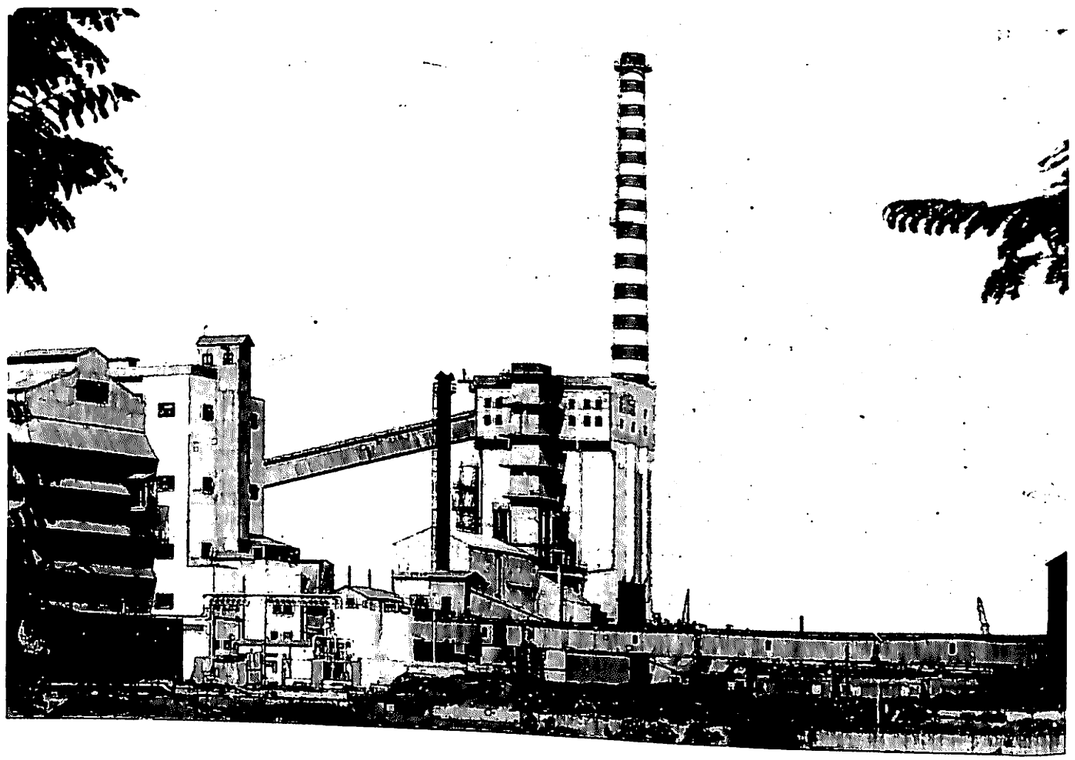
1.1 The Indian Iron and Steel Co. Ltd. (IISCO). owns and operates an integrated steel plant at Burnpur, captive iron ore mines at Gua and Manoharpur, captive collieries at Chasnalla, Jitpur and Ramnagar, a coal washery at Chasnalla and a large foundry complex at Kulti. Management of IISCO held by the private parties were acquired by Central Government on 17th July, 1976. The shares held by the Public Financial Institutions etc. were also purchased by Central Government and subsequently transferred to Steel Authority of India Limited (SAIL). IISCO became a wholly owned subsidiary of SAIL on 30th March, 1979.

1.2 Production Performance

Saleable steel output at 541.9 thousand tonnes and ingot steel production at 545.4 thousand tonnes during the 1987-88 was 3% higher than 1986-87. Coke consumption rate at blast furnaces and overall energy consumption per tonne of ingot steel reduced significantly during 1987-88.

At Kulti, the foundries complex produced 51.7 thousand tonnes of foundry products. Production of 54.3 thousand tonnes of spun pipes was 7% higher compared to previous year.

Production of coal during the



A view of IISCO Plant

year was 428.9 thousand tonnes. Washery output was 470.8 thousand tonnes. Performance of collieries was affected due to large backlog of overburden removal coupled with low availability of earth moving machinery at Chasnalla and repeated breakdown of old underground equipment at Jitpur. Low captive production of coal and lower availability of coal from BCCI sources curtailed the washery output.

Production of Iron Ore Lump during the year was 1157.5 thousand tonnes which was marginally higher than the previous year's production.

1.3 Projects

Coke Oven Battery No. 8 with by product and coal and coke handling plant was commissioned in December, 1987. Open Hearth Furnace 'E' duly converted to 'KORF' process was lighted up in July, 1988.

Government of India accorded 'in principle' approval to the modernisation proposal of Burnpur Works and sanctioned Rs. 30 crores for enabling works and preparation of DPR. Enabling works are in progress. Environmental study is being conducted. Action has been initiated for acquiring 570 acrs of land for the scheme

Light castings departments at Kulti duly modernised is expected to be commissioned by December, 1988.

Progress on mine development work in respect of Chasnalla upper seam development project was affected due to geological disturbances. The mine is expected to work at its rated capacity by 1992. Out of four turnkey packages of balancing facilities for Chasnalla wahsery work on water services has been completed. Packages relating to raw coal handling plant and product handling plant have almost been completed.

1.4 Financial Results

During 1987-88 turnover was Rs. 497.70 crores which registered an increase of 8% over 1986-87. Net loss after depreciation and interest was Rs. 115.75 crores as against the loss of Rs. 81.91 crores in 1986-87. The increase in loss was mainly due to continued escalations in input prices like coal, ferro-alloys, cess on coal and payment of interim/adhoc relief to employees etc.

1.5 Industrial Relations

Industrial relations during the year was by and large peaceful. The gains in production and productivity consolidated during 1986-87 were further reinforced during the year. The Company continued to operate without any overtime payment during the year.

2. IISCO-Ujjain Pipe & Foundry Co. Ltd.

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

2.2 Production & Sales Performance

During 1987-88 Stiscon produced 32,212 tonnes of cast iron spun pipes against 35,815 tonnes in 1986-87. Despatches and despatchable order bookings were 32,134 tonnes and 32,251 tonnes respectively as against 33,038 tonnes and 35,748 tonnes in 1986-87.

Market condition for cast iron spun pipes remained depressed during 1987-88 also. Due to tight monetary condition on account of drought in the various parts of the country and also in view of the availability of cheaper substitutes like AC, PVC, PSC, RCC pipes, demand for CI spun pipes further shrunk. Continuous efforts and intensive customer contacts are made to improve order bookings.

2.3 Projects

2 MT capacity medium frequency induction furnace came into trial production in September 1987. It will help increasing the quantum of smaller dia. pipes in the product-mix.

2.4 Financial Results

During the year Stiscon incurred a net loss of Rs. 106.45 lakhs compared to the loss of Rs. 24.51 lakhs in 1986-87. The increase in loss over last year was mainly due to lower turnover and higher wages.

2.5 Industrial Relations

The industrial relations situation during the year remained satisfactory.

3. Maharashtra Elektrosmelt Limited

3.1 Maharashtra Elektrosmelt Limited (MEL) became a subsidiary of SAIL with effect from 18th October, 1986. SAIL took over the management of this small and compact company for utilising some of its facilities for R&D Works as well as maximise the production of ferro-manganese for captive use in SAIL Plants. In order to make its financial year to co-terminus with SAIL, it was changed to end on 31st March each year. The financial year 1986-87 being the transition period consisted 9 months only i.e. from 1.7.86 to 31.3.1987. Comparative performance during 1987-88 and previous year 1986-87 may be considered in the light of this background.

Financial & Operating Review

3.2 MEL achieved a turnover of Rs., 5568.90 lakhs during 1987-88 as compared to Rs., 2860.51 lakhs during previous year of 9 months i.e. 1st July, 1986 to 31st March, 1987. Gross profit rose to Rs. 603.58 lakhs from Rs. 370.82 lakhs in last year. Net profit for the year was Rs. 161.36 lakhs as against Rs. 46.88 lakhs in the previous year.

Production & Sales Review

3.3 Production of Ferro-manganese during the year 67,186 MT which represents growth of 22% on pro-rata basis over 41,470 MT produced in the last year. MEL also produced 1,867 MT of

Silico manganese. Production of steel in 1987-88 was 7,253 MT as compared with last year's production of 5,508 MT. Sales of Ferro-manganese during the year has been 70,193 MT. Besides, sales of steels and silico manganese have been 8,481 MT and 533 MT respectively.

Research & Development

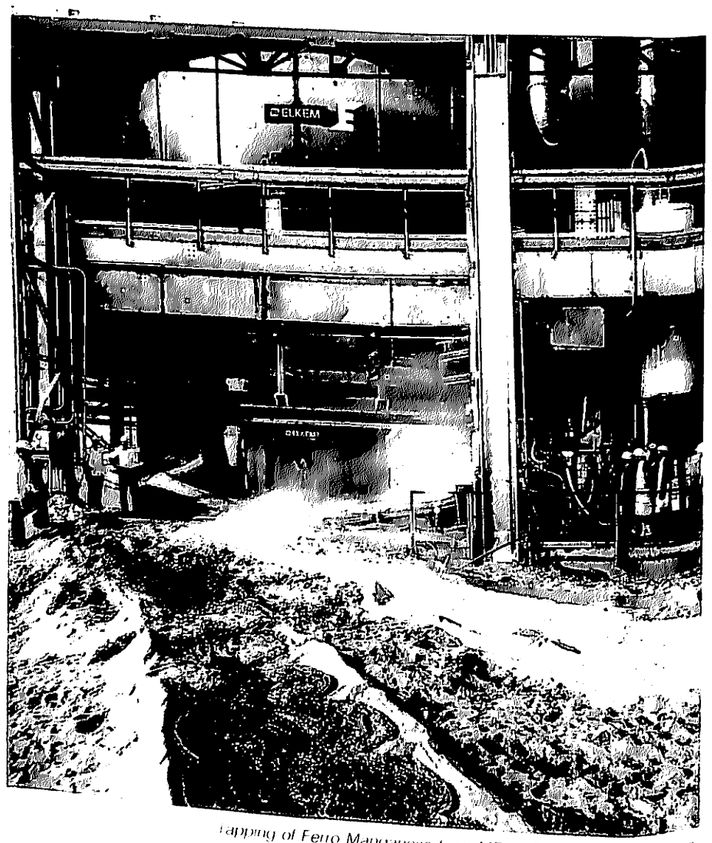
3.4 The R&D activities were largely concentrated in steel division with objective towards improving quality of steels, reduction in cost of production and diversification to higher value added products. There have been significant technology development in areas like Coke Breeze Injection, De-sulphurization using DRI, Combined Blowing etc.

Conservation of Energy

3.5 More than 5% saving in power consumption was achieved during the year as compared to the previous best. Inferior and cheaper materials were used as fuel in place of high cost material. Injection of coke fines in cupola, substituting high cost hard coke has been successfully introduced.

Technology Absorption

3.6 CLU technology obtained from M/s Uddeholm was successfully commissioned on 20th February, 1988. Austenitic grades of stainless steels has been successfully produced.



Tapping of Ferro Manganese from MEL's Smelting Arc Furnace

Visvesvarya Iron and Steel Limited, Bhadravati

1.0 The Visvesvarya Iron and Steel Limited (VISL) is a major producer of special and alloy steels with a capacity of 77,000 tonnes per annum. In addition, to special steels, it produces Mild Steels, Ferro Alloys, Castings, Pig Iron etc.

1.1 Capital Structure

As on 1.4.1988 the authorised capital of the Company was Rs. 75 crores of which Rs. 46.40 crores were subscribed and paid up. 60% of the paid up capital i.e. Rs. 727.84 crores was held by the Government of Karnataka and 40% i.e. Rs. 18.56 crores by the Steel Authority of India Ltd.

1.2 Change of Name

This plant was sanctioned by the Govt. of Mysore in 1917-18 and owes its origin to the inspiration of the great engineer statesmen Sir M. Visvesvaraya. As a tribute to the former Chairman of the Company, the company was renamed as Visvesvaraya iron & steel company in 1972.

2.0 Production

The installed capacity of the plant, production during 1987-88, estimated production during 1988-89 are furnished at Annexure-A.

3.0 Capital Schemes

3.1 There is no Capital Scheme presently under implementation.

4.0 Research and Development Activities Undertaken

4.1 The following studies have been taken up in the recent past.

1. Ingot Mould Study: A new mould design is being made and is in the process of implementation so that ingot mould consumption is brought down to 32 kg/ton from 55 kg/ton.
2. Study into cracking of Cast Iron Brake pulley for M/s Tungabhadara Steel Products Ltd., Hospet, Karnataka-for successful production of defect free casting
3. Research into production process of ingot Moulds of 2.66 MT. for Alloy Steels Plant, Durgapur.
4. Standarisation and process control study on spheroididize Annealing Treatment of Ball Bearing Quality Steels.
5. Investigation into heavy rejections of AISI 1043 steel and standaradisation of steel making process. By this method Improvement of Met OK Steel increased from 40% to 80%
6. Inclusion control in steel making.
7. Failure Analysis: (i) End opening of Case hardening steels in Rod and Bar Mill; (ii) Fracture of Forging Ingot of 2% C 12 Cr. steel.
8. Process Evaluation of Continuous Cast operation.

5.0 Man Power

The present manpower strength of the company is as follows:

Man Power Total	SC	ST	Ex-service-man
9,148	1,956	76	148

Pig Iron Furnace

Visvesvaraya Iron & Steel Limited, Bhadravati

Annexure-A

Production Details for 1987-88 & Estimated Production for 1988-89

(Figures in tonnes)

Sl. No.	Name of the Product	1987-88		1988-89			
		Installed Capacity	Production	Target	Actual upto Jan. 89	Estimated for Feb. & March. 89	Estimated Production For 1988-89
1.	**Pig Iron**	1,80,000	—	—	5,633	5,000	10,633
2.	**Steel Ingots:**						
	a) Mild Steel		548				
	b) Special Steel	1,80,000	51,133	—	—	—	—
3.	**Saleable Steel**			69,000	42,265	11,500	56,765
	a) Mild Steel	48,000	1,677	24,500	108	—	108
	b) Alloy & Spl. Steel	77,000	37,628	52,000	30,220	8,800	39,020
4.	a) **Ferrosilicon**	20,000	10,639	13,200	9,334	2,200	11,534
	b) Ferro-Alloys	3,800	6,480	10,000	5,549	1,400	6,949
5.	**Steel Castings**	2,500	162	1,000	169	50	219
6.	**Cast Iron Castings**	15,600	2,431	6,000	1,793	500	2,293
7.	a) **Refractories**	9,600	2,392	4,000	2,164	660	2,824
	Chrome Ore brick-bats						
8.	**Cement**	—	7,942	9,500	5,739	1,550	7,289
9.	**Mines. (Quartz)**	96,000	332	—	—	—	—
		48,000	16,820	26,000	23,946	4,500	28,446

Sponge Iron India Limited

Introduction

The demonstration sponge iron plant of the Sponge Iron India Limited (SIIL) was initially set up with an annual capacity of 30,000 tonnes with the assistance of UNDP/UNIDO to establish the techno-economic feasibility of producing sponge iron suitable for steel making in Electric Arc Furnaces from lump iron ore and non-coking coal available in the country. The plant went into regular operation from November, 1980. The plant is designed and instrumented in a manner which would facilitate its use both for commercial production and for R&D work. The plant originally based on the SL/RN Technology developed by Lurgi of West Germany, but subsequently several innovations have been made and the Technology upgraded to make it workable under actual working conditions. These developments have been done by the Company without the assistance of Lurgi. The Company has been successfull in operating the plant at high level of capacity utlisation.

Considering the successful operation of the demonstration plant, the expansion of the plant (to double its capacity from 30,000 tonnes to 60,000 tonnes per annum by the setting up of a second unit) was sanctioned. This unit, which was wholly designed and built by the Company's engineers incorporating the various modification carried out to the demonstration plant for adapting the technology to Indian conditions, went into regular operation from October, 1985.

The Company has also successfully designed and built a plant for briquetting of sponge iron fines (below 6 mm size), which were earlier not usable by Electric Arc Furnace. The Briquetting Plant was commissioned in October, 1987 and is now operating to full capacity. The sponge iron briquettes produced from fines have received wide acceptance in the market.

2. Finance

Against an authorised capital of the Company of Rs. 13 crores on 31.3.1988, the paid up capital was Rs. 12.52 crores. Shares amounting to Rs. 11.59 crores are held by the Govt. of India and the balance of Rs. 0.83 crores by the Govt. of Andhra Pradesh.

3. Production

Production of sponge iron during the year 1987-88 was 39,467 tonnes thus attaining 66% of the capacity utilisation. Production was seriously affected due to power cut imposed by the State Electricity Board. With considerable difficulties and hiring of D.G. Sets, a production level of 66% of capacity utilisation is achieved.

As the power restrictions are continuing during 1988-89, action has been initiated to acquire additional diesel generation capacity as to maintain production as far as possible. It is expected that a production of 51,400 tonnes, representing 85% of capacity utilisation, would be achieved during 1988-89. The production achieved upto December, 1988 was 36,829 tonnes, representing 72% of the year target.

4. Sales and Profitability

During the year 1987-88, 37,712 tonnes of sponge iron was sold fetching sales revenue of Rs. 7.81 crores. During the year 1988-89 despatches are estimated to be 51,570 tonnes out of this 35,770 tonnes having been already despatched up to December, 1988.

5. Joint Venture for a Commercial Sponge Iron Plant.

The Company is proposing to set up a commercial sponge iron plant of capacity 100,000 tonnes per annum in the Ballary Hospet area of Karnataka State Industrial Development Corp. Discussions have been held with the Central Financial Institutions for providing necessary funds for the project.

6. Setting up of a Plant for Manufacturing of Building Materials from Industrial Waste

The Company propose to set up a plant for manufacture of bricks and tiles from the industrial waste of their plant. During the production of sponge iron, large quantity of waste products are generated in the form of iron oxide sludge

from ore washing and gas cleaning plants, which are at present being dumped around the plant causing serious problems of environmental pollution. Analysis of the sludge indicates the presence of substantial quantities of silica and alumina combined with iron oxide. It is proposed to utilise the waste products for production of useful products.

A preliminary study sponsored by UNIDO confirmed the technical and economic feasibility of production of building products like high strength bricks, wear resistant unglazed ceramic flooring tiles etc. from these waste materials. The report submitted was examined and after careful examination, it was decided to set up the plant.

It is proposed to obtain UNIDO assistance for this as a Special Industrial Service (SIS) project. The project is expected to cost about Rs. 2 crores, and is expected to be completed in about 12 months.

7. Setting up of Submerged Arc Furnace (SAP) Facility for Production of High Grade Pig Iron and a Power Generation Plant based on Waste Heat from the Kilns

The company has 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 turbine. The power generated is proposed to be utilised in a specially designed Submerged Arc Furnace for the production of low phosphorous pig iron using pre-reduced iron ore fines and other from the plant. The project is estimated to cost about Rs. 16 crores for the production of 45,000 tonnes per annum of pig iron. It is expected that the profitability of the Company, after these facilities are installed and commissioned, would increase considerably.

8. Efforts made towards Indigenisation

The Engineering and Projects Division of the Company set up in 1982 had successfully completed the engineering and erection work of the expansion unit in 1985. 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 operation of the existing plant.

In addition, the Engineering and Projects Division had developed basic engineering data/designs for setting up large commercial sponge iron plants relevant to locally available iron ores and coal. In this direction, the Company has secured a contract from a private party for technical know-how and engineering services for the setting up of a Spong Iron Plant at Salem in Tamil Nadu using lignite from Neyveli. Basic and detailed engineering work on this project is under way.

Shri M L Fotedar, Minister Steel & Mines laying the Foundation Stone of the Pig Iron Plant of SIIL

9. Research and Development

During the year, the R&D activities were concentrated on optimisation of raw materials and on improvement of quality of product. A techno-economic feasibility study for setting up beneficision plant for the non-coking coal for improving the quality of coal was carried out. The study established the feasibility for setting up the plant with an output of 300 tonnes of beneficiated coal per day with ash percentage of below 25%. Studies on the feasibility of injecting iron ore fines from the discharge end of the kiln and the coarser coal into the central portion of the kiln have also been taken up with the objective to optimise the specific consumption of coal and iron ore. The necessary equipment required for the purpose on regular basis has been ordered.

High carbon, sponge iron briquettes with 4.5% carbon were successfully made during the year. Samples of these briquettes were sent to NML, Jamshedpur, for melting trials in Hot blast Cupola.

The schemes for production of sponge iron by Direct Reduction Hot Blast Cupola Route and Vertical Report Direct Reduction Technology in association with National Metallurgical Laboratory, Jamshedpur, have been taken up.

10. Manpower

The break up of the total number of employees of the Company as on 31.12.88 is furnished below:

Sl. No.	Groups	Total No. of Employees	SC	ST	Ex-Service men	Physically handicapped	Women
1.	Group (A)	63	6	3	—	—	—
2.	Group (B)	19	1	—	—	—	—
3.	Group (C)	251	30	15	4	2	20
4.	Group (D) (Excluding Sweepers)	150	39	25	1	7	4
5.	Group (D) Sweepers	5	2	—	—	—	2
	Total	488	78	43	5	9	26

11. Implementation of use of Hindi

The Company continues to lay strong emphasis on increasing use of Hindi in its communications, both within and outside. During November 1988, a Seminar on 'Rajbhasha' and the role of the Central Government employees on its promotion was organised and 5 papers were presented. Employees from Govt. undetakings and voluntary organisations had participated in the Seminar.

12. Anti Pollution Measures

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

13. Employees Participation in Management

Pursuant to the directive of the Government, a scheme for Employees' participation in Management has been implemented in the Company. Under this scheme, one Plant Level Committee and 3 Shop Floor Level Committees have been constituted with representatives of both Management and Employees, and regular meetings are being held to discuss various problems and finding solutions internally.

Kudremukh Iron Ore Company Limited

1. General

The Kudremukh Iron Ore Company Limited (KIOCL) was established in April, 1976 for the management of the Kudremukh Iron Ore Project. The Project was implemented on the basis of a Financial Agreement and a Sale & Purchase Contract with Iran concluded in November, 1975, and had an annual capacity of 7.5 million tonnes of iron ore concentrate. The Sale & Purchase Contract stipulated that Iran would purchase 150 million tonnes of iron ore concentrate from this Project over a period of 21 years commencing from August, 1980. Under the Financial Agreement, Iran agreed to extend a loan not exceeding US$ 630 million to meet the cost of the project and related infrastructure. Against this promised loan, Iran paid only US$ 255 million and then stopped further disbursements. Iran failed to fulfil their obligations under both Agreements in that they have not paid the balance amount of the loan and have also indicated their inability to lift the contracted quantity of the concentrate. However, the project was completed in August, 1980, as per schedule with the required funds provided by Government, and KIOCL started locating alternate buyers for the sale of concentrate. The total expenditure incurred on the project was nearly Rs.517 crores

2. Pellet Plant

2.1 Keeping in view the uncertainty in the off-take of the material by Iran, Government sanctioned in May, 1981, the setting up of a pellet Plant of 3 million tonnes per year capacity (to be located in Mangalore) for the conversion of a part of Kudremukh's iron ore concentrate production into pellets. This was based on a forecast that pellets, which are required as a feed material both for use in Blast Furnaces in Steel plants as well as by gas-based Sponge Iron Plants, might have a better marketability than iron ore concentrate, and would also be a product with a higher value-added content. The pellet plant has started commercial production from April, 1987. The total cost of the Project was nearly Rs.118 crores.

3. Finance

The authorised capital of the Company is Rs.675 crores. The paid-up capital as on December 31, 1988 is Rs.634.51 crores.

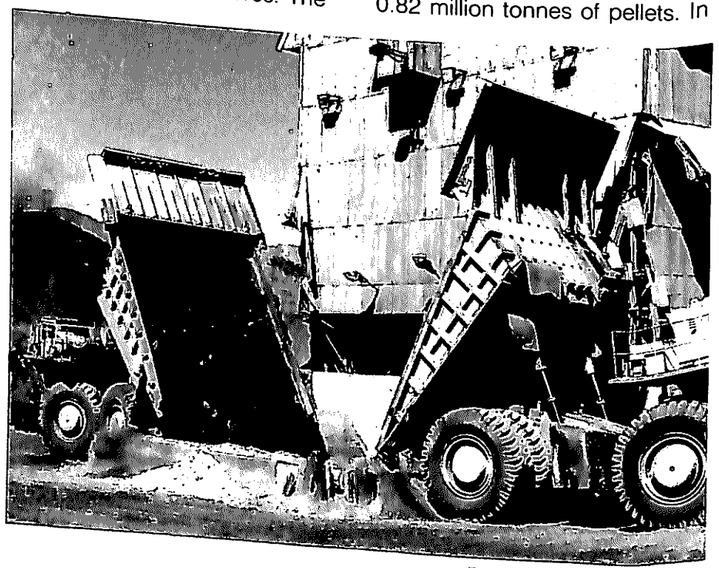
4. Production

4.1 Iron Ore Concentrate

Production at Kudremukh is directly dependent on the volume of its exports. In 1987-88 KIOCL produced 4 million tonnes of iron ore concentrate. In the period April-December, 1988, 3.45 million tonnes of iron ore concentrate has been produced, which is expected to go to 4.7 million tonnes by the end of March '89. For 1989-90 the Company has planned a production of 5.5 million tonnes of concentrate.

4.2 Iron Ore Pellets

In 1987-88 KIOCL produced 0.82 million tonnes of pellets. In the period April-December, 1988, 1.19 million tonnes of pellets have been produced. During the year 1988-89 about 1.45 million tonnes of pellets are expected to be produced. For the year 1989-90 a production of 2 million tonnes of pellets has been planned.



Dumpers Unloading at Crusher

5. Exports

As a result of persistent marketing efforts, KIOCL has been able to enter more markets for the sale of their products. In 1987-88, 3.18 million tonnes of iron ore concentrate and 0.79 million tonnes of pellets were exported. In the period April-December, 1988, 2.27 million tonnes of concentrate and 1.2 million tonnes of pellets have been exported. About 3.25 million tonnes of concentrate and 1.43 million tonnes of pellets are expected to be exported during the full year 1988-89. For 1989-90 export of 3.5 million tonnes of concentrate and 2 million tonnes of pellets has been planned.

6. Working Results

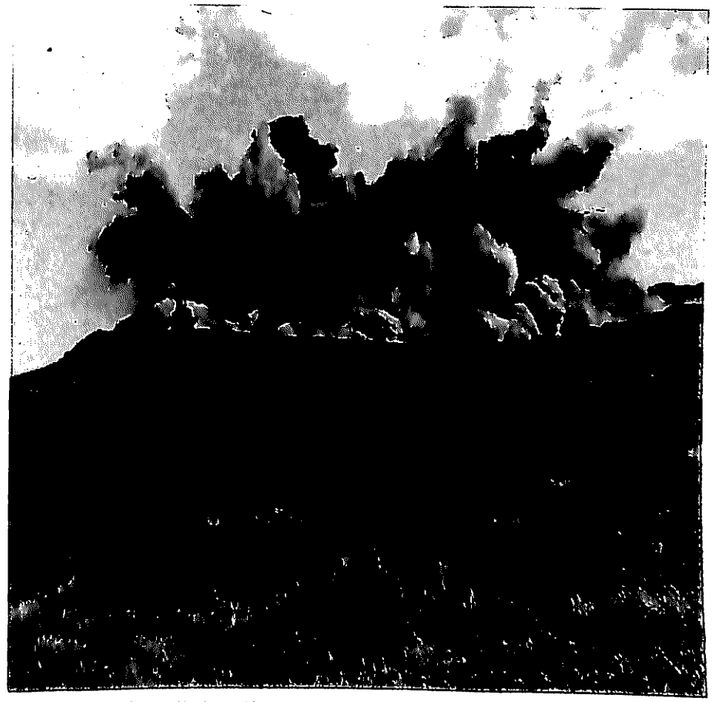
In 1987-88 the Company suffered a net loss of Rs.27.25 crores. The loss was mainly due to lower production of iron ore concentrate than rated capacity, on account of failure of Iran to take the contracted delivery of the material and lack of other buyers in the international market. The Company is likely to incur a loss of about Rs.12 crores in 1988-89.

7. Manpower

The details of employees in the Company as on 31st December, 1988, are as follows:

Group	No. of Employees		SC		ST		Ex-serviceman	
	Male	Female	Male	Female	Male	Female	Male	Female
A	*440	*20	*35	2	3	*1	7	—
B	72	10	2	—	—	—	—	—
C	1314	84	*134	2	*18	—	124	1
D	173	12	40	3	23	1	4	—
D (Sweepers)	29	11	27	9	2	1	—	—
Total	*2028	*137	*238	16	*46	*3	135	1

*includes trainees



Blasting of Iron Ore at Kudremukh

8. Workers Participation in Management

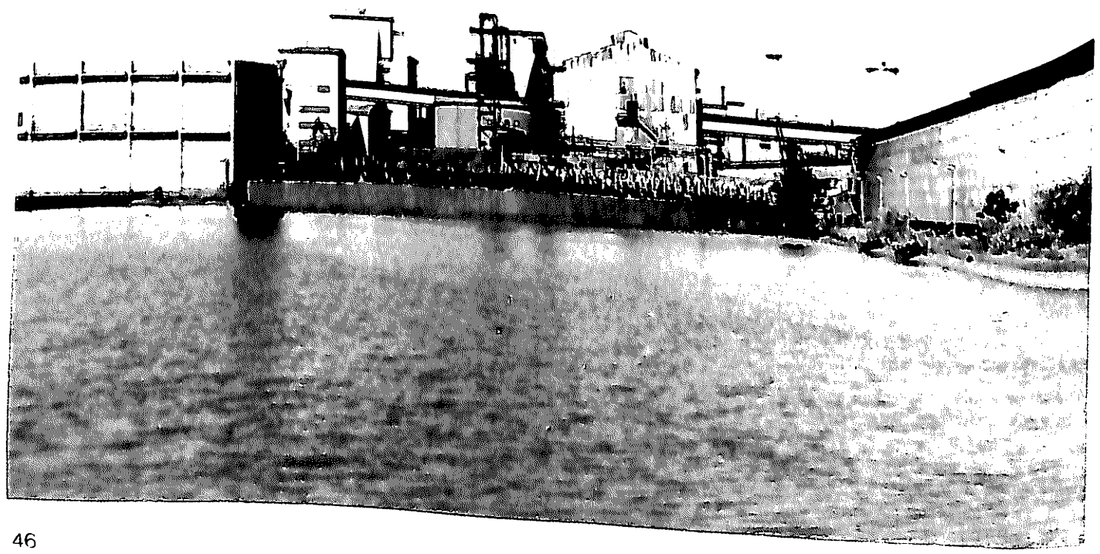
The Company has set up 10 Shop-level Councils and 2 Joint Councils at the Apex Level. These Councils meet periodically to discuss measures for improving production and productivity. In addition, the Company has constituted Works Committees at its Kudremukh and Mangalore establishments comprising representatives of both management and workmen. These Committees deal with matters of general interest.

9. Contract Labour

As a matter of policy, KIOCL does not employ contract labour. Only jobs of casual nature are got done through contractors. In such cases, provisions of Contract Labour (Regulation and Abolition) Act, 1970, and obligations under the Act as principal employer are implemented.

10. Safety Measures

A Safety Department is functioning independently. In addition, every department in KIOCL has a Safety Committee which meets once in every month. Safety Campaign is observed for a week every year. Safety rules have been compiled for each work area considering all safety aspects. All employees have been provided with these booklets. On various occasions the company has received shields/medals from the Mines/ Safety Associations for good safety measures adopted.



Filter Plant at Mangalore

Manganese Ore (India) Limited

1. Manganese Ore (India) Limited was formed in 1962 to take over the manganese leases in Madhya Pradesh and Maharashtra, previously held by Central Provinces Manganese Ore Company Ltd., (CPMO) a foreign Company registered in U.K. In MOIL 49% shares were held by CPMO and the remaining 51% in equal proportion by Government of India and State Governments of Madhya Pradesh and Maharashtra. Under an agreement signed between Government of India and CPMO in sept. 1977, the Ordinary and Preference shares held by CPMO in MOIL were acquired by Government of India and with that, MOIL became wholly owned Government Company with effect from October, 1977.

2. 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 production of Dry Battery Cells.

3. Finance

The authorised capital of the Company is Rs.17 crores and the paid up capital was Rs. 11.06 crores as on 31 st December, 1988.

4. Performance

The physical and financial performance of the Company during 1987-88 and 1988-89 is given below:

Quantity: in lakh tonnes
Value: in Rupees crores

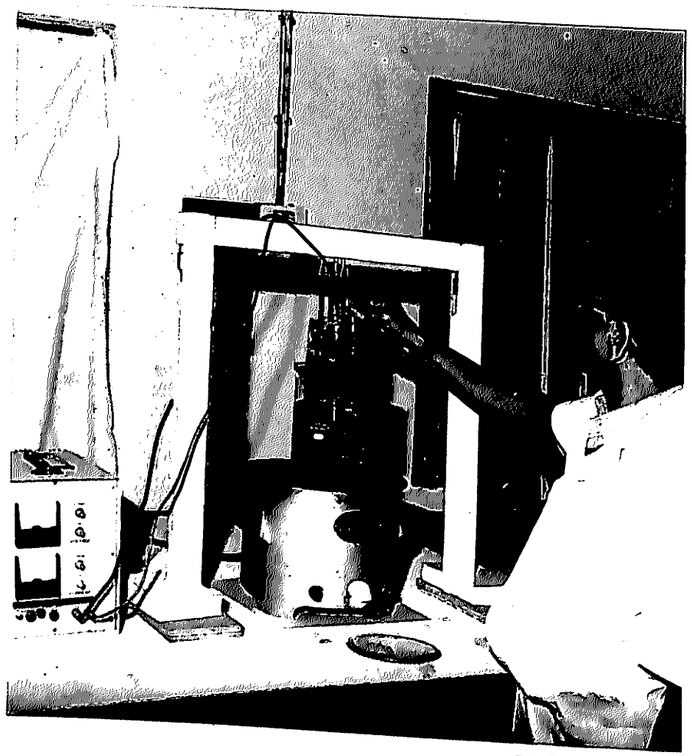
	1987-88	1988-89 (anticipated)
Production	5.03	5.12
Turnover	24.81	25.89
Profits	0.66	0.43

5. Capital Schemes

The position in respect of major capital works is given below:

— Deepening of Holmes Shaft at Balaghat Mine of the Company has been completed.
— A crushing and Screening Plant at Balaghat Mine has been commissioned.
— The works relating to the Sinking of a Vertical Shaft at Chikla Mine and a Main Hoisting Shaft at Ukwa Mine are in progress.
— The establishment of an electrolytic Manganese Dioxide Plant (700 TPA) is in progress and is expected to be completed by March 1990.
— The works for augmentation of beneficiation facilities at Dongri Buzurg Mine is expected to be completed in March/April '89.

RB 54 Electrical Shovel



R & D Centre of MOIL

6. R & D Feasibility Studies

R & D efforts of the Company have been in the following major areas:

i) To locate new manganese bearing areas and to prove further reserves in existing areas.
ii) Improvement in mining methods.
iii) Beneficiation techniques for medium and low grade ores
iv) Development of processes for setting up manganese based industries.

7. The Company is undertaking exploration by diamond drilling, trenching, pitting, underground drivage, etc. for locating new manganese ore areas and proving manganese ore deposits in and around its mining leasehold areas. Pre-mining support by cable bolting and use of steel support in place of timber are being carried out in the underground working on experimental basis. Beneficiation processes for upgrading medium and low grade manganese ores to high grade is being developed.

8. On successful development of high intensity magnetic separation process to upgrade ores of Dongri Buzurg Mine to high grade, suitable for use in dry battery manufacture, a plant is being set up at Dongri Buzurg Mine. Efforts are also being made to develop processes to set up manganese based industries. In this direction, the Company is setting up a plant to manufacture electrolytic Manganese Dioxide, used a depolariser in dry battery industries. In the existing process, manganese ore fines could be utilized for production of ferro manganese only after agglomeration. Techno-economic viability of plasma smelting process which could use manganese ore fines directly for production of ferro manganese is also being examined.

9. Safety Measures

Over the years, ore deposits in MOIL's areas of operations near the surface have been gradually getting depleted. Workings are extending deeper and extraction is increasingly through underground working. Deeper workings require, extra vigilance with regard to support system, ventilation and efficient filling of the voids arising out of extraction of ore. Even in respect of opencast workings, the depth has increased, and therefore, the use of earth-moving machinery has been judicious to ensure safe and efficient workings. Emphasis is laid on training and re-training 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 the Chief (Safety). Safety weeks are observed and exhibitions are held to inculcate safety habits. Safety Committee Meetings are held during which any unsafe acts committed/ observed are discussed to avoid recurrence. These combined efforts have resulted in improvement of overall safety record of the Company.

10. Workers Participation in Management

Works/Canteen/Grievance Committees are functioning satisfactorily at each unit. The members of these Committees are from different sections of the employees. During the Committee Meetings they are encouraged to put forth problems, along with suggestions if any, to ensure efficient functioning of different Welfare Schemes at units.

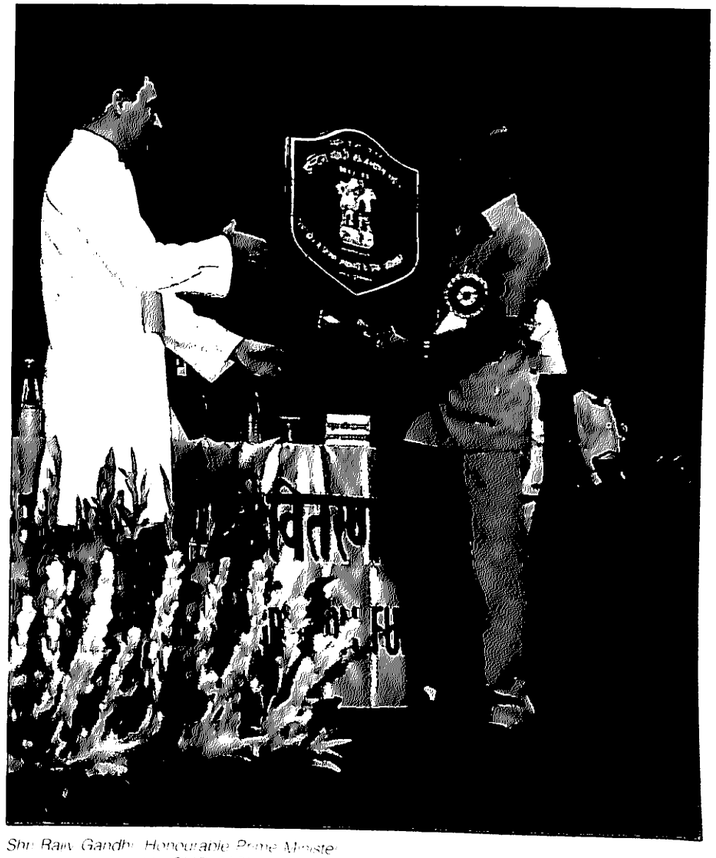
11. MOIL has given high priority to the principle of participative management. An effective mechanism exists for the association of workers' representatives right from the grass root level to the Apex Council which functions at the Corporate Level with workers and management representatives, under the Chairmanship of the C.M.D. to review and find solutions to major problems. There is a continuing effort to strengthen this arrangement.

12. Contract Labour

Casual/contract labour is not employed on jobs of permanent, regular and continuous nature. However, in certain areas which are of temporary, contingent or intermittent nature like transportation and railing of ore, supply of filling materials, and in one of the mines where limited ore reserves are spread over a wide area, some contract labour is engaged. Total number of such casual/contract labour employed by the company is 2088 as on 31.12.88.

13. Progressive use of Hindi

MOIL attaches importance to the progressive use of Hindi in its various sections and mines. At Head Office, the Raj Bhasha Adhikari, assisted by supporting staff, is looking after these functions. Periodical meetings with the senior executives of the company are



Shri Rajiv Gandhi, Honourable Prime Minister giving away award to CMD, MOIL for effective implementation of Official Lan-

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.

14. 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 Govt. Schemes. MOIL was awarded 2nd and 1st prizes for effective implementation of the Official Languages Act, and progressive use of Hindi in Region 'B' for the year 1986-87 and 1987-88 respectively. A special prize was also awarded to C.M.D. being the Chairman of Hindi Implementation Committee of MOIL.

15. Environmental Protection

The Company has initiated steps with regard to protection of environment. Planting of trees in large numbers on the leasehold areas of the Company has been taken up besides undertaking environmental studies covering different aspects such as impact of manganese mining on ecology, air and water pollution etc.

16. Personnel

The details of employees in the company as on 31-12-1988 are indicated below:-

Group	S.C	S.T	Others	Total
A	13	3	165	181
B	7	6	142	155
C	338	430	1184	1952
D	1394	2325	3730	7449
Total	1752	2764	5221	9737

Out of the total number of 9737 employees, 2239 are female

Afforestation at MOIL

Bharat Refractories Limited

1.0. Bharat Refractories Limited was registered as a Company on July 22, 1974 as 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 with special emphasis on the quality of production, optimum utilisation of the installed capacity. Coordinated development of specialised high quality refractories and reasonable pricing in the public sector, Bharat Refractories Ltd. was restructured with affect from May 1, 1978. As result of the restructuring of the Public Sector Iron & Steel Industry, 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 Ltd. (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.40 crores against which the paid up capital as on 31st December, 1988 is Rs.39.51 crores. The total outstanding loan together with interest accrued thereon as on 31.12.1988 amounts to Rs.71.01 crores.

3.0 Production Performance

The production performance of the various units of the Company as well as subsidiary IFICO during 1987-88 and anticipated production during 1988-89 is

Quantity in Mt
Value in crores (Rs.)

Name of Unit	1987-88		1988-89	
	Qty.	Value	Qty.	Value
Bharat Refractories Ltd.				
Bhandaridah Refractories plant	18379	4.77	16142	4.74
Ranchi Road Refractories plant	5077	3.88	6484	7.25
Bhilai Refractories plant	34927	24.92	35459	27.83
Total of BRL	58383	33.57	58085	39.82
India Firebricks & Insul. Co. Ltd.	32048	10.2	32083	13.12

4.0 Financial Performance

During the year 1987-88, the Company (BRL) incurred a net loss of Rs.3.80 crores after providing for interest and depreciation to the tune of Rs.3.67 crores and Rs.2.65 crores respectively. During 1988-89, the Company is likely to incur a net loss of Rs.8.56 crores after providing for interest and depreciation (including DRE) to the tune of Rs.4.43 crores and 3.81 crores respectively.

During 1987-88, the subsidiary company, IFICO incurred a net loss of Rs.1.98 crores after providing for interest and depreciation to the tune of Rs.1.81 crores and Rs.0.51 crores respectively. During 1988-89, the Company is likely to incur a net loss of Rs.2.68 crores after providing for interest and depreciation to the tune of Rs.2.32 crores and Rs.0.67 crores respectively.

The company and subsidiary are likely to achieve almost same level of production in physical terms with an improvement of 19% and 31% respectively in terms of value during 1988-89 as compared with the previous year. This trend is not reflected in the anticipated financial performance as the prices of almost all the raw materials have shown an increase leading to reduction in contribution offered by different categories of products. Coupled with this, the selling prices during current year have shown a marked decline compared with the previous year. Further, the escalation in raw material cost earlier

allowed by SAIL, the principal customer of the Company, has been withdrawn whereby profitability of the Company has been adversely affected.

5.0 Foreign Collaboration

Considering the swift changes taking place in steel making technology, the Company has already entered into collaboration agreement with M/s. Kawasaki Refractories Co. Limited, Japan for transfer of know how for manufacture of following high performance refractories:-

i) Magnesia-Carbon Bricks;
ii) Refractories for Sliding Gate Systems;
iii) Casting Mixes for Steel Ladles;
iv) Gunning Repair Materials; and
v) Spinel and Magnesia-Spinel Bricks.

Out of the above, first three items have already been commercialised and are being supplied to the different steel plants.

The Company has also entered into another collaboration agreement with M/s. Shinagawa Refractories Co. Limited, Japan for manufacture of Coke-Oven Silica Bricks including seven metre tall batteries. Necessary action is being taken for implementation of the collaboration agreement.

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 subsidiary have been recognised by the Deptt. 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 Blocks, High Alumina Burner Blocks for reheating furnaces, Curb Blocks, Porous Plugs etc.

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 31.12.1988 in different units and subsidiary of the Company was as follows:-

Sl. No.	Name of Unit	Total Man-Power	S.C.	S.T.	Women	Physically Handicapped
1.	BHRP	874	109	64	80	1
2.	RRRP	355	31	34	14	3
3.	BRP	1604	184	272	17	12
4.	NS Mines	224	2	109	14	1
5.	PMP	38	3	1	2	—
6.	Head Office	145	12	3	—	—
	Total :	3240	341	483	127	17
7.	IFICO	1115	46	145	32	12
	Grand Total :	4355	387	628	159	29

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

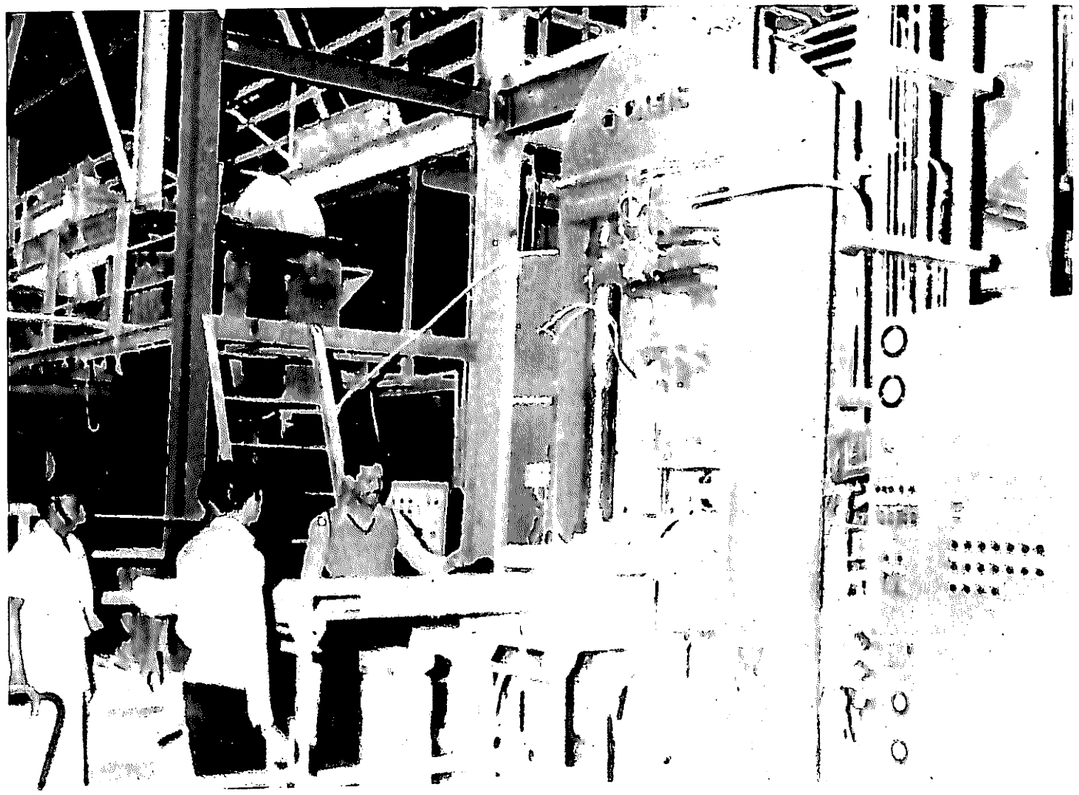
10.0 Contract Labour

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.

The Company has bagged the shield instituted by the department for best performance in the use of Official Language during 1986-87. The shield was presented by the Hon. Minister for Steel & Mines on 12.9.1988. The Company achieved yet another milestone by winning the prestigeous indira Gandhi Rajbhasha Shield instituted by the Ministry of Home Affairs for best performance in the use of Official Language for the year 1987-88 among the undertakings coming in region 'A'. The shield was awarded by the Hon. Prime Minister of India on 16.9.1988.



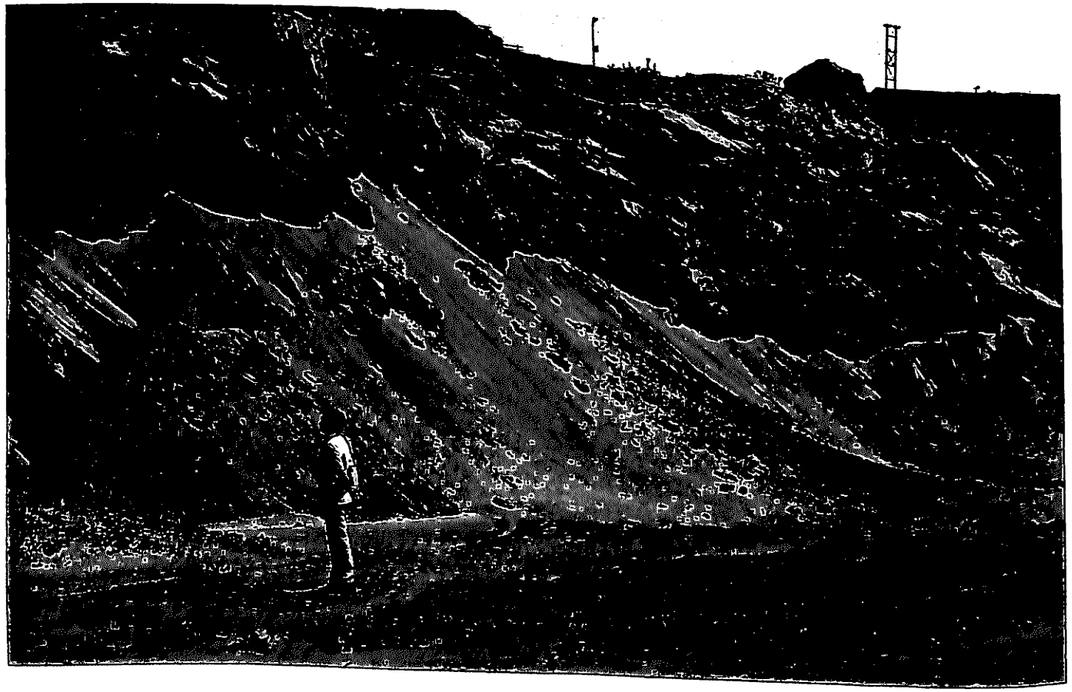
Lacs Press Operation at BHRP

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.

A. **Production Projects**	**State in which located**
Iron Ore	
Bailadila-14	Madhya Pradesh
Bailadila-5	
Donimalai	Karnataka
Diamond	
Panna Diamond Mining Project (Majhgawan Mine)	Madhya Pradesh
B. Projects Recently Commissioned	
Iron Ore	
Fine Ore Handling Scheme (Bailadila-5)	
Bailadila-14 Expansion and Modification Scheme. (Bailadila-11 C)	Madhya Pradesh



Blue Dust New Horizons

2.0 Finance

The authorised capital of the corporation is Rs.150 crores. The paid-up equity capital on 31.12.88 was Rs.115.35 crores. The Government of India's loan outstanding as on 31.3.88 was Rs.64.58 crores and increased marginally to Rs.66.58 crores as on 31.12.88.

3.0 Production

Production in the units of NMDC during 1987-88 1988-89 is given below:

Name of the Project	1987-88 (Actuals)			1988-89 Targets for the full year *			Actuals for April '88 to December '88			Targets for Jan. to Mar. '89		
	Lump	Fines	**Total**	Lump	Fines	**Total**	Lump	Fines	Total	Lump	Fines	**Total**
A. Iron Ore												
(In Lakh Wet Tonnes)												
1. Bailadila-14/ IIC	18.62	10.82	**29.44**	17.40	12.80	**30.20**	15.37	10.04	**25.41**	4.53	3.67	8.20
2. Bailadila-5	26.17	17.59	**43.76**	25.10	10.10	**35.30**	17.73	10.25	**27.98**	7.49	3.03	10.52
3. Donimalai	13.24	15.81	**29.05**	6.60	5.40	**12.00**	8.50	9.00	**17.50**	1.65	1.35	3.00
Total Iron Ore (1+2+3)	**58.03**	**44.22**	**102.25**	**49.20**	**28.30**	**77.50**	**41.60**	**29.29**	**70.89**	**13.67**	**8.05**	**21.72**
B. Diamond												
(Carats) Panna Diamond Mining Project	**15824**			**15500**			**9839@**			**4100**		

* The targets are as per the Action Plan for the year 1988-89.
@ This is site weight. At the time of pooling of diamonds for sale, there is likelihood of a reduction of estimated 0.4% on the total site weight for the year.

The production of iron ore from NMDC mines during april to December 1988 was 27% higher than the target for the period. It was also 5% more than the corresponding period last year. The Corporation hope to attain the targetted level of production for the year 1988-89.

4.1 Export/Sale

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

(in lakh Tonnes)	
1987-88	**1988-89**
80.50	**76.50**

The actual quantity of iron ore exported during 1987-88 was 77.88 lakh tonnes as per the actual nomination of ships. Against this, the total quantity exported in the current year 1988-89 was 67.48 lakh tonnes upto December 88.

4.2 17450 carats of diamond were disposed off through

auction/tender sales for a value of Rs.362.59 lakhs during the year 1987-88. In the current year 1988-89 (upto the end of December 88), the quantity disposed off was 9636 carats for value of Rs.289.62 lakhs.

5.0 Operating Results

The Company has incurred a loss of Rs.21.09 crores upto Dec.1988 in the year 1988-89 (this calculation is based on the standard cost price for 1986-87 which is applicable in 1987-88 and 1988-89 also). The loss for the whole year is likely to be around Rs.35 crores.

6.0 Highlights of Performance during 1987-88

i) The production of 102.25 lakh tonnes of iron ore during the year 1987-88 was the highest record performance of the Company.

ii) Donimalai project achieved a record production of 29.5 lakh tonnes of lump and fines which was 15% more than what was achieved in the previous year.

iii) Panna Diamond Mining Project produced 15824 carats during 1987-88, which is the best performance in the past decade. Also sale of diamonds for a value of Rs. 362.59 lakhs during the year was the highest sales figure so far.

Hand-Picking of Diamonds at NMDC's Panna Project

iv) The company earned for the nation a sum of Rs. 166 crores through export of iron ore produced from its mines.

7.0 Supplementary Projects under operation

i) Fine Ore Handling scheme (Bailadila-5)

To meet the demand of fine ore for Visakhapatnam Steel Plant (which is likely to come on stream in 1989-90) and also to make more fine ore available for export, mechanical facilities for loading/reclamation of fines have been provided at Bailadila-5. The capacity for handling fines at this project is 2.8 million tonnes per year. This fine ore handling system was commissioned in January 1987. Sanctioned revised capital cost of this project was Rs.30.77 cores.

ii) Bailadila-IIC

This project was designed to meet the iron ore requirements of VSP and export. It has capacity of 3.3 million tonnes of ROM to yield 2.8 million tonnes of lump plus fines per year. The project was commissioned in October 87. Sanctioned revised capital cost of this project was Rs.29.52 crores.

8.0 Projects Under Construction/Consideration

i) Deeper Level Mining at Bailadila Deposit No.14

This scheme was formulated to make fuller utilisation of ore reserves at deeper levels which would have otherwise been left unmined forever. The scheme was sanctioned by the Government on 15.6.88. This scheme, when completed, will have a capacity of 1.74 million tonnes of lump and fines per year. Implementation of this project is in progress and is likely to be completed by Dec.1989.

ii) Bailadila Deposit-14 Expansion & Modification incorporating (i) Blue Dust Mining Scheme; and (ii) fine Ore Handling Scheme

The Techno-Economic Feasibility report (TEFR) encompassing these two schemes was submitted by the Corporation to the Government of India in July 87, and Government's approval is awaited. The Blue Dust Scheme is designed to mine and handle 0.7 million tonnes of High Grade Blue Dust per year at Bailadila-14. There are many high-tech uses for this product as it can be used as raw material for production of iron powder, ferrites etc. The TEFR also outlines a system of handling fines at Bailadila-14 (FOHS-Bld-14) which will be geared to meet the demand for iron ore from VSP.

iii) Kotmi-Sonar Dolomite Project

The TEFR was prepared in November, 1986. This project was conceived of as a source of supply of Blast Furnace Grade/Dolomite to VSP. However, VSP has now been linked to Birmitrapur deposit of Bisra Stone & Lime Co. Limited for its full requirement and the Kotmi-Sonar project is, therefore, likely to be shelved.

9.0 Projects under Investigation

I) Low Silica Lime Stone (Himachal Pradesh) at Arki, solan District in Himachal Pradesh

NMDC has taken up exploration of low Silica limestone deposit at Arki, Himachal Pradesh. This Limestone can be used as flux in LD Converters in the Steel Plant. It has been established that this deposit has 80 million tonnes of SMS Grade Limestone. The Company has also prepared a mine plan which has been submitted to IBM, and has applied for a mining lease. Presently NMDC is engaged in carrying out air monitoring water sample analysis, soil testing and collecting other details as required for environment management plan, in addition to exploration work.

II) Panthal Magnesite (J & K)

High Quality Low Silica Magnesite deposit as Chipprian near Panthal in Udhampur district of J&K is sought to be exploited by NMDC for making Dead Burnt Magnesite (DBM), which is used for furnace lining in LD Converters of integrated steel plants and electric arc furnaces. This deposit is proposed to be jointly developed by NMDC and J&K Minerals. The state Govt. of J&K have agreed to have 26% of the equity of the new company to be set up for this project.

The mining lease has already been sanctioned. NMDC has completed detailed investigation and testing of the deposit. The environment management report is under preparation.

III) Tungsten Deposit

NMDC has undertaken exploration of tungsten Deposit at Burugubanda and Tapaskonda villages near Rajahmundry of Andhra Pradesh Applications for prospecting licence covering Burugubanda and Tapaskonda deposits have been submitted to Govt. of Andhra Pradesh for sanction. This project would be in the nature of diversification of the mining activities of the NMDC.

10.0 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 assessment studies made at each project on pollution control systems and suggestions of consultants having expertise in these aspects. The major activities broadly are:

i) Construction of tailing dams, check dams, drains 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.

Afforestation programme at working sites, residential areas and wasteland within lease hold is being implemented on high priority. A highly satisfactory survival rate of over 75% has been achieved in this regard.

Base-line data on water, land and climatic conditions of flora and fauna were collected in respect of Panthal Magnesite project of J&K State and High Grade Limestone project at Arki in Himachal Pradesh.

11. Research and Development

During the year 1987-88, as well as in the current year (i.e.1988-89) the R&D laboratories of the corporation have done various mineral investigation studies, both in respect of the projects of NMDC as well as for a number of outside agencies.

Special studies on use of **Blue Dust** in **High-Tech** areas and manufacture of raw materials used for ferrites and for iron powder for powder metallurgy, are being carried out. Studies and field trials for use of Panna Tailings for agricultural purposes, as well as for other uses such as tiles manufacture etc. are in progress.

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 9 month period April to December 1988, 675 employes of the corporation had gone through such programmes (446 employees were exposed to training programmes conducted within the Company; 166 were sent to attend programmes conducted externally; and 63 derived the benefit by attending seminars.)

13. Personnel

Details of employees in the Corporation as on 31.12.88 are indicated below:

Group	Total No. of Regular Employees (as on 31.12.88)	No. of Scheduled Cast Employees (out of Col.2	No. of Scheduled Tribe Employees (out of Col.2	No. of Women Employees (out of Col.2)
1	2	3	4	5
A	569	24	4	11
B	811	45	15	30
C	3417	453	540	143
D (Excluding Sweepers)	1899	407	462	149
D (Sweepers)	142	104	3	34
Total	**6838**	**1033**	**1024**	**367**

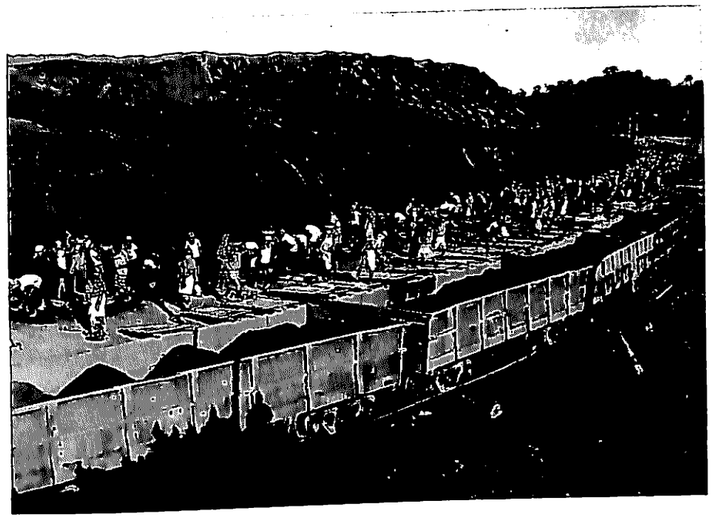
14. Industrial Relations

The overall Industrial Relations situation in the Corporation during the period April to December 88 was peaceful.

15. Workers' Participation in Management

The Scheme of workers' participation in Management is working satisfactorily at two out of three levels viz. shop level and plant (project) level. However, it has not been possible to hold Apex level meetings in the past two years.

The meetings of joint councils at various levels take place regularly and follow up steps provide an effective two way communication and valuable exchange of information between the management and the workers.



Loading at Bailadila

16. Contract Labour Position

The number of labourers engaged in transportation and loading of fine ore into railway wagons at Bailadila-14 has come down marginally to 854, as compared to 858 of last year. The number of contract labour engaged in petty civil contracts and miscellaneous jobs has also been reduced to around 629 as of December 1988.

17. Safety Measures

Apart from normal statutory provisions as provided under Mines Act, Mines Rules and Mines regulations, NMDC is taking specific measures in reducing the occurence of accidents at all their mines. To achieve this, the following steps are being implemented by the Corporation:

a) Vocational training
b) Refresher training
c) acquainting new appointees with the safety standards through safety officers
d) Regular Pit Safety Committee meetings
e) Medical examinations
f) Celebrations of Safety Week every year to propagate safety conciousness among mine employees
g) Providing workers with safety equipments/ appliances duly approved by DGMS
h) Each mine has separate safety officer and training officer to look after and train on the safety aspects in the mine. The compliance report on safety aspects is sent to Head Office for review in tripartite meetings. A separate Internal safety Organisation headed by a senior officer is working at Corporate Office to monitor the progress in this respect.
i) An internal Tripartite Safety meeting was conducted at Hyderabad on 27.9.88 to review the progress of implementation of recommendations of the VIth Conference on Safety in Mines. The meeting was attended by the Trade Union leaders, the representatives of the Management from different units and the Directorate General of Mines Safety. The Corporation is fully geared up to see that safety is given prime importance in all spheres of production and construction activities.

18. Raj Bhasha

Use of Hindi in 1988-89

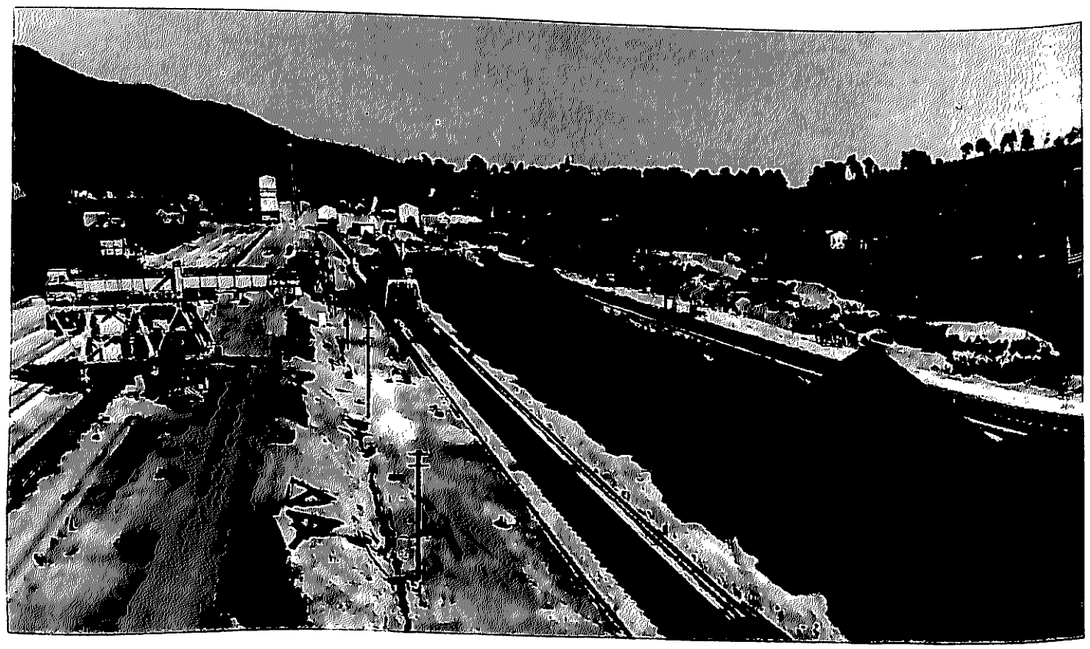
The provisions of Official Languages Act are complied with in promoting use of Hindi in the Corporation. In September 88, NMDC was awarded Raj Bhasha Trophy by the Hon'ble Minister of Steel and Mines, Shri M.L. Fotedar, for its outstanding performance in the promotion of the use of Hindi during 1986-87. NMDC also received Indira Gandhi Raj Bhasha Shield 1987-88 from Hon'ble Prime Minister Shri Rajiv Gandhi on 16th September 1988. This was given for excellent work done by NMDC among all public sector undertakings situated in category 'C' Region.

19. Welfare measures for people belonging to Scheduled Castes and Scheduled Tribes

The Corporation has on its rolls 6838 employees and out of this 2057 (30.08%) are scheduled Caste/scheduled tribe employees. Concessions are given to SCs/STs in direct recruitment and promotion as per Government of India directives. The Corporation also makes facilities for promotion of education among their children by offering free scholarships in local Kendriya vidyalayas and by providing free educational facilities to children of tribals who seek admission in the project schools. An exclusive school for tribal children has been started in Bailadila. All tribals near the project areas are afforded free medical facilities from project hospitals.

Non-employee scheduled tribes also avail themselves of the services of project cooperative societies. In Bailadila project, NMDC has constructed two permanent Community Centres at Kirandul and at Hill Top. Weekly film shows and other entertainments are provided. NMDC has provided 14 hand pumps and also has dug 37 wells in the near by villages in order to improve drinking water facilities.

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



A general view of Bailadila 5-FOH new Siding

Mandovi Pellets Limited

1.1 National Mineral Development Corporation (NMDC) is participating on behalf of Government of india in a Joint Sector enterprise, Mandovi Pellets Limited (MPL) which was set up in 1975 to produce 1.8 million tonnes of blast furnace grade iron ore pellets for export to Japan. The plant started production in 1979. SAIL and M/s. Chowgule and Company Private Limited (CCPL) each contributed ⅓rd of the equity capital of this Company. The remaining ⅓rd was to be contributed by the general public/financial institutions. Subsequently the shares of SAIL were transfered to NMDC.

1.2 MPL had entered into a long term agreement with the 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 pellet prices in the international market.

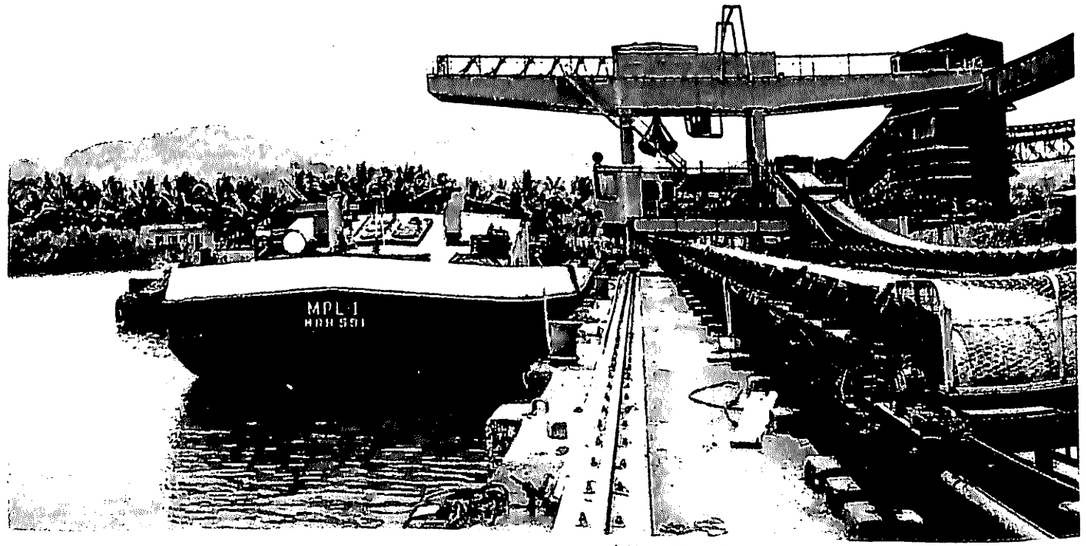
1.4 An agreement was executed whereby the Japanese Steel Mills agreed to take 2.3 million tonnes of iron ore fines instead of pellets for the year 1981-82. The JSM also agreed to pay a premium of $ 4.85 in 1981-82 per tonne approximately over and above the price of fines. Due to continued recession in the steel industry this agreement was further extended for another 3 years i.e., 1982-83 to 1984-85 but the premium was reduced to $ 4.5 per tonne of fines. The contract for supplying fines was assigned to M/s. CCPL who also paid contribution to MPL for this deal.

1.5 In February, 1985, MPL and JSM executed and agreed to purchase a total of 2.98 million DMT of iron ore with a total premium of US $ 14.35 million during 1985-86 and 1986-87. The long term contract was cancelled by mutual agreement without any further rights or obligations to either party. The shipments have since been completed by CCPL on behalf of MPL. The pellet plant continues to remain closed.

1.6 As there was little possibility at that time of reopening the pellet plant for production of pellets for export in view of sluggish price of pellets even upto 1986, MPL negotiated with SAIL to relocate the pellet plant near Bhilai Plant to convert BSP's iron ore into pellets to be supplied to BSP as blast furnace feed. Trials with 10,000 tonnes MPL pellets at BSP conducted in June/July 1986 proved encouraging and significant increase in blast furnace productivity and reduction in coke rate was established. The proposal of relocating the pellet plant at Bhilai did not, however, fructify as no acceptable solution could be found for financing the cost of relocation which was estimated at around Rs.50 crores

1.7 There has been a turnaround in the global steel industry situation from the beginning of 1987 and the international market for pellets has also shown signs of improvement. Following the growth in DR (Sponge Iron) production in South East Asia, Persian Gulf and Egypt, demand for DR grade pellets has picked up. At the same time a significant increase in demand for BF pellets has taken place in the European markets. MPL therefore proposed to the Government to be permitted to reopen the pellet plant as a 100% EOU and submitted an application to the effect in July 1988. The proposal included setting up a Captive Power Plant, imported

free of duty, and also import of fuel oil free of duty on continuing basis for process and power generation. The proposal has recently been approved. The plant is expected to re-commence production in about a year's time.



A View of the Ore Concentrate Unloading/Pellets Loadout Jetty

Metal Scrap Trade Corporation

Part-I

1.0 Introduction

The Metal Scrap Trade Corporation Ltd. (MSTC), a Government of India enterprise, is the canalising agency for export of ferrous scrap and import of Carbon Steel Scrap including Alloy Steel Scrap, Sponge Iron/Hot Briquetted Iron, Re-rollable Scrap and Old Ships for breaking. The Company is also responsible for 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 Present Activities & Objectives

2.1.1 Main activities of the Company through its two Operating Divisions, viz., Foreign Trade and Domestic Trade are briefly described as follows:-

2.1.2 Foreign Trade

i) Canalising import of Carbon Steel Melting Scrap, Alloy Steel Scrap, Sponge Iron/Hot Briquetted Iron, Re-rollable Scrap & Old Ships for scrapping,
ii) Export of Ferrous Scrap.

2.1.3 Domestic Trade

i) Disposal of Ferrous and miscellaneous scrap arisings from integrated steel plants (under SAIL)
ii) Disposal of Scrap and surplus stores from other Public Sector Undertakings and Govt. Deptts. The Corporation has also a Market Research & Development Division which basically aims at improving the quality of servicing through its market research & developmental activities. The main functions of this Division are by way of providing regular feedback about market development for items dealt by MSTC, by planning and execution of diversification and development plans and by servicing as data-bank for regular supply of statistics within the organisation.

2.2 While the major business policies and strategies are framed at the Head Office level, certain activities have been decentralised at the Regional level in the overall interest of servicing the scrap based industry. The major items of import purchases are dealt with at the Head Office level. The Regional Offices, however, are actively participating in the execution of policies and guidelines framed for smooth operation. In conformity with modern Management Principles & Practice, suitable guidelines and action plans had been drawn in the beginning of the financial year 1987-88.

Heavy Melting Scrap Imported from USSR

3.0 Performance & Results

3.1 Physical Performance

		Unit '000 Tonnes/Ldt		
		Actuals		
		1986-87	1987-88	Upto Dec. 1988-89
A. Import of				
A.	i) Carbon Steel Melting Scrap/Sponge Iron/HBI (including under NOC)	2482	1963	1693
	ii) Stainless Steel Scrap	5.5	6	0.10
	iii) Ships for breaking	386	149	168
B.	**Export of Mill Scale** Scrap	47	46	—
C.	**Home Sales Scrap arising of-**			
	i) Steel Plants	127	119	60
	ii) Other Public Sector Undertakings and Govt. Deptts (Auction/Tender Sale) (Rs. in lakhs)	Rs.5190	Rs.6518	Rs.6668

3.2 Financial Results

Rs. in crores

i) Gross Profit before Interest & Depreciation	10.45	10.31	9.36
ii) Interest & Depreciation	0.97	1.87	1.03
iii) Profit before tax	9.48	8.44	8.33

4.0 Special Achievements During 1987-88

4.1 Notable features during 1987-88 in terms of financial achievements are described briefly as under:-

4.1.1 The percentage of retained profit to turnover works out to 0.93% as against 0.82% in the previous year i.e. 1986-87.

4.1.2 After maintaining a steady rate of 20% dividend and all payments of taxes, the reserves of MSTC stand at Rs.14.08 crores as on 31.3.88 as against Rs.10.36 crores as on 31.3.87

4.1.3 Contribution to the National Exchequer was to the tune of Rs.4.60 crores during 1987-88. In addition, Rs.1.25 lakhs was contributed by the Corporation towards donation to PM Relief Fund and CM Relief Fund.

4.1.4 Generation of Internal resources rose from Rs.4.42 crores in the previous year to Rs.5.22 crores during the year under report, thus registering a significant increase of 18 percent.

5. Employment Statistics

5.1 The distribution of manpower at different centers including three Reginal offices of MSTC besides Head office at Calcutta as on 31.3.88 are given below:-

	Executive*	Non-Executive	Total
i) Head Office in Calcutta	61	126	187
ii) Regional Office at Bombay	10	14	24
iii) Regional Office at New Delhi	9	9	18
iv) Regional Office at Bangalore	7	10	17
	87	159	246

6.0 Diversification Plan

6.1 The company had undertaken plans to diversify its activities in the following projects:-

6.1.1 Equipment leasing: As a step towards achieving diversification of activities, MSTC procured equipments worth around Rs.4.93 crores upto the end of financial year 1987-88 and leased out the same to its Subsidiary company on an annual rental basis towards its programme for replacement and modification of old and obsolete equipments.

6.1.2 Scrap Yards The Corporation has decided to set up Scrap Storage Yards with processing facilities for imported scrap materials.

Ferro Scrap Nigam Limited

1. Introduction

Ferro Scrap Nigam Limited (FSNL) is a joint sector company under 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% being held by M/s. Harsco Corporation Inc, USA. The Company undertakes recovery and re-processing of scrap from slag and refuse dumps in the Steel Plants in Rourkela, Burnpur, Bhilai and Bokaro Steel Plants.

2. Overall Performance

The production performance of FSNL for the last two years and projected performance for the year 1988-89 and 1989-90 is given below:

Production Performance

Major Product	1986-87	1987-88	1988-89	1989-90
Recovery of Scrap (lakhs M.T.)	5.60	5.65	5.65	6.00
Value of Production (in Rs. crores)	1387.00	1567.00	1551.00	1746.00

3. Financial Performance

For processing the slag and for reclamation of Iron and Steel Scrap from the dumps/current arisings, FSNL gets service charges from the Steel Plants. During the year 1987-88 the Company earned a service charge income of Rs. 1567 lakhs resulting in a net profit of Rs.340 lakhs. The corresponding figures for 1986-87 are Rs.1387 lakhs from service charges and Rs.328 lakhs as net profit. The net profit for the year 1988-89 has been estimated to be Rs.339 lakhs. The net profit target for the year 1989-90 has been fixed at Rs.351 lakhs.

4. Sales Realisation

Sales realisation in 1987-88 and estimated sales realisation in 1988-89 and 1989-90 per M.T. is indicated below:-

1987-88	1988-89	1989-90
(Actuals) Rs. 271.76.	Rs. 287.43	Rs. 288.88

5. Future Programme

Keeping in view, the availability of the scrap arisings in the various Steel Plants, and huge quantity of Iron and Steel Scrap lying burried in the dumps of various Steel plants, FSNL has expanded the capacity in its existing units by augmenting the resources in terms of equipment, marginal manpower, etc. It also proposed to take up scrap processing in other Steel plants like Durgapur and Vizag, during the next five years. FSNL has already started scrap recovery in Bokaro since 1984-85 as a part of phased programme. It has drawn up a plan for replacement/renovation of the ageing equipments and procurement of additional machinery at an estimated investment of Rs.45 crores during VIIth Five Year Plan to meet these plans.

6. Efforts Made Towards Cost Reduction

(a) As a short term strategy, costs have been controlled by the following:

(i) Checking the Manpower strength at the present level;
(ii) Improvement in the machine availability through careful plant preventive maintenance;
(iii) Better material management operations; and
(iv) Quality improvement in the scrap recovered.

(b) The company with the help of IDPL Hyderabad has achieved success in the controlled crack initiation technology (CCIT). The process besides hastening the process of skull breaking, may result in reduction in consumption of Oxygen.

(c) In order to minimise the escape of metallics in the worked-through slag while recovering the scrap from the slag through separators, FSNL has introduced the double magnetic drum system in the 4 separators operated by it.

Hydraulic Excavator in action

Metallurgical & Engineering Consultants (India) Limited

1. Metallurgical & Engineering Consultants (India) Limited-(MECON) is the premier Design, Engineering and Consultancy Organisation in the Country rendering services to Iron & Steel Industry, Non-ferrous metals, Mining, Refractory, Cement, Power Plants, selected Chemical Plants, Ocean Engineering, Defence, general Engineering and Environmental Engineering. MECON's range of services include

i) Planning, analysis and reports
ii) Basic and detailed engineering
iii) Project and construction management including supervision of erection and commissioning services
iv) Design and supply of equipment and systems for Coke Ovens, Coke Dry Cooling Plants, Blast Furnaces and its auxiliaries, Basic Oxygen Furnace Gas cleaning Plants, Hot and Cold Rolling Mills, Processing Lines and Coal-based Chemical Plants.

2. Present Major Contracts

(a) Engineering & Consultancy Services:

— Consultancy and detailed engineering, contract engineering and project management services for the modernisation of Durgapur Steel Plant.
Engineering, consultancy project and construction management services for 880,000 T/yr gas based Direct Reduction Plant for Essar Steels.
— Consultancy and detailed engineering services, procurement assistance, project and construction management services for the 105,000 T/yr Lead Zinc Smelter Complex at Chanderiya for Hindustan Zinc Limited.
— Detailed engineering and consultancy services for the setting up of Jawaharlal Nehru Aluminium Research Development and Design Centre at Nagpur.
— Detailed engineering and consultancy services for the modernisation of ore crushing line at Ghatsila for Hindustan Copper Limited.
— Detailed engineering and consultancy services for the expansion of Dalli Mines of Bhilai Steel Plant.
— Engineering, consultancy, project and construction management and contract engineering services for important projects in the Defence Sector;
— Engineering and consultancy services for the Dolomite Brick plant at Visakhapatnam for Burn Standard Co. Ltd.
— Detailed engineering and consultancy services for production of coated sheets for Munak Galva Sheets Ltd.
— Basic design, detailed engineering, consultancy, erection, heating-up and commissioning of 7 metre tall Coke Oven Batteries and Dry Coke Cooling Plant for Visakhapatnam Steel Project.
— Design, engineering,. consultancy, heating up and commissioning of MECON-Design Coke Oven Batteries at Rourkela Steel Plant.
— Engineering and consultancy services for 4 MT expansion as well as debottlenecking schemes for Bokaro Steel plant.
— Environmental engineering including EIA and EMP studies to a host of industry including mines, steel plants, power plants, cement plants etc.

B. Equipment and System Design

— Design, dismantling, supply, erection, renovation, installation, testing and commissioning of plant and equipment for Coke Oven Battery No.9 Complex including By-product plant, coke and coal handling plant of Indian Iron & Steel Company, Burnpur.
— Design, engineering, supply, erection civil works and commissioning of Benzol Plant (30,000 T/yr) for visakhapatnam Steel Project
— Design, manufacture, supply, erection of 710,000 T/yr capacity Light & Medium Merchant Mill complete with mechanical and electrical equipment, associated auxiliary system, reheating furnaces for Visakhapatnam Steel Project.
— Design, supply of indigenous equipment and erection & commissioning of 4 strand Wire Rod Mill for Visakhapatnam Steel Project.
— Modification, design & supply of equipment for the blast furnace of Rourkela Steel Plant.
— Design, supply, erection and commissioning of Gas Cleaning Plant for converter shop No.1 & 2 of Visakhapatnam Steel Project.

3. Assignment Abroad

MECON is rendering Project Management and Technical services for construction of 1.3 MT per annum Integrated Steel Plant at Ajaokuta, Nigeria. At present more then 60 MECON engineers are deputed in Nigeria for this job. The contract for rendering MECON's services has been extended upto May, 1990.

4. Finance

The authorised capital of the Company is Rs.4.00 crores and issued, subscribed and fully paid up equity share capital is Rs.2.02 crores.

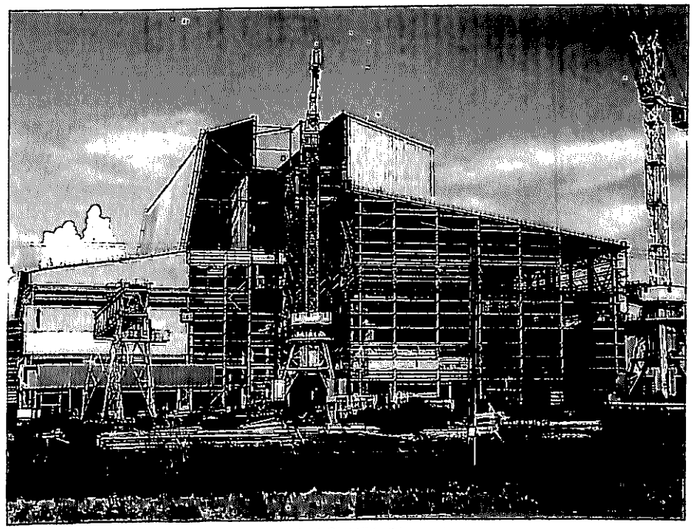
5. Working Results

The turnover of the company during 1987-88 was Rs.78.70 crores against Rs.77.29 crores during 1986-87. The profit of the year was Rs.13.85 crores as against Rs.12.97 crores during 1986-87.

The budgeted turnover for the current year (Revised) is Rs.86.28 crores and the profit is estimated to be Rs.8.15 crores.

6. Contract Labour Position

The company does not normally appoint contract labour for its activities.



Blast Furnace Shop Under Erection at AJAOKUTA (Nigeria)

7. Industrial Relations and Workers participation

The Industrial Relations situation in MECON during the year has been good. This has been possible because of healthy cooperation existing between the MECON Management and the MECON Employees' Union.

A system of participation in the management by the employees both at departmental and corporate levels exists in the company. Various Zonal Committees at the departmental level discuss the subjects related to jobs, organisation, quality of work etc., and send their suggestion to the higher management wherever necessary. Besides, there are other Committees to cover the issues relating to welfare, housing, medical, schools, sports, provident fund and gratuity etc.

In addition to the above, the Management also keeps constant touch with the Employees' Union and Association at the corporate level in order to brief them about the work situation and prospects relating to the growth of the organisation and other problems.

8. Capacity Utilisation

MECON is an engineering organisation and not a manufacturing unit. Its main assets are a team of competent and qualified engineers technical staff. The company

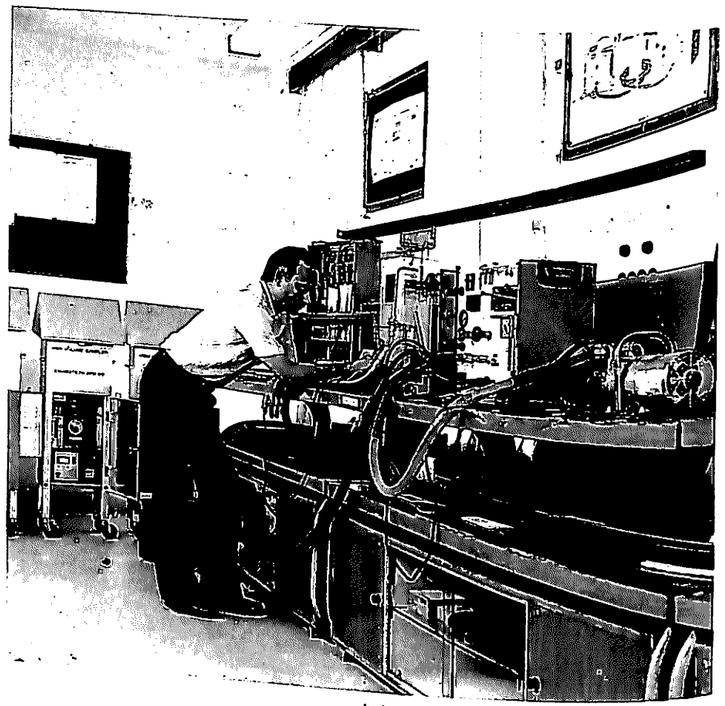
has at its disposal about 2.7 million engineering manhours and 0.82 million drafting manhours per annum. In terms of preparation of working drawings, MECON has the capacity to prepare about 25000 working drawings per annum. Capacity utilisation of engineering manhours during the year 1988-89 (upto December) has been around 85.7% on chargeable jobs of which detailed engineering jobs represent about 33.5%.

9. Towards Cost Reduction

In order to have an effective control on cost, all efforts are made to keep the manpower at the minimum required and there has been no significant addition to the manpower during the year. The existing manpower resources are put to maximum use and the manhours on each job are closely monitored by the use of the inhouse computer. The expenses on overtime allowance, travelling, advertisement, seminars, stationery etc. are constantly reviewed for effecting economy in these areas.

10. Efforts made towards Indigenisation

Over the last 30 years, the Company has developed expertise far beyond what is normally understood as consultancy and engineering services. It has contributed in a major way in bridging the technological gap in the country in the "HIGH TECHNOLOGY" areas for



In-house Pollution Control Laboratory, Ranchi

Metallurgical Industries. In this connection besides its own development, the Company has entered into basic know-how licence/cooperation agreements with various foreign companies. MECON has been doing pioneering work in Technology transfer and technology absorption of high technology in various fields.

The 4.0 MT expansion of Bhilai Steel Plant for which MECON rendered consultancy, detailed engineering services and supervisory services during the erection& commissioning of the various units, MECON's effort has brought down the import content in structurals and refractories to NIL. For the mechanical & electrical equipment the imported components accounted to nearly 19% as against 82% during the expansion of BSP from 1 Mt to 2.5 Mt stage.

Similarly, in the design and supply of equipment & systems for rolling mills, processing lines, BOF Gas cleaning plant, Coal chemical plant the import content is confined only to proprietory items/items for which no manufacturing facility existed in the country. In the area of Blast furnace & auxiliaries MECON has developed bellow type compensator for tuyere stocks. These have been supplied to Bhilai and Rourkela Steel Plant.

11. Welfare Measures

The company has a well planned township at its headquarter at Ranchi which meets housing need of 71% of the employees posted at Ranchi. There is a well equipped 50 bedded hospital which provides free medical facilities to employees and their family members. A higher Secondary School providing free education to nearly 3734 children upto Class XII. There are various facilities for cultural activities, sports, games, etc. for employees and their family members. The company provides medical and educational facilities to employees which include reimbursement of expenses in other places where the company has an office but no townships of its own.

12. Responsibilities Towards Society

The Company pays proper attention for peripheral development of its surrounding areas which is situated in a tribal belt of Chotanagpur.

It pays regular scholarship' text book/grants to the meritorious students of two schools in the neighbouring villages besides grants to various schools at Ranchi. The company has adopted two villages in the neighbourhood of Ranchi and has been extensively helping the tribal people of these villages for their economic upliftment, improvement of road, street lighting, sanitary condition etc. Besides this company is intending to adopt two more villages Peridih & Chana in Namkum Block for rural development. The company is acting as the major driving force in maintaining the Cheshire Home of India, Ranchi which looks after nearly 40 chronically sick, permanently disabled, crippled and destitute persons.

13. Manpower Position

The growth of the technical manpower of MECON over the last decade has been phenomenal. In 1970 MECON's technical strength was only 600 comprising 400 engineers and 200 drafting personnel. Presently MECON's technical manpower strength is over 2222 comprising 1747 qualified engineers and about 475 drafting personnel. Besides this, the supporting technical/non-technical manpower of the company is 1640 making a total manpower strength of MECON 3862. The total number of employees in the company as on December' 88 is 3862 out of which 235 are Scheduled Caste and 440 are Schedule Tribes.

One of the Engineering Offices of MECON, at Ranchi

Visakhapatnam Steel Project

1. Project Profile

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.

This 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 mix
- 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 viability. As against the revised estimated cost of about Rs. 7,500 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 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 individiual 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. The major problem arises due to the delay in the availability of water for the steel plant from Yeleru Water Supply Scheme which is being implemented by the Andhra Pradesh Govt. Besides, the performance of some of the agencies working for the above project is not fully satisfactory. The delay in the procurement of certain critical equipments from USSR is the other constraint. Every possible effort is being made to get over these problems.

3. Product Mix Under The Rationalised Concept

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	2656,000
Pig Iron for Sale 555,750	

4. Progress of Construction

The Progress of construction at site in major areas upto December, 1988 as compared to scheduled quantities was as follows:

Item of Work	Cumulative Percentage Progress of the Project	
	Stage-I	Total Project
Concreting	100.4	100.8
Structural fabrication	99.5	97.4
Structural erection	95.3	92.3
Equipment ordering	99.7	103.7
Equipment erection	84.6	88.4
Refractory erection	95.0	87.7

5. Progress of External Infrastructural Facilities

(1) Rail Facilities

The progress for the provision of railway facilities for VSP is being made as per the schedule. Most of the facilities for Stage-1 of the Project have, in fact, been provided already. A particular mention may, in this connection, be made of the 200 KM Koraput-Rayaguda Railway Line which is being constructed for the transportation of iron ore from Bailadila to VSP site. It is expected that this Railway Line will be completed by March, 1991. Until then, the existing Koraput-Kotavalsa Railway Line will be used for transporting iron ore for the steel plant.

(2) Coking Coal

As per the equipment design, the blend ratio of coking coal to be used at VSP would be 35% indigenous prime, 20% imported prime & 45% indigenous medium. For indigenous prime coking coal, VSP has been linked to Pootkee and Bhalgora Washeries. However, until these Washeries become fully operational, the requirements of prime coking coal to the extent necessary, would be met through imports. The supplies of Medium coking coal would be made to VSP from Rajrappa and Gidi Washeries.

(3) Boiler Coal

Anantha Mines would be the source of supply for boiler coal to VSP. To begin with and until Anantha mines become operational, the supplies of boiler coal will be made from Ib valley in Talcher Coal-fields.

(4) Water

Andhra Pradesh Government is implementing the Yeleru

LD Converter No 1 (SMS) Steel Melting Shop

Water Supply Scheme for the supply of water to VSP. The scheme was scheduled to be completed by June, 1988 but this did not materialise. The assurance now given by the State Government is that the Yeleru Water Supply Scheme would be completed by May, 1989 and water for VSP would be released by June 1989.

(5) Power

The power requirements will be met partly by VSP's own generation and the balance from APSEB. For this purpose, a sub-station is in the process of being constructed by NTPC and APSEB. It is expected that the construction would be completed by December, 1991.

(6) Port Facilities

For handling imported coking coal, the question of providing additional facilities at Visakhapatnam Port is under consideration. For the present, however, the imported coal will be handled through inner harbour of Visakhapathnam Port.

(7) Iron Ore

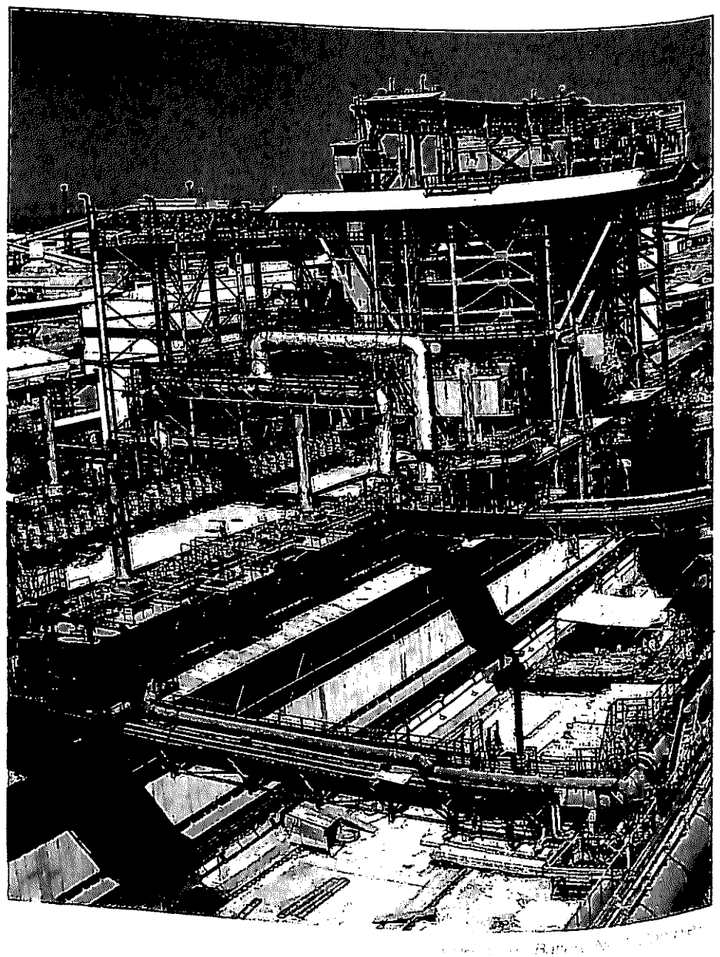
VSP's requirements of iron ore will be met by NMDC from its Bailadila mines. For this purpose, VSP and NMDC will be entering into a formal agreement.

(8) Dolomite

For SMS Grade dolomite, VSP will get the requisite supplies from its captive mines at Khammam. As regards Blast Furnace Grade Dolomite supplies would be made by M/s Bisra Limestone Company. An agreement to this effect has already been executed between the two companies.

6. Budget and Expenditure

The total budget allocations for 1988-89 was Rs.640 crores, including an amount of Rs. 50 crores made available, to the Project from extra budgetary resources. The actual expenditure during the year upto December, 1988 was Rs. 643.84 crores, including foreign exchange component of Rs. 144.35 crores. The cumulative expenditure upto December, 1988 was Rs. 4,557.44 croes.



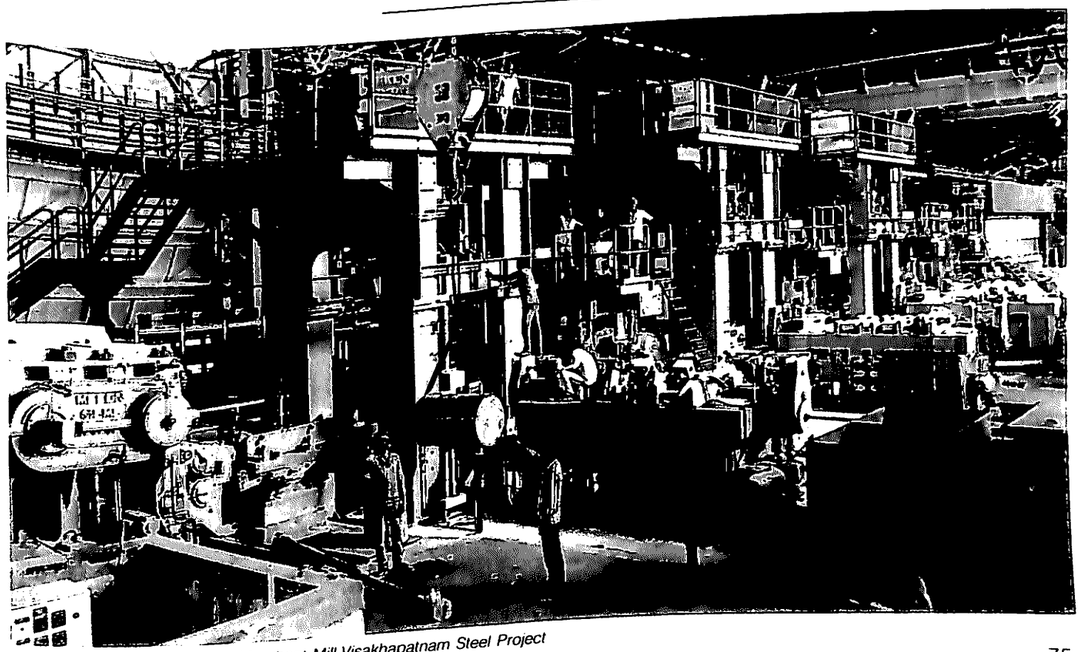
7. Environmental Pollution Control

The Project has been cleared from the environmental angle both by the State Government as well as by the Central Government. In terms of these clearances, VSP is taking several measures to ensure that the environment is properly protected and preserved. An amount of about Rs. 360 crores is expected to be spent on different pollution control measures. This includes a massive afforesatation programme. For the year 1988-89, VSP had drawn up a programme for planting 5 lakh trees out of which 4 lakh trees have already been planted.

8. Personnel and Manpower

The total number of the employees of the project as at the end of December, 1988 is 8601 of which 1120 are executives, 303 Management Trainees, 3489 non-executives and 3689 trainees. As on 31.12.1988, 3145 displaced persons (including 1470 trainees) have been provided employment in the company. The representation of SC/STs, Ex-servicemen, Physically handicapped persons and women employees as on 31.12.1988 in the employment is as given below:-

Group	Total Employees	SC	ST	EX-S.	PH	Women
'A'	1423	148	12	03	01	22
'B'	271	33	02	10	04	03
'C'	2895	426	41	136	23	81
'D' (Excluding sweepers)	223	35	34	34	01	15
'D' (Sweepers)	100	25	03	02	01	03
Total	4912	667	92	185	30	124
Trainees	3689	391	161	—	12	—



Mill Stands-Light and Medium Merchant Mill-Visakhapatnam Steel Project

Neelachal Ispat Nigam Limited

In October, 1980, Government decided in principle to set up the second steel plant in Orissa. Accordingly Government formed Neelachal Ispat Nigam Limited. (NINL) 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 Pardip port, was changed to another in Daitari region.

The total provision in the VII Five Year Plan for new steel plants, which includes the Neelachal Ispat Nigam Limited is only Rs. 10 crores. With this meagre allocation, it has not been possible to take any substantive steps for setting up this plant so far.

Vijayanagar Steel Limited

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 the Bellary Hospet area. Accordingly, in December, 1982, a seperate Company, Vijayanagar Steel Limited was incorporated.

The total plan provision in the VII Five Year Plan for new steel plants, which includes the Vijayanagar Seel Ltd., is only Rs. ,10 crores. With this meagre allocation, it has not been possible to take any substantive steps for setting up this plant so far.

Hindustan Steel Works Construction Limited

1. Hindustan Steel Works Construction Limited (HSCL) was established in 1964, under the Ministry of steel and Heavy Industry as a construction agency of the Government of India with the objective of creating an organisation in Public Sector to undertake execution of modern integrated Steel Plants. Since its inception HSCL has diversified its activities over the years and has developed capabilities and infrastructure to undertake, besides setting up integrated Steel Plants, Townships, Buildings, Industrial Plants, Bridges, Highways, Dams, Power Plants, Coke Oven and Chemical Plants, Silos, Chimneys, Dry Docks and Water Front Structures, Mining Complexes etc. It has also attained the capabilities to undertake complex industrial plants on turnkey basis.

2. Finance

The Authorised and Paid-up Share Capital as on 31.12.1988 was Rs. 20 Crores.

3. Performance

The working results of the Company during 1987-88 and 1988-89 are given below:-

(Rs. in crores)

		1987-88	1988-89 (anticipated)
A.	Turnover	184.88	185.00
B.	Profits	(-) 12.10	(-) 10.96

Note: The loss has not taken into account the interest on Govt. loan, which is Rs. 13.23 crores for 1987-88 and Rs. 11.47 crores for 1988-89.

4. Manpower Strength

The manpower position of the company as on 31.12.1988 is given below:-

Group	Total Strength	SC/ST	%	Female employ-ees	Ex-service men	Physi-cally Handi-capped
A.	2015	88	4.0	8	6	1
B.	700	49	7.0	10	3	1
C.	15350	2238	14.6	202	192	35
D.	3360	3310	98.5	1220	4	11
Total	21425	5685	26.5	1440	205	48

Due to reduction in work load in the steel sectors, a large number of employees have become redundant to the present requirement of various jobs. Many of such employees have been developed by diversification to non-steel sector. Company has been able to reduce its manpower by 1010 through Voluntary Retirement Schemes introduced in June, 1986.

5. Contract Labour Position

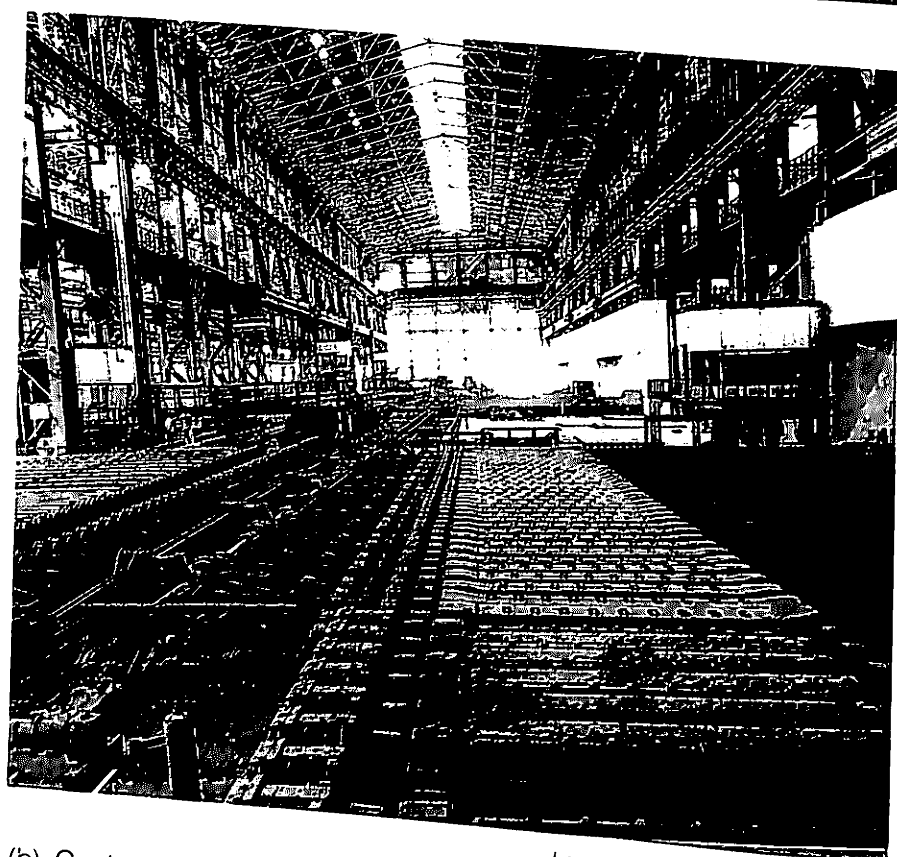
With the reduction of work in the Steel Sector, and with greater involvement of departmental workers in all the Steel Plant Works of the Company, the indirect labour force engaged by PRWs/Contractors has been reduced. The jobs for which outside agencies are employed are mostly in the Civil Engineering area. In other discipline, 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 including the work of Navodaya Vidyalayas awarded to the company during the year. The strength of PRWs/Contractor Workers in the company is 14,700 as on 31.12.1988.

6. Safety Measures

To emphasize the importance of safety in the operation especially in the Steel Sector such as Blast Furnace, Erection and Materials handling jobs, two safety seminars at Calcutta at BS City were held.

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

(a) Safety Organisations are functioning in all the major units.



Largest Plate Mill, Bhilai Steel Plant

(b) Contracts/PRWs engaged at various HSCL sites are appraised of the safety measures and implementation of safety measures are constantly monitored. Employees are educated, advised and instructed to use safety appliances which are made available by the Company for execution of hazardous jobs.

(c) Periodic seminars are also conducted to acquiant the Personnel with latest safety measures and to review the safety requirements of various work sites in HSCL.

7. Workers Participation in Management

There are various forums for ensuring workers' participation in Management. The apex Level Joint Forum which comprises of the management of HSCL and the Trade Unions meet regularly to discuss important matters.

8. Welfare Plant for SC/ST

(a) Such employees are exposed to various management developments and training programmes.

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

(c) Assistance is given for supply of drinking water.

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

(e) Children of SC/ST employees get due preference in the matter of schooling at Projects where short term construction work is to be undertaken.

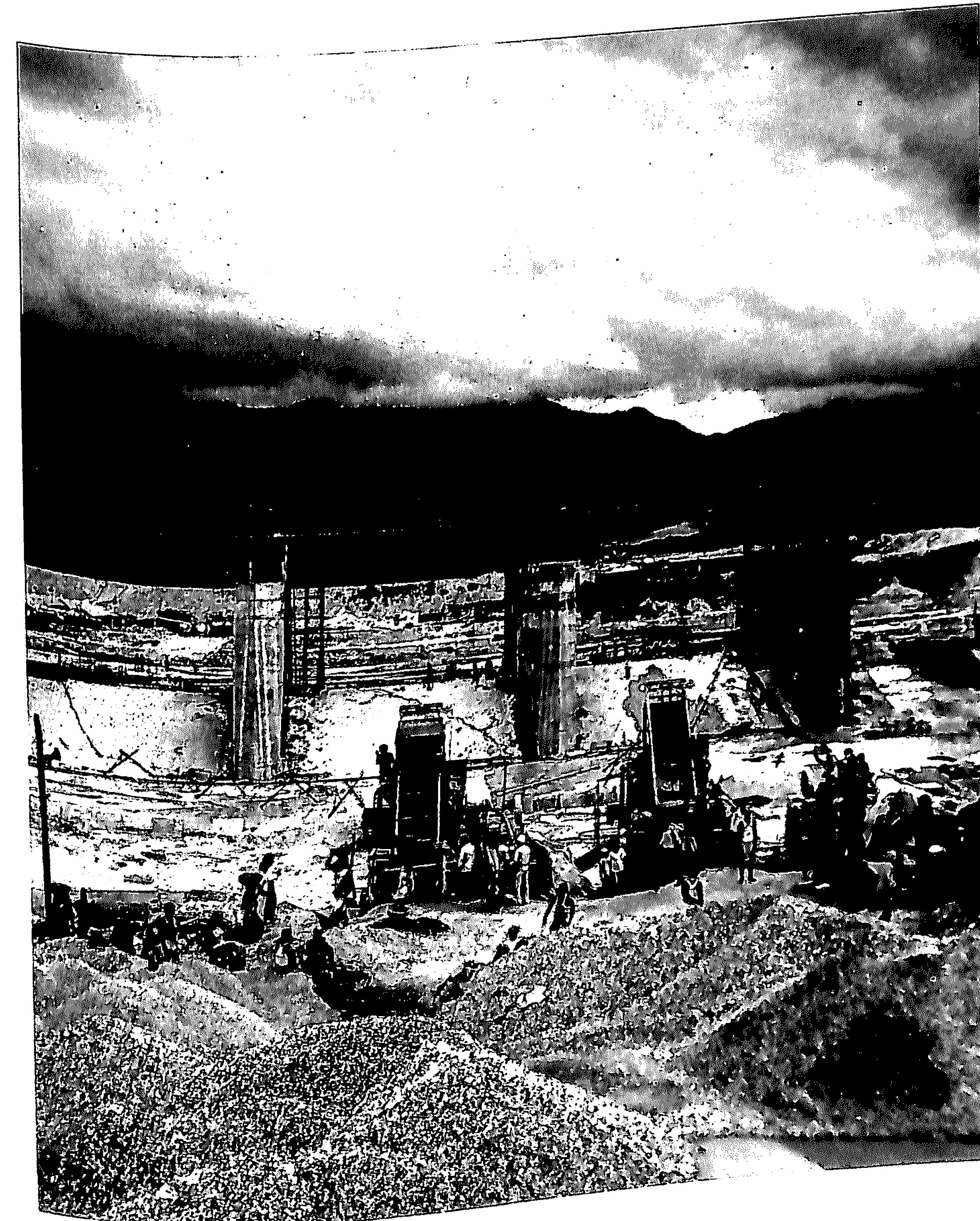
9. Welfare Schemes

(i) Service Linked Advancement Scheme

To foster effective working and remove stagnation a Service Linked Advancement Scheme was introduced in the Company with effet from 1st April, 1987. The Scheme covers all non-executives and workers. So far around 6,000 employees have been benefitted under the scheme.

(ii) Employees' Voluntary Welfare Scheme

A Central Welfare Fund Scheme for HSCL employees was introduced w.e.f. 1.4.1987. It covers all sections of employees in the Company. The scheme is intended to provide immediate financial assistance to the dependents of employees in the event of death while in service. So far 39 nominees of the deceased employees have been benefitted under the scheme.



Piers Constructed for [illegible] Bridge [illegible] (U.P.)

Companies of the Bird Group

The erstwhile Bird and Company Ltd. has been taken over by Govt. w.e.f. 25th Oct., 1980. Under section 4 (1) of the Bird and Company Ltd., (Acquisition and Transfer of Undertakings and other Properties) Act, 1980., shares held by the Bird and Company Ltd., in certain other Companies specified in Schedule-1' to the Act stood transferred to the Central Government.

The Deptt. of Steel looks after the affairs of the some of the companies of the Bird Group as a share holder on behalf of the President. These companies are listed below:

(1) Orissa Minerals Development Company Limited.
(2) The Karnapura Development Co. Ltd.
(3) The Kumardhubi Fireclay and Silics Works Ltd.
(4) The Bisra Stone Lime Company.
(5) Eastern Investment Ltd.

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

I. The Orissa Minerals Development Company Ltd.

The Orissa Minerals Development Company Ltd., is engaged in the mining of iron ore and manganese ore. The company is operating in the Barbil area in district Keonjhar in Orissa. The Iron and Manganese Ores are supplied to Steel Plants, mainly Durgapur Steel Plant.

The performance of the company during 1987-88 and 1988-89 is given below:

Quantity : In lakh tonnes
Rupees : In crores

	1987-88	1988-89 (anticipated)
Production	6.36	6.40
Turnover	5.80	7.07
Profit/Loss	(-) 0.53	(-) 0.44

II. The Bisra Stone Lime Company Ltd.

It is engaged in the mining of limestone and dolomite. The Company has mining leases in Sundergarh District of Orissa. It supplies limestone and dolomite to the Steel Plants at Durgapur, Burnpur and Rourkela.

The performance of the company during 1987-88 and 1988-89 is given below:

Quantity : In lakh tonnes
Rupees : In crores

	1987-88	1988-89 (anticipated)
Production	9.98	9.60
Turnover	11.15	10.36
Profit/Loss	(-) 5.38	(-) 1.52

The Company has introduced a voluntary Retirement Scheme to bring about reduction in staff to match its despatches. This scheme has had a good response and a reduction of about 1000 in the work-force has been achieved. In addition, the company has entered into a long term contract for supply of dolomite for Visakhapatnam Steel Project.

Till January, 1989, the company has been given financial assistance of Rs. 3.02 crores during 1988-89.

III. The Karanpur Development Company Ltd.

The Company is presently engaged in the mining of lime stone and clay. During the year 1988, it produced 110,700 tonnes of limestone, as compared to production of 91,510 tonnes of limestone during 1987.

IV Scott and Saxby Ltd.

This company is fully owned subsidiary of Karanpur Development Company Ltd. Its activities are sinking of deep tubewells, soil testing, construction of tubular structures, supply of pumps and spares, repairing and maintenance of pumps and tubewells, laying of pipelines for supply of water in plantations for drinking and industrial use in factories and for irrigational purpose and trading in pumps, motors and spares and their installation.

The performance of the company during 1987-88 and 1988-89 is given below:

Rupees in crores

	1987-88	1988-89 (anticipated)
Turnover	0.96	1.48
Profit/Loss	(-) 0.36	(-) 0.39

Financial assistance of Rs. 0.22 crores given in 1988-89.

V. The Kumardhubi Fireclay and Silica Works Ltd.

It is one of the major producers of refractories of the country. It has an installed capacity of 1,35,006 tonnes of refractories, mainly fire-bricks, high alumina bricks, silica bricks and castables. During 1987-88, it produced 35,188 tonnes of refractories as compared to a production of 59,439 tonnes during the previous year. It incurred a net loss of Rs. 1.42 crores during the period. The corresponding loss during the previous year was Rs. 1.77 crores. The main problem faced by the company is shortage of working capital leading to non-availability of raw materials, essential spare parts for sustaining production and meeting the emergency as well as regular maintenance requirements of plants and machineries. Upto Jan., 1989, the company has been given financial assistance of Rs. 60.00 lakhs.

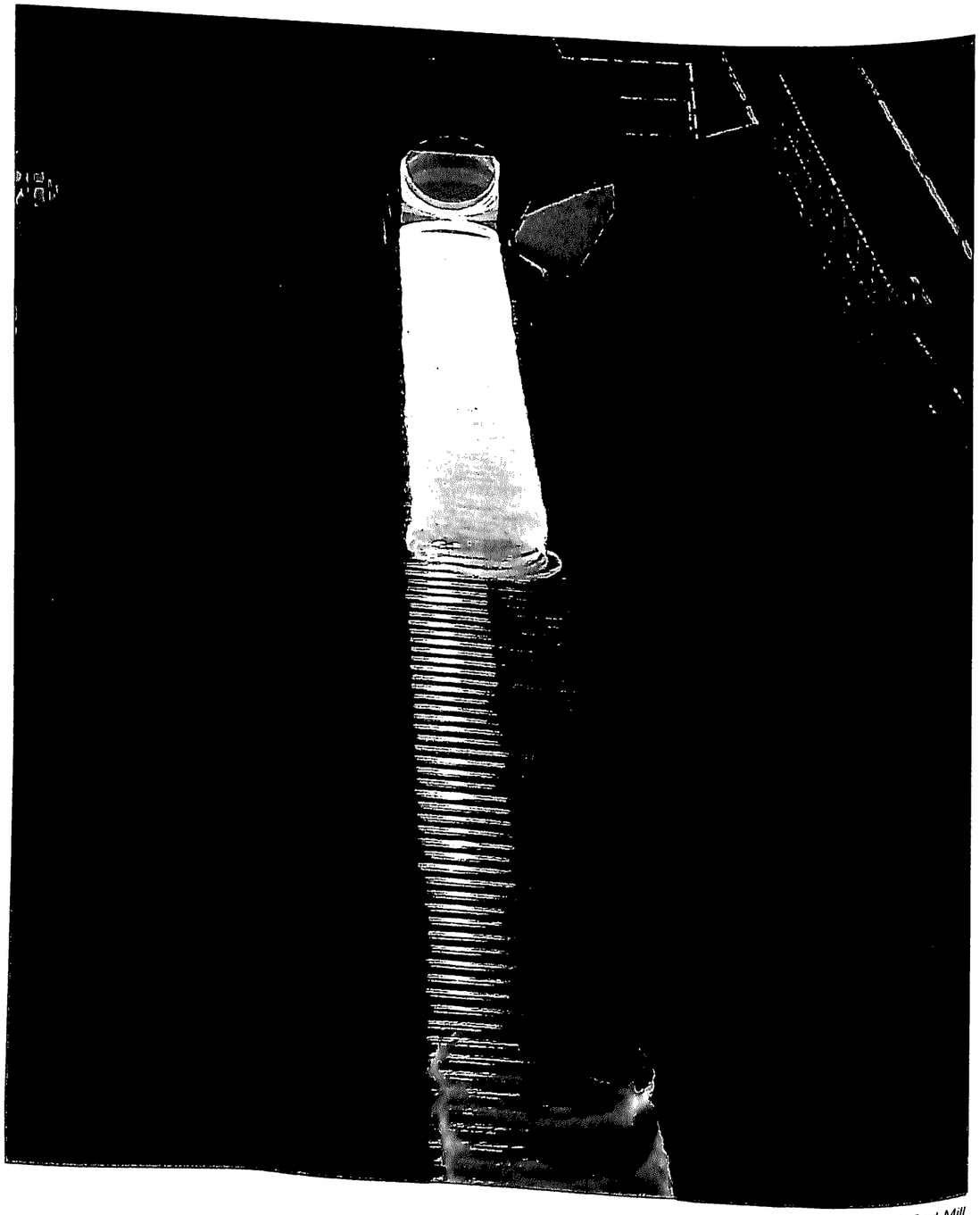
VI Eastern Investment Ltd.

It is an investement company with income from dividend 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. The company incurred a loss of approx. Rs. 66,000/- in 1987.

Outlay for central industrial and mineral projects in the Seventh Five Year Plan

S.NO.	Name of the Undertaking	(Rs. in Crores) 7th Plan (1985-90) Outlay
1.	2.	3.
	DEPARTMENT OF STEEL	
A.	**IRON & STEEL**	
1.1	**Bhilai Steel Plant**	
1.1.1	Continuing Schemes	**906.33**
1.1.2	Replacement & Renewals	621.33
1.1.3	Modernisation and New Schemes	100.00
1.14	Township and other programmes	180.00
1.2	**Bokaro Steel Plant**	5.00
1.2.1	Continuing Schemes	**774.01**
1.2.2	Replacement & Renewals	554.01
1.2.3	Modernisation & New Schemes	55.00
1.2.4	Township and other programmes	160.00
1.3	**Durgapur Steel Plant**	5.00
1.3.1	Continuing Schemes	**688.03**
1.3.2	Replacement & Renewals	28.03
1.3.3	Modernisation and New Schemes	190.00
1.3.4	Township and other programmes	460.00
1.4	**Rourkela Steel Plant**	10.00
1.4.1	Continuing Schemes	**674.20**
1.4.2	Replacement & Renewals	166.20
1.4.3	Modernisation & New Schemes	143.00
1.4.4	Township and other programmes	360.00
1.5	**Alloy Steels Plant**	5.00
1.5.1	Continuing Schemes	**94.23**
1.5.2	Replacement & Renewals	66.23
1.5.3	Township & other programmes	23.00
1.6	**Salem Steel Plant**	5.00
1.6.1	Continuing Schemes	**16.06**
1.6.2	Replacement & Renewals	10.06
1.6.3	Township & other programmes	5.00
1.7	**Indian Iron & Steel Company & IISCO-Ujjain**	1.00
1.7.1	Continuing Schemes	**215.14**
1.7.2	Modernisation & New Schemes	73.14
1.7.3	Replacement & Renewals	52.00
1.7.4	Township and other programmes	83.00
1.8	**Research & Development Centre**	7.00
1.8.1	Continuing Schemes	**90.44**
1.8.2	Modernisation & New Schemes	38.44
1.8.3	Township and other programmes	50.00
1.9	**Central Marketing Organisation**	2.00
1.9.1	Continuing Schemes	**48.00**
1.9.2	Replacement & Renewals	12.00
1.9.3	Modernisation & New Schemes	8.00
1.9.4	Township and other programmes	26.00
1.10	**Corporate Office, CET & MTI**	2.00
1.10.1	Continuing Schemes	**18.00**
1.10.2	Modernisation & New Schemes	5.00
1.10.3	Township and other programmes	5.00
		8.00

1.	2.	3.
1.11	**Visvesvaraya Iron & Steel Co. Ltd.**	**51.24**
1.11.1	Continuing Schemes	1.24
1.11.2	Modernisation and New Schemes	50.00
1.A.	**STEEL AUTHORITY OF INDIA LTD.**	**3575.68**
1.A.1	Continuing Schemes	1575.68
1.A.2	Replacement & Renewals	607.00
1.A.3	Modernisation & New Schemes	1343.00
1.A.4	Township and other programmes	50.00
1.12	**RASHTRIYA ISPAT NIGAM LTD.**	**2500.00**
1.12.1	Continuing Schemes	2500.00
1.13	**SPONGE IRON INDIA LTD.**	**31.80**
1.13.1	Continuing Schemes	1.80
1.13.2	Replacement & Renewals	5.00
1.13.3	Modernisation and New Schemes	25.00
1.14	**METALLURGICAL & ENGINEERING CONSULTANTS (INDIA) LIMITED**	**8.00**
1.14.1	Continuing Schemes	3.00
1.14.2	New Schemes	5.00
1.15	**HINDUSTAN STEEL WORKS CONSTRUCTION LIMITED**	**24.66**
1.15.1	Continuing Schemes	14.66
1.15.2	Replacement & Renewals	10.00
1.16	**BHARAT REFRACTORIES LIMITED**	**45.99**
1.16.1	Continuing Schemes	5.99
1.16.2	Replacement & Renewals	25.00
1.16.3	Modernisation & New Schemes	15.00
1.17	**METAL SCRAP TRADE CORPN. (Modernisation and New Schemes)**	**10.00**
1.18	**NEW STEEL PLANTS**	**10.00**
1.19	**LOAN TO STATE GOVTS. FOR TENUGHAT & MAHANADI**	**14.00**
A	**TOTAL IRON & STEEL**	**6220.13**
B.	**FERROUS MINERALS**	
1.20	**NATIONAL MINERAL DEVELOPMENT CORPN.**	**145.30**
1.20.1	Continuing Schemes	39.38
1.20.2	Replacement & Renewals	45.00
1.20.3	Modernisation & New Schemes	54.00
1.20.4	Township and other programmes	6.50
1.21	**KUDREMUKH IRON ORE. CO. LTD.**	**18.45**
1.21.1	Continuing Schemes	16.45
1.21.2	Replacement & Renewals	2.00
1.22	**MANGANESE ORE (INDIA) LTD.**	**18.80**
1.22.1	Continuing schemes	0.30
1.22.2	Replacement & Renewals	8 .00
1.22.3	Modernisation & New Schemes	8.00
1.22.4	Township and other programmes	2.50
1.23	**MINERAL DEVELOPMENT BOARD**	**5.00**
1.23.1	Modernisation & New Schemes	5.00
1.24	**LOANS TO KARNATAKA GOVERNMENT FOR ROAD & POWER SCHEMES OF KUDREMUKH PROJECT**	**12.45**
1.B.	**TOTAL FERROUS MINERALS**	**200.00**
	GRAND TOTAL DEPARTMENT OF STEEL	**6420.13**



View of Bar & Rod Mill

6. Private Sector

1. Tata Iron and Steel Company Limited

The Tata Iron and 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 an iron ore mine at Noamundi in Bihar. M/s TISCO embarked on an ambitious modernisation programme in 1980 and commissioned first phase of modernisation in March, 1983. Presently they are implementing Phase II, of their modernisation programme. Under Phase II, M/s TISCO have installed a new bar and rod mill of 3,00,000 tpa capacity. After completion, their saleable steel capacity has increased to 2.1 mtpa from 1.74 mtpa, achieved in Phase I. M/s TISCO have received an approval in principle to expand their saleable steel capacity from 2.1 mtpa to 2.7 mtpa under phase-III modernisation plan.

2. Production

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

(tonnes)

	April 89/ January 89	April 87/ January 88	Change	
Hot Metal	1855,800	1649,700	2,06,100	(+ 12.49%)
Liquid Steel	1920,100	1877,700	42,400	(+ 2.2%)
Saleable Steel	1606,100	1517,900	88,200	(+ 5.8%)
Semis %	47.7%	51.85%		

It may be noted that the production of saleable steel has been higher by 88,200 tonnes. Subject to availability of inputs, particularly Power, Coal, Coke, Iron Ore the gross production of saleable steel is expected to be over 3,14,000 tonnes in remaining two months. This year, TISCO is expected to have the highest ever production of saleable steel of 1.92 million tonnes. This output is all the more creditable with a lower percentage of semis.

Eventhough power supply from Public Utility (DVC) was lower by about 5.66%, by maximising the captive generation including that from their newly installed D.G. Sets and with optimal distribution & utilisation of power monitored by a computer model, increased production with a lower percentage of semis could be achieved. Higher production by the Continuous Caster has also helped in this direction though it was out of operation for 20 days. The Crude Steel production which has maintained a lead compared to the corresponding period of previous year is also expected to reach an all time high.

In this regard, it is worth mentioning that the production and productivity of Blast Furnaces have been outstanding.

In the current year, it has been possible to maintain such a high level of output with the help of imported raw-materials as indicated below:

		Lakh-t used in 1988 (April to December)
a.	Coal	4.85
b.	Limestone	1.58
c	Dolomite	0.49

3. Financial Performance

Tata Steel has reported a profit before tax of Rs. 71.94 crores for the period April-September, 1988 as against profit of Rs. 34 crores during the corresponding period of 1987. The envisaged capital outlay for the financial year is Rs. 225 crores.

The spiralling costs, mostly due to factors beyond the control of the company, have been absorbed to some extent by well planned and sustained cost control efforts.

4. Modernisation Phase I

The performance of all the major units installed under Modernisation Phase I, viz. L.D. shop, Lime calcining, Tar Dolo, Oxygen Plant and Bar Forging Unit is quite satisfactory eventhough the VADR Unit at LD shop has been adversely affected due to power constraint.

5. Modernisation Phase II

A major facility under Modernisation Phase II. Bar and Rod Mill with 3,00,000 tpa capacity is now geared to produce almost all the grades and sections of products envisaged, with good quality, at near rated capcity. The Waste Recycling Plant is also operating at its rated capacity. The other major facilities like coke oven Battery No.7 with Stamp Charging arrangement, the new Sinter Plant of 1.37 mtpa capacity. the Bedding & Blending Yard and the New Coal Handling Plant have also been commissioned recently and these units are on trial-run

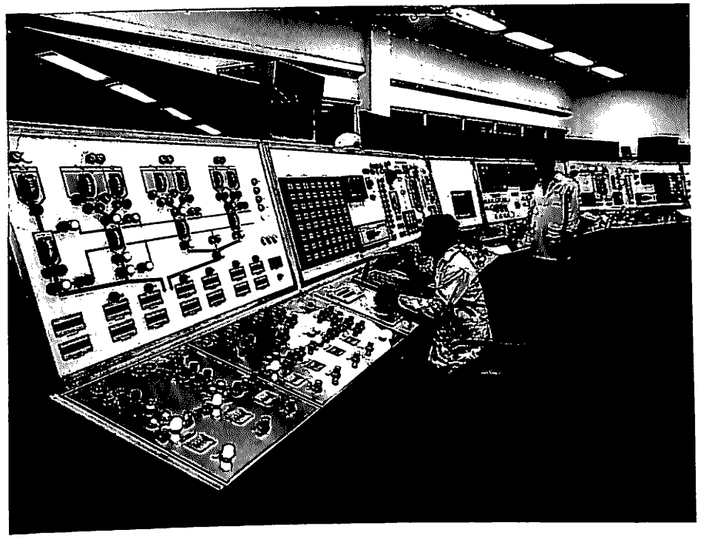
The KORF High Intensity Oxygen Technology introduced at the Steel Melting Shop No. 3 Open Hearth furnaces last year, has stablised at 4.5 heats/day with resultant benefit of reduced fuel-rate and cycle-time. Due to the promising results obtained so far, plans are afoot to convert more O.H. Furnaces to KORF process.

6. Industrial Relations

Harmonious Industrial relations continue at TISCO. This is significantly aided by the effective functioning/contribution of the Joint Department Council. which have gone up to 47 in number during the year.

7. Energy Conservation

Energy Conservation is given special attention at Tata Steel. There have been several landmarks in the Works Operations during the period under review. At Blast Furnaces. the coke rate has reduced to 727 kg/t from 743 kg/t and the heat consumption has been brought down from 3.43 K.cal/t to 3.37 K.cal/t. The overall fuel rate has increased from 9.374 to 9.667 G.cal/t of Crude Steel, due to higher Iron to steel ratio and lower production of semis. Fuel rates have shown a significant downward trend at Steel Melting Shop No. 3, Blooming Mills, Merchant Mills, M&L.S. Mill, Sheet Mill, Strip Mill, B.F. & T.M. Plate Mill and Bar & Rod Mill.



LD Control Room

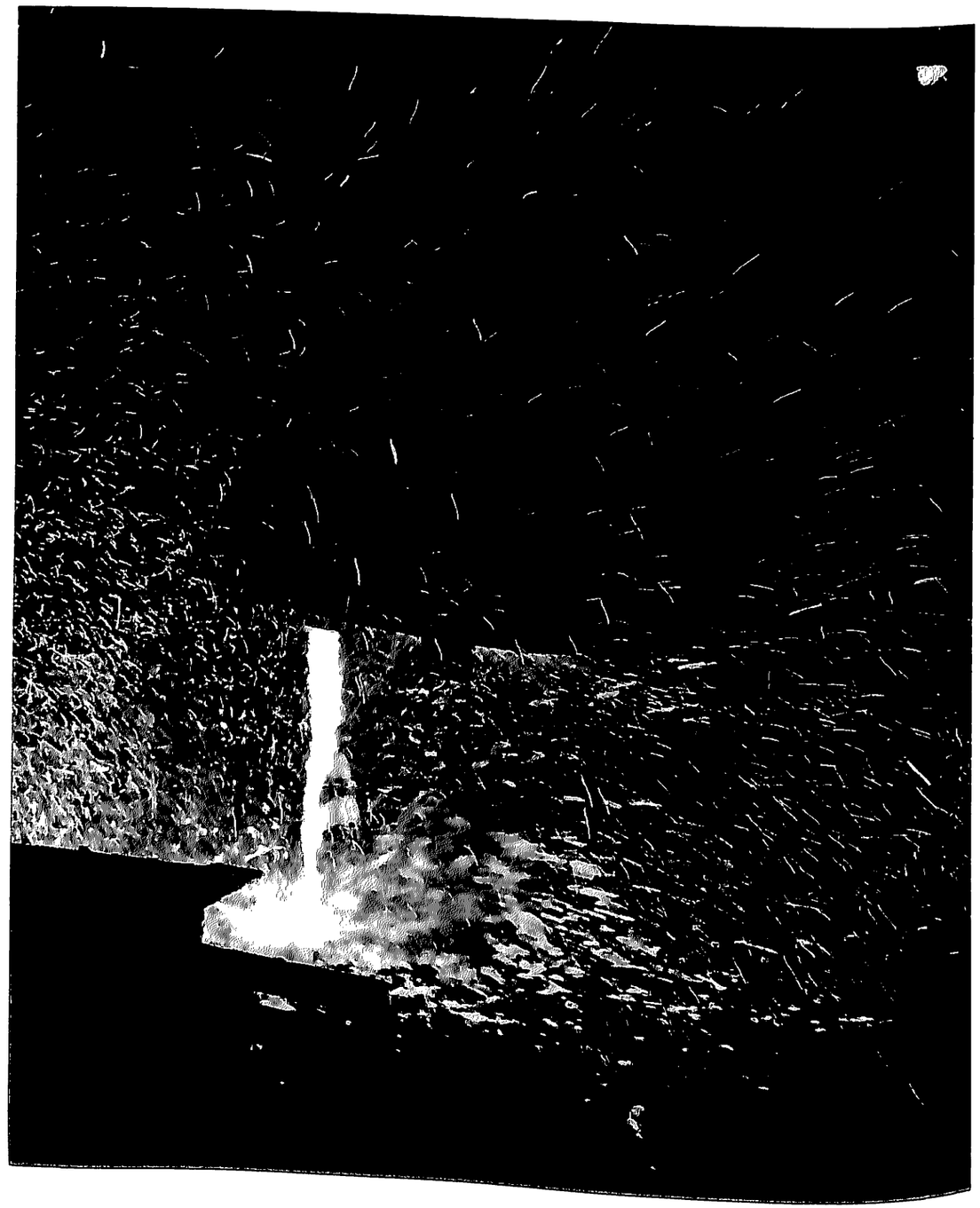
8. Safety Measures

1988 has been particularly a good year on the Safety and accident Prevention front with a total of 175 accidents which is a record low figure. The previous lowest was 242 during 1987. Works completed 2 million accident-free man hours twice and 1 million accident-free man hours, 14 times at a stretch. The departments which achieved outstanding records include Sheet Mills with 9 million, Agrico & shops with 5 million each and Loco & Loco Crane Department with 4 million accident-free man hours at a stretch. However, the most unfortunate part has been the rise in number of fatal accidents which has increased from 2 to 6 including road-accidents. All efforts are being made to bring down fatal accidents in the Works to Zero.

Campaigns for improvement of Productivity and Quality in all fields of activity have been initiated with specific time-bound programmes. Employees. at all levels, participated through the Joint Departmental Councils and other forums to discuss and set the targets for Productivity and Quality. Most of the targets have been met through dedication, sustained efforts and timely provision of need-based inputs. Customer-Satisfaction is another key area where substantial efforts are being put in by the Works department during the current year.

Electric Arc Furnace Industry

Production of steel by Electric arc Furnace (EAF) route, popularly known as Mini Steel Plants, started in India in early seventies to meet the acute shortage of steel and presently about 3.0 million tonnes of steel, accounting for nearly 30% of India's steel production, is produced through this route. Several factors like; affordable and comparatively lower 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 downstream technological developments such as continuous casting and ladle metallurgy practices, favoured the development and emergence of EAF route for production of steel. Today Mini Steel Plants are producing all grades of steel including alloy. high carbon and special steels



The main raw material of Mini Steel Plants is Steel scrap. Since the availablity of the steel scrap in India is limited, Government 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 setting up of new units based on modern technological concept which includes setting up of Ultra High Power Furnace, ladle refining, water cooled panels etc. which are capable of utilising sponge iron to the extent of a minimum of 30% in the feed material. The existing units are also being encouraged to modernise through adoption of modern energy saving equipment and replacement of smaller furnaces by bigger ones. As per guidelines for licensing in force, the units are being permitted to replace smaller furnaces of capacity of less than 15 tonnes each by a single furnace of 15 to 25 tonnes capacity. This would not only lead to modernisation of the industry but also increase the availability of steel.

Further, incentives by way of liberal grant of additional capacities have ;been announced in order to encourage the existing mini-steel plants to undertake modernisation. Any existing mini-steel plants which after modernisation would be able to produce liquid metal sufficient for producing a minimum quanity of 1 lakh tonnes per annum of hot rolled strips/coils would also be permitted to set up facilities for the manufacture of such strips/coils in the wider width (600 mm and above).

At present 173 mini steel plants with a total capacity of about 5.4 million tonnes per annum have been licensed and out of these 166 units with a licensed capcity of 5.24 million tonnes have already been commissioned. Quite a few units have taken the advantage of increasing their capacities under the Minimum Economic Scale (MES) scheme.

Production of Electric Arc Furnace units, which are reporting their production to the office of Development Commissioner for Iron & Steel, during the last three years and for April-Sept., 1988 is given below:

(In lakhs tonnes)

Category	1985-86	1986-87	1987-88	April-Sept. 1988
Mild Steel	21.73	22.14	21.94	9.78
Medium/High Carbon Steel	3.13	3.64	3.83	2.16
Alloy Steel	3.65	4.40	4.21	2.00
Stainless Steel	0.93	0.99	1.13	0.56
Total	29.44	31.17	31.11	14.50

The above figures do not include production of steel by Casting Units registered with D.G.T.D.

Steel Re-rolling Industry

There are about 1068 units holding COB licences, Industrial Licences, registrations and letters of intents for rerolling of long products with a capacity of about 22 million tonnes. In addition, there are quite a large number of units which are operating in the small scale sector. Capacity utlisation of this industry is quite poor and is in the range of 25% to 35%. The existing rolling units are being permitted free diversification to roll all grades of carbon steel and alloy steels including stainless steel. They are also being permitted to produce all types of bars, rods and structurals

within their overall licensed capacity.

In order to give further push to the re-rolling industry, Government have constituted an Advisory Committee under the chairmanship of Development Commissioner for Iron & Steel for development of indigenous rerolling Industry.

On the basis of discussions held in the advisory Committee Meetings, a National Institute for Secondary Steel Technology has been set up at Mandi Gobindgarh, Punjab for imparting training to personnel of secondary units mainly mini steel plants and steel re-rolling units on subjects relating to:

i) Energy Conservation;
ii) Reduction in cost of production;
iii) Pollution Control etc.

Production of these re-rolling units who are regularly sending production report to the Office of Development Commissioner for Iron & Steel during the last 3 years and for April-Sept., 1988 is as follows:-

(In lakh tonnes)

Category	1985-86	1986-87	1987-88	April-Sept., 88
Bars/Rods	23.05	21.35	21.66	9.17
Wire Rods	3.62	4.45	5.47	2.39
Structurals	4.42	8.41	9.11	4.43
Hoops	0.23	0.23	0.22	0.03
Special Sections	1.29	1.96	0.84	0.33
Slabs/Plates	0.16	0.16	0.07	0.16
Total	32.77	36.56	37.37	16.51

Steel Wire Drawing Industry

At present, there are 73 units having industrial licences with a capacity of 0.84 million tonnes per year. In addition to this, there are about 500/600 units operating in the small scale sector.

Production of steel wire drawing units which are reporting to the office of Development Commissioner for Iron & Steel during the last three years and for April-Sept., 1988 is as under:

(In lakh tonnes)

Category	1985-86	1986-87	1987-88	April-Sept., 1988
Mild Steel	1.98	2.57	2.38	0.91
Medium/High Carbon	1.42	1.55	1.54	0.73
Alloy Steel	0.07	0.08	0.08	0.04
Stainless Steel	0.01	0.01	0.03	0.01
Total	3.48	4.21	4.03	1.69

In order to develop this industry Government have taken up the following measures:

i) Import of carbon, alloy and stainless steel wires of all sizes have been restricted to encourage indigenous production.
ii) Wire Drawing Industry has been delicensed except for MRTP/FERA Companies.

Cold Rolled Steel Strips Manufacturing Industry

There are 57 units licensed/granted letters of intent for a capacity of around 1.5 million tonnes. Out of these 47 units are already in production.

The production of units which are reporting to the Office of Development Commissioner for Iron & Steel for the last 3 years and for April-Sept., 1988 is as follows:

(In lakh tonnes)

Category	1985-86	1986-87	1987-88	April-Sept., 1988
Mild Steel	1.69	2.19	3.10	1.76
Medium Carbon Steel	0.09	0.09	0.07	0.07
High Carbon Steel	0.08	0.08	0.08	0.05
Alloy Steel	0.01	0.01	0.01	0.02
Stainless Steel	0.14	0.16	0.13	0.04
Total	2.01	2.53	3.39	1.94

In order to develop this industry Government have taken up the following measures:

i) The unit can diversify freely into production of all grades of carbon and alloy steels including stainless steel strips with indigenous raw material.
ii) A minimum economic capacity of 10,000 tonnes has been fixed for this industry.
iii) Higher capacity upto 50,000 tonnes per annum is allowed to those units which have facilities to produce wider width strips and are prepared to undertake modernisation, renovation and installation of balancing facilities.
iv) Fresh capacities for captive use of bicycle manufacturers precision tube manufactures and coated steels strips/sheets manufacturers are allowed.

Hot Rolled Steel Strips Units

Apart from the integrated steel plants-Bokaro and Rourkela, there are 7 licensed units in the private sector for the manufacture of HR Sheets/Strips with a licensed capacity of 2,35,000 tonnes per annum. In addition, 8 units have been issued letters of intent for a capacity of 5,70,000 tonnes per annum.

These units are at the various stages of implementation.

In order to augment the availability of the hot rolled steel strips new composite units with a capcity of 1.5 lakh tonnes each based on sponge iron are proposed to be licensed.

GP/GC/Galvalume/Galfan/ PVC/Vinyl Coated Sheets/Strips

There are 15 units holding licences/letters of intent for the manufacture of GP/GC sheets. Out of these, 9 units with a licensed capacity of 3,64,500 tonnes, have been granted industrial licences. Another six units are holding letters of intent for a capacity of 2,15,000 tonnes and are in various stages of implementation.

Production of GP/GC Sheets during the last 3 years for April-Sept., 1988 is as follows:-

Category	1985-86	1986-87	1987-88	April-Sept., 1988
				(In thousand tonnes)
GP/GC Sheets/Strips	9.5	63.0	119.9	72.6

There are 4 units which have been granted letters of intent for the production of Zinc-aluminium alloy coated sheets/strips (Galvalume) with a total capacity of 2,60,000 tonnes.

Government have also granted 5 letters of intent for an aggregate capacity of 2,25,000 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.

In order to give more flexibility of the product-mix and to improve economic viability of the units, Government has decided to permit the broad-banding of all coated sheets/strips/Tinplates.

Besides Rourkela Steel Plant, there are two more units in the private sector for production of tinplates. Total capacity of these 3 units is 0.3 million tonnes of electrolytic tinplates per year. All these 3 units use imported tin mill black plates as their raw material.

The total production of Hot Rolled Steel Strips units during the last 3 years and for April-Sept., 1988 is as under:

Category	1985-86	1986-87	1987-88	April-Sept., 1988
				(In thousand tonnes)
Hot Rolled Strips	16.3	34.3	48.3	19.8

To help the indigenous industry become more viable, Govt. have allowed import of TMBP at a concessional rate of duty.

Production of electrolytic tinplate of the two units in the Private Sector during the last 3 years and for April-Sept., 1988 is as follows:

Category	1985-86	1986-87	1987-88	April-Sept., 1988
				(In thousand tonnes)
Oil Can Size	42.6	59.6	45.8	16.9
Non Oil Can Size	25.1	16.7	15.1	22.2
Total	67.7	76.3	60.9	39.1

Ferro Alloys

Ferro Alloys is one of the vital input raw materials for steel making. At present 25 units in the Organised Sector are having industrial licences/letters of intent with capacity of 0.65 million tonnes per year. There are also three 100% export oriented units for manufacture of charge chrome with a licensed capacity of 0.14 million tonnes who have started production. Besides, one more 100% export oriented unit, having letter of intent with licensed capacity of 50,000 tonnes for manufacture of charge chrome, is ready for commissioning. Production during the last 3 years and April-Sept., 1988 is as follows:

Category	1985-86	1986-87	1987-88	April-Sept., 1988
				(In thousand tonnes)
Ferro Manganese	191.00	194.00	180.00	88.00
Silicon Manganese	2.00	5.00	17.00	10.00
Ferro Silicon	55.00	59.00	40.00	15.00
Ferro Chrome	30.00	35.00	35.00	15.00
Silicon Chrome	4.00	3.00	3.00	—
Charge Chrome	37.00	52.00	69.00	31.00
Other Ferro Alloys	1.00	1.00	1.00	—
Total	320.00	349.00	345.00	159.00

To help meet the increasing demand of ferro chrome/charge chrome the licensed ferro manganese units are allowed to diversify into production of these ferro alloys and in additon some new units are proposed to be licensed.

7. Research and Development

The Department as the Administrative Ministry for iron and steel has been attaching importance to Research and Development in steel sector. Although, different units have been pursuing their own R&D programme in their respective areas, the major efforts so far have been directed at R&D Centre of SAIL. However, a need has been felt towards greater thrust and more co-ordinated effort between different agencies and who are undertaking R&D as an organised activity. This would also involve more collaborative research with national/international organisation and pooling of resources.

Salient features of the efforts being made in the areas are as follows:

R&D Centre for Iron & Steel

1. The R&D Centre, SAIL, at Ranchi has contributed to the iron & steel industry, through its efforts in generating innovative ideas, advanced concepts and sophisticated approach. The Centre has been instrumental in augmenting commercial viability of SAIL plants through technological expertise. The thrust has been towards improving productivity through process optimisation, reducing cost of production, developing new and quality products, introduction of cost effective technologies. and conservation of energy Comprehensive and multi disciplinary programme are pursued to seek solutions in the most optimum manner. The details of projects undertaken, completed and implemented are given below:-

	As on 1.1.1989
i) Running Projects	204
ii) Projects under implementation	57
iii) Projects completed (since inception)	358
iv) Projects implementation (since inception)	100

The project statistics below indicates the performance of the Centre.

	1984-85	1985-86	1986-87	1987-88	1988-89 (as on 1.1.1989)
Projects taken up	56	82	107	62	39
Projects completed	23	20	108	122	12
Projects implemented	6	9	15	59	6

Some of the salient highlights related to projects pursued during the current year are outlined below:-

- Rationalisation of the coal preparation scheme to improve quality of coal blend and coke at IISCO.
- Technology for obtaining caprolactum grade benezene using a multistage acid washing technique of crude benzol has been established in trials conducted at BSP.
- Optimisation of the ignition regime of sinter charge for sinter plant of BSP the modifications in the ignition hood has resulted in improvement in sinter quality and productivity.
- Adoption of mixed and layer charging practice to optimise the burden distribution using movable throut armour systems in the blast furnaces at BSP, RSP and IISCO indicated an increase in hot metal production and decrease in coke rate and silicon content of hot metal.
- Successful indigenous development of anhydrous tap hole mass at BSP. Efforts are now on for transfer of this technology to other steel plants—
- Ceramic fibre sealing system adopted in all the 28 soaking pits at BSP has resulted in reduction of both duel and refractory consumption.

Electron Probe Micro Analyser

- Introduction of low thermal mass veeneering in Merchant Mill reheating furnace at DSP has resulted in improved thermal efficiency of the furnace and reduced fuel consumption.
- Incorporation of SAIL combined flowing technology in one of the converters at BSL has led to reduced ferro-alloy consumption and better yield. Work on implementation of this technology has been completed at RSP and is in progress at BSP.
- KORF technology has been adopted and assimilated in the open hearth furnaces in RSP and IISCO, resulting in greater productivity and savings in energy.
- Ingot moulds of improved design have led to improvement in life of the moulds at BSP.
- Installation of the modified skid system in one of the reheating furnaces of Rail & Structural Mill at BSP has been successful in reducing heat losses substantially.
- The productivity of B&R Mill at DSP for the manufacture of sleeper bar has been augmented through modifications incorporated in the proper mill setting, guide system and improvement in the cooling system.
- Introduction of Aluminium wire feeding systems have been introduced in all the 3 argon rinsing units of BSP.
- The technology for controlled cooling of plates has been developed for 16-20 mm thick plates at BSP. The technology has the promise of saving energy, improving productivity and manufacturing value added products.
- A number of important grades of steel have been developed and some of them have been commercialised. Such as EDD quality slabs, CRNO steel, low nickel stainless steel, etc at BSL.

3. In the area of energy conservation in steel plants of SAIL, targets for lowering of energy consumption have been fixed and R&D Centre is co-ordinating with the plants to achieve the targets. The plans include monitoring of energy consumption data, carrying out energy audit, evolving recommendations and rendering assistance in implementing energy conservation measures in steel plants. Various steps taken in this direction have been responsible in lowering the energy consumption pattern in steel plants. Further efforts are being coordinated to achieve better results.
4. The Centre acts as a control agency in coordinating the function of the operating committee and helps in translating the recommendations into sound work procedures. During the year ten important topics were

deliberated upon in the operating committee discussions. Four intensive refresher courses were also organised on subjects of quality, technology, environment and continuous casting.

5. The Centre is also taking steps towards providing technological services to metallurgical industries in the form of undertaking contract research programmes in Latin American, African and South East Asian countries. A memorandum of understanding has been entered into with Birla Consultancy Services for extending technical know-how on projects likely to be secured from third world countries.

6. The Process Analysis Centre for Emerging Technology (PACET) has been functioning in the area of emeging technologies for liquid iron production vis-a-vis their relevance to SAIL. Three reports have been prepared by PACET. At present, PACET is concentrating on a thrust project-installation of a lignite based demonstration plant. Based on laboratory results, suitable decision for conducting a joint feasibility study and industrial scale trials in association with KTS Brazil will be taken.

Indo-Soviet Collaboration

The collaboration with V/O. TIAZPROMEXPORT has been successful with a large number of projects initiated in various SAIL plants being completed and implemented. These have enabled to significantly improve performance standards in the plants. A new collaborative agreement was signed whereby joint research work would be carried out on intramural basis of funding in the areas of hot metal pre-treatment, converter control, continuous casting and physical metal metallurgy. The fifth Indo-Soviet Bilateral Symposium on Basic Oxygen Steel Making & Continous Casting was held at Ranchi to discuss and exchange ideas on the present and future challenges in this Crucial technological area. To further consolidate and expand the Indo-Soviet collaboration, proposals for entering into bilateral agreements between R&D Centre and Soviet Union Institute of Refractories, Leningrad and CET, SAIL & GIPROMEX, Leningrad are being closely followed.

SAIL-NSF Collaboration

This collaboration envisages at initiating projects under two broad programme heads,where leading academic institutes of USA, under the guidance of National Science Foundation, USA research organisations and academic institutes in India will participate. R&D Centre will play the role of the central coordinating agency in India. The Programmes being pursued are—

— Direct iron and steel making technology and clean steels.

— Net shaping and new products.

SAIL-NKK Collaboration

R&D Centre is coordinating the activities pertaining to identification of technological recommendations and their implementation in three plants, namely RSP, DSP & IISCO. Through intensive investigations, NKK, Japan have evolved specific recommendations to upgrade the technology base in these plants. Consequent to the implementation of a number of suggested recommendations a general improvement in the performance of the three plants has been observed.

Interaction with CSIR Laboratories & Academic Institutes

To foster participative research with the country, the Centre has been jointly working on research project with different CSIR laboratories and academic institutes.

7. The National Mission on Iron & Steel as suggested by the Science Advisory Committee and subsequently approved by the Government, has started functioning to bring about tangible improvements in the performance of the steel industry in the country. The Mission operates within the framework of five broad programmes and is being centrally coordinated by Director, Mission Management Borad.

The five thrust programme areas are:

i) Upgradation of coke quality and improvement in blast furnace operation

ii) Alternative routes for liquid iron production using indigenous raw materials

iii) Quality and reliability improvement of steel products

iv) Energy conservation in steel plants and

v) Continous castings

A number of mission oriented projects have been cleared for actual execution. The identified projects have been selected in a manner so that it has direct effect on the steel industry at present or will enhance the technological base in the future. The mission has been successful in bringing together experts and research organisations for working towards a national goal.

8. The Public Sector Undertakings under Deptt. of steel are also undertaking R&D works. Some of the important areas are listed below:

I. Manganese Ore India Ltd.

(a) Study of direct utilisation of manganese ore fines in the production of ferro manganese through plasma smelting process.

(b) Benefication of low manganese di-oxide ore of Dungri Bujurg Mines to battery grade.

(c) Benefication of low managanese ore to medium/high grade and reduction of phosphorous in manganese ore.

(d) Investigations for alternative method of support in underground works i.e.

(i) Use of cable bolting in underground working at Balaghat Mines for pre-mining support in the supporting areas: and

(ii) Steel roof support.

(e) R&D work is also in progress in collaboration with Central Mining Research Institute, Dhanbad to gradually induce the use of steel supports of various types and designs in the underground working.

II. Bharat Refractories Limited

(a) Development of well Blocks, High alumina chequered bricks for open hearth furnace, super blocks, 54% alumine furnace blocks for re-heating furnaces, curb blocks, porous blocks etc.

(b) The Company has entered into foreign collaboration agreement with Kawasaki Refractories Co. Ltd. Japan for development of new products,such as Manganesia graphite bricks, casting mixtures for steel ladles, gunning repair material, refractories from sliding gate system and spinel and magnesia spinel refractories.

(c) The Company has also entered into an agreement with Shinagava of Japan for manufacture of new products such as coke oven silica refractories including dense and super dense.

(d) The Company has also entered into an agreement for RDCIS SAIL for collaborative research for research and development and commercial production of new products.

III. Sponge Iron India Ltd.

(a) During the year, the R&D activities are concentrated on optimisation of raw materials and on improvement of quality of product.

(b) A study for setting up beneficiation plant for the non-coking coal for improving the quality of coal has established the feasibility for setting up the plant with an output of 300 MT of beneficiated coal per day

with ash percentage of below 25%.

(c) Studies on the feasibility of injecting iron ore fines from the disscharge end of the kiln and the coarser coal into central portion of the kiln are also taken up with the objective to optimise the specific consumption of coal and iron ore.

(d) High carbon sponge iron briquettes with 4.5% carbon were made during the year successfully. Samples of these briquettes are sent to NML, Jamshedpur for melting trials in hot blast Cupola.

(e) The schemes for production of sponge iron by "Direct Reduction-Hot Blast Cupola Route" and "Vertical Retort District Reduction Technology" in association with National Metallurgical Laboratory, Jamshedpur have been taken up.

IV. National Mineral Development Corporation Ltd.

(a) Investigation on medium grained blue dust from Bailadilla-14 for P/M ferrites.

(b) Sponge Iron-Sponge production through briquetting of blue dust and melting Induction furnace; (ii) Sponge through iron powder route and melting in induction furnace; (iii) Iron powder-high apparent density, carbonil powders (iv) Studies on natural pellets from all mines.

(c) Finalisation of flow sheet to produce feed for various types of ferrites from fine grained dust.

(d) **Direct Steel**
Using good quality briquattes; (ii) Through plasma technique.

(e) **Use of Kimberlite Waste Material**
As soil nutrient and conditioner and its application in ceramic.

V Kudremukh Iron Ore Co. Ltd.

(a) The quality of iron ore concentrate has been upgraded to make DR grades pellets as also market DR/BF grade pellets in other countries by improvement in the iron content and decrease in the gangue contents.

(b) At the Pellet Plant at Mangalore, laboratory and plant scale trials have been carried out with a view to find out alternative binders additives to improve the quality of pellets as required. Based on the favourable results with such additives, it has been decided to provide additional facilities in the Pellet Plant to improve the quality of pellets.

VI Tata Iron & Steel Company Limited

(a) Research Studies on the following areas

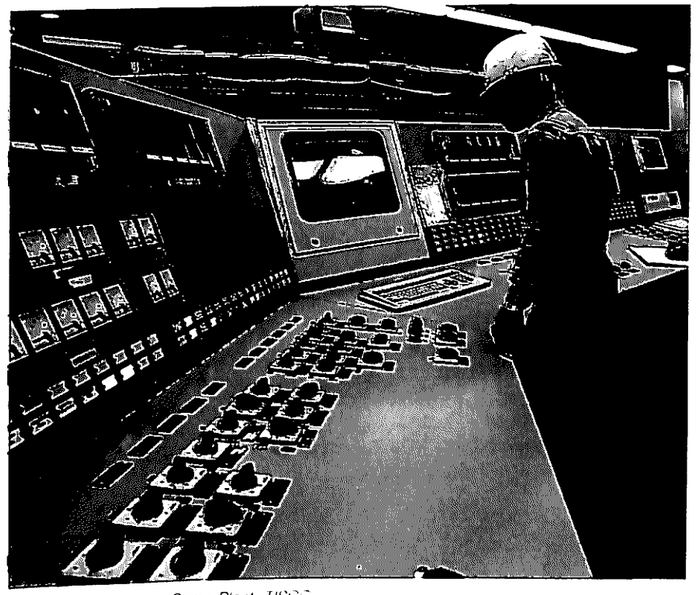
i) Assessment of permeability characteristics of blast furnace burden material to understand the extent of resistance offered by different burden materials with different fines contents in it.

ii) Burden distribution studies for blast furnace in order to achieve increased producitivity by optimum utilisation of the movable throat armour.

iii) Hot grate sintering test under the conditions of new sinter plant commissioned in December, 1988 by varying the parameters namely bed depth, suction pressure, coke breeze, moisture and raw material preparation to find their effect on sinter quality and productivity.

iv) Model study of fluid flow in tundish of the six strand continuous casting machine to arrive at the optimum configuration of weirs and dams.

v) Study on increasing the proportion of solid charge in steel making which has revealed that is possible to increase the proportion of scrap charge/iron ore in open hearth steel making by using burnt coal (Jhama)/lignite.



Control Room of New Sinter Plant TISCO

(b) Product Development Studies in the following areas

i) Development of creep resistant steel of T-11 and T-12 grades which have been provisionally accepted by the Central Boiler Board for usage in the Thermal Power Plant.

ii) Development of low carbon steel structural microalloyed with titanium to give guaranteed low temperature impact properties of 10 Joules at 40°C. Grade. This is an import substitution item.

iii) Development of special corrosion resistant steel for structurals which have been found to be 4-5 times more corrosion resistant particularly in marine atmosphere.

iv) Development of cold heading quality wire rods through R&D trial rolling in bar rod mill which if accepted by the Fastner manufacturers, would serve as a major import substitution item.

Vii Metallurgical & Enginnering Consultants (India) Limited

(a) Remote Area Power System Development
(b) Flywheel based energy storage system
(c) Urban Transport system
(d) Thermoelectricity
(e) Laser Technology & Hydrology
(f) Desiccant Cooling System
(g) Mathematical modelling of heat transformer
(g) Robot vehicles
(i) High Pressure hydraulics.

8. Development of Management Information System

1. For an efficient control, regulation and monitoring the activities of the Department of Steel and those of its public sector undertakings, increasing use of computers is, of late, being made. Over a period of time, several Management Information systems (MIS) have been developed and stabilised with the assistance of National Informatics Centre (NIC). The important functional areas for which this facility exists today are as follows:—

(1) Administration.
(2) Finance, Budget and Accounts.
(3) Steel Industry in general and public sector steel plants in particular.

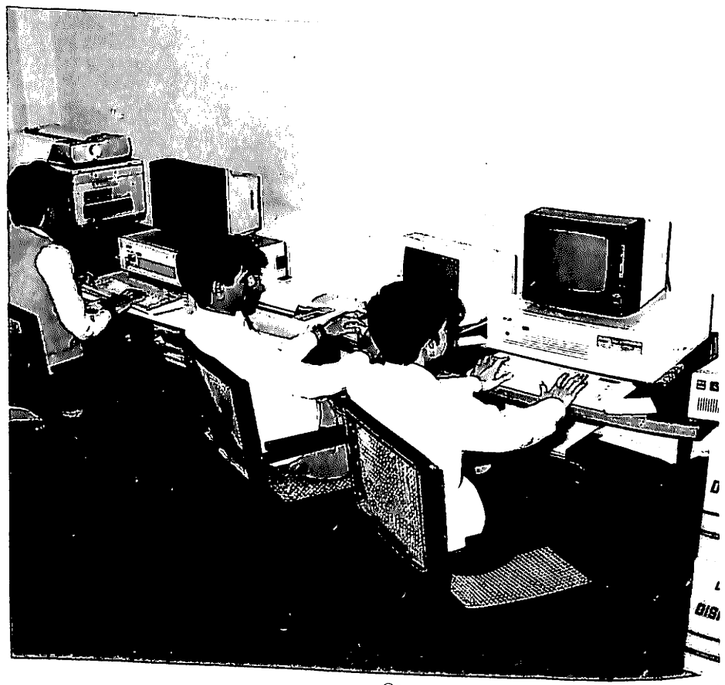
2. In the administrative area, the prevalent systems cover the following aspects:—

(1) Timely disposal of important cases, particularly VIP references.
(2) Functioning of various Branches in the Deptt. with reference to certain common parameters, such as speed of disposal of cases, implementation of vital decisions, recording of papers, weeding out old files, indexing etc.

3. On the Finance, Budget and Accounts side, computerised facilities have been used for pay rolls and schedules, General Provident Fund, Loans and Advances to the Public Sector Undertakings Plan expenditure from month to month etc.

4. As regards the monitoring of the steel industry, systems/software packages are already in operation to cover production, pricing, imports etc. These systems also provide for monitoring the domestic and import prices of the various items, including steel scrap. Besides, the Systems also cover the issue of Letters of Intent/Industrial Licences to the private parties, clearance of capital goods for their schemes and approval of foreien collaboration. Similarly, comprehensive systems are in operation to regulate various facets of public sector steel plants, such as, production performance achievement of technical indices (coke rate, energy consumption rate etc.), financial status, man-power position etc.

5. The Computer Terminals have been provided to Key officers in the Department of Steel who make full use of this facility in their day to day decision making process. At the same time, a review of the existing Management Information Systems has been taken up. The object is to make the computer facility a still more effective instrument for the regulation and control of all the activities of the Department of Steel.



Computers being used for MIS development

9. Organization Structure

1.1 The Department of Steel has a Secretary, four Joint Secretaries, five Directors, three Deputy Secretaries, seven Under Secretaries, one Senior Analyst and one Deputy Controller of Accounts. In addition, the Deptt 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 of 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 is 308. A list of items of work allocated to Deptt. 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 Deptt. 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

Annexure I

List of Items of Work allocated to the Department of Steel

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 and assistance to, all iron and steel industries.
6. Production, supply, pricing and distribution of iron ore, manganese ore, limestone, sillimanite, kyanite and other minerals and alloys used in steel industry, excluding grant of mining leases or matters connected therewith.
7. The Steel Authority of India Limited and its subsidiaries.
8. Matters relating to the following undertakings namely:
   i) The Visvesvaraya Iron and Steel Company Limited.
   ii) The Bolani Ores (India) Limited
   iii) The Manganese Ore (India) Limited
   iv) The Metal Scrap Trading Corporation.
9. Other Public Sector Enterprises or undertakings falling under the subjects included in this list except such as are specifically allotted 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 31.12.1988 in respect of the Department of Steel (Secretariat)

Classification of post	No. of employees (in position)	Men	Women	SC	ST	Physically handicapped	Ex-servicemen
Grade A	32	30	2	2	—	—	—
Grade B (Gazetted)	36	34	2	1	—	—	—
Grade B (Non-Gazetted)	51	44	7	8	—	—	—
Grade C	88	57	31	13	4	—	1
Grade D	66	63	3	28	7	2	2
Total	273	228	45	52	11	2	3

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. He is assisted by a Under Secretary, who is whole-time in-charge of the SC/ST Cell.

1.4 In pursuance of the instruction of the Department of Administrative Reforms and Public Grievances and Cabinet Secretary. an officer of the level of Director has been designated as Director (Public and Staff) Grievances. The erstwhile Complaints Cell has been redesignated as Grievance Cell, and this Cell provides the necessary support to Director of Grievances.

1.5 In keeping with the special emphasis being laid by the Prime Minister on the launching of an ideological battle against communalism, 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 21.11.88, a pledge was taken by all employees to work towards the strengthening of the freedom and integrity of the nation.

1.6 The Department of Steel has 16 Public Sector Undertakings under its administrative control. A list of these undertakings is given in AnnexureIII.

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

In the Head Office at Calcutta, the Development Commissioner for Iron and Steel, who is in 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, one Industrial Advisor, two Development 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 organization of Development commissioner as on 31-12-1988 is given at Annexure V

1.8 The Organization of the Development Commissioner for Iron and Steel is a field organization of the Department of Steel, with its functions broadly divided as regulatory and developmental. The feed-back furnised by this organization is utilized for the formulation of policies and 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.

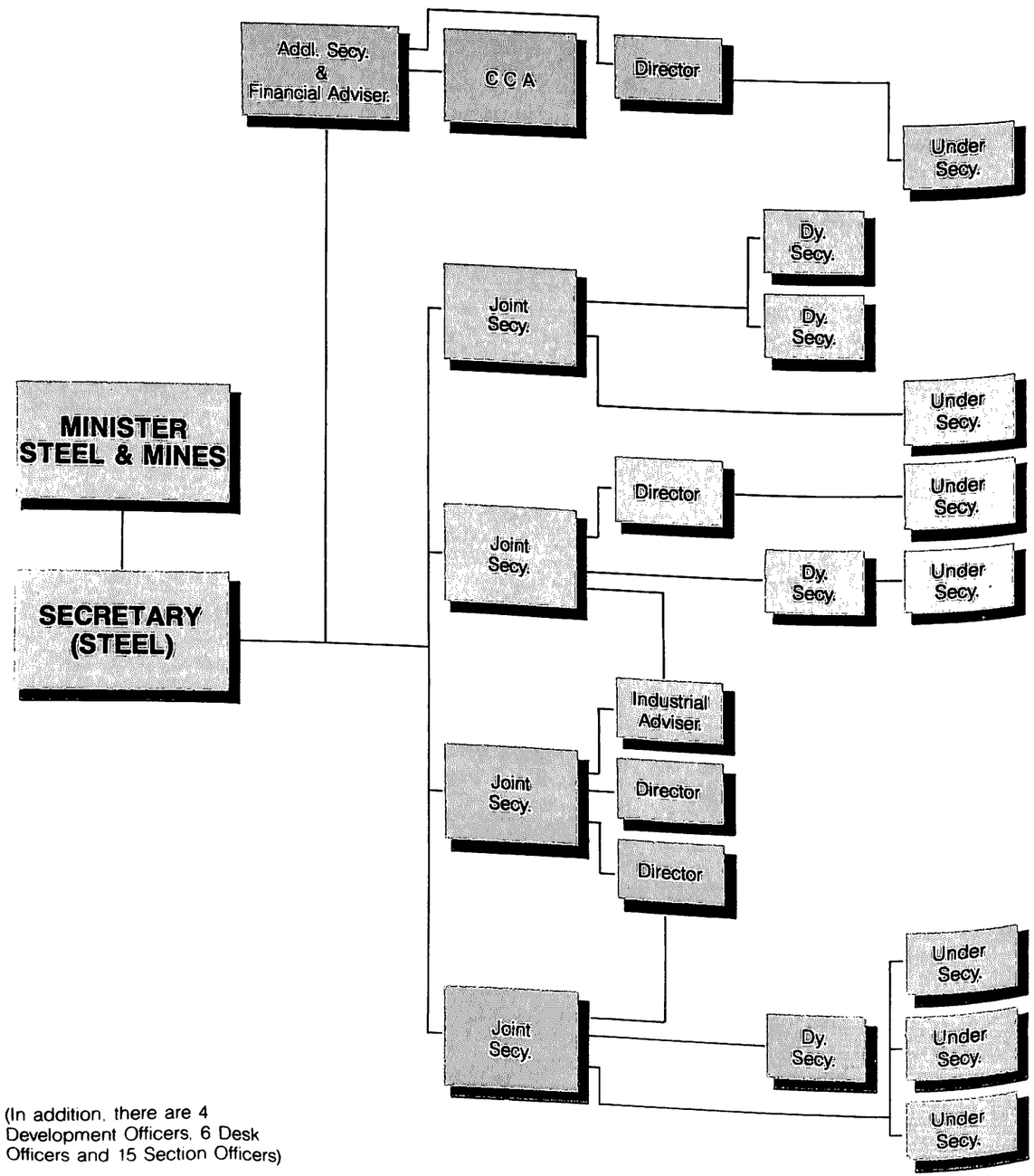
1.9 The Organization of the Development Commissioner for Iron and Steel has made good progress in the implementation of the Official Language policy of the Govt. Two meetings of the Official Language Implementation Committee have been held so far during the current year.

Annexure—VI

Statement showing the number of employees number of SC/ST, Physically handicapped, Ex-servicemen men and women as on 31.12.1988 in respect of Development Commissioner for Iron and Steel Organisation.

Group of Posts.	No. of Employees	Men	Women	SC	ST	Physically handicapped	Ex-servicemen
Group 'A'	26	26	Nil	(5)	1	—	—
Group 'B'	31	30	1	15	1	—	—
Group (C)	178	151	27	33	4	4	6
Group (D)	71	67	4	23	4	2	1
Total	306	274	32	76	10	6	7

Organisational Chart of the Department of Steel

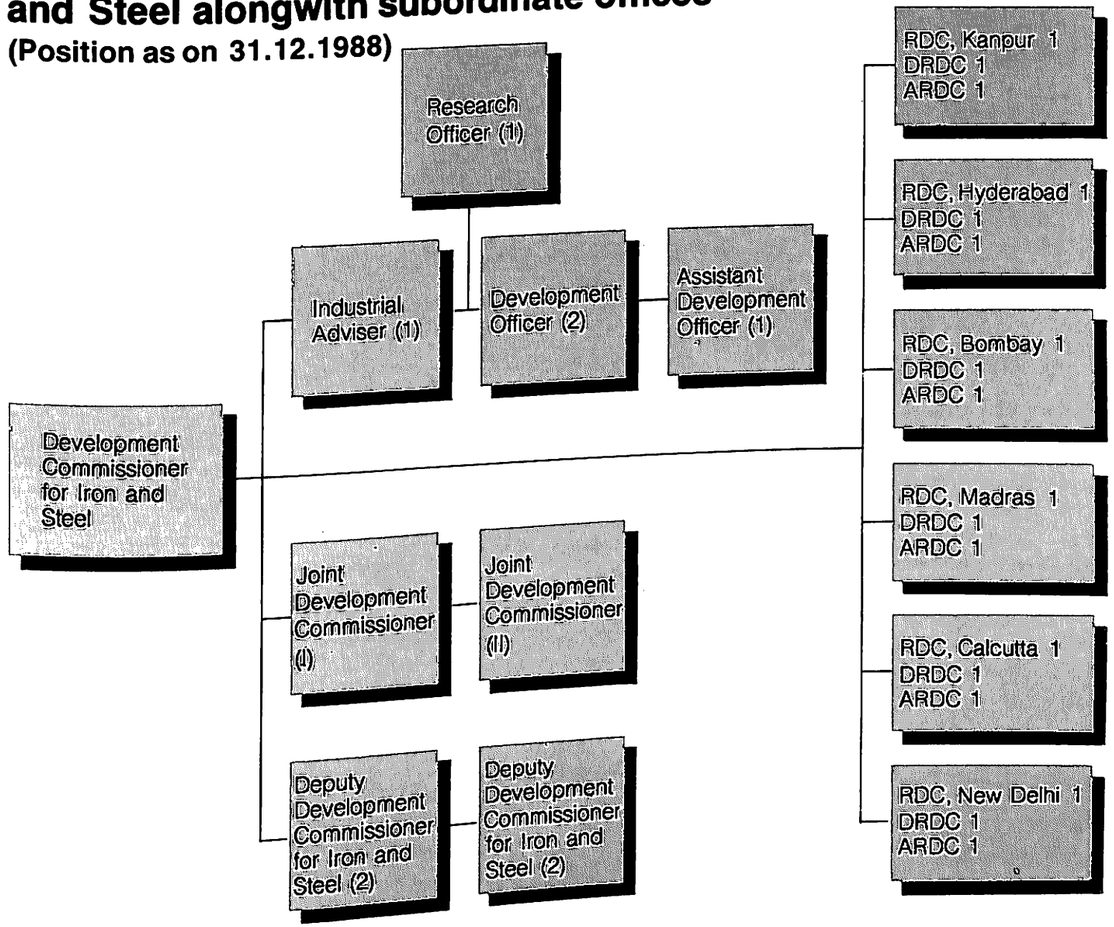


(In addition, there are 4 Development Officers, 6 Desk Officers and 15 Section Officers)

Organisational Chart of the office of the Development Commissioner for Iron and Steel alongwith subordinate offices

(Position as on 31.12.1988)

Annexure-V



Abbreviations

RDC— Regional Development Commissioner for Iron and Steel

DRDC—Deputy Regional Development Commissioner for Iron & Steel

ARDC—Assistant Regional Development Commissioner.

Annexure III

List of Public Sector Undertakings under the Deptt. of Steel

1. Steel Authority of India Limited, Ispat Bhavan, Lodi 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., II 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 Bhawan, 10-3-3 11/A Castle Hills, Hyderabad-500 028.
9. Rashtriya Ispat Nigam Limited, Project Office 'A' Block, Visakhapatnam-530031 (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-700020.
12. Vijayanagar Steel Limited, Blue Cross Chambers, III Floor, 'B' Wing, Infantry Road, Bangalore-560 001.
13. Ferro Scrap Nigam Limited, Building No. 54 Old Admn. Office Complex, Bhilai-490001.
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 Station Pipe and Foundry Co. Ltd., IISCO House, 50 Chowringhee, Calcutta-700 071.

10. Welfare of the Weaker Sections

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. This officer also supervises matters relating to representation of Scheduled Castes/Scheduled Tribes and Physically Handicapped persons in Public Sector Undertakings under the administrative control of the Department of Steel. Periodic review and Status reports received from Public Sector Undertakings regarding recruitment/promotion of Scheduled Castes and Scheduled Tribes against the Vacancies reserved for them are scrutinised in the Department of Steel and appropirate directions issued to the Undertakings as necessary.

The actual record of performance of some of the major Public Sector Undertakings in respect of representation of Scheduled Castes/Scheduled Tribes during 1988-89 is indicated below:

(i) Steel Authority of India Ltd.

The total manpower of the Company as on 31st March, 1988 was 2,01,415 comprising of 17,203 executives and 1,84,212 non-executives. The average in-take of Scheduled Caste and Scheduled Tribe candidates was 21% and 15% respectively of total recruitment. The representation of SC & ST employees in promotion made was 8.8% and 6.3% respectively. As on 31st December 1987, Scheduled Caste and Scheduled Tribe employees were 12% and 8.4% of the total manpower.

The Rosters for reservation are being maintained by the 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 those SC/ST Candidates who fail to qualify for selection as management trainees (technical). A Batch of 144 SC/ST candidates was under training under this scheme during 1987. Similiarly, SC/ST employees are also imparted in-service training to improve their chances of promotion. During the year 1987, a total number of 35,625 employees were given in-service training out of which 4,820 employees belonged to SC/ST community.

The SC/ST candidates are also permitted relaxation in prescribed standards in respect of eligibility, experience, written tests and interview. A member of SC/ST community is associated in all Selection Board Meetings.

(ii) Visakhapatnam Steel Project (VSP)

The total number of persons employed in VSP as on 31.12.88 was 4,912; out of these 667 persons belong to Scheduled Castes, 92 belong to Scheduled Tribes, 185 are ex-servicemen, 30

are physically handicapped and 124 are women. In percentage terms SC/ST, ex-servicemen, physically handicapped and women are 13.6%, 1.9%, 3.8%, 0.6% and 2.5% respectively.

(iii) Bharat Refractories Limited (BRL)

The total number of employees in BRL as on 31.12.88 is 4,355, out of which 387 belong to Scheduled caste, 628 belong to Scheduled Tribes, 159 are women and 29 are physically handicapped. In percentage terms, the Scheduled Castes are 8.9% Scheduled Tribes are 14.4% women form 3.6% and physically handicapped form 0.7%.

(iv) National Mineral Development Corporation (NMDC)

Total number of employees in NMDC as on 31st December, 1988, was 6,838 and out of this 1,033 belong to

Scheduled Castes and 1,024 belong to Scheduled tribes and 367 are women. The Scheduled castes, Scheduled Tribes and women are 15.1%, 15% and 5.4% respectively of the total persons employed.

The Corporation gives facilities for promotion of education among the children of SCs/STs by offering scholarships in Local Kendriya Vidyalayas and by providing free educational facilities to children of tribals who seek admission in project's schools. A school exclusively for children of tribals has been started by the Company at their Bailadila-5 Project. All tribals residing in the project area are afforded free medical facilities by NMDC project hospitals. Members of the Scheduled Tribe communities can also avail of the services of the Project Co-operative Societies, even though they are not employees of the Company.

At their Bailadila Project, the Company has constructed two Community Centres one each at Kirandul and at Hilltop. Weekly film shows and other entertainment are provided at these centres. NMDC had 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 Adivasis get an opportunity to sell their wares.

(v) Manganese Ore (India) Limited (MOIL)

The total number of employees in MOIL as on 31st Dec., 1988 was 9,737 out of which Scheduled Castes, Scheduled Tribes and women were 1,752, 2,764 and 2,239 respectively. The percentage of Scheduled Castes is 17.2% Scheduled Tribes 28.4% and women 23%.

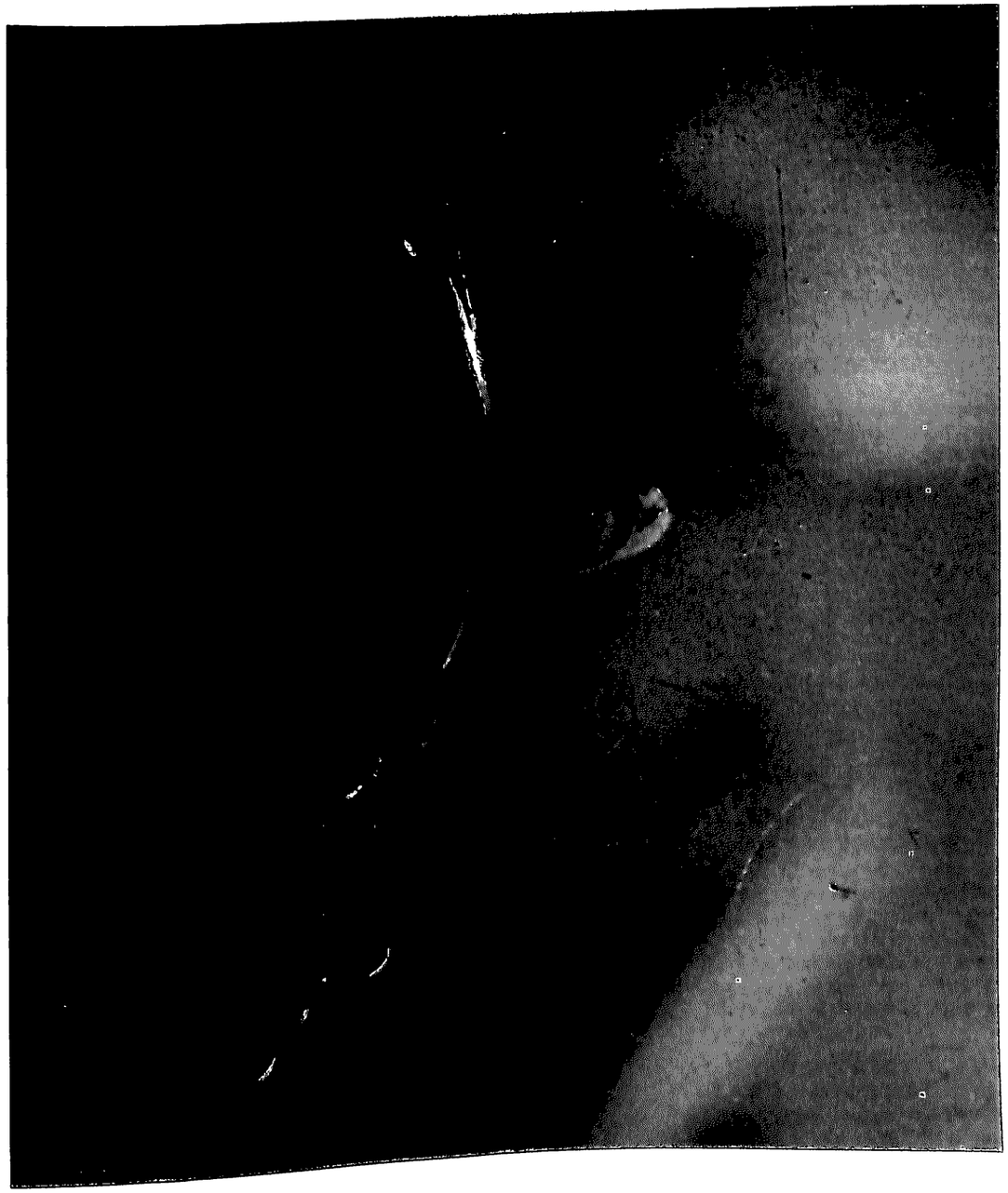
(vi) Metallurgical & Engineering Consultants (India) Ltd. (MECON)

The total number of employees in the MECON as on 31st December, 1988 was 3,862 out of which 235 belong to Scheduled Castes and 440 belong to Scheduled Tribes. In percentage terms SC & ST are 6.1% and 11.4% respectively.

(vii) Hindustan Steelworks Construction Limited (HSCL)

Out of total number of 21,425 employees of HSCL, 5,685 belong to Scheduled Castes/Scheduled Tribes, 1,440 are women, 205 are ex-servicemen and 48 are physically handicapped. In percentage terms the SC/ST, women, ex-servicemen and physically handicapped are 26.5%, 6.7%, 1% and 0.2% respectively.

The Company has provided schools in the areas where there are a number of SC/ST employees residing. Plots are alloted to Scheduled Castes/Scheduled Tribes workers for making hutments in the land allotted at sites of clients with free electricity, water supply and sanitation arrangements, etc. Children of SC/ST employees get due preference in the matter of schooling at construction projects which are of a relatively short-term duration.



11. Progressive use of Hindi

The Department continued its efforts for greater use of Hindi during the year 1988-89, in keeping with the Annual Programme.

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 (OL), a Senior Translator, three Junior Translators, one Hindi Stenographer and one Typist (Hindi) assist in this work. 12 Devnagari typwriters, 3 bilignual electronic typewriters, Hindi reading material, etc. are available in the Department. A number of measures are being taken for the promotion of progressive use of Hindi in the Department, the office of the Development Commissioner for Iron and Steel and the Public Sector Undertakings under the administrative control of the Department of Steel.

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

1. House Journals

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 all libraries.

2. Inspections

An Inspection Team has been constituted to oversee the status of implementation of the provisions of the Official Languages Act/Rules in attached offices and the Public Sector Undertkaings under the administrative control of the Department. In the year under review, this Inspection Team has made 19 such inspections.

3. Committees Relating to Official Language

There is an Official Language Implementation Committee under the Chairmanship of 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 under the administrative control of the Department of Steel. Meetings of the Committee are held regularly once a quarter. Accordingly, four such meetings have been held in 1988. In these meetings, representatives of two undertakings are invited by turns and the status of the progressive use of Hindi in these units is reviewed.

4. Hindi Salahkar Samiti

In accordance with Government's instructions a separate Hindi Salahkar Samiti for the Department of Steel has been constituted in June, 1988. Earlier, there was one such Samiti both for the Department of Mines as well as the Department of Steel. Two meetings of the newly constituted Samiti have been held during the current year.

5. Rajbhasha Shield/Trophies

In order to encourage the use of Hindi in the Offices/Undertakings under the Department of Steel, a Rajbhasha Shield and two Trophies have been instituted. These are awarded each year to Offices/Undertakings whose performance in this field is rated the best.

Shri Rajiv Gandhi Honourable Prime Minister receiving 1st Prize as Chairman & Managing Director, BR.

6. Implementation of Section 3(3)

In pursuance of the Offical Langauge policy of Government almost all agreements, contracts, etc. are prepared both in Hindi as well as in English. General Orders, posting orders, transfers, etc. are also issued both in Hindi and English. There are 23 proformae being used in different Sections of the Department. All these proformae have been prepared in Hindi and English. In order to ensure that letters issued in Hindi to Central Govt. Offices located in Regions 'A' and 'B' "Check points" have been framed in the Department.

7. Noting and Drafting in Hindi

All sections of the Department have started writing short/routine notes in Hindi. Some officers have also started writing notes in Hindi. Officers have been requested to use Hindi to the extent possible so that they may set an example. All communications received in Hindi, are being replied to in Hindi. As far as possible, correspondence with offices located in Region 'A' is being done in Hindi.

8. Training of Staff in Hindi/Hindi Typing/Hindi Stenography

A programme has been drawn up for imparting training in Hindi/Hindi Typing/Hindi stenography to all employees for whom in service training is obligatory. The position regarding training of Government servants in Hindi/Hindi Typing/Hindi Stenography in this Department is as under:-

Hindi Training

Total number of employees (Group A, B, & C)	211
Total number of employees possessing working knowledge of Hindi	197
Total number of employees under training	5
Total number of employees yet to be trained in Hindi	9

Hindi Typing/Hindi Stenography

	Trained	Under training	Yet to be trained
Hindi typing	5	7	15
Hindi Stenography	17	2	11

Officers and staff of the attached office and public Sector Undertakings are given training under Hindi Teaching Scheme of the Ministry of Home Affairs, wherever such facilities exist. In other places, employees are encouraged to learn Hindi through correspondence courses conducted by the Central Hindi Directorate; the expenditure incurred on such training is borne by the concerned offices.

9. Hindi Essay Competition

To encourage officials of this Department to work in Hindi, A Hindi Essay Competition was conducted in the month of December 1988. Separate prizes are awarded to the best essay amongst Hindi-speaking candidates as well as from those whose mother tongue is not Hindi.

10. Award for Writing of Hindi Books

Under the scheme for awarding cash prizes for writing technical books in Hindi, prizes are awarded to selected authors.

11. Hindi Week

In order to create interest in Hindi in official work among officers/employees of the Department, 'Hindi Week' was observed commencing from the eve of Hindi day i.e.14.9.1988.

12. Cash Prizes Scheme for Dictation in Hindi

An incentive scheme for officers for giving dictation in Hindi has been introduced in the Deptt. from this year.