

DEPARTMENT OF STEEL
MINISTRY OF STEEL AND MINES

Report 1986-87



GOVERNMENT
OF
INDIA

REPORT

1986-87



सत्यमेव जयते

GOVERNMENT OF INDIA

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MINISTRY OF STEEL & MINES

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1. Production of Steel

The production of saleable steel in the five integrated steel plants of Steel Authority of India Limited (SAIL) was 4.92 million tonnes during the period April 1986 to January 1987, as compared to 4.73 million tonnes during the corresponding period of the year 1985-86, thereby indicating a growth rate of about 4%. SAIL had planned to produce 7.2 million tonnes of saleable steel during 1986-87 as against about 6 million tonnes in 1985-86; however the original target has been revised downwards and SAIL now expects to produce about 6.4 million tonnes of saleable steel during the current year. Electric Arc Furnace units are likely to produce about 3.0 million tonnes of steel in 1986-87 as against 2.9 million tonnes in 1985-86.

2. Demand And Availability of Steel

As per estimates of the Joint Plant Committee, the demand projections for the year 1986-87 for finished steel are 11.62 million tonnes and for pig iron are 1.54 million tonnes. The estimates of demand projections by the Working Group, however, are 11.93 million tonnes and 1.69 million tonnes respectively.

As against these estimates, it is expected that the availability of finished steel, including imports, would be 11.79 million tonnes and of pig iron 1.29 million tonnes.

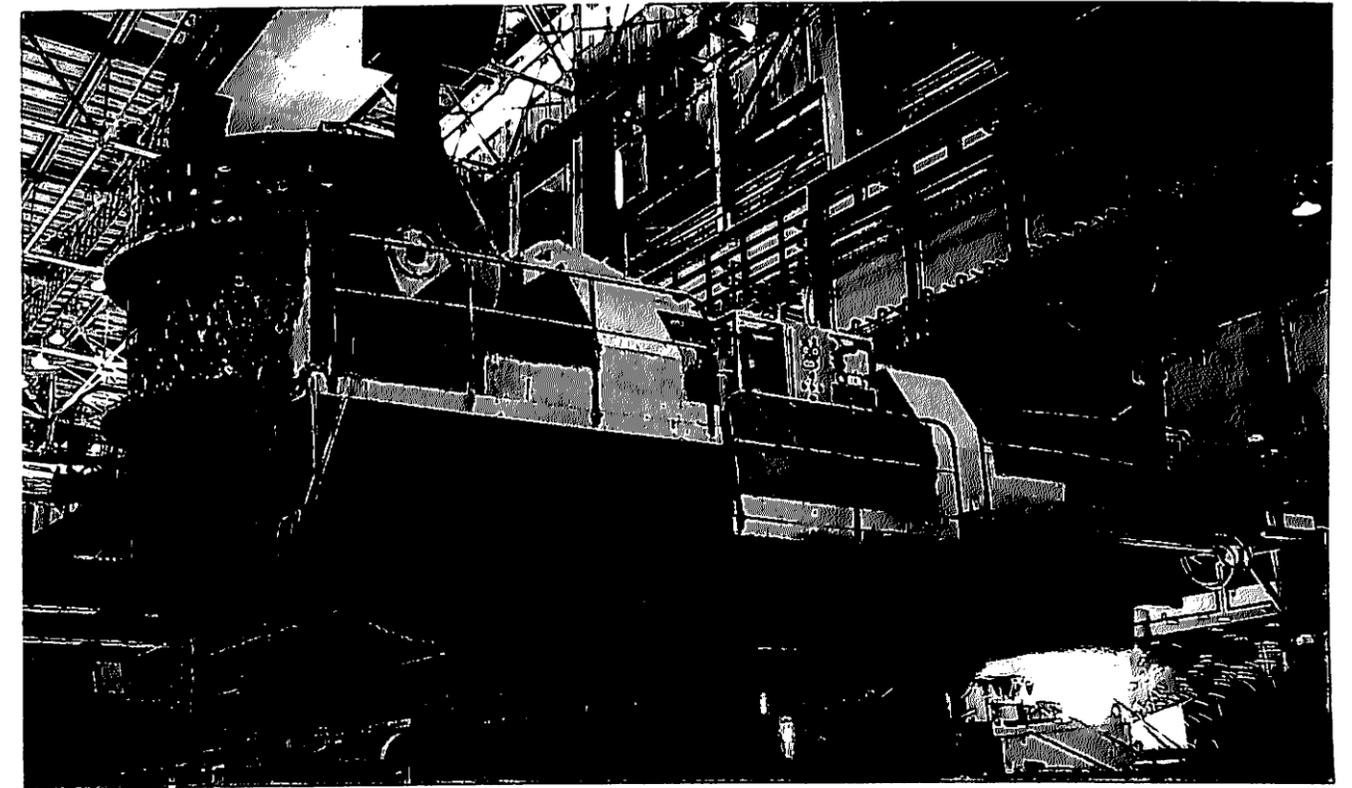
3. Performance of SAIL

The overall capacity utilisation of saleable steel at SAIL's plants was 74% up to January 1987. The capacity utilisation of individual steel plants has been as under:—

Bhilai Steel Plant	75%
Durgapur Steel Plant	56%
Rourkela Steel Plant	88%
Bokaro Steel Plant	79%
IISCO	61%

SAIL earned a profit of Rs. 159 crores in 1985-86 as against a profit of Rs. 4 crores in 1984-85. SAIL had targetted to earn a profit of Rs. 160.13 crores during 1986-87, but due to lower production and variations in its product-mix, SAIL now expects to make only a modest profit during the year.

Concast Shop at Bhilai



4. Construction Projects

(a) SAIL Projects

SAIL has taken special measures to improve upon its project implementation. The Stripper Yard and Additional Coil Yard, components of the 4 million tonnes expansion scheme of Bokaro Steel Plant, were commissioned ahead of schedule in August and November 1986, respectively.

Work on the 4 million tonnes expansion units at Bhilai Steel Plant continued satisfactorily and the expansion scheme is expected to be commissioned in September 1988.

The commissioning of the captive power plants of SAIL steel plant could not be carried out as originally planned due to delay in the supply of equipment, slow work by erection agencies and a fire at Bokaro. The first unit at Durgapur was commissioned in December 1986, against the planned commissioning

in March 1986. The second unit scheduled for March 1987 is likely to be commissioned by December 1987. The first unit at Rourkela scheduled for commissioning in June 1986, was synchronised in December, 1986. The second unit scheduled for commissioning in December 1986 is likely to be commissioned in October 1987. The first unit of Bokaro was commissioned in December 1985, but due to an unfortunate fire in July 1986 it became out of operation. This is now expected to be re-commissioned in April 1987. The second and the third units at Bokaro scheduled for commissioning in September 1986, and March 1987, are now likely to be commissioned in June 1987, and September 1987, respectively.

(b) Visakhapatnam Steel Project

(i) Project Construction

Construction of Visakhapatnam Steel Project is progressing very well. At the end of December 1986,

the progress of work vis-a-vis the schedule in the major areas was as follows:—

1) Concreting	100.3%
2) Strl. Fabrication	99.3%
3) Strl. Erection	93.8%
4) Equipment Ordering	98.7%
5) Equipment Erection	84.8%
6) Refractory Ordering	81.3%
7) Refractory Erection	97.6%

2. During 1986 the Project achieved structural erection of 10,201 tonnes which was the highest for any project in the country. In December 1986 the project achieved 5,263 tonnes of equipment erection which was a new monthly record.

(ii) Revised Rationalised Concept Adopted For VSP-Some Salient Features:

3. A revised Rationalised Concept has been adopted for this new integrated steel plant. In order to implement this Project at a lesser capital cost and

within a shorter time-frame in order to improve its economic viability. The capital cost of the Project has been cut down by Rs. 1500 crores.

4. The Project has also planned to adopt a new work culture in order to construct and commission the project in time and to achieve higher equipment and labour productivity. As against the current level of manpower productivity of 30 to 35 tonnes ingots per man per year in Indian steel plants, this project proposes to achieve higher productivity of 230 to 240 tonnes per man per year.

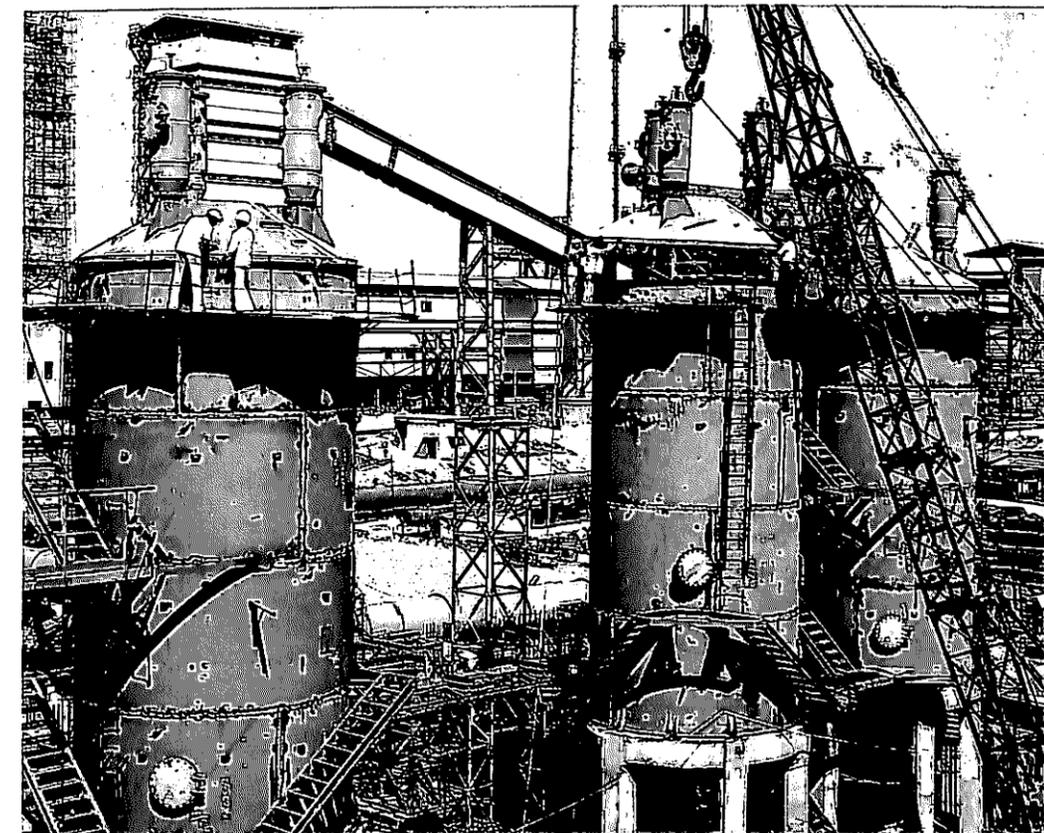
(c) Pellet Plant of Kudremukh Iron Ore Company Ltd.

The Pellet Plant which was set up to convert 3 million tonnes per annum of Kudremukh iron ore concentrate into pellets has been commissioned. Initial runs have already been undertaken and the plant is in the process of starting commercial production. Trial shipments of pellets have been sent to China and Hungary.

Expansion work at Bhilai Steel Plant



Equipment erection in Coke Oven Bye Product Plant at Visakhapatnam Plant



5. The Electric Arc Furnace Industry

During the last 2 decades, there has been a steady growth in the steel made by Electric arc furnaces. Today, approximately 20% of the crude steel in the world is produced from this method. Electric arc furnaces have certain advantages over the traditional Blast Furnace route such as greater flexibility to adapt to market conditions, quicker response to specific requirements, low specific investment cost and the possibilities of greater geographical dispersal. Presently, there are 160 units in the country with a capacity of about 4.8 million tonnes which produce approximately 25% of the total mild steel produced in India. In addition, 44 units for a capacity of about 2 million tonnes having Letters of Intent for producing steel through the Electric Arc Furnace route. In 1985-86, out of a steel production of about 10.6 million tonnes of steel, the EAF units produced approximate 2.9 million tonnes. In 1986-87, it is expected that out of a total production of 11.05 MT of steel, the EAF industry will contribute about 3.00 MT.

2. Production of EAF units which are reporting production to the office of the Iron & Steel Controller during the last 3 years and for 1986-87 (Upto November, 86) is given below:—

Categorywise Production of Ingots/ Concast Billets By Mini Steel Plant

(In thousand tonnes)

Category	YEAR			
	1983-84	1984-85	1985-86	1986-87 April-Nov.*
Mild Steel	1677.9	1648.2	2173.1	1178.5
Medium/High Carbon Steel	349.4	306.2	312.4	146.2
Alloy Steel	376.9	385.6	458.7	186.6
Total:	2404.2	2340.0	2944.2	1511.3

(The above does not include production of Casting Units registered with DGTD).

*Provisional.

3. During 1986-87, several indigenous producers have developed creep resistance steels which have been recognised by Central Boiler Board, and as such it is expected that this will help reduction in the import of creep resistance steel. Several units have also taken up modernisation by installation of facilities like ladle furnace, water cooled panels etc. The cost of production will be reduced by the

installation of such facilities and it is also expected that better quality steel would be made available.

4. In recognition of the important role that this industry plays on the domestic steel scene, the Government has constituted a Development Council for Iron and Steel and Special Steels. The first meeting of the Council was held on 26th December, 1986 in which various matters relating to development of the electric arc furnaces and the sponge iron industry were considered.

5. To improve economic viability of the existing units, the Government has announced a policy of endorsement of capacity to enable the units to achieve certain minimum economics of operation which has been fixed at 50,000 tonnes per annum. In pursuance of this policy, 17 Mini-steel plants have been allowed to increase their licensed capacity to the minimum economic level of 50,000 TPA. The Government also encourages the production in this sector by importing adequate quantities of scrap and sponge iron/HBI. During 1986-87, the plan is to import 2.2 million tonnes of scrap and sponge iron/HBI. In addition, to lessen the burden of import duty on these commodities, the Government has reduced the import duty from 25% and 30% on shredded scrap and sponge iron/HBI respectively to a uniform rate of 20%. The import duty on heavy melting scrap has also been reduced from 80% to 20%.

6. To study the status of the EAF industry, on the request of the Department of Steel, MECON along with the Economic Research Unit of the Joint Plant Committee conducted a study on the problems of the industry. In their report, it has been highlighted that there is an urgent need for modernising this industry in case it has to remain economically viable. Looking to the fact that the EAF industry will continue to play a significant role in meeting the demand for steel, the Government is formulating a strategy for encouraging Mini steel plants to take up modernisation.

6. Sponge Iron units

Sponge iron is a substitute material for scrap for making steel in the electric arc furnace. At present, the country is importing both scrap and sponge iron to bridge the gap between the supply and the demand. To reduce import of scrap, all encouragement is being given to set up Sponge Iron Plants in the country. With a view to encourage quicker growth, sponge iron industry was delicensed in March, 1985. About 150 units have so far been registered/hold industrial

licence/Letter of Intent for the production of sponge iron. At present three units with a capacity of 4.5 lakh tonnes are already in production. Work on project implementation has started in two units with a capacity of 2.7 lakh tonne. A Linkage Committee has been constituted in the Department under the chairmanship of Secretary (Steel) for finalising and reviewing the linkage of coal and iron ore to Sponge iron units so as to assist in their quicker implementation.

7. Steel Consumers Council

Steel Consumers Council was set up under the chairmanship of Steel and Mines Minister in January 1986 to provide a forum for interaction between Government and different categories of steel consumers. The first meeting of the Council was held in Delhi on 8th March, 1986 and the second in Bombay on 15th November, 1986. This has proved to be an extremely useful forum for exchange of views between Government and consumers and has thrown up a number of valuable suggestions for bringing about improvement in the distribution and availability of steel. It has, therefore, been decided to hold these meetings on a regional basis and to provide a larger representation to consumers of the particular region at such meetings. This would enable the Department of Steel to get a better picture of regional problems on the availability and distribution of steel to be taken into account in the formulation of Government policies.

8. Management Information System developed in the Department

With a view to improve the efficiency of decision making in the Department, a scientifically developed integrated MIS has been introduced with the assistance of National Informatics Centre. The broad areas covered by this system are, administrative efficiency, Performance Monitoring of Public Sector Undertakings, steel supply, projects, finance, budgeting and accounts.

9. Protection of Environment

In pursuance of a decision taken at the first meeting of the National Land Use and Wastelands Development Council held in February, 1986 under the Chairmanship of the Prime Minister to the effect that steps need be taken by Government to encourage and involve industry in the national task of afforestation, a meeting was convened by National Wastelands Development Board under the Chairmanship of the Minister of Steel & Mines on 6th January, 1987, which was attended by Chief Executives of all major public sector undertakings

under the Ministry of Steel and Mines. The Minister asked the Public Sector Undertakings to draw up an action plan of afforestation and environmental regeneration in their areas and subsequently extend it in the neighbouring rural areas.

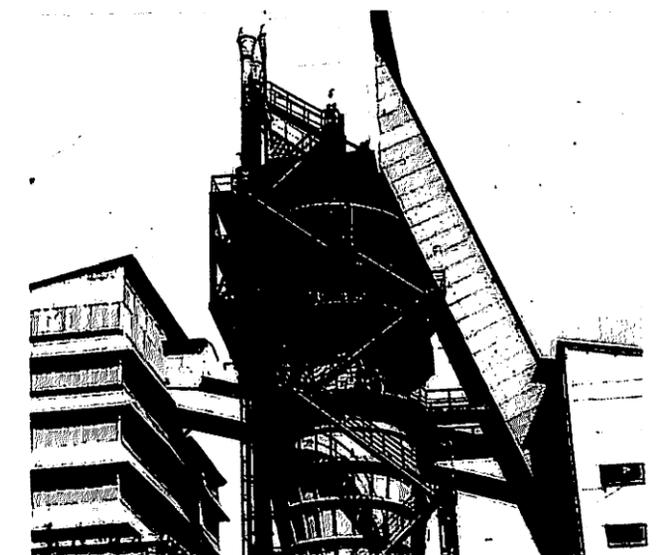
Steel plants under SAIL have already undertaken considerable amount of afforestation activity. The management of Visakhapatnam Steel Project have planted 1,20,000 trees in the current year. Kudremukh Iron Ore Company Limited has planted 53 lakh trees in 10 years, out of their own nursery.

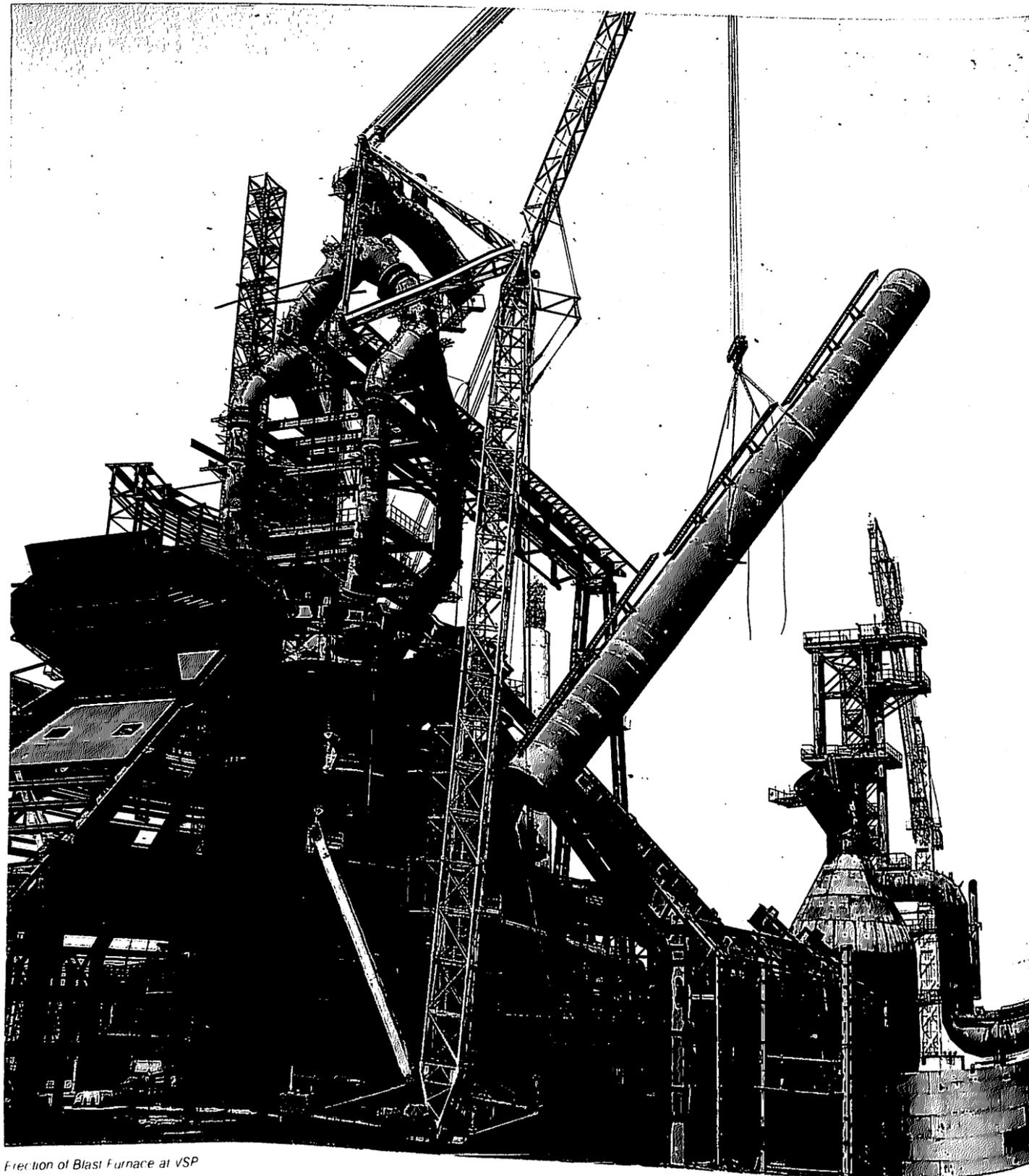
10. Prime Minister's 15-point directive about welfare of minorities.

All public sector undertakings under the Department of Steel have been asked to give special consideration to recruitment from minority communities, whenever they make any recruitment of staff, in accordance with Government directives on the subject. Suitable action is being taken by the public sector undertakings.

Appropriate relief has been provided to the staff of the public sector undertakings and their families who belong to minority communities, wherever they have been victims of communal violence and riots. Financial assistance has also been given in such cases by way of ex gratia payment. Bokaro Steel Plant has also given employment to one dependant of each employee belonging to a minority community, who had died in communal riots.

Pellet Plant at Mangalore





Erection of Blast Furnace at VSP

Steel is one of the critical inputs required for sustaining the growth of the economy in the industrial sector. Timely and adequate availability of steel determines the level of Industrial growth and also the contribution to the GNP by this sector. Steel availability is also a key factor in infrastructural development in such important areas as Railways, Tele-Communications, Power and Irrigation Projects.

An indepth study has been conducted by the Department of Steel on the long term planning of the steel industry in India with a view to determining the likely demand and availability of finished steel up to the year 2000 A.D. The following picture emerges out of this study:

Terminal Year of	(Million tonnes)		
	Demand	Availability	Gap
7th Plan (1989-90)	14.28	15.55	(+) 1.27
8th Plan (1994-95)	18.79	18.96	(+) 0.17
9th Plan (1990-2000)	24.96	19.52	(-) 5.44

The estimated availability is more than the estimated demand upto 1994-95 and there is an estimated shortfall of 5.44 million tonnes in 1999-2000 A.D. Even though the overall picture of estimated demand and availability shows a net surplus upto 1994-95 there is actually a shortfall in the availability of some of the flat products and as such imports will be required to bridge the gap. Some new production capacities also may have to be set up.

1. The above is based on the following assumptions:
 - a) Completion of 4 MT expansion scheme at Bhilai and Bokaro by May 1988 together with their debottlenecking scheme.
 - b) Modernisation proposal of Durgapur 1.6 MT by 1991-92.
 - c) Rourkela modernisation to 2.3 MT by 1993-94.
 - d) IISCO 1 MT by 1993-94.
 - e) 95% Capacity utilisation in SAIL Plants.

2. a) Modernisation phase III in TISCO will be approved and completed in 1992-93 and full production would be available from 1995-96.
- b) One Cold Rolling mill during modernisation programme phase IV would be completed by the year 1995-96 and full production will be available by 1999-2000.

3. Availability yearwise from the modernisation and the expansion plans of the main producers is subject to

- a) 50% incremental output assumed in the first year after modernisation/expansion.
- b) 95% capacity utilisation from the 2nd year onwards after modernisation/expansion in the case of SAIL and 100% in the case of TISCO.

4. Vizag availability is as per the latest estimates. The year-wise output of Bars and Rods, Structural and Billets according to the latest estimates assuming 100% capacity utilisation is as follows:—

	(Production in '000 tonnes)				
	1988-89	1989-90	1990-91	1991-92	1992-93 Onwards
Bars & Rods	69	596	1270	1314	1330
Structurals	154	290	609	990	1080
Billets	—	—	55	298	246
Saleable Steel	223	886	1934	2606	2656

However, while assessing the overall availability 90% of capacity utilisation has been assumed from 1989-90 from Vizag.

5. Availability from secondary producers is broken down into two components:—
 - a) from the existing units
 - b) from the new 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 their estimated production

Sources of Finished Steel Availability

	(Million tonnes)		
	1989-90	1994-95	1999-2000
SAIL	7.66	8.60	8.60
TISCO	1.30	1.69	2.15
VIZAG	0.80	2.17	2.17
Secondary Producers	6.12	6.87	6.97
Total*	15.55	18.96	19.52

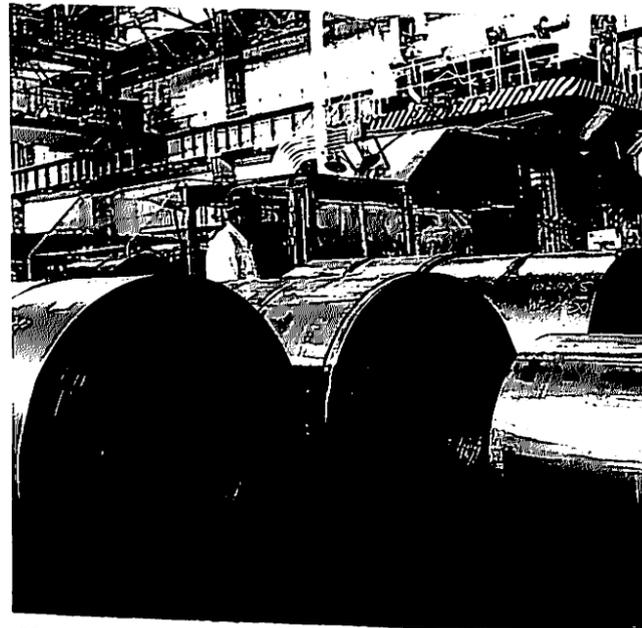
* excludes provision of feed material of 0.33, 0.37 and 0.37 million tonnes respectively for secondary producers of flat products.

Plant Wise Availability of Finished Steel

	(Million tonnes)		
	1989-90	1994-95	1999-2000
BSP	2.470	2.470	2.470
DSP	0.573	0.745	0.745
RSP	1.164	1.721	1.721
BSL	2.998	2.998	2.998
IISCO	0.452	0.665	0.665
TISCO	1.297	1.691	2.147
VSP	0.797	2.169	2.169
Secondary Producers	6.121	6.871	6.978
Total	15.872	19.330	19.893

The making of steel through the Electric Arc Furnace route has made rapid strides in the recent years all over the world. In 1960, this industry accounted for only 11% of the world steel production, and by 1984 it stood at 24.6%. In India also, the electric furnace steel industry has made remarkable progress since the seventies. At present, the Mini-steel plants are producing nearly 3 million tonnes of steel which account for nearly 30% of India's total production of steel. While the production of special and alloy steel from this industry has shown an increase during the last decade, the bulk of its production still comprises of mild steel.

The steady development of the electric furnace industry is an indicator that it will continue to play a significant role in meeting the steel requirements of the country. The advantages of this route over the conventional blast furnace route are their relatively low investment costs, the short construction period



CR coil in CRM of Bokaro Plant

and the fact that they can be economically built and operated with a much smaller capacity than is possible with conventional technologies. In India, there are presently 160 Mini-steel plants with a capacity of 4.8 million tonnes. In addition, 44 units for a capacity of about 2 million tonnes have Letters of Intent/Industrial Licences for setting up such plants.

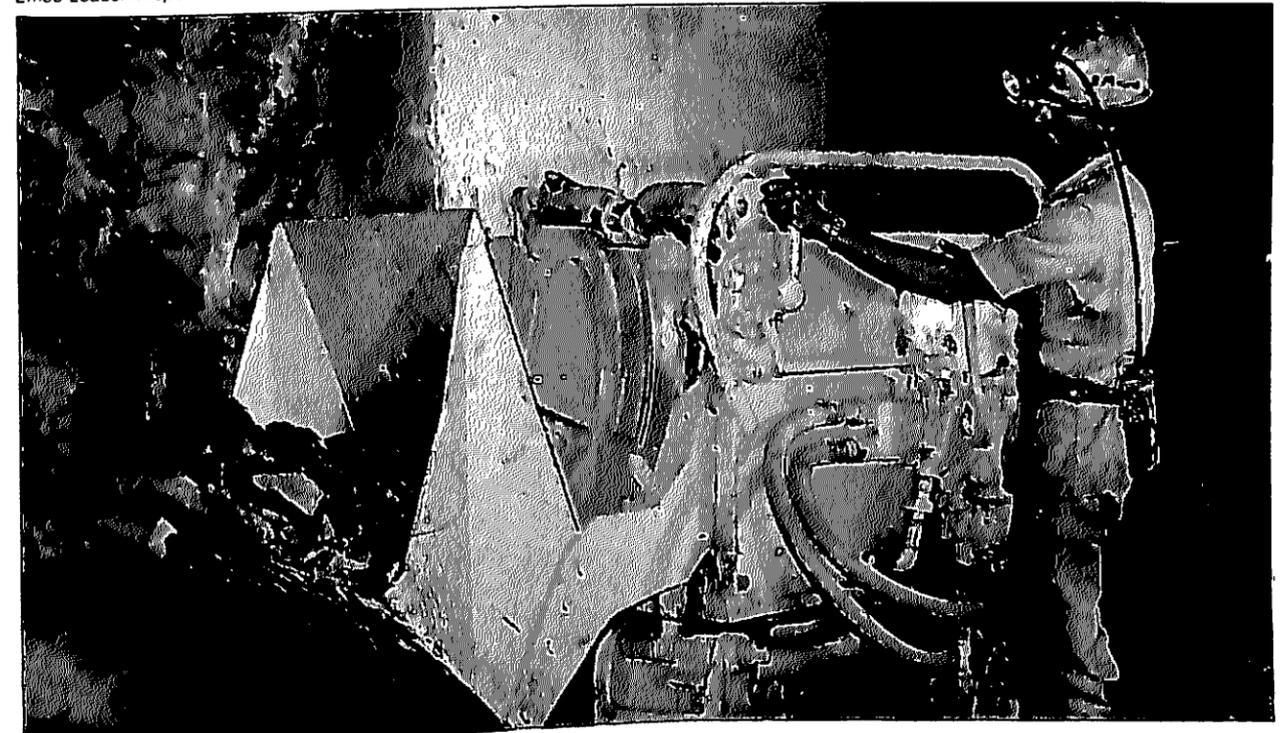
The Mini-steel plants are presently heavily dependant on the use of scrap as raw material. The indigenous availability of scrap is limited and the demand for imported scrap is steadily increasing with the growth of production. In 1985-86 India imported 14.52 lakh tonnes of scrap and in 1986-87, it is expected that the imports will be about 21.00 lakh tonnes. It would be difficult to allow increasingly higher levels of import every year, since there is an overall limitation in the availability of foreign exchange. The industry has, therefore, to move in the direction of replacing use of imported scrap by sponge iron. The sponge iron technology has been established in India, and its commercial acceptance has opened a new avenue for the Mini-steel industry.

The growth of the electric furnace industry is, therefore, closely linked to the development of the sponge iron industry. To facilitate the growth of the sponge iron industry, it has been delicensed, and as a result, the registered capacity has increased from about 6 million tonnes in 1985-86 to about 20 million

tonnes in 1986-87. In addition, with a view to increasing the production of sponge iron, the Govt. is permitting the import of technology alongwith the hardware. To provide a forum to discuss the strategy for development of these two inter-linked industries, the Govt. has constituted a Development Council for Iron & Steel. The first meeting of the Council was held on 26th December, 1986 in which various matters relating to the growth of the electric furnace industry and sponge iron industry were discussed.

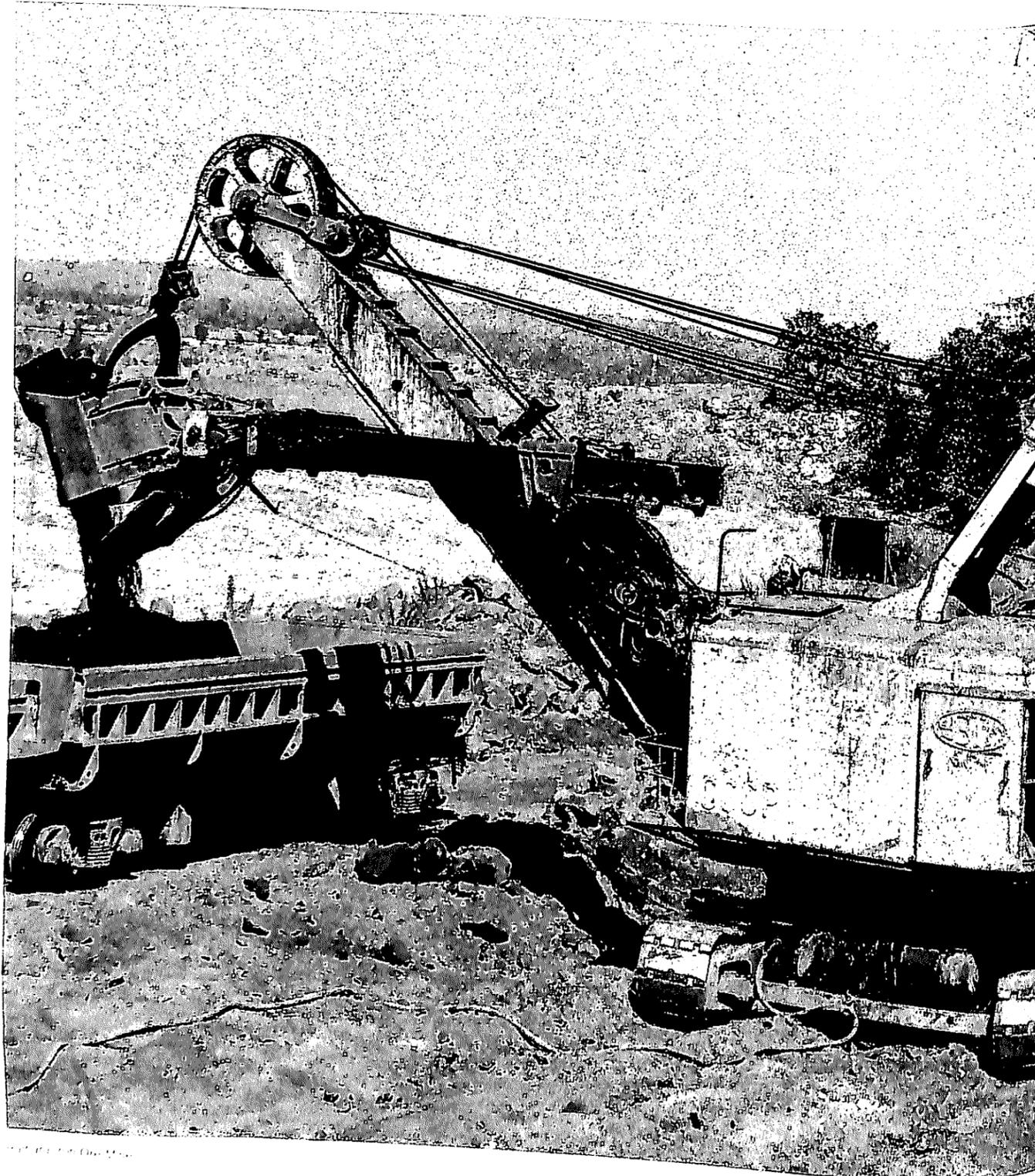
In the field of technological upgradation of electric furnace steel making, there have been vast developments on the international scene. On the domestic scene, however, even though the share of this industry in the total steel production has been keeping pace with the world trend, the technological advancements have been very slow. Most of the units are equipped with small capacity arc furnaces with size range of 5-12 tonnes. Only a few furnaces of about 25 to 30 tonnes are in operation. Therefore, to keep pace with the world trend, and to remain economically viable, it would be necessary for the Mini-steel plants to adopt modern techniques on a large scale. To encourage them to do so a strategy in consultation with the industry is being worked out.

Emco Loader in operation at Balaghat mine



During 1986-87, a study was conducted on the demand and availability of steel for the future. This study has thrown up data which indicates that there will be a shortfall of some of the flat products in the future. To meet this gap, the Department has taken up the expansion and modernisation of integrated steel plants in the public sector. The expansion of TISCO to 3.00 million tonnes will also help in partly meeting the gap. After taking into consideration these expansion and modernisation programmes, there would still be a shortfall of approximately 1.27 million tonnes in the availability of flat products.

Based on this data, the Department is presently studying the various technical parameters and options which are available for meeting this gap. It appears that one of the more viable options for filling this gap would be by creation of additional steel making capacity through the electric furnace route and other similar technological processes. Traditionally, this industry has been making billets and rolling them into long products. Therefore, the new units which will be permitted to be set up, would, for meeting this gap of flat products be of a different type. Against this background, the existing Licencing Policy for steel making is being reviewed.



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 public sector and several smaller mines operated on manual or semi-mechanised basis in 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 on manual and semi-mechanised methods of mining for export and internal consumption.

1.1 Reserves of Iron Ore

The iron ore reserves of the country are presently estimated at 17664 million tonnes, out of which 11470 million tonnes are haematite and 6194 million tonnes magnetite, distributed in five distinct areas viz. Barajamda sector in Bihar and Orissa, Dalli-Rajhara-Bailadilla in Madhya Pradesh, Bellary-Hospet in Karnataka, Ratnagiri in Maharashtra, and Goa. The reserve estimate is likely to show an upward revision due to intensification in exploration activity. Infact GSI has recently discovered/explored additional reserves of over 1600 million tonnes of haematite ores which would raise the reserve of Haematite ore to over 13070 million tonnes.

1.2 Production and Despatches

The production of iron ore (including concentrates) during the year 1986 is estimated at 47.8 million tonnes as against the recorded production of 44.2 million tonnes in 1985. Goa continues to be the chief iron ore producing state during the current year also accounting for 13.9 million tonnes (29%) of the total production during 1986, followed by Madhya Pradesh at 9.3 million tonnes (20%), Bihar at 7.6 million tonnes (16%), Karnataka at 8.0 million tonnes (17%) and Orissa at 7.3 million tonnes (15%). The balance 1.7 million tonnes is from Andhra Pradesh, Maharashtra and Rajasthan.

The despatches of iron ore/concentrates in 1986 are estimated at 45.2 million tonnes, the share of internal consumption and exports being 17.3 million tonnes (38%) and 27.9 million tonnes (62%) respectively.

1.3 Consumption of Iron ore at Steel Plants

During the year 1985-86, SAIL steel plants including IISCO procured 102 lakh tonnes of iron ore from their captive mines and 32.3 lakh tonnes from other domestic sources. Their consumption of iron ore during the year was 137.5 lakh tonnes.

During the year 1986-87, SAIL Steel Plants are likely to procure 113.9 lakh tonnes of iron ore from their captive mines and 58.7 lakh tonnes from other domestic sources. Their consumption during the year is likely to be 141.9 lakh tonnes.

Tata Iron and Steel Company Ltd. (TISCO) consumed during 1985-86, 28.1 lakh tonnes of iron ore which was procured entirely from its captive mines at Noamundi. The estimated consumption during 1986-87 is 30.1 lakh tonnes.

2. Manganese Ore

Manganese ore reserves of the country are estimated to be 135 million tonnes; of these 18 million tonnes are measured, 31 million tonnes are indicated and 86 million tonnes are inferred. The reserves are located in eight states viz. Andhra Pradesh, Bihar, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Orissa and Rajasthan and the Union territory of Goa.

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 de sulphurizing, 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 steel industry chiefly in the form of ferro-manganese or silico-manganese.

Manganese imparts strength, hardness and stiffness to aluminium and hardness, stiffness and corrosion resistance to magnesium. The common dry-cell battery uses manganese dioxide as the depolarizer in the cell, either as battery grade natural ore, synthetic dioxide or a blend of both.

Manganese dioxide ore are used also as oxidants in the production of hydroquinone, in the leaching of uranium ores, in the electrolytic production of zinc and in various chemical processes.

Manganese ore (including carbonate ore), ferro-manganese, manganese metal powder and manganese chemicals are used in the manufacture of welding coatings and fluxes. Manganese ores

and/or chemicals made from them are employed to produce various colour effects in face brick and to a much less extent, to colour or decolour glass and ceramic products. They also have use as paint and varnish dryers, and in the production of dyes, fungicides and pharmaceuticals. Manganese dioxide has use as a constituent of the frits for bonding glass and procelains to metal. The manganese zinc ferrites used in magnets for electronic applications have their manganese introduced as manganese oxides or electrolytic manganese metal powder. Manganese or manganiferous ores may be used as a flux in the smelting of base metal ores.

Production of manganese ore during 1986 is estimated at 1.21 million tonnes as compared to the recorded production of 1.26 million tonnes in 1985. Major producing states during 1986 are Orissa, Karnataka, Madhya Pradesh and Maharashtra accounting for 35%, 23%, 19% and 18% respectively of the total production of manganese ore during 1986.

Despatches of manganese ore are estimated at 1.18 million tonnes in 1986 of which 0.85 million tonnes (72%) are for internal consumption and 0.33 million tonnes (28%) for exports.

2.1 Consumption of Manganese Ore at Steel Plants

During the year 1985-86, SAIL steel plants including IISCO procured 3.65 lakh tonnes of manganese ore and consumed 4.15 lakh tonnes of the ore.

During the year 1986-87, SAIL steel plants are likely to procure 0.14 lakh tonnes of manganese ore from their captive mines and 3.84 lakh tonnes of the ore from other domestic sources. Their consumption of the ore during the year is likely to be 4.23 lakh tonnes.

TISCO consumed 0.74 lakh tonnes of manganese during 1985-86 which was procured entirely from its captive mines. TISCO's likely consumption of the ore during 1986-87 is 0.82 lakh tonnes out of which 0.58 lakh tonnes would be from its captive mines.

3. Chromite

The total reserves of chromite in the country are estimated to be 135 million tonnes, major portion

being located in Sukhinda-Naushai belt of Orissa. Other States where deposits are located are Andhra Pradesh, Bihar, Karnataka, Maharashtra, Manipur, Tamil Nadu and the Union territory of Andaman and Nicobar island.

Chromite is used mainly in three sectors of production 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°C), moderate thermal expansion, stability of crystalline form at high temperatures and a comparatively neutral chemical behaviour.

The production of chromite during 1986 is estimated at 6,16,000 tonnes as against the recorded production of 5,67,000 tonnes in 1985. Orissa continued as the principal producer accounting for 5,41,000 tonnes (88%) of the total production followed by Karnataka with 73,000 tonnes (12%).

Despatches of chromite in 1986 are estimated at 5,52,000 tonnes, of which 3,84,000 tonnes (76%) are for internal consumption and 1,68,000 tonnes (30%) for exports.

4. Ferro Alloys

Ferro Alloy addition for the purpose of deoxidation or alloying is an integral part of steel making. Traditionally, integrated steel plants producing tonnage steel basically use manganese and silicon in the form of several ferro alloys. These alloys, Ferro-Manganese, Ferro-Silicon and Ferro-Chrome are called bulk/tonnage ferro alloys. Other ferro alloys which are more critical and strategic ferro alloys, such as 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 and other batch processes. These elements, such as vanadium, tungsten, molybdenum, niobium, titanium are introduced into steel in the form of ferro alloys because their production is simpler and cheaper. These alloys are generally used in the production of alloy steels, special steels, special quality pig iron etc.

Actual consumption of the various ferro-alloys at SAIL steel plants including IISCO during 1985-86,

and estimated consumption during 1986-87 is as follows:—

	1985-86 Tonnes	1986-87 Tonnes
Ferro-Manganese	1,09,443	1,09,027
Ferro-Silicon	13,035	13,617
Ferro-Chrome	4,083	5,029
Ferro-Nickel	1,851	2,045
Silico-Manganese	1,075	4,785
Ferro-niobium	68	49
Ferro-phosphorus	57	54
Ferro-molybdenum	0.5	4.2
Ferro-tungsten	4.5	19
Ferro-titanium	61	40
Ferro-vanadium	1.1	0.7
Other ferro-alloys	3.3	—

Actual consumption of the various ferro-alloys at

TISCO during 1985-86 and estimated consumption during 1986-87 is as follows:—

	1985-86 Tonnes	1986-87 Tonnes
Ferro-manganese	15,215	17,852
Ferro-Silicon	3,939	3,693
Ferro-Chrome	603	510
Silico-manganese	9,704	12,156
Ferro-niobium	39	43
Ferro-phosphorus	384	325
Ferro-molybdenum	44	39
Ferro-tungsten	0.2	1.1
Ferro-titanium	150	160
Ferro-vanadium	137	150
Other ferro-alloys	4	0.7

TISCO procured ferro-manganese entirely from its captive source. The rest of the ferro-alloys were purchased from other domestic sources.

Purnapani Lime Stone Quarry



5. Limestone

Limestone is used as a flux in iron as well as 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.

SAIL steel plants during 1985-86 procured 16.94 lakh tonnes of blast furnace grade and 8.98 lakh tonnes of steel melting shop grade limestone from their captive mines, 0.77 lakh tonnes of blast furnace grade ore and 5.80 lakh tonnes of SMS grade limestone from other sources. The consumption during the same period by SAIL plants was 25.65 lakh tonnes of blast furnace grade limestone and 12.53 lakh tonnes of steel melting grade limestone. TISCO plant consumed 2.84 lakh tonnes of blast furnace grade and 3.36 lakh tonnes of steel melting grade limestone during 1985-86. The consumption during 1986-87 is likely to be 28.63 lakh tonnes by SAIL plants and 1.58 lakh tonnes by TISCO plant of blast furnace grade and 13.59 lakh tonnes by SAIL and 3.6 lakh tonnes by TISCO of the steel melting shop grade limestone. To meet indigenous demand of low silica steel melting grade limestone, 0.49 lakh tonnes was procured from abroad.

6. Dolomite

Dolomite finds extensive applications in metallurgical industry as a flux, as a refractory and as a source of mangnesia for the production of magnesium metal. In Steel industry it is used as a flux as well as a refractory material. Total reserves of dolomite are estimated at 4354 million tonnes.

During the year 1985-86, SAIL steel plants including IISCO procured 2.22 lakh tonnes of blast furnace grade dolomite from their captives mines and 3.81 lakh tonnes from other domestic sources. Their consumption during the year was 6.94 lakh tonnes.

During the year 1986-87, SAIL plants are likely to procure 1.69 lakh tonnes of blast furnace grade dolomite from their captive mines and 4.83 lakh tonnes from other domestic sources. Their consumption during the year is likely to be 7.39 lakh tonnes.

TISCO consumed 3.19 lakh tonnes of blast furnace grade dolomite during 1985-86. It was procured

entirely from its captive mines. TISCO's consumption during 1986-87 is likely to be 2.86 lakh tonnes.

During the year 1985-86, SAIL steel plants procured 3.03 lakh tonnes of steel melting shop grade of dolomite from their captive mines and 2.47 lakh tonnes from other domestic sources. Their consumption during the year was 5.58 lakh tonnes.

During the year 1986-87, SAIL plants are likely to procure 2.77 lakh tonnes of steel melting shop grade dolomite from their captive mines and 3.14 lakh tonnes from other domestic sources. Their consumption during the year is likely to be 3.81 lakh tonnes.

TISCO procured 1.35 lakh tonnes of steel melting shop grade dolomite from its captive mines and 0.66 lakh tonnes from other domestic sources during the year 1985-86. The consumption during the year was 2.01 lakh tonnes. During the year 1986-87, TISCO is likely to procure 0.9 lakh tonnes of steel melting shop grade dolomite from its captive mines and 0.62 lakh tonnes from abroad for consumption during the year.

7. Coking Coal

Indian coking coals have a high ash content mainly because of the sedimentary nature of their origin. Total mineable reserves of coking coal are estimated to be 6,630 million tonnes.

During the year 1985-86, SAIL steel plants including IISCO procured 4.18 lakhs tonnes of coking coal from their captive mines, 103 lakh tonnes from other domestic sources and 19 lakh tonnes from abroad. Their consumption of coking coal during the year was 122 lakh tonnes.

During the year 1986-87, SAIL steel plants are likely to procure 3.47 lakh tonnes of coking coal from their captive mines, 95.7 lakh tonnes from other domestic sources and 23 lakh tonnes from abroad. Their consumption during the year is likely to be 122.3 lakh tonnes.

TISCO procured during 1985-86, 18.59 lakh tonnes of coking coal from its captive mines, 1.71 lakh tonnes from other domestic sources and 2.16 lakh tonnes from abroad. The consumption during the year was 22.46 lakh tonnes.

During the year 1986-87, TISCO is likely to procure 14.41 lakh tonnes of coking coal from its captive

mines, 0.06 lakh tonnes from other domestic sources and 3.18 lakh tonnes from abroad.

8. Non-Coking Coal

During the year 1985-86, SAIL steel plants including IISCO procured 0.4 lakh tonnes of non-coking coal from their captive mines and 25.77 lakh tonnes from other domestic sources. Their consumption during the year was 26.19 lakh tonnes.

During the year 1986-87, SAIL steel plants are likely to procure 0.38 lakh tonnes of non-coking coal from their captive mines and 28.28 lakh tonnes from other domestic sources. The consumption during the year is likely to be 25.69 lakh tonnes.

TISCO procured during 1985-86, 6.45 lakh tonnes of non-coking coal from its captive mines and 3.15 lakh tonnes from other domestic sources. The consumption during the year was 9.6 lakh tonnes.

During the year 1986-87 TISCO is likely to procure 6.72 lakh tonnes of non-coking coal from its captive mines and 3.39 lakh tonnes from other domestic sources. The consumption during the year is likely to be 10.11 lakh tonnes.

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 1985-86 and likely to be procured during 1986-87 by SAIL steel plants, TISCO, and Visakhapatnam Steel Project are given below:—

SAIL—Plants' Procurements

	1985-86 Tonnes	1986-87 Tonnes
Fireclay	1,15,448	1,10,993
High Grog	60,389	65,061
High Alumina	8,922	4,233
Silica General Purpose	18,191	14,967
Silica Coke oven	3,502	2,940
Basic	1,02,104	91,655
Others	46,450	46,140

TISCO's Procurement

	1985-86 Tonnes	1986-87 Tonnes
Fireclay/High Grog/		
High Alumina	47,167	42,241
Silica General	12,221	437
Basic	26,960	29,981
Others	75	80

Visakhapatnam Steel Projects Procurement

	1985-86 Tonnes	1986-87 Tonnes
Fireclay	7,515	13,423
High Alumina	650	3,250
Silica General Purpose	70	5,350
Silica Coke Oven	9,336	941
Others	1,776	3,177

Mineral Development Board

The Mineral Development Board was established on 15th June, 1979 by reconstituting the erstwhile Iron Ore Board. It is an autonomous registered society under the administrative control of the Department of Steel and advises the Government on problems connected with the optimal utilisation of mineral raw materials and in their conservation. It also undertakes studies on specific research programmes and projects at a micro level.

The Mineral Development Board completed 5 schemes and studies during the year 1985-86. Some of the activities of the Board in various areas are briefly indicated below:—

Iron Ore—MDB had commissioned Regional Research Laboratory, Bhubaneswar, to assess the feasibility of recovering iron ore fines contained in slimes and to investigate the feasibility of utilising the recovered fines in the production of sinter. The study indicated that the fines could be recovered and be mixed in sinter feed.

A study entrusted by MDB to Engineers India Limited to determine the techno-economic parameters of recovery of iron values from the slimes of Kiriburu and Barsua mines has been completed. It has revealed that iron values from Kiriburu and Barsua can be recovered at a cost of Rs. 15 and Rs. 20 per tonne. The investment required for setting

up this recovery plant, capable of handling 0.5 to 1 million tonnes of slimes per annum, would be of the order of Rs. 2-3 crores.

Tungsten—The exploratory work at Degana revealed mineralisation of Tungsten in the granites. This will significantly upgrade the resource potential if an economic recovery process can be devised and then adopted.

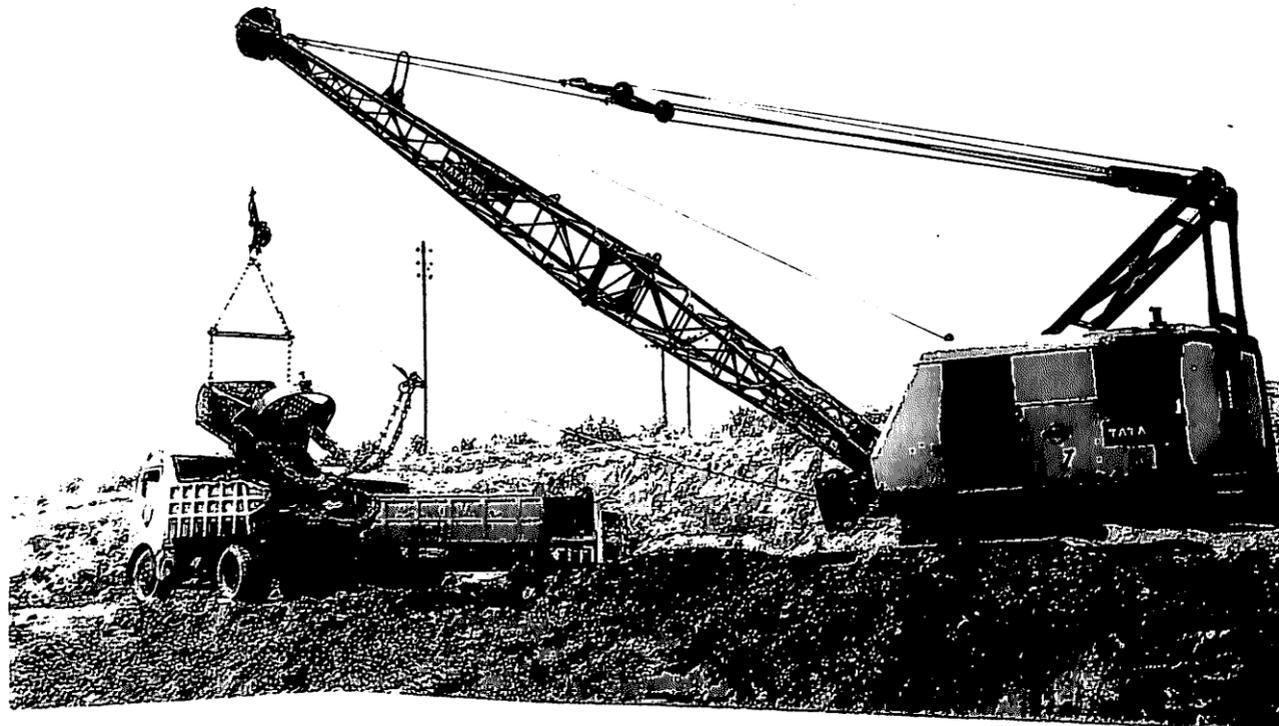
A preliminary exploration study of Tungsten in the Burugubanda area of Andhra Pradesh entrusted to National Mineral Development Corporation was completed. The reconnoitry survey covered an area of 15 sq. kms. and geological mapping of 5,000 sq. meters. The preliminary results are extremely encouraging and the Board has, therefore, approved the implementation of the second phase.

Magnesite—MDB initiated studies on magnesite

mines in Tamil Nadu with the aim of reducing the Silica content. The pilot plant study revealed that the Silica level could be reduced significantly. The study was entrusted to National Metallurgical Laboratory, Madras. As the beneficiation work was completed in Phase I programme, MDB had initiated the Phase II techno-economic feasibility of the beneficiation. This work has also since been completed.

Dolomite—MDB had sponsored, in collaboration with the Government of Arunachal Pradesh, the exploration of dolomite deposits in that State. The National Mineral Development Corporation was commissioned to take up the field work, which has since been completed. The study revealed that the Dolomite deposits are of the order of 150 million tonnes and are of a quality containing less than 3% Silica. Of this, there is a mineable quantity (reserves upto 40 meters depth) of 31 million tonnes of high grade dolomite (i.e., with less than 1% Silica content).

Ramnagar Colliery



1. Table below gives the availability of iron and steel to the home market during 1985-86 and the estimated availability during 1986-87.

	('000 tonnes)			
	Pig iron		Finished Steel	
	1985-86	1986-87	1985-86	1986-87
	(Estimated)		(Estimated)	
1. Production				
a) Main producers	1159	1183	5778	5815
b) Secondary producers	90	90	4716	4933
2. Import arrivals (Canalised)				
a) SAIL	—	—	—	—
b) MMTC	—	15*	1156.4	1392.0*
3. Total (1+2)	1249	1288	11650.4	12140
4. Interplant transfers	—	—	257.0	300.0
5. Exports	—	—	15	20
6. Net Availability (3-4-5)	1249	1288	11378.4	11820

*indicates total estimated imports. Canalised imports of steel during April-Jan. '87 has been 630.2 thousand tonnes and of pig iron 14 thousand tonnes.

Note: Net availability shown against Item No. 5 during 1985-86 might be higher as it gets supplemented by direct imports, data about which is not yet available.

2. Distribution of Steel

2.1 Strategy

The measures introduced in the previous years to ensure fair distribution of available materials were continued during the year.

With the objective of streamlining the supplies of iron and steel materials to actual consumers, Steel Authority of India Limited (SAIL) introduced a new demand registration scheme. The scheme has been given effect, from the quarter October-December, 1986. This scheme is in addition to the Time-bound Supply Scheme, which was introduced by SAIL with effect from the quarter January-March, 1986. The customers covered under Status 'A' are not eligible to register their requirements under this scheme, because they are given priority allocation by Joint

Plant Committee (JPC) on quarterly basis. Other eligible consumers are required to register their projected demand with the nearest Branch Sales Offices of SAIL. The registration is a continuous one. Registrations up to 110 days before the commencement of the quarter are considered for supply during the quarter and the registrations made after the cut-off date are considered for supply in the subsequent quarter. A demand registration fee of 1% of the value of the material or Rs. 10,000 whichever is lower is required to be deposited by the registrant.

The materials which are not supplied against the registrations are carried forward to the subsequent quarter for supply. In case, a customer does not accept the offer, the registration fee deposited will be forfeited to enable SAIL to cover expenses of producing and bringing the materials to stockyards as per customers' demand projection.

2.2 Distribution procedure

The guidelines for distribution of iron and steel materials formulated by the JPC in 1980 were reviewed and revised. The Government had conveyed to JPC its approval of the salient features of the guidelines. The guidelines have since been adopted by JPC. The revised guidelines (to be known as JPC Guidelines on Distribution-1987) will be applicable from the planning period April, 1987-March, 1988 onwards.

According to the revised distribution guidelines priority sector consumers under Status 'A' like Defence, Railways, P & T, Irrigation, Power, Bio-gas, etc., will be allocated steel quarterly by JPC. Allocations to SSI Corporations, who are also given Status 'A' priority, will be done by the Iron & Steel Controller as earlier. Consumers other than these have to register their requirements with the main producers/their Branch Sales Offices for supply of all items. Small Scale units are normally to register their demand with their respective SSICs. However, Small Scale Units with quarterly offtake of steel materials of 100 tonnes or more from the main producers in any quarter during the past five years will be eligible to register their demand with the respective stockyards and receive supplies directly. While calculating such offtake, materials supplied under Compact Group Schemes, offtake of imported materials and purchase of plant disposals will not be taken into account. SSI units other than those receiving supplies under Compact Group, I & SC release orders on account of engineering exports/Essentiality Certificates and eligible units with offtake of 100 tonnes prescribed.

are to get their requirements from the concerned SSICs. All SSI units will be eligible to draw supplies of Compact Group items like billets, wire rods, HR coils/skelp, CR coils/sheets, from the main producers in terms of the guidelines.

Supplies of compact group items to individual functioning units will be made as per the unit's entitlements arrived at on the basis of the best of the last three years offtake from the main producers. In the new guidelines there will be a provision to take care of the requirements of new/sick units/units with negligible past offtake/units with additional capacity creation. The entitlements of such units will be determined by the technical representatives of the main producers.

The entitlements of units situated in centrally declared backward areas, in districts where main producers' steel plants are located, North-Eastern sector and J & K, will be increased by 10%. In case the district where producers' steel plant is located is also a centrally declared backward district of North-Eastern sector and J & K, its total entitlement would be increased by 15%.

2.3 Distribution of Pig Iron

The Iron & Steel Controller/JPC makes allocation of pig iron to the consumers under Status Group 'A', railway sleeper manufacturers and spun pipe manufacturers taking into account their projected demand, past offtake and availability. DGTD units having foundries obtain their requirements directly from plants/stockyards. SSI units can draw materials either from

- main producers; or
- State SSI Corporations; or
- through registered associations/cooperatives of consumers already sponsored by Directorates of Industries of States/Union Territories concerned in the case of direct despatch.

The choice for the channel of supply once exercised will remain valid for a period of 3 financial years. Since the supplies of pig iron are based on past offtake in the case of SSI Corporations and Associations, the entitlement will be the sum total of the entitlements of individual units attached to the respective SSICs or Associations/Cooperatives.

2.4 Small Scale Industries corporations and Supplies of iron and steel materials to them

Allocations of iron and steel to SSI Corporations are

made by Iron and Steel Controller annually.

The table below indicates allocations and offtake /supplies of iron and steel to SSICs in 1985-86 and 1986-87 (upto December, 1986).

Year	(Qty. in '000 tonnes)			
	Allocations		Offtake/Supplies	
	Pig Iron	Steel	Pig Iron	Steel
1.	2.	3.	4.	5.
1985-86	557.8	527.7	239.2*	243.2
1986-87 (April- December, 86)	354.0	347.6	179.2@	166.3

*Excludes 371,400 tonnes supplied direct to SSI unit and 33,000 tonnes cleared for import

@Excludes 192,977 tonnes supplied direct to SSI units.

2.5 Distribution by other steel producers

Distribution of the products of ministeel plants, rerollers and secondary producers is done by the producers themselves. Similarly, alloy steel products are distributed by the producers through their sales network.

2.6 Rebates for supplies for Iron and Steel

Small Scale Industries Corporations have been entrusted with the task of distribution of iron and steel to SSI units since 1972. They are supplied steel at rebate by the main producers so that it would be made available to the Small Scale Industrial Units at prices comparable to main producers' stockyard prices. There were representations from the Corporations that the handling margins given to them for distribution of iron and steel were inadequate and should be revised. After a careful consideration of these representations the handling margins for steel have been revised upward. These now range between Rs. 310 to Rs. 440 per tonne as against Rs. 210 to Rs. 300 per tonne earlier. A rebate of Rs. 100 per tonne is also allowed on the sales of pig iron to them from the main producers' stockyard and on the imported pig iron. No rebate is, however, given for supply of pig iron directly from the plants as this is supplied at JPC plant price which is Rs. 175 per tonne less than the stockyard price. The Corporations are required to sell pig iron to the SSI units at the corresponding prices of main producers' stockyards and expected to cover their handling charges from this difference of Rs. 175 per tonne.

2.7 Distribution network

SAIL including IISCO have a network of 43 Departmental stockyards, 11 consignment agency yards and 88 other conversion agencies/twisting yards throughout the country. TISCO has 11 stockyards, 19 consignment agents and 97 conversion agents/twisting agents. During the year under review, 2 new outlets are likely to be opened by SAIL.

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.

3. Pricing

There is no control, statutory or otherwise, on the prices of iron and steel. These are determined and announced from time to time by the JPC, a body constituted by the Government under the Iron and Steel (Control) Order, 1956. The Committee is headed by the Iron and Steel Controller and the main producers of iron and steel, namely, Steel Authority of India Limited, Tata Iron and Steel Company Ltd., 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 the major items of iron and steel produced by the integrated steel plants. Rerollers, ministeel plants, alloy steel producers, etc., fix their own prices for their products.

There has been no increase in steel prices since 21st Feb., 1985 though input costs of the main

Despatch work in Stockyard



producers have gone up considerably since then as a result of revision of duties and tariffs on power by State Governments, increase in Railway freight, increase in price of furnace oil and petro fuels and increase in coal prices and cess on coal. The producers have been making all-out efforts to absorb these increases in costs through better productivity, better capacity utilisation and improvement in technological norms etc.

Iron and Steel materials are supplied by the main producers at a uniform price throughout the country, be they directly from the steel plants or through stock-yards. For this purpose, a freight equalisation fund is operated and maintained by the JPC. Presently, the freight element for steel is Rs. 470/- per tonne and for pig iron it is Rs. 320 per tonne. Government has also reviewed its earlier decision about phasing out freight equalisation scheme in respect of iron and steel in the light of the representations received from various State Governments and has decided to refer the matter to the National Development Council. 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 Iron and Steel Controllers. Corrective action is taken wherever and whenever necessary.

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4. Import-Export

The general policy procedure for import and export of iron and steel, ferro alloys and ferrous scrap are decided by the Ministry of Commerce. The Import Policy was amended significantly on 6th November, 1986 when import of carbon steel hot rolled as well as cold rolled coils/sheets, hot rolled skelps and tinplate OTSC quality were canalised through MMTC. These items were earlier in the list of limited permissible items covered by the supplementary licencing procedure. In deciding the policy procedure the scope for bulking as well as other relevant facts are taken into account. Export of iron and steel is canalised through SAIL. Due to domestic demand the

export of steel items have not been sizeable. The current exports are mainly surplus plates from Bhilai Steel Plant. According to DGCI&S import of steel during 1982-83 was 2.150 million tonnes valued at Rs. 894.28 crores. Canalised imports during 1985-86 and 1986-87 (April 1986 to January, 1987) are given in the statement at Appendix I.

Whether for import under canalisation procedure or under supplementary licencing arrangement the I&SC is required to express his views from indigenous angle. In the matter of canalised import, comments of I&SC from indigenous angle are normally made available to the canalising agency co-terminus with the receipt of tenders against tender enquiries floated by the canalising agency, MMTC. For supplementary licencing I & SC has been expressing his views in the SLC meeting itself.

A constant watch is being maintained to ensure that the industrial requirements are met to the maximum extent possible from domestic supplies supplemented by imports and corrective measures are taken promptly to see that imbalance in availability do not result in bottlenecks for industrial growth.

For supplies to exporters of engineering goods a system of issue of release orders by I & SC on the main producers of steel within the country has been in force. Every effort is made to meet the requirements of exporters of engineering goods from domestic sources based on release orders issued by I & SC. However, it is also open to them to go in for imports under the advance licencing/imprest licencing facilities. For canalised items, the exporters have the facility of direct import as well. During 1986-87 allocation of 50,000 tonnes of pig iron & 143100 tonnes steel was made for EEPSC sector. During April 1986 January 87 export of iron and steel through SAIL totalled 20,000 tonnes valued at Rs. 6.58 crores. This export is in addition to supplies to the neighbouring countries, Nepal and Bhutan.

5. Functions of Iron & Steel Control Organisation

The Iron and steel Control Organisation was initially set up to perform the regulatory functions envisaged in the Iron and Steel (Control) Order 1956. Its responsibilities have expanded over the years. Although the regulatory functions in terms of Steel distribution and price fixation have been considerably reduced in the recent years, it continues to perform very important function of providing data on various issues to the ministry. It also oversees the functioning of the secondary Steel producing sector. The only regulatory function currently performed relates to misuse of Steel.

In performing the regulatory and control functions assigned to him the Iron and Steel Controller and his Regional Controllers 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 the Iron and Steel Control Organisation during 1985-86 and 1986-87 (April-December, 1986) is shown below:—

Statement showing the number of cases of inspections of units/suspensions of supplies/debarments during 1985-86 and 1986-87 (April-December, 1986)

Region	Inspections		Suspensions		Debarments	
	1985-86	1986-87 (April- Dec., 86)	1985-86	1986-87 (April- Dec., 86)	1985-86	1986-87 (April- Dec., 86)
Bombay	483	342	83	100	26	20
Calcutta	251	354	4	13	1	12
Delhi	333	399	54	36	20	15
Hyderabad	583	269	16	14	5	11
Kanpur	396	454	68	100	18	60
Madras	614	442	87	34	47	40
Total	2660	2260	312	297	117	158

SOURCE: I & SC's Reports

Appendix I

Canalised Import of Iron & Steel

Item	1985-86 (SAIL + MMTC)		1986-87 (April 86-January 87)	
	Quantity	Value	Quantity	Value
1	2	3	4	5
1. Pig Iron	—	—	14134	2.586
2. Carbon Steel	201142	54.332	343460	94.073
A. Semis				
B. Finished Steel				
i) Bars & Rods	64890.97	23.312	3408	1.280
ii) Structurals	66436	23.592	64085	29.481
iii) MS/HT Plates	213520.52	83.538	—	—
iv) SBQ Plates			67454	26.667
v) HR Coils/Skelp	107456	41.552	—	—
vi) CR Coils/Sheets	179572	83.676	—	—
vii) Galvanized Sheets			15193	9.477
viii) Aluminium Alloy coated sheets	9885	6.031	2524	1.631
ix) Electrical steel sheets/coils	45626.5	47.356	34374	37.816
x) Tin Mill Black Plate	168659	99.441	71957	42.148
xi) Tinplate	5302	4.469	2343	1.741
xii) Tin Free Steel	2741	1.868	899	0.550
xiii) HR/CR Strips	6999.45	4.68	1714	1.318
iv) Tinplate Waste	30735	15.05	—	—
xv) Seconds/Defectives	35150	12.475	—	—
3. Alloy/Stainless Steel	18292.78	18.003	8649	14.906
Total:	1156407.3	519.378	630194	263.674

The Public Sector

V



Continuous Casting in Bhilai

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 78



Ingot coming out from Soaking Pit

Steel Authority of India Limited

1. General

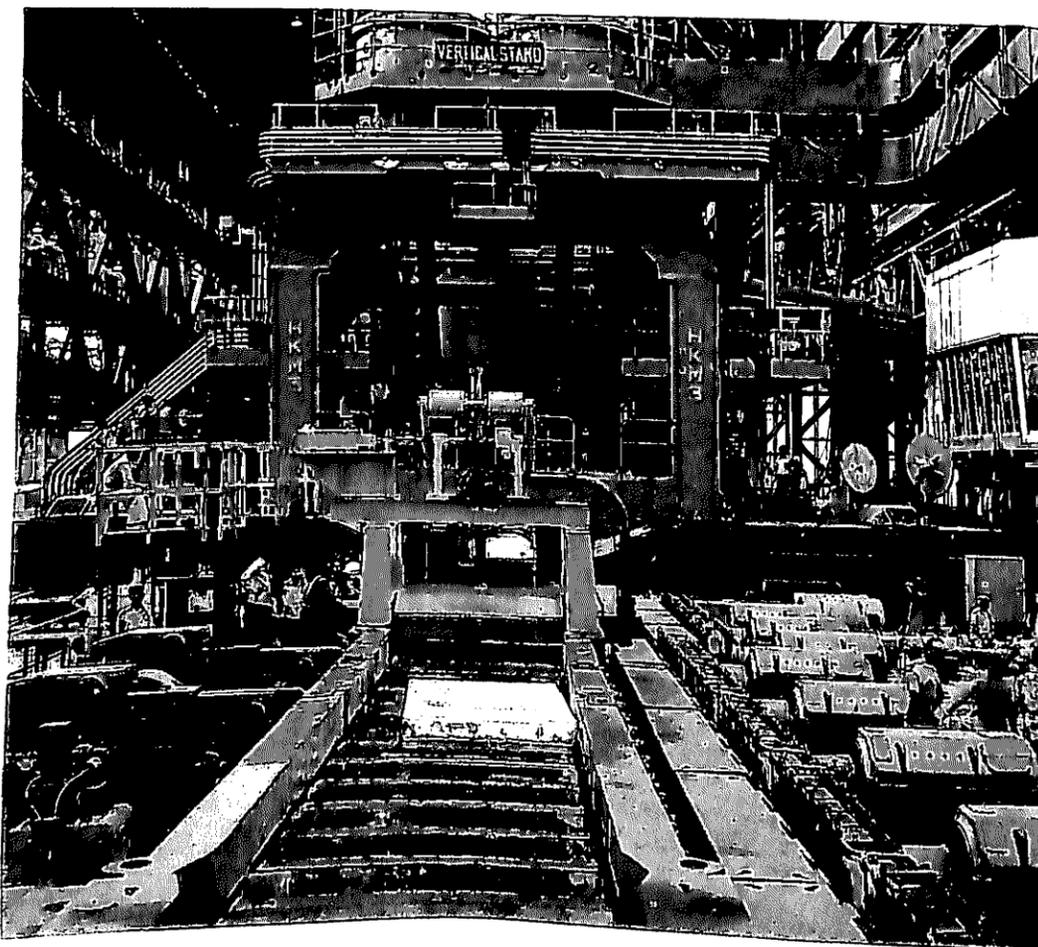
SAIL which is a wholly owned enterprise of Government of India, is responsible for the management of five out of six integrated steel plants in the public sector at Bhilai (MP), Durgapur (West Bengal), Rourkela (Orissa), Bokaro (Bihar) and IISCO plant at Burnpur (West Bengal). The sixth integrated steel plant of Rashtriya Ispat Nigam Limited under erection/construction will be the first shore-based integrated steel plant being set up at Visakhapatnam in Andhra Pradesh. In addition, the two special alloy steels plants at Durgapur (West Bengal) and Salem (Tamil Nadu) are also managed by SAIL.

2. Financial Performance

2.1 Turnover and Profits

The gross turnover of the Company during 1985-86 was Rs. 4469.50 crores as against Rs. 3719.07 crores in 1984-85. The Company earned record net-profit of Rs. 159.00 crores during 1985-86 as against a marginal profit of Rs. 4.24 crores in the previous year. Profit before interest and depreciation was Rs. 694.50 crores which is also the highest ever as against Rs. 354.04 crores for the year 1984-85. All the plants under SAIL showed improvement in their financial performance over last year. The Bokaro

Vertical Stand Slabbing Mill



Steel Plant wiped out its accumulated losses during the year. Plantwise working results from 1981-82 to

1985-86 are given in the following table:—

Plantwise Working Results

Rs. in crores

Plants/Units	1981-82	1982-83	1983-84	1984-85	1985-86
Bhilai	66.09	19.95	2.83	49.27	64.38
Durgapur	0.70	(-) 44.23	(-) 63.72	(-) 53.36	(-) 26.52
Rourkela	(-) 21.71	(-) 74.99	(-) 100.32	27.10	33.62
Bokaro	6.54	18.09	0.55	11.47	112.93
Alloysteels	(-) 6.64	(-) 15.31	(-) 33.75	(-) 30.02	(-) 28.30
Salem	(-) 0.13	(-) 14.21	(-) 18.08	0.53	2.92
Others	(-) 5.68	4.94	3.62	(-) 0.75	(-) 0.03
Total	39.17	(-) 105.76	(-) 214.53	4.24	159.00

2.2 Reliefs & Waivers

As a matter of policy SAIL did not press for reliefs and waivers this year except for the Steel Development Fund contributions for Durgapur Steel Plant (Rs. 26.30 crores). During 1984-85, SAIL secured a relief of Rs. 116.94 crores towards interest debitable to Profit & Loss Account on loans from the Steel Development Fund, Government of India and the balance of import price pool fund with SAIL and waiver of Steel Development Fund contributions for Durgapur Steel Plant.

SAIL waived interest amounting to Rs. 12.26 crores receivable from the Indian Iron & Steel Company Limited, a subsidiary of SAIL, for the period April to September, 1985 on the loans given from own resources. These loans to IISCO were subsequently converted into equity.

2.3 Key Factors for Improved Financial Results

Increased volume of production, improved performance in the techno-economic areas—particularly energy consumption; savings in interest on working capital were some of the key factors for earning a record profit of Rs. 159.00 crores.

2.4 Cost Escalations

The Company did not seek increase in the selling prices of steel in spite of the following cost escalation:

- Cess on coal at pit-head value increased by Bihar Government from 20 per cent to 30 per cent from 21st June, 1985.

- Inward freight increased from 15th April, 1985 under the Railway Budget;
- Revision in power tariffs by the various State Electricity Boards;
- Reclassification of coal for freight purposes by Railways from 1st October, 1985;
- Administered price of coal revised upwards by Rs. 32 per tonne or Rs. 41 per tonne including cess from 8th January, 1986, and
- Other escalations in the prices of ferro-alloys petroleum products, etc.

2.5 Liquidity

Mobilisation of alternative sources of funds at lower interest rates through public deposits and short term borrowings from other public sector undertakings resulted in substantial reduction in cash credit utilisation from Rs. 297.81 crores as on 31st March, 1985 to Rs. 197.23 crores as on 31st March, 1986. The total deposits collection from public as at the end of this year, net of repayments, stood at Rs. 184.48 crores corresponding to Rs. 96.24 crores as at the end of the last year, an increase of over 92 per cent. This amount increased to Rs. 214 crores as on 30th September, 1986. The short term borrowings from other public sector undertakings increased from Rs. 25 crores as on 31st March, 1985 to Rs. 85.89 crores as on 31st March, 1986.

Improved liquidity position enabled SAIL to discharge its obligation to the exchequer:

Arrears and current interest on Government of India Loans : Rs. 183.72 crores

Government of India Loans : Rs. 189.32 crores
 Steel Development Fund Loans : Rs. 15.80 crores
 Repayment of Import Pool Fund : Rs. 81.00 crores

2.6 Capital Expenditure

Rs. 608.95 crores (on cash basis) inclusive of interest was spent during the year on various schemes. This compares with Rs. 580.10 crores during last year. Internal resources generated by SAIL coupled with shareholders equity and borrowings from the Steel Development Fund were utilised for financing the capital expenditure.

2.7 Authorised and Paid-up Share Capital

The Authorised Capital of the Company remained unchanged at Rs. 4000 crores. During the year, Government provided equity funds in cash amounting to Rs. 210.31 crores, including Rs. 17.36 crores for IISCO. The paid up share capital of the company increased from Rs. 3583.31 crores (excluding share money of Rs. 130.34 crores pending allotment) to Rs. 3871.65 crores (excluding share money pending

allotment of Rs. 52.31 crores) as at the end of the year.

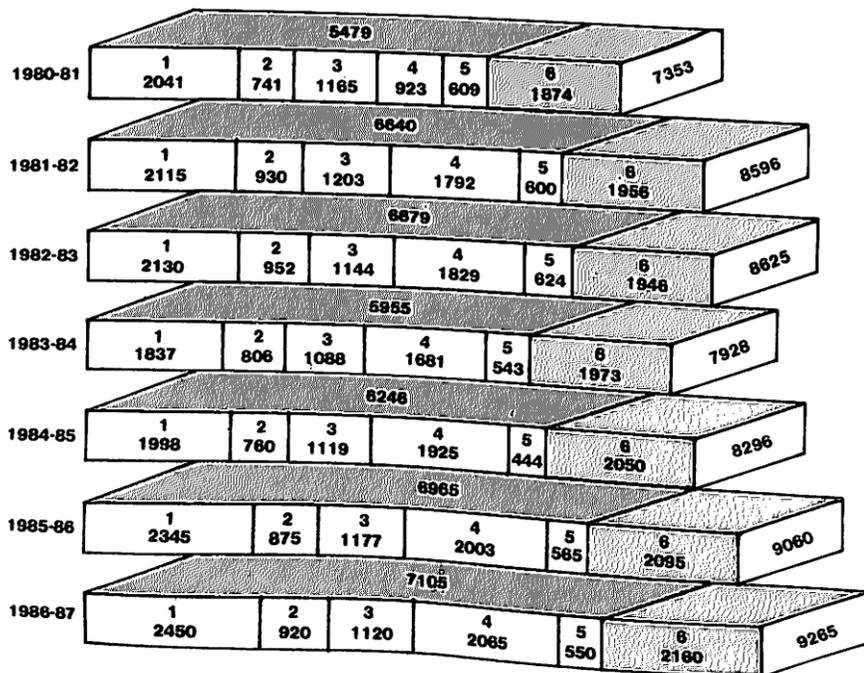
2.8 Long Term Debt

The Company borrowed Rs. 312.39 crores from Steel Development Fund. The Government of India provided loans of Rs. 8.49 crores i.e. for Indian Iron & Steel Company Limited (Rs. 8.20 crores) and Visvesvaraya Iron & Steel Limited (Rs. 0.29 crores). The Government also advanced Rs. 48.17 crores through SAIL to IISCO for meeting their working capital requirements. After adjustment of payments, total borrowing at year-end from Government of India and Steel Development Fund amount to Rs. 854.50 crores and 1504.00 crores respectively.

3. Production Review (1985-86)—SAIL (excl. IISCO)

3.1 Overall Production

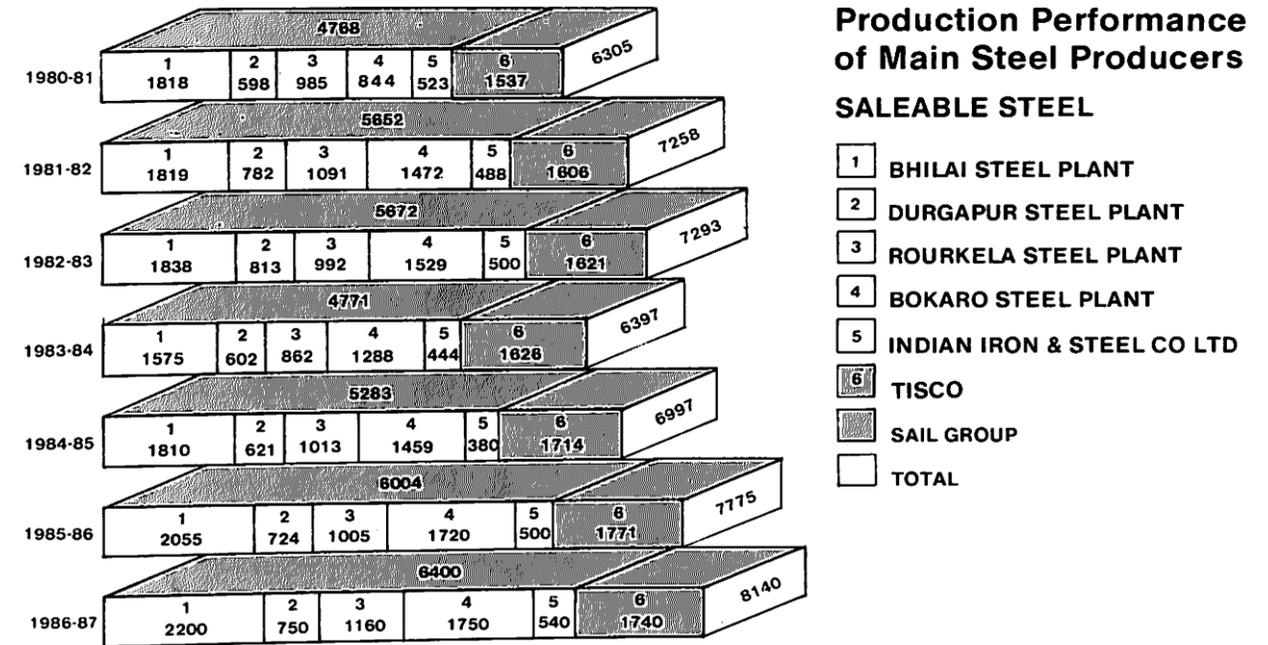
The output of saleable steel at 5.5 million tonnes at the four integrated steel plants has been an all time



Production Performance of Steel Plants

INGOT STEEL

- 1 BHILAI STEEL PLANT
- 2 DURGAPUR STEEL PLANT
- 3 ROURKELA STEEL PLANT
- 4 BOKARO STEEL PLANT
- 5 INDIAN IRON & STEEL CO LTD
- 6 TISCO
- SAIL GROUP
- TOTAL



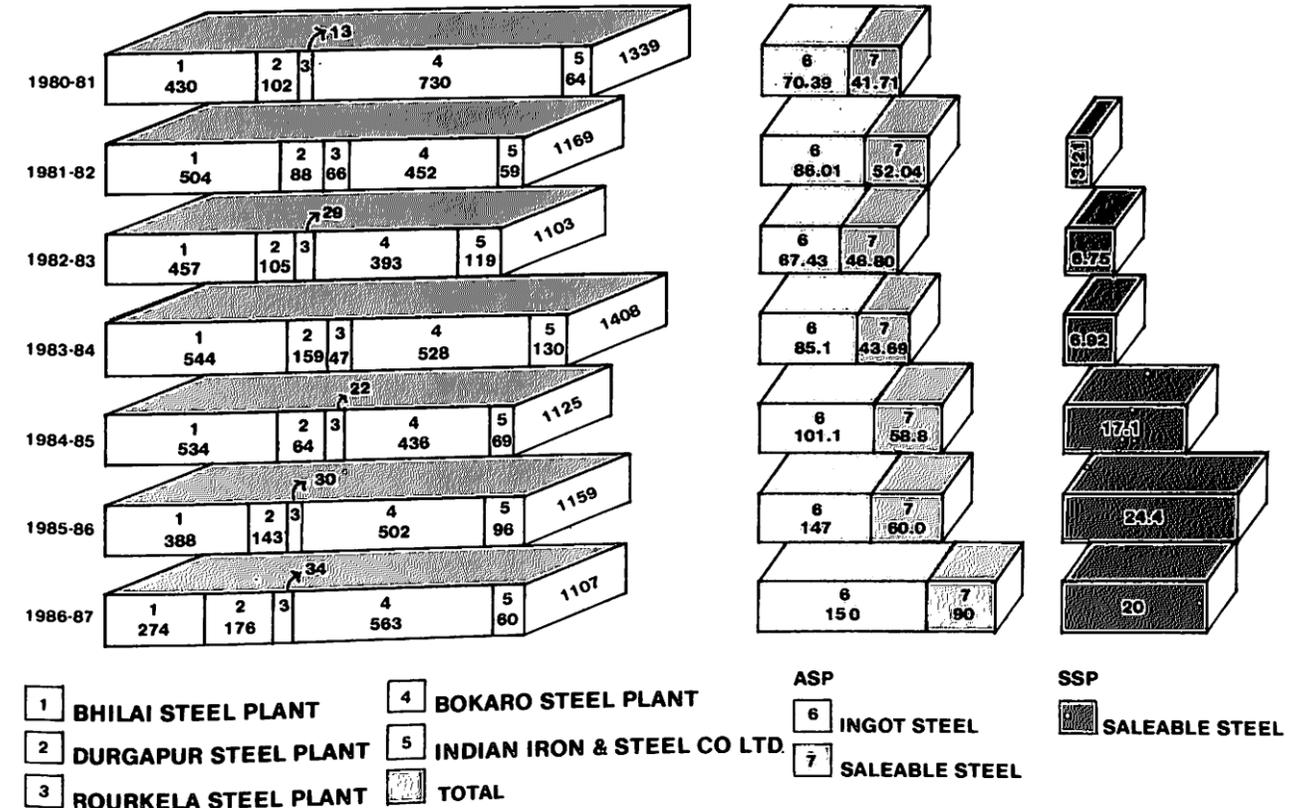
Production Performance of Main Steel Producers

SALEABLE STEEL

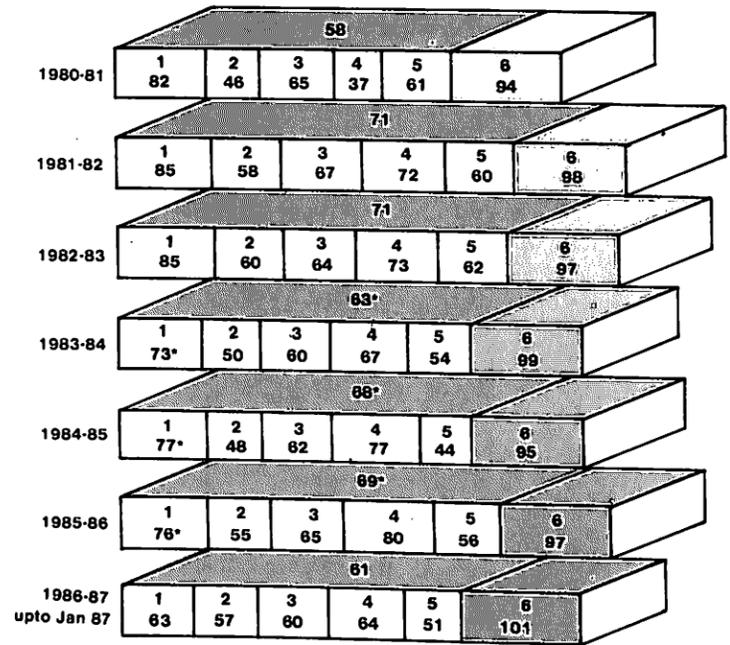
- 1 BHILAI STEEL PLANT
- 2 DURGAPUR STEEL PLANT
- 3 ROURKELA STEEL PLANT
- 4 BOKARO STEEL PLANT
- 5 INDIAN IRON & STEEL CO LTD
- 6 TISCO
- SAIL GROUP
- TOTAL

Production Performance of SAIL

SALEABLE PIG IRON



- 1 BHILAI STEEL PLANT
- 2 DURGAPUR STEEL PLANT
- 3 ROURKELA STEEL PLANT
- 4 BOKARO STEEL PLANT
- 5 INDIAN IRON & STEEL CO LTD
- 6 ASP
- 7 SALEABLE PIG IRON
- 8 INGOT STEEL
- 9 SALEABLE STEEL
- TOTAL

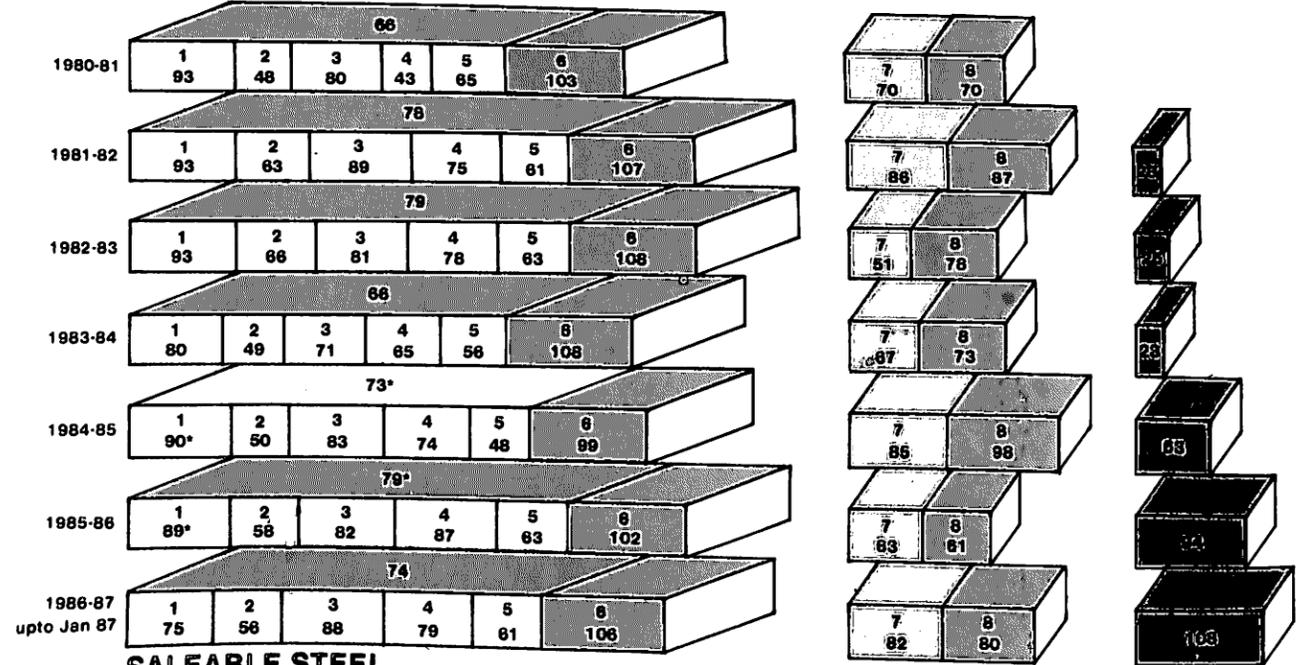


Capacity Utilisation Percentage

INGOT STEEL

- 1 BHILAI
- 2 DURGAPUR
- 3 ROURKELA
- 4 BOKARO
- 5 IISCO
- 6 TISCO
- SUB-TOTAL SAIL

Percentage Capacity Utilisation of main Steel Producers



SALEABLE STEEL

- 1 BHILAI
- 2 DURGAPUR
- 3 BOKARO
- 4 ROURKELA
- 5 IISCO
- 6 TISCO
- SUB-TOTAL SAIL

ASP**

- 7 INGOT STEEL
- 8 SALEABLE STEEL

SSP

- SALEABLE STEEL

* With reference to 2.5 MT Stage only at BSP

** Capacity increased from 1983-84 & w.r.t. equivalent tonnes based on DPR product mix.

high crossing the earlier best of 5.17 million tonnes achieved in 1982-83. The output of sinter, hot metal and ingot steel was also the highest for any year. The growth in production over last year was satisfactory: 11 per cent in hot metal (7.42 million tonnes), 12 per cent in liquid/ingot steel (6.4 million tonnes) and to 14 per cent in saleable steel. The saleable pig iron production was 1.06 million tonnes. Two special steel plants at Durgapur and Salem also established annual records in their respective production ranges.

3.2 Plantwise Production

The Bhilai and Bokaro Steel Plants produced 2.06 million tonnes and 1.72 million tonnes of saleable steel during the year registering a growth of 14 per cent and 18 per cent respectively. Durgapur bettered its production by 17 per cent to 0.72 million tonnes this year. Rourkela produced 1.005 million tonnes of saleable steel despite power constraints matching its annual plan of 1 million tonnes. Alloy Steels Plants established an annual record in saleable steel by producing 60,229 tonnes the previous best being 58,779 tonnes during 1984-85. Salem Steel Plant

produced 24,360 tonnes of saleable steel improving the previous best of 17,139 tonnes in 1984-85, a growth of 42 per cent.

3.2.1 Performance During 1986-87

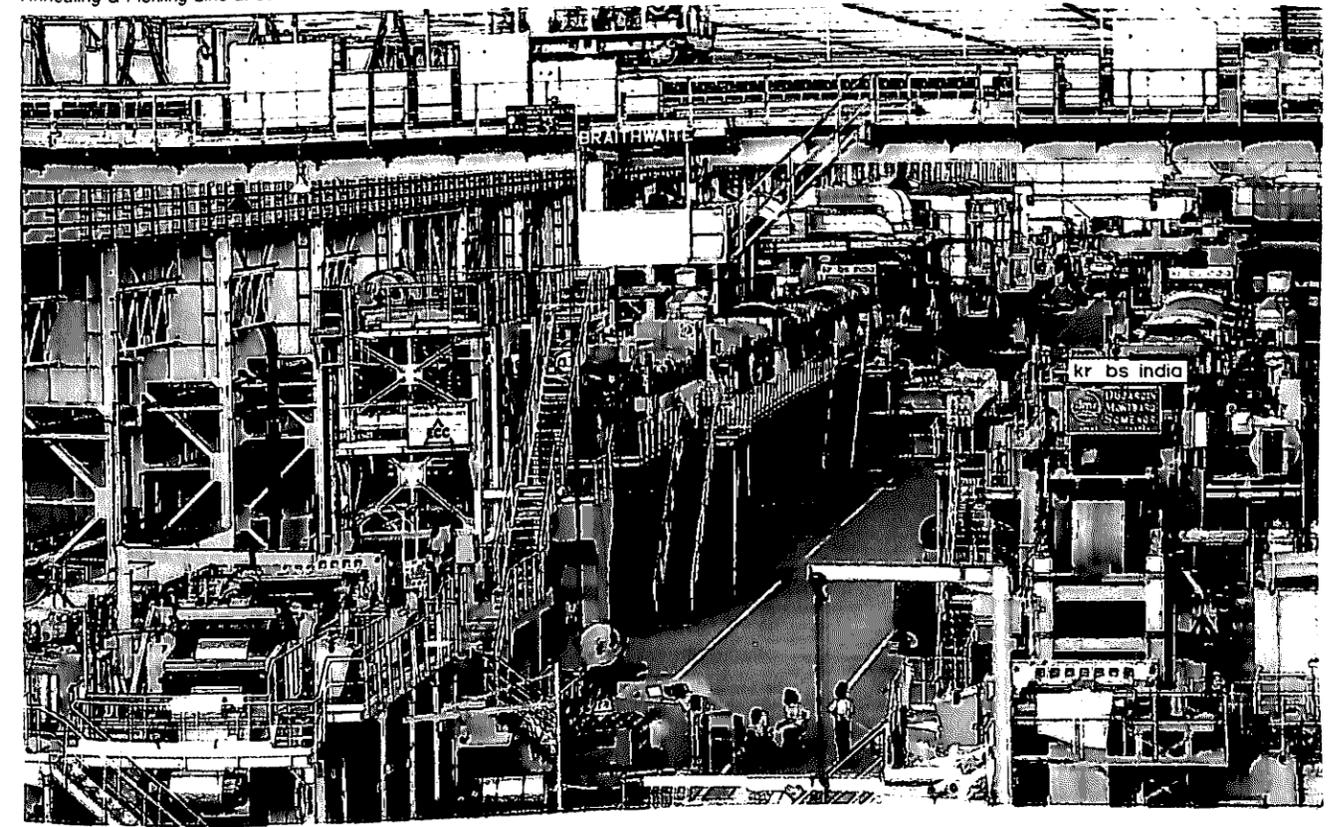
Production of saleable steel at 6.004 million tonnes in SAIL plants during 1985-86 was higher than in 1984-85 by 14%. The capacity utilisation also improved from 73% in 1984-85 to 79% in 1985-86.

During 1986-87 the production of saleable steel in SAIL plants is as under:

	April 86	January 87	('000 t)
Target			5975
Actual			4921
April-85 January-86 (Actual)			4730
1986-87			
Target			7220
Anticipated			6400 (80% of capacity)

The main constraint on production during the year has been the severe power restrictions from public

Annealing & Pickling Line at Salem Steel Plant



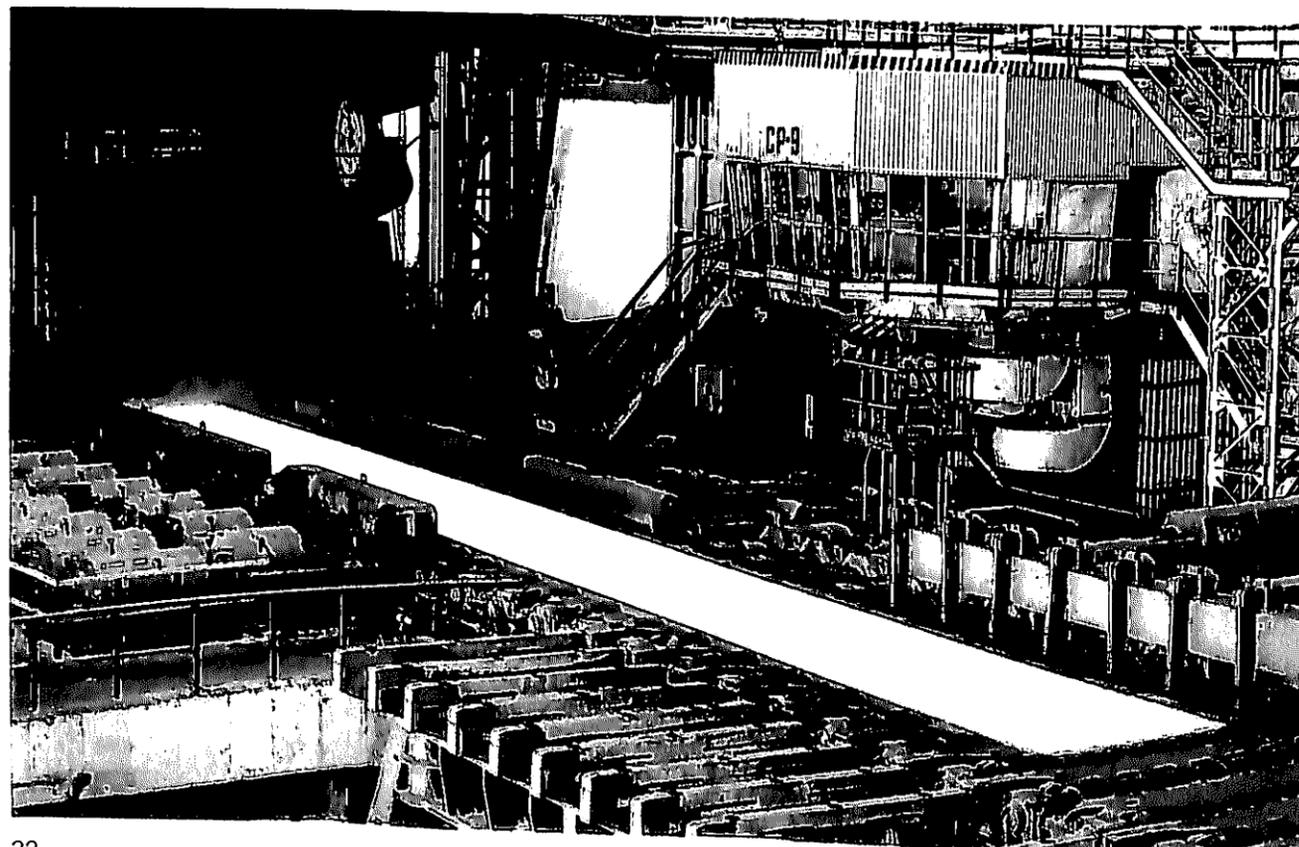
utilities, particularly during the first quarter from OSEB on RSP and during July and August 1986 from DVC on Durgapur and Bokaro. The total loss of production on account of power shortage during April 86—January 1987 is estimated at 529,000 t.

There were also some initial problems of adjustment to improve work practices adopted to achieve better organisational and technological discipline. Production is now showing a steadily rising trend and production of saleable steel during September-October, November 1986 and January 1987 have been new monthly records.

Production during 1986-87 was also affected due to the following:

1. Oxygen shortage at Bokaro due to damage to turbo compressor on account of an accident in July, 1986.
2. Fire in July, 1986 in the new captive power plant of Bokaro putting Unit No. 1 out of commission.
3. Break-down in Blast furnace No. 6 of Bhilai during Sept. '86 leading to its stoppage for 19 days.

Heavy Plate Mill, Bhilai



Supplies of indigenous coking coal have been only 83% of the Plan but production at SAIL plants was not affected on this account.

There has been some improvement in the average ash content of indigenous coking coal supplies from 20.5% in 1984-85 to 19.4% in 1985-86 and further to 19.3% in 1986-87 (April-Oct.) This is still much higher than the DPR norm of 17%. Further, wide day to day fluctuations in ash content of supplies of indigenous coal to SAIL plants are affecting the operations. Imports are being resorted to not only for supplementing the indigenous coal supplies but also to improve the quality of coal blend.

Imports of coking coal by SAIL in the recent past have been as under:

	Million tonnes
1984-85	0.665
1985-86	2.034
1986-87 (Apr-Jan)	1.940

It is expected that imports of coking coal during 1986-87 would be marginally more than last year's import against estimated total consumption of 12 M. tonnes.

3.3 Special and Critical Items

As the requirements of steel users in recent years have diversified, types of steel and their applications have become more complex. SAIL emphasises on special/critical items. At Bhilai the production of tested rails at 344 thousand tonnes was the highest production surpassing the previous best of 294 thousand tonnes achieved in 1984-85. The output of boiler quality plates at Bhilai and Rourkela showed a steady improvement at 13,610 tonnes during the year 1985-86 as against 11,660 tonnes in 1984-85. The output of tor steel also improved to 169 thousand tonnes during 1985-86 from 136 thousand tonnes in 1984-85.

3.4 Techno-Economic Parameters

The Company including Burnpur works of IISCO achieved significant improvements in techno-economic parameters during the year:

- The overall coke consumption rate in blast furnaces was brought down by 4 per cent during 1985-86, thereby effecting a saving in coking coal consumption.
- There was an improvement of about 5 per cent in the specific consumption of electricity per tonne of saleable steel during 1985-86 over 1984-85.
- The overall energy consumption per tonne of crude steel in SAIL plants has been improved by 6 per cent during 1985-86.
- There had been a general improvement in blast furnace productivity over 1984-85.
- Overall consumption of raw materials had been brought down.
- The purchase of raw materials was contained at the same level as in 1984-85 in spite of increase in the production of hot metal and the crude steel by 11 per cent and 12 per cent respectively. This was brought about by increased receipts from captive sources and reduction in specific consumption rates.

3.5 Mines

The receipts of major raw materials from captive sources during 1985-86 increased by 6 per cent over last year. Production at BSP's Rajhara/Dalli mechanised iron ore mines and Nandini Limestone mines, RSP's Barsua iron ore mines and Purnapani

Limestone and Dolomite Quarries scaled new heights during the year.

The production of SMS grade limestone at Satna quarry of RSP and BF grade limestone at Bhavanathpur mines of BSL during 1985-86 went up by 12 per cent each over last year. However, the production of SMS grade limestone at Kuteswar was at the level of last year.

Production at Kiriburu iron ore mines at BSL was around 50 per cent of the capacity. Production was affected mainly due to equipment failures and IR problems.

Meghahatuburu iron ore mines of BSL which was commissioned during the year produced 346 thousand tonnes in single shift operation.

Iron ore fines washing plant at Bolani mines of DSP could not stabilise due to inherent design problems.

3.6 Equipment Maintenance

Close attention to maintenance contributed to better availability and utilisation of equipment which was generally close to the norms.

Major break downs were low due to extensive failure analysis and remedial steps taken to improve equipment reliability. Import substitution also helped significantly in these efforts. Measures pursued during the year helped indigenise 850 more items bringing the uptodate figures to 11,000 items and leading to saving of foreign exchange to the tune of Rs. 44 crores. To supplement these efforts inter-plant steel standardisation was also continued with 46 more standards having been brought out during the year, raising the total IPSS standards so far published to 215.

The small scale and ancillary units encouraged and assisted by the Company (about 1200) also resulted in better availability of spares and components. The value of purchases made from these units during the year was of the order of Rs. 43 crores against Rs. 33 crores in the previous year.

3.7 Constraints in Production

The hot metal production at the SAIL Plants was affected mainly due to:

- the 38-day long illegal strike at the blast furnace department of the BSL during April-May, 1985.

- Bokaro's four blast furnaces operation against the plan of five blast furnaces operation till 22nd December, 1985;
- Three blast furnaces operation at DSP against the plan for four blast furnaces operation due to delay in the commissioning of blast furnace No. 1 which was down from 6th January, 1984 and was blown in on 17th September, 1985.

The public utilities continued to severely restrict supplies of power to the steel plants especially the Orissa State Electricity Board to RSP during the first quarter of 1985-86. Thereafter the supply position eased from 20th June, 1985 to 14th November, 1985 because of the assistance from Andhra Pradesh State Electricity Board through Orissa grid. The position with regard to DVC supply to DSP and BSL, however, was restricted affecting saleable steel production mainly during the first half of 1985-86.

4. Marketing Performance

4.1 Sale of Iron & Steel

The sale of the Company's own saleable steel in the domestic market at 4.944 million tonnes was the highest ever and exceeded the volumes during the previous year 3 per cent. The total supplies of steel

(including imported materials) at 5.594 million tonnes was also higher by 3 per cent as compared to the previous year. Besides, the sale of the Company's pig iron during the year was of the order of 1.032 million tonnes.

4.2 Sectorwise Sales

There was an increase in supplies to sectors crucial to the growth of the economy. Materials supplied to the Defence, Railways, Heavy Industries, Power Sector, Coal Sector and Export Promotion Units were respectively 34 per cent, 10 per cent, 5 per cent, 27 per cent, 129 per cent and 17 per cent higher as compared to supplies during the previous year.

4.3 Stocks

The overall stocks including imports of pig iron held by the Company during the year came down by about 38 thousand tonnes, however, steel stocks went up marginally.

4.4 Tools, Alloy and Special Steels

During the year, there was record sale of tool and alloy steels of Alloy Steels Plant. The sale of stainless steel produced at Salem Steel Plant at 21.8 thousand tonnes was also the highest ever, an increase of 16

per cent as compared to the previous year.

4.5 Fertilizers and Bye-products

The sales of Calcium Ammonium Nitrate (CAN) and Ammonium Sulphate during the year aggregated to around 244 thousand tonnes registering an increase of 5 per cent over the previous year. During the year, 11 thousand kilo litres of benzol product and 47 thousand tonnes of tar products were sold as compared to 13.4 thousand kilo litres and 55.3 thousand tonnes, respectively during the previous year.

4.6 Imports & Exports

In terms of the Import Policy for 1985-88, the Company no longer remained a canalising agency for import of iron and steel items.

The overall domestic demand and availability of mild steel did not throw up any surplus for export during 1985-86. As such no physical exports of mild steel items were made during the year. A small quantity of 182 tonnes of stainless steel of Salem Steel Plant, was exported.

However, with the increased availability of plates from Bhilai and expected surplus in production as compared to domestic demand, orders for export of 40 thousand tonnes of medium/high tensile plates from Bhilai Steel Plant were booked for shipment in 1986-87.

5. Personnel & Welfare

5.1 Manpower & Productivity

The total manpower of the Company as on 31st March, 1986 was 2,07,839 comprising 16,989 executives and 1,90,850 non-executives. The productivity per manyear measures in term of ingot tonnes improved at Durgapur and Rourkela. The manpower position as on 31st March, 1986 was as follows:

Plant/Unit	Executives	Non-executives	Total
Bhilai Steel Plant	4,559	60,630	65,189
Bokaro Steel Plant	4,423	48,538	52,961
Durgapur Steel Plant	2,332	32,487	34,819
Rourkela Steel Plant	3,043	36,404	39,447
Alloy Steel Plant	896	6,441	7,337
Salem Steel Plant	223	997	1,220
Others	1,513	5,353	6,866
Total	16,989	1,90,850	2,07,839

Considerable emphasis was placed on redeployment to increase utilisation. During the year 3647 employees were re-deployed. In Alloy Steel Plant though the capacity was increased by 60 per cent, the entire requirement of manpower was met by redeployment from within.

5.2 Reservation for SC/ST

The intake of schedule caste and scheduled tribe candidates was 14 per cent and 11.97 per cent respectively of the total recruitment. The share of scheduled caste and scheduled tribe employees in promotion was 10.88 per cent and 7.92 per cent respectively. As on 31st March, 1986 SC and ST candidates were 11.48 per cent and 8.28 per cent respectively of the total manpower. The category-wise employment position is given below:

Group	Total number of employees as on 31.3.86	Scheduled Castes	Scheduled Tribes	Women Employees
A. SAIL				
Group A	16589	477	168	277
Group B	19335	542	326	941
Group C (Excluding Sweepers)	160752	19296	16472	6678
Group C (Sweepers only)	4470	3560	238	1003
Total (A)	201146	23875	17204	8899
B. SUBSIDIARIES				
Group A	1742	55	10	32
Group B	3282	137	41	46
Group C (Excluding Sweepers)	36966	5780	2116	1405
Group C (Sweepers only)	847	798	2	168
Total (B)	42837	6770	2169	1651
Total (A+B)	243983	30645	19373	10550

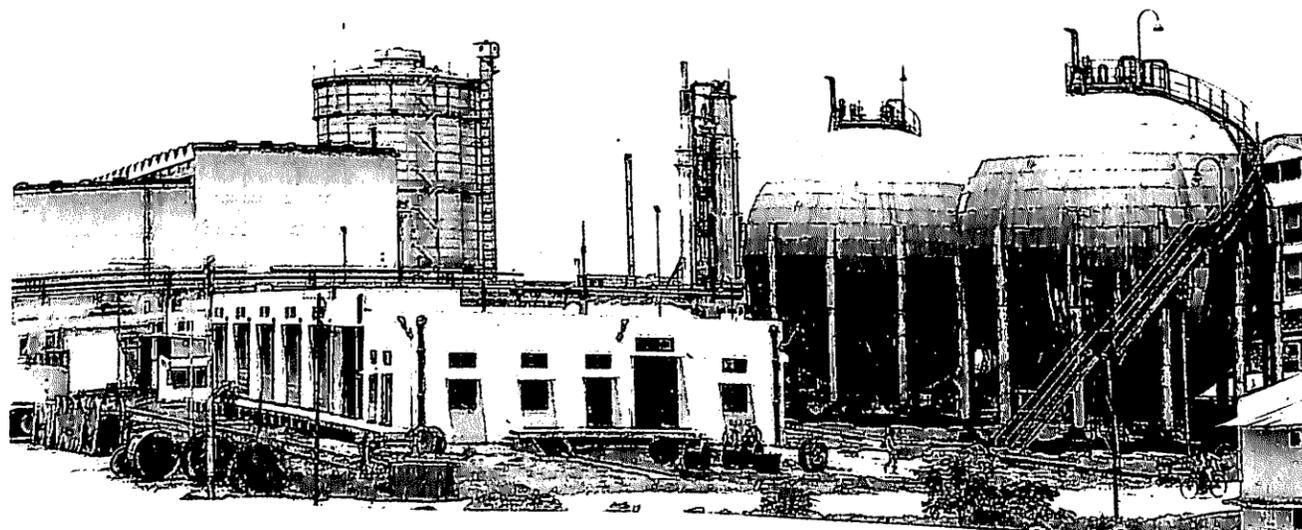
5.3 Training

Attempts in all the units were to improve the effectiveness of training by integrating this effort into the organisational mainstream. During the year, 11,992 officers and 27,227 non-executives attended training courses. Focus has been on technological upgradation and attitude development.

5.4 Human Resources Management

During 1985-86, a number of initiatives have been taken in the areas of human resource management.

Fertiliser Plant at Rourkela Steel Plant



Broadly the efforts were directed to improve the productivity of human resources through a new culture encompassing positive attitude and a high level of organisational and personal discipline. Considerable success was achieved in controlling demurrage, overtime and eliminating shift change-over delays from key areas. Discipline was tightened and steps taken to control absenteeism and improve work practices.

5.5 Career Development

The Executives' Promotion Policy and Appraisal System was amended in line with the effort to link career growth with the performance of the officers. Considerable benefits would accrue in the new appraisal system in terms of role clarity, motivation and improved communications.

5.6 Harmonious Industrial Relations

There was a changed approach in the management of industrial relations. Instead of monitoring indices of mandays/saleable steel losses focus was on building a new work culture by obtaining the participation of large groups of employees/associations and trade unions. Attention was focussed on systems of collective bargaining and conflict resolution. There was a greater and more fruitful interaction with the trade unions at the NJCS and Production and Productivity Forum.

5.7 Safety

During the year, SAIL made concerted efforts to promote a culture of safe working through involvement and participation of shop floor workers and officers. A consultant (Safety) was appointed to give overall coordination and direction in the area of safety. The system of reporting fatal accidents and dangerous occurrences and investigation/enquiry into such incidents was streamlined.

5.8 Housing and Employees' Welfare

The housing and other facilities in the Company's township continued to be improved to meet the growing needs of the employees. The Company spent Rs. 36 crores to add new assets in steel townships this year in addition to Rs. 113 crores on maintenance of housing, medical, education and other facilities. Other welfare schemes such as sports, recreational and cultural activities continued to be promoted by the Company as in the previous year.

5.9 Peripheral Development

Rs. 14.50 lakhs was spent on peripheral development activities which included providing amenities like supply of drinking water, construction of schools, community centres, roads etc. in areas within 10 kms. of the townships. Agricultural improvements, distribution of seeds and fertilizers and development of poultry also formed part of the scheme.

6. Capital Schemes

6.1 New Facilities Commissioned

New assets worth Rs. 917.06 crores (including Rs. 35.65 crores for social facilities) were added during the year.

—Bhilai Steel Plant

Phase-I of 4 million tonne expansion programme completed

Units commissioned—100 tonne LD converter, 3 Nos. slab casting machines in the continuous casting shop and second shear line and heat treatment facilities in the Plate Mill complex.

—Bokaro Steel Plant

Meghahatuburu Iron Ore Project commissioned
—Would meet the requirement of iron ore for 4 million tonne expansion programme.

6.2 Bhilai Steel Plant

Several major units were commissioned during the year marking the completion of phase-I of the 4 million tonne expansion programme. Phase-II, comprising primarily the 7th blast furnace and the 9th coke oven battery are expected to be completed progressively by January, 1988. Further, as a measure of technology upgradation and in consonance with demand trends a decision has been taken to instal a Vacuum Arc Degassing UNIT (VAD) in the converter shop and a second normalising furnace in Plate Mill.

A number of technological improvement schemes were undertaken, the most notable being the conversion of open hearth furnace No. 10 into twin hearth furnace which was commissioned in September, 1986.

6.3 Bokaro Steel Plant

The main facilities of the 4 million tonne expansion excluding the cold rolling mill but including the Meghahatuburu Iron Ore Project stand completed as

at the end of the year. Additional facilities adjudged during the course of the project to be essential for achieving 4 million tonne ingot capacity were completed by December, 1986. The additional oxygen facilities are scheduled to be completed by May, 1988. The second cold rolling mill is due to be commissioned progressively from September, 1987 to February, 1988.

Against the revised cost estimate of Rs. 2071.58 crores, the total expenditure upto 31st March, 1986 amounted to Rs. 1602.71 crores.

6.4 Durgapur Steel Plant

The proposal to modernise Durgapur Steel Plant is under active consideration of the Government of India. However, the preliminary and enabling works etc., out of an ad-hoc sanction of Rs. 25 crores accorded by the Government pending approval of the modernisation scheme are under implementation.

6.5 Rourkela Steel Plant

In the Silicon Steel Project, the cold rolled grain oriented lines are ready for hot trials and the production is likely to start during 1987. The revised cost estimate for the project amount to Rs. 186.35 crores out of which Rs. 162.87 crores has been spent upto January 1987.

6.6 Alloy Steels Plant

To update the technology and improve its economic viability, the stage-II expansion of Alloy Steels Plant has been undertaken. The scheme is likely to be completed by Sept., 1987 and is expected to cost Rs. 98.63 crores out of which Rs. 53.15 crores has been spent till 31st March, 1986.

6.7 Captive Power Plants

The scheme for augmenting the captive power generation in different steel plants are in advanced stage of completion. Due to fire incident in Bokaro captive plant on 10th/11th July, 1986, the unit No. 1 which was commissioned in December, 1985 and was under performance guarantee trial run has become non-operational. The first unit of 60 MW at Bokaro is now likely to be recommissioned in April 1987. The other two units are also likely to be commissioned in 1987—88.

The first unit of 2x60 MW captive power plant at Rourkela was synchronised in December, 1986. Unit

II of this plant is likely to be commissioned in October, 1987. The first unit of 2x60 MW captive power plant at Durgapur was synchronised in February 1987 and the second unit is expected to be commissioned in December 1987.

7. Research & Development

7.1 The R&D Centre of SAIL continued its efforts towards improvement in the techno-economic performance of the steel plants through implementation of a large number of state-of-the-art projects and also development of new products to meet consumer requirements and import substitution. Sustained efforts of R&D, supported by an improved work culture, have shown fruitful results in the overall performance of the steel plants.

7.2 With the inauguration of the R&D Centre's laboratory Complex at Ranchi on 5th January, 1986 by the Hon'ble Minister of Steel & Mines, Shri K.C. Pant, the infrastructural facilities of the Corporate R&D have become fully functional, which is a significant milestone in achieving SAIL's commitment towards consistent technological upgradation. Some of the important equipment and facilities provided in the Laboratory Complex are:

7.3 Pilot Pot Sintering Unit, Pilot Coke Oven, Reduction under Load Equipment for Reducibility Characteristics of Iron Ore and Sinter, Experimental Rolling Mill, 300/100 kg Vacuum Induction Furnace, Scanning Electron Microscope, Corrosion Measuring system, X-ray Diffraction Equipment with fully automatic Texture Analysis System, X-ray Fluorescence Spectrometer, Precision Universal and Dynamic Testing Machines, Stress Rupture Machines, Sophisticated Dilatometers and Laser Doppler Anemometer System with Video Cassette Recorder, Large Computer system, etc.

7.4 During the year 1985-86, 95 new research projects in various technological areas were initiated keeping in view the overall Corporate R&D goals and catering to the immediate needs of our steel plants. In addition, research work for 34 projects has been successfully completed and a special thrust is being given for their speedy implementation with active participation of R&D Sub-Centres in the plants and Plants personnel at the steel plants. A few selected projects in the various technological areas where

significant contributions were made are indicated below:

7.5 Product Development

With the development of new products like: (i) Forging quality Micro-alloyed Steel, (ii) Cold Heading Quality Steels for making High Tensile Fastener, (iii) API X-60 Grade Line Pipe Steel, (iv) Weather Resistant Steel (SAIL-COR A), (v) Rail Steel Through LD-CC Route, (vi) High P-brake Shoes of Locomotives and Wagons, (vii) Ladle Mortar without Kyanite, (viii) Dry Basis Gunning Mix for Hot Metal Mixer, the spectrum of new products developed by R&D Centre has widened.

7.6 Yield & Productivity Improvement

Some of the successes achieved were: (i) Improvement in yield in Blooming Mill of DSP (ii) Improvement in Rolling Technology of Continuous Billet Mill of BSP, (iii) Improvement in roll life in Bar Mill of ASP, (iv) Reduction in formation of camber in Channel Section of Heavy Structure Mill of TISCO.

An on-line control system has been developed to roll 12 mm wire rod in Wire Rod Mill of BSP. This has resulted in flexibility in planning 12 mm rolling campaign, less mill set up time, reduction in roll consumption, more stable and trouble free rolling and feasibility of ribbed bare rolling.

7.7 New Technology Development

A modified ignition hood was developed and successfully installed at the Sintering Plant of BSP which led to an increase in machine productivity and decrease in coke breeze consumption.

Development of a suitable injection system of Lime-Fluorspar for dephosphorisation in 50 T Electric Arc Furnace of ASP, has been commissioned.

Demonstration plant for Lime Dust Injection into Blast Furnace of DSP is nearing completion and would be commissioned in 1987.

Considerable progress was achieved in development of Inert Gas Purging Technology for LD converters at BSL and the system was commissioned in August 1986.

There had been considerable increase in productivity of soaking pit of BSL by incorporating ceramic fibre sealing.

A hot model has been set up in the Sponge Iron Pilot

Plant to develop the system of a submerged injection of auxiliary reduction characteristics of iron ore and also to develop a suitable control system with a view to improve the productivity of rotary kiln and reduce accretion build-up in the kiln.

7.8 Ingot mould life could be improved substantially by treating with Ferro-Titanium and incorporating a new design. The technology is being implemented commercially at RSP. This is also being transferred to other steel plants.

Significant improvement in the quality of BF through lining at BSP and RSP has been achieved by using a newly developed Alumina Carbon mass (RADTROUGH-BF).

7.9 Conservation of natural resources

Extensive trials were carried out in the R&D Centre's pilot coke ovens to establish the possible use of Nandan coal and Assam coal as a component of coal blend to be charged into the coke ovens of SAIL steel plants.

Towards the long term objective of conservation of coking coal, characterisation tests are continuously being carried out with different iron ore and non-coking coal linkages for establishing their efficacy in Sponge Iron Production in the Pilot Plant (DRPD).

8. International Assistance

8.1 Significant steps were also taken to embark into an ambitious long term goal-oriented programme with inputs of basic research. A major achievement in this direction is the understanding reached with the National Science Foundation of the U.S.A. to jointly undertake basic research in the area of iron & steel covering problems of mutual interest. This agreement provides a unique opportunity of availing the expertise of leading U.S. Scientists while pursuing co-operative research. The work would be concentrated in the areas of direct production of liquid iron, production of clean steels, thermo-mechanical treatment, net shaping and new products. A multi-organizational interaction mechanism has been established involving R&D Centre as the nodal agency in India and Carnegie Mellon and Colorado School of Mines as nodal agencies in U.S.A. The first Indo-US Workshop was held at the R&D Centre from 6th to 9th January, 1986.

8.2 R&D Centre has a key role in co-ordinating and monitoring the activities under the SAIL-NKK agreement towards the technological upgradation of

DSP, RSP & IISCO. After visiting these three steel plants and studying their present health and performance, M/s NKK, Japan have submitted a "General Investigation Report" and specific measures for improvement have been jointly identified, some of which have been already implemented and certain other measures are being implemented.

8.3 The collaboration agreement with Soviet Union renewed for a further period of 5 years in January, 1985 has given a fillip to the research activities being carried out, the close cooperation has increased manifold due to extension of the sphere of involvement and guidance of Soviet Scientists to all the SAIL steel plants under the new contract. The research programmes at BSP and BSL, aimed to attain a capacity of 4 MT each in the shortest possible time, are being actively pursued. Besides, under separate Licence agreements already signed with USSR, SAIL was getting the technology as well as equipment for flame gunning of L.D. Converters and also Roll Knurling Machine for Bhilai Steel Plant.

8.4 While the valuable research work done by the R&D Centre and the encouraging results obtained in the Steel Plant have been duly acknowledged from time to time, some of our engineers were honoured at the national level during the year, as in the previous years also. For outstanding research contributions in the area of Refractories, three of our engineers were awarded the National Metallurgists' Day Award and one of our Senior engineer was conferred with the "Steel Eighties Award" of I.I.M.

8.5 A special feature of the year was initiation of a series of workshops on "Priorities for Action" organized by SAIL and attended by Senior Executives of all the plants and units of SAIL. These workshops were conducted at R&D Centre in which indepth study and analysis were made to achieve the objectives of improving work culture, making optimum use of available facilities, generating profits through control of cost and providing better customer services. At the end of each workshop, concrete recommendations were made on each of the themes with a view to improving overall performance of SAIL.

9. Centre for Raw Materials & Mines

The Centre for Raw Materials and Mines has formulated detailed five-year plan for major raw materials (other than coal) outlining the development needs, investment proposals, quality parameters and proposed linkages. Exploration for new sources of

raw materials continued during the year. Scouting for low silica lime-stone for LD Converters was carried out in Meghalaya, Dehradun Valley and Rajasthan and further follow up to fix up the possible sources is in progress. Work on standardisation of major mining and ore dressing equipment was also initiated and preparation of proposal for Central Base. Repairs Workshop for the captive mines of SAIL in Barajamda Sector was undertaken.

10. Centre for Engineering & Technology

To achieve upgradation of existing technologies and improve production and productivity in the plants, the Centre for Engineering and Technology in consultation with R & D Centre acquires design and know-how capabilities. In line with this, the principal agreements entered during the year were with:

- Messrs KORTEC, Switzerland for transfer of technology for adoption of KORF Process for intensification of open hearth furnaces at Rourkela and Burnpur based on feasibility report prepared by CET.
- Messrs Saarberg, West Germany to prepare and submit a feasibility report on the stamp charging technology in the coke ovens of the Rourkela Steel Plant.
- Messrs ESTS BV (Hoogovens), Netherlands for modification of blast furnace stoves suitable for higher blast temperature.

Feasibility report for introduction of Ga1valume technology at Rourkela and Bokaro from Messrs BHP, Australia has been received and is under examination at the centre.

The centre is also getting involved in the modernisation and debottlenecking schemes of the plants and is assisting them in overcoming their operational and maintenance problems.

Visvesvaraya Iron & Steel Limited

1. The Visvesvaraya 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 Steel, Cement, Ferro Alloys, Castings, Pig Iron, etc.

As on 1.4.1986 the authorised capital of the Company was Rs. 75 crores of which Rs. 46.40 crores were subscribed and paid-up, 60 per cent of the paid-up capital i.e. Rs. 27.84 crores was held by the Government of Karnataka and 40 per cent i.e. Rs. 18.56 crores by the Steel Authority of India Limited. In addition Rs. 3.63 crores were received for which the shares were still to be issued.

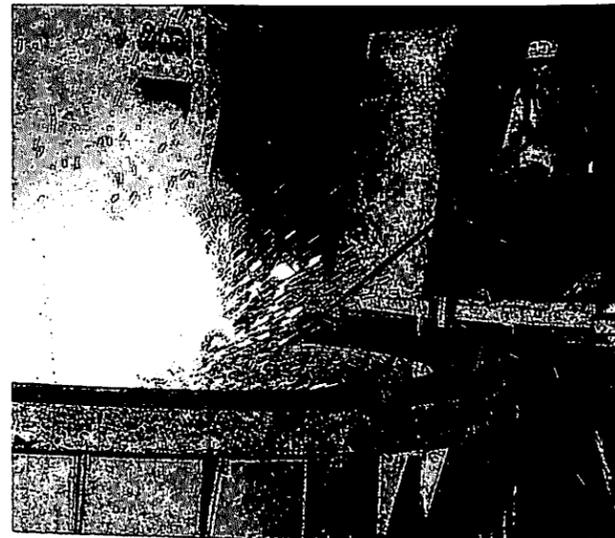
2. Production

The installed capacity of the plant, production during 1985-86, estimated production during 1986-87 are as follow:

(In tonnes)

Products	Installed capacity Tonnes/ Annum	Production during		Product- ion from Apr. 1986 to Dec. 1986
		Actual Product- ion 1985-86	Budget- product- ion 1986-87	
Mild Steel	48000	8,615	10,000	6,173
Alloy & Special Steel	77000	45,974	40,000	31,561
Steel Ingots	180000	69,463	66,000	45,522
Ferro-silicon	20000	1,391	7,500	2,523
Cement	96000	50,725	20,000	19,096
Ferro Alloys	3800	2,860	6,000	2,529
Pig Iron	180000	32,962	5,000	4,532
Steel Castings	2500	384	300	171
Castings	15600	4,075	5,500	2,777
Cast Iron Spun Pipes	17000	—	—	—
Refractories	9600	5,400	6,000	1,024

During the year 1985-86 the company incurred a loss of Rs. 32.41 crores. According to preliminary estimates a loss of Rs. 28.58 crores is projected for 1986-87. Reasons for adverse working results during 1985-86 and 1986-87 in brief are: increased percentage of power cuts and phenomenal increase in power tariff; depression of the market; excess manpower and steep increase in salary and wage bills consequent upon the NJCS agreement; substantial increase in interest liabilities; substantial increase in cost of fuel, oil and other raw-materials; and the alloy steel manufactures' inability of recovering increased cost of input by matching increase in selling prices of alloy steel due to the market depression and stiff competition.



Temperature measurement of Steel in a ladle at VISL, Bhadravati

3. Capital Scheme Under Implementation

The following are the details regarding capital schemes undertaken as per optimisation scheme Phase-I, Stage-I, which is almost under completion. Under the scheme, the following plants have been erected:

- i) One two stand continuous casting machine is completed in 1983-84 along with connected auxiliary facilities in melting shop. The plant is under production since May 1983. Total capital cost of the plant is Rs. 4.64 Crores.
- ii) Erection of one No. 850 NM³/Hr. or 30 TPD Oxygen Plant is completed in 1985-86. The plant is under trial running from Jan. 86. Total cost of the plant is Rs. 7.0 crores (approx).

4. Research and Development Activities Undertaken

Research and Development activities undertaken during 1986 are furnished hereunder:

1) By-product and waste utilisation

Grinding dust generated during surface conditioning of high alloy chrome nickel steels were processed which was hitherto treated as waste and expensive alloying elements like nickel and chromium were recovered.

2) Forged Grinding Media

Production of superior quality and improved wear

resistant grinding media through Forging route and heat treatment were made and put on trial in Ball Mills in VISL. Wear rate measurements are in progress. Preliminary results are encouraging at about 0.1 kg/ton consumption of grinding media during dry cement grinding in open circuit.

3) Ingot Mould Life

A study has been made of life of CI ingot moulds at EAF steel plant. Various parameters and operating practices have been carefully examined. The R&D activities in this area has resulted in drastic reduction of mould iron consumption to about 25 kg/ton steel made. Further R & D work is in progress to improve quality of mould and prolong their lives.

4) Annealing

Certain grades of low alloy steel ingots were earlier subjected to annealing treatment to facilitate easy

surface conditioning. Now this method has been stopped and direct grinding is done by eliminating intermedia softening.

5) Deoxidation of Steel with Complex Deoxidiser

Ferro-Aluminium alloy processing was developed. The Fe.Al thus made was used as a deoxidant in VISL's Electric Arc Furnace steel making. The results are highly encouraging. Further processing is in progress.

5. Man-power

Total manpower working in the company as on 1.1.87	SC	ST	Ex-service-men	Physically handicapped	Women
10,044*	1,182	74	160	27	372

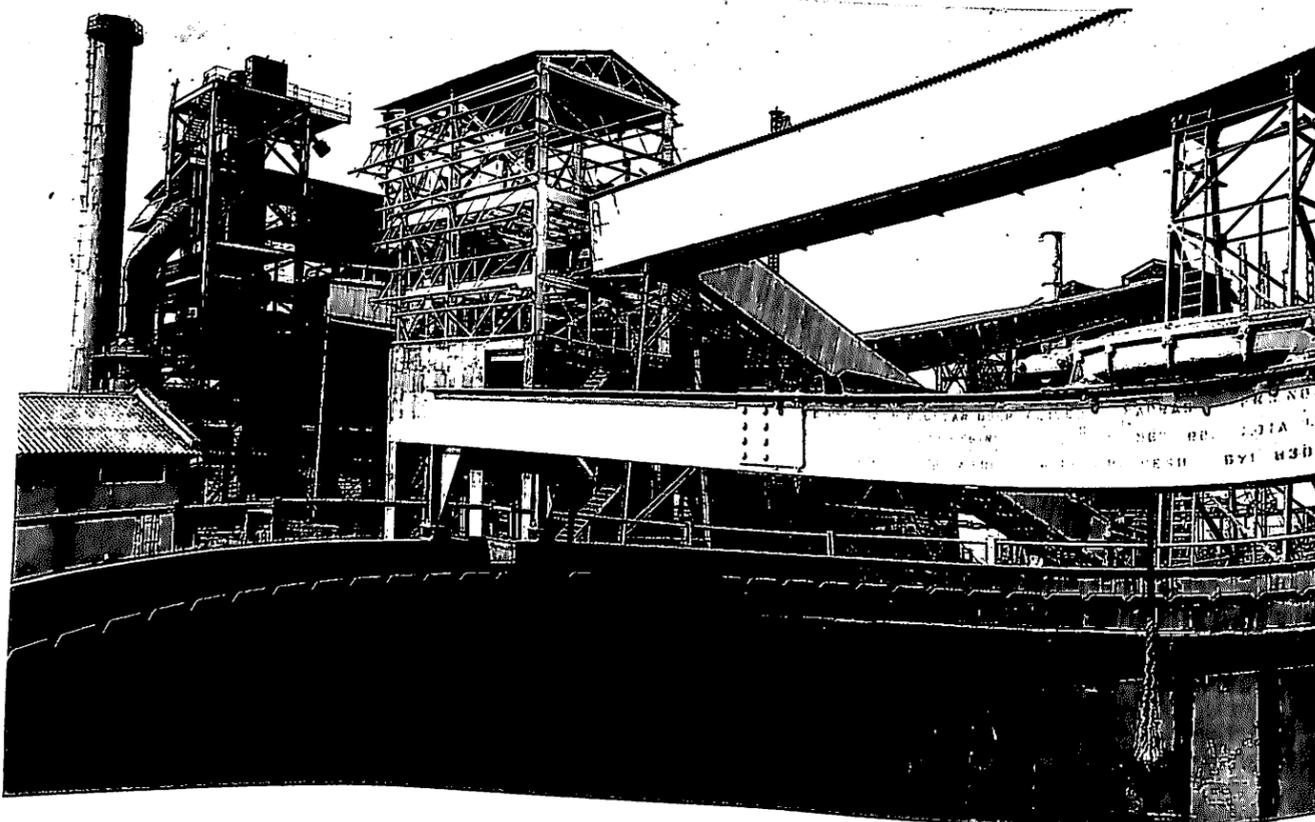
*Includes lent officials.

Sponge Iron India Limited

1. Sponge Iron India Ltd. (SIIL) initially set up a 30,000 tonnes per annum Demonstration Sponge Iron Plant in Paloncha, Kothagudem (District Khammam) Andhra Pradesh with UNDP/UNIDO assistance. The Plant went into operation in 1980 with the objective of establishing the techno-economic feasibility of using 100% lump iron ore and non-cling coal for production of sponge iron, which in-turn would be suitable as a substitute for steel scrap for production of steel in Electric Arc Furnace. The sponge iron produced at this plant is very stable, free from fire hazard and can be transported and stored with minimal precautions and is being successfully melted in Electric Arc Furnaces in different parts of the country.

The plant is equipped with sophisticated equipments and its Test Centre has facilities for carrying out basic and applied research in the field of direct reduction. SIIL is also registered as an Industrial Consultant by UNIDO for test work and project feasibility studies in the field of Sponge Iron Technology.

A view of the Plant



2. Capacity

On the successful completion and operation of the first unit the capacity of the plant has subsequently been expanded to 60,000 tonnes per annum of sponge iron with effect from July, 1985. The expansion work was completed as per schedule both in respect of time and cost and regular operation has been established in the second unit also.

3. Finance

Against the authorised capital of Rs. 12.00 crores, the paid up capital as on 31-3-1986 was Rs. 11.39 crores, out of which Government of India holds equity worth Rs. 10.56 crores and the Government of Andhra Pradesh has the balance of Rs. 0.83 crores.

4. Production

During 1985-86, against the target of 44,500 tonnes, actual production was 42,033 tonnes. During the current year 1986-87 (upto January, 1987) the actual

production was 41,753 tonnes against the target of 41,830 tonnes, thus achieving the full target.

5. Sales and Profitability

During the year 1985-86, sales of sponge iron were 36,223 tonnes valued at Rs. 690.66 lakhs. Target for 1986-87 is sale of 55,955 tonnes of sponge iron valued at Rs. 1128.53 lakh. Actual sale of sponge iron in 1986-87 (upto January '87) is 33,974 tonnes valued at Rs. 679.49 lakhs.

6. Test Work and Research & Development

A test campaign to study the effect on productivity of using low ash (25%) coal with varying proportions of carbon (fixed)/iron in the feed was carried out as a part of R&D programme. Results showed improvement in productivity by nearby 10-12 per cent and lowered coal consumption by 0.15 tonnes per tonne of sponge iron. Test work on use of Lignite using Neyveli lignite to the extent of 25% of the injection coal was carried out. R&D work was carried out for beneficiation of Manuguru and Kothagudem round coal with encouraging results. Based on the same further work on pilot plant scale has been entrusted to National Metallurgical Laboratory, Madras. Test melting of Sponge Iron in Induction Furnace was also carried out at New Delhi during November, 1986.

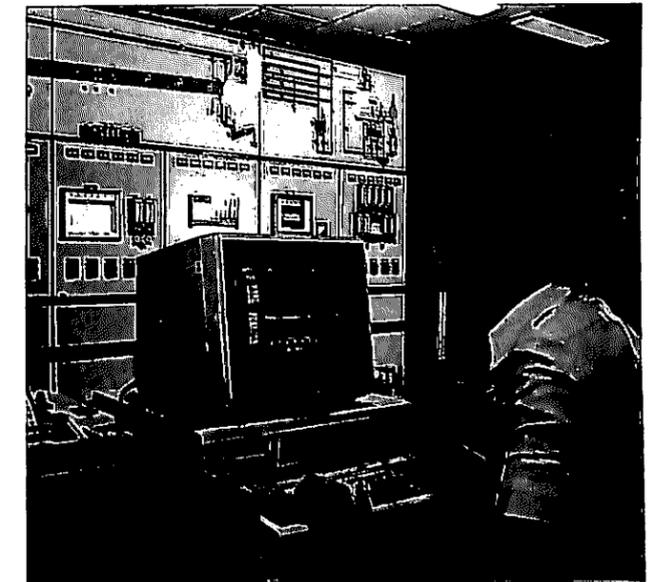
7. Consultancy Services

An assignment has been received from the Ministry of External Affairs for the preparation of a Feasibility Report for production of Sponge Iron in the Preferential Trade Area for Eastern and Southern African States. Pursuant to the above, a three member team from the Company has left for Angola, Mozambique, Tanzania, Uganda and Zambia for collection of necessary samples for test work and for gathering pertinent information for the preparation of the report.

A contract is received from UNIDO for bulk scale testing of raw materials for Vietnam Similarly another contract has been awarded for Lab/Bench Scale testing of raw materials of Nepal and Niger. The tests are in progress.

8. New Schemes-Briquetting Plant

In the process of manufacture of sponge iron, considerable amount of fines in the size range of below 3mm are generated which are presently



Computerised Monitoring System

dumped as waste products, as electric furnace users are reluctant to use material below 3mm size due to problems of lower yield and high refractory wear. It has therefore become necessary that sponge iron be screened so that above 3mm size could be sold as prime product for electric steel making. On account of this, below 3mm size material which amounts to 10% of the production is not saleable. In order to salvage the waste sponge iron fines and in the process obtain a commercial value, it has been proposed to agglomerate them in a Briquetting press with a suitable binder. Order for critical imported equipments consisting of Briquetting Press mixer and dosing pumps were placed in April, 1986. The manufacture of indigenous equipment is in advanced stage. Trial runs of the plant are scheduled in March 87. The Scheme is estimated to cost Rs. 157 lakhs and would result in additional revenue of Rs. 75 lakhs annually.

9. Joint Venture for a large Commercial Sponge Iron Plant

The Company is contemplating setting up of a large sized commercial sponge iron plant (capacity 100,000 tonnes per annum) in the Bellary-Hospet region of Karnataka as a joint venture with the Karnataka State Industrial Investment and Development Corporation. Linkage of coal and iron ore for the proposed project is being considered. Discussions have been held with the Central

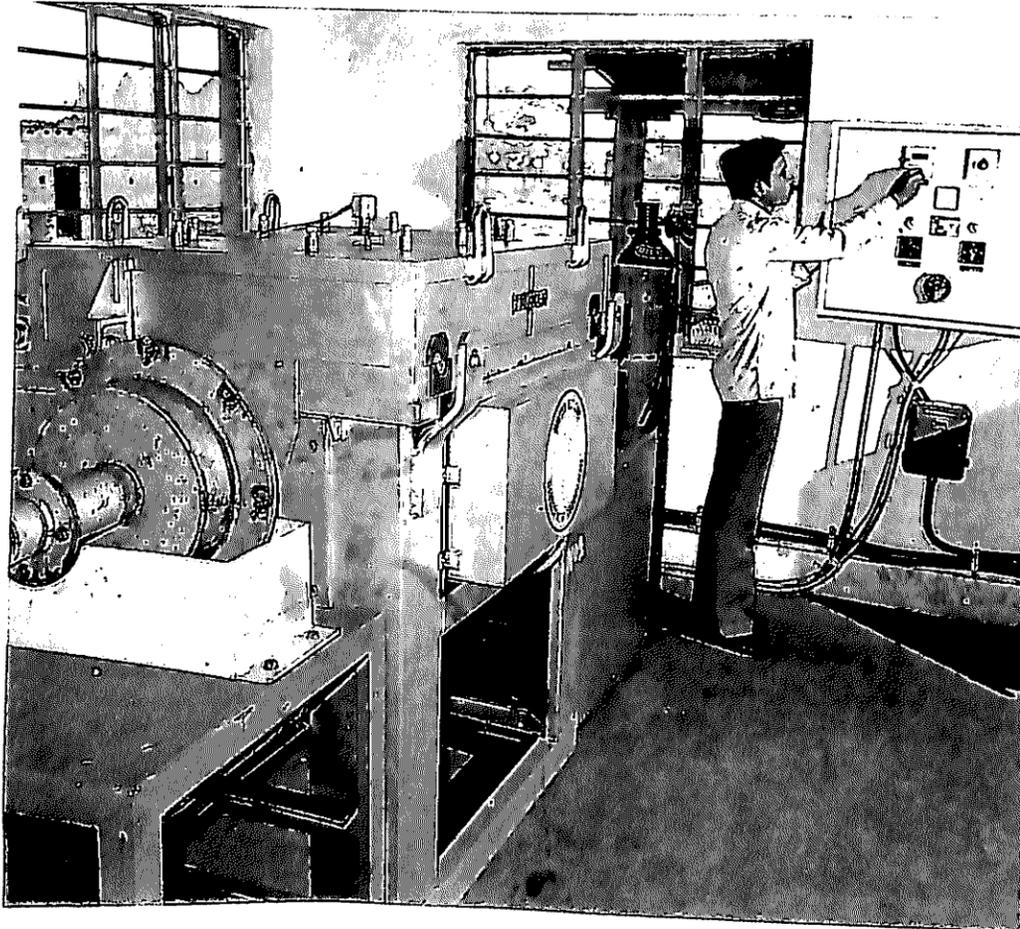
Financial Institutions who have shown interest in funding the project.

10. Manpower

The total number of employees of the company indicating separately persons belonging to Scheduled Castes, Scheduled Tribes, Ex-servicemen, physically handicapped and women is furnished below:—

Groups	Total No. of Emp.	S.C.	S.T.	Ex-ser-vice-men	PHC	Women
Group (A)	57	4	—	—	—	—
Group (B)	19	1	—	—	—	—
Group (C)	231	27	14	5	1	15
Group (D)	114	39	18	1	3	2
Group (E)	5	2	—	—	—	2
	426	63	32	6	4	19

Sponge Iron India Ltd. at Hyderabad



11. Hindi Implementation

Vigorous efforts were made for the progressive use of Hindi in the official work of the Company. As an effort towards increased use of Rajbhasha in the Company's work, a Hindi Seminar was organised in December, 1986 coinciding with the Company's foundation day celebration. Competitions were organised during January, 1987 in Kavitha Gosthi, Essay Writing and Elocution in order to promote use of Rajbhasha in the Company.

12. Anti-Pollution Measures

The plant has an inbuilt anti-pollution equipment for controlling air and water pollution to international standards. The stack emissions and plant effluents are regularly analysed to ensure conformity to the standards. The equipment is overhauled at the end of every operating campaign to ensure desired levels of efficiency.

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 which was conceived and implemented on the basis of a Financial Agreement and the Sale & Purchase Contract with Iran concluded in November, 1975. The designed capacity of the Project is 7.5 million tonnes per annum 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 the related infrastructure. Against this promised loan, Iran has so far paid US \$ 255 million. Iran has failed to fulfil its obligations under the Agreements in that they have not paid the balance amount of the loan and have also not lifted the contracted quantity of concentrate. However, the project was completed in August 1980 as per

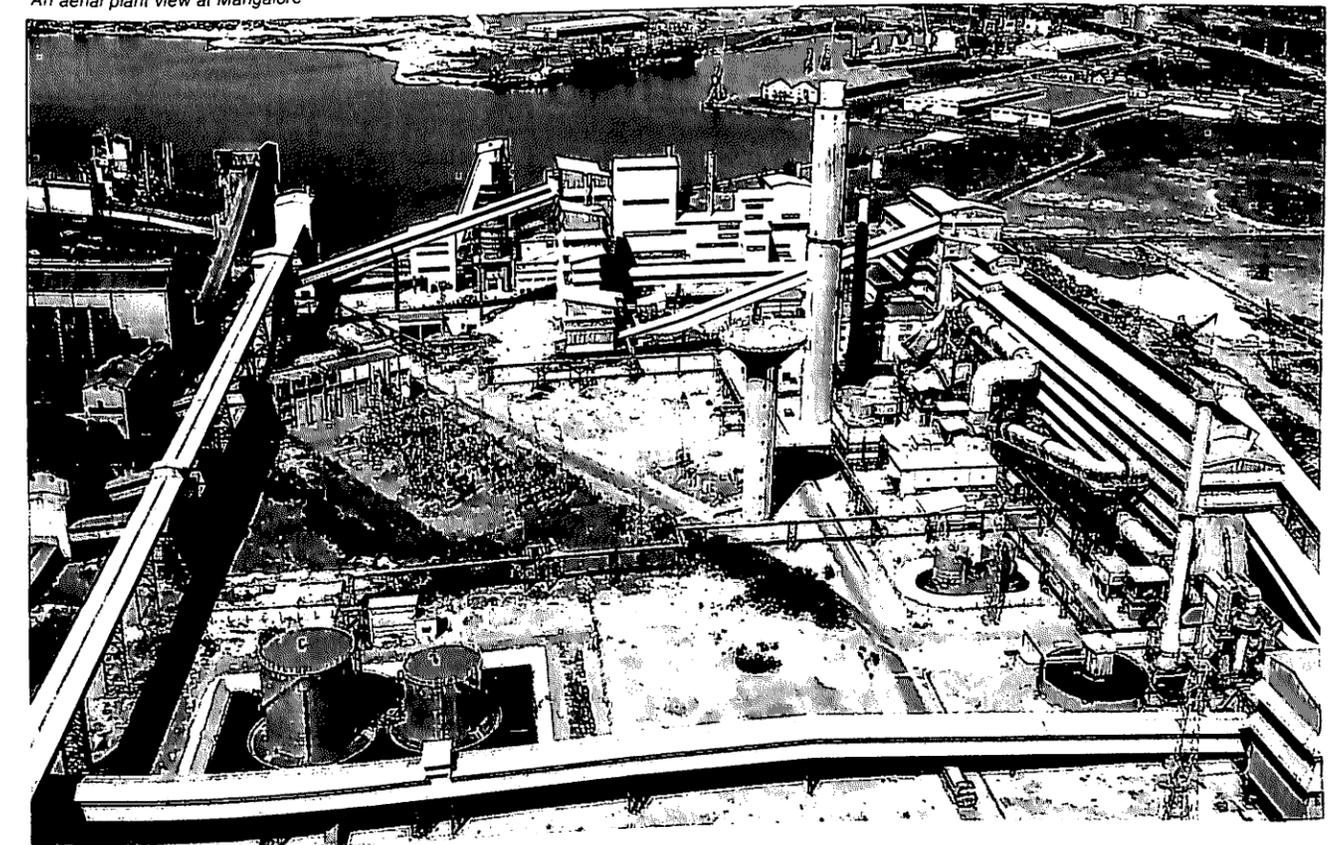
schedule with the balance funds provided by the Government of India and KIOCL started locating alternate buyers for the sale of iron ore concentrate.

2. Pellet Plant

2.1 Keeping in view the uncertainty in the offtake of iron ore concentrate by Iran and in order to revitalise the project, in May, 1981, the Government sanctioned the erection of a Pellet Plant of 3.00 million tonnes per year capacity located at Mangalore for the conversion of Kudremukh iron ore concentrate into pellets. This was in the context of a forecast that the markets for pellets may be better than for the concentrate. The sanctioned cost of the project is Rs. 103.50 crores.

2.2 This project has since been completed. During several trial runs undertaken up to the end of January, 1987 about 1,65,000 tonnes of iron ore pellets have been produced. Out of this, two trial shipments of about 25,000 tonnes each have been made to China and Hungary. A trial shipment of

An aerial plant view at Mangalore



about 36,000 tonnes to Poland and about 35,000 tonnes to Hungary, is also expected to be made during the current financial year. Sale of pellets to various other Countries is being pursued vigorously by the company.

3. Finance

The authorised capital of the Company is Rs. 675 crores. The paid up capital as on 31st January, 1987 is Rs. 634.51 crores.

4. Production

4.1 The Company has had to plan its production relating it to market demand. The production of iron ore concentrate during 1985-86 was 1.802 million tonnes. The target for production of iron ore concentrate during 1986-87 is 3.1 million tonnes. Against this, the actual production in the period April 1986 to January, 1987 is 2.886 million tonnes. It is anticipated that by the end of 1986-87 the production of concentrate may reach 3.8 million tonnes well ahead of the planned target. For 1987-88 the Company has planned a production of 4.6 million tonnes of concentrate.

4.2 The commercial production of iron ore pellets at the Pellet Plant by the end of 1986-87 is likely to be about 70,000 tonnes; this is in addition to the production made during trial runs. The target of production of pellets during 1987-88 is 0.6 million tonnes.

5. Exports

As a result of vigorous marketing efforts, KIOCL have been able to make steady progress in the sale of iron ore concentrate. During 1985-86, 2.06 million tonnes of iron ore concentrate was exported against a target of 2.00 million tonnes. In the period April 1986 to January, 1987, the Company has exported 2.782 million tonnes of concentrate to Australia, Bahrain, China, Czechoslovakia, Yugoslavia, France & Japan. Total exports during 1986-87 are likely to be of the order of 3.6 million tonnes. Exports planned for 1987-88 are 4.0 million tonnes of concentrate and 0.6 million tonnes of pellets.

6. Working Results

In 1985-86 the Company suffered a net loss of

Rs. 21.17 crores. The loss was mainly due to restricted production of iron ore concentrate 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. 17.4 crores in 1986-87.

7. Energy Conservation and cost reduction measures

A tunnel, along with other connected facilities including a pipeline, has been constructed so as to convey water from the Lakhya Dam to the Concentrator Plant by gravity system replacing the earlier pumping arrangement. This has resulted in saving of electrical energy and reduction of operating costs. Some major modifications to the Plant have also been carried out to increase the throughput.

8. Employees participation in the management

The Company has set up ten Shop level councils and two joint councils at the apex level. These councils meet periodically to discuss measures for improving production and productivity.

10. Contract Labour

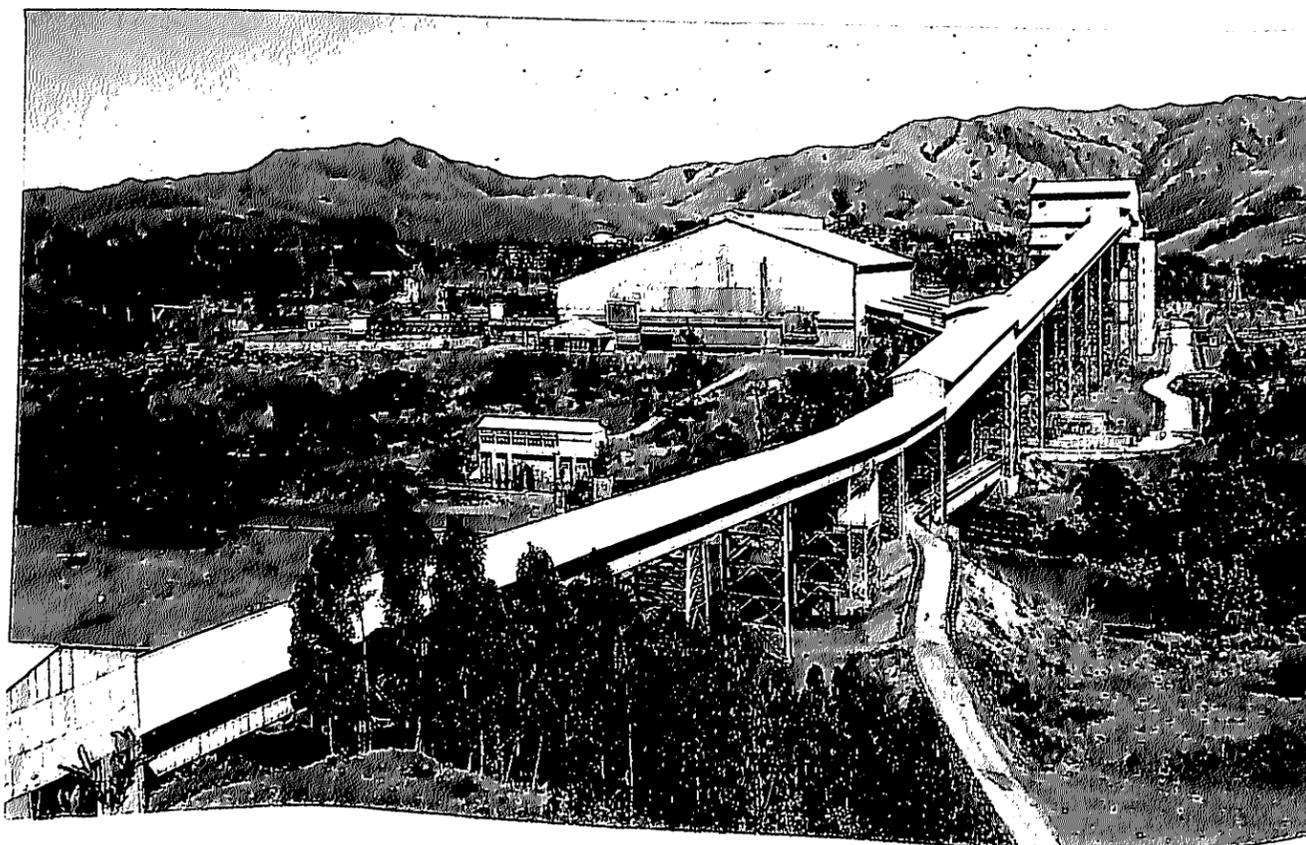
As a matter of policy the Company does not employ contract labour. Jobs of a purely casual nature are, however, got done through contractors. In all such cases provisions of Contract labour (Regulations & Abolition) Act, 1970 and obligations under the Act, as principal employer, are implemented.

11. Safety Measures

A Safety Department functions independently. Besides this, every Department 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 this booklet. This Company has received from the Mines Safety Association Shields and medals for the best safety measures adopted.

During December, 1986 the Zonal Mines Safety Week for the South Zone was celebrated at Kudremukh. Kudremukh was adjudged best in overall performance in terms of safety, dust suppression, maintenance and services and injury rate.

A view of the Kudremukh Project



9. Manpower

The details of employees in the Company as on 31st January, 1987 are as follows:—

Group	No. of employees		Scheduled Casts		Scheduled Tribes		Ex-Servicemen	
	Male	Female	Male	Female	Male	Female	Male	Female
1	2	3	4	5	6	7	8	9
A	417*	17*	27*	1	2	1*	—	—
B	48	6	2	—	—	—	—	—
C	1297*	86	112	2	13	—	129	1
D	216	13	44	3	30	1	5	—
D (Sweepers)	31	8	26	8	3	—	—	—
Total:	2009*	130*	211*	14	48	2*	134	1

* Includes Trainees.

Manganese Ore (India) Limited

1. Manganese Ore (India) Limited is the largest producer of high grade manganese ore in the country. The Company originally started as the Central Provinces Prospecting Syndicate in early 1896. Later, it became the C.P. Manganese Ore Company Limited (registered in London). The Company was incorporated under the Indian Companies Act, 1956, in June 1962. It became a fully owned Government Company in October 1977. The shares of the Company are held by the Government of India, Govt. of Madhya Pradesh and Govt. of Maharashtra in the ratio 72.10:11.85:16.05 respectively. The high grade manganese ore is used for producing ferro manganese, which is used in the manufacture of steel. Manganese being a strategic mineral with limited proven reserves in the country, Government's policy has been against permitting the export of high-grade, low-Phos ores.

2. Finance

The authorised capital of the Company is Rs. 17 crores and the paid up capital as on 31st December, 1986 was Rs. 5.30 crores.

3. Production

In 1985-86, Manganese Ore (India) Limited produced from its various mines 4.533 lakh tonnes of manganese ore of various grades against the target of 4.345 lakh tonnes. From April 1986 to December 1986, the Company produced 3.52 lakh tonnes of manganese ore and the anticipated production during January to March 1987 is 1.20 lakh tonnes. The target of 1986-87 was 4.55 lakh tonnes. The Company has exported 0.16 lakh tonnes of manganese ore during the period April to December 1986 and about 0.42 lakh tonnes of ore is likely to be

exported during January to March 1987. The total sales (domestic and export) during the period April to December 1986, were 3.80 lakh tonnes valued at Rs. 16.975 crores and sales during January to March 1987 are expected to be 1.36 lakh tonnes valued at Rs. 6.379 crores. The target for total sales during 1986-87 was 5.16 lakh tonnes valued at Rs. 23.354 crores.

The Company has undertaken a number of measures towards cost reduction.

4. Working Results

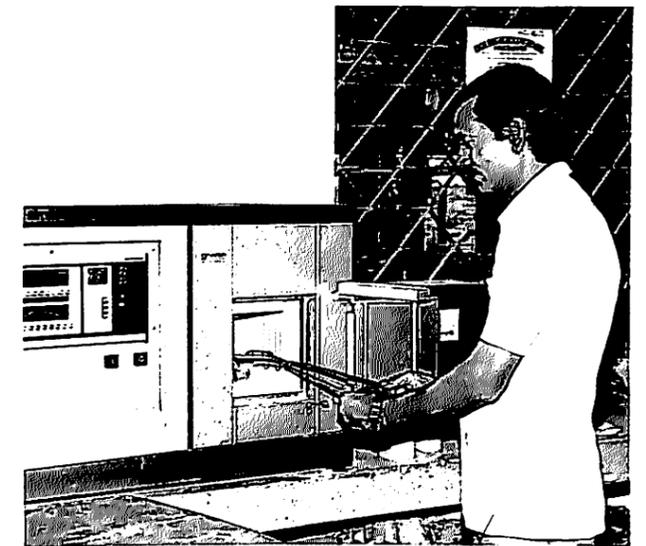
During the year 1985-86, the Company incurred a marginal loss of Rs. 10.54 lakhs after providing for depreciation as against a loss of Rs. 216.83 lakhs in the previous year. Due to loss incurred by the Company, it was not in a position to distribute any dividend for the year 1985-86. The Company is likely to earn profit of Rs. 5.10 lakhs in 1986-87.

5. Capital Schemes

Deepening of Holmes Shaft at Balaghat Mine of the Company has been completed. In addition the Company had taken up the following capital Schemes. (A) Sinking of vertical Shaft at Chikla Mines (B) Sinking of Main Hoisting Shaft at Ukwa Mine, (C) Crushing and Screening Plant at Balaghat Mine. It is also actively considering the establishment of an Electrolytic Manganese Dioxide Plant. The Company has applied for extension of the validity of the letter of the intent of this plant and it is under consideration of the Govt. of India. The Company also proposes to take up the production of Ferro Manganese from manganese ore fines through Plasma Furnace route.

6. Safety Measures

The main activity of the Company is underground mining. The Company has taken particular care to ensure safety of its workers. Apart from complying with the rules and regulations promulgated by the Government, Pit Safety Committees are functioning in all the mines. These Committees meet at least once every month to analyse causes of accidents and adopt measures for their prevention. A system of inspection by worker Inspectors in Mining, Mechanical and Electrical disciplines has been introduced in all the mines. Safety campaigns are undertaken periodically to instill a sense of safety awareness amongst staff at all levels. One of the Chief Mining Engineers of the Company functions as



Quality Control at MOIL

Chief Safety Officer and carries out inspections of the mines from time to time.

7. Workers Participation in Management

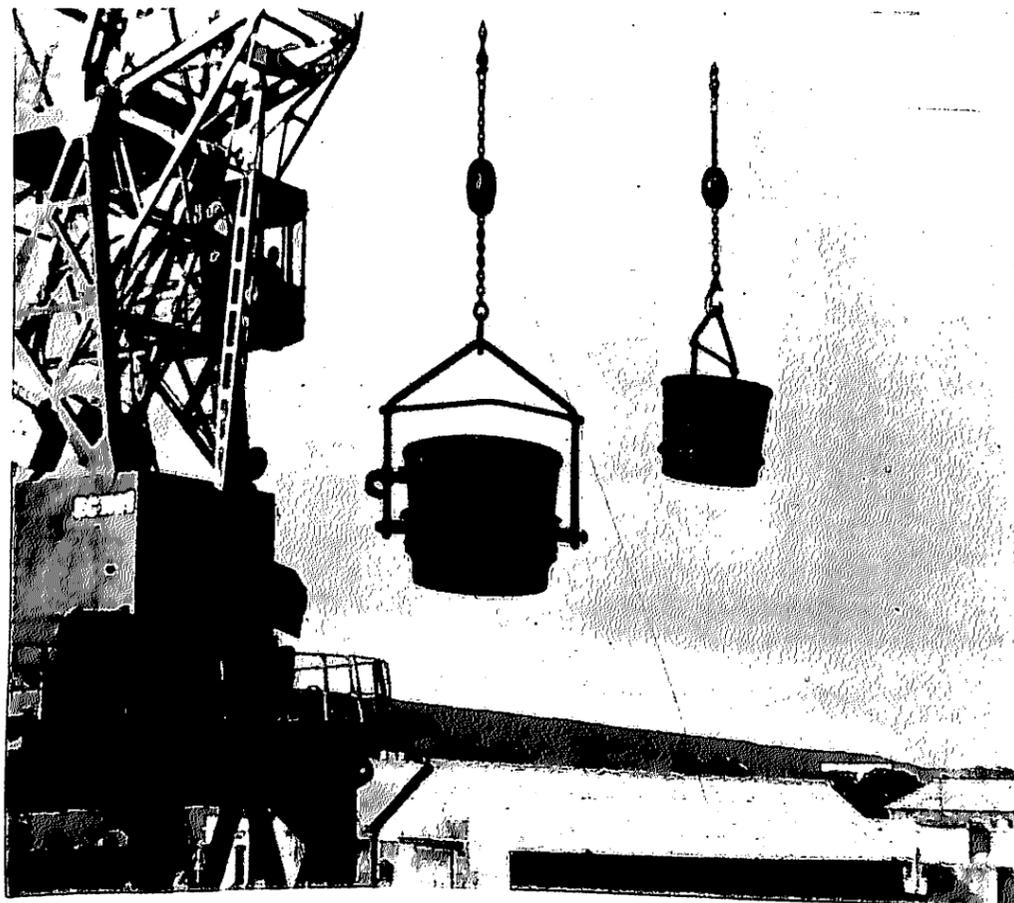
Various consultative forums are already functioning in different units of the Company for the effective participation of workers in management. Workers Committee, Canteen Management Committee, etc. have been functioning satisfactorily at each unit. Joint Management Councils have also been constituted at different units. The problems which cannot be solved at the unit levels are referred to the Apex Body functioning at the Corporate level.

8. Contract Labour Position

MOIL is not employing any casual or contract labour on jobs which are of permanent, regular and continuous nature. However, contract labour is deployed on certain jobs which are of a temporary, contingent or intermittent nature. Such workers are mainly employed for transportation and railing of ore and on supply of filling material. Also, in one of the small mines because of limited ore reserves and consequent short span of life of the mine, employment of regular workers is not possible and some contract labour is engaged at that mine.

The total number of such casual/contract labour employed by the Company was 1414 as on 31.12.1986.

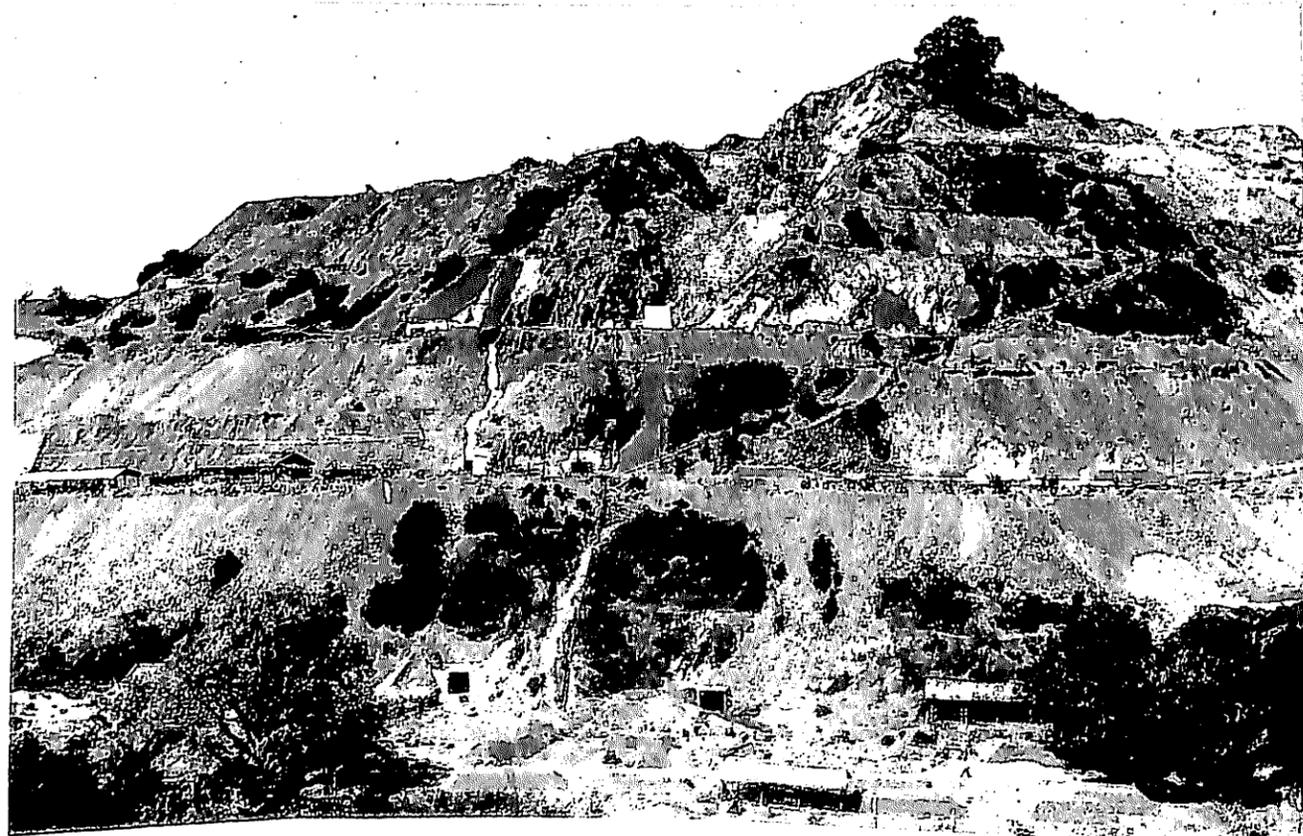
Loading of material



9. Progressive Use of Hindi

For the progressive use of Hindi in MOIL, the Company has formed a Hindi Cell at Head Office headed by a Hindi Officer who is assisted by supporting staff. To keep a watch on the progress of implementation of Hindi, the Company has also formed implementation Committee at Head Office and at the Mines of the Company. These Committees inspect the implementation of Hindi as per the Official Languages Act at Head Office and Mines. As per the instructions received from Government many schemes and check points have been made for the progressive use of Hindi. MOIL is alert towards implementation of these schemes and check points. A running shield has been instituted to be given to the Department in the Company which does maximum work in Hindi at the Head Office in Nagpur. Similarly, running shields have also been instituted for the mines situated in Regions 'A' and 'B' separately. A seminar on "How to make Hindi more attractive in Official Work" was organised in September 1986, in which the employees of the Company enthusiastically participated. Eminent outside personalities also

Chikla Mine



participated in the Seminar. An adequate number of Hindi books on various subjects have been procured for the office library. Periodical review meetings of the progress made are taken at the corporate office by the Chief Executive.

10. Personnel

The details of employees in the Company as on 31.12.1986 are indicated below:

Group	S.C.	S.T.	Others	Total
A	4	1	151	156
B	18	16	149	183
C	236	210	954	1400
D	1471	2833	4285	8589
Sweepers	101	—	—	101
Total	1830	3060	5539	10429

Out of the total number of 10,429 employees, 2,558 are female.

Bharat Refractories Limited

1. The Refractory Plant at Bhandaridah was acquired by the Government of India under the provisions of the Asian Refractories (Acquisition of Undertaking) Act, 1971, and was managed on behalf of the Government of India by the Bokaro Steel Limited upto 21.7.1974. On 22.7.1974 a separate Company in the name and style of "Bharat Refractories Limited" was incorporated as subsidiary to the Bokaro Steel Limited. Subsequently under the provisions of the Public Sector Iron and Steel Companies (Restructuring and Miscellaneous Provisions Act,) 1978, Bharat Refractories Limited ceased to be a subsidiary of Bokaro Steel Limited/Steel Authority of India Limited, and the Company was placed under the direct administrative control of Department of Steel with effect from 1st May, 1978. The following undertakings were also transferred to and vested in Bharat Refractories Limited from the above date:

- Refractories Plant at Ranchi Road (now known as Ranchi Road Refractories Plant), which had earlier been taken over by M/s. Hindustan Steel Limited, along with its captive sillimanite mines in Meghalaya, known as Nongstoin Sillimanite Mines.
- The Refractories Plant of Bhilai Steel Plant of SAIL located at Bhilai (now known as Bhilai Refractories Plant).
- India Firebricks & Insulation Co. Limited, formerly a subsidiary of Steel Authority of India Limited, was made a subsidiary of BRL.

All the units of the Company, including the subsidiary company (IFICO) but with the exception of Bhilai Refractories Plant, were taken over as sick units from the private sector.

2. Capital Structure

The authorised share capital of the Company is Rs 40 crores against which the paid up capital as on 31.12.86 was Rs 37.24 crores

3. Production and Financial Results

A. Production Results

The production performance of various units of the company and its subsidiary, IFICO Limited, during the

years 1985-86 and 1986-87 is given below:

Name of Unit	Qty. in tonnes.			
	1985-86		1986-87 (*)	
	Bricks (incl. Mass)	Mortar	Bricks (incl. Mass)	Mortar
Bhandaridah Ref. Plant	11,758	2,775	15,046	2,210
Ranchi Road Ref. Plant	4,089	—	4,807	—
Bhilai Refrac-tories Plant	34,534	—	33,967	—
India Firebricks & Insulation Co. Ltd.	32,006	—	31,017	—

(*) Based on actuals till December, 1986 and estimates for January-March, 1987.

B. Financial Results

During the year 1985-86 the company incurred a net loss of Rs. 729.90 lakhs after providing for both interest and depreciation of Rs. 539.34 lakhs and Rs.242.09 lakhs respectively; the plantwise break-up of this loss is as follows:—

Name of the unit	Loss incurred
Bhandaridah Refractories Plant	268.46
Ranchi Road Refractories Plant	128.92
Bhilai Refractories Plant	332.52
	<u>729.90</u>

The subsidiary Company, India Firebricks & Insulation Company Limited, incurred a net loss of Rs. 264.07 lakhs in 1985-86, after providing for depreciation amounting to Rs. 43.75 lakhs and interest on borrowed funds to the tune of Rs. 124.83 lakhs.

The company is likely to incur a net loss of Rs.714.01 lakhs in 1986-87. The plantwise break-up of the likely loss as being projected is as under:—

Name of the Unit	Loss likely to be incurred
Bhandaridah Refractories Plant	169.82
Ranchi Road Refractories Plant	107.77
Bhilai Refractories Plant	436.42
Total	<u>714.01</u>

The subsidiary, India Firebricks and Insulation Company Ltd. is likely to incur a net loss of Rs.176.47 lakhs in 1986-87.

The production in Bhandaridah Refractories Plant was adversely affected due to unduly high power cuts which were to the tune of 1117 hours in 1289 trippings during the 8 months period April to November, 1986. The production in Ranchi Road Refractories Plant also suffered on account of power cuts. In Bhilai Refractories Plant, the production was affected due to heavy absenteeism caused by stoppage of payment of overtime allowance to workers. At India Firebricks and Insulation Co. Limited also power cuts adversely affected production.

The financial performance of the Company including its subsidiary substantially improved during 1986-87 over performance in the previous year. The gross margin earned by Bharat Refractories Limited in 1985-86 was Rs. 51.53 lakhs. It is likely to be Rs.157.01 lakhs in 1986-87. The gross margin earned by India Firebricks and Insulation Company

Limited in 1985-86 was (-) Rs. 95.49 lakhs. It is likely to be (+) Rs. 15.03 lakhs in 1986-87, which is a significant improvement.

4. Pithoragarh Magnesite Project

Pithoragarh Magnesite Project, with a calcination capacity of 25,000 tonnes per annum of dead burnt magnesite, was approved by the Government in October, 1982 with a capital outlay of Rs. 14.00 crores. MECON was selected to render consultancy services for the project. The latest assessment made by MECON, with prices prevailing in the 1st quarter of 1985, shows that the capital cost would now be about Rs. 26.03 crores. A decision on the revised estimates of the project will be taken after considering the viability of the project based on current costs and overall demand and availability position of magnesite.

5. Foreign Collaboration

The Company has entered into a technical collaboration agreement with Shinagawa Refractories

Company Limited, Japan for the production of Coke-oven silica bricks.

Under licence from Kawasaki Refractories Company Limited, Japan, the Company has embarked upon the production of Magnesia—Carbon bricks, a priority refractory item for Steel Plants, and some quantity of these materials has already been supplied to Bhilai and Bokaro Steel Plants. The consumer Steel Plants are likely to line their converters shortly with the Magnesia-Carbon bricks, manufactured and supplied by Bhilai Refractories Plant. The manufacture of four other items of refractories under the collaboration with Kawasaki is planned to be undertaken in different plants of the company and its subsidiary.

6. Man Power

The man power position as on 31.12.1986 in different units of the company and its subsidiary is as below:—

Name of the Unit	Total man power	S.C.	S.T.	Women	Physically handicapped
1.	2.	3.	4.	5.	6.
Bhandaridah Ref. Plant	871	108	61	90	01
Ranchi Road Ref. Plant	349	30	34	14	03
N S Mines	235	2	111	15	01
Bhilai Ref. Plant	1577	181	269	14	11
Pithoragarh Magnesite Project	33	2	—	—	—
Head Office	136	19	1	—	—
IFICO	1132	42	155	29	12

7. Safety Measures

Safety measures are being provided in all the plants of the Company in accordance with the provisions of Factories Act, 1984. Safety committees have been constituted in all the units of the company and the subsidiary which review the precautionary safety measures.

8. Implementation of Official Language Act

The Company has been making concerted efforts towards progressive use of Hindi in accordance with the provisions of Official Language Act, 1963, and the Official language, Rules, 1976. All the Plants, Head Office and the subsidiary company IFICO Limited have already been notified in the Gazette in terms of Rule 10(4) of the above rules. Official language Committees have been constituted in all the units, subsidiary and Head Office and they are meeting regularly for speedy implementation of the instructions being received from the Government from time to time. Cash awards and commendation certificates are awarded to deserving employees.

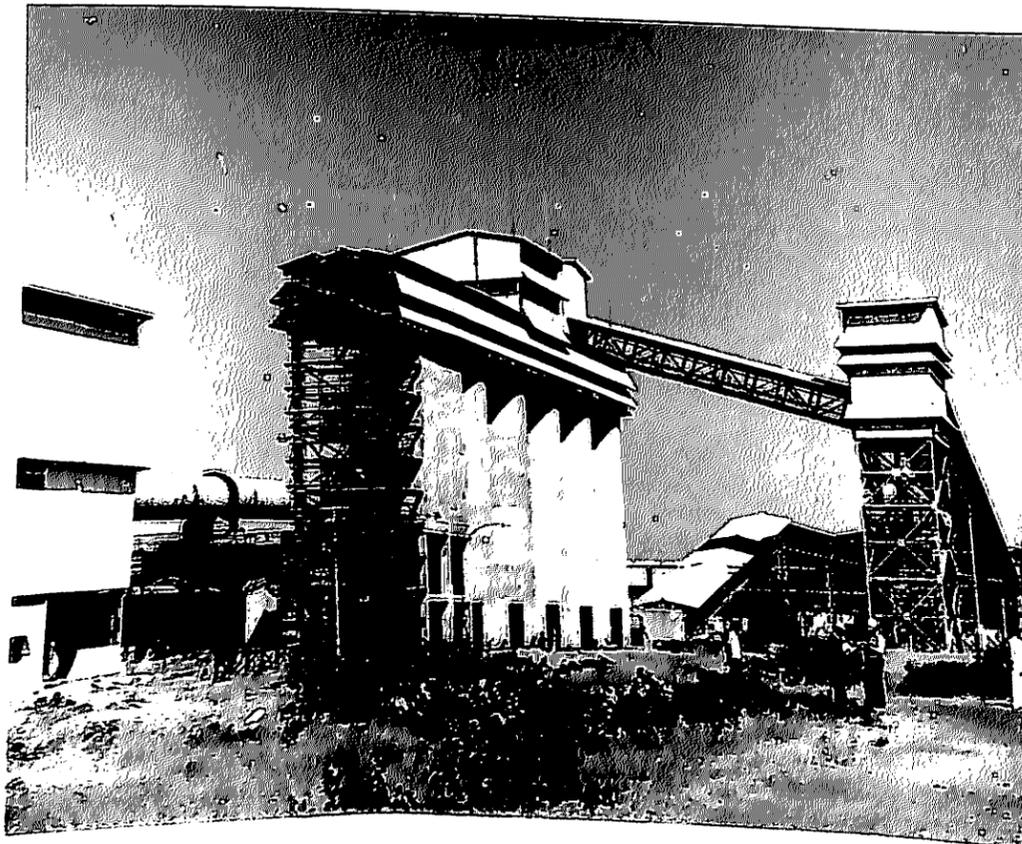
9. Engagement of Contract Labour

Contract labour is engaged on non-perennial jobs only. However, contract labourers are given regular appointment against vacancies subject to their names being sponsored by the local employment exchange. Minimum statutory wages are being paid to contract labour. In addition, they are being allowed the benefits like Provident Fund, E.S.I. Leave and Welfare facilities.

10. Industrial Relations

The industrial relations situation by and large remained peaceful in all the units and the subsidiary company of the undertaking.

Bhilai Refractory Plant



National Mineral Development Corporation Limited

1. The 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. On the exploration, planning and development side, its investigation, planning and consultancy wings are dealing with various minerals such as iron ore, diamond, limestone, dolomite, magnesite, emerald, tin, tungsten, etc. In respect of iron ore, the NMDC is a producer for exports only. The export of iron ore is canalised through the MMTC. Japanese Steel Mills are the major buyers of iron ore produced by the NMDC. The following units are under the control of NMDC.

A. Production projects	State in which located
Iron Ore	
Bailadila-14	Madhya Pradesh
Bailadila-5	
Donimalai	Karnataka
Diamond	
Panna Diamond Mining Project (Maihgawan Mine)	Madhya Pradesh
B. Projects Under Construction	
Iron Ore	
Bailadila-14 Expansion and Modification Scheme (Bailadila-11/C)	Madhya Pradesh
Fine Ore Handling Scheme (Bailadila-5)	
Dolomite	
Dolomite Project	Madhya Pradesh

Hand picking of Diamond at NMDC's Panna Project



2. Finance

The authorised capital of the Corporation is Rs. 150 crores. The equity capital was Rs. 110.82 crores as on 31.3.86 and Rs. 112.82 crores as on 31.12.86. The Government loans outstanding amounted to Rs. 39.63 crores as on 31.3.86 and Rs. 50.38 crores as on 31.12.86.

65.40 lakh tonnes (Bailadila ore 44.53 and Donimalai ore 20.87).

4.2 14791 carats of diamond were disposed of through auctions/tenders for a value of Rs. 199.66 lakhs during the year 1985-86. During April 86 to January 87, the quantity disposed of is 15010 carats for a value of Rs. 252.17 lakhs.

3. Production

Production in the units of NMDC during 1985-86 and 1986-87 is given below:

Name of the	1985-86 (Actuals)			1986-87									
	Lump	Fines	Total	Target for the full year (Revised)			Actuals for April 86 to January 87			Targets for Feb. & Mar. 87 (Revised)			
				Lump	Fines	Total	Lump	Fines	Total	Lump	Fines	Total	
A. Iron Ore (in lakh wet tonnes)													
1. Bailadila-14	20.68	6.99	27.67	18.44	8.10	26.54	16.60	8.46	25.06	3.45	1.53	4.98	
2. Bailadila-5	28.28	13.94	42.22	30.02	14.05	44.07	22.68	12.26	34.94	6.10	2.54	8.64	
3. Donimalai	14.45	9.51	23.96	11.00	9.00	20.00	11.98	9.06	21.04	1.75	1.53	3.28	
Total Iron Ore (1+2+3)	63.41	30.44	93.85	59.46	31.15	90.61	51.26	29.78	81.04	11.30	5.60	16.90	
B. Diamond (Carats)													
Panna Diamond Mining Project				15819			15000			12398*			2650*

*These are site weights. 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 total iron ore production during the year 1986-87 is therefore expected to exceed not only the revised target of 90.61 lakh tonnes but also be higher than the previous year's total of 93.85 lakh tonnes. The target for diamond production for the year is also expected to be met.

4. Export/Sale

4.1 Total iron ore export from the NMDC mines during 1985-86 was 82.53 lakh tonnes (Bailadila ore 58.04 and Donimalai ore 24.49). During the current year 1986-87, total iron ore export from NMDC mines during the period April 86 to January 87 has been

5. Working Results

5.1 Sales turnover during the year 1985-86 was Rs. 138.52 crores as compared to Rs. 112.31 crores during the previous year. During 1986-87 (upto Dec. 86) the sales turnover has been Rs. 91.52 crores.

5.2 During 1985-86, the NMDC earned a profit of Rs. 5.33 crores as compared to Rs. 3.36 crores during 1984-85. During the period April to December 86, the NMDC has incurred a loss of Rs. 15.38 crores. The main reasons for the losses are:

i) Decision by Committee of Secretaries on iron ore

and coal exports to only pay 'Standard Cost' to NMDC without return.

- ii) No Fe bonus has been taken into account for calculating the working result. Fe bonus is not being paid to NMDC.
- iii) No rebate in railway freight has been provided for by the Railways in 1986-87 (in 1985-86 a rebate of Rs. 5.22 crores was given by the Railways for achieving a movement of 6 million tonnes of iron ore on Bailadila-Vizag line).

6. Performance Highlights

- i) During the year 1985-86, there was an all-round improvement in the performance of the Company by way of earning higher profits, wiping off the accumulated loss and registering increases in production and sales both in iron ore and diamond.
- ii) The Company made a profit of Rs. 8.17 crores during the year 1985-86 compared to Rs. 1.23 crores during the previous year. The profit after adjustments relating to earlier years amounted to Rs. 5.33 crores against Rs. 3.36 crores in the previous year. For the first time in the history of the Company the accumulated loss had been wiped off during the year and the surplus at the close of the year stood at Rs. 2.56 crores (for carry forward to the next year).
- iii) The production, sales (to MMTC, the canalising agency for iron ore export) and shipment (from the ports) of iron ore during the year 1985-86 were the highest for the Company till date. Compared to the previous year (1984-85), the increase in production, sales (to MMTC) and shipment of iron ore during 1985-86 were 3.8%, 10.2% and 9.6% respectively.
- iv) The total iron ore shipment by NMDC during the year 1985-86 amounted to 82.53 lakh WMT against the anticipated target of 82.20 lakh WMT (fixed after considering problems faced by Vizag Port in the tipping of railway wagons and the loading of ships) and the actual shipment of 75.29 lakh WMT during the previous year, registering an increase of 9.6% over 1984-85.
- v) The production of diamond during the year was higher than the actual of the previous year by 5.6%. The sale of diamond during the year also registered an increase of 11.4% over the previous year. However, there was a fall in average sales realisation per carat, which was Rs. 1322 during the year compared to Rs. 1506 during the previous year.

- vi) The Foreign Exchange earned on the export of iron ore from the mines of NMDC (as distinct from company's own receipts) amounted to Rs. 187 crores as compared to Rs. 153 crores in the previous year.

7. Projects Under Construction

(i) Bailadila-11/C

Bailadila-11/C Mine is being developed to supplement and ultimately replace the Bailadila-14 mine, the production of which will be tapering year by year due to the continued operation of the mine since 1968-69 and the consequent dwindling of ore reserves and increasing operational constraints. The revised capital cost of Bailadila-11/C project Rs. 29.52 crores, was sanctioned by the Government in October, 1986. The installed capacity of the mine is 2.8 million tonnes of lump and fines per year. The production from this mine is meant for export/supply to Visakhapatnam Steel Plant. The scheduled date for completion of the project is June, 1987.

(ii) Fine Ore Handling Scheme (Bailadila-5)

Government had sanctioned this project for handling (including reclamation and loading facilities) 2.8 million tonnes of fines per year at an estimated capital cost of Rs. 25.94 crores in September, 1982. The revised estimated capital cost of the project is Rs. 30.77 crores which is awaiting Government's approval. Major civil and structural works and erection of equipment for the main scheme (Fine Ore Handling System) were completed by 31st December, 1986 & Trial operations commenced. The first rake was successfully loaded on 31.1.87. The Fine Ore Reclamation System is expected to be ready by the end of March, 1987. This is an independent system and will not affect in any way the main scheme (i.e. Fine Ore Handling System).

(iii) Dolomite Project

NMDC had been assigned the task of developing dolomite deposit for supply of blast furnace grade dolomite to Visakhapatnam Steel Plant. Government of Madhya Pradesh had rejected the application of NMDC for mining lease for Machkot Dolomite Deposit in Bastar District of the state. The revision application of NMDC is also reported to have been rejected by the Central Government. On the advice of the Ministry, a suitable alternative dolomite deposit at Kotmi-Sonar in Bilaspur District of M.P. has been identified by NMDC. Mining lease for this deposit has been granted by the State Government. Detailed exploration of the deposit is in progress (preliminary

prospecting was already completed) and 2156 metres of drilling have been completed till January 87. Efforts are being made to develop the dolomite deposit so that supply of dolomite can commence by the time Visakhapatnam Steel Plant is commissioned. A techno-economic feasibility report on Kotmi-Sonar dolomite project has been prepared for a total estimated cost of Rs. 30 crores and submitted to Government for approval.

8. Planning for New Projects

(i) Bailadila-14 Expansion and Modification Scheme

A TEFR consisting of the following schemes has been prepared for a total cost of Rs.60 crores.

- i) Mining of Bailadila-14 at deeper level;
- ii) Blue dust mining and handling scheme;
- iii) Fine ore handling scheme, Bailadila-14/11C

The report has been submitted to Government in November, 1986 for sanction.

(ii) Bailadila-11B

The development of a new mine based on Bailadila Deposit No. 11B may be necessary to meet the needs of export market as well as Visakhapatnam Steel Plant, provided it is found to be economically viable. A preliminary report has been prepared after completing the investigation. Before the scheme is formulated and submitted to Government for approval, expert consultancy agencies are being approached for preparation of a pre-feasibility report and quotations have been received from various parties which are under examination.

(iii) Environmental Improvements

The modification of tailing dam at Donimalai has been completed. The construction of Tailing Dam for Bailadila-14/11C complex has been taken up and is in progress. The proposals for second tailing dam at Bailadila-5 are under finalisation. In addition to this, afforestation of the area and the construction of check dams wherever necessary to prevent silting of streams is being taken up in a phased manner.

9. Investigation

The Company is engaged in investigation of following mineral deposits:

- i) Tungsten Deposits in Burugubanda in A.P.



Lump Ore Conveyor for Iron Ore

- ii) Super High Grade Limestone Deposits in Rajasthan.
- iii) High Grade Magnesite Deposits in Jammu & Kashmir.

10. Research & Development

During the year 1985-86 as well as the current year (1986-87), the R & D Laboratories of the corporation at Hyderabad had undertaken various investigation studies in respect of its own projects as well as a number of outside agencies covering various minerals.

Special studies on use of 'Blue dust' for use in 'High Tech' area have been carried out successfully. This will lead to 'import substitution'.

11. Training Activities

The Corporation attaches great importance to the development of the skills of its employees through suitable training programmes. These training programmes are designed to meet the needs of the Company. During the period April to December 86, 631 employees of the Corporation had gone through such programmes.

12. Personnel

The details of the employees in the Corporation as on 31.1.87 are indicated below:

Group	Total No. of Regular employees as on 31.1.87	No. of Scheduled Caste employees (out of Col. 2)	No. of Scheduled Tribe Employees (out of Col. 2)	No. of Women Employees (out of Col. 2)
1	2	3	4	5
A	575	22	3	11
B	780	43	11	30
C	3392	447	467	140
D	1885	390	518	147
(Excluding Sweepers)				
D	135	104	1	24
(Sweepers)				
Total	6767	1006	1000	352

13. Industrial Relations

Industrial Relations situation in the Corporation during the period April 86 to December 86 was by and large peaceful and cordial.

Consequent on the expiry of the existing wage settlement for the workers, the All India NMDC Workers' Federation and its Affiliated Unions had submitted a charter of 37 demands on 27.10.86. These were briefly discussed in the bipartite meetings held on 22.12.86 when the Federation was urged to continue the present settlement beyond 31.8.86 and also to link the revision to production/productivity which were both rejected by them. The demands are being examined for their financial implications etc.

14. Workers' Participation in Management

The Corporation continues to follow the scheme for workers' participation in management as introduced by the Govt. of India vide their Resolution No 5(1011)/4/75-DK-1(B) dated 30.10.1975 and subsequently modified vide notification No. L-56011/1/85-Desk (i) dated 30.12.83. The scheme is working satisfactorily at all the 3 levels, viz. shop level, plant (project) level and Apex (Corporate) level. The meetings of joint councils at all these levels take place at regular intervals and the follow up steps provide an effective two-way communication and

exchange of valuable information between the management and the workers. The AJC at corporate level held 3 meetings during the year. Matters of mutual interest which fall within the ambit of these joint councils are usually discussed freely.

In the 3rd meeting of the Tripartite Committee on Employees' Participation in Management held on 10.10.85, it was agreed that studies to evaluate the working of the scheme would be undertaken in certain undertakings. It is heartening to note that NMDC was one of the few undertakings mentioned in this connection. In pursuance of the above decision, the Ministry of Labour had collected information through NMDC from the members of the shop/plant councils in our projects through a questionnaire/proforma devised by the Ministry to cover important aspects of the introduction and working of the scheme. Based on the responses received from the members, an analytical note was prepared in the Head Office of NMDC which was sent to the Labour Ministry in July, 1986 as desired by them. This analytical note was very much appreciated by the Ministry of Labour and was placed by them in the agenda of the 4th meeting of the Tripartite Committee on Workers' Participation in Management held at New Delhi on 22nd and 23rd October, 1986 for detailed discussion. Some of the shop floor and plant level representatives of the employees as well as management representatives were also invited to attend the meeting. In the meeting, while the workers' representatives were invited to express their view points freely, the management representative was requested to present the position paper relating to the Corporation which was well received by the delegates to the meeting.

15. Contract Labour Position

As compared to an average of about 1500 contract labour during last year, there were about 2000 labour on an average during the year 1986. The increase of about 500 is mainly due to the increased activity in civil construction jobs which may continue for another few months. The number of labours engaged in transportation and loading of fine ore into the railway wagons at Bailadila-14 remains almost unchanged with 871 as against 874 reported last year.

16. 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 incidence of accidents at all their mines. To achieve the above, the following are being implemented by the Corporation:—

- Vocational training.
- Refresher training.
- Acquainting the new appointees with the safety standards through the safety officers.
- Regular Pit Safety Committee meetings.
- Medical examinations.
- Celebration of safety week every year.
- Providing the workers with safety equipments/appliances duly approved by DGMS.
- 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. Chief (ISO) has been kept in Head Office to monitor the progress in this respect.
- Detailed discussions were held regarding implementation of the Vth Conference on Mines Safety recommendations at the Corporate Head Office on 24.9.86 in which workers representatives from all the NMDC Projects, the management representatives from the Projects and Head Office and the Directorate General of Mines Safety, Government of India, headed by the Deputy Director General, deliberated on all aspects of the above recommendations. It will suffice to mention here that the Corporation is conscious and is fully geared up to see that safety is given prime importance in all spheres of production and construction activities in all NMDC mines.

Mandovi Pellets Limited

1.1 National Mineral Development Corporation (NMDC) is participating on behalf of Government in Joint Sector Enterprise Mandovi Pellets Limited (MPL) which was approved in 1975 to produce 1.8 million tonnes of blast furnace grade iron ore pellets. The

plant started production in 1979 as a 100% export oriented unit. NMDC and M/s Chowgule and Company Private Limited each contributed to the extent of 1/3rd of the equity capital of this Company. The remaining 1/3rd was being contributed by the general public/financial institutions. MPL had entered into a long term agreement with Japanese Steel Mills (JSM) for the export of a total quantity of 18.32 million tonnes of pellets at a rate of 1.82 million tonnes per year over a period of 10 years starting with financial 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 reason for shortfall in production was inadequate supply of power.

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

1.3 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 tonnes of fines. The contract for supplying fines was assigned to M/s CCPL who also paid contribution to MPL for this deal.

1.4 In February, 1985, the MPL and JSM executed an agreement under which JSM was to purchase 1.8 million DMT of iron ore fines and Nippon Kokan KK (NKK) Tokyo to purchase 1.18 million DMT of Iron Ore during 1985-86 and 1986-87. The CCPL is to ship this ore to Japan on behalf of MPL. The Pellet Plant continues to be closed during the year.

Metal Scrap Trade Corporation Limited

Part—I

1. Introduction

The Metal Scrap Trade Corporation Ltd. (MSTC) is the canalising agency for export of ferrous scrap and import of Carbon Steel Scrap, Alloy Steel Scrap, Sponge Iron/Hot Briquetted Iron, Re-rollable Scrap, Pig Iron Chips 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 of other Public Sector Undertakings and Government Departments.

2. Present Activities & Objectives

2.1 Main activities

Foreign Trade

- i) Canalising import of Carbon Steel Melting Scrap and Alloy Steel Scrap;
- ii) Canalising import of Sponge Iron/Hot Briquetted Iron;
- iii) Canalising import of Re-rollable Scrap;
- iv) Canalising import of old ships for scrapping;
- v) Canalising import of Pig Iron Chips;
- vi) Export of ferrous scrap.

Domestic Trade

- i) Disposal of Ferrous and miscellaneous scrap arising from integrated Steel Plants (Under SAIL);
- ii) Disposal of scrap and surplus stores of other Public Sector Undertakings and Government Departments.

The Corporation has also a Market Research and Development Division, which basically aims at improving the quality of service through its market research and development activities. The main functions of this Division may be briefly stated as under:

- i) To service the Operation Divisions by providing regular feedback about market developments, both short-term and long-term, in respect of each item dealt with by the Company;

- ii) To initiate, propose and monitor schemes for diversification/development of projects and implementation thereof;
- iii) To serve as data-bank for regular and automatic supply of statistics available within the organisation by the Operation Divisions in a time-bound fashion.

2.2 Objectives

The main objectives of MSTC are as under:

- i) To promote concerted action in the matter of movement of scrap within India and shipment of scrap to and from foreign countries in conformity with the policy of the Government;
- ii) To promote and develop measures for increased and improved collection of scrap within the country;
- iii) To support, protect, maintain, increase and promote export of scrap;
- iv) To ensure supplies of scrap to Indian users on such terms as may be determined from time to time;
- v) To under take manufacturing activities allied to the steel industry.

3. Organisational Structure

3.1 The Company is presently headed by a Managing Director assisted by three General Managers to look after Foreign Trade Division, Finance and Accounts Division and Market Research and Development Division. The Domestic Trade Division is looked after by a Deputy General Manager. The Company has three Regional Offices at Bombay, New Delhi and Bangalore, headed by Zonal Managers.

3.2 The major policies and strategies are framed at the Head Office level but certain activities have been decentralised at the Zonal levels, in the interest of servicing the scrap trade industry. In conformity with modern management practices, suitable guidelines and action plans were drawn in the beginning of the financial year 1985-86 and these have contributed to the accelerated growth and performance of the Corporation during the year under report.

Part—II

1. Performance & Results

1.1. Physical Performance

	Unit—Tonnes/LDT		
	Actuals		
	1984-85	1985-86	1986-87 Up to Dec.
A. Import of			
i) Carbon Steel Melting Scrap and Sponge Iron/HBI (Including under NOC)	8,10,000	15,44,000	17,71,000
ii) Stainless Steel Scrap	6,500	5,600	2,797
iii) Ships for breaking	3,32,000	6,15,000	2,34,194
B. Export of			
Mill Scale Scrap	61,000	84,000	47,000
C. Home Sales- Scrap Arising of			
i) Steel Plants	1,86,000	2,10,000	96,497
ii) Other Public Sector Undertakings (Rs. in lakhs)	Rs. 1,710	Rs. 3,279	Rs. 3,476

1.2 Financial Results

	Units—Rupees in Crores		
	Rs.	Rs.	Rs.
i) Gross Profit before Interest & Depreciation	4.76	8.90	7.85
ii) Interest & Depreciation	0.15	0.42	1.18
iii) Profit before tax	4.61	8.48	6.67

2. Manpower

There are 80 executives and 148 non-executives in the Head Office and in Regional Offices at Bombay, Delhi and Bangalore.

3. Future Outlook

With the increase in volume of business, importance of quick analysis and interpretation of data are felt essential. With this end in view an Electronic Data Processing System is being installed in MSTC Office at Calcutta with future compatibility for connecting all the Regional Offices of MSTC with the main system, through Indo-Net System of CMC Ltd. Action in this regard was initiated during the end of 1985-86 and the installation and functioning of this System is likely to commence end 1986-87.

Ferro Scrap Nigam Limited

1. Introduction

Ferro Scrap Nigam Limited (FSNL) is a joint sector company in which the Metal Scrap Trade Corporation Limited holds 60% equity shares with the remaining 40% being held by M/s. Harsco Corporation Inc., U.S.A. The company undertakes recovery and reprocessing of scrap from slag and refuse dumps in the Steel Plants in Jamshedpur, Rourkela, Burnpur and Bhilai. It also has undertaken the recovery of scrap in the Bokaro Steel Plant.

2. Overall Performance

The Production performance of FSNL of the last two years and projected performance for 1986-87 and 1987-88 is given as under:—

Major Product	Production Performance			
	1984-85	1985-86	1986-87	1987-88
Recovery of Scrap from Dumps (lakh MT)	4.52	5.63	6.12	6.30
Value of Production (in Rs. Crores)	8.52	11.56	14.68	15.12

3. Financial Performance

For processing the slag and reclaiming Iron and Steel from the Dumps, FSNL gets service charges from the Steel Plants. Based on the service charge income of Rs. 1156 lakhs in 1985-1986, the net profit of FSNL was Rs. 291 lakhs. As against this the corresponding figures for 1984-85 are Rs. 852 lakhs of service charge income and Rs. 176 lakhs as net profit. The net profit of the year 1986-87 is estimated at Rs. 307 lakhs and anticipated growth rate of about 5.5% per annum. The net profit target for the year 1987-88 has been fixed at Rs. 379 lakhs.

4. Efficiency Parameters

FSNL being a service organisation, its performance depends upon the various factors such as availability of equipment, power and other services extended by the Steel Plants and most important is the material input by the Steel Plant. Based on the experience and technological considerations, the efficiency norm for production in FSNL can be fixed with reference to a module of equipment comprising of Crane/Shovel, Magnetic Separator, Dumpers and Dozers. One module of equipment as indicated above, is estimated to give annual production of 36,000 MT.

5. Sales Realisation

Sales realisation in 1985-86 and estimated sales realisation in 1986-87 per MT at constant prices during the three years is indicated below:

1985-86 Actual	1986-87	1987-88
Rs. 206.40	Rs. 206.40	Rs. 206.40

6. Future Programme

Keeping in view the availability of the scrap arising in the various Steel Plants and huge quantity of iron and steel scrap lying buried in the dumps of various steel plants, the Company proposes not only to expand the capacity in its existing units by augmenting the resources in terms of equipment, marginal manpower, etc. but also to take up scrap processing in other steel plants like Durgapur and Vizag, during the next five years. The Company has already started scrap recovery in Bokaro in 1984-85 as a part of phased programme. It has accordingly drawn up a plan for replacement/renovation of the ageing equipments and procurement of additional machinery at an estimated investment of Rs. 45 crores.

7. General Activities

(i) Safety Measures

The Company gives utmost importance to safety measures. All employees working in the field have been provided with helmets, safety goggles, hand-gloves, etc. First Aid Boxes and Fire Extinguishers are placed at prominent places. Safety posters and pamphlets are displayed from time to time to create safety consciousness among the employees. The Safety Department is under the supervision of a qualified Jr. Manager.

(ii) Contract Labour Position

The Company carries out its activities by permanent employees of the Company. Contract labourers are not ordinarily engaged. Hence the Company does not face problems on account of contract labourers.

(iii) Worker's Participation in Management

Workers are given due participation in productive disciplines. Their suggestions are vetted and generally implemented. There are several committees such as Workers Committee, Joint Consultative Committee, Welfare Committee, etc.

(iv) Capacity Utilization

Capacity utilization of the Company from 1983-84 has been more than 100%. The growth rate is around 10% per year. Hence capacity utilization has been in the order of 110% on an average during the year 1986-87.

(v) Efforts made towards Cost Reduction

The Company gives top-most importance to cost reduction in various areas of activities. The cost expenditure towards travelling, telephone bills, overtime payment, etc. have been controlled to a great extent. The overall control on the cost is regularly monitored through budgetary controls.

(vi) Efforts made towards Indegenisation

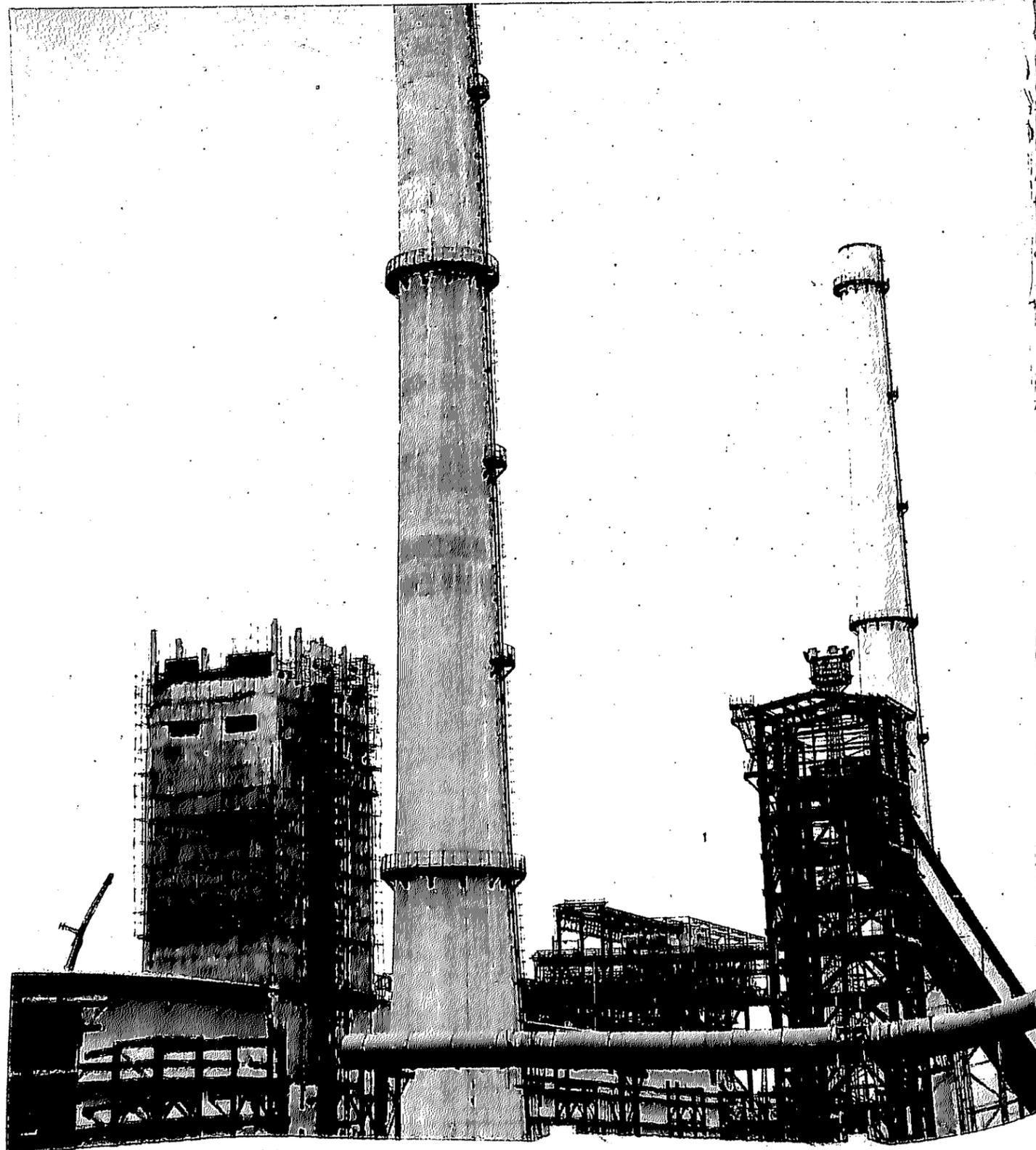
From the year 1985-86 onwards, more stress has been laid on the use of Indian equipment. The important cranes are being substituted by the indigenous shovels and backhoes. Similarly, efforts are being made in the use of indigenous magnets and drop balls. Constant efforts are on to save foreign exchange by import substitution.

8. Efforts for Development

- (i) The Company is continuously following up with the customers to renew contract in time, enhance the service charges for meeting the cost of escalation and new investment and to provide sufficient quantity of oxygen. In case of non-availability of oxygen, Steel Plants are being persuaded to make up the additional cost on account of installing a vapourisation oxygen plant from local companies such as Indian Oxygen Ltd. and Asiatic Oxygen Ltd. etc.
- (ii) The Company is making efforts to seek assistance from the Steel Plants, holding company MSTC through ferrous Scrap Committee for new investment and replacement of old equipment etc.

9. Man Power

Man power is being kept at constant level through improved efficiency.



Coal tower and Chimneys for Coke Oven battery at VSP

Metallurgical & Engineering Consultants (India) Limited

MECON was set up in 1959 as Central Engineering & Design Bureau of erstwhile Hindustan Steel Limited and later incorporated as fully owned subsidiary of SAIL on 31st March, 1973. In 1978 when SAIL was made into an operative company from the earlier holding company status, MECON was brought directly under the Department of Steel in the Ministry of Steel & Mines. It has emerged as a premier design, engineering and consultancy organisation in Public Sector for metallurgical industry. MECON offers a comprehensive range of services which include:

- i) Rendering technical consultancy, design and engineering and other technical services providing supervision of construction, erection and commissioning at site.
- ii) Project management services for setting up plant and machinery in ferrous, non-ferrous metallurgical industries.
- iii) Design and supply of equipment for Coke Oven Batteries (including 7 Metre high coke ovens) dry coke cooling plants, blast furnace, gas cleaning plant and rolling mills.
- iv) Design, engineering and supply of processing, finishing and galvanising lines for ferrous and non-ferrous industries etc.

2. Present Major Contracts

- a) Design of Plant and equipment and systems including supply, erection and commissioning work of Coke Oven Battery (without supply), Rolling Mills, Gas Cleaning Plant for Vizag Steel Plant.
- b) Design, engineering, consultancy and project management services for various Defence establishments in the country.
- c) Design, engineering, manufacture, supply, supervision of erection and commissioning of Mini Galvanising Lines for M/s. Century Tubes Limited, New Delhi, M/s. Munak Galva Sheets Ltd., New Delhi, M/s. Harikrishnan Coated Sheets Ltd.
- d) Design and supply of Cold Rolling Mills for M/s. Road Masters Steel Strip Ltd., Rishikesh and Pennar Steel Ltd., Hyderabad.
- e) Detailed Engineering and Consultancy services for High speed Steel Plant for M/s. Powmex Steel Ltd. Hyderabad
- f) Design Engineering, Supervision of Erection and Commissioning of Coke Oven Batteries at Bhilai Steel Plant
- g) Detailed Engineering and Consultancy Services for the new Mint Project at NOIDA.

- h) Modernisation and Debottlenecking of Khetri Copper Refinery Plant for Hindustan Copper Ltd.
- i) Consultancy services for Maruti Udyog Limited.
- j) Detailed Engineering and Consultancy services including inspection of Plant & equipment for the Lead-Zinc Smelter Complex at Chandera for Hindustan Zinc Limited.
- k) Modernisation of 700 mm Billet Mill at Alloy Steel Plant, Durgapur.

3. Assignment abroad

MECON is rendering consultancy, Project Management and Technical Services for construction of 1.3 MT per annum capacity Blast Furnace based integrated Steel Plant at Ajaokuta, Nigeria and at present 58 MECON engineers are deputed in Nigeria for this job. The two rolling mills of priority commissioning units under Stage-I have already been commissioned. The Company has renewed the contract upto May 1988 with Delta Steel Company, Warri for rendering post commissioning services and for setting up of Design Bureau.

The Company has submitted Feasibility Report for Kyanite Calcination Plant at Zimbabwe, and Pre-investment Feasibility Report for setting up a Rolling Mill unit in Nigeria.

4. Finance

The authorised and paid up capital as on 31.3.1986 was Rs. 4 Crores and Rs. 2.02 Crores respectively.

5. Working Results

The Company's turnover during the year 1985-86 was Rs. 100.75 Crores against Rs. 101.09 Crores during 1984-85. The Company earned a net profit before tax of Rs. 12.14 Crores during 1985-86 as against Rs. 12.02 Crores during 1984-85. The budgetted turnover and profit before tax for the year 1986-87 has been estimated to be Rs. 81.54 crores and Rs. 9.11 crores respectively.

6. Expertise Beyond Normal Consultancy & Engineering Services and Major Contribution towards bridging technical know-how gap.

Over the last 28 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 Metallurgical Industries. In this connection besides its own development, the Company has entered into basic know-how licence/co-operation agreements with the following foreign companies.

- (i) M/s. Wean United of USA for Rolling Mills and Auxiliary Equipment in 1969.
- (ii) V/o Tiajpromexport of Moscow, USSR, for Detailed Engineering for Metallurgical Industries in 1970.
- (iii) M/s. Creusot-Loire of France for Converter Gas Cleaning Plant (basic agreement with SAIL and operated by MECON) in 1978.
- (iv) V/o Tiajpromexport of USSR for Tall Coke Oven Batteries in 1980.
- (v) V/o Tiajpromexport of Moscow USSR for Dry Coke Cooling Plants in 1980.
- (vi) M/s. SMS Schloemann Siemag of West Germany for Long Product Rolling Mills in 1981.
- (vii) M/s. Gilbert/Commonwealth International Inc., USA in the field of utility power plants.
- (viii) M/s. Mannesman Demag Huttentechnik (MDH), West Germany for transfer of basic know-how for equipment and systems design of Blast Furnace Plant.
- (ix) M/s. TUV Rheinland, West Germany for Environmental Protection.
- (x) M/s. Maerz Offenbau AG, Switzerland in the field of Mini Cement Plants.
- (xi) M/s CLECIM of France for Terminal Equipment of Mini Galvanising Lines in 1984.
- (xii) M/s. A.V. VERITECH, OSLO & DT VERITAS, Norway for off-shore platforms in 1985.

7. Contract Labour Position

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

8. Industrial Relations And Workers Participation

The Industrial Relations situation in MECON even since its inception in 1973 has been generally good. This has been possible because of healthy co-operation existing between MECON Management and the MECON employees' Union, a non political union and has been recognised by the Management on the recommendation of the State Government. The executive staff of the organisation, who constitute more than 50% of the total strength of the organisation are represented by the MECON



Modernisation work at Durgapur Steel Plant

Executives' Association, registered under the Societies' Registration Act. This Association has also been recognised by the Management. The major issues relating to the employees, like wages, incentive and promotion policy etc. are periodically discussed with the union and settlements for specified period are arrived at. For settlement of these issues, Committees consisting of representatives of both the Management and Union are constituted. In case of any difficulty in arriving at bipartite settlement, the assistance of the conciliation officer is sought.

A three tier Grievance Handling System exists as far as the individual grievances are concerned. These matters are also sometimes taken up either by the Union, on behalf of these individuals and the issues are discussed.

A system of participation in management by the employees both at the departmental level as well as the corporate level exists in the Company. Zonal Committees at departmental level discuss the subjects related to job, organisation, quality of work etc. and send their suggestions to the higher management wherever necessary. Besides there are other Committees to cover the issues relating to welfare, housing, medical, schools, sports, provident fund & gratuity etc. In addition to the above Management also keeps in-constant touch with the Employees' Union at the corporate level in order to brief them about the work situation and prospects relating to the growth of the organisation and other problem.

9. 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 2.4 million engineering manhours and 0.8 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 1986-87 (upto January '87) has been around 81% on chargeable jobs of which detailed engineering jobs represents about 37%.

10. 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, stationery etc. are constantly reviewed for effecting economy in these areas.

11. Efforts Made Towards Indigenisation

MECON has been doing pioneering work in Technology transfer resulting in Indigenisation of high technology in various fields including design and supply of Rolling Mills, design of processing lines, coke oven batteries, dry coke cooling plant, gas cleaning plant etc. Specific mention may be made with regard to design and supply contracts being executed by MECON for light and Medium Merchant Mill, Wire Rod Mill and Gas Cleaning Plant for Visakhapatnam Steel Project. MECON has also developed its own design for 4.5 M Coke Oven Batteries. Three sub-batteries at Durgapur and one sub-battery at Rourkela as per MECON design are already installed and under operation.

The Company is not only keeping abreast with the latest technology in its field of activities but also getting the appropriate technologies transferred with a view to assimilating and indigenising of the same. It has taken initiative in acquiring technology, in a number of areas for the iron and steel industry like selective crushing of coal, design of coke oven battery with a stamp charging technology, recovery of anhydrous ammonia by phosam process, coal dust injection in blast furnace stoves, for the higher blast temperature, movable throat armour for blast furnace,

cast house slag granulation etc. In addition, the company is pursuing for the transfer of complete know-how for sintering plant, basic oxygen furnace shop and computerised process control etc.

12. Welfare Measure

The Company has a well planned township, at its headquarter at Ranchi which meets housing need of 70% of the employees posted in Ranchi. There is a well equipped 50-bedded hospital which provides free medical treatment to employees and their family members, a Higher Secondary School providing free education to nearly 3249 children upto Class XII (nominal charges for children reading in plus two classes) There are various facilities for cultural creativity, sports, games etc. for employees and their family members. The company provides the facilities of medical care and education either through its clients or through other devices including reimbursement of expenses in other places where it has an office but no township of its own.

13. Responsibilities Towards Society

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

The Company is acting as the major driving force in maintaining the Cheshire homes of India, Ranchi which looks after nearly 40 chronically sick, permanently disabled, crippled & destitute persons..

14. 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 2050 comprising 1550 qualified engineers and about 500 drafting personnel. Besides this, the supporting technical/non-technical manpower of the Company is 1656 making a total manpower strength of MECON 3706. The total number of employees in the company as on 31.12.86, was 3706 out of which 238 are Scheduled Caste and 452 are Scheduled Tribes.

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.

2. This plant is designed to adopt some of the most modern technologies, some of which are:—

- Selective crushing of coal
- 7 Metre tall Coke Ovens
- Dry quenching of coke with auxiliary power generation facilities.
- On ground blending of sinter base mix
- 3200 M³ Blast Furnaces
- Conveyor charging and bell-less top charging for Blast Furnaces
- 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.

3. Revision of Project Concept and Cost

The Visakhapatnam Steel Plant was designed to produce 3.4 MT of molten steel. A Revised Project Concept has been adopted for implementation of this project at a lesser capital cost and within a shorter time-frame in order to improve its economic viability. As against the revised estimated cost of about Rs. 7500 crores for the approved concept the cost has been reduced to about Rs. 6,300 crores (at 1st quarter, 1986 prices).

The first phase of the project is now scheduled for commissioning by December, 1988 and the complete plant by June, 1990 as against 1990-91 envisaged

for the earlier revised concept. The revised project concept is under Government's consideration. However, the project has been allowed to go ahead with the revised concept.

4. Products Mix Under the Rationalised Concept

The Product Mix of VSP under the Rationalised

Concept is shown in the following table:
Finished Steel (for sale)

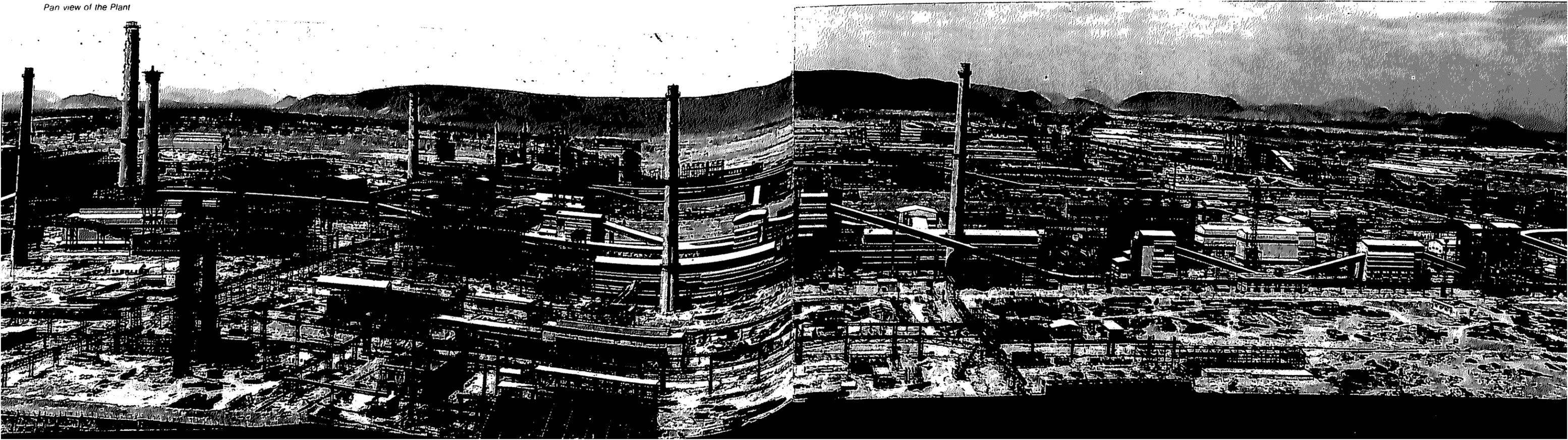
	Tonnes per year
<i>Rounds and Squares</i>	1,256,000
<i>Flats</i>	74,000
<i>T bars</i>	24,000
<i>Equal and unequal angles</i>	661,000
<i>Channels</i>	251,000
<i>Beams</i>	144,000
<i>Billets</i>	246,000
Total	2,656,000
Pig Iron for sale	555,750

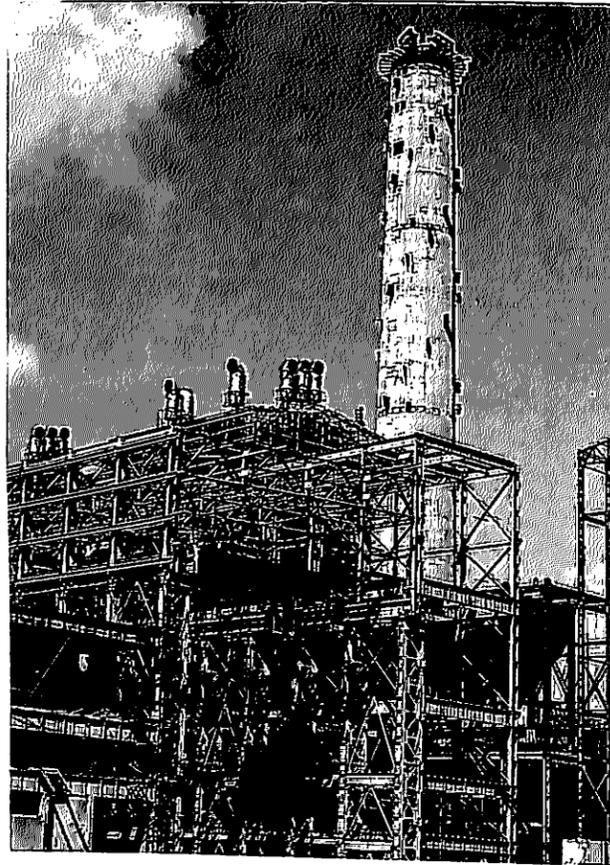
5. Progress of construction

Overall progress of construction at site in major areas, upto December, 1986 was as under:—

Sl. No.	Item	Total Quantity (revised concept)	Cumulative till December, 1986		% Fulfilment of Schedule (%)
			Schedule	Actual	
1.	Concrete (m ³)	2790395	2080048	2085576	100.3
2.	Strl. Fabrication (t)	414307	288204	287500	99.3
3.	Strl. Erection (t)	414307	213033	199743	93.8
4.	Eqpt. Ordering (t)	415750	379847	374830	98.7
5.	Eqpt. Erection (t)	415750	85074	72149	84.8
6.	Refr. Ordering (t)	165496	165602	134655	81.3
7.	Refr. Erection (t)	165496	65084	63514	97.6

Pan view of the Plant





Work on Thermal Power Plant in progress

6. Progress of External Infrastructure facilities

- i) The work on in-coming lines from Simhachalam and Duvvada junctions is in progress and railways have taken up work on the Peripheral Yards, inside the steel plant area.
- ii) Linkages for coking coal, boiler coal, iron ore, limestone dolomite, etc. have been identified, and construction work on mines/washeries etc. planned.
- iii) A techno-economic feasibility report regarding port facilities at Visakhapatnam Port, for import of coking coal, has been obtained and the same is under examination.
- iv) Government of Andhra Pradesh have assured supply of water from Yeleru Water Supply Project by June 1988 to meet the full requirement of 73 million gallons per day. 77% of the earth-work on

Head-works, 52% of Earth-work on the 153 km. long canal portion, 53% of the proposed canal lining and about 10% of Cross Masonry and Cross Drainage have been completed. In order to enable the Government of Andhra Pradesh to expedite implementation of the water supply project in time to suit the commissioning of the steel project. Government of India have agreed to give a loan assistance of Rs. 70 crores to the State Government.

- v) Under the Rationalised Concept, the total power requirement has been reduced from 343 MW to 280 MW. The steel project would have captive power generation units of 3x60 MW sets. Additionally two units of 7.5 MW each will generate power utilising waste heat from the dry quenching coke in coke ovens; and 2x12 MW back pressure turbines utilising pressure available from top gases of blast furnaces. The balance requirement will be met from supply from Andhra Pradesh State Electricity Board.

7. Budget and Expenditure

The total budget allocation for 1986-87 was Rs. 630 crores. An additional fund of Rs. 79.10 crores has been made available by way of Supplementary Grants for the Project. In addition, Rs. 51.51 crores would be available to the project from Extra Budgetary Resources.

The Cumulative Expenditure upto December 1986 since inception is Rs. 2796.32 crores with a Foreign Exchange component of Rs. 492.39 crores.

8. Environmental Pollution Control

Various measures have been taken by VSP to ensure that the pollution of environment is kept within the limit of acceptance specified by relevant standards. VSP is spending around Rs. 348 crores towards pollution control measures.

Afforestation

VSP has undertaken in a big way afforestation programme over an area of around 2,600 acres in a phased manner. In 1986 alone, over 1 lakh trees have been planted.

9. Personnel and Manpower

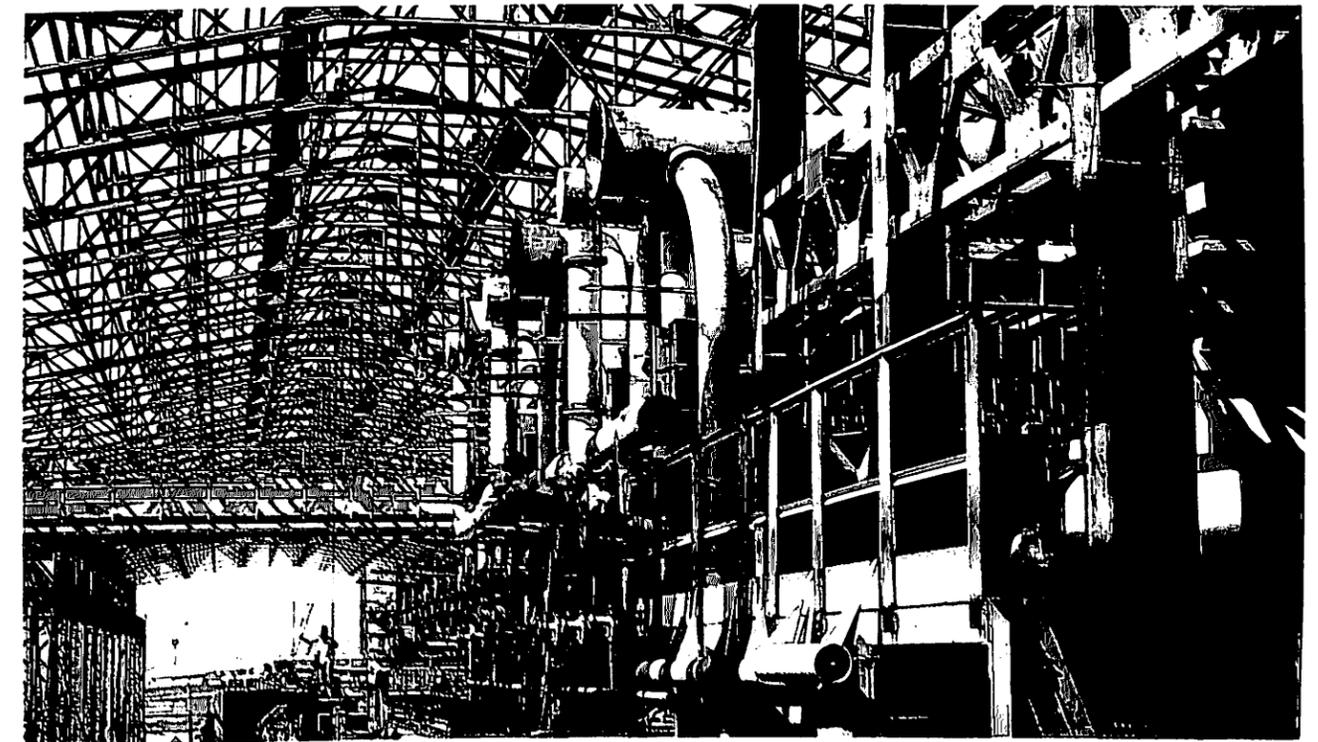
The total number of employees of the Project as at the end of December, 1986 is 3961 of which 1123 are Executives and 2838 are, Non-Executives. The break-up of SC/ST, Ex-servicemen, Physically

Handicapped, Women and Displaced Persons are given below:

	SC	ST	ES	PH	Women	DPS
Executives	105	8	2	2	16	—
Non-Executives	415	73	185	25	97	1517
Total	520	81	187	27	113	1517

The Project has also provided training facilities to enable SC/ST candidates to acquire the requisite skills for the jobs. A scholarship scheme for undergraduate engineering students belonging to Scheduled Castes and Scheduled Tribes exists to provide financial assistance to these students during their college education.

VSP Sinter Plant



Neelachal Ispat Nigam Limited

In October, 1980, Government decided in principle to set up a second steel plant in Orissa. A new Company named Neelachal Ispat Nigam Limited was registered on the 27th March, 1982 for implementation of the new steel plant. On Techno-Economic consideration, the site of the project has been changed from Paradip to Daitari region.

Due to severe constraints on resources only a token provision of Rs. 10 crores has been provided in the VII Five Year Plan for new steel plants including the project at Daitari. As such, no purposeful action can be envisaged at this stage for setting up the proposed steel plant.

Vijayanagar Steel Limited

Government took a decision in principle to set up a steel plant in Karnataka state in April, 1970 so as to utilise the deposit of iron ore available in the Bellary-Hospet area. In December, 1982 a separate Government took a decision in principle to set up a steel plant in Karnataka state in April, 1970 so as to utilise the deposits of iron ore available in the Bellary-Hospet area. In December, 1982 a separate company, Vijayanagar Steel Limited, was incorporated to expedite the work on this project. However, due to a constraint on resources, it has not been possible to take substantive steps to set up the proposed steel plant.

Hindustan Steelworks Construction Limited

1. India's foremost construction organisation 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. Initially set up by pooling the expertise already available in all the disciplines in the three Steel Plants constructed at Rourkela, Bhilai and Durgapur with a view to creating a base for undertaking steel plant construction, 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

31.1.1987 was Rs. 20 crores. The total amount of loans from the Government outstanding at the end of February 1987 was Rs. 65.93 crores (Plan Loan Rs. 31.59 crores and Non Plan Loan Rs. 34.34 crores) as against Rs. 59.93 crores as on 31.3.1986. During 1986-87 an amount of Rs. 4 crores (Plan) and Rs. 2 crores (Non-Plan) loans were released to HSCL upto February 1987.

3. Working Results

The cumulative turnover (1986-87) achieved up to the end of January 1987- for works in India is Rs. 113.32 crores against a target of Rs. 143.38 crores. The Company achieved a turnover of Rs. 192.03 crores in 1985-86. The Company made a profit of Rs. 7.65 crores in Indian works and incurred a loss of Rs. 5.50 crores in the foreign works resulting in a net profit of Rs. 2.15 crores for the year 1985-86. During the year 1986-87, HSCL incurred a loss of Rs. 29.93 crores upto January 1987. It is expected that position would improve during February and March 1987. The cumulative loss which was Rs. 65.02 crores as on

Installation work for NTPC super Thermal Plant at Korba



31.3.1986 increased to Rs. 94.95 crores by 31.1.87

4. Personnel

Manpower position of the Company as on 31.12.1986 alongwith the statistics of SC/ST employees, female employees, ex-servicemen and physically handicapped employees is given below:—

Group	Total Strength	S/C	S/T	Female employees	Ex-Servicemen	Physically Handicapped
"A"	1915	53	14	6	6	1
"B"	705	50	5	11	3	1
"C"	15700	1500	750	207	192	30
"D"	3910	1407	2051	1220	4	11
Total:	22230	3010	2820	1444	205	43

5. Surplus Labour

For want of sufficient workload in the Steel Sector, some idle workforce is expected to remain. However, the reduction of the workload in Steel Sector is gradually being off-set by securing additional works in other sectors, like power and coal etc. Since the highest concentration of employees exists in Bokaro unit of the company, special efforts are being made to disperse manpower from BS City and it has been possible to deploy about 2400 employees from BS City to other Projects such as Icha Dam, BCCL works/Dhanbad, Vizag Steel Project, Tanakpur, Durgapur and Madhuband etc. during the period from 1st April, 1985 to 31st December, 1986.

6. Contract Labour Position

The total number of workers engaged by PRW/Contractors at various units of the company is around 14,500 as on 1.12.1986. The jobs for which these agencies are employed are mostly Civil Engineering, Structural Fabrication and Structural Erection, Equipment Erection etc. Besides these, to some extent they are also employed in Mechanical and Electrical works to supplement the work being done by the departmental workers in these areas. The engagement of contractor and PRWs is done only for trades in which the Company does not have a trained workforce or for meeting schedules fixed by Company's clients.

7. Safety Measures

HSCL has formulated its own safety code and for its

implementation the following steps are taken:

- Safety Organisations are functioning in all the major units with independent safety engineers reporting to respective General Managers/Project Managers. In smaller units the Resident Engineer is incharge of safety organisation.
- Contractors/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 invariably made available by the Company for execution of hazardous jobs. Periodic seminars are also conducted to acquaint the personnel with latest safety measures and also to review the safety requirements of various work sites in HSCL.

8. Workers' participation in Management

The details of participation of workers in HSCL during the year 1986 is as under:

Sl. No.	Name of the Committee/ Scheme	Details
1	2	3
1.	Apex Level Joint Forum	This comprises of the management of HSCL and the National Level Trade Unions viz. INTUC, CITU, AITUC, HMS and three Independent Unions. From the inception of the formation of the Apex Level Joint Forum body in 1981 there have been 17 meetings altogether. The Sub-committees of the Joint Forum met four times during 1986 to discuss various important matters.
2.	Grievance Committee	As a part of the modified procedure grievance committees consisting of workers' representatives and Management representatives are functioning at projects and offices for timely redressal of grievances.

- Canteen Committee/ Calcutta
At corporate office, the affairs of Canteen are looked after by a Committee of representatives from Management and Union.
- Sports & Recreation Council/ Calcutta
The Council organises various cultural programmes, games and sports and participation in various inter-office tournaments during the year.
- Safety Committee
The Committee reviews and analyses causes of accidents during the year and suggests preventive measures to be taken to avoid future recurrence of such accidents. Training on safety has also been organised at the unit to inculcate the safety consciousness among the supervisors.

9. Welfare Plan for SC/ST

- Such employees are exposed to various management developments and training programmes.
- Schools have been provided with assistance of the Management in the areas where SC/ST employees mostly reside.
- Assistance is given for supply of drinking water.
- Plots are allotted to workers for making hutments in the land allotted at sites of clients with free electricity, water supply and sanitation arrangement etc.
- children of SC/ST employees get due preference in the matter of schooling at projects where short term construction work is to be undertaken.

Companies of the Bird Group

The erstwhile Bird and Company Limited was taken over by Government with effect from 25th October, 1980. Under Section 4(1) of the Bird and Company Limited (Acquisition and Transfer of Undertakings and Other Properties) Act, 1980, shares held by the Bird and Company Limited in certain other Companies specified in Schedule 1 to the Act stood transferred to the Central Government. Such Companies included six investment Companies of the Bird Group. These were amalgamated in September 1984 into one company known as Eastern Investment Limited under a notification issued by Department of Company Affairs.

The Department of Steel looks after the affairs of the following companies of the Bird Group as a share holder on behalf of the President; the percentage of share capital of each company held by the President of India is specified below:

1. The Orissa Minerals Development Company Limited	14.20
2. The Karanpura Development Company Ltd.	31.25
3. The Kumardhubi Fireclay and Silica Works Limited	8.00
4. The Bisra Stone Lime Company Limited.	One out of 5,00,000 Shares
5. Eastern Investment Limited	34.77

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

The Orissa Minerals Development Company Limited

The Orissa Minerals Development Company Limited 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 ore and manganese ore are supplied to Steel Plants, mainly Durgapur Steel Plant, IISCO and Bokaro Steel Plant. High grade manganese ore produced by the Company is also supplied to ferro manganese producers. Some quantity of the ores is exported through MMTC. The company produced 4.80 lakh tonnes of iron ore and 0.73 lakh tonnes of manganese ore during 1985-86 (July 1985 to June 1986). It incurred a net loss of Rs. 40.22 lakhs during the period after allowing for investment allowance reserve (*) In an effort to rehabilitate the Company Commitment of minimum assessed offtakes of iron ore have been obtained both from SAIL and from MMTC. (*) Government has also sanctioned plan

loans amounting to Rs. 75 lakhs for meeting capital requirements and for purchase and repairs of equipment.

The Karanpur Development Company Limited

The Company is presently engaged in the mining of limestone and clay. During the year 1986, the Company produced 66,281 tonnes of limestone. It incurred a net loss of Rs. 25.71 lakhs during the year.

A refractories unit is also owned by the Company which continues to remain closed being unviable.

Scott and Saxby Limited

It is a fully owned subsidiary of Karanpura Development Company Limited. 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 irrigation purpose and trading in pumps, motors and spares and their installation. During the year 1986, the turnover of the Company was Rs. 72.74 lakhs. It incurred a net loss of Rs. 44.10 lakhs during the year. Government has sanctioned a plan loan of Rs. 15 lakhs for meeting capital requirements of the Company, and a non-plan loan of Rs. 30 lakhs for meeting working capital requirements of the Company. As a result of this, the operations of the Company has improved to the extent that cash losses each month have ceased.

The Kumardhubi Fireclay and Silica Works Limited

It is one of the major producers of refractories in the country. It has an installed capacity of 1,35,000 tonnes for refractories, mainly firebricks, high alumina bricks, silicabricks and castables. The Company produced 48,720 tonnes of refractories valued at Rs. 9.10 crores during the year 1986. The Company incurred a net loss of Rs. 82.52 lakhs during 1986. The main difficulty faced by the Company is that there is excess installed capacity in the refractory industry taken as a whole, demand is about half the installed capacity.

The Bisra Stone Lime Company Limited

It is engaged in the mining of limestone and dolomite. The company has mining leases covering an area of 7.98 sq. kms. in Birmitrapur in Sundergarh district of

Orissa. It supplies limestone and dolomite to steel plants at Jamshedpur (TISCO), Durgapur, Burnpur (IISCO) and Rourkela. The Company produced 9.60 lakh tonnes of limestone and 4.54 lakh tonnes of dolomite during 1985-86. It incurred a net loss of Rs. 49.08 lakhs during the year after allowing for depreciation and investment allowance reserve. Because of reduced offtake of limestone by the steel plants, the Company is passing through a severe financial crisis. All plans to rehabilitate the Company

if possible, are under consideration.

Eastern Investment Limited

It is an investment 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. 24,000 in 1986.

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

(Rs. in Crores)

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

Tata Iron and Steel Company Limited

1. 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 a modernisation programme in 1980 and with the commissioning of first phase of modernisation in March, 1983, the annual installed capacity of TISCO has increased to 2.16 million tonnes of ingot steel and 1.74 million tonnes of saleable steel. Presently they are implementing Phase II of their modernisation programme.

2. Production

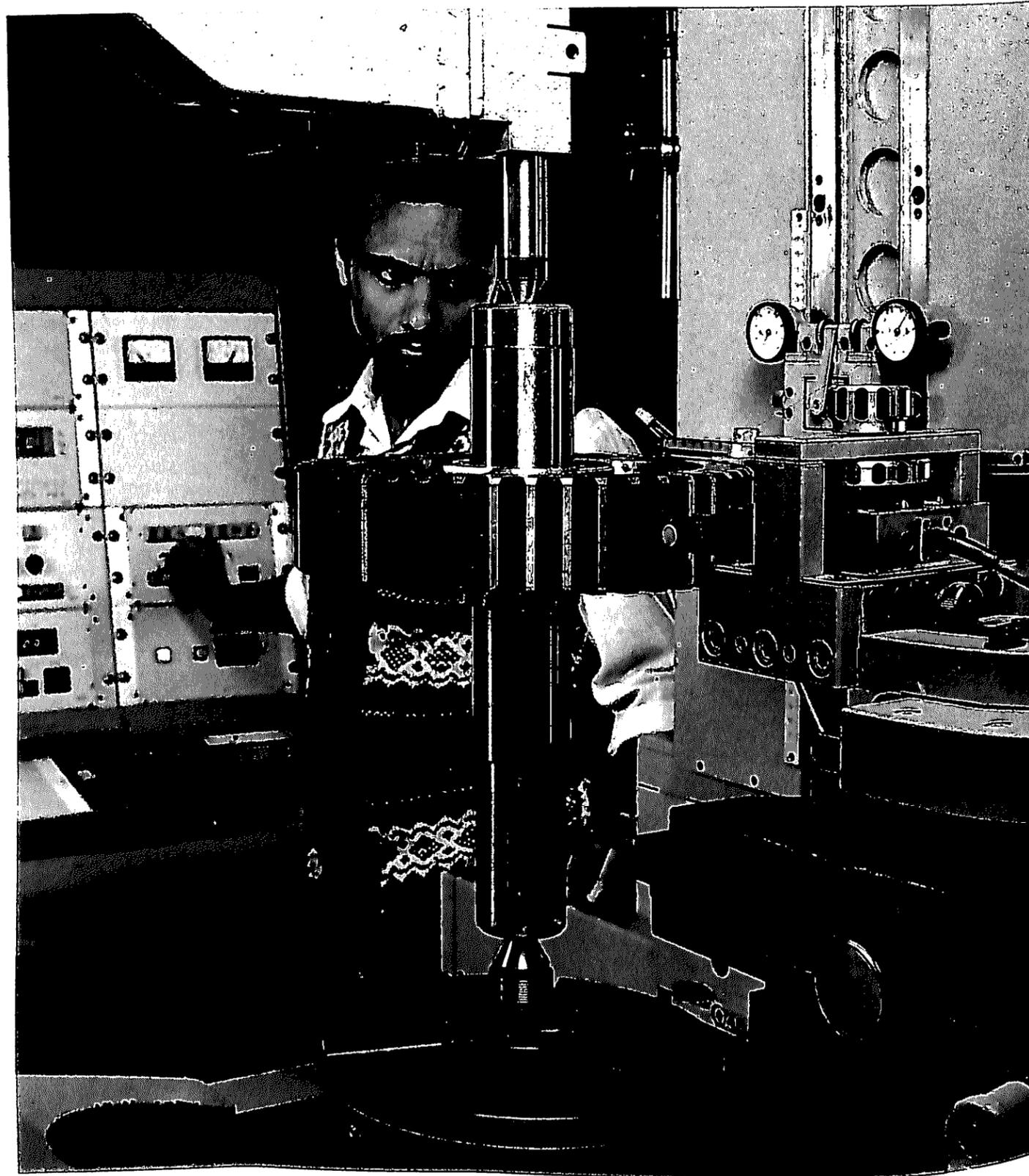
Production in the first ten months (April 1986 to

January, 1987) has been satisfactory and is as under:—

	Hot Metal	Crude Steel	Saleable Steel
April 86 to January 87 (provisional)	15,92,101	18,38,001	15,50,638
April 85 to January 86.	14,35,220	17,17,856	14,35,438

It will be noted that the saleable steel production in the first ten months of this year is 115,000 tonnes more over corresponding period last year.

Operations have been considerably helped by the



Continuous Casting at TISCO



availability/use of following imported raw materials:

	Tonnage used (April-December, 1986)
a) Coking Coal	3,18,188t (18.59)
b) Limestone	56,766t
c) HBI	70,378t

It is expected that total crude steel production for the year will be 2.23 million tonnes and gross saleable steel almost 1.85 million tonnes. For 1987-88, a gross saleable steel output of 1.9 million tonnes is targeted.

3. Cost Control/Financial Performance

Tata Steel has reported a profit before tax of Rs. 30.56 crores for April-September, 1986 as against a corresponding profit of Rs. 68.50 crores during April-September, 1985. Despite a higher production of saleable steel and higher sales, the profits for the half-year ended 30th September, 1986 compare unfavourably with those for the corresponding period of the previous year, primarily because of severe power shortages suffered by the Company at its Jamshedpur Works during the first half of the year.

In addition to power shortage, the Company had also to absorb, during the first half-year, steep increases in costs of coal, oil and power tariff, prices of stores, spares, refractories, ferro-alloys, increased contribution to Steel Development Fund and increase in dearness allowance paid to workers in the various Divisions of the Company.

4. Modernisation Phase II/Other Capital Projects

Works on Units on this phase is proceeding well. The most important Unit—the 300,000 tpa capacity Bar and Rod Mill will be commissioned in March 1987. The capital cost of this Mill is expected to be around Rs. 78 crores.

The sophisticated Waste Recycling Plant, installed at a cost of nearly Rs. 18.5 crores, was commissioned during the year.

For the first time in the country, Tata Steel shall be adopting Stamp Charging Technology to produce coke optimally, with superior properties. The first

such battery with a capacity of 377,000 tpa/coke, is under installation and is scheduled for completion in January, 1988 at a overall cost of Rs. 68 crores.

The second Sinter Plant—a modern and sophisticated one, with a capacity of 1.37 mtpa, is under installation. Equipped to handle/sinter diverse materials including iron rich blue dust and estimated to cost about Rs. 88 crores, the plant may be commissioned by end 1988. Once this is in operation, percentage of sinter in the burden of blast furnace can reach 65% from current level of 40%. The facilities will also include raw material bedding and blending which is expected to cost Rs. 72 crores. Augmenting captive power generation is vital and hence, these capital projects are accorded priority. Two 30 MW sets are being installed at current estimated cost of Rs. 90 crores. The progress of these has been hampered by lockout in 'ABL', Durgapur, and consequent uncertainties of supply of boiler/auxiliaries.

Anticipated capital outlay for the Company this year is nearly Rs. 228 crores on capital schemes.

5. Industrial Relations

Harmonious industrial relations continue at TISCO. This is considerably aided by the dedicated work of Joint Departmental Councils—41 in number. 'Working Together' for excellence/productivity/quality has become the key and guiding factor at Tata Steel.

6. Safety Measures

Safety measures continue to receive priority attention. Well organised safety campaigns are conducted. Special competitions, awards for good safety performance, act as incentives. A large number of departments completed one million accident-free hours a number of times. Overall, the Works crossed two million accident-free hours (first ten months) once.

7. Energy Management

Optimisation on "Energy Management" has to receive priority attention particularly in integrated steel plants in India, where 'energy costs' account for nearly 30% or over of the Works cost of saleable steel. Hence, this area has received special attention at TISCO and in the decade 1975-76 to 1985-86, specific energy consumption per tonne of saleable steel has been brought down from 13.17 million K Cals/tonne to 10.97 million K Cals/tonne. Despite the increase in costs of purchase liquid fuels (this

account for 15% of fuel energy costs at TISCO though in terms of heat value they contribute 3% of inputs only), the overall cumulative savings achieved due to this dedicated, optimal energy management, is over Rs. 100 crores in the ten-year period. The efforts to improve savings in fuel rate continue.

Mini steel Plants

1.1 The electric arc furnace units or mini steel plants continued to play an important role in the production of steel in the country. While the integrated steel plants produced mild steel in bulk quantities, electric arc furnace units also produced alloy, special and stainless steels in addition to mild steel.

1.2 As on 5.3.1987, there were 202 units which have been issued Industrial Licences/Letters of Intent/(Part) Approvals for steel making through electric furnace route for a capacity of 6.8 million tonnes. Out of these 160 units have been commissioned with a capacity of about 4.5 million tonnes. The rest are in various stages of implementation.

(a) Production

Production of Electric Arc Furnace Units which are reporting production to the office of the Iron and Steel Controller during the last 3 years and for 1986-87 (upto November, 1986) is at Annexure-I.

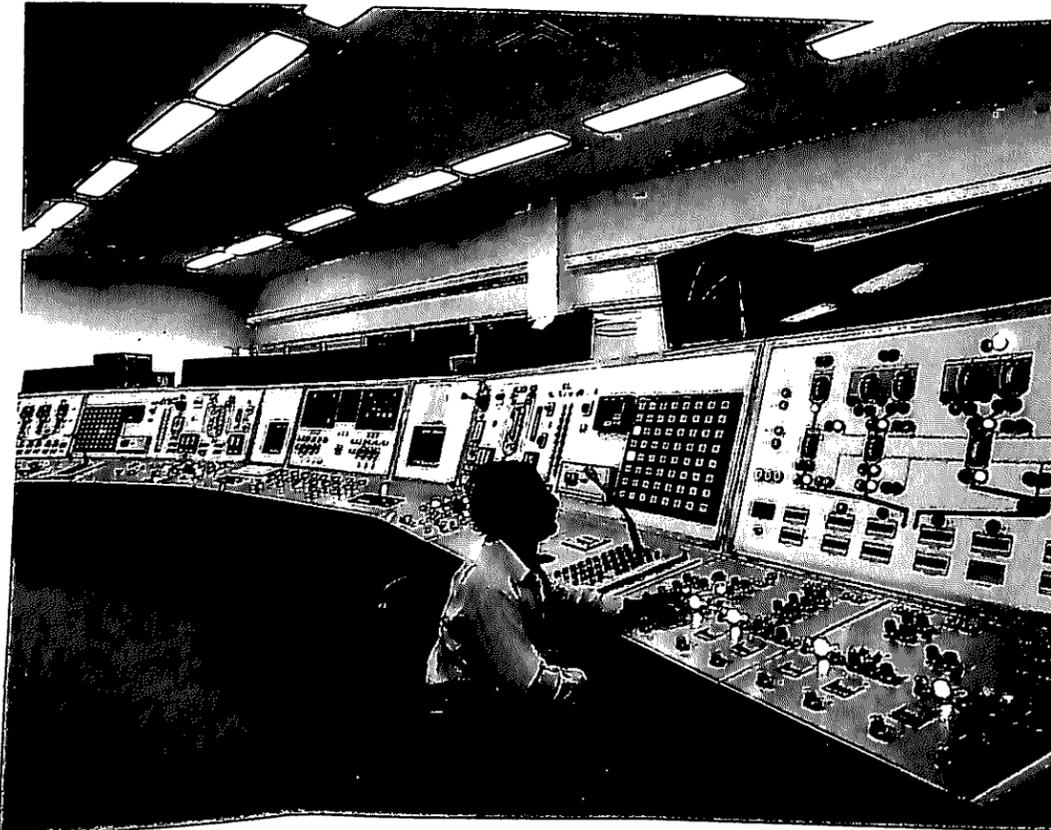
(b) Major Improvements

- During this year several indigenous producers have developed creep resistant steel which has been recognised by Central Boiler Board and as such it is expected that this will help reduction in the import of creep resistant steel.
- Several units have installed secondary steel making facilities like VD, LF etc. so that they can produce cleaner steel for different industries mainly the automobile sector. These improvement will also help to cut down imports.
- Installation of VOD equipment by several stainless steel producers have helped them to cut down the cost.

(c) Health of Mini Steel Plants

Production of Mini Steel Plants has improved due

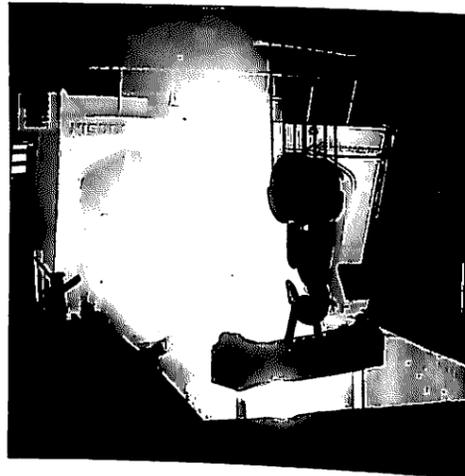
Control Panel for Steel production at TISCO



to adequate import of steel melting scrap/sponge iron/HBI. To assist the industry, Govt. has reduced the import duty from 25% and 30% on shredded Scrap Sponge Iron and HBI respectively to 20%. The import duty on Heavy melting scrap has also been reduced from 80% to 20%.

Government is encouraging Mini Steel Plants to modernise their units by liberally allowing import of necessary capital goods and machineries.

A view of Electric Arc Furnace



1.3 Government has announced a policy of endorsement of capacity to actively encourage expansion of capacities of existing industrial undertakings to achieve certain minimum economic levels of operations where the existing installed capacities fall short of such levels. In pursuance of this Policy, 17 mini-steel plants have been allowed to increase their licenced capacities to the minimum economic level of 50,000 tonnes per annum.

1.4 A Development Council for Iron and Steel (Metal) and Special Steels has been set up under the Industries (Development and Regulation) Act, 1951. This Council is to perform all the functions specified in the above Act for such councils with special reference to the development of sponge iron and electric arc furnace industries. The First meeting of the Council was held on 26th December, 1986 in which various matters relating to development of electric arc furnace industry and sponge iron industry were considered.

Rerolling Industry

2.1 There are about 1000 units holding COB licences, Industrial Licences and registrations for rerolling of long products with a capacity of about 20.00 million tonnes.

2.2 Capacity utilisation of this industry is quite poor and is in the range of 18 to 20%. In order to increase availability of input raw materials Govt. has allowed import of about 0.5 million tonnes of M.S. billets.

2.3 Govt. has constituted an Advisory Committee under the Chairmanship of Iron & Steel Controller for development of indigenous Rerolling Industry. As per recommendations of this Committee, it has been decided to set up a National Institute on Rerolling Industry at Mandi Gobindgarh for imparting training to personnel from Rerolling Units regarding matters relating to:

- i) Energy Conservation;
- ii) Reduction of cost of production;
- iii) Pollution control etc.

2.4 In addition, there are quite a large number of units which are operating in the small scale sector.

2.5 Production of Rerolling Units which are regularly sending production reports to the Office of Iron & Steel Controller during the last 3 years and for 1986-87 (upto November, 1986) is at Annexure II.

3. Steel Wire Drawing Industry

3.1 There are 73 units having Industrial Licences with a capacity of 0.94 million tonnes per year. Out of this, 72 units have already been commissioned. In addition to this, there are about 500 to 600 units operating in the small scale sector.

3.2 Production of Steel Wire Drawing Units in the organised sector which are reporting production to Iron & Steel Controller for the last 3 years and for 1986-87 (upto Nov., 1986) is given in Annexure-III.

3.3 In order to develop this industry Government has taken the following measures:

3.3.1 Import of carbon, alloy and stainless steel wires of all sizes have been restricted to encourage indigenous production.

3.3.2 Diversification in production of all grades of carbon, alloy, stainless steel wires except for mild steel wires thicker than 12 SWG has been allowed to the existing units to improve economic viability

4. Narrow Cold Rolled Steel Strip Manufacturing Industry

4.1 There are 63 units with a capacity of 1.30 million tonnes who have been granted permission to manufacture Narrow Cold Rolled Steel Strips. Out of these, 43 units with a capacity of 0.54 million tonnes have been granted Industrial Licences.

4.2 Production of units which are reporting to Iron & Steel Controller for the last 3 years and for (1986-87 (upto Nov., 1986) is shown in Annexure-III.

4.3 Due to some scarcity in availability of mild steel HR coils, production of these units has not been improving as expected. In order to give more flexibility in production and also for improving economic viability Government has allowed the existing units to diversify freely into production of all grades of carbon and alloy steels including stainless steel strips with indigenous raw materials.

5. Tinsplate Industry

5.1 Besides, Rourkela Steel Plant there are two more units in the Private Sector for production of tinsplates. Total capacity of these 3 units is 0.3 million tonnes of electrolytic tinsplate per year. All these 3 units use imported tin mill black plate as their raw material.

5.2 To help the indigenous industry to become more viable, tin mill black plate are allowed to be imported under concessional rate of import duty of 50%.

5.3 Production of electrolytic tinsplate of the two units in Private Sector during the last 3 years and for 1986-87 (upto Nov., 1986) is shown in the Annexure-III.

6. GP/GC sheets/coils producing units

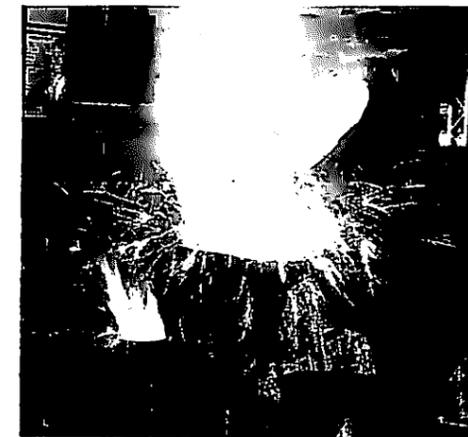
6.1 6 units with a capacity of 0.22 million tonnes have been issued Industrial Licences. Out of these, 3 units have already been commissioned and have started commercial production. One more unit is expected to start commercial production shortly. Another 10 units are holding letters of intent with a capacity of 0.35 million tonnes and are at various stage of implementation.

6.2 Out of 3 units mentioned above, one unit had started production in 1985-86, and other two units started production in late 1986. Their production during 1985-86 and 1986-87 (upto Nov., 1986) is shown in Annexure III.

7. Pig Iron

7.1 Besides, Integrated Steel Plants there are 3 units in the Secondary Sector which have been issued Industrial Licence for production of pig iron to the extent of 0.2 million tonnes. In addition to this, one more unit has been issued a Letter of Intent with a capacity 0.15 million tonnes.

Pouring of a roll



7.2 Production of pig iron in the Secondary Sector during the last 3 years and for 1986-87 (upto Nov., 1986) is shown in Annexure III.

8. Ferro Alloys

8.1 One of the vital input material for steel making is ferro alloys. At present, there are 25 units with a total capacity of 0.65 million tonnes for production of ferro alloys. Besides, there are many ferro alloy units in the small scale sector which are producing ferro alloys like ferro molybdenum, ferro vanadium, ferro columbium and ferro titanium etc. by Alumino Thermic Process. Production of different ferro alloys in the organised sector by units reporting production to the Office of Iron & Steel Controller during last 3 years and 1986-87 (upto Sept., 1986) is shown in Annexure IV.

9. Hot Rolled Steel Strips Units

9.1 Apart from the integrated steel plants, there are 7 units in the private sector with a licensed capacity of 0.22 million tonnes for the production of hot rolled steel strips. In addition, 17 more units have been granted Letters of Intent for a capacity of 0.68 million tonnes.

9.2 The total production of hot rolled steel strips during the last 3 years is given in Annexure-III.

Annexure I

Categorywise Production of Ingots/Concast Billets by Mini Steel Plants.

Category	Year			April-Nov.,
	1983-84	1984-85	1985-86	1986*
	(In thousand tonnes)			
Mild Steel	1677.9	1648.2	2173.1	1178.5
Medium/High Carbon Steel	349.4	306.2	312.4	146.2
Alloy Steel	376.9	385.6	458.7	186.6
Total:	2404.2	2340.0	2944.2	1511.3

(The above does not include production of Casting Units registered with DGTD).
*Provisional

Annexure II

Categorywise Production of Re-Rollers

Category	Year			April-Nov.,
	1983-84	1984-85	1985-86	1986*
	(In thousand tonnes)			
Bars/Rods	1239.8	1305.9	2305.0	1051.6
Wire Rods	326.8	362.7	362.0	120.9
Structurals	222.7	333.9	442.0	306.5
Hoops	19.3	30.7	23.4	14.9
Spl. Section	26.6	90.8	129.1	80.2
Slabs/Plates	16.0	12.0	15.8	5.1
Total:	1851.2	2136.0	3277.3	1579.2

* Provisional

Annexure III
Production of Wires, Tin Plates, GP/GC Sheets etc.

Item	Year			April-Nov.,
	1983-84	1984-85	1985-86	1986*
	(In thousand tonnes)			
Wires				
Mild Steel	153.3	163.1	197.9	100.9
Medium/High Carbon	111.2	120.3	141.7	64.4
Alloy Steel	8.1	7.2	6.6	3.3
Stainless Steel	1.3	1.5	1.4	0.5
Total	273.9	292.1	347.6	169.1
Tinplates				
Oil Can Size	41.8	42.6	42.6	31.7
Non Oil Can Size	28.6	23.5	25.1	17.4
Total	70.4	66.1	67.7	49.1

Pig Iron	74.9	64.2	90.1	39.2**
GP/GC Sheets	—	—	9.5	24.4
Hot Rolled Sheets/Strips	9.8	9.3	9.8	6.0**
Cold Rolled Sheets/Strips				
Mild Steel	130.3	152.5	168.7	108.7
Medium Carbon Steel	9.7	10.3	9.2	5.1
High Carbon Steel	5.3	7.4	8.6	4.4
Alloy Steel	0.7	0.5	0.5	0.5
Stainless Steel	8.5	17.1	14.5	8.0
Total:	154.5	187.8	201.5	126.7

*Provisional
**Figures for April-September, 1986.

Annexure IV
Production of Ferro Alloys

Category	Year			April-Sept.
	1983-84	1984-85	1985-86	1986*
	(In tonnes)			
Ferro Manganese	153,556	121,829	191,024	94,077
Silico Manganese	2,763	31,897	1,647	698
Ferro Chrome	47,267	50,892	55,097	28,759
Charge Chrome	33,155	23,876	30,063	19,001
Silico Chrome	25,536	31,702	37,535	20,449
Other Ferro Alloys	2,464	3,802	4,178	559
Total:	309	284	615	350
Total:	265,050	264,282	320,159	163,893

*Provisional

Sponge Iron Industry

Sponge iron industry has been de licensed since March, 1985, with a view to encourage quicker growth. At present about 150 units with an aggregate capacity of 20 million tonnes (approximately) have been registered/issued Letters of Intent/Industrial Licences. Currently, three units are in production. They are:

Sponge Iron India Ltd.	Capacity (tonnes)
Orissa Sponge Iron Ltd.	60,000
IPITATA Sponge Iron Ltd.	150,000
	90,000

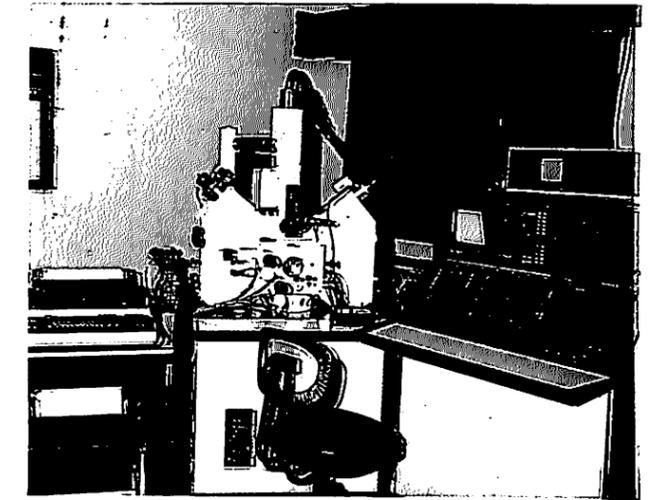
2. Actual production of sponge iron in these units during the last 3 years has been given in the Table below:

Year	(In '000 tonnes) Production
1984-85	85.6
1985-86	124.3
1986-87 (upto December 1986)	110.0

1. Technological innovation and upgradation are vital for the sustenance and growth of any industry. Research and development form the foundation on which the edifice of technology is built. Research and development in an industrial sector like steel requires close and constant interaction between the in-house Research Organisation of the industry, National Research Institutes, Universities and the Steel Plants. In order to facilitate concerted efforts in the development of science and technology in iron and steel industry, the Science Advisory Committee was constituted in the Department of Steel. This Committee is headed by an eminent Scientist, Dr. V.S. Arunachalam, Scientific Adviser to the Defence Minister. The Committee consists of members representing Government, Steel Authority of India Limited, Council for Scientific and Industrial Research, Universities, Defence Metallurgical Laboratories, Planning Commission and premier Research and Development Institutes in the country. The Committee has been given the responsibility of evolving short and long term strategies on research and development in the steel sector. After detailed deliberations, the Committee has recently finalised a report on "National Mission on Iron and Steel". This report identifies five major areas requiring priority attention in the steel sector for intensive research and development. These five areas have been divided in specific projects which are required to be pursued with well-defined objectives. Organisational arrangements and methodology for implementation of "National Mission on Iron and Steel" are being finalised. The five programmes constituting the Mission have been identified as follows:—

- Upgradation of coke quality and improvement in Blast Furnaces operation.
- Alternative routes for liquid iron production using indigenous raw materials.
- Quality and reliability improvement of steel products.
- Energy conservation in steel plants; and
- Continuous casting.

2. To meet the basic R & D objectives of the steel sector, Research and Development Centre for Iron and Steel, Ranchi is already working as a nucleus both for basic and for applied research. This centre, formally inaugurated by Hon'ble Minister of Steel and Mines, Shri K.C. Pant, in January 1986, is equipped with modern and sophisticated equipments, research tools, pilot units, centralised workshops, computers and information and documentation centre.



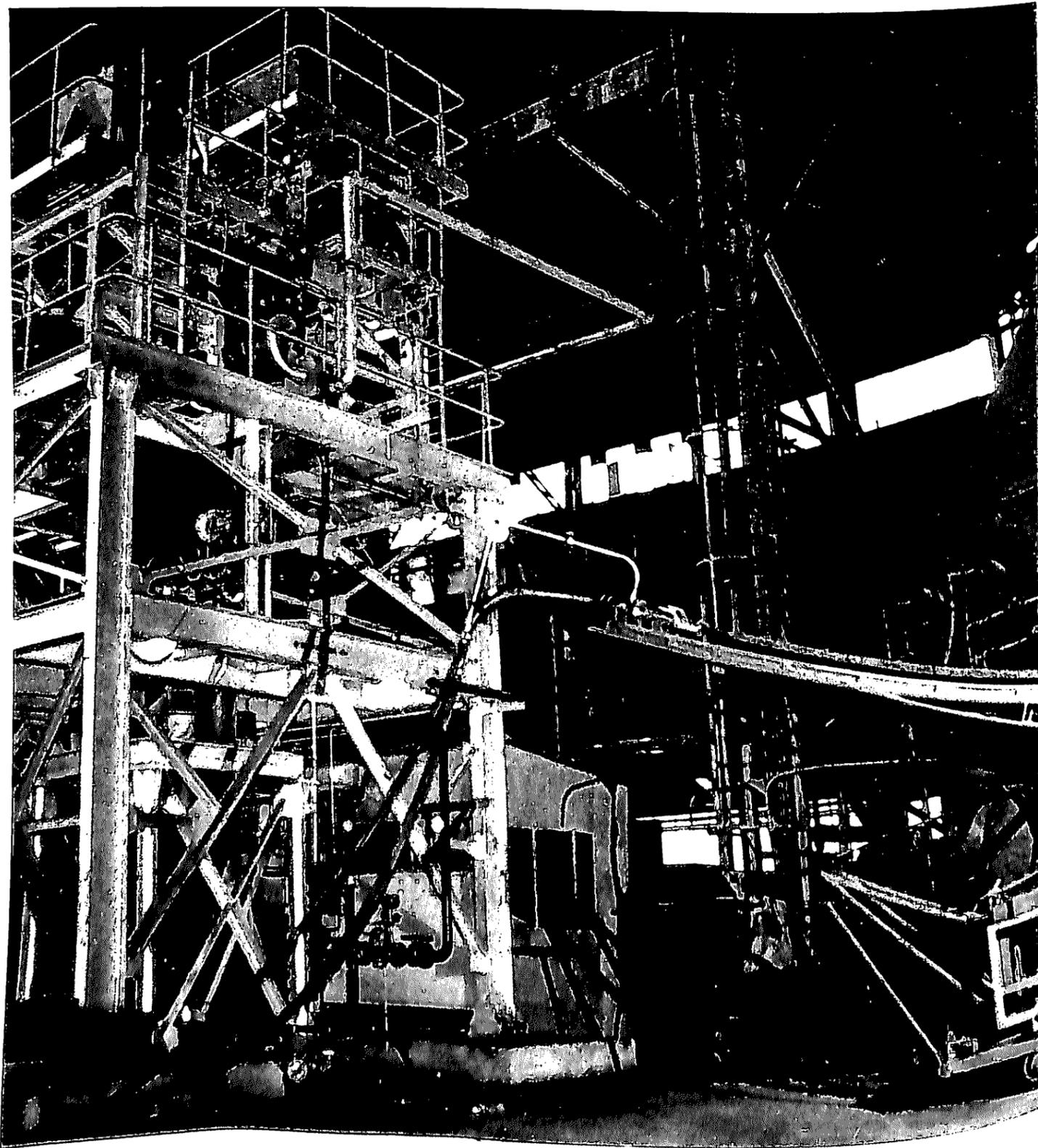
R&D Laboratory with most modern equipment and testing facilities

3. The various programmes undertaken by the centre can be categorised under the four following heads:

- Improvement in the state-of-art of technology
- Conceptualisation to final commissioning of process technologies
- Product development
- Identification and adaptation of relevant software based imported technologies compatible with indigenous requirements

R & D has been pursuing 368 projects including short term assignments and laboratory based investigations: up-to-date details of such projects are summarised below:

As on 31.3.1987	
(A) Running Projects	
i) In-house projects	331
ii) Indo-Soviet collaborative projects	10
iii) SAIL-CSIR interaction projects	17
iv) UNDP assisted projects	1
v) 4 MT expansion projects at BSL and BSP	9
Total:	368
(B) Completed projects	181
(C) Implemented projects	36
(D) Projects under imp.ementation	55



The total number of projects completed during the last three years are as under:—

Items	1983-84	1984-85	1985-86	1986-87 as on 31.1.1987
Projects taken up	56	56	82	106
Projects completed	18	23	20	59

The highlights of some of the projects implemented during this year are as follows:—

- Introduction of combined blowing technology in steel making converters at BSL has resulted in improvement in yield and operation parameters as well as reduction in ferro-alloys consumption. Horizontal transfer of this technology to other steel plants is being planned.
 - A system for air injection in Open Hearth Furnace of IISCO Burnpur has resulted in savings on input costs and in energy consumption. Action to introduce the same system in other furnaces is being taken.
 - A lime-fluorspar powder injection system for dephosphorisation of steel in Electric Arc Furnace at ASP Durgapur has enabled use of high phosphorous scrap and production of steel with low phosphorous content.
 - Conversion of Open Hearth Furnace to Twin Hearth Furnace at BSP has led to increased furnace productivity and substantial savings in energy.
 - In the area of development of special steels, grades like 90 UTS rails, LPG grade steel, EDD Steel, API X-60 grade high strength pipe steel for HBJ pipeline, have been made possible. Development of TMBP coils and pressure vessel steels has been undertaken.
- 4.** In the Direct Reduction pilot plant at Ranchi, 3 test campaigns have been undertaken this year with various ore-coal combinations for conducting research and for developing appropriate technology of sponge iron production in the country. In addition, a prototype hot model has been commissioned where studies for increasing the carbon content of sponge iron, investigations on mechanism of accretion formation in the rotary kiln, study of high temperature reoxidation properties of sponge iron, etc. have been initiated.
- 5.** A large fourth generation computer, installed and commissioned this year, is being used for

mathematical modelling of processes, computerised data base for blast furnace, computerised information and documentation system, financial accounting, personnel data base, computer aided design etc.

6. Several new advanced sophisticated equipments have also been installed in 1986-87 to further strengthen the infrastructural facilities in the centre to promote scientific research. Some of the important equipment installed are:

- 400 KV Transmission Electron Microscope (first unit in the country) with Electron Energy Loss Spectrometer and energy dispersive analyser.
- Electron Probe Micro Analyser.
- Reduction under load and melt down apparatus for study of iron ore and agglomerates.

7. SAIL has formally taken over the management of Maharashtra Elektrosmet Ltd. (MEL). Various R&D activities, especially in steel making, have been planned, utilising the pilot scale facilities at MEL. The centre is also engaged in improving the quality of products made at MEL and to diversify its range. A KR demonstration plant for production of liquid iron, using iron ore and non-coking coal, is being planned to be set up at MEL.

8. For maximal utilisation of scientific knowledge, expertise and infrastructure, the Centre has embarked upon collaborative research with outside institutions and organisations both in India and abroad, with a view to finding solutions to the problems faced by the Indian Steel Industry.

—Indo-Soviet collaboration: The extension of the agreement with V/O "Tiajpromexport" has paved the way for initiation of research programmes in all the SAIL steel plants under joint participation. These collaborative efforts have already resulted in the successful completion of 16 R&D projects out of which 7 have been implemented with an estimated techno-economic benefit of over Rs. 10 crores. Joint efforts are under way to finalise a monograph on blast furnace operation under typical Indian and Soviet raw materials as well as operating conditions.

—Collaboration with National Science Foundation (NSF), Washington, USA: R&D Centre has been identified as the nodal agency in India for carrying out collaborative research in ferrous metallurgy with the NSF. Under this agreement, 20 research programmes have been identified. Apart from this, 2 other projects are currently being pursued with the involvement of NSF.

—Collaboration with MEFOS, Sweden: R&D has entered into an agreement with MEFOS, which is a leading process technology developer. This agreement provides for exchange of research engineers on process metallurgy areas of mutual interest on intramural funding basis.

—UNDP assisted projects: The participation and assistance of UNDP has resulted in the completion of 2 projects. A third project on "Conservation of energy in SAIL plants" is currently being pursued.

—SAIL-CSIR interaction: Under this programme 7 projects have been completed. In order to impart a "Mission-oriented-direction" for future projects, three broad mission have been identified. Structured proposals have been submitted to the Apex body for approval.

—Interaction with Academic Institutions: R&D Centre has entered into joint research efforts with the leading academic institutes in the country, viz. Indian Institutes of Technology, Banaras Hindu University, Indian Institute of Science and Bengal Engineering College. These research activities are primarily basic in nature, relevant to Indian steel industry.

—Collaboration with the leading Japanese Steel Company NKK: The R&D centre has been entrusted with the overall coordination for updating of technology in the steel plants at Rourkela, Durgapur and Burnpur under the SAIL/NKK agreement. Based on the visits of experts from NKK to SAIL and of SAIL engineers to NKK, various short term, medium term and long term measures for implementation in steel plants have been identified. Some of these measures have already been implemented with associated techno-economic benefits.

It is recognised that Management Information Systems are an invaluable tool, for improving the efficiency of decision making in Government. A scientifically developed Integrated MIS is particularly relevant for core sectors like Steel which is very sensitive to a number of internal and external parameters. The efficient operation of the Steel Sector requires close monitoring of raw material movement and supply, power position, personnel matters etc. Performance monitoring of Public as well as Private sector steel producing units for production and financial aspects is an important element in identifying problems and taking timely remedial measures. A close watch on shifting consumer demands is essential to ensure production of steel of appropriate specifications in the steel plant. The large number of interacting variables call for the development of a Computer based Management Information System (MIS). In developing this system the Department has obtained the assistance of the National Informatics Centre, Department of Electronics.

The functional areas for developing an Integrated MIS have been identified as follows:

- I. Administrative efficiency
- II. Performance Monitoring of PSUs.
- III. Steel supply.
- IV. Projects.
- V. Finance, Budgeting & Accounts

A. Administrative efficiency

Area	Brief description
1. System to Monitor Important Cases (SMIC)	SMIC monitors VIP references such as letters from MPs, Ministers and PM's office and important issues such as Parliament assurances.
2. Decision Monitoring System (DMS)	Monitors all the vital decisions taken at different meetings or otherwise needing follow up.
3. Section's Activity Monitoring System	Monitors the section's activities such as Recording, Indexing, Weeding and Reviewing etc.

B. Performance Monitoring of PSUs

System/Software Packages under operation	
1. Public Enterprises Performance	PEPMS generates action/exception oriented reports

Monitoring System (PEPMS)	
2. SAIL Production Data Base	Production data base since 1975-76 has been created with reference to all SAIL plants. It provides effective decision support for production performance monitoring of steel plants.
3. PSU Production Data Base	Production Data Base for all PSUs have been created to provide effective decision support.
4. SAIL Technical Data Base	Data base on vital technical indices such as coke rate, energy consumption rate and six other vital indices have been created to monitor energy conservation efforts.

System/software packages under development:

1. Creation of PSU Financial Data Base	This will serve the major need of storage and quick retrieval of data for financial analysis and capital restructuring decisions etc.
2. Daily Monitoring of SAIL Plants.	A system to log daily data on actual production, raw material position, power position etc. This would give signals at the appropriate time for corrective action to be initiated.

C. Steel Supply

System/software packages under operation:	
1. Monitoring of Major Steel Item Prices of four Major Cities.	This provides a weekly report of market prices of semis and finished steel. Highlights shortage as well as surplus areas for corrective action.
2. Supplementary Licences Monitoring System.	To keep track of supplementary licences issued for import of various steel items in terms of quantity and value.

3. **Steel Quality Production Data Base** This indicates the satisfaction level of consumers in terms of quality of finished steel produced at steel plants.
4. **Duty Structure Analysis & Tracking System** Keep track of import duties, basic import prices, port charges, Marine insurance and related stock yard prices for various items of steel. Identifies items needing duty revision based on landed cost vis-a-vis stock yard prices.

D. Projects

System/software packages under operation:

1. **Project Monitoring** Vizag Steel Plant is a major project which is under implementation stage. System to monitor performance w.r.t. agencies, type of work and milestone have been evolved and stabilized.

E. Finance, Budgeting & Accounts

System/software packages under operation:

1. **Pay Roll & Pay Bills** Pay roll and schedules have been computerised.

System/software packages under development:

1. **GPF computerisation & Income Tax assessment** These packages are under development and will help in timely completion of accounts reconciliation as well as the submission of returns in these areas.
2. **Loan & Advances to PSUs.** This will enable tracking of payment of interest as well as the repayment of loans and will act as decision support while granting new loans.

Computing Facilities & Training

Existing facilities:

The computer Centre as a central facility has been established and is equipped with following Hardware.

- | | | | |
|---|---|----------------------------------|--------|
| A | 1 | IBM PC/AT compatibles with 3MB | 3 Nos. |
| | 2 | main memory and 40 MB Hard disk. | |
| | 2 | Dot Matrix Printer | 3 Nos. |

3. Plotter 1 No.
 4. Line Printer 600 LPM 1 No.
- B. Terminals 1 No.
Steel & Mines Minister Secretary 1 No.
- C. Connection to NIC Super computer is available for Central facility.



Computer Centre in the Deptt. of Steel

Plans

i) Detailed plans have been worked out for establishing Local Area Network (LAN) in which terminals with Steel & Mines Minister and Secretary will be connected in LAN as well as terminals will be provided to AS&FA and Joint Secretaries through LAN.

LAN will connect all these officials and facilities such as electronic mail will be available as well as the Gateway to NIC/NET and Super Computer will be available through the Central facility.

Training

An appreciation programme of three days duration was conducted by NIC which was attended by all the officials (50) from Section Officers to Secretary. In addition 6 officers have attended detailed training programmes at NIC. LDC/UDC/Desk Officers of the Department has been given hands on training and it is planned to provide intensive training on the usage of the computer during 1987-88.

Computer Professionals

A team of 6 computer professionals from NIC have been deputed to the Department for developing/evolving/implementing MIS. Efforts are being made to develop an integrated team of users and computer professionals

1.1 The Department of Steel has a Secretary, four Joint Secretaries, an Officer on Special Duty of the rank of Joint Secretary, two Directors, five Deputy Secretaries, eight Under Secretaries, one Senior Analyst and One Deputy Controller of Accounts. In addition, the Department of Steel shares with the Department of Mines one Financial Adviser of the status of Additional Secretary and a Controller of Accounts of the rank of Director. There is also a Technical Wing comprising of an Industrial Adviser, 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 312. A list of items of work allocated to Department of Steel is given in Annexure—I-A. The statement showing the representation of women, Scheduled

Castes and Scheduled Tribes, Ex-servicemen and Physically handicapped is given in Annexure 1-B.

1.2 There is a vigilance Cell to look into the vigilance cases of the employees of the Department of Steel. One of the Joint Secretaries in the Department of Steel functions as the Chief Vigilance Officer of the Department. Separate vigilance units exist in the Public sector undertakings under the Department of Steel. Vigilance inspections of the offices of the Iron and Steel Controller and its six Regional Offices are conducted by the Department from time to time. Director incharge of establishment acts as the Liaison Officer for watching the interest of SC and ST employees in service matters. One of the Under Secretaries functions as Welfare Officer of the Department. For receipt and redressal of all

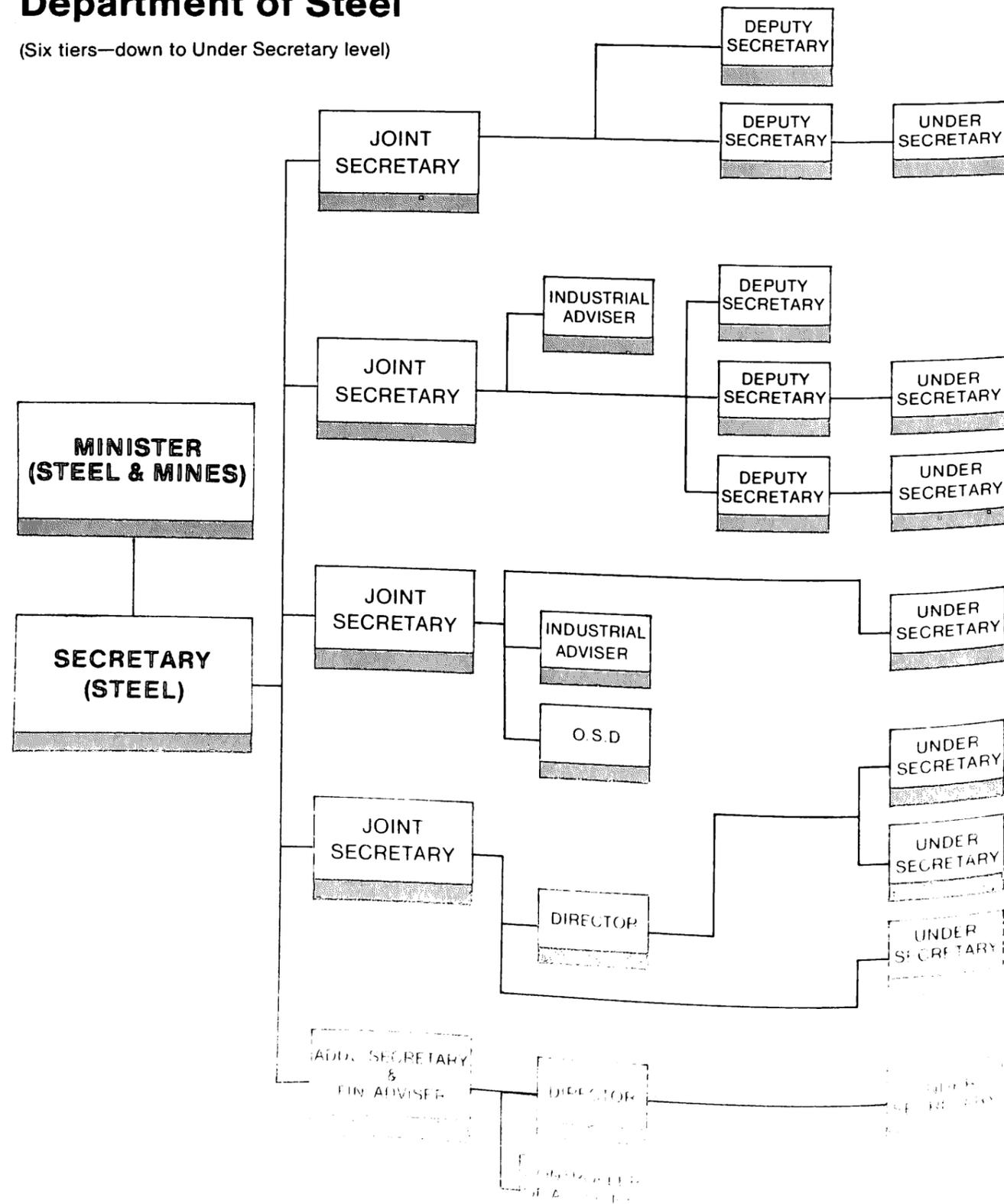
Annexure 1—C

List of Public Sector Undertakings Under the Department of Steel

1. **Steel Authority of India Limited,** Ispat Bhavan, Lodi Road, New Delhi-110003.
2. **Metallurgical & Engineering Consultants (India) Limited,** MECON, Building, Ranchi-834002 Bihar.
3. **National Mineral Development Corporation Limited** Castle Hills Masab Tank Hyderabad-500028.
4. **Bharat Refractories Limited,** Sector IV-3 Quarter No. 56 Bokaro Steel City-827001 Bihar.
5. **Kudremukh Iron Ore Co. Ltd.** 11 Block Koramangala Bangalore-560034.
6. **Manganese Ore (India) Ltd.** 3, Mount Road Extension Nagpur-440001.
7. **Hindustan Steel Works Construction Ltd.** No. 1 Shakespeare Sarani, (8th Floor) Calcutta-700071.
8. **Sponge Iron India Limited** NMDC Complex, Khanij Bhawan 10-3-3 11/A Castle Hills Hyderabad-500028.
9. **Rashtriya Ispat Nigam Limited** Project Office 'A' Block Visakhapatnam-530031 (AP)
10. **Neelachal Ispat Nigam Limited,** IPICOL HOUSE (4th Floor) Bhubaneswar-751007.
11. **Metal Scrap Trade Corporation** 225 F, Acharya Jagdish Bose Road, Calcutta-700020.
12. **Vijayanagar Steel Limited** Sankaranarayana Building 2nd Floor 25, Mahatma Gandhi Marg, Bangalore-560001.
13. **Ferro Scrap Nigam Limited** Post Box No. 73 Jamshedpur-831001.
14. **India Fire Bricks and Insulation Company Limited** Rly. Station Ranchi Road, P.O. Marar-820177 District Hazaribagh Bihar.
15. **Indian Iron and Steel Co. Limited** Burnpur-713325.
16. **IISCO Stanton Pipe and Foundry Co. Ltd.** IISCO House, 50 Chowringhee Calcutta-700071.

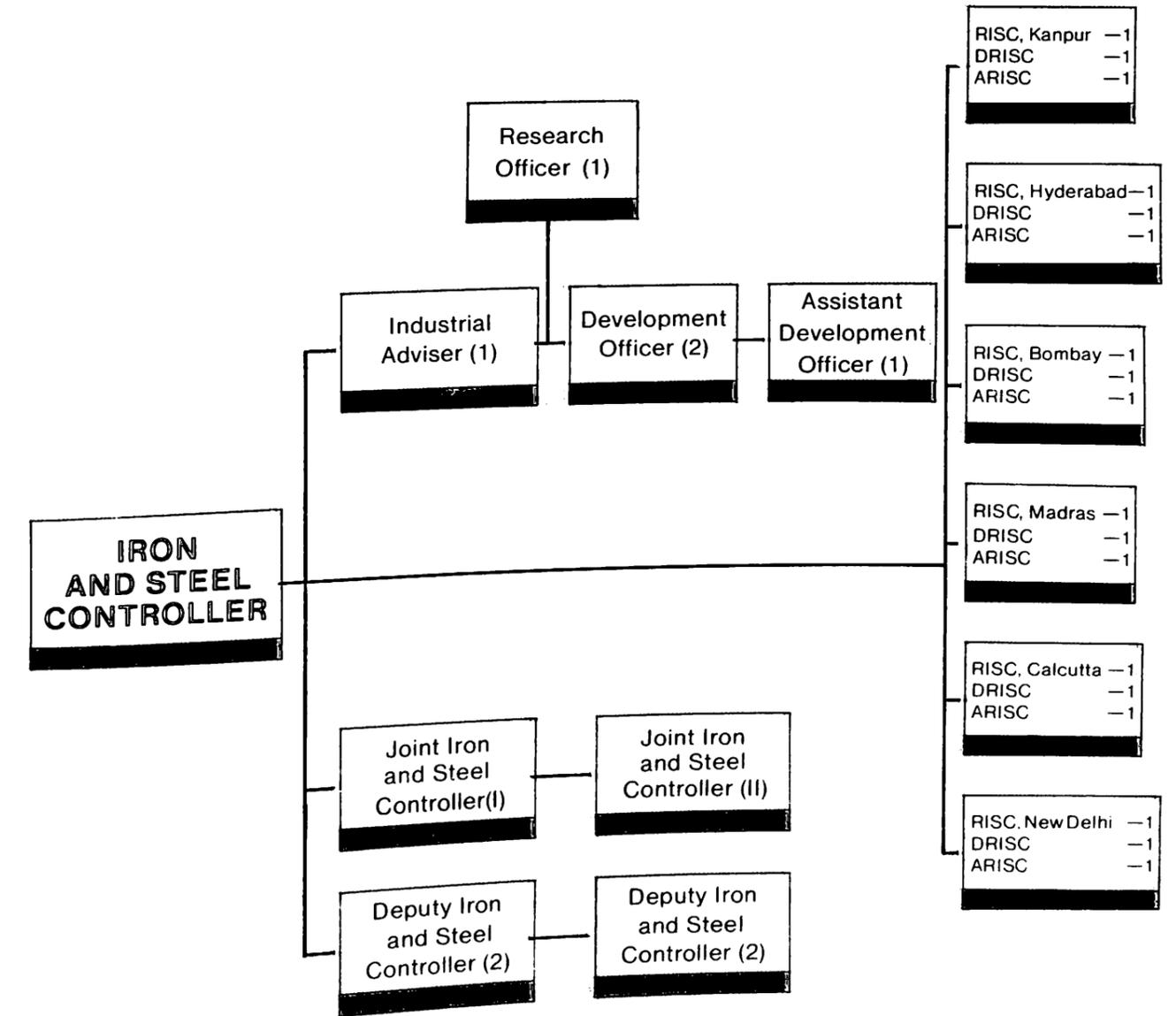
Organisational chart of the Department of Steel

(Six tiers—down to Under Secretary level)



Organisational Chart of the Office of Iron and Steel Control Organisation along with Subordinate Offices.

POSITION AS ON 31.1.87



Note 1. The figure (s) in bracket(s) denote the number of posts.
 2. Apart from the posts mentioned in the chart, the following gazetted posts are also operated in the main office of the Iron and Steel Control Organisation —

- 1 Assistant Iron and Steel Controller — (7)
- 2 Accounts Officer — (2)
- 3 Hindi Officer — (1)
- 4 Assistant Controller of Payments — (1)

Abbreviations
 RISC — Regional Iron and Steel Controller
 DRISC — Deputy Regional Iron and Steel Controller
 ARISC — Assistant Regional Iron and Steel Controller

complaints and grievances received from public a separate complaint cell has been set up and an officer of the rank of Under Secretary has been nominated as the Complaints Officer.

1.3 In keeping with the special emphasis being laid by the Prime Minister on the launching of an ideological battle against communalism, the Secretary for Steel held a meeting of all officers of the Department of Steel in Celebration of the Quami Ekta Week. In this meeting held on 19.11.1986, a pledge was taken by all employees to work towards the strengthening of the freedom and integrity of the nation.

1.4 The Department of Steel has 16 Public Sector Undertakings under its administrative control. A list of these undertakings is given in the Annexure I-C.

There is also a Mineral Development Board which is a registered society under the administrative control of the Deptt. of Steel, and functions as an autonomous institution in an advisory capacity for formulating plans for development of Minerals.

1.5 The Department of Steel has only one attached office viz., the office of the Iron and Steel Controller at Calcutta. Under it, there are six subordinate offices each headed by Regional Iron and Steel Controller at Bombay/Calcutta/Hyderabad/Kanpur/Madras/New Delhi. In the main office at Calcutta, the Iron and Steel Controller who is of the status of a Joint Secretary to Govt of India is assisted by two Joint Controllers, four Deputy Controllers and seven Assistant Controllers. In addition, one Industrial Adviser two Development Officers and one Assistant Development Officer assist him in technical matters.

1.6 A Research Assistant looks into the work relating to the Statistical division attached to the Main Office. The organisational structure of the Iron and Steel Controller and its Regional Offices is given at Annexure 1-D. The statement showing the personnel

group-wise and category-wise Male/female, SC/ST, Handicapped, Ex-servicemen in each category as on 21.12.1986 is given at Annexure I-E.

1.7 The Iron and Steel Controller functions as a field officer of the Department of Steel. In addition he has developmental functions including coordination and regulatory functions. The feed back furnished by the Iron and Steel Controller is utilised for formulation of policies and taking executive decisions. Holding of field meetings to identify the gap between demand and domestic availability of Iron and Steel materials, recommending import and export policies to the concerned Ministry, investigation of complaints received from the public, redressing the grievances of Iron and Steel consumers are some of the important activities of the Iron and Steel Control Organisation.

1.8 The Iron and Steel Control Organisation is vigilant about the effective implementation of the official Language Act. In addition to meeting the requirements of the provisions of the Official Language Act, the organisation celebrated Hindi Day on 6.10.1986 with a view to create awareness among officials towards learning and progressive use of Hindi. A Hindi Library attached to Hindi Cell of this Organisation is also functioning for the benefit of staff Iron and Steel Controller has been appointed as Dy. Chairman of CALTOLIC Zone-II, which consists of 50 Central Government offices in Calcutta.

Moving towards a more efficient administration

1.9 The measures introduced during the last year to minimise delays as also to entrust responsibility of decision making to officers at the lower level was reviewed from time to time during 1986 and the action taken in this regard was found satisfactory by the administrative reforms wing of the Department of Personnel and Training.

Annexure I—B

Statement showing the number of employees, number of SC/ST, physically handicapped, Ex-servicemen, Men and Women as on 31.12.86 in respect of the Secretariat of the Department of Steel

Group of posts	No. of employees	Men	Women	SC	ST	Physically handicapped	Ex-servicemen
Group A	34	32	2	2	—	—	—
Group B	88	82	6	9	1	—	—
Group C	119	88	31	18	5	1	2
Group D	71	68	3	26	10	2	2
Total	312	270	42	55	16	3	4

List of items of work allocated to the Department of Steel

Annexure I—A

- Steel Plants in the public and private sectors, the rerolling industry and ferro-alloys, including all future development.
- Development of iron ore mines in the public sector.
- Development of other ore mines and minerals processing for the steel plants.
- Production, distribution, prices, imports and exports of iron and steel and ferro-alloys.
- Planning, development and control of and assistance to, all iron and steel industries.
- 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.
- The Steel Authority of India Limited and its subsidiaries.
- Matters relating to the following undertakings namely:—
 - The Visvesvaraya Iron and Steel Company Limited.
 - The Bolani Ores (India) Limited.
 - The Manganese Ore (India) Limited.
 - The Metals Scrap Trading Corporation.
- Other Public Sector Enterprises or undertakings falling under the subjects included in this list except such as are specifically allotted to any other Department.
- All attached or subordinate offices or other organisations concerned with any of the subjects specified in this list.

Annexure I—E

Statement showing number of personnel groupwise and categorywise male, female, SC/ST, physically handicapped, ex-servicemen etc in each category as on 21.12.1986, (1986) in the Iron & Steel Control Organisation

Group/Category	Male	Female	SC	ST	Physically handicapped	Ex-servicemen	Total
Group 'A'	10	—	2	—	—	—	10
Group 'B' (Gazetted)	12	—	5	—	—	—	12
Group 'B' (Non-gazetted)	20	1	10	—	—	—	21 (2 are on leave vacancy)
Group 'C'	3	—	1	—	—	—	3
Inspector	33	12	5	1	2	—	45
Assistant	5	1	1	—	—	—	6
Sr. Steno	4	—	—	3	1	5	40
Jr. Steno	35	5	6	1	2	1	39
U.D.C.	37	2	9	—	—	—	1x2
L.D.C.	2	—	1	—	—	—	1
Staff-car Driver	1	—	—	—	—	—	1
Caretaker	—	—	—	—	—	—	14
Group 'D'	13	1	1	—	—	—	1
Daftry	1	—	—	3	1	1	34
Roneo Operator	31	3	8	—	—	—	5
Peon	5	—	—	—	—	—	6
Watchman	5	1	6	—	—	—	—
Safaiwala	5	—	—	—	—	—	97

During the year under report, efforts were continued to be made towards the implementation of various provisions of Official Language Act, 1967, Official Language Rules, 1976 and the Annual Programme for the Progressive use of Hindi for the year 1986-87.

The work relating to the progressive use of Hindi in the Department of Steel is under the administrative control of a Joint Secretary and Director. A Hindi Section consisting of an Assistant Director (Hindi), a Senior Translator, three Junior Translators, one Hindi Stenographer and two typists assist in this work. 14 Devnagiri Typewriters, Help literature, 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, its attached offices and the public sector Undertakings under the administrative control of the Department of Steel. These measures are:—

1. Implementation of Section 3(3)

In pursuance of the language policy of the Government both Hindi and English are being used for agreements, contracts etc. Most of the standard forms in use in the Department have already been translated into Hindi. As far as possible, all general orders are issued both in Hindi and English.

2. Noting and Drafting in Hindi

Noting and Drafting in the Hindi Section is done in Hindi. All sections of the department have started writing short/routine notes in Hindi. Some officers have also started writing short notes in Hindi; others have been requested to use Hindi to the extent possible so that it may serve as an encouragement to the staff working under them. Efforts are being made to ensure that all communications received in Hindi are replied to in Hindi. As far as possible, originating correspondence with Hindi Speaking State is done in Hindi.

3. Training of Staff in Hindi/Hindi Typewriting/Hindi Stenography

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

The position regarding training of Government servants in Hindi/Hindi Typewriting/Hindi

Stenography in this Department is as under:

Hindi Training:

Total number of employees (Group A,B & C)	246
Total number of employees possessing requisite Hindi qualification	190
Total number of employees who have passed Prabodh, Praveen and Pragya/intensive Course/Special Departmental Examinations etc.	35
Total number of employees under training	6
Total number of employees yet to be trained in Hindi Typewriting/Hindi Stenography	15

	Trained	Under training	Yet to be trained
Hindi Typewriting	10	6	21
Hindi Stenography	8	4	32

The officers and staff of the attached offices 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 and the expenditure incurred on it, is borne by the concerned offices. About 1800 employees of Steel Authority of India Ltd. alone have benefitted from these schemes.

4. 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 the library.

SAIL have purchased the film 'LEARN DEVNAGARI' which is screened regularly. Lingue Cassettes have also been purchased by SAIL and are made available to the employees on demand.

5. Inspections

In accordance with the orders of the Department of Official Language, an Inspection Team has been constituted to see the position of implementation of the provision of the Official Languages Act/Rules in attached offices and the Public Sector Undertakings under the administrative control of the Department. In the year under report, the Inspection Team has

inspected the following offices:

1. Bharat Refractories Ltd., Bokaro.
2. Bhandaridah Refractories Plant, Bhandaridah.
3. Ranchi road Refractories Plant, Ranchi Road
4. Bhilai Refractories Plant, Bhilai.
5. India Firebricks & Insulation Co. Ltd.
6. MECON, Ranchi.
7. Hindustan Steelworks Construction Ltd., Calcutta.
8. Neelachal Ispat Nigam Ltd., Bhubaneswar.
9. MECON's office at Bokaro.
10. HSCL's office at Bokaro.
11. Bhilai Steel Plant, Bhilai.
12. MECON's office at Bhilai.
13. HSCL's office at Bhilai.

6. Committees relating to Official Language

There is an Official Language Implementation Committee under the chairmanship of Joint Secretary

Shri P.C. Gupta, CMD, NMDC, receiving Rajbhasha Shield from Smt. Ramdulari Sinha, MOS, Deptt. of Mines, Ministry of Steel & Mines

(Hindi) 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. So far 51 meetings have been held.

7. Hindi Salahkar Samiti

There is also a Hindi Salahkar Samiti attached to the Ministry of Steel & Mines under the chairmanship of Minister for Steel & Mines for monitoring and promoting the use of Hindi. Some meetings of the re-constituted Samiti have already been held.

8. Rajbhasha Shield/Trophies

In order to encourage the use of Hindi in the working of the offices/undertakings under the Department of Steel, it has been decided to award Rajbhasha Shield/Trophies every year to the offices/undertakings.



As a result of measures adopted for promotion of Hindi, for official purposes, the following work has been done during the year 1986-87

(a) The work regarding the use of Hindi for the quarter ending 31.3.1986, 30.6.1986, 30.9.1986 and 31.12.1986.

i)	Total no. of Hindi communications received from anywhere in the Deptt.	5883
ii)	Total no. of communications replied to in Hindi.	4190
iii)	Total no. of communications replied to in English *(Remaining letters are only for information)	NIL*

b) Position regarding originating corresponding

	Number issued	
	Total in Hindi	Total in English
(i) Letters issued by the office to the offices in Hindi Speaking regions.	6889	2735
(ii) Telegrams sent to offices	20	1800*

*Total figures of Telegrams sent to Regions 'A', 'B' & 'C'

(c) Documents issued both in Hindi & English

	Total	Issued in Hindi & English	Issued in English
(i) General orders & circulars etc.	180	180	—
(ii) Resolution & Notification	82	82	—
(iii) Administrative & other Reports.	—	—	—
(iv) Papers laid before the House of Parliament.	1	(Annual Report in Hindi & English separately)	
(v) Budget Performance of the Department of Steel for the year 1986-87.	1	(—do—)	
(vi) Government Reviews on the Annual Reports.	14	14	—
(vii) Agenda Notices and Minutes of the meeting of the Staff Council and Consultative Committee.		All Agenda papers and the Minutes of Staff Council and Consultative Committee Meetings were normally issued bilingually.	