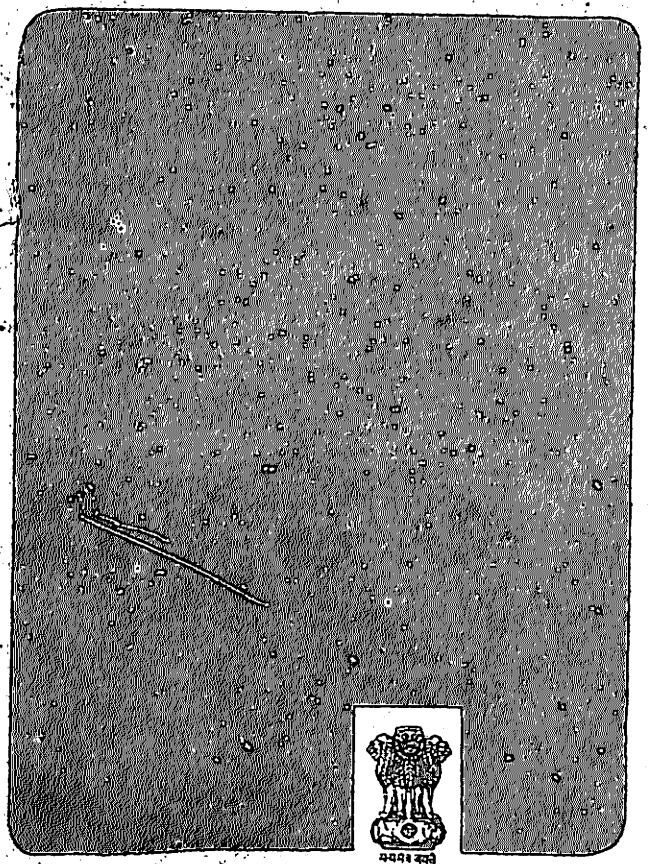

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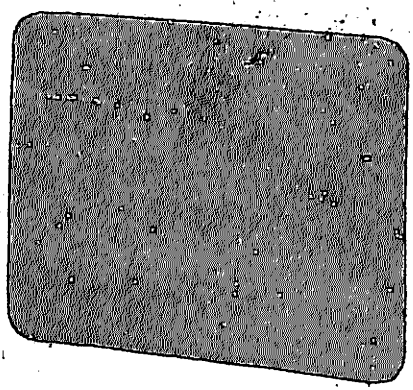

GOVERNMENT OF INDIA
STRY OF STEEL AND MINES
NEW DELHI

REPORT

1978-79

MINISTRY OF STEEL & MINES

ERRATA

Page No.	*Reference*	*For*	*Read*
(ii)	Line 6	MIUES	MINES
29	Line 6 from bottom	1:ft	lift
92	Line 21	33	3A
100	Line 4 from bottom	104,312	104,312 (Estimated)
114	Item No. in statement	Pig Iron Steel	Pig Iron
114	insert heading STEEL between item No. 1 & 2		
117	Line 9 from bottom	April-December	April-December, 1978
122	Line 8 from bottom	1:10:000	1:10,000
123	Line 5-6 from bottom	re-factory	refractory
130	Line 6	delete (i)	
136	Last line	dolomick	dolomite
145	Para 4.3 line 2	(Regulation/ development)	(Regulation and Development)
153	Line 16 from bottom—last col.	4.186	4186
168	Line 2 from bottom	figures relate to "Sweepers"	
179	Line 21	delete (Unit:Tonne)	
186	Line 17	tailng	tailing

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GOVERNMENT OF INDIA
MINISTRY OF STEEL AND MINES
NEW DELHI

CONTENTS

PART—III

DEPARTMENT OF MIUES

PREFACE

This Report is divided into three parts.

Part I presents an overall picture of the Ministry of Steel and Mines highlighting, inter alia, the strategy adopted for the development of steel, mining and non-ferrous metal industries.

Part II covers the activities of the Department of Steel and the performance of the organisations/undertakings under it during the year.

Part III describes the activities of the Department of Mines and the performance of the organisations/undertakings under it during the year.

PART I

THE MINISTRY OF STEEL AND MINES

PART I

CHAPTER I

THE MINISTRY OF STEEL AND MINES—MAIN FUNCTIONS AND ORGANISATIONAL STRUCTURE

1. MAIN FUNCTIONS

The Ministry of Steel and Mines comprises two Departments—Department of Steel and Department of Mines. The Department of Steel is responsible, *inter-alia,* for the planning and development of iron and steel industry including electric furnace units, re-rolling mills, alloy and special steels and ferro-alloys, as also for the concurrent development of input industries such as iron ore, manganese, chromite, limestone and other minerals used in the steel industry. The implementation of Iron and Steel (Control) Order, 1956 as well as the formulation of policies relating to production, distribution, import and export of iron and steel also fall within the ambit of its functions. A detailed list of the subjects allocated to the Department of Steel is given in Appendix IA.

The Department of Mines is responsible for the survey and exploration of all minerals, other than natural gas, petroleum and atomic minerals, for mining and metallurgy of non-ferrous metals like aluminium, copper, zinc, lead, etc., and for administration of the Mines and Minerals (Regulation and Development) Act, 1957 and the rules framed thereunder for all mines and minerals, other than coal, natural gas, petroleum and atomic minerals. A detailed list of the subjects allocated to the Department of Mines is given in Appendix IB.

2. ORGANISATIONAL STRUCTURE

1.1 Prior to May, 1977, the Department of Steel functioned separately under the administrative charge of Secretary (Steel) while the Department of Mines was placed under the charge of an Additional Secretary. With effect from 14th May, 1977 both the Departments have been placed under one common Secretary as the administrative head. This structural change marks a significant break from the past and has been made

essentially with a view to achieving a well-coordinated and fully-integrated development of mineral and metal industries, ferrous as well as non-ferrous. Close attention to this sector is a matter of basic importance to rapid industrialisation and speedy attainment of the country's economic goals.

1.2 Apart from the Secretary, who is in overall charge of both the Departments, the Department of Steel has one Additional Secretary, three Joint Secretaries, three Directors, four Deputy Secretaries and seven Under Secretaries. A Technical Development Wing consisting of one Industrial Adviser, three Development Officers and two Assistant Development Officers forms an integral part of the Department. A Special Cell functions under the Department to provide close attention to and follow-up on matters concerning public complaints and grievances. The Department of Mines, similarly has one Additional Secretary, three Joint Secretaries, three Directors, seven Deputy Secretaries and four Under Secretaries. Both the Departments have a common Joint Secretary *cum* Integrated Financial Adviser.

1.3 The Department of Steel has one attached office, viz., the office of the Iron and Steel Controller, which is located at Calcutta. This office has six regional offices at New Delhi, Kanpur, Calcutta, Madras, Hyderabad and Bombay. It was set up initially to perform certain regulatory functions under the Iron and Steel (Control) Order, 1956. Over the years, however, the role and functions of the Iron and Steel Control Organisation have been extended to cover wider areas. It now plays an important advisory role in the formulation of export and import policies, levy of custom and excise duties, and other matters relating to the iron and steel industry. The Iron and Steel Controller now also functions, *inter alia*, as the monitoring agency for supply of steel items from the main producers to State Small Scale Industries Corporations. This arrangement is expected to ensure regular supply to Small Scale Industrial Units of even those categories of steel which are in short supply. In the context of relative scarcity of supplies, that organisation has been entrusted with the responsibility of surveillance in the utilisation of steel materials by indenting parties in order to prevent misuse and misdirection of supplies to them. The Iron and Steel Controller also keeps a close watch on the electric arc industry, to monitor its functioning, identify problems etc.

A study of the re-rolling industry with a view to evolving solutions to the problems of capacity utilisation and viability of the units in that industry has been assigned to a committee under the Iron & Steel Controller's Chairmanship.

The duties of the Regional Iron and Steel Controllers have also been enlarged to cover the developmental aspects. Details of their duties and functions are given in Appendix I-C.

This Organisation issues a Quarterly Bulletin, called 'Iron and Steel Control', which gives statistical information on iron and steel of interest to Government, traders and consumers.

1.4 Consequent upon the nationalisation of the refractory plant of the Assam Sillimanite Limited in 1976, certain claims against M/s Assam Sillimanite Limited in relation to the Refractory Plant have to be received, processed and settled out of the amount of compensation payable under the Nationalisation Act. This being a statutory obligation, an office of Commissioner of Payments as envisaged in the Act has been set up at Ranchi.

1.5 A statement showing the total number of Government servants under the Department of Steel and its attached offices as on 31-12-1978 and the number belonging to Scheduled Castes and Scheduled Tribes amongst them is at Appendix II.

1.6 The Iron Ore Board was registered in January, 1973 as a society under the Societies Registration Act. Its office is in Delhi. The Board was constituted mainly to act as the Central policy planning and development agency for iron ore deposits in the country including matters such as conservation and optimum utilisation of iron ore and its export. Its role is primarily advisory. In October, 1978, Government decided to enlarge the scope of the Board to include minerals which are important inputs to the steel industry such as manganese, chromite, vanadium, titanium, nickel, molybdenum, tungsten, kyanite, sillimanite and magnesite. The Board as an expert high level body will study on a continuing, systematic and scientific basis matters connected with the exploration, conservation, production, processing and utilisation of these minerals and advise Government on problems relating to these activities. As a result, the Board has been renamed Mineral Development Board.

1.7 A list of public sector undertakings under the administrative control of the Department of Steel is given in Appendix III.

1.8 The Department of Mines has three Subordinate Offices,

the Geological Survey of India, (GSI) the Indian Bureau of Mines (IBM) and the Controller of Mining Leases. The first has its headquarters at Calcutta, the headquarters of the second and the third are located at Nagpur.

1.9 The GSI is a multi-disciplinary scientific organisation responsible primarily for geological mapping, geo-physical surveys, mineral investigation, geo-technical investigation, off-shore mineral exploration and study of marine geology, geothermal investigation, laboratory studies involving petrology, palaentology, geochronology and isotope-geo-mineral physics, etc.

1.10 The GSI has grown considerably over the years and now has a very large strength of scientists of various disciplines. Its activities have also been extended to cover off-shore areas. Government, therefore, considered it necessary to streamline the functioning of the GSI in specialised fields of inventory control, personnel management, workshop management and finance so that the procedures and functioning are in line with modern management practices. To achieve this, and in order to improve the over-all functioning of the GSI, Government decided to constitute a Board of Management with Secretary of the Ministry of Steel & Mines as Chairman, the membership consisting of besides the D.G., eminent geo-scientists, representatives of other scientific organisations and financial management experts. Government have also decided to delegate practically all the powers of the Ministry to the Management Board. The intention is to devolve a greater degree of the autonomy on the organisation and to ensure prompt and full consideration of the problems of the GSI and to oversee planning and implementation of GSI's problems.

The IBM is concerned primarily with the conservation and development of mineral resources, and administration of Mineral Conservation and Development Rules, 1958. The Controller of Mining Leases deals with modification of pre-1949 mining leases in order to bring them in conformity with the existing law.

1.11 A statement showing the total number of Government servants under the Department of Mines and its subordinate offices as on 31-12-1978 and the number belonging to Scheduled Castes and Scheduled Tribes amongst them is at Appendix IV.

1.12 A list of the pubilc sector undertakings under the administrative control of Department of Mines is given in Appendix V.

APPENDIX IA

List of subjects allocated to the Department of Steel

1. Steel plants in the public and private sectors, the re-rolling industry and ferro-alloys including all future development.
2. Development of iron ore mines in the public sector.
3. Development of other ore mines and coal washeries and mineral processing for the steel plants.
4. Production, distribution, prices, imports and exports of iron and steel and ferro-alloys.
5. Planning, development and control of, and assistance to, all iron and steel industries.
6. Production, supply, pricing and distribution of iron ore, manganese ore, limestone, sillimanite, kyanite and other minerals and alloys used in the steel industry, excluding grant of mining leases or matters connected therewith.
7. The Steel Authority of India Ltd. and its subsidiaries.
8. Matters relating to following undertakings, namely
   1. Visveswaraiya Iron and Steel Ltd.
   2. The Bolani Ore (India) Ltd.
   3. The Manganese Ore (India) Ltd.
   4. The Metal Scrap Trade Corporation.
9. Other Public Sector Enterprises or undertakings falling under the subjects included in this list except such as are specifically allotted to any other Department.
10. All attached or subordinate offices or other organisations concerned with any of the subjects specified in this list.
11. Iron and Steel Companies Amalgamation Act 1952 (79 of 1952).
12. The Indian Iron and Steel Company Taking over Management) Act 1972 (50 of 1972 dated 3-9-1972).
13. The Indian Iron and Steel Company Taking over of Management) Amendment Act, 1974 dated 31-8-1974.
14. The Indian Iron and Steel Company (Acquisition of Shares) Act, 1976 dated 2-9-1976.
15. The Indian Iron and Steel Company (Acquisition of Shares) Act, 1977.

APPENDIX IB

List of subjects allocated to the Department of Mines

1. Regulation of mines and minerals development under the Mines and Minerals (Regulation and Development) Act, 1957 and other Union Laws including questions concerning various States and incidental business in respect of these.
2. All other metals and minerals not specifically allotted to any other Department, such as, aluminium, zinc, copper, gold, diamond, lead and nickel.
3. Planning, development and control of, and assistance to all industries dealt with by the Department.
4. Geological Survey of India.
5. Indian Bureau of Mines.
6. All other attached or subordinate offices or other organisations concerned with any of the subjects specified in this list.
7. The Sikkim Mining Corporation Limited.
8. Public Sector enterprises and undertakings falling under the subjects included in this list except such as are specifically allotted to any other Department.

APPENDIX IC

Duties and functions of the Regional Iron and Steel Controllers

(i) To collect factual information regarding the capacities of all iron and steel based units registered with the Iron and Steel Controller and, *inter-alia,* to monitor particulars of the various inputs, production and capacity utilisation of those units on a regular basis.

(ii) In all cases where import clearance is given by the Iron and Steel Controller, to ensure proper utilisation of imported materials and to report about the actual requirements of raw material spare parts and other consumables. This, however, is subject to formal concurrence of the Ministry of Commerce.

(iii) To identify and encourage industrial units taking up programmes of import substitution and also suggest items which need not be imported because of indigenous availability.

(iv) To render assistance to core projects and priority sectors in obtaining their requirements of steel.

(v) To conduct monthly market survey, and report the overall availability and supply position of iron and steel materials in their regions with particular reference to price trends of critical items.

(vi) To aid, assist and guide the iron and steel based units to increase production by ensuring adequate supply of raw materials and other inputs.

(vii) To inspect iron and steel based units registered with DGTD and also report progress of implementation of letters of Intent and licences issued by the Government of India so far as they pertain to the Iron and Steel industry.

(viii) To conduct status survey of the iron and steel industry licensed by Iron and Steel Controller and

(ix) To take up any other items of work which may be assigned to them from time to time.

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

The Statement showing the number of Inspections carried out by the Regl Offices as also suspension debarment orders issued under the I and SC order till November, 1978

Region	No. of Inspections	No. of Suspension cases	No. of Debarment cases	No. of cases in Court	Total
1	2	3	4	5	6
Calcutta . .	292	1	1	—	2
Delhi . .	353	16	1	1	18
Bombay . .	244	2	—	—	2
Madras . .	247	14	8	—	22
Hyderabad . .	423	72	—	—	72
Kanpur . .	238	13	4	—	17
TOTAL . .	1797	118	14	1	133

APPENDIX II

DEPARTMENT OF STEEL
(INCLUDING ITS ATTACHED OFFICE)

(Statement showing the total number of Government servants and the number of Scheduled Castes and Scheduled Tribes amongst them as on 31st December 1978)

Class	Total No. of Employees	Scheduled Castes	Scheduled Tribes
Group A . .	48	5	1
Group B . .	90	6	—
Group C . .	318	49	1
Group D . .	152	40	8

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APPENDIX III

List of Public Sector Undertakings under the Department of Steel

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

APPENDIX IV

DEPARTMENT OF MINES (INCLUDING ITS SUBORDINATE OFFICES)

(Statement showing the total number of Government servants and the number of Scheduled Castes and Scheduled Tribes amongst them as on 31st December 1978)

Class	Total No. of Employees	Scheduled Castes	Scheduled Tribes
Group A . .	1806	66	8
Group B . .	687	30	8
Group C . .	7609	1037	216
Group D (excluding Sweepers)	2642	543	110
Group D (Sweepers)	115	106	—

APPENDIX V

List of Public Sector Undertakings under the Department of Mines

1. Hindustan Zinc Limited.
2. Bharat Aluminium Company Limited.
3. Hindustan Copper Limited.
4. Bharat Gold Mines Limited.
5. Mineral Exploration Corporation.
6. Sikkim Mining Corporation (in which Central Government has 49% equity participation).

CHAPTER II

THE YEAR UNDER REVIEW AND PROSPECTS

IRON AND STEEL

2.1 *Demand.*—The growth in the economy was reflected in a continuing upsurge in demand for steel. In the previous year 1977-78, steel consumption showed a rise of about 10% over the consumption in 1976-77. Buoyancy in demand continued during the current year and it is estimated on the basis of actual offtake so far that the consumption of steel will show an increase of 15.8% over 1977-78. There is every reason to believe, on the strength of the available market intelligence that the coming year 1979-80 will also be characterised by a growth rate of the order of 15 to 20%. Planning for supply of steel has, therefore, to take cognisance of this factor. Taking into account the target of production fixed for the integrated steel plants and the electric arc furnaces, as also the planned import of steel, the expectation is that the availability of steel in the economy during 1979-80 will increase by about 20% over 1978-79.

2.2 *Review of production.*—The demand for steel is met by three sources (a) the integrated steel plants, (b) electric arc furnaces and (c) net import of steel. The integrated steel plants had to face a series of major problems adversely affecting their production. The first relates to the supply of Coking Coal. Both in terms of quantity and quality, the supply situation throughout the year was one of anxiety. Supplies were marked by very high ash content of the order of 20-21%, leading at times to technical problems in satisfactorily operating the blast furnaces. Productivity of the blast furnaces is also adversely affected; to the extent of about 2% in hot metal for every 1% increase in ash content of coal. In quantitative terms, the estimated supplies of coking coal during the current year 1978-79 will be less than the actual supplies in the preceding year by about 0.9 million tonnes. As a result, the stocks available with the steel plants continued to decline from 11 days stocks in April, 1978 to as low a figure as 4 days stock as on 31-1-79. The position was particularly aggravated by unforeseen occurrence of heavy floods in the eastern region leading to inundation of a number of coking coal mines, disruption of rail traffic, and partial flooding of two of the steel plants also. Since the coke oven batteries cannot be shut down except with

serious consequences, the oven pushing had to be regulated to a reduced scale to match the available stocks of coal. It is hoped that in the following year this particular constraint will be reduced considerably not only because of expected increase in production of coking coal but also because these will be supplemented by imports of coking coal from Australia and Canada of the order of about 1 million tonnes, a small part of which has already arrived in the country and is being used in the Rourkela and Bhilai steel plants. The trial runs so far have shown satisfactory results. The second factor was the lack of steady and adequate supply of power. Power supply to most of the steel plants was characterised by frequent interruptions as also fluctuations in voltage and insufficiency to meet the full demand. The third factor relates to industrial relations. While there were no major problems except in the Indian Iron & Steel Company, generally speaking industrial relations were not as satisfactory as they should have been. These three factors, i.e. coking coal, power and industrial relations resulted in an appreciable loss of production. In addition, the floods in September, 1978 led in all the integrated steel plants including TISCO to a certain production loss.

The loss of production of saleable steel attributable to these factors during the current year is estimated to be 650,000 tonnes. Despite these problems, however, production of saleable steel of all the integrated steel plants in the current year estimated at 6.56 m. tonnes will be less than the production of 6.89 m. tonnes during 1977-78 by only about 4.8%. In terms of ingot steel production, the corresponding figure will be 3%. Had the adverse factors mentioned earlier not been in operation, production in the current year would have exceeded that of 1977-78. For the year 1979-80, the target of production of saleable steel has been fixed at 7.4 million tonnes, thus marking an increase of 12.8% over the anticipated actuals of the current year. It would also be pertinent to mention here that because of the vastly improved production performance of the mini steel plants, which was entirely due to a large number of important measures taken by the Government, the total domestic production of saleable steel in the current year will be slightly higher than what it was in the preceding year.

2.3 The production of pig iron in the current year is expected to be at the same level as in 1977-78, i.e. 1.46 million tonnes. For the year 1979-80, the target of 1.62 million tonnes has been fixed

which would be about 11% higher than the anticipated production in the current year.

2.4 The electric arc furnace industry has been a sick industry. To restore the units to health, Government announced a series of fiscal reliefs exempting them from excise duties on their products. Government also adopted a liberal policy of permitting diversification of their product-mix from mild steel to alloy and special steels which have higher added value. They were also assisted by rescheduling of their obligations to the public financial institutions who have invested large amounts in them and making them eligible to loans on soft terms. Liberal import of scrap through the Metal Scrap Trading Corporation was permitted. As the scrap prices abroad were higher than the prices in India, scrap imports both of the re-rollable and non-rollable varieties were exempted from import duties. As a result of these efforts and the pick up in demand in the demestic market, the electric arc furnaces were able to increase their production very significantly. The anticipated production of ingots in the current year is 1.5 million tonnes compared to the actuals of 0.96 million tonnes in the previous year, thus marking an increase of about 60%. But for power cuts and difficulties in the availability of scrap, performance in the current year could have shown further improvement.

As part of the effort to increase the availability of scrap, the Metal Scrap Trading Corporation was directed to launch a vigorous programme of acquisition of old ships for breaking up so that the availability of re-rollable and melting scrap could be augmented. As a result, since November, 1978, when a decision to acquire foreign flag ships was taken, 4 ships have already been obtained and are being broken up at different ports. In addition, the availability of Indian ships for breaking up has also increased; the quatity of scrap obtained by breaking up Indian ships is 70,000 tonnes upto Jan 1979 as compared to 30,600 tonnes for the whole of the previous year. Ship breaking activity has been dispersed over several ports. It has considerable employment potential. In order to increase this activity, a development fund into which the net receipts from purchase and disposal of old ships will be paid by the Metal Scrap Trading Corporation has also been constituted, to be utilised exclusively for augmenting ship breaking facilities.

2.5 *Projects for Sponge iron.*—While these measures will suffice in the short term, it is quite clear that the economy does not generate enough scrap to feed the electric arc furnace industry even to the extent of its present licensed capacity. In

order to meet the full demand for raw material as also to maintain the prices of indigenous scrap at reasonable levels, it is necessary to provide an alternative raw material in the form of sponge iron to the electric arc furnace industry. The established processes for production of sponge iron involve the use of liquid or gaseous hydro-carbons. Since both these are either not available or are scarce in the country and have high opportunity costs, Government have decided to adopt the process of production of sponge iron using solid reductant in the form of non-coking coal which is available in plenty in the country. The technology for the use of solid reductant is not, however, fully established and its practicability also varies with the characteristics of the particular non-coking coals proposed to be used. In pursuance of this objective, Government have sanctioned a 30,000 tonne direct reduction experimental plant using non-coking coal, partly financed by the UNDP, in Andhra Pradesh. In addition, the Research and Development Division of the Steel Authority of India will be setting up a pilot plant for trying out alternative processes of direct reduction. Over and above these units which are in the public sector, Government have also permitted the installation of a sponge iron plant in the private sector in Orissa, with foreign collaboration, having a capacity of 150,000 tonnes.

Installation of pellet plants.—India and some of the Asian countries have certain complementarity of resources. While the latter have large reserves of natural gas but no iron ore, India has plentiful supplies of iron ore but not enough gas to meet the requirements of a low priority product such as sponge iron. Government have worked out and are pursuing a strategy of deriving maximum advantage of such complementarity of natural resource endowments between ourselves and the countries concerned for our mutual benefit. There are large accumulations of fines of high iron content in the public sector mines at Bailadila. Fines will also be generated at the public sector Donimalai mines. Export of these fines would fetch only a relatively low value and would be uneconomic to National Mineral Development Corporation. Accordingly, National Mineral Development Corporation have commissioned feasibility reports for the setting up of pelletisation plants of 2 million tonnes capacity at each of these two places. These feasibility reports have been received and examined. Quotations for plant and machinery have also been received. Before putting up these plants, however, in view of the very large investments involved, it is considered advisable to tie up the marketing of atleast of half the production on a long term

basis. Discussions have been held with a number of parties in different countries with a view to securing long term export contracts. These exploratory efforts are continuing. As these are direct reduction pellets and by and large the conventional steel industry has been resorting to increasing use of sinter which requires only fines, the market for these high value pellets will be primarily in direct reduction plants which are contemplated in the Middle East, Indonesia and other Asian countries. It is in this context that the idea of deriving mutual advantage from the complementarity of resource endowment is being pursued. If a cooperative production pattern could be worked out with foreign parties, involving the export of pellets to parties setting up or having direct reduction plants, so that some of the sponge iron produced in those plants could be imported for use in the electric arc furnaces, it would be of mutual advantage to all concerned. By so doing, the electric arc industry would be assured of a steady source of raw material to supplement scrap at reasonable prices.

2.6 *Imports of finished steel.*—In the wake of rising demand for steel, the import and export policy has undergone a drastic change in the current year as compared to what it was in the previous year. Exports have been reduced. No fresh commitments of exports were allowed to be made. Whatever exports have taken place in the current year were only in fulfilment of past commitments. Action was also taken to arrange for sizeable quantity of imports, particularly of certain categories which were in acute short supply. These are structurals, plates, hot rolled and cold rolled coils and sheets. As the international prices of steel are appreciably higher than the indigenous prices, Government decided to exempt such of the imports as were effected as "buffer stocks", as distinct from imports to meet requirements of particular customers on a back to back contract basis, from import duties. Of the total import of about 817,000 tonnes, over half the quantity i.e. 4,69,000 tonnes, is being imported as buffer stocks. Prices of imported steel are much higher than those of indigenous steel. In the past when steel was imported, these remained in stock for several years because of the reluctance of local consumers to buy costlier imported steel. In order to overcome such reluctance and to avoid complaints in the allocation of cheaper domestic steel, Government decided to introduce a system of pooling the prices of imported quantities with prices of indigenous production in the particular categories involved so that all steel of a particular category whether locally produced or imported is sold only at one price to all consumers.

There has admittedly been a certain time lag between the rapid rise in demand and the flow of imports into the system which has led to shortages in certain categories and therefore certain premia in the market. It is expected that these premia will disappear with the planned import of steel in larger quantities in the coming year than in the current year and increased production from domestic plants.

2.7. *Pricing and Distribution policy.*—The year under review also witnessed significant changes in the pricing and distribution policy for steel. It would be recalled that a dual pricing policy was in vogue from 1973 when steel was freed from all controls except in respect of certain priority categories, viz., railway material, plates and structurals which were consumed to a large extent by Government and the public sector undertakings. These categories were subject to an informal price control but in respect of all other categories the producers were left free to determine the stockyard prices. They were also free to determine the stockyard prices for the priority categories. As a result wide margins developed between the stockyard and the JPC prices which were applicable to deliveries ex-plant in rake loads. While stockyard prices and the JPC prices of the non-priority categories could be adjusted from time to time by the producers, such adjustment was not allowed in respect of JPC prices for ex-plant deliveries of the priority categories. Apart from depressing the prices of the priority categories to levels at which the plants did not earn any return, this policy also led to discrimination against the small and medium consumers whose demands were not large enough to enable them to obtain supplies from the plants in rake loads as they had to rely on the stockyards for their supplies at much higher prices. In addition, the steel plants returns were also getting eroded because of the controls. Following the deliberations of an inter-Ministerial Committee, Government decided to increase the prices of steel. A significant decision was to retain a margin of only Rs. 35 per tonne between JPC prices and the stockyard prices of steel items as compared to the much wider margins that prevailed till then. In determining the revised prices, special care was taken to minimise the impact on the priority categories.

In order to assist the small scale industrial units who get their supplies through the small scale industries corporations in the various States, it was decided (a) that the producers should meet the distribution costs of the SSICs and (b) to give a rebate of Rs. 40 per tonne in the stockyard prices so that the small scale

units are able to obtain their supplies at prices which are marginally less than the ex-plant prices. These steps have removed the discrimination in the form of higher costs of raw materials to small scale units. Concurrently with the above, Government also enhanced the allocations of steel to the small scale units. It is Government's policy to funnel increasing supplies of steel to small scale units through the SSICs. Fair distribution margins have also been determined for the different SSICs on the basis of study of their costs. It is, however, necessary that all the SSICs gear themselves to a high level of performance by strengthening their distribution net works and their service facilities to the small scale units, while simultaneously streamlining their operations with a view to cutting costs. There is considerable room for improvement in this regard in several of the SSICs.

2.8. *Steel Development Fund.*—The public sector steel industry has large repayment obligations on account of principal and interest to Government. With the regime of administered prices, their internal resource generation has not been of such a magnitude as to enable them to make any significant contribution to Plan outlays from their internal resources after meeting their repayment obligations to Government. Steel plants in the country except for Bokaro are all old and these require renewal, modification and modernisation. An inter-Ministerial Committee set up in1976 had observed in its report that sufficient attention had not been given in the past to continuous modernisation and replacement of machinery in steel plants. This had led to low productivity and higher cost of production of steel. The Committee recommended that it was essential that in the next few years adequate resources are provided for maintenance and replacement of machinery in the existing steel plants. However, because of increase in the cost of production, the availability of funds in the revenue account for modernisation and rehabilitation of plants was not adequate, thus leading to increased dependence on Central budgetary support. The expenditure on replacement, balancing facilities, modernisation etc. is thus not only inevitable but will grow in the coming years if the plants are to be kept in a state of good health and are to achieve high levels of capacity utilisation and productivity and minimise costs. As a means of ensuring that adequate funds are made available for this purpose and lessening dependence on the Central budget, Government decided to constitute a Steel Development Fund by levying a surcharge of Rs. 100 per tonne on the non-priority categories i.e. other than plates, structurals and railway materials. The amounts

from this fund will be made available to the steel plants for approved schemes of modernisation, rehabilitation and development. Detailed criteria and mechanism of operating the fund will be decided in consultation with the Planning Commission and concerned Ministries of Government.

2.9 *Draft plan.*—The draft Plan for the period 1978-83 which envisages a growth rate of 4.7% in Gross Domestic Products per annum rising to 5.5% during 1983-88 has projected a steel demand of 10.90 million tonnes in 1982-83 and 15.4 million tonnes in 1987-88. The assumed growth rates in demand for steel for different categories range from 9.7% to 9.2% per annum. On this basis, it has been estimated that there would be deficit in supply of shaped products to the extent of 0.925 million tonnes by 1982-83. This deficit in supply is likely to increase rapidly thereafter. Judging, however, by the growth rate in demand in the last 2 years, and as projected for the forthcoming year, it would appear that the assumed rate of growth in the draft Five Year Plan document might be an under-estimate, in which event the deficit in the availability of shaped products would be even larger than has been mentioned by 1982-83. Imports of this order would have serious consequences in terms of foreign exchange and would also affect the domestic price situation because imported steel is much costlier than domestically produced steel. In respect of flat products, howeve, the draft Five Year Plan assumes that there will be a surplus of about 850 thousand tonnes in 1982-83 but as in the case of shaped products, the surplus might either disappear or turn out to be much smaller if the recent trends in growth of demand continue.

2.10. *Strategy of development.*—The strategy of development in the coming years to meet the anticipated increases in demand at the minimum possible cost has been broadly delineated as follows :—

1. Expeditious completion of expansion/construction work of continuing schemes.
2. Build-up of production in the existing steel plants to attain maximum capacity utilisation.
3. Modernisation and replacement of equipment in the existing steel plants.
4. Technological improvements such as :
   (i) Reducing cost of production through increased productivity;

   (ii) Improving quality of products;
   (iii) Diversification to increase production of items of added value;
   (iv) Emphasis on R&D efforts to reduce consumption of coking coal, use of more non-coking coal, improve LD lining life, produce new varieties of steel, and generally to upgrade blast furnace, sintering, steel making and rolling practices.
5. Measures for up-dating of technology and modification and replacement of obsolescent processes.
6. Augmentation of in-plant generating capacity with a view to minimising the effect of restrictions on power supply by public utilities on production.
7. Economic utilisation of blast furnace slag for production of cement.

Particular attention is being paid to up-dating technology in operating practices. There is no doubt that present technological practices are much behind the practices in vogue in the large steel making countries abroad. Modernisation and updating of technology is the surest means of securing significant increases in output from the existing facilities and increase in productivity at costs which are far below what it would cost to produce the additional steel at green-field sites. Apart from ensuring better utilisation of capacity and optimising cost effectiveness, modernisation will also improve the quality of finished products. Some of the major schemes of modernisation/augmentation of capacity contemplated are (i) enhancement of the ingot capacity of the Bhilai Steel Plant from 4 million tonnes to 5.5 million tonnes with the assistance of the USSR; it is proposed to convert, on an experimental basis, one open hearth furnace in the steel melting shop into a twin bath furnace in order to increase the productivity and also launch a scheme for injection of coal dust in the blast furnaces in order to replace partially coking coal by non-coking coal. (ii) With the cooperation of the USSR, a programme for technological improvements at Bokaro Steel Plant is being drawn up aimed at increasing ingot capacity to 5.5 m. tonnes; the investment required will be quite low compared to the investment for similar additional capacity in a green-field site. (iii) Conceptual schemes for the modernisation and rehabilitation of Durgapur and Rourkela steel plants within the framework of existing facilities are being prepared, largely relating to quality improvements

in the raw materials area, as well as productivity increases in the iron making and steel making and finishing areas. Discussions are in progress with Austrian and British agencies for collaboration in implementing the modernisation schemes at Durgapur and Rourkela. (iv) TISCO is considering a proposal for modernisation in implementing the modernisation schemes at Durgapur and ing additional facilities in the primary units as also installation of new facilities which will lead to a marginal increase of about 2,00,000 tonnes in steel making capacity. (v) The Alloy Steels Plant at Durgapur which has large in-built capacities in some of its upstream facilities is going ahead with the installation of an additional electric arc furnace which will increase the production of hot metal to 1,60,000 tonnes. Alloy and constructional steel of different types are proposed to be produced with the additional metal. Further, a scheme for increasing the production of stainless steel by adopting VAD/VOD process in the electric arc furnaces is also under consideration of Government. It is proposed that ASP will produce stainless steel slabs which will be hot rolled at Bokaro so that these can be cold rolled and finished at Salem. This will not only enable fuller utilisation of the capacity of ASP but also obviate import of hot strip and enable the production of stainless steel at a much lower capital cost.

2.11. *Research and Development.*—Considerable emphasis has also been placed upon creation of R&D facilities and drawing up of R&D programmes aimed at increasing productivity, reducing costs and introducing new products. A scheme drawn up by SAIL for establishment of a complex of R&D laboratories at Ranchi is under consideration of Government.

2.12. *Vizag Steel Plant.*—It is necessary in the context of the anticipated large deficit in availability of shaped products by 1982-83 to create additional steel making facilities. Government have examined the detailed project report of the Vizag Steel Plant. The ultimate capacity of the plant has been envisaged as 3 million tonnes. It is proposed to implement the project in phases, the first phase consisting of blast furnaces, a steel melting shop based on LD convertors and a merchant mill. Billets will also be produced for sale to re-rolling industry which has presently large idle capacity as also pig iron for sale. The main production units will be supported by various ancillary facilities. The estimated capital cost of the first phase is expected to be around Rs. 1000 crores with a foreign exchange component of about Rs. 250 crores. Discussions

have been held with the USSR for technical and financial collaboration in the project. The foreign exchange component would be found partly from the Rouble credit of 250 millions and partly through a scheme of production compensation which would meet part of the cost of purchase of plant, equipment and services from the Soviet Union, through the sale of pig iron and other products to them over a certain period. Discussions covering all these aspects are continuing with the USSR authorities. A Soviet team of specialists is also presently examining the detailed project report and proposed production plan.

2.13. *Reorganisation of Steel Authority of India.*—In the context of the challenges implicit in attaining high levels of production and productivity in the public sector steel plants, plans for their modernisation and diversification, and plans for further growth, Government reviewed the adequacy of the organisational and top management structure of the public sector steel industry. The Steel Authority of India had been organised as a Holding Company with the operating steel companies as subsidiaries in the form of Hindustan Steel and Bokaro Steel etc. The previous Government had also decided to break up HSL and transform the production units as new subsidiary companies. Activities not directly related to steel production such as design and engineering, construction, mining and supply of input materials, were brought within the purview of the holding company by making the companies providing these services viz. Metallurgical & Engineering Consultants (India) Ltd., Hindustan Steelworks Construction Limited, National Mineral Development Corporation etc. as subsidiaries of the Steel Authority of India. These latter companies, however, provided services and goods not only to the steel industry but to other industries in India and abroad. After a careful review of the working of SAIL, the Government came to the conclusion that the holding company concept had not proved a success and that its continuance would actually stand in the way of implementing the large present and future tasks devolving upon the public sector steel industry. The attention of top management would also be diverted to matters not entirely or directly related to the steel industry by having to oversee the functioning of companies like MECON, HSCL, NMDC etc. Government, therefore, came to the conclusion that the management and development problems of the steel industry could best be tackled by (a) forming an Integral Company having the main production units as divisions and not as subsidiary companies under it, and (b) removing from the purview of that company certain companies

which were subsidiaries and consequently bringing them under the direct control of the Ministry. Legislation to this effect was approved by Parliament. As a consequence, the Steel Authority of India now consists of only the main producing units, viz., Bhilai, Bokaro, Rourkela, Durgapur, Salem Steel Plants and Alloy Steels Plant and any new steel plants that may be approved by Government. Till the transfer of shares held by the public financial institutions is effected, IISCO remains a subsidiary of SAIL. It is expected that the formalities for the transfer of shares of the financial institutions will soon be completed, thus making IISCO also a division of SAIL and abolishing its status as a separate company. MECON, NMDC, Bharat Refractories Ltd. and HSCL whose activities are not exclusively in the field of steel have been placed under the direct charge of the Ministry. These changes will enable the top management of SAIL to devote its attention exclusively to the producing plants, to technological improvements and to development of new capacities.

2.14. *Plan Outlay.*—The Plan outlay for the Department of Steel in the current year is Rs. 569.32 crores. Out of this, Kudremukh Iron Ore Company accounts for Rs. 180.00 crores and SAIL Rs. 346.15 crores. For the year 1979-80, the Plan outlay has been fixed at Rs. 600 crores of which Kudremukh accounts for Rs. 127 crores and SAIL for Rs. 445 crores. The major continuing schemes in steel are (1) Expansion of Bokaro to 4 million tonnes and installation of a new cold rolling mill with finishing facilities, (2) expansion of Bhilai to 4 million tonnes, (3) Modernisation of the hot strip mill at Rourkela, (4) Installation of facilities for production of electrical sheets at Rourkela and (5) installation of cold rolling and finishing facilities for stainless steel at Salem. A major scheme approved during the year is expansion of the power plants at Bokaro and Durgapur. The Bokaro power plant is proposed to be augmented by 3 units of 60 MW each at an estimated cost of Rs. 76 crores. Similarly, a project for additional power generation facilities comprising 2 × 60 MW sets at Durgapur has been approved by Government. Tenders are being evaluated for the power plants and construction work is expected to start in right earnest in 1979-80.

2.15 As part of the process of modernisation of technology, a scheme for steel making through bottom blown oxygen converter has been approved by SAIL. The estimated cost of the project is about Rs. 14 crores. This is to be taken up first on an experimental basis at Durgapur.

2.16 *Kudremukh Project.*—The Kudremukh Iron Ore Project is progressing according to schedule and as presently foreseen, it should be able to meet its commitments to start shipping out concentrates to Iran by the scheduled date, viz., September, 1980.

2.17 *Rerolling Industry.*—The re-rolling industry in this country has large unused capacity and has various problems. Government have decided to set up a Committee to assess their capacity, study their problems and recommend measures for ensuring healthy growth of the industry.

2.18 *UNIDO Conference.*—In pursuance of the LIMA Declaration of March, 1975, the United Nations Industrial Development Organisation (UNIDO) had organised the First Consultation Meeting on the Iron and Steel Industry at Vienna in February, 1977, with the overall objective of exploring ways and means of increasing the total world steel production and, in particular, of raising the share of developing countries in world steel production through increased international cooperation. The Second Consultation Meeting was hosted by the Government of India and was held at New Delhi from 15th to 19th January, 1979. The Conference was inaugurated by the Minister of Steel and Mines and the Secretary of the Ministry was elected as its Chairman. In all, 155 delegates from 52 countries and 12 international agencies participated in the meeting.

The most important outcome of the Conference was that the developed countries accepted the necessity for the developing countries to augment steel making capacity, notwithstanding the fact that the steel industry in most of the Western countries as well as in Japan is presently passing through a recession. There was also unanimity that, for the development of the steel industry in the developing countries, finance was the most critical input. Similarly, there were problems of supply of raw materials, managerial inputs, exchange of technical information and training of manpower. It was, therefore, decided that a working group should be constituted under the auspices of UNIDO which will go into the question of 'resource mobilisation' for setting up steel plants in the developing countries as a total package including finance. This working group will consist of experts from the developed countries, developing countries and some of the international organisations.

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NON-FERROUS METALS

2.19 Unlike the steel industry, the raw materials for the development of which are available in plenty within the country, the prospects for expanding the production of non-ferrous metals, except for aluminium are not too bright on the basis of available geological data about occurrence of these ores. Government have, therefore, decided to give high priority to exploratory efforts by the GSI for non-ferrous ores. Besides, demands on the GSI are increasing, specially due to higher priority given now to irrigation and hydel power projects. The expertise with the GSI in the field of engineering geology is required in connection with the projects in these areas. The programme of systematic mapping of the country is also to be accelerated so that indications about potential resources of ores are available with a minimum loss of time. The GSI is also venturing on a larger scale into the fields of aerial photography, remote sensing, etc. Considering the increasing demands to be made on the GSI, and its own increasing resources of man-power and equipment, Government decided to effect a major re-organisation in the administration of the GSI. This has been done by constituting a Management Board consisting of the Secretary of the Ministry as Chairman and eminent earth scientists, management experts, etc. In order to speed up the process of decision making practically all the powers of the Ministry have been delegated to the Board of Management. Apart from overall supervision, it will be able to expeditiously consider the various problems of the GSI, give approvals where necessary and in the interest of maximising cost effectiveness, set up suitable systems of management of inventories, finances, equipment, etc. In order to strengthen the GSI and to upgrade its technical skills, a protocol has been signed with the USSR which envisages assistance from that country in the desired areas. Similar assistance is being sought from other countries also.

2.20 Reorganisation of the Indian Bureau of Mines has also been contemplated so that it is in a position to augment its capabilities in the field of ore dressing and beneficiation and take up more investigations and be of greater assistance to mining projects both in the public and the private sectors.

2.21 Coming to the production units in the Ministry, with a view to tackling the serious technological problems encountered by the Hindustan Copper Ltd, they were authorised by the Government to obtain technical assistance from a leading Japanese producer of copper. As a result of the sustained efforts

made by this firm and by the management, a significant breakthrough in the production of copper has been achieved very recently. The levels of production at Khetri and Ghatsila have in the last three months been the highest since these projects were set up. The cost of production of copper at Khetri is, however, higher than at Ghatsila; one of the reasons for this is the unexpectedly low grade of ore in its captive mines. Its cost of production can be reduced and in-built capacity brought to a stage of fuller utilisation only by developing a new mine. It is in this context that Government have sanctioned the construction of a new mine together with facilities for the production of concentrates at Malanjkhand in Madhya Pradesh at an estimated cost of Rs. 92 crores. Work on the project is in full swing and it is expected to go into commercial production in about 3½ years time. The concentrates at Malanjkhand would be fed to the smelter and refinery at Khetri. Apart from this project, another component of the development strategy in copper is to evolve processes for recovering strategic and valuable metals such as cobalt, tellurium, molybdenum and maximising the recovery of gold, silver, nickel, etc. A protocol has been signed with the USSR for technical assistance in this regard.

2.22 With the completion of the Vizag zinc and lead smelter, the production of zinc and lead has increased in the current year to record levels. The increase in output in respect of zinc compared to the previous year is expected to be 55% and in respect of lead 48%. Yet higher targets have been fixed for 1979-80, the target for zinc being 73,000 tonnes and for lead 15,000 tonnes. Unlike copper and lead where indigenous production is sufficient only to meet about 30% of the total demand, with the level of production expected in 1979-80 of zinc, internal demand would be met by indigenous production to the extent of 67%. It may be mentioned here that a project for producing 6400 tonnes of lead at a cost of Rs. 12 crores has been sanctioned at Sargipalli in Orissa. The concentrates produced there from run-of-mine ore will be treated at the smelters at Vizag and Tundoo which can be expanded at a very low cost. Feasibility studies for such expansion have already been commissioned. Apart from these developments in the matter of copper, zinc and lead, the emphasis will be, in the coming years, on upgrading technology including increasing the recovery of metals, enhancing efficiencies, etc., through installation, where necessary, of balancing equipment and initiating R&D programmes. The only major continuing scheme of lead and

zinc is the development of a 3000 tpd mine with matching concentrator at Rajpura-Dariba. A scheme for detailed exploration of Baroi lead-zinc deposit has also been sanctioned.

2.23 The only non-ferrous metal in which India has a large installed capacity, enough to meet the country's demand, and for which there are very extensive deposits of ore, is aluminium. Unlike in developed countries, aluminium finds extensive use in the distribution of electrical energy in the country. About 55% of the total production of aluminium is used for the manufacture of cables and conductors required for the power industry. The importance of this metal and the demand for it will, therefore, increase rapidly in the coming years because of the proposed very large investments and high priority given to the power sector by Government. It has been estimated that by 1983-84, the demand for the metal will be 4,05,000 tonnes and 5,95,000 tonnes by 1987-88. The present installed capacity is 3,30,000 tonnes, which, however, is not fully utilised because of power constraint. The production in the current year which is expected to be 215,000 tonnes is a marked improvement over the previous year's production of 179,000 tonnes showing a growth rate of 20%. This has, however, fallen short of demand so much so that large scale imports to the tune of about 40,000 tonnes have been resorted to in the current year for the first time in the history of the country. In the year 1979-80, production has been placed at 240,000 tonnes but because of the anticipation that demand will even be higher than in the current year, larger imports are planned to be made in 1979-80. Action to effect such imports is already in hand so that metal is readily available. These imports which consume valuable foreign exchange could be minimised, if not avoided altogether, if only adequate power to enable full utilisation of the existing smelter capacity could be made available by the Electricity Boards. The major sufferer on this account has been the only public sector concern, *viz.*, Bharat Aluminium Company Ltd., whose production this year is expected to be only 32,000 tonnes against an installed capacity of 100,000 tonnes; even next year the production at the Korba Plant of BALCO is not likely to be more than 40,000 tonnes due to power constraint. This poor capacity utilisation is on account of the inability of the M.P. State Electricity Board to supply requisite quantity of power. As a result, in the scheme of price control also, BALCO has had to be given a much higher retention price compared to other producers, thus leading to a higher price to the consumer than need be if its capacity were fully utilised. While in the short

term, existing capacity might be adequate to meet demand if power were available, there is no doubt that in the context of the five year and ten year projections, large additional capacity will have to be created. Where and how exactly this capacity should be created is engaging the attention of Government. Feasibility studies for construction of an alumina/aluminium complex in Orissa and an alumina plant in Andhra Pradesh based on the extensive deposits of bauxite that have been found in these States, which were entrusted to M/s Aluminium Pechiney of France and to the USSR respectively, are in an advanced stage of completion and are expected to be available by May-June of this year. The preliminary assessment reports of A.P and of bauxite reserves from the USSR have been received. The reports are quite encouraging.

2.24 The Government is aware that aluminium is the metal of the future; the development of this industry is, therefore, being given all the attention by the Government so that India can attain a pre-eminent position in the world aluminium industry in the next decade.

2.25 During the year under review, a significant change was made in the dual pricing policy which was in existence till October. The main components of this policy were (a) controlled price for EC grade aluminium based on cash costs only, (b) freedom to producers to sell CG grade aluminium at prices to be fixed by them and through which they were expected to recover the depreciation and interst on EC grade aluminium also, (c) differential rates of excise duty on EC and CG grades with a view to securing near parity of their respective price, (d) a subsidy of Rs. 3,150 per tonne to the State Electricity Boards on the EC grade aluminium consumer by them, (e) fixation of much higher rates for supply of power than prevailed till 1975. These rates differ from State to State based on the mix of hydel and thermal power. This policy was framed in the expectation that Electricity Boards, with the upward revision of power tariffs, will have the necessary incentive to supply more power to the smelters. This expectation has however not been fulfilled. The dual pricing policy also led to the Electricity Boards showing reductance to 1 : ft imported EC grade metal on which no subsidy was admissible.

2.26 On the basis of a study made by the BICP, the pricing policy was changed. The main features of this policy are :

(i) Fixation of retention prices for both EC and CG grade metals with a differential of only Rs. 100 per

tonne in favour of EC grade. The retention prices have been so fixed as to meet the full cost and provide a return related to the extent of capacity utilisation upto a maximum of 12% post tax.

(ii) Removal of subsidy on supplies to the Electricity Boards.

As has been mentioned earlier, large imports of aluminium have had to be resorted to. The landed cost of aluminium is higher than the cost of indigenously produced aluminium to the consumer. Therefore, the import duties have been regulated on each shipment in such a manner that the landed cost of imported aluminium is the same as the pooled price of indigenously produced aluminium. It is proposed to continue this policy of making available aluminium, whether imported or indigenously produced, at a uniform price.

PART II

DEPARTMENT OF STEEL

CHAPTER I

PLANNING AND DEVELOPMENT IN THE STEEL SECTOR

1.1 The progressive increase over the years in the installed capacity for steel making in the integrated steel plants in terms of ingot steel is shown in the table below :

(In million tonnes)

Five Year Plan	year ended	Installed capacity at the end of the Plan.
1	2	3
First	31 March 1956	1·5
Second	31 March 1961	6·0
Third	31 March 1966	8·9
Fourth	31 March 1974	8·9
Fifth	31 March 1978	10·6

1.2 The draft Fifth Five Year Plan centered round the expansion of Bhilai Steel Plant from a capacity of 2.5 million ingot tonnes to 4.0 million ingot tonnes and the continuance of work on Bokaro Steel Plant to ultimately achieve a capacity of 4.75 million ingot tonnes by 1978. Taking into account the production build-up in the expanded plants and maximum capacity utilisation in the existing plants, it was estimated that about 8.8 million tonnes of saleable mild steel would be available by 1978-79. In addition, about 1 million tonnes of mild steel bars and rods were expected to be available from the electric furnace units by 1978-79. Work on three new Steel Plants at Visakhapatnam, Vijayanagar and Salem was also planned to be taken up.

In the Mid-term Appraisal of the Fifth Five Year Plan (June, 1976) the targets of installed capacity at the end of 1978-79 were placed at 12.90 million tonnes of ingot steel and 9.865 million tonnes of saleable steel. The targets of produc-

tion for that year were 10.15 million tonnes of ingot steel and 7.74 million tonnes of saleable steel.

During the Fifth Five Year Plan which terminated on 31st March, 1978, 1.7 million tonnes stage of Bokaro Steel Plant was commissioned, thereby increasing the total installed capacity to 10.6 million tonnes of ingot steel at the end of the Fifth Plan. The actual production in the last year of the Fourth Plan and in each year of the Fifth Plan is indicated below :—

(In '000' tonnes)

Year	Ingot Steel	Saleable Steel
1973-74	5722	4353
1974-75	6262	4901
1975-76	7251	5779
1976-77	8428	6922
1977-78	8424	6894

1.3 In order to formulate policies and programmes for the five-year period, 1978–83, the Planning Commission set up a Working Group on Iron and Steel under the Chairmanship of Secretary, Steel and Mines, in September, 1977. One of the terms of reference of the Group was to assess the demand in 1982-83 and in 1987-88 and to recommend levels of capacity and production for these two years taking into account the desirable levels of self-sufficiency and the gestation period of the projects. The Group submitted its report in February, 1978 which was taken into account in formulating the Draft Five Year Plan 1978—83. According to the Draft Plan, the demand for saleable mild steel is expected to rise to 10.90 million tonnes by 1982-83 and 15.4 million tonnes by 1987-88. Production is projected to go up to 11.8 million tonnes in 1982-83. While production will be in excess of aggregate demand, there will however, be imbalances as between categories of steel. The demand for shaped products is expected to out-strip supply by 1982—83 but flat products would continue to be in surplus till 1987-88.

The Draft Plan makes provision for an out-lay of Rs. 2491 crores for the steel plants including approximately Rs. 1976 crores on the on-going projects. The important schemes included in the Plan are the following :—

(i) Completion of current expansion programmes of Bhilai and Bokaro Steel Plants to a capacity of 4.0 million ingot tonnes each.

(ii) Further expansion of Bokaro Steel Plant to a capacity of 4.75 million ingot tonnes.

(iii) Setting up of a plant at Rourkela to produce 37,500 tonnes of cold rolled grain-oriented electrical steel sheets and 36,000 tonnes of cold rolled non-grain-oriented sheets per annum to meet the requirements of the electrical industry.

(iv) Completion of the first phase of Salem Steel Plant to produce 32,000 tonnes of cold rolled stainless steel sheets/strips.

(v) Provision of additional melting facilities at Alloy Steels Plant, Durgapur to increase the existing capacity from 1,00,000 ingot tonnes of alloy steels to 1,60,000 tonnes.

(vi) Modernisation and replacement of equipment in the existing steel plants to maintain their technical and physical health.

(vii) Measures for updating of technology and replacement of obsolescent processes.

(viii) Research & Development schemes for achieving higher productivity in steel plants.

(ix) Installation of an experimental plant for producing sponge iron using solid reductants.

(x) Augmentation of captive power generating capacity with a view to minimising the effects of restrictions on power supply by public utilities on the production of steel. Schemes for the installation of 3×60 MW Coal-based thermal generating units at Bokaro Steel Plant and 2×60 MW Thermal generating units at Durgapur (for Durgapur Steel Plant and Alloy Steels Plant) have been sanctioned at a total cost of Rs. 130.85 crores.

(xi) Production of cement for economic utilisation of blast furnace slag from Bhilai and Rourkela Steel Plants.

(xii) Creation of certain nucleii for additional steel capacity to be realised in subsequent plan periods.

1.4 Against the apparent consumption of 7.102 million tonnes of saleable mild steel in 1977-78, the consumption for 1978-79 has been estimated at 8.221 million tonnes, a growth of 15.8%.

The overall availability of steel in the country in the current year would compare favourably with the overall availability in 1977-78. The production from the integrated steel plants in 1977-78 was 6.894 million tonnes and from the mini steel plants about 0.957 million tonnes, making a total of 7.851 million tonnes. While the production from the integrated steel plants in 1978-79 is expected to be 6.560 million tonnes only on account of a number of unfavourable factors mentioned elsewhere, the production from the mini steel plants is estimated to be around 1.50 million tonnes. Further, while the imports in 1977-78 were only 0.348 million tonnes, the arrivals of imported materials during 1978-79 are expected to be about 0.817 million tonnes. At the same time, the exports in 1978-79 would be only about 0.560 million tonnes as against 1.1 million tonnes in 1977-78. Thus, there would be additional availability of steel in 1978-79, to the extent of 15.8%.

1.5 In May, 1978, Planning Commission reconstituted the Working Group on Iron and Steel under the Chairmanship of Secretary, Steel and Mines to give it a wider coverage. Among other things, the Group was to make an assessment of the demand in 1983-84 and 1988-89 and to recommend appropriate levels of capacity and production. Based on the demand forecasts of the Perspective Planning Division of the Planning Commission for the years 1983-84 and 1988-89, the Group has given the following demand and availability projections :—

(In million tonnes)

Particulars	1983-84		Surplus (+)/gap (—)	1988-89		Surplus (+)/gap (—)
	Demand	Availability		Demand	Availability	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Shapes .	6·960	5·725	(—)1·235	9·745	9·363	(—)0·382
Flats .	4·367	5·018	(+)0·651	6·300	6·603	(+)0·303
Railway Materials .	0·400	0·550	(+)0·150	0·450	0·557	(+)0·107
TOTAL : .	11·727	11·293	(—)0·434	16·495	16·523	(+)0·028

1.6 The availability from the integrated steel plants has been worked out on the basis of capacity and output in terms of ingot steel as indicated below :—

Plant	1983-84		1988-89	
	Capacity	Out-put	Capacity	Out-put
Bhilai Steel Plant . . .	4000	3100	5500	4950
Durgapur Steel Plant . .	1600	1280	1600	1280
Rourkela Steel Plant . .	1800	1620	1800	1620
Bokaro Steel Ltd. . .	4000	3600	5500	4950
IISCO	1000	800	1000	800
TISCO	2200	2000	2200	2100
VIZAG	Nil	Nil	3000	2700
TOTAL	14600	12400	20600	18400

1.7 The availability of saleable steel in 1983-84 has been worked out on the basis of optimum production from the existing steel plants with technological and other improvements and additional investments and takes into account the net contribution of about 1.45 million tonnes from the secondary producers and mini steel plants.

1.8 The availability in 1988-89 is only indicative and has been worked out on the following assumptions :—

(a) The existing steel plants will be working to their optimum capacity levels varying between 80% and 95% in the different plants;

(b) Bokaro Steel Plant would have raised its capacity and out-put to a level of 5.5 MT of ingots;

(c) Bhilai Steel Plant would have raised its capacity to a level of 5.5 MT of ingots and

(d) The new steel plant at Visakhapatnam would have developed to its full rated capacity of 3.0 MT of ingots.

A net contribution of about 2.33 MT from secondary producers and mini steel plants has been assumed.

1.9 Government have lately been considering the feasibility of setting up three shore-based plants. Discussions are continuing with a number of countries such as USSR, Romania, France West Germany and the U.K. on the parameters of technical and financial collaboration that they could offer.

CHAPTER II

PRODUCTION AND DISTRIBUTION

OVER-ALL PRODUCTION OF STEEL IN 1978-1979

2.1.1 The production of saleable steel from the integrated steel plants in the first 10 months of year 1978-79 totalled 5.422 million tonnes as compared to the production of 5.754 million tonnes in the same period last year. For the year as a whole, saleable steel production is estimated at 6.560 million tonnes which will be short of the production of 6.894 million tonnes in 1977-78 by 4.8%.

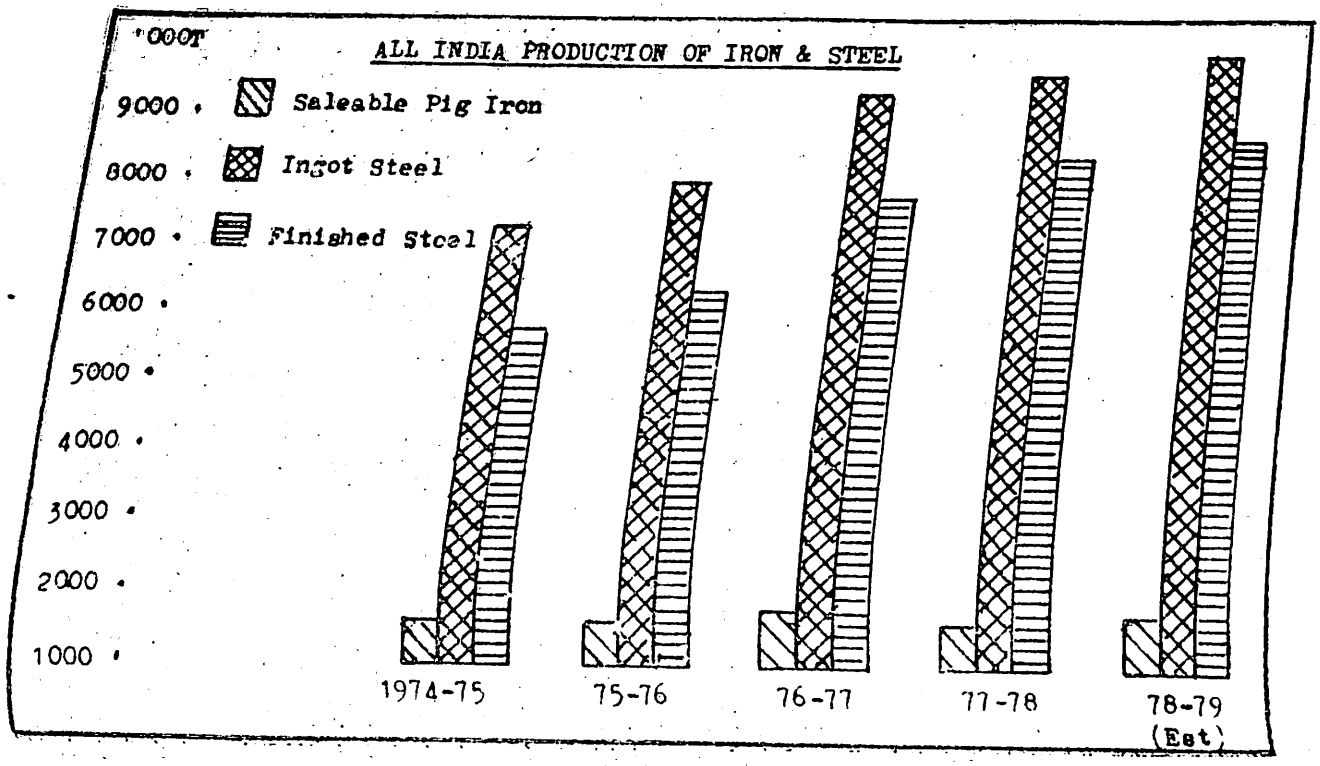
2.1.2 Including the estimated production of mild steel from the electric arc furnace units and of alloy steels, the total production of saleable steel during 1978-79 is expected to be 8.404 million tonnes as against 8.109 million tonnes in the preceding year.

2.1.3 Category-wise details of production of saleable pig iron and steel during the last 5 years are given in Appendix I. Charts showing production target fulfilment and capacity utilization are also given on pages 40-42.

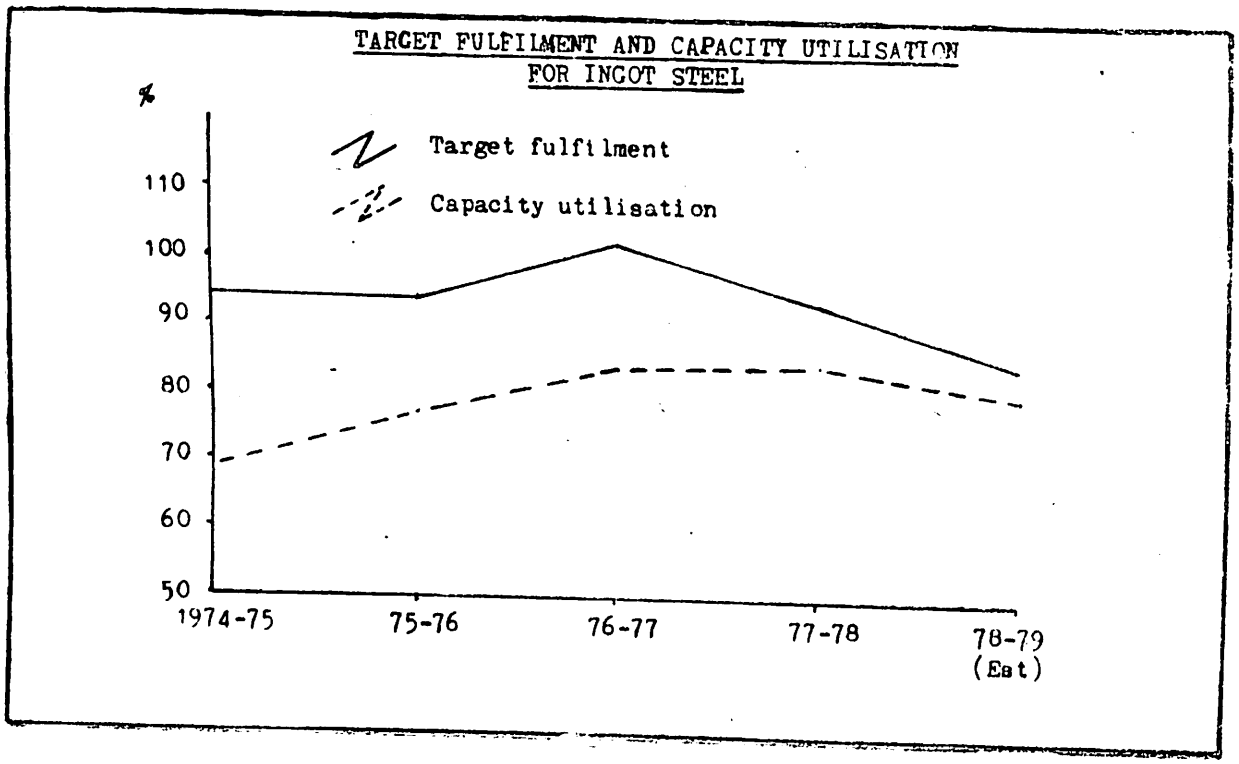
2.2 *Distribution*

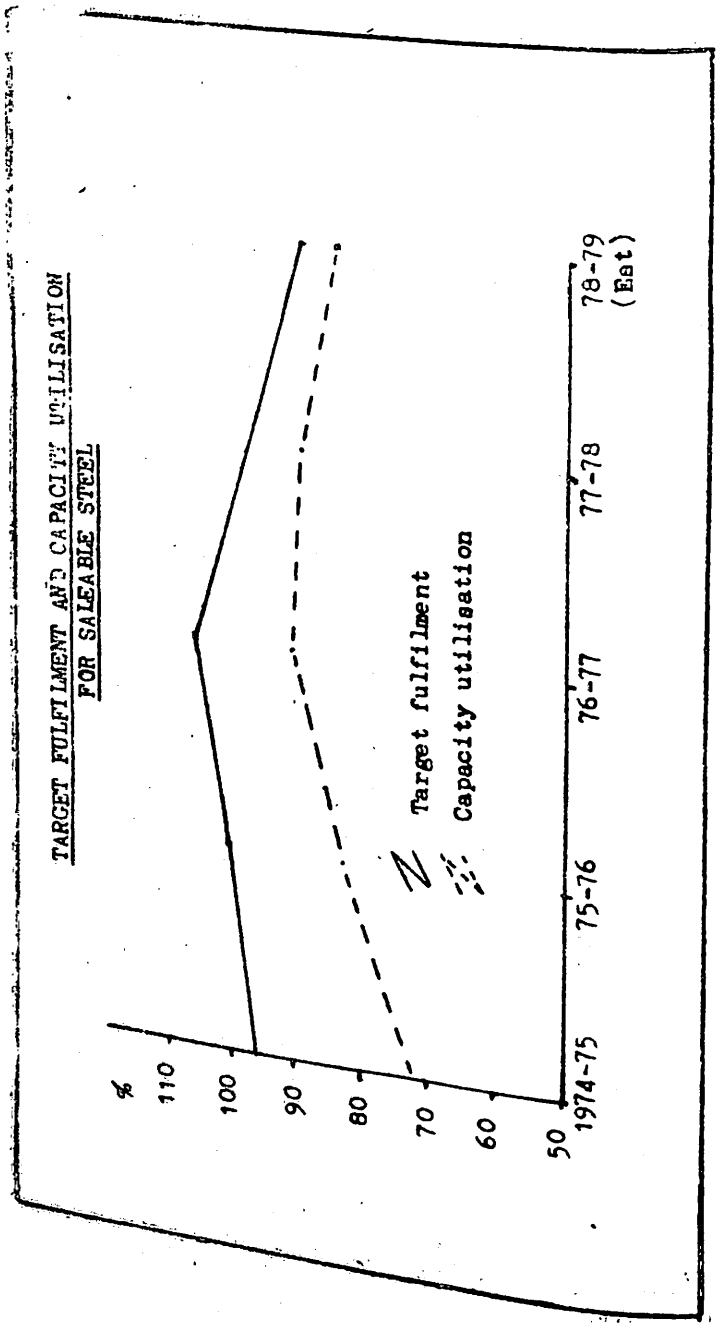
2.2.1 While the production of saleable steel (including that of mini steel plants) is a little more than what it was during last year, there has been an increase in the demand also. This has resulted in shortage of a number of items such as plates, sheets and structurals. The distribution policy for steel had, therefore, to be reviewed from time to time, keeping in view the shortages which had occurred in respect of some categories.

2.2.2 In the case of billets and re-rolling materials, a rational distribution formula was evolved in consultation with the representatives of re-rollers, taking into consideration past off-take, capacity of the individual units and the export commitments of the re-rollers. Similarly, in the case of hot rolled coils and skelp, a procedure for distribution was evolved in consultation with the Department of Heavy Industry, Ministry of Commerce and DGTD in the light of past off-take, capacity and export commitments.


'000T
ALL INDIA PRODUCTION OF IRON & STEEL
9000
8000
7000
6000
5000
4000
3000
2000
1000
Saleable Pig Iron
Ingot Steel
Finished Steel
1974-75
75-76
76-77
77-78
78-79
(Est)

986S&M/78


TARGET FULFILMENT AND CAPACITY UTILISATION
FOR INGOT STEEL
%
Target fulfilment
Capacity utilisation
110
100
90
80
70
60
50
1974-75
75-76
76-77
77-78
78-79
(Est)



2.2.3 Special consideration was given to the needs of the small scale sector. Supplies to the State Small Industries Corporations, through whom the supplies to the small scale units are mainly routed, have been considerably stepped up. The supply to each Corporation is based on their off-take during the best year in the recent past. The Iron & Steel Controller has been made responsible for monitoring supplies to these corporations on a month to month basis. The despatches to these Corporations from April to December, 1978, were 2,08,950 tonnes as against 1,76,000 tonnes during the whole of 1977-78.

2.2.4 The prices of different categories of steel were revised with effect from the 5th June, 1978, to provide for :

(i) escalations in cost of production;

(ii) increased incidence of freight on account of increase in lead;

(iii) fair return to main producers; and

(iv) to find resources for modernisation, development and rehabilitation of the steel industry and to lessen its dependence on support from the Central Budget.

The difference between the stockyard prices and the JPC prices was brought down to a uniform level of Rs. 35/- per tonne only. Earlier, this difference used to be substantial, with the result that a consumer getting steel in rake loads from the plants direct at JPC prices (such consumers were mostly in the large scale sector) was at a considerable advantage compared to smaller units taking material from the stockyards. To help the small scale units, Government have decided that steel should be supplied to the SSI Corporations at a concessional price, on condition that they in turn would supply steel to the SSI Units at a price which is Rs. 40/- per tonne less than the stockyard price. In effect, therefore, the small scale units are now getting steel from the SSI Corporations at a price which is slightly lower than the JPC price.

2.2.5 While revising prices w.e.f. 5th June, 1978, it has been provided that the contracts entered into by exporters prior to that date would be protected by re-imbursing to them the excess over the pre-revised price plus 10%.

2.2.6 Last year, a system was introduced for the despatch of pig iron in rakes to groups of consumers and/or their Associations to one destination, in rake loads. This system has been

continued with the result that at present the major portion of home sales of pig iron is by direct despatches from the plants.

2.2.7 Taking into consideration the transport difficulties in the North-Eastern region, SAIL has started, since July 1978, delivery of steel materials by road to all State capitals in the North-Eastern region without any additional cost to the consumers.

2.3 *Imports*

2.3.1 1978-79 witnessed further liberalisation in the procedure and content of the import policy compared to the previous year. A large number of items have been placed under Open General Licence facility for actual users. Issue of release orders for canalised items has been dispensed with. Items which are produced in the country have been placed in the restricted list so that automatic import licensing facility for these items is limited to 110% of the imported consumption in the past. For additional requirements, the import requests are considered by the Supplementary Licensing Committee. While bringing about changes in policy, adequate precautions have been taken to ensure that the industries are not put to difficulty during the transitional period.

2.3.2 SAIL is the agency for import of all canalised items of steel other than stainless steel plates, sheets and strips which are with MMTC. MSTC continued to be the canalising agency for import of ferrous scrap including re-rollable scrap in the form of old ships for breaking.

2.3.3 The policy provided for liberal imports of various categories of steel the production of which was not sufficient to meet demand. However, due to rise in demand as well as some shortfall in production, substantial additional imports had to be made under the buffer stock programme. The following are the main categories in which shortages occurred :

(i) MS/HT Plates

(ii) Structurals

(iii) HR Sheets/Coils

(iv) CR Sheets/Coils

(v) GP/GC Sheets.

2.3.4. SAIL was authorised to take advance action to import 4,69,000 tonnes of steel in the above categories and 75,000 tonnes of ingots. These imports (5,44,000 tonnes) have been exempted from payment of customs duty and it has been decided to subsidise the imports to the extent SAIL is required to pay the countervailing excise duty. The entire quantity of 4,69,000 tonnes and some quantities of ingots are expected to arrive before 31st March, 1979. In addition, SAIL has been importing canalised items to meet the requirements of the users who register their requirments with SAIL. In all, SAIL has planned import of over 800,000 tonnes of steel during the current year including the duty exempted buffer import of 5,44,000 tonnes.

The above exemptions in fiscal levies were given as the c.i.f. prices were appreciably higher than domestic prices. In pursuance of Govt.'s policy to sell these actegories of steel, whether from domestic production or imports, at equalised or pooled prices, a surcharge of Rs.100/-per tonne was levied on sales of domestic production.

2.3.5 Details of total imports of iron and steel during 1977-78 (provisional) and the preceding two years are given in the appendix II.

2.4 *Export*

2.4.1 Export policy for iron and steel and ferro-alloys for the year 1978-79 was formulated keeping in view the growing demand in the domestic market. Exports were generally restricted to those categories where there were exportable surpluses. In view of increased domestic demand, export during 1978-79 of items like structurals, GP/GC Sheets etc. was restricted to the extent of past commitments. Export of iron and steel and ferro-alloys continued to be canalised through SAIL.

2.4.2 In order to give a boost to production by mini steel plants and also to utilise the large capacity in the re-rolling sector, export of bars and rods and wire rods rolled out of concast billets/poncil ingots was allowed without any specific quantity restriction.

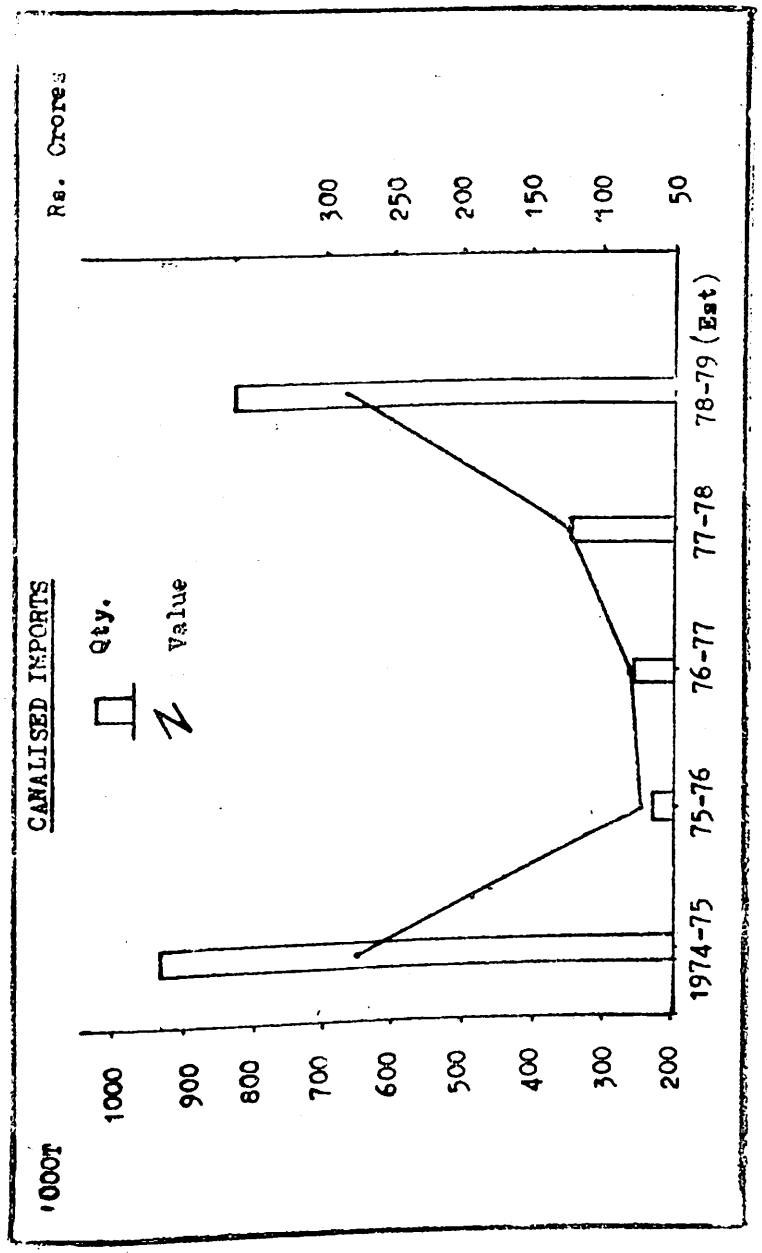
2.4.3 The country's exports of iron and steel and ferro-aloys during 1977-78, 1978-79 (April-December, 1978) and anticipated during 1978-1979 are given below :—

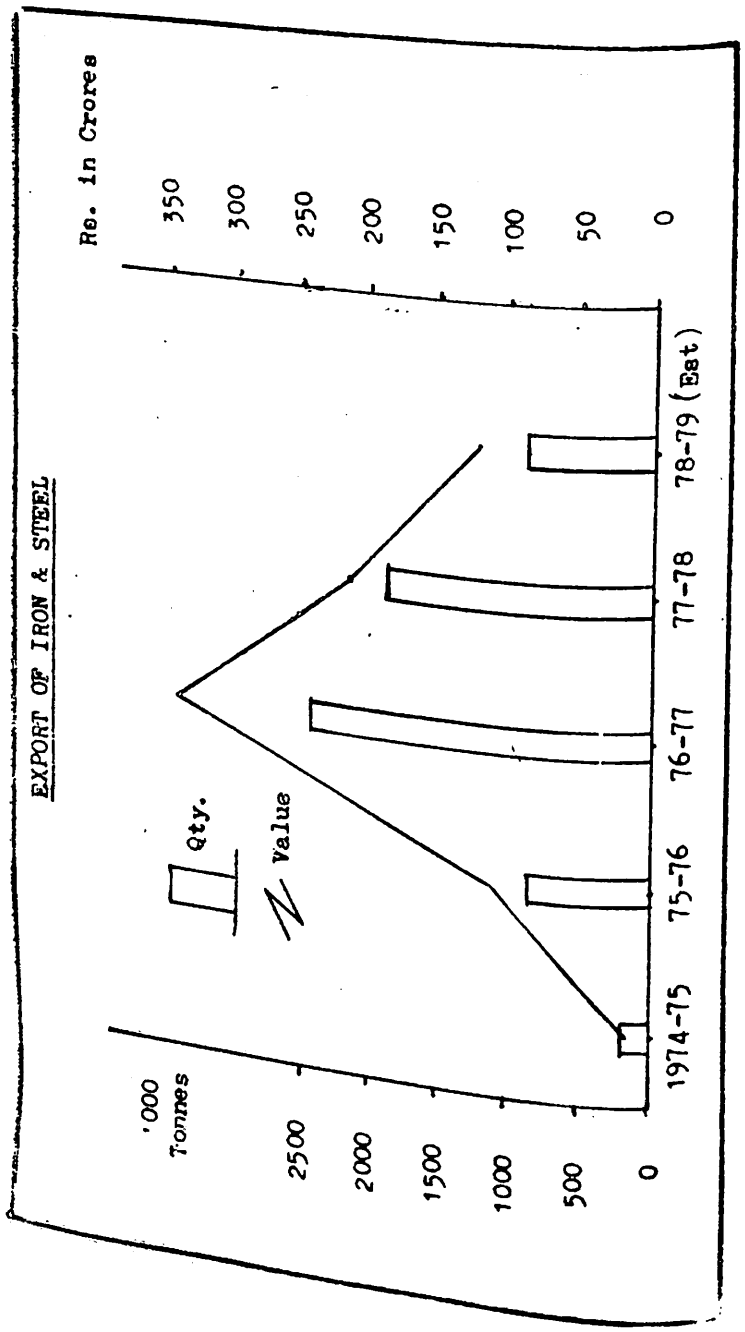
Quantity : In MT
Value : In Rs Crores

	1977-78		1978-79 (April—December, 1978		Anticipated exports during 1978-79
	Qty.	Value	Qty.	Value	Qty.
Pig iron ..	6,98,891	44·81	1,90,220	13·73	2,81,000
Steel ..	11,00,811	186·21	4,24,003	85·46	6,82,000
Ferro-Alloys.	70,622	10·11	1,04,682	17·62	1,50,000

2.4.4 A category-wise break-up of these exports is given in Appendix III. It may be observed that estimated exports of pig iron and steel during 1978-79 are about 46% lower in terms of quantity as compared to the exports during 1977-78. On the other hand, exports of ferro-alloys during April-December, 1978 has already surpassed the total quantity of ferro-alloys exported during 1977-78.

Charts showing canalised imports & exports are also provided at pages 47-48.





CHAPTER III

THE PUBLIC SECTOR

1. *STEEL AUTHORITY OF INDIA LIMITED*

3.1.1 *Restructuring of Public Sector Steel Industry*

As a result of review of the previous Government's decision to restructure Hindustan Steel Limited and of the organisational structure and functioning of steel plants under Steel Authority of India Limited, it was decided by Government that it would be conducive to the efficiency of the steel industry if public sector steel plants were brought under the over-all control of an integral company keeping all activities which were not directly related to steel production outside its purview. This would enable the integrated company to concentrate attention on steel producing units and ensure better management of and greater efficiency in their working. Further, having regard to the nature of the activities not directly connected with steel production and their future potential, it would be advantageous if the concerned units/companies functioned directly under Government and not as subsidiaries of a Holding Company. Accordingly, certain structural changes in the organisational set-up of SAIL have been brought about by Government through the Public Sector Iron and Steel Companies (Restructuring) and Miscellaneous Provisions Act, 1978, which came into effect on 1st May, 1978. These changes are detailed below :—

(i) Hindustan Steel Limited, Bokaro Steel Limited, Salem Steel Limited, SAIL International Limited, Bhilai Ispat Limited, Rourkela Ispat Limited and Durgapur Mishra Ispat Limited which were wholly-owned subsidiaries of SAIL have been dissolved and merged in SAIL.

(ii) The shares held by Government in Indian Iron and Steel Company Limited have been transferred to SAIL thus making it a subsidiary of SAIL.

(iii) The share capital of Metallurgical & Engineering consultants (India) Ltd., Hindustan Steel Works Construction Limited and National Mineral Development Corporation Limited, wholly owned subsidiaries of SAIL, has been transferred to the Central Government. Accordingly, these companies ceased to be subsidiaries of SAIL and have come under the direct administrative control of the Ministry. Kiriburu and

Meghahataburu Iron Ore Mines of NMDC have, however, been transferred to SAIL to serve as captive units of Bokaro Steel Plant.

(iv) All the share held by Bokaro Steel Limited in the share capital of Bharat Refractories Limited, its wholly-owned subsidiary, were transferred to the Central Government. Accordingly, Bharat Refractories Limited has become an independent Company under the direct control of the Ministry. The Ramgarh Refractory Plant, Bhilai Refractory Project and Sillimanite Mines situated in the State of Meghalaya, all belonging to HSL, have been transferred to Bharat Refractories Limited. Further, all the shares held by SAIL in the share capital of India Fire-bricks & Insulation Company Limited have been transferred to Bharat Refractories Limited thus making it a subsidiary of the latter.

(v) The immovable properties owned by Hindustan Steel Limited at its Head Office at Ranchi together with liabilities and obligations in relation thereto have been transferred to MECON.

3.1.2 The Articles and Memorandum of Association of SAIL have been amended suitably.

3.1.3 As a result of the above changes, SAIL has now emerged as the main integrated steel company with four of the integrated steel plants in the public sector as its constituent divisional units and one as its subsidiary, with maximum autonomy consistent with accountability.

In pursuance of the provisions of the Bolani Ores Limited (Acquisition of Shares) and Miscellaneous Provisions Act, 1978, the shares held by Orissa Minerals Development Company Ltd., in Bolani Ores Limited, a subsidiary of SAIL, were to be transferred to SAIL and the Company was to be dissolved and amalgamated with SAIL with effect from 1st Jan., 1979. However, the enforcement of the Act was stayed by the Supreme Court by its Order dated 2nd Jan. 1979.

3.1.4 *Finance*

With a view to facilitating smooth transfer of the undertakings under the Act and to avoid preparation of accounts for the month of April, 1978, separately, the financial year 1977-78 of SAIL

and some of its former subsidiaries has been extended to cover a period of 13 months upto 30th April, 1978.

3.1.5 The authorised capital of SAIL as the Holding company continued to be Rs. 2000 crores in 1977-78. Its paid-up capital went up from Rs. 1557.14 crores as on 31st March, 1977, to Rs. 1980.31 crores as on 30th April, 1978 (excluding share money pending allotment amounting to Rs. 94.24 crores). The authorised capital has been increased to Rs. 2,500 crores with effect from 30th August, 1978.

3.1.6 Government loans amounting to Rs. 64.63 crores were advanced to the Company during 1977-78 for its subsidiaries. The total amount of Government loans outstanding as on 30-4-1978 was Rs. 372.38 crores.

3.1.7 An amount of Rs. 1.24 crores was given as grant in aid by Government in 1977-78 to enable the Company to meet expenditure on Research and Development.

3.1.8 The Company's investments increased from Rs. 1551.68 crores as on 31st March, 1977, to Rs. 1,687.84 crores as on 30th April, 1978. The equity investment position in the various companies in which it has interest, is indicated below :—

(Rs. in lakhs)

Name of the company/subsidiary	As on 31-3-77	As on 30-4-78
1 2	3	4
1. Hindustan Steel Ltd.	81 985·00	94,288·41
2. National Mineral Development Corporation Limited	9,562·03	9,952·03
3. Bokaro Steel Limited‡	60,052·16	60,062·53
4. Hindustan Steel Works Construction Ltd.	300·00	500·00
5. Salem Steel Limited	1,252·53	1,837·53
6. Bolani Ores Limited	50·50	50·50
7. Metallurgical & Engg. Consultants (India) Ltd.	0·05	0·05
8. Metal Scrap Trade Corp. Ltd.	16·00	16·00
9. India Firebricks & Insulation Co. Ltd.	*	*
10. SAIL International Ltd.	1·00	1·00
11. Bhilai Ispat Ltd.	41·68	41·68
12. Rourkela Ispat Ltd.	41·68	41·68
13. Durgapur Mishra Ispat Ltd.	16·64	16·64
	1,53,319·27	1,66,808·05

1	2	3	4
	Other Companies		
14.	Mandovi Pellets Ltd.	127·50	255·00
15.	Indian Iron & Steel Co. Ltd.	106·54	106.54
16.	Manganese Ore (India) Ltd.	36·62	36·62
17.	Visvesvaraya Iron & Steel Ltd.	1,578·00	1,578·00
	Grand Total	1,848·66	1,976·16
		1,55,167·93	1,68,784·21

†Investment in Bokaro Steel Ltd. includes investment in Bharat Refractories Limited.
*The investment is Rs. 20 only.

3.1.9 The total revenue expenses of the Company for 1977-78 amounted to Rs. 1723.75 lakhs as compared to Rs. 842.89 lakhs in 1976-77. The increase was mostly due to increase in interest on loans which amounted to Rs. 1542.25 lakhs as against Rs. 771.78 lakhs in 1976-77. The Company incurred a loss of Rs. 87.36 lakhs after providing for preliminary expenses and accumulated losses amounting to Rs. 96.95 lakhs relating to Bhilai Ispat Ltd., Rourkela Ispat Ltd. and Durgapur Mishra Ispat Ltd. against a surplus of Rs. 2.58 lakhs in the year ending 31st March, 1977.

3.1.10 The working results (before tax) of the subsidiaries of SAIL for the year 1977-78 are indicated below :—

(Rs. in crores)

Name of subsidiary	1976-77	1977-78
1. Hindustan Steel Ltd.	(+)67·46	(+)46·78
2. Bokaro Steel Ltd.	(+)1·76	(—)10·10
3. SAIL International Ltd.	(+)4·48	(+)4·41
4. National Mineral Dev. Corpn. Ltd.	(—)1·77	(—)11·77
5. Hindustan Steel Works Const. Ltd.	(+)1·01	(+)0·14
6. Metallurgical & Engg. Consultants (India) Ltd.	(+)0·92	(+)2·15
7. Bharat Refractories Ltd.	(—)0·23	(—)0·37
8. Indian Firebricks & Insulation Co. Ltd.	(—)0·20@	(—)0·51
9. Metal Scrap Trade Corpn. Ltd.	(+)0·30	(+)0·16
10. Bolani Ores Limited	(—)0·47£	(—)1·63
Total	(+)73·26	(+)29·26

NOTE:—Expenditure during the year on Bhilai Ispat Ltd., Rourkela Ispat Ltd. and Durgapur Mishra Ispat Ltd. was only a few thousands of rupees.
(2) The accounts of companies at serial No. 1, 2, 3, 4 and 6 are for thirteen months April 1977 to April 1978.
@ Relates to 11 months period from May-1976 to March 1977.
£ Relates to 18 months period ended 31-3-1977.

Working of important erstwhile subsidiaries

3.1.11 *Hindustan Steel Limited*

The authorised capital of the Company was raised from Rs. 850 crores to Rs. 1000 crores during the year 1977-78. Its paid up capital which was Rs. 819.85 crores as on 31-3-1977, went up to Rs. 942.88 crores as on 30-4-1978.

3.1.12 An amount of Rs. 26.00 crores was drawn as loan from SAIL for meeting expenditure on capital schemes and Rs. 1.24 crores as grant-in-aid to meet expenditure on Research & Development Schemes. Rs. 81.24 crores and Rs. 64.15 crores were repaid during the year towards borrowings from Government and SAIL, leaving a balance of Rs. 255.00 crores and Rs. 5.0 crores respectively as on 30-4-1978.

3.1.13 The total gross-turn-over of the Company in 1977-78 (13 months) was Rs. 1179.17 crores as against Rs. 1060.66 crores in 1976-77 (12 months). The sales realisation from imported stocks went down from Rs. 12.99 crores in 1976-77 to Rs. 2.68 crores in 1977-78. The FOB value of exports in 1977-78 amounted to Rs. 129.03 crores as against Rs. 164.46 crores in the preceding year. The Company earned a net profit of Rs. 46.78 crores (as against the profit of Rs. 67.46 crores in 1976-77) after providing for depreciation of Rs. 50.91 crores and interest charges of Rs. 27.45 crores and after making an overall provision of Rs. 7.16 crores towards Investment Allowance Reserve Account. The working results of the various units of the Company in 1976-77 and 1977-78 and the cumulative results since inception are indicated below :—

(Rs. in crores)

1	1976-77	1977-78	Cumulative since inception
	2	3	4
Bhilai Steel Plant	(+)49·05	(+)39·76	(+)157·00
Durgapur Steel Plant	(—)7·73	(—)17·54	(—)236.40
Rourkela Steel Plant	(+)33.13	(+)19.10	(+)73.60
Alloy Steels Plant	(+) 4.17	(+)2.14	(—)28.87
Fertiliser Plant Rourkela	(+)2.71	(+)2.60	(—)9.49

1	2	3	4
Central Coal Washeries Organisation.	(+)2·36	(+)1·67	(+)10·51
Refractory Plant Ramgarh	(—)0·06	(—)0·02	(—)0·18
Provision for unrealised profit.	(—)0·17	(+)0·07	(—)0·19
Investment allowance reserve and provision for contingencies etc.	(—)16·00	(—)1·00	(—)5·00
TOTAL	(+)67·46	(+)46·78	(—)39·02

3.1.14 *Bokaro Steel Limited*

The authorised capital of the Company was raised from Rs. 850 crores to Rs. 1200 crores in 1977-78. The paid-up capital went up from Rs. 600.52 crores as on 31-3-1977 to Rs. 976.63 crores as on 30-4-1978 including share money pending allotment amounting to Rs. 376.00 crores. The Company's total borrowings on capital account as on 30th April, 1978 stood at Rs. 459.86 crores including an amount of Rs. 48.0 crores borrowed in 1977-78.

3.1.15 The total expenditure on the Project till 30th April, 1978 amounted to Rs. 1,446.29 crores including Rs. 132.01 crores incurred in 1977-78.

3.1.16 With the formal commissioning of Blast Furnace No. 3 by the President of India on 26th February, 1978, the plant completed its first stage of development i.e. 1.7 million tonnes capacity.

3.1.17 The Company incurred a loss of 10.10 crores in 1977-78 after providing for depreciation of Rs. 42.05 crores. The accumulated loss as on April 30, 1978 amounted to Rs. 52.83 crores.

3.1.18 *SAIL International Ltd.*

The authorised and paid-up capital of the company continued to be Rs. 5.0 crores and Rs. 1 lakh respectively during the year 1977-78.

3.1.19 The turn-over of the Company in 1977-78 (13 months) was Rs. 138.17 crores as against the turn over of Rs. 95.66 crores in 1976-77 (12 months). Export shipments in 1977-78 accounted for 6.83 lakhs tonnes of pig iron valued at Rs. 42.97 crores and 7.36 lakhs tonnes of steel products valued at Rs. 123.35 crores. The total FOB value of these two items was 156.98 crores. The Company earned a profit of Rs. 4.41 crores (before tax) as against the profit of Rs. 4.48 crores in 1976-77. Consequent upon the merger of the Company with SAIL, no dividend has been declared for 1977-78.

3.1.20 *Salem Steel Limited*

The authorised capital of the Company continued at Rs. 100 crores. The paid up capital went up from Rs. 12.53 crores as on 31-3-1977 to Rs. 18.38 crores as on 30th April, 1978. The total expenditure on the project upto 30th April, 1978 amounted to Rs. 19.17 crores.

3.1.21 An agreement was signed with M/s. Peugeot Loire of France on 26th January, 1978 for the supply of know-how for cold rolling of stainless steel.

3.1.22 *Production performance*

The following table indicates the annual capacity of the various plants/units under the Company, their production in 1977-78 and targets for and actual production during the period, April—January, 1979.

('000 tonnes)

Plant/Unit	Annual Capacity	Production 1977-78	April '78— Jan. '79 Target	Actual
1	2	3	4	5
	INGOT STEEL			
Bhilai Steel Plant	2500	2371	2007	1826
Durgapur Steel Plant	1600	1092	1042	789
Rourkela Steel Plant	1800	1409	1288	1090
Bokaro Steel Plant	1700	933	1703	943
IISCO	1000	651	627	516
Total	8600	6456	6667	5146
Alloy Steels Plant	100	97·23	82·88	79·17

1	2	3	4	5
	SALEABLE STEEL			
Bhilai Steel Plant	1965	1930	1620	1531
Durgapur Steel Plant	1239	864	833	649
Rourkela Steel Plant	1225	1178	977	852
Bokaro Steel Plant	1355	815	1233	752
IISCO	800	506	487	388
Total	6584	5293	5150	4172
Alloy Steels Plant	60	48·81	43·43	38·40
	CALCIUM AMMONIUM NITRATE			
Rourkela Fertilizer Plant	459·2	288	274	240

3.1.23 The total production of 5.164 million tonnes of ingot steel and 4.172 million tonnes of saleable steel from the integrated steeel plants of the Company during the ten months period, April 78—January, 1979, fell short of the production in the corresponding period last year by 4.9% and 6.0% respectively. The shortfall as compared to the target was, however, much higher, 22.5% in the case of ingot steel and 19.0% in the case of saleable steel. The overall capacity utilization in terms of ingot steel was 72% and in terms of saleable steel 76%, though saleable steel capacity utilization in the case of Bhilai and Rourkela Steel Plants was much higher at 93.5% and 83.5% respectively.

3.1.24 The production during this period was adversely affected on account of a number of factors such as continued problems in supplies of coal, both in terms of quantity and quality, shortage and frequent restrictions/fluctuations in power supply; indifferent industrial relations in some of the plants and unprecedented rains and floods in West Bengal in September, 1978, resulting in flooding of coal fields as well as Durgapur Steel Plant and affecting rail movement. Further, converter No. 5 of Bokaro Steel Plant which was expected to be commissioned in May, 1978, could be commissioned only on 1st January, 1979.

3.1.25 A number of measures have been taken to step up production at these plants. Close liaison is being maintained with the Ministry of Energy, DVC authorities and Electricity Board, Coal supplying agencies and the Railways so as to secure maximum supplies of power and coking coal. Arrangements have been made for the import of one million tonnes of low-ash coking coal in order to supplement indigenous supplies. The supplies of imported coal have started arriving from January 1979. It is expected that as a result of these measures, the production in the remaining months of the year 1978-79 will improve substantially.

3.1.26 *Research and Development*

The Research and Development Centre of Steel Authority of India Limited continued its work on a number of projects. The manufacture of High Strength Low Alloy Steels on a commercial scale was undertaken for the first time in India at Rourkela Steel Plant and 8,900 tonnes of this material was supplied for the expansion of Bhilai Steel Plant, resulting in foreign exchange saving of Rs. 3 crores. The computerisation of billet cutting operation at Bhilai Steel Plant through indigenous equipment has resulted in an increase in billet yield by about 0.5%. The improvement in heating technology of soaking pits has shown definite scope for increase in pit availability through reduction in total heating time.

3.1.27 Some of the important projects on which work is being done are indicated below :—

(i) Beneficiation of iron ore to remove alumina.

(ii) Coal dust injection in blast furnace to reduce coke rate. A protocol was signed in August, 1977, between Bhilai Steel Plant and USSR authorities for the design and supply of coal dust injection plant. The scheme has reached an advanced stage and the plant is expected to be commissioned by 1981.

(iii) Introduction of new technologies like pre-heating of coal and briquet blending in coke making practice for reducing prime coking coal consumption.

(iv) Flux practice in L.D. steel making so as to improve the lining life, yield and quality of steel.

(v) Development of special quality steels as a product diversification measure.

3.1.28 R&D Centre is setting up a pilot plant and laboratory facilities at Ranchi, for the development and adoption of rotary kiln direct reduction process technology by using non-coking coal for the production of sponge iron at an estimated cost of Rs. 4.78 crores. It is also proposed to consider subsequently the prospects

of using indirectly heated retort process and shaft reactor technology based on coal gas for production of sponge iron. The Centre will also be closely associated with the implementation of the proposal for increasing production from the existing facilities at Bhilai Plant through the introduction of technological innovations/improvements. A number of research programme which will need to be conducted before commercial implementation have been agreed upon between the Indian and Soviet experts.

3.1.29 Steel Authority of India Limited has recently approved a proposal for the establishment of a laboratory complex at Ranchi at an estimated cost of Rs. 15.1 crores. This would enable the R&D Centre to undertake diagnostic analysis of reasearch programme before these are introduced in the steel plants on a commercial scale. The proposal is presently under consideration of Government. SAIL has also decided to set up an Information & Documentation Centre at an estimated cost of Rs. 1.8 crores along with the laboratory complex for the maintenance of latest scentific and technological literature and dissemination of technical information to all concerned. Four site offices have also been started at Bhilai, Durgapur, Rourkela and Bokaro Steel Plants, specialising in different areas of steel technology.

3.1.30 *Capital Scheme*

(a) *Bhilai Steel Plant*

Civil Engineering and structural erection work relating to the expansion of Bhilai Steel Plant from 2.5 MT to 4.0 MT stage is progressing well and orders for structurals and plant and equipment have been placed for practically all the major units. The target date for completion of the major expansion units except the 7th Blast Furnace Complex which has been deferred because production from it would be required only during the latter period of gestation of 4 MT stage is planned to be commissioned by June, 1983. The project is presently estimated to cost Rs. 1120 crores.

3.1.31 The work on the Dalli mechanised mines has been completed and trial runs were started in October, 1978. The completion of the second sintering plant has, however, been delayed, mostly on account of delays in equipment supplies. Out of the two sinter machines, one machine is now expected to be commissioned in February/March, 1979.

3.1.32 The 8th Coke oven Battery is likely to be commissoined in March, 1979, to coincide with the shut-down of Battery No. 2 for rebuilding.

3.1.33 Certain proposals are also under consideration for the incorporation of technological improvements/innovations designed to increase production by about 1.0 million tonnes with only relatively low investments.

3.1.34 (b) *Rourkela Steel Plant*

Work relating to the installation of silicon electrical sheet plant and modernisation of the hot strip mill is progressing. The scheme for the setting up of medium pressure boiler plant to augment the supply of process steam has been completed, one boiler having been commissioned in March and the other in May, 1978. The second naphtha reforming unit of 180 tons capacity per day at the fertilizer plant, sanctioned at an estimated cost of Rs. 18.69 crores, is expected to be commissioned by the middle of 1979.

3.1.35 Installation of facilities for external desulphurisation of hot metal at an estimated cost of Rs. 4.65 crores has been recently approved by the SAIL BOARD. This will help produce low sulphur steel to meet stringent specifications and production of special grade steels.

3.1.36 With a view to meeting the growing requirements of cement as well as gainful utilization of blast furnace slag from Rourkela and Bhilai Steel Plants, SAIL has approved, subject to Government approval, the setting up of facilities for the production of 1.67 million tonnes of portland blast furnace slag cement per annum at an estimated cost of Rs. 95.10 crores. The proposal envisages the setting up of facilities for mining and crushing of limestone, clinker plant, grinding and bagging plant at Chilhati based on slag from Bhilai and another grinding and bagging plant at Rourkela based on slag from Rourkela Steel Plant. The scheme is presently under the consideration of Government.

(c) *Durgapur Steel Plant*

3.1.37 In order to improve and diversify production at Durgapur Steel Plant, a number of schemes involving additions/modifications/balancing facilities/replacements etc. have been taken up. Of these, half coke Oven Battery No. 5A has been completed. Government have sanctioned a proposal for the installation of 2×60 MW coal based thermal generating units at Durgapur for Durgapur Steel Plant and Alloy Steels Plant at an estimated cost

of Rs. 54.91 crores. This will help meet the situation arising from interruptions/restrictions in power supply from DVC. The first unit will be commissioned in 3½ years and the second unit 6 month thereafter. SAIL has also sanctioned, at an estimated cost of Rs. 4.06 crores, the provision of certain balancing facilities in the Wheel and Axle Plant so as to increase its production capacity from 40,000 to 50,000 sets per year.

3.1.38 With a view to diversifying production from the Skelp Mill, SAIL has recently approved modification of the mill for the production of high value skelp/strip and mild steel angles at an estimated cost of Rs. 5.82 crores. This scheme is presently under the consideration of Government. SAIL has also approved as a measure of diversification, a proposal for the installation of a Universal Beam Mill for the production of 2,50,000 beams per annum. In order to economise on the use of furnace oil and to up-date the technology of steel making, SAIL has decided to enter into use and engineering licence Agreement with M/s Greusot Loire of France for Bottom Blown Oxygen Converter process of steel making. SAIL has also approved a proposal for the installation of a pilot Plant at Durgapur Steel Plant for establishing the techno-economic viability of this process under Indian conditions at an estimated capital cost of Rs. 13.90 crores. These proposals are under Government's consideration.

(d) *Bokaro Steel Plant*

3.1.39 With the commissioning of Blast Furnace No. 3 in February 1978, 1.7 MT stage of Bokaro Steel Plant had been virtually completed except for a few auxiliary units which are likely to be completed by end of 1978-79. The only main work left is the tar distillation plant which will be commissioned in 1979-80. The revised cost estimate of 1.7 MT stage as sanctioned by Government now amounts to Rs. 981.34 crores. Expenditure against this estimate upto 31st March, 1978, was Rs. 946.93 crores.

3.1.40 The work relating to expansion of the plant to a capacity of 4.0 million tonnes is progressing. All the major units excluding the cold rolling mill complex are expected to be commissioned progressively by June, 1980. Although there have been delays in the supply of equipment by major suppliers, rectification required to be carried out at site in the equipment supplied and shortage of resources with the various construction agencies, all efforts are being made to adhere to this schedule. The CRM complex is scheduled to be commissioned by December, 1982. The 4 MT stage is estimated to cost about

Rs. 1097.24 crores. With a view to obtaining maximum output from the facilities at 4 MT stage, SAIL approved in November, 1978, the Detailed Project Report for further expansion of the plant to a capacity of 4.75 million ingot tonnes. This expansion is estimated to cost Rs. 141.09 crores. The project is now under consideration of Government.

3.1.41 As in the case of Bhilai, certain proposals for the incorporation of technological innovations/improvements so as to increase the productivity of the plant by about one million tonnes are also under consideration.

3.1.42 The slag granulation plant with an annual capacity of 1.3 million tonnes is expected to be completed by the middle of 1979.

3.1.43 A scheme to augment the in-Plant generating capacity by 3 units of 60 MW each at an estimated cost of Rs. 75.94 crores has been approved by Government. Orders for the supply of plant and equipment are expected to be placed by the end of 1978-79 and the first set is likely to be commissioned within 36 months of the placement of orders.

3.1.44 The Meghatuburu Iron Ore Project (transferred from NMDC) which is designed to produce 1.2 mt of lump ore and 2.66 MT of fines per annum at 90% rated capacity to meet the requirement of second phase of Bokaro Steel Plant is now likely to be completed by the middle of 1981 as against the earlier target date of December, 1979.

3.1.45 (e) *Alloy Steels Plant, Durgapur*

The capacity of the plant is being augmented from 1,00,000 ingot tonnes to 1,60,000 tonnes per year by the installation of a 50 tonnes electric arc furnace with minor conditioning facilities for the utilization of second shift of Blooming and Billet mill at an estimated cost of Rs. 8.46 crores. The scheme which was scheduled to be completed in March, 1979, is however, likely to be delayed by a few months. Another scheme for further expansion of the capacity of the plant to 2,60,000 tonnes per annum of liquid steel (stage II expansion) at an estimated cost of Rs. 46.75 crores has also been approved by SAIL and is presently under the consideration of Government. This scheme envisages that stainless steel slabs produced by ASP will be supplied to the Bokaro Steel Plant for rolling into hot rolled coils

which will be transferred to Salem Steel Plant for cold rolling and finishing. The scheme is planned to be completed in 1981-82 so as to synchronise with the commissioning of Salem Steel Plant.

3.1.46 (f) *Salem Steel Project*

The work relating ot the execution of stage I is progressing. The project is scheduled for completion by September, 1981.

3.1.47 With a view to making intensive and economic use of the inbuilt facilities at stage I, a scheme to set up another Sandzmir mill to cold roll a further quantity of 33,000 tonnes of stainless steel sheets/strips per annuam at an estimated cost of Rs. 25.50 crores has been approved by SAIL. The scheme is presently under the consideration of Government.

3.1.48 *Industrial Relations*

The industrial relations situation during the year (up to December 1978) was not as satisfactory as it could have been. In all 5,12,860 man hours were lost during the period, April to December, 1978 on account of labour troubles in Bhilai, Durgapur, Rourkela and Bokaro Steel Plants, Alloy Steels Plant, Durgapur and Burnpur Plant of IISCO. The total value of production lost came to Rs. 51.78 crores.

3.1.49 *Personnel*

The total number of employees in the Company as on 31-12-1978 indicating separately the number belonging to the Scheduled Castes and Scheduled Tribes is given in the table below :—

Group of Posts	Total No. of Emplyees	No. of SCs.	No. of STs.
A	12,728	190	73
B	11,932	402	136
C (exclusing sweepers)	149,099	15,322	13,628
C (Sweepers)	3,990	3,005	178
TOTAL	177,749	18,919	14,015

3.2 *INDIAN IRON AND STEEL COMPANY LIMITED*

3.2.1 The Indian Iron and Steel Company Limited, comprises;

(i) An integrated steel plant of one million ingot tonnes per annum capacity at Burnpur;

(ii) Ferrous and non-ferrous foundries and two spun pipe plants at Kulti.

(iii) Iron ore mines at Gua and Chiria (Manoharpur) and a phosphate rock mine at Pithoragarh; and

(iv) Collieries at Nondih-Jitpur, Chasnalla and Ramnagore.

3.2.2 Indian Iron and Steel Co. Ltd. has also a subsidiary in IISCO Stanton Pipe & Foundry Co. Ltd. Ujjain, which makes cast iron spun pipes. This is a joint venture between IISCO and Stanton & Staveley (U.K.) a subsidiary of the British Steel Corporation (International) Ltd. IISCO holds two-third shares and one-third share is held by B.S.C. (Int.) Ltd. in a capital investment of Rs. 3 crores.

3.2.3 *Take-over of management by Government*

In view of the progressive decline in the production of the steel plant of the Company at Burnpur, the deterioration in the condition of the plant and equipment and its financial difficulties, the management of the Company was taken over by the Government of India with effect from the 14th July, 1972, for a period of two years, pending a decision on the future working of the Company. The take-over was with a view to arresting the precipitous fall in production of the steel plant, toning up the management and increasing production by undertaking the necessary replacements and renovations. The period of take-over was extended by three years with effect from the 14th July, 1974, with a provision for a further extension by a period of five years, if necessary.

3.2.4 *Acquisition of privately held shares of the Company by Government in* 1976

Immediately after the take-over of management, a Plant Rehabilitation Scheme (PRS) was launched to restore the technical health of the plant. A ten year programme of capital reconstruction was also initiated in order to sustain production at the rated level. However, it soon became clear that substantial financial investment by Government would be necessary to implement these schemes and to make the steel plant a viable unit.

It was felt that such investments could be justified only if complete ownership of the company vested in the Government/ Government instituitons. It was accordingly decided that Government should acquire the shares of the company held by parties other than the State Governments and public sector institutions on payment of compensation. These shares were acquired by the Central Government through the promulgation of the Indian Iron & Steel Co. (Acquisition of Shares) Ordinance, 1976, later replaced by the Indian Iron and Steel Co. (Acquisition of Shares) Act, 1976 (89 of 1976). With this acquisition, the Central Government as such held 57.33 per cent of the equity capital and 57.37 per cent of the preference capital of the company.

3.2.5 *Transfer of IISCO to SAIL*

In order to ensure co-ordinated development of the Company and to make for better management of its technological, production and financial problems, the shares held by the Central Government in this Company were transferred to the Steel authority of India Limited (SAIL) with effect from the 1st May, 1978. From this date the Company has become a subsidiary of SAIL. It has also been decided by the Government to purchase the shares held by the public financial institutions and State Governments in IISCO and to transfer them to SAIL so that IISCO, like other public sector steel plants, also becomes a division of SAIL.

3.2.6 *Production Performance*

The performance of IISCO has improved steadily since the take-over of Management of the Company by the Government except for a shortfall in 1977-78 as will be observed from the following figures :—

Year	Ingot steel (in '000 tonnes) (Rated Capacity 1000,000 tonnes)	Saleable steel (in'0000 tonnes) (Rated capacity 800,000 tonnes)
1972-73	431	
1973-74	439	347
1974-75	532	358
1975-76	630	415
1976-77	667	500
1977-78	651	542
1978-79 (April—Nov. 78)	397	506
		297

The fall in output during 1977-78 was due to extraneous factors, such as deteriorating quality of raw materials particularly coal, high coke rate, labour problems etc. The estimated production during 1978-79 is 626,000 tonnes of ingot steel and 471.000 tonnes of saleable steel.

3.2.7 *Working results*

The working results of the Company since 1972-73 have been as under :—

(in crores of rupees)

Year	Profit/Loss
1972-73	(—) 5·76
1973-74	(—) 3·68
1974-75	(+) 1·05
1975-76	(—) 5·60
1976-77	(—) 16·25
1977-78	(—) 31·29

3.2.8 The main reasons for the heavy losses incurred by the Company are lower capacity utilisation, heavy interest burden, outmoded technology in certain areas, adverse industrial relations and high operating costs.

3.2.9 *Personnel*

The total number of employees in the Company as on 31-12-1978 indicating separately the number belonging to the Scheduled Castes and Scheduled Tribes is given in the table below :—

Group of Posts	Total No. of Employees	No. of S.Cs.	No. of S. Ts.
A	1266	6	1
B	1454	105	6
C (excluding sweepers)	33289	4854	3090
C (Sweepers)	761	761	—
Total	36770	5726	3097

3.3 *VISVESVARAYA IRON AND STEEL LTD., BHADRAVATHI*

3.3.1 The Mysore Iron and Steel Works was started in the year 1923 with a small Blast Furnace to produce about 24,500 tonnes of Pig Iron annually. It was expanded from time to time

and is now one of the main producers of Alloy and Special Steels in the country. The other products manufactured by the plant are mild steel, Ferro silicon, Cement, Castings, Spun Pipe, Ferro Alloys etc.

3.3.2 Mysore Iron and Steel Ltd. was incorporated under the Companies Act, 1956, on 30th June 1961 and commenced business from 1-4-1962. It is now a joint undertaking of the Government of Karnataka and the Government of India (through Steel Authority of India Limited). In February, 1976 the name of the Company was changed as Yisvesvaraya Iron and Steel Ltd. (VISL).

3.3.3 *Capital Structure*

The authorised capital of the Company is Rs. 50 crores made up of 50,00,000 Equity Shares of Rs. 100/- each. The subscribed and paid up capital of the company at as 31st March 1978 was as under :—

	(Rs. in crores)
(a) Government of Karnataka 60% (23,67,000 shares of Rs. 100 each—fully paid)	23·67
(b) Steel Authority of India 40% (15,78,000 shares of Rs. 100 each—fully paid)	15·78
Total	39·45

3.3.4 The present installed capacity of the different units is as under :—

	Tonnes
1. Mild Steel	48,000
2. Special Steel	72,000
3. Steel Ingots	1,80,000
4. Ferro silicon	20,000
5. Cement	96,000
6. Ferro Alloys	3,800
7. Pig Iron	1,80,000
8. Steel Castings	2,500
9. Grey Iron Castings	15,600
10. Cast Iron Spun Pipies	17,000
11. Cast Iron Plate Sleepers	15,000
12. Refractories	9,600

3.3.5 *Actual Production*

The actual production for the year 1977-78 and 1978-79 (upto the end of December, 1978) and the estimated data for January to March, 1979.

(Quantity in tonnes)

Product	Actual production 1977-78 (Upto 31-12-78).	Actual production 1978-79	(Estimated production (1-1-79 to 31-3-79
Mild Steel	23,370	21,945	11,015
Special Steels	50,166	39,831	18,169
Steel Ingots	1,02,658	85,470	36,140
Ferro Silicon	10,381	11,940	5,160
Cement	90,318	71,278	25,562
Ferro Alloys	2,442	2,489	1,049
Pig Iron	67,254	68,019	21,461
Steel Castings	1,654	1,478	1,022
C. I. Castings	7,819	6,205	1,995
C. I. Spun Pipes	3,614	4,007	1,543
Refractories	8,322	3,898	1,752

3.3.6 The production during 1977-78 was severely affect by the cut imposed in power supply to the plant. The maximum power cut with effect from the 1st October, 1977 was 55 per cent. During the current year 1978-79 the power cut has been gradually reduced with effect from the 1st June, 1978 and is 20 per cent with effect from the 21st October, 1978.

3.3.7 *Working results*

The operations of the Company for the year 1977-78 resulted in a net loss of Rs. 613.66 lakhs after providing for depreciation and interest, compared to a loss of Rs. 121.62 lakhs for the year 1976-77. An improvement in the financial position is expected in the current year.

3.3.8 *Sales*

The total sales turn over for 1978-79 is estimated at Rs. 61.16 crores as against the actual turn over of Rs. 38.54 crores during 1977-78.

3.3.9 *Export*

During the year 1978-79, the Company concluded a contract for the export of 4,000 tonnes of ferro silicon valued at Rs. 2

crores, compared to export of 334 tonnes of the same material valued at Rs. 14.55 lakhs during 1977-78.

3.3.10 *Capital Projects*

(i) *Forge Plant* : The installation of the forge plant at an estimated cost of Rs. 16.65 crores is practically complete. The new varieties of steel being produced are high speed steel, high carbon, high choromium tool steel, hot work steel and die blocks. The expenditure incurred on the project till the end of March, 1978 amounted to Rs. 14.29 crores.

(ii) *Gas Holder* : Upto the end of October, 1978, 80 per cent of the work on the commissioning of the gas holder had been completed and an expenditure of Rs. 33.83 lakhs incurred.

(iii) *Vacuum Degassing/Vacuum Oxygen Decarburisation (VOD) Unit* : For producing quality ingots for the forge plant, a Vacuum Degassing/Vacuum Oxygen Decarburisation Unit is being installed at a total cost of Rs. 140 lakhs. The expenditure incurred upto the end of October, 1978 was Rs. 62.59 lakhs.

3.3.11 *Sixth Five Year Plan/Proposal*

The company has formulated a proposal for the installation of balacing facilities to optimise production, at an estimated cost of about Rs. 36 crores. It is proposed to implement the project in two stages. The first stage costing about Rs. 25 crores, has been cleared by the Board of Directors of the Company and is under consideration of SAIL/Government.

3.4 *SPONGE IRON INDIA LIMITED*

An experimental sponge iron plant is being set up at Kothagudem, Andhra Pradesh, with UNDP/UNIDO assistance. The total cost of the project is expected to be about Rs. 12 crores. A Company called Sponge Iron India Limited has been formed to implement this project and both the Central Government and the Government of Andhra Pradesh are equity shareholders. The Central Government has also advanced an interest free loan of Rs. 4 crores for this project.

3.4.2 The capacity of this Plant will be 30,000 tonnes per annum. The project, using non-coking coal as reductant, is based on SL/RN technology. Equipment is being supplied by Messrs. Lurgi of West Germany. The plant is expected to be commissioned in early 1980.

3.4.3 The total number of employees in the Company as on 31-12-1978 indicating separately the number belonging to the Scheduled Castes and Scheduled Tribes is given in the table below :—

Group of Posts	Total No. of employees	No. of S.Cs.	No. of S. Ts.
A	5	—	—
B	5	—	—
C	36	—	—
D (excluding sweepers)	36	5	—
D (Sweepers)	2	1	—
Total	84	6	—

3.5. *BHARAT REFRACTORIES LIMITED*

3.5.1 Bharat Refractories Limited was registered on 22nd July, 1974, as a wholly-owned subsidiary company of Bokaro Steel Limited with an authorised capital of Rs. 2 crores. It owned only one Refractory plant located at Bhandaridah upto 30-4-1978. Consequent upon the restructuring of Steel Authority of India Limited in accordance with the provisions of the Public Sector Iron & Steel Companies (Restructuring) and Miscellaneous Provisions Act, 1978, the following units have been transferred to Bharat Refractories Limited from Hindustan Steel Ltd. with effect from 1-5-1978 :—

1. Refractories Plant at Marar (now known as Ranchi Road Refractories Plant).
2. Sillimanite Mines in Meghalaya.
3. Bhilai Refractory Project (now known as Bhilai Refractories Plant).

In addition, India Firebricks and Insulation Company Ltd., a subsidiary of SAIL, has been made a subsidiary of Bharat Refractories Limited.

3.5.2 *Finance*

The authorised capital of the Company is Rs. 200 lakhs and its present paid-up capital is Rs. 113.45 lakhs.

3.5.3 *Production*

The production performance of the various units including that of IFICO during the period 1-4-1978 to 31-12-1978 as compared to the corresponding period last year is indicated in the annexure.

3.5.4 *Bhandaridah Refractories Plant*

This plant has a licensed capacity of 24,000 tonnes of fireclay bricks per year; the installed capacity of the plant, however, is 15,000 tonnes per year. It was decided by SAIL in May, 1977, to expand the plant to the economically viable capacity of 26,000 M.T. a year at an estimated cost of Rs. 3.20 crores. The expansion is expected to be completed in 1980-81.

3.5.5 *Bhilai Refractories plant*

The setting up of a refractory plant at Bhalai as a part of Bhilai Steel Plant to produce 1,37,500 tonnes of quality refractory bricks was approved by Government in October, 1975 at an estimated cost of Rs. 26 crores. From 1-5-1978, this plant has been transferred to Bharat Refractories Limited. The Basic and Silica Shops of the Plant are expected to be commissioned by October, 1979 and the Fire-clay Shop by the middle of 1980.

The revised cost for the project, is estimated at Rs. 37 crores.

The total number of employees in the Company as on 31-12-1978 indicating separately the number belonging to the Scheduled Castes and Scheduled Tribes is given in the table below :—

Group of Posts	Total No. of Employees	No. of S. Cs.	No. of S. Ts.
A	73	—	—
B	23	—	—
C	1274	129	98
D (Excl. Sweepers)	106	12	19
D Sweepers	12	12	—
Total	1488	153	117

3.6 *INDIA FIREBRICKS AND INSULATION CO. LTD.*

With effect from 1-5-1978, the Company became a subsidiary of Bharat Refractories Ltd. The licensed capacity of the plant is 72,000 tonnes of refractories per annum and the installed capacity is 50,000 tonnes per annum, of which about 30,000 tonnes would be of standard varieties. A Committee consisting of experts from SAIL and MECON was appointed to study the requirements of balancing facilities, etc., to make the plant an economically viable unit. The Committee recommended an investment of Rs. 327.10 lakhs which was approved by SAIL. Work on the scheme is in progress.

The total number of employees in the Company as on 31-12-1978 indicating separately the number belonging to the Scheduled Castes and Scheduled Tribe is given in the table below :—

Group of Posts	Total No. of Employees	No. of S. Cs.	No. of S. Ts.
A	20	—	—
B	47	—	2
C	888	40	122
D (Excl. Sweepers)	—	—	—
D (Sweepers)	7	7	—
Total	962	47	124

ANNEXURE

BHARAT REFRACTORIES LIMITED

Production and Despatches during 1977-78—April—December, 1978

(Unit Lakh Tonnes)

Particulars	April—December 1977		1978-79	April—December, 1978		January—March 1979
	Target	Actuals	Target for the year	Target	Actual	Target
I—Production Bhandridah Plant						
Bricks	*N.A.*	*10185*	*13179*	*9264*	*8177*	*3915*
Mortar	*N.A.*	*3951*	*5424*	*3864*	*3853*	*1560*
TOTAL	*N.A.*	*14136*	*18603*	*13128*	*12030*	*5475*
II—Ranchi Rd Plant						
Bricks	*N.A.*	*4803*	*5350*	*5076*	*4363*	*2103*
Mortar	*N.A.*	*638*	*850*	—	*369*	*250*
TOTAL	*N.A.*	*5441*	*6200*	*5076*	*4732*	*2383*
III—India Firebricks and Insulation Co. Limited						
Bricks	N.A.	20072	28000	20000	19837	9000
Mortar	N.A.	31	—	150	615	—
TOTAL	N.A.	20103	28000	20150	20452	9000

6—986 S&M/78

DESPATCHES

II—Despatches Bhandridah						
Bricks	*N.A.*	*10935*	*13516*	*8861*	*7064*	*4555*
Mortar	*N.A.*	*3870*	*5230*	*3670*	*3733*	*1560*
TOTAL	*N.A.*	*14805*	*18746*	*12531*	*10797*	*6115*
(B) Ranchi Rd. Refractories Ltd.						
Bricks	N.A.	4302	5349	5148	4319	2097
Mortar	N.A.	638	950	—	369	350
TOTAL	N.A.	4940	6299*	5148	4688	2447

*for 11 months (from 1-5-78 to 31-3-79)

India Firebricks and Insulation Co. Ltd.						
Bricks	N.A.	19703	30000	21516	21452	8484
Mortar	N.A.	93	—	150	418	—
TOTAL	N.A.	19796	30000	21666	21870	8484

3.7. *NEW STEEL PLANTS*

3.7.1 *Salem Steel Project* :

Background :

The first stage of the Salem Steel Project planned to produce 32,000 tonnes of cold rolled stainless steel sheets and strips per year from purchased hot bands at an estimated cost of Rs. 126.81 crores was approved by Government in March, 1977 and is currently under implementation. This stage is scheduled to be completed towards the end of 1981.

3.7.2 *Know-how* :

M/s. Peugeot Loire (PL) of France have been appointed as the Know-how Advisers for supply of production and process know-how, product application and development and training services for cold rolling of stainless steel. In terms of the agreement, PL have been assisting Salem Steel in the finalisation of layout of the Plant, specifications of the equipment, selection of the suppliers, manpower planning and drawing up of training programmes for the personnel in India and abroad. Technical information in the form of documentation relating to the cold rolling of stainless steel has also started flowing in from PL. The first batch of project personnel is likely to complete training at PL's works at France by August 1979.

3.7.3 *Orders for Main Plant Equipment* :

Orders for supply of about 60% of the equipment required for the first stage have been placed upto January '79.

3.7.4 *Global Tenders* :

Tenders for supply of main plant and equipment were opened during the first week of November 1977. Orders for the Skin-pass Mill and the Sendzimir Mill were placed in September/October, 1978 and for the Annealing and Pickling Lines in December 1978. Orders for the remaining equipment are in process of finalisation. Delivery of the equipment at site is due in the first half of 1980.

3.7.5 *Indian Equipment* :

Orders for E.O.T. cranes were placed during April/May 1978. These are expected to be commissioned progressively during the later half of 1979.

The equipment for the receiving substation for the electric power for which order has been placed on M/s. NGEF, Bangalore is expected to be commissioned during mid-1980.

3.7.6 *Progress of Construction at Site* :

The overall progress of construction at site as at the end of December, 1978 is as under :

Item	Unit	Total Quantity	Progress upto 31-12-78	Complete (%)
1. Site preparation	'000 Cu m.	1,430	,430	100
2. Excavation	'000 cu m	876	601	69
3. Concrete	'000 cu m.	138	37	27
4. Railway track	km	10·0	7·4	74
5. Structural fabrication	tonnes	11,200	2,411	22
6. Structural erection	tonnes	11,200	1,044	9
7. Equipment erection]	tonnes	11,700	—	—

3.7.7 *Civil Works* :

The infrastructure facilities have been completed.

The Salem Steel Plant (BG) Railway Siding linking the steel plant with Salem Railway Junction was commissioned on 9th March, 1978.

3.7.8 Work on the Cold Rolling Mill building was taken up during January, 1978. The tempo of civil works for CRM would be stepped up from April, 1979. A number of civil structures, of a subsidiary nature, are expected to be completed by mid-1979.

3.7.9 *Structural Work* :

About 11,000 tonnes of structures are to be erected in Stage I of the project. Structures for auxiliary shops like mechanical and electrical repair shops, stores complex, etc., amounting to 1,100 tonnes have been erected. The progress of work on structural fabrication for CRM building is as under :—

Procurement of steel	84%
Preparation of fabrication drawings	67%

Fabrication commenced during August, 1978 and 1294 tonnes of fabricated structures out of the total of 10,000 tonnes for the CRM building have been inspected and approved upto December, 1978.

3.7.10 *External Water Supply* :

Water for the plant will be drawn from the river Cauvery at Poolampatti, 28 km away from the plant site. The external water supply system is estimated to cost Rs. 3.27 crores. The preparation of detailed designs and execution of the scheme has been entrusted to the Tamil Nadu Water Supply and Drainage Board. The work commenced in November, 1977.

3.7.11 The supply of 600 mm dia CI pipes ordered on Indian Iron and Steel Company Limited has been completed to the extent of 80%. Pipeline has been laid for a length of 5 km out of the total length of 28 km. Action is in hand for procuring the pumpsets, motors, transformers, etc. Construction of coffer dam has been completed and construction work for the headworks facilities is in progress. The system is expected to be commissioned in mid-1980 as scheduled.

3.7.12 The master plan for the steel plant township has been prepared by M/s Auroservice of Pondicherry. M/s Auroservice 'D' Auroville Trust of Pondicherry have been appointed as Consultants for detailed engineering for Sector I of the township.

3.7.13 *Second Cold Rolling Mill and Associated Facilities for Salem Steel Project* :

The original concept was to import the hot rolled coils from abroad and cold roll them at Salem until hot rolling facilities are established at Salem itself. As a measure of import substitution, it is now proposed that additional steel melting capacity to produce 90,000 tonnes of stainless slabs per year would be set up at the Alloy Steels Plant, Durgapur. These slabs are to be rolled into hot rolled coils in the hot strip mill at Bokaro. These will be converted at Salem into cold rolled sheets/strips. This scheme would also enable doubling of the capacity for cold rolling of stainless steel at Salem help at Stage I at an additional cost of only Rs. 27.40 crores. An investment proposal for installing additional equipment at Salem and at Durgapur to produce 65,000 tonnes of stainless steel cold rolled sheets/strips per year is under the consideration of Government.

3.7.14 *Expenditure* :

The expenditure incurred on the project upto the end of 1977-78 amounted to Rs. 18.95 crores. The expenditure during the current financial year upto the end of December 1978 is Rs. 5.07 crores.

3.8 *VISAKHAPATNAM STEEL PROJECT*

3.8.1 As part of the overall development programme for enhancement of capacity in the steel industry, the feasibility of setting up port-based, export oriented plants has been under consideration of Government. The USSR had evinced interest in the establishment of a 1 million tonne blast furnace complex in India. In the protocol of the 4th meeting of the Indo-Soviet Joint Commission signed on March 6, 1978, both sides agreed in principle to cooperate, technically and financially in the establishment of a port-based, export-oriented blast furnace complex of 1 million tonne capacity per annum of foundry grade pig iron, the Soviet loan and interest being paid through export of the product.

3.8.2 It was later thought that in the light of the increasing domestic demand for steel, and the shortage of billets being experienced by re-rollers, instead of restricting the project to the blast furnace stage, it would be desirable to instal additionally a steel melting shop billet making facilities and a merchant mill in the first stage. Following discussions with the Soviet Authorities in Moscow in July, 1978, it was agreed that the question of co-operation in the construction of the billet making facilities would be considered by organisations of the two sides additionally. Following further discussions during the year, the DPR in respect of the Visakhapatnam Steel Project has been handed over to the Soviet Authorities for their examination. A Soviet team has already visited India for discussions with SAIL and the other organisations concerned. This team has also visited the plant site at Visakhapatnam. Follow-up action is also being taken by SAIL in respect of the various infrastructure facilities. The necessary processing for an investment decision is under way. The first phase of the project is estimated to cost about Rs. 1000 crores with a foreign exchange component of Rs. 250 crores. The foreign exchange will be found partly by utilising Rouble Credit and partly by export of pig iron to the USSR.

3.9 *VIJAYANAGAR STEEL PROJECT*

3.9.1 The Detailed Project Report of Vijayanagar Steel Project submitted by MECON in April, 1977 envisages an estimated cost of Rs. 1580 crores to create 3.0 MT liquid steel capacity based on the prevailing price as in the 3rd quarter of 1976. The cost of infrastructure facilities covering the mines, external transport facilities, external water and power facilities not included in the capital costs of the project proper are Rs. 825 crores, of which Rs. 491 crores is towards the coal transport system.

3.9.2 The Detailed Project Report is under examination of Steel Authority of India Limited. During the year, certain preparatory jobs/investigations were completed, in various other surveys and studies for development of infrastructure facilities are in progress. The cumulative expenditure on the project is about Rs. 3.53 crores.

3.10 *METAL SCRAP TRADE CORPORATION LIMITED*

3.10.1 Metal Scrap Trade Corporation Limited is a subsidiary of Steel Authority of India Limited; 80% of the paid up capital of the Company is held by SAIL and the remaining 20% by scrap traders and scrap consumers, viz., members of Iron and Steel Scrap Association of India and Steel Furnace Association of India. The authorised capital of the company is Rs. 2 crores and the paid up capital Rs. 20 lakhs.

3.10.2 MSTC is the canalising agency for import of ferrous scrap including re-rollable scrap in the form of old ships, vessels, etc., for breaking and also for export of ferrous scrap. It is the sole selling agent for the scrap generated by some of the integrated steel plants. viz., IISCO Rourkela, Durgapur and Bhilai.

3.10.3 Metal Scrap Trade Corporation proposes to set up a new company in which it will have 60% share holding, the balance 40% shares being held by M/s Hackett Engineering Company, a division of Harsco Corporation Inc. USA, for recovery of scrap from slag in the steel plants. M/s Hackett Engineering Company have been operating in India for recovery of scrap at IISCO-Jamshedpur, IISCO-Burnpur and RSP. The Indian business of Hacketts is proposed to be taken over by the new company

3.10.4 The registered office of MSTC is located at Calcutta. During 1977-78 MSTC earned a profit of Rs. 16.20 lakhs before tax.

3.10.5 MSTC has been authorised to enter the ship breaking business on its own and to encourage ship breaking by State Government Undertakings in addition to releasing imported ships to the ship breakers in the country. Accordingly a number of ships have already been acquired and are being broken up at different ports. It is proposed to create a devlopment fund out of the profits earned by the MSTC through disposal of imported foreign flag vessels and to utilise this fund for developing facilities for ship breaking at various ports.

3.10.6 The total number of employees in the Company as on 31-12-1978 indicating separately the number belonging to the Scheduled Castes and Scheduled Tribes is given in the table below :—

Group of Posts	Total No. of Employees	No. of S. Cs.	No. of S.Ts.
A	14	—	—
B	5	—	—
C (Excluding sweepers)	21	3	—
C (Sweepers)	—	—	—
TOTAL	40	3	—

3.11 *NATIONAL MINERAL DEVELOPMENT CORPORATION LIMITED*

3.11.1 The National Mineral Development Corporation Limited was incorporated in 1958 with the object of development of mineral resources (other than coal, oil and lignite) in the public sector. Presently, its activities are confined to the development of iron ore mines, and operation of diamond mines at Panna. Consequent on the transfer of Kiriburu and Meghahatuburu projects from NMDC to SAIL, the Corporation operates iron ore mines at Bailadila No. 14 and Bailadila No. 5 in Madhya Pradesh and Donimalai in Karnataka. The mine at Bailadila No. 5 commenced production from January, 1977 and the Donimalai mine from October, 1978. The Corporation is engaged in feasibility studies on certain other large iron ore deposits such as Kumaraswamy B&D Block, Bababudan (Second Phase) in Karnataka, Ongole in Andhra Pradesh and Bailadila 11B/10 etc. in M.P. Keeping in view the importance of ore dressing and beneficiation in the field of iron ore mining, the NMDC has also set up an R&D Laboratory at Hyderabad.

3.11.2 The NMDC plans to set up export oriental pelletisation plants based on Donimalai and Bailadila Iron Ore fines for which feasibility studies have been prepared. The proposals are under consideration of Government. Efforts are being made in this connection to locate parties abroad who would be willing to enter into long term contracts for pellets.

3.11.3 *Finance.*—The authorised capital of the Company is Rs. 150 crores, paid up capital as on 30-11-78 was Rs. 102.02

crores and loans from Government stood at Rs. 63.86 crores (excluding Kiriburu and Meghahataburu transferred to SAIL (Bokaro Steel Plant on 1-5-78).

3.11.4 *Production & Despatches.*—Production and despatches during the year 1977-78 and during the period April-December, 1978 are indicated in Appendix IV.

3.11.5 *Performance of projects in production* :

(i) *Bailadila No.* 14.—The production, despatch and shipment from the mine has been less than the target fixed for 1977-78, mainly because of global recession in the steel industry. Production had to be cut back at the mine because of accumulation of stocks. During the current year (upto October, 1978) the actual production is, however, slightly higher than the target which in view to reduced off-take of the Japanese Steel Mills had been fixed at a lower level.

(ii) *Bailadila No.* 5.—The actual production from this mine during 1977-78 was slightly less than the target, as the mine which commenced production in January, 1977 had certain teething problems. In the year 1978-79 (upto October, 1978) the actual production has been more than the target.

(iii) *Donimalai.*—The mine commenced production only from October, 1977. During the current year (upto October, 1978) actual production was less than the target, mainly due to certain mechanical defects in the plant and lack of purchase orders.

(iv) *Panna Diamond Mines.*—Production during 1977-78 was 16,343 carats as against the target of 20,000 carats, mainly due to lower incidence of diamonds at Majhwagan mine. For the same reason, the production during the current year (upto October, 1978) was also lower than the target. During 1977-78, 19716 carats valued at Rs. 251.74 lakhs were sold by auction. During the current financial year till January, 1979 11372.32 carats of diamonds were sold for Rs. 211.27 lakhs.

3.11.6 *Feasibility studies.*—The position with regard to the various feasibility studies/investigations taken up by the NMDC is indicated below :—

(a) *Bababudan Second Phase (Pt. I).*—After completing investigation work at Bababudan Phase-I, the NMDC have taken

up investigation of Phase-II (Pt. I) at a cost of Rs. 70 lakhs. The entire work is likely to be completed by 1980.

(b) *Kumaraswamy B&D Blocks.*—Work of investigation is in progress but at a reduced pace because of diversion of drills to Bababudan which was assigned higher priority.

(c) *Ongole investigation.*—The field investigation of Ongole Magnetite deposits in A.P., was taken up by the NMDC in October, 1977 at a total estimated cost of Rs. 25.70 lakhs. The work is likely to be completed in 1979.

(d) *Bailadila 11C/13 deposits.*—The NMDC had taken up this investigation in February, 1975. It is expected to be completed shortly. A proposal has been received from the NMDC for the development of this mine at a total cost of Rs. 9.90 crores to supplement the mine at Bailadila No. 14. The proposal is under consideration of Government.

(e) *Bailadila 11B/10 deposits.*—With a view to identifying the source of supply of iron ore to Vizag Steel Plant, the NMDC intends to take up detailed investigation of these deposits at an estimated cost of Rs. 59.50 lakhs. Field investigation which started in April, 1978, is expected to be completed by August-September, 1979.

3.11.7 *Personnel.*—The total number of employees in the Corporation as on 31-12-1978 indicating separately the number belonging to the Scheduled Castes and Scheduled Tribes is given in the table below :—

Group of Posts	Total No. of employees	No. of S. Cs.	No. of S. Ts.
A	471	14	1
B	505	18	4
C (Excluding Sweepers)	4779	587	786
C (Sweepers)	112	64	3
Total	5867	683	794

3.11.8 *Industrial Relations.*—The overall industrial relations in the Corporation during the year 1978-79 were normal except an incident which took place in April, 1978 when contractors labour in one of the float ore mines were retrenched on expiry of the contract.

3.12. *MANGANESE ORE (INDIA) LIMITED*

3.12.1 Manganese Ore (India) Limited (MOIL) was formed in 1962 with the Government of India and the two State Governments of Madhya Pradesh and Maharashtra holding 51% shares and the Central Provinces Manganese Ore Company Limited (CPMO) a U.K. based Company, holding the balance 49% shares. The shares held by CPMO have since been acquired by Government and MOIL has now become a wholly owned Government Company. MOIL has also entered the area of Dongri Buzurg Mine in Maharashtra which was previously being worked by CPMO.

3.12.2 *Finance.*—The authorised capital of the Company is Rs. 6 crores consisting of 4,00,000 equity shares and 2,00,000 7½ per cent preference shares of face value of Rs. 100/- each. The paid-up capital of the Company is Rs. 2,15,45,100. The Company is the largest producer of manganese ore in the country. The bulk of its production is of high grade ore. Until last year, its activities were confined only to the States of Maharashtra and Madhya Pradesh. MOIL has since extended its operations to the States of Orissa and Andhra Pradesh.

3.12.3 *Performance.*—Against the target of 2,86,664 tonnes the production during April-December, 1978 has been 2,84,121 tonnes. The target for the year 1978 was higher than the target for 1977. The figures of production and the stock of manganese ore held by the Company during the last three years were as under :—

(In lakh tonnes)

Year	Production	Closing stock
1975-76	3.09	2.26 as on 31-3-1976
1976-77	4.32	2.99 as on 31-3-1977
1977-78	3.88	3.15 as on 31-3-1978

3.12.4 The financial performance of MOIL during the last three years was as follows :—

(Profit (in lakhs)

Year	
1975-76	80.28
1976-77	90.76
1977-78	95.11

3.12.5 *Personnel.*—The total number of employees in the Company as on 31-12-1978 indicating separately the number belonging to the Scheduled Castes and Scheduled Tribes is given in the table below :—

Group of Posts	Total No. of employees	No of SCs.	No. of STs.
A	62	—	—
B	15	—	—
C (Excluding Sweepers)	12218	1946	4381
C (Sweepers)	147	147	—
TOTAL :	12442	2093	4381

3.12.6 *Industrial Relations.*—Industrial relations in the Company during the year 1978-79 have been satisfactory.

3.13. *BOLANI ORES LIMITED*

3.13.1 Bolani Ores Limited was incorporated in 1957. The Company was formed by the Government of India in collaboration with Orissa Mineral Development Company Limited (OMDC) for the supply of iron ore to Durgapur steel plant. It started with an authorised and paid-up share capital of Rs. 100 lakhs subscribed by the Government of India and the Orissa Minerals Development Company Limited in the ratio of 50.5% and 49.5% respectively. With the formation of steel Authority of India Limited, the shares held by the Government of India were transferred to SAIL in 1973. Government decided to acquire the shares held by OMDC, transfer these shares to SAIL and merge the Company with SAIL. Accordingly, the Bolani Ores Ltd. (Acquisition of Shares) and Miscellaneous Provisions Act, 1978 was enacted. The enforcement of the Act which was to take effect from 1-1-79, has, however, been stayed on account of an ex-parte stay granted by the Supreme Court on 2-1-79.

3.13.2 *Production.*—The Company supplies iron ore to the Durgapur Steel Plant. The production and despatches of iron ore, manganese and ferrugenous manganese ore during the last three years have been as under :—

(In thousand tonnes)

Production	1975-76	1976-77	1977-78	1978-79 (Upto Dec. 78).
Iron Ore Lump	1044	997	845	809
Iron Ore Fines	139	453	440	276
Manganese/FMO	11	4	2	—
DESPATCHES				
Iron Ore Lump	1091	996	843	740
Iron Ore Fines	139	453	440	276
Manganese/FMO	10	3	1	—

3.13.3 *Financial Results.*—The financial year of the Company which was formerly from 1st October of one year to 30th September of the following year was changed to conform to the financial year of Steel Authority of India Limited and its subsidiaries, i.e., from 1st April of one year to 31st March of the next year. The financial year commencing October 1975, therefore, covered the period upto March, 1977. The profit made loss incurred by the Company during the last 3 years has been as under :—

(Rs. in lakhs)

Year ending	Profit/Loss (+)	(—)	(after provision or depreciation)
September, 1975		(—)	55.03
October 75 to March 1977 . . .		(—)	47.09
April 77 to March 1978 . . .		(—)	162.79

The cumulative loss upto 31-3-78 was Rs. 271.07 lakhs.

3.13.4 *Expansion.*—In order to meet the demand of the Durgapur steel plant for sized iron ore, the Company had undertaken a scheme of expansion and mechanisation at its mines. The project was fully commissioned in April, 1977. The capital cost of the scheme was initially estimated at Rs. 411 lakhs, to be met by a term loan of Rs. 275 lakhs from the financial institutions and the remaining from internal resources. The cost of the scheme increased to Rs. 482.51 lakhs. The Company could not generate internal resources. As a result it had to resort to borrowings from HSL.

3.13.5 *Personnel.*—The total number of employees in the Company as on 31-12-78 indicating separately the number belonging to Scheduled Castes and Scheduled Tribes, is given in the table below :

Group.	Total	Scheduled Caste	Scheduled Tribes.
A	41	1	—
B	130	4	14
C (Excluding sweepers) . . .	1044	155	240
C (Sweepers)	33	33	—
TOTAL	1248	193	254

3.13.6 *Reorganisation.*—In view of the unsatisfactory financial position of the company, it had to postpone replacement of equipment, affecting current production. This led to old equipment being used even after they had become uneconomic to operate, causing increased maintenance costs and fall in production. It was estimated that the Company would need immediately about Rs. 250 lakhs to complete the capital schemes in hand and for providing balancing facilities and to replace some of the worn out earth moving machinery. Without this investment, the requirement of iron ore of Durgapur Steel Plant could not be met by Bolani Ores Limited. Bolani is the main source of supply of iron ore to Durgapur Steel plant. There are adequate deposits of iron ore of the requisite quality at Bolani and the entire requirement of Durgapur Steel Plant can be met at a reasonable cost if additional capital of the order indicated above is made available to the Company. Orissa Minerals Development Company was not interested in investing further in the company. Before making such large investment on its own, it was necessary for Government to assume full control of the company and its management.

3.14 *KUDREMUKH IRON ORE PROJECT*

3.14.1 The Kudremukh Iron Ore Project is being implemented in pursuance of a long-term contract for supply of iron ore concentrate to the National Iranian Steel Industries Company, (NISIC). The Government of Iran have undertaken to provide credit to the extent of $ 630 million to finance the construction of this project.

Both these Agreements-the sale and Purchase Contract with NISIC and the Financial Agreement with the Government of Iran were executed on the 4th November, 1975 by the Steel Authority of India Limited (SAIL). The sale contract provides for supply of 150 million tonnes of concentrate over a period of 21 years starting from August, 1980, the average rate of supply being 7.5 million tonnes per year. With the formation of Kudremukh Iron Ore Company Ltd. to implement this project, the two Agreements have been assigned by SAIL to the new company.

3.14.2 *Scope of the project.*—The project consists essentially of the mine, the ore processing and concentrating facilities, the tailings dam in which the detritus after extraction of concentrate will be dumped, the slurry pipeline to the port, the port facilities for filtration, storage and ship loading, the road from the project site to the port, facilities for generation and supply of power and the further development of the new Mangalore port to receive

and load ore carriers of up to 60,000 D.W.T. The project will use the latest methods of beneficiation of low grade magnetite and long distance transport by pipeline in the form of slurry. The concentrate produced at Kudremukh will be pumped in the form of slurry to New Mangalore port, a distance of 67 kms. At the port, the slurry will be filtered and the resultant "filter cake" loaded into bulk carriers. The concentrate will be shipped in vessels upto 60,000 DWT. capacity and draft not exceeding 12.5 metres, to be nominated by NISIC. The development of port facilities is the responsibility of the Mangalore Port authorities. The project is estimated to consume about 522 million units of electrical energy with a maximum demand of 118.50 M.W. To meet the power requirements it has been decided to construct dams on the Chakra and Savehaklu rivers and water conductor systems to divert the water to the Sharavati reservoir. This work has been entrusted by the Government of Karnataka to the Mysore Power Corporation Limited.

3.14.3 Canadian Met-Chem Consultants Ltd., Montreal a subsidiary of U.S. Steel Corporation, are assisting Kudremukh Iron Ore Company in this project as the Mining Associate-cum-Engineer Constructor. Apart from providing fully integrated and coordinated services from the planning and design stage to the start-up and commissioning of the project, Canadian Met-Chem will also supervise and coordinate the operation of the project during the first three years. A large number of Indian agencies are engaged in the engineering as well as construction of the project. Indigenous capabilities in equipment manufacture are also being fully utilised for this project.

3.14.4 *Progress of work.*—1978-79 has been a year of significant achievements. Substantial progress was made during the year in the areas of civil engineering, structural and equipment erection. Ordering for equipment was practically completed during the year. Major items of equipment such as electric mining shovels, blast hole drills, 120 tonne dump trucks, gyratory crushers and autogenous mills were received from foreign suppliers. The erection of the autogenous mills was taken up in September, 1978 ahead of schedule. Since then erection of other items of equipment has also commenced. The 1.6 kilometre tunnel for the slurry pipeline was completed in May, 1978 about six months ahead of the schedule. With the completion of this work, the laying of the pipeline has been taken up simultaneously from the Kudremukh end also and is expected to be completed by end March. 1979. The erection of the ship-loader at the New Mangalore port has also commenced in December, 1978.

3.14.5 The progress of work, both at Kudremukh and Mangalore has kept broadly to schedule. Work on the critical areas like concentrator, warehouse and monsoon stockpile is closely monitored so that timely effective action is taken. The unusually heavy rainfall during the 1978 monsoon did somewhat retard the progress in civil engineering and erection work. Redoubled efforts are being made by KIOCL and other agencies to make up the log during the current working season, which is critical for the timely completion of the project.

3.14.6 *The project estimate and expenditure*

The preliminary project estimate which formed the basis of the Financial Agreement with Iran was Rs. 567 crores ($ 630 million). Based on the definitive cost estimate submitted by Canadian Met-Chem for their scope of work and the revised estimates prepared by other agencies for works and facilities outside Met-Chem's scope, the project is now estimated to cost Rs. 647.33 crores ($ 719.10 million). The increase in estimated cost is principally due to escalation as a result of the shift of about 2 years in the completion of the project the more stringent specifications of the concentrate to be supplied to Iran and the larger quantity of ore required to be mined and processed compared to the original plan.

3.14.7 The authorised capital of the Company has been raised from Rs. 150 crores to Rs. 185 crores on the basis of the revised cost estimate. The authorised capital was fully subscribed by September, 1978 and further funds required are being released to the company in the form of loan. The total expenditure incurred since the inception of the project upto the end of October, 1978 is Rs. 203.30 crores. In addition the expenditure incurred on port facilities, road and power schemes specific to the project upto 30th September, 1978 was Rs. 47.79 crores. During the year 1978-79, it is estimated that Rs. 160 crores will be spent on the project proper. A further sum of Rs. 20 crores is to be spent by Government of Karnataka, the funds being advanced by the Government of India, for development of power and road facilities specific to the project. The total number of employees

in the Company as on 31-12-78 indicating separately the number belonging to the Scheduled Castes and Scheduled Tribes is given in the table below :

Group of Posts	Total No. of employees	No. of S. Cs.	No. of S. Ts.
A	261	10	1
B	50	1	1
C (excluding Sweepers)	795	76	30
C (Sweepers)	2	2	—
TOTAL	1108	89	32

3.15. *Metallurgical & Engineering Consultants (India) Limited*

3.15.1 In pursuance of the provisions of the Public Sector Iron and Steel Companies (Restructuring) and Miscellaneous Provisions Act, 1978, the shares held by Steel Authority of India Limited in this Company were transferred to the Central Government from 1-5-1978, whereby it ceased to be subsidiary of SAIL and has come under the direct control of the Ministry from this date.

3.15.2 The authorised capital of the Company is Rs. 4.0 crores. Its paid-up capital continues to be Rs. 5,000/-. The turn over of the Company in 1977-78 was Rs. 9.69 crores as compared to the turnover of Rs. 9.36 crores in 1976-77. It made a net profit of Rs. 214.53 lakhs in 1977-78 against a profit of Rs. 91.64 lakhs in the preceding year.

3.15.3 *Activities* :

During 1977-78, a number of assignments were completed. These include : detailed engineering for 2.5 Mt stage of Bokaro Steel Plant and Forge Shop of Visvesvaraya Iron & Steel Limited; design, engineering and supply of Hot Saw with related equipment for Seamless Steel Tube Plant for Indian Tube Company; feasibility report for Rotary Kiln Complex for dead-burnt magnesite at Pithoragarh for Bhilai Steel Plant and consultancy assignment for Slag Granulation Plan for Rourkela Steel Plant.

3.15.4. *Major Assignments in hand* :

The major assignments in hand are :

(a) Detailed engineering for expansion of Bokaro Steel Plant from 2.5 to 4.0 Mt and 4.75 Mt stages, Slag Granulation Plant, Bhawnathpur Limestone Project and captive Power Plant. The work relating to the design, engineering and supply of the second cold rolling complex and detailed engineering of all processing lines connected therewith is in progress.

(b) Detailed engineering for expansion of Bhilai Steel Plant to 4.0 Mt including 8th Coke Oven Battery, Second Sintering Plant and the Bhilai Refractory Plant. MECON has also been assigned the design, engineering, supply, erection and commissioning of auxiliary systems for the plate mill which is part of the 4 Mt expansion.

(c) At Rourkela steel plant, work on design and supply of equipment for modernisation of Hot Strip Mill, detailed engineering for rebulding of Coke Oven Battery 1A, SMS Slag Disposal and Slab Yard facilities is continuing. MECON has recently been assigned design, engineering and supply of 4-High Reversing Cold Rolling Mill for Cold Rolled Grain Oriented electrical sheet project.

(d) The work at Durgapur steel plant covers detailed engineering, supervision and inspection of Coke Oven Battery No. 2 and detailed engineering and consultancy for modification of Blast Furnaces.

(e) Detailed engineering and consultancy work for aluminium smelter and fabrication complex of Korba Project of Bharat Aluminium Company Limited (BALCO). An assignment has also been received from BALCO for association in the preparation of a feasibility report for the export-oriented East Coast Alumina Project in Andhra Pradesh.

(f) Detailed engineering and consultancy for Kudremukh Iron Ore Project; Titanium Dioxide pigment project for Kerala Minerals and Metals Limited; Carbon Black project for Carbon & Chemicals India Limited; Seamless Steel Tube Plant of Bharat Heavy Electricals Limited, at Trichy; Cold Rolling Complex of Steel Strips Ltd., Calcium Carbide Plant for Andhra Pradesh Chemicals Limited and Sponge Iron Plant for a joint sector venture of Orissa State Government. Consultancy services for

Meghahatuburu Iron Ore Project of SAIL (Bokaro Steel Plant) and feasibility Report for Electrolytic Manganese Dioxide Plant for Orissa Mining Corporation.

(g) Design, engineering and supply of 3-Stand Bar Mill and 7-Stand Wire Rod Mill for Mishra Dhatu Nigam Limited, Hyderabad; 2 High Reversing Skin Pass Mill for Salem Steel Plant; Blooming Mill indigenous equipment for Mahindra Ugine Steel Company, Bombay and Combination reversing cold reducing and skin pass mill for Steel Strips Limited, Chandigarh.

3.15.5 *Foreign Assignments* :

MECON which had signed an agreement with the Federal Govt. of Nigeria in January 1978, for rendering technical consultancy and project monitoring services for the installation of 1 Mt Direct Reduction Steel Plant at Orwian-Aladja, near Warri, in Nigeria, has now secured another assignment for consultancy services for the establishment of a township for the steel plant.

3.15.6 Under the agreement signed between MECON and Arab Iron and Steel Union, both sides have taken steps for co-operation in establishing Consultancy and Engineering Bureau for the Union in Algeria.

3.15.7 An agreement was signed by MECON on 28th February, 1979, with the Syrian Government for the preparation of a feasibility-report for setting up of an iron & steel project in Syria.

3.15.8 MECON has submitted a Detailed Feasibility Report for an integrated steel plant in Liberia. MECON has also submitted a report on rehabilitation of Vietnam Steel Casting and Rolling Mills in Vietnam and a feasibility study for a sponge iron & steel complex in Abu Dhabi.

3.15.9 Following the signing of Memorandum of Understanding between MECON and M/s. Swiss Aluminium Limited (ALUSUISSE) of Switzerland for collaboration in setting up industrial projects in third countries, a joint venture company is being formed with 50:50 equity ownership by the two parties.

3.15.10 *Personnel* :

The total number of employees in the Company as on 31-12-1978 indicating separately the number belonging to the Scheduled

Castes and Scheduled Tribes is given in the table below :

Group of posts	Total No. of employees	No. of S. Cs.	No. of S.Ts.
A	1524	31	10
B	244	1	10
C (Excluding sweepers)	1471	122	342
C (Sweepers)	73	52	20
TOTAL	3312	206	382

3.16 *HINDUSTAN STEELWORKS CONSTRUCTION LIMITED*

3.16.1 Hindustan Steelworks Construction Limited was incorporated in June, 1964 with the principal object of undertaking all major construction works connected with setting up of steel plants.

3.16.2 Starting with site levelling, civil engineering works and fabrication and erection of steel structures for Bokaro Steel Plant, the Company has enlarged its activities into the fields of erection of technological structures, erection of mechanical and electrical equipments, referactory lining works of coke oven batteries, blast furnaces, reheating furnaces, rebuilding of coke oven batteries, capital repairs to coke ovens, etc.

3.16.3 Over the years, the Company has also diversified its activities into the construction of docks, dams, power houses, bridges, development of mines, townships and other industrial projects.

3.16.4 The Company has also developed a full-fledged Architectural Wing with a design office capable of providing latest expertise in the design of buildings, structures, townships, water supply and sewerage systems, etc.

3.16.5 Efforts are being made to enter foreign markets, particularly in the Middle East, in the construction field. These efforts have resulted in the award of the work for design and construction of a township in Libya. Negotiations are in progress in other countries for various projects.

3.16.6. The authorised capital of the Compay has been increased from Rs. 10 crores to Rs. 20 crores. The paid-up

capital as on the 31st March, 1973 was Rs. 5 crores (this has since been increased to Rs. 6 crores). The Compay's accumulated reserves have increased from Rs. 4.70 crores as on the 31st March, 1977 to Rs. 5.36 crores as on the 31st March, 1978.

3.16.7 The annual turnover of the Company has increased from Rs. 77 crores in 1976-77 to Rs. 106 crores in 1977-78. The turnover during the current year is expected to be Rs. 116.73 crores. As on the 30th September, 1978 the value of works on hand was Rs. 359.74 crores.

3.16.8 The Company is engaged at present on the following major construction projects :—

Steel Sector

Bokaro Steel Plant	Expansion to 4 M.T. stage, township and Bhawanathpur Limestone Quarry.
Bhilai Steel Plant	4 M. T. expansion, Second Sintering Plant, Refractory Plant, Coke Oven Battery.
Durgapur Steel Plant	Rebuilding of coke oven battery No. 2, capital repairs to coke oven battery No. 33, running repairs to coke oven battery No. 3 and 4 (of Durgapur Projects Ltd.)
Rourkela Steel Plant	Rebuilting of Battery 1A, Third Rising Main, Additional Slab Yard, Heavy Loco Repair Shop, Additional Naphtha Plant, Cement Godown. Silicon Project, Capital/running repairs to coke oven battery.
Salem Steel Plant	Cold Rolling Mill, Mechanical and electrical repair shop, Central Stores, Training Institute, Workshop Building, Roads, etc.
Indian Iron and Steel Company Burnpur	Boiler Equipment erection work of Unit No. 1 & II, relining of blast furnace No. 4, Civil works of boiler house.

3.16.9 *Important works outside steel sector*

Kudremukh Iron Ore Project	Civil and structural works, township.
Super Alloys Projects (Hyderabad)	Civil and strucural works.
Balco Smelter Complex, Korba	Site levelling, civil and structural works.
Supa Dam in Karnataka	Dam construction.
Obra Thermal Power Plant	Structural works and erection of 3 nos. boiler.
Bhusawal Thermal Power Plant	Erection, testing and commissioning of 210 MW boiler.
Super Thermal Power Plant, Singrauli	Site levelling and civil works of water circulation system.
Nagjhari Power House, Karnataka	Civil and structural works.
Coal Preparation Plant at Moonidih, Dhanbad	Civil Structural and equipment erection works.
Cement Factory at Rajban	Civil works.
Ore Processing Plant and Ore Handling Plant, Meghahataburu Iron Ore project	Civil, structural and mechanical equipment erection.

3.16.10 *Personnel*

The total number of employees in Hindustan Steelworks Construction Limited, as on 31st December, 1978 is given below :—

Group of posts	Total strength	of which	
		Scheduled Castes	Scheduled Tribes
A	1848	20	8
B	573	13	3
C (Excl. Sweepers)	24135	3360	3385
C (Sweepers)	79	73	6
TOTAL	26635	3466	3402

CHAPTER IV

THE PRIVATE SECTOR

4.1 *Tata Iron and Steel Company Limited*

4.1.1 Tata Iron and Steel Company Limited owns and operates an integrated Steel Plant at Jamshedpur, captive collieries at Sijua, Jamadoba and West Bokaro and an iron ore mine at Noamundi. The Steel Plant is the oldest integrated steel plant in the country and has an installed capacity of 2 million tonnes per annum of steel ingots equivalent to 1.5 million tonnes of saleable steel. To achieve this capacity the Company had undertaken a series of modernisation and expansion programme which were part financed by the Government of India and the World Bank. The plant produces a variety of semi-finished and finished steel items such as blooms, billets, tin bars, rails and heavy structurals, plates, sheets, etc.

4.1.2 *Production*

The plant has been operating at more than 90 per cent capacity for the past many years. The production during the past three years has been as under :—

(Figures in thousand tonnes)

	Steel Ingots	Saleable Steel
Capacity	2,000	1,500
1975-76	1,787	1,486
1976-77	1,908	1,550
1977-78	1,968	1,601
1978-79	1,398	1,123
(Upto December, '78)		

During 1978-79, the operations were affected by acute shortage of coal caused mainly by heavy floods, severe power restrictions imposed by the D.V.C. and disruption in transport of fuel oil. The target of production for 1979-80 is 1.950 million tonnes of ingot steel and 1.550 million tonnes of saleable steel.

4.1.3 *Exports*

During the year 1977-78 the Company's exports of steel were 140,000 tonnes. Against this, the exports during April—December, 1978 amounted to about 32,000 tonnes because of the pick up in demand in the home market.

4.1.4 *Important Capital Schemes*

In order to maintain operational efficiency, the Company has to undertake a continuous programme of replacements, repairs and modernisation. The Board of Directors of the Company have sanctioned, in principle, a capital expenditure programme amounting to Rs. 170 crores for the five year period 1978-79 to 1982-83. The progress on some of the important projects included in this programme is indicated below :—

(a) *Coke Oven rebuilding programme*

A phased programme to rebuild coke oven batteries has been prepared. Coke Oven battery No. 2 which is being rebuilt is expected to go into operation by March, 1979.

(b) *Colliery Development Project Phase-I*

The objective is to increase production from the captive collieries to 2.7 million tonnes of raw coal a year. Most of the work at this project, including its West Bokaro Colliery part, has been completed. Installation of three winders is in progress. Preparatory work on long-wall trails is under way.

(c) *Colliery Development Project Phase-II*

The Company was granted an Industrial Licence in May, 1977 for further expansion of West Bokaro Colliery to increase its production from 0.7 million tonnes of raw coal per year to 2.5 million tonnes of raw coal per year. With this expansion, TISCO would become self sufficient in coking coal. The company has already taken a number of steps towards implementation of the Project.

4.2 *Mini Steel Plants*

4.2.1 The electric furnaces used to cater mainly to the demand of the foundries. The acute shortage of steel in 1970 and the post-recession industrial growth resulting in a sharp increase in the demand for steel by the rerolling and the engineering industries gave a large impetus to the electric furnace industry in the early seventies. Government encouraged the augmentation of steel production through establishment of small or medium sized electric furnaces by utilising scrap which was being mostly exported.

4.2.2 With the rapid growth of electric furnace industry and the corresponding increase in demand for ferrous scrap, it was felt that the expansion of this industry should be carefully watched. A Working Group on ferrous scrap was accordingly set up in June, 1970. The report, which was received in November, 1971 estimated the availability of scrap in 1975-76 at 1.5 million tonnes. Government, however, felt that taking into consideration improved collection methods, better scrap consciousness, etc. the availability would be around 2.2 million tonnes by 1975-76. To prevent haphazard growth of this industry which would have led to serious difficulties in regard to availability of vital inputs such as scrap, power, refractories, graphite electrodes, etc., Government decided that until the availability position became better, it would generally not allow more units to be established in this sector.

4.2.3 As on 1-12-78, there were 144 licensed electric furnace units for production of mild steel ingots/billets with a total capacity of 3.29 million tonnes per annum. The implementation of the licences has, however, not been satisfactory. So far only about 130 units with a capacity of 2.97 mililon tonnes have been commissioned. The remaining units are lying closed or are at various stages of implementation.

4.2.4. The electric furnace units were not able to utilize their installed capacity adequately. Accordingly, a detailed survey was conducted in March-April, 1977. It indicated that several factors such as high cost of production; financial constraints such as want of working capital; inadequate and erratic power supply; shortage of input materials; forward integration for rolling not being permitted; management problems and the surplus of supply from integrated steel plants over demand affected the mini steel plants adversely.

4.2.5 In order to improve the economic viability of the mini steel plants, Government have taken the following steps :

(i) Excise Duty on ingots/rolled products has been abolished;

(ii) Import of ferrous melting scrap for use in the electric arc furnaces has been exempted from customs duty;

(iii) Apart from allowing direct import of 200,000 tonnes of ferrous melting scrap by the electric arc furnace units on ad hoc basis during 1977-78 against which the units have finalised import of 40,000 tonnes, in the current year, import of ferrous melting scrap has been placed on the canalised list without any quantitative restrictions. In addition, import of foreign flag vessels for breaking up has also been permitted. Ship breaking generates 10% to 15% melting scrap which will be available for melting by the melting units, apart from 75% re-rollables which will be supplied to the re-rolling mills which in turn will release more melting scrap to electric arc furnaces;

(iv) Excise duty on certain categories of heavy melting scrap procured from the integrated steel plants has been abolished;

(v) Mini Steel Plants have been allowed to diversify into production of certain grades of alloy steels;

(vi) It has been agreed that financial institutions would consider favourably applications for loans from mini steel plants for purposes of diversification, depending upon the viability of the scheme;

(vii) Import of Graphite Electrodes has been allowed to meet the shortage of supply from indigenous sources; and

(viii) Steel Re-rolling mills and mini steel plants may now seek assistance from the financial institutions under the soft loan Scheme.

4.2.6 These measures, together with pick up in home demand for steel, have already started showing results. The average capacity utilisation has increased appreciably to about 75% with the result that the production of ingot steel during the current year is expected to be 1.5 m. tonnes compared to 0.96 m. tonnes in the previous year, thus making a sharp increase of over 50%.

4.3. *Re-Rolling Industry*

4.3.1. The re-rolling mills produce such items as bars, rods, wire rods, twisted deformed bars, light sections and other profiles from billets and satisfy a very wide range of consumer demand. In the organised sector, there are 200 units with a total licensed capacity of about 3.8 million tonnes per annum on two shift basis. In addition, 1200 small scale units with a total capacity of 4 million tonnes per year are reported to be registered with the Directorates of Industries of various States. The capacity utilisation achieved by the re-rolling industry has been very low. Several

units are reported to be lying closed for different reasons. The main reason for low production by the re-rollers has been a slower growth of demand within the country and higher production in the integrated steel plants. The future of the re-rolling sector lies in improving its efficiency of operation, having closer links with the electric furnace units, and developing capabilities to roll quality products, especially various grades of carbon, special and alloy steels.

4.3.2. The total production of rolled products achieved by the Billet re-rollers and others during the past three years has been as below :

Year	Production in '000' tonnes
1976-77	1004.8
1977-78	982.5
1978-79	1086.8 (Estimated)
Actual between April—Sept.' 78	544.3

4.3.3 From time to time the Department has received requests from the re-rolling Industry for re-assessment of the installed capacity in the industry. It was also observed that although it is an important segment of the steel sector, lack of adequate data on its capacity, status and performance often caused difficulties in formulation and implementation of policies for its development and growth.

4.3.4 A Committee has been set up in September, 1978 to make a study of the industry. It has broad terms of reference and is expected to cover all aspects of the steel re-rolling industry. Its report is expected in June, 1979. The terms of reference of the Committee are as below :

(i) To assess and recommend capacity of steel re-rolling units on maximum utilisation basis,

(ii) To evaluate the facilities installed by all the re-rolling units with special attention to th eidentification of—

(a) units which are technically capable of rolling ingots, blooms and billets of carbon as well as alloy steels;

(b) units considered fit to avail of the ISI certification mark scheme in respect of their end products;

(c) units which are integrated or have tie-up for ingots/billets with mini-steel plants; and

(d) units which are lying closed.

(iii) To recommend a plan of rationalisation of sections for rolling between integrated plants and re-rollers.

(iv) To recommend any other measures for the growth, diversification and development of the re-rolling industry.

4.4 *Wire Drawing Units*

4.4.1 In the organised sector there are 72 wire drawing units with a licensed capacity of 7.38 lakh tonnes per annum. In addition there is a very large number of small scale units with a capacity of 8 to 10 lakh tonnes per annum. A majority of the small scale units produce only thicker gauges of mild steel wires.

4.4.2 Almost all the requirements of the country in respect of steel wires are met from indigenous production. However, production of thinner stainless steel wires required by the textile industry is yet to be developed. With a view to promoting production of thinner quality wires, it has been decided to entertain applications from existing wire drawing units for diversifying production within their existing licensed capacity into all grades of carbon steel and alloy steel wires subject to the condition that diversification will be confined to 18 gauge and thinner sizes.

4.4.3 As the installed capacity is quite high compared to demand, the units run at about 45 to 50% capacity utilisation only. The wire drawing units also manufacture sophisticated types of wires such as auto tyre bead wires etc. which are exported in large quantities.

4.4.4 Most of the raw materials i.e. wire rod for this industry are from indigenous sources except for a few types having stringent specification and also stainless steel wire rod.

4.4.5 The total production of various grades of wires in the country during the last three years is indicated below :

Year	Production in tonnes
1976-77	317.700
1977-78	325,900 (Estimated)
1978-79	350,678
Actual between April—Sept.' 78	165,339

4.5 *Tin Plate*

4.5.1 Apart from the tin plate plant at the Rourkela with an annual capacity of 2 lakh tonnes, there are 2 units in the private

sector—M/s. Tin Plate Co. of India Ltd., Golmuri (Bihar) and M/s. K. R. Steel Union in Maharashtra. M/s. Tin Plate Co. are licensed to produce 90,000 tonnes of electrolytic tin plates and 70,000 tonnes of hot dipped tin plates per anum. M/s. K. R. Steel Union has a capacity of 60,000 tonnes of electrolytic tin plates and 20,000 tonnes of hot dipped tin plates per annum. This unit has so far been working off and on according to the availability of the raw material. It has now been decided that both the units viz., M/s. Tin Plate Co. of India and M/s. K. R. Steel Union will be supplied imported black plate coils by Steel Authority of India. The total production of tin plates in the private sector during the last three years is indicated below :—

Year	Production in tonnes
1976-77	47,917
1977-78	31,804
1978-79	25,268 (Estimated)
Actual between April—Sept.' 78	12,634

4.6 *Strips*

4.6.1 Cold rolled steel strips have a wide range of applications in industries such as automobiles, bicycles, typewriters, hacksaw and bandsaw blades, etc. The present licensed capacity of 28 strip making units in the organised sector is 2.23 lakh tonnes. In order to allow flexibility in production and to improve their economic viability, the existing units manufacturing hot or cold-rolled steel strips have been permitted to freely diversify into manufacturing all grades of carbon steel, alloy steels except stainless steel and heat resisting steel grades; in respect of these two grades, diversification is permitted to a maximum of 200 tonnes per annum within the overall licensed capacity of each unit.

4.6.2 Production of C.R. Strips in the country during the last three years is indicated below :

Year	Production in tonnes
1976-77	77,638
1977-78	94,286
1978-79	104,312

4.7 *Ferro Alloys*

4.7.1 Ferro alloys are required as in-put material for the alloy and special steel industry, and, therefore, play an important role

in the steel development programme of the country. The position regarding demand and availability is reviewed from time to time to consider the need for creation of new capacity. At present, there are 21 licensed units to produce about 4.95 lakh tonnes of ferro alloys of different grades. The licensed capacity is adequate to meet the internal demand.

4.7.2 However, with a view to encouraging utilisation of low grade ores and fines, M/s. Manganese Ore India Ltd., were granted a Letter of Intent during this year for production of 60,000 tonnes of ferro-manganese per annum. Similarly, M/s. Maharashtra Electrosmelt Ltd., a Public Sector Undertaking of the Government of Maharashtra have been granted a Letter of Intent for production of ferro-manganese by way of diversification.

4.7.3 The production of ferro alloys in the country during the past three years has been as follows :

Year	(Production in tonnes)
1976-77	2,48,409
1977-78	2,83,862
1978-79	2,88,444 (Estimated)

4.8 *Sponge Iron*

4.8.1 There is presently world wide interest in methdos of steel making that seek to by-pass the traditional blast furnace and steel melting shop route of the integrated steel plants. The production of sponge iron and its conversion in direct reduction furnaces is one such.

4.8.2 The feasibility of production of sponge iron with hydro carbon gases as reductant is already established in other countries. India is not endowed with enough hydro carbon gases. Therefore efforts are being made to establish the production of sponge iron with solid reductant as raw material. A demonstration plant to produce sponge iron with non-coking coal is being set up with UNDP assistance and financed by the Central and State Governments at Kothagudam in Andhra Pradesh.

4.8.3 A pilot plant for the purpose of producing sponge iron through direct reduction process is being set up at Ranchi by the Research and Development Centre of Steel Authority of India Limited at an estimated cost of about Rs. 4.78 crores. This plant is for the development of Rotary Kiln direct reduction technology based on the use of non-coking coal as reductant. The initial capacity of this plant will be 10 tonnes per day.

4.8.4 M/s. Industrial Promotion and Investment Corporation of Orissa Ltd., were granted a letter of intent for the production of 3,00,000 tonnes of sponge iron per annum. In this project, it is proposed to use 80% solid Reductants and 20% oil as inputs for the manufacture of sponge iron.

4.9 *Pig Iron*

4.9.1 Apart from the integrated steel plants, Kalinga Iron Works and Sandur Manganese and Iron Ore Ltd. are licensed for an annual production of 2.15 lakh tonnes and 30-35,000 tonnes of pig iron respectively. These units produce high quality pig iron.

4.9.2 The total production of saleable pig iron in the country during the last three years has been as follows :

Year	Production in '000' tonnes
1976-77	1,898·7
1977-78	1,425·1
1978-79	1,652·0
Actual production between April-September' 78	(Estimated) 826·0

4.9.3 There is, however, need to develop production of special categories of pig iron, such as low/high phosphorus, spheroidal grain and low carbon grain pig iron.

CHAPTER V

SUPPLY OF RAW MATERIALS

5.1.1 *Iron Ore* :

India is well endowed with large reserves of iron ore, both in terms of quantity as well as quality. The iron ore reserves of the country are presently estimated at 13,500 million tonnes, out of which 10,500 million tonnes are haematite and 3000 million tonnes magnetite. With the continuing programme of exploration, there should be substantial addition to the reserves.

5.1.2 The production of iron ore during 1978 was 37.0 million tonnes as against 42.5 million tonnes in 1977, showing a fall of 13%. In Goa, the output declined from 12.8 million tonnes in 1977 to 8.8 million tonnes due to a steep fall in export demand attributable to recession in the Japanese steel industry. The production of iron ore during 1978 as compared to the previous year is shown below :

(In million tonnes)

	1976	1977	1978 (estimated April-Dec. 1978)
Production of iron ore	43.8	42·4	37·0
Despatch for :			
Internal consumption	17·2	16·5	15·9
Exports	25.9	24.9	20.4

Pelletisation :

5.1.3 Recent trends in iron making technology have favoured the use of sinter in integrated steel plants and pellets in direct reduction furnaces, both produced from iron ore fines instead of lumpy ore. There are two pelletisation plants already operating with a total capacity of 1.5 million tonnes. Another pellet plant with a capacity of 1.8 million tonnes, which is presently under installation by Mandovi Pellets Co. in Goa, is likely to go into production by the middle of 1979. The National Mineral Development Corporation holds one-third of the equity. Its production is earmarked for export to Japan under a long term contract.

5.2 *Manganese*

5.2.1 The total recoverable reserves of manganese ore in the country placed at 79.48 million tonnes, as shown below :—

	(In million tonnes)
High Grade	17·28
Medium Grade	22·87
Low Grade	39.33
TOTAL	79·48

5.2.2 In view of the limited reserves and the increasing requirements for expansion of the steel industry, an integrated programme of exploration, coordinated by Geological Survey of India and assisted by Mineral Exploration Corporation, Manganese Ore (India) Limited and the State Government agencies concerned, has been launched during the year. Concurrently, a programme of beneficiation of low grade ores, dephosphorisation of high phosphorus ore and utilisation of fines and rejects has also been initiated in consultation with the National Metallurgical Laboratory, Indian Bureau of Mines and Regional Research Laboratory, Bhubaneshwar.

5.2.3 In the interest of conservation, exports of high grade manganese ore continue to be banned and exports of other grades are restricted within certain ceilings. The figures of production, exports and consumption of manganese ore during the last three years are given below :—

Year	(In Lakh tonnes)		
	Production	Exports	Internal consumption
1975	16·05	8·12	8·41
1976	18·3	7·34	10·52
1977	18.4	5.94	10.13

5.3 *Chromite* :

5.3.1 The known reserves of chromite in the country, as on 1-1-1975, are estimated at 17.3 million tonnes, the bulk of which, 13.84 million tonnes, are located in Orissa. As a result of exploratory work now in progress, GSI has estimated a reserve of about 31.17 million tonnes of ore in Orissa. The grade of ore, as visually estimated is expected to be high; analytical work is in progress. Chromite is used mainly in the production of ferro chrome, for alloying with steel, in production of refractories and

in the manufacture of certain chemicals. In view of the limited reserves of chrome, particularly the high grade lumpy variety, the exports of high grade lumpy chromite suitable for metallurgical purposes has been altogether banned. Appropriate ceilings have also been imposed on the export of other grades of chromite. The export of chromite was canalised through Minerals and Metals Trading Corporation during the year under review. The production and export of Chromite Ore during the last three years has been as under :—

Year	(In Lakh tonnes)		
	Production	Export	Internal consumption
1975	5·0	3·62	0·95
1976	4·02	2·38	1·26
1977	3·52	1·52	1·51

Wide variations in production are evident; these are primarily ascribable to fluctuations in the export market. The total demand was reasonably good in the last two years. Internal consumption has been building up slowly but steadily.

5.4 *Mineral Development Board*

5.4.1 The Iron Ore Board came into existence in the year 1973 as a Registered Society. It was constituted mainly to act as the Central policy planning and development agency for iron ore deposits in the country which *inter-alia* included matters like the conservation, development and utilisation of the ores as well as their export.

5.4.2 Government has recently reviewed the role and functions of the Board and its past performance. It has been decided that certain other inputs minerals for the steel industry such as manganese, chromite, vanadium, tungsten, nickel, titonium, kyanite, sillimanite and magnesite etc. should also be brought within the ambit of the Board which would be redesignated as the Mineral Development Board.

5.4.3 As against revised estimates of Rs. 47 lakhs during 1977-78, an amount of Rs. 22 lakhs was provided in budget estimates for the year 1978-79. The constitution of the Board provides for 15 Members of which 5 are to be whole-time Members including the Chairman and the Member-Secretary. The Board continued to function with a part-time Member-Secretary.

5.4.4 The Board received the final report of Phase I of the Chiria exploration. Phase II of the Chiria Iron Ore Exploration

programme commissioned in early 1976 continued during the year and is nearing completion. As a part of the Phase II programme, ore dressing and metallurgical tests of iron ore from Chiria were also carried out. The Board constituted a Study Group to report on the demand for iron ore by 1990. The report has been submitted to Government. The Planning Commission has since decided to expand the scope of this Group to cover the Ferrous Group of minerals. The Board also commissioned the Indian Bureau of Mines to undertake a sample study on the Iron Ore dumps and rejects from selected iron ore mines in Bellary Hospet region to assess their useability. Likewise M.E.S. was commissioned to assess current float ore potential in Bellary Hospet Region. The report has since been completed by the M.E.C.

CHAPTER VI

PROGRESSIVE USE OF HINDI

6.1 There is a Hindi Section in the Department of Steel consisting of one Hindi Officer, four translators and two typists. One post of Hindi Assistant and one post of typist are lying vacant.

6.1.2 The progress made in the progressive use of Hindi in the Department is briefly indicated below :—

Implementation of the annual programme for accelerating the use of Hindi in the official work.

6.1.3 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. Efforts are being made to use Hindi in correspondence between the subordinate offices and undertakings located in Hindi—speaking areas and the Ministries and Departments.

As far as possible, all general orders are issued both in Hindi and English. Periodical inspections are conducted to ensure that the orders/instructions issued on the use of Hindi by the Ministry/Department of Official Language from time to time are implemented.

6.1.4 Noting and Drafting in the Hindi Cell 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 States is done in Hindi.

6.1.5 *Hindi Typewriters and help-literdture* :

There are 15 Hindi typewriters in the Department. An Order has been placed for the purchase of two more Hindi Typewriters. Help literature has been provided to officers and staff to facilitate their working in Hindi. To create interest in Hindi, Magazines/Newspapers have been provided in the Library.

6.1.6 *Circulation of orders relating to official Language to Corporations and Companies*

Regular inspections are conducted of attached/subordinate offices and undertakings and short-comings are brought to the notice of their heads for taking remedial action. During the year under review, the Hindi officer inspected the offices of National Mineral Development Corporation Ltd., Hyderabad, Regional Iron and Steel Controller, Hyderabad/New Delhi and Kanpur.

A sub-committee of the Hindi Salahkar Samiti of this Ministry has also visited some offices/undertakings under this Ministry to get first-hand knowledge about progress in the use of Hindi in these offices/undertakings.

6.1.7 *Committees relating to official languages :*

(i) *Official Language Implementation Committee*

An Official Language Implementation Committee is functioning in the Department. The Committee periodically reviews the progress made in the use of Hindi for official purpose in the Department, its attached/subordinate offices and undertakings and decides on the measures to be taken to accelerate its use. So far 22 meetings of this Committee have been held. Similar Committees are also functioning in all offices/undertakings of this Department.

(ii) *Liaison Committee*

A small committee consisting of one representative each of the Ministry of Home Affairs (Department of Official Language), the Central Translation Bureau, Legislative Department (Official Language Wing) and this Department has also been set up. This Committee maintains liaison between these translation agencies and helps in expeditious disposal of translation work.

(iii) *Hindi Salahkar Samiti*

The Hindi Salahkar Samiti for this Ministry was re-constituted on the 21st February, 1978. So far, two meetings of this Samiti have been held.

6.1.8 *Hindi Workshop :*

Steps have been initiated to start Hindi Workshop in the Department.

6.1.9 *Training 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 :—

I. *Hindi Training*

Total number of employees (Group A,B&C)	233
Total number of employees possessing requisite Hindi quilification	149
Total number of employees who have passed Prabodh, Praveen and Pragya/ intensive Course/Special Departmental Examination etc	64*
Total number of employees under training	8
Total number of employees yet to be trained	12

*This includes 20 Official who have declared that they possess working knowledge of Hindi

II. *Hindi Typewriting/stenography*

	Trained	Under training	Yet to be trained
Hindi Typewriting	8	5	38
Hindi Stenography	8	2	36

6.1.10 *Notification of the Department and its Offices in the Gazette of India*

The Department has been notified in the Gazette of India on 5-1-78 in terms of Rule 10(4) of the Official Language (Use for Official purposes of the Union) Rules, 1976. Two attached Offices of this Department namely the Offices of Regional Iron and Steel Controller at New Delhi and Kanpur have also been notified.

6.1.11 Some statistical details (for the Calendar year 1978) regarding the use of Hindi in the work of this Department are

given below :—

(a)	Total number of Hindi communications received from anywhere in the Deptt	2057
(b)	Total number of communications replied to in Hindi	1026
(c)	Total number of communications replied to in English	173 (Replies to other communications were not necessary)

Positions regarding Originating Correspondences

	Number Issued		
	Total	In Hindi	In English
(a) To the offices in Hindi Speaking States and States/Union Territories which have adopted Hindi for purpose of communication with Government of India	34	18	16
(b) To public of Hindi speaking States.	..	..	..
(c) (1) To Central Government Offices located in Hindi speaking States	2	1	1
(2) To Central Government Offices located in States/Union Territories which have adopted Hindi for purpose of communications with Government of India	305	32	273
(3) To Central Government Offices located in Non-speaking States	—	—	—
	67	..	67

Documents issued/in both Hindi and English

	Number issued billingually.	Number issued in Hindi only	Number issued in English only
(1) General Orders	114	61	273
(2) Resolution & Notifications	65	..	..
(3) Rules	..	..	..
(4) Administrative and other reports	1	..	..
(5) Fulfilment of Assurance given in Parliament	37	..	..
(6) Budget performance of the Deptt. for the year 1977-78	1	..	..
(7) Government Reviews on the Annual Reports of:—			
(a) Kudremukh Iron Ore Co. Ltd	1		
(b) Indian Iron&Steel Co. Ltd.	1	..	..
(8) Agenda Notes and Minutes of the meeting of Staff Council and Consultative Committee	These were issued billingually		

APPENDIX I

ALL INDIA PRODUCTION OF IRON AND STEEL

(Rounded to '000 tonnes)

Products	1974-75	1975-76	1976-77	1977-78	1978-79 (Estimated)
1.	2.	3.	4.	5.	6.
(i) Saleable Pig Iron@	1640	1629	2052	1529	1560
(ii) Saleable Steel :					
I. MILD STEEL					
A. MAIN PRODUCERS :	1150	1762	1975	1890	1507
(a) Semis	344	447	705	638	645
(b) Flat Products :	129	169	187	202	198
Plates	167	171	166	190	221
*HR Sheets (10—14G)	98	104	171	224	217
CR Sheets/	444	586	931	891	914
HR Sheets (16G & above)	156	173	187	197	198
CR Coils	51	50	43	61	73
*HR Coils/Skelp	30	48	54	59	59
GP/GC Sheets					
Elec. Sheets					
Tinplates					
(c) Non-flat Products :	779	641	695	709	700
Rounds/Flats	374	392	473	480	461
Wire Rods	321	397	412	483	399
Light Structurals	194	258	279	273	255
Medium Structurals					

Heavy Structurals	200	164	148	180	167
Shell Bars	9	8	4	5	1
Gothic Bars	36	47	39	25	50
(d) Railway Materials :					
Hy. Rails	243	201	304	224	320
Lt. Rails	12	14	15	11	10
Sleepers	50	61	41	64	60
Wheel, Tyres & Axles	33	37	37	39	41
Bearing Plates	|	3	|	|	
Crossing Sleepers	12	|	|	|	11
Fish Plates	4	2	2	3	3
TOTAL (A) :	4381	5728	6867	6848	6510
B. MINI STEEL PLANTS : Billet/Pencil Ingot)	700	400	700	957	1494
II. ALLOY AND TOOL STEELS	264	248	290	304	400
TOTAL SALEABLE STEELS :	5795	6376	7857	8109	8404

*Includes production of Strips meant for Rourkela Pipe Plant.

@IISCO normally does not have any pig iron for sale. Therefore, the saleable production figures above represent actually the despatches to their own Kulti/Ujjain Works.

Note:—Alloy and special steels produced by TISCO are included in "Alloy and Tool Steels .

APPENDIX II

Import of Iron & Steel during 1977-78* (Qty. in tonnes and value in Rs. '000)

Category	Quantity	Value
1. Short angular, grit, Iron or Steel powder, sponge iron or steel	1054	5202
2. Carbon Steel	327973	1118813
3. High Carbon Steel	39152	148285
4. Alloy Steel	57322	440389
5. Rails & Railway materials	7113	56535
6. Iron & Steel Scrap	56342	120705
7. Total Iron & Steel	488956	1889929
8. Ferro Alloys	1060	22392
9. Grand Total (8+9)	490016	1912321

Source : D.G.C.I.S.

*Items appropriate to Deptt. of steel

Category	1976-77		1975-76	
	Qty	Value	Qty	Value
1. Sponge iron steel powder angular grit pellets etc	500	2654	518	2502
2. Mild Steel	245978	809672	355306	1253507
3. High Carbon Steel	30267	137703	66156	285224
4. Alloy Steel	39030	346502	51777	438116
5. Railway, rails, tram rails, wheels, axles, sleepers, etc	3054	18603	1971	12617
6. Iron & Steel Scrap	35131	63733	17588	32850
7. Iron & Steel	353960	1378867	493316	2024816
(Total)	526	19706	1138	24469
8. Ferro Alloys	354486	1398573	494454	2049285
9. Grand Total				

Source : DGCI&S

APPENDIX III

Quantitp : In MT
Value : In Rs. Crore

STATEMENT SHOWING CATEGORY-WISE EXPORT OF PIG IRON STEEL AND FERRO ALLOYS DURING 1977-78 & APRIL DECEMBER, 1978

Sl No.	Category	Exports during 1977-78		Exports during April-December 1978	
		Qnty	Value	Qnty	Value
1	2	3	4	5	6
1.	Pig Iron Steel	6 98 891	44·81	1 90 220	13·73
2.	Billets	3 27 898	43·61	90 533	13·29
3.	Bars & Rods	4 30 265	71·57	1 91 736	37·59
4.	Structurals	1 11 571	19·96	45 068	8.10
5.	Rails/Railway materials	76 270	21·71	40 388	13·81
6.	HR Plates	19 285	3·59	381	0·09
7.	HR Coils	91 793	14·72	12 715	2·17
8.	CR Coils/Sheets	9 970	2·24	21 401	5·02
9.	GP/GC Sheets	6 884	1·90	5 909	1·54
10.	Pipes	17 588	4·16	14 434	3·43
11.	Special Steel	3 156	0·92	1 438	0·42
12.	Wires	6 131	1·83		
	TOTAL STEEL	11 00 811	186·21	4 24 003	85·46
	TOTAL PIG IRON & STEEL	17 99 702	231·02	6 14 223	99·19
13.	Ferro Alloys	70 622	10·11	1 04 682	17·62
	GRAND TOTAL	18 70 324	241·13	7 18 905	116·81

APPENDIX IV

PRODUCTION DESPATCHES AND SHIPMENT OF IRON ORE (DURING 1977-78 APRIL-DECEMBER, 1978)

(Unit LAKH TONNES
January-March

PARTICULARS	1977-78		1978-79			1979
	Target	Actual	Target for the year	April-Dec. '78 Target	'78 Actual	Target
1	2	3	4	5	6	7
I. PRODUCTION						
1. *Bailadila* 14 (*Lump*)						
Plant	27·00	21·66	20·00	13·90	17·15	6·10
Float	28·00	32·12	15·00	12·50	10·76	2·50
TOTAL	55·00	53·78	35·00	26·40	27·91	8·60
Reclaimed Fines		2·10				
Bailadila 5 (*Lump*)						
2. *Baila0ila* 5 (*Lump*)						
Plant	18·00	14·27	25·00	17·40	17·23	7·60
3. *Kiriburu Plant*						
Lump	9·80	10·07	Project transferred to Bokaro Steel Plant (Under SAIL) from 1-5-78 Hence no data furnished for 1978-79			
Fines	16·00	12·27				
Total	25·80	22·34				

1		2	3	4	5	6	7
4. Donimalai							
Lump: Plant		*3·25*	*0·80*	*6·60*	*4·10*	*3·28*	*2·50*
Float		*3·68*	*2·90*	..	..	..	..
Fines : Plant		*4·69*	*0·68*	*6·05*	*3·76*	*2·41*	*2·29*
TOTAL		*11·62*	*4·38*	*12·65*	*7·86*	*5·69*	*4·79*
5. Total Iron Ore Production							
(a) Excluding Kiriburu		*84·62*	*74·53*	*72·65*	*51·66*	*51·56*	*20·99*
(b) Including Kiriburu		*110·42*	*96·87*				
II. Despatches							
1. Bailadila-14	Lump	*58·00*	*48·29*	*35·00*	*27·95*	*26·45*	*7·05*
	Fines		*2·10*			*0·73*	
	TOTAL	*58·00*	*50·39*	*35·00*	*27·95*	*27·18*	*7·05*
2. Bailadila-5	Lump	*18·00*	*12·25*	*25·00*	*17·15*	*16·92*	*7·85*
3. Kiriburu	Lump	*9·80*	*7·19*				
Rourkela	Fines	*16·00*	*11·57*				
	Lump	..	*1·87*				
	Fines	..	..				
Durgapur	Lump	..	*0·26*				
	Fines	..	*0·30*				
TOTAL		*25·80*	*21·19*				

Project transferred to Bokaro Steel Plant (Under SAIL) from 1-5-1978. Hance no data furnished for 1978-79.

4. Donimalia	*Lump*	*6·07*	*3·44*	*6·60*	*4·95*	*3·55*	*1·65*
	Fines					*0·62*	
	TOTAL :	*6·07*	*3·44*	*6·60*	*4·95*	*4·17*	*1·65*
5. Total Iron Ore Despatches							
(a) Excluding Kiriburu		*82·07*	*66·08*	*66·60*	*50·05*	*48·27*	*16·55*
(b) Including Kiriburu		*107·87*	*87·27*				
III. Shipment							
Bailadila-14 / Bailadila-5	Lump	*73·44*	*59·61*	*60·00*	*45·00*	*43·28*	*15·00*
Bailadila-14 (Fines)			*1·15*			*0·96*	
Tobah :		*73·44*	*60·76*	*60·00*	*45·00*	*44·24*	*15·00*

IV. Closing Stock of Iron Ore Lump	At Mine				At Visakhapatnam	Total
	Bld-14	Bld-5	Donimalia	Total	Port (Bld.Ore)	Mine+ Port
As on 31-3-77	*5·91*	*0·88*	*1·43*	*8·22*	*4.58*	*12·80*
As on 31-3-78	*11·39*	*2·90*	*1·69*	*15·98*	*6·02*	*22·00*
As on 31-12-78	*12·71*	*3·21*	*1·42*	*17·34*	*5·50*	*22·84*

Production and sale of Diamond during 1977-78 *and April-December*

PANNA DIAMOND MINING PROJECT

I. Production						
Maghgawan	*18000*	*14102*	*18000*	*12400*	*8797*	*5600*
Ramkheria	*2000*	*2230*	*2000*	*1400*	*1661*	*600*
TOTAL :	*20000*	*16332*	*20000*	*13800*	*10458*	*6200*

II. Sale 29700 Cts (Rs.232.13 lakhs)	19717 cts 20000 cts (Rs. 251.74 lakhs)	(Rs. 100·30 lakhs)	10315 cts (Rs. 173·51 lahs)
III. Closing Stock of Unsold Diamond	As on 31-3-77 7946	As on 31-3-78 4561	As on 31-12-1978 4705

PART III

DEPARTMENT OF MINES

CHAPTER I

GEOLOGICAL SURVEY OF INDIA

Introduction

1. Geological Survey of India is a multidisciplinary scientific organisation for carrying out geological mapping, mineral investigations and geotechnical investigations in the country. It also conducts research, both fundamental and applied, in all the branches of earth sciences, besides special investigations in glaciology, environmental geology and geothermal studies.

2. During the last few decades, there has been considerable diversification and multiplication of G.S.I's activities, which has resulted in significant increase in the quantum of work. Government, therefore, constituted a high powered Committee to review the organisation, structure, functions and performance of G.S.I. The recommendations of the Review Committee have been accepted by Government and are in the process of implementation. Government have constituted a Board of Management for G.S.I. with a view to reorganising its administrative structure to allow greater autonomy to the organisation, and to ensure fullest participation by scientists at all levels in the planning and implementation of the programmes. The Board is headed by the Secretary, Ministry of Steel and Mines, and includes amongst its members, the Director General, G.S.I., an eminent geoscientist, an eminent executive, representatives of other scientific organisations and representative of the Ministry of Finance.

3. The constitution of the Board will ensure that senior representatives of GSI, alongwith eminent technical and other members, are associated with the decision making functions which were earlier exercised by the Ministry. The Board has been vested with practically all the powers of the Ministry. Together with other organisational changes, the new administrative framework is designed to expedite decision making, enhance cost effectiveness, better personnel management and optimum utilisation of men and materials in the GSI and appropriate devolution of powers and responsibilities within the organisation.

9—986 S&M/78

Activities

4. In addition to systematic geological mapping of the country, which is the fundamental work of GSI, exploration for coal and non-ferrous minerals continued to receive high priority. In view of the growing demand, exploration for coal was carried out in 18 coalfields and a total of 51 drills were in operation. Exploration for copper-lead-zinc was continued in various parts of the country by deploying more than 50 drills. Concept oriented programmes introduced a few years back to locate deposits having no surface indications have started paying dividends. Singhana-Muradpur copper intersections in the sand covered alluvial tract in Rajasthan and the Aldahalli-Dasapura copper fields in Karnataka located through air borne and ground geochemical surveys are good examples. In view of critically inadequate manganese and chromite resources, a major time-bound programme for exploration of these minerals was taken up in collaboration with M.E.C., MOIL and O.M.C. The potash investigation in Bikaner and Churu districts of Rajasthan has been acccelerated by increasing the inputs and according it a high priority. Under the International Geological Coorelation Programme, about 20 projects in the realm of stratigraphy, metallogeny, genesis of ore deposits, remote sensing and mineral exploration, computerisation of geodata, etc., were taken up. In order to initiate and execute geomorphological, geological and geohydrologcal studies in the Brahmaputra Basin a separate Unit was set up at the Central Headquarter at Calcutta in January, 1978.

Performance :

5. Systematic mapping was carried out both in hard rock areas and in Quaternary sediments. During the year, a total area of 6430 sq. km and 138 sq. km respectively. sq. km. of large scale mapping (from 1 : 10,000 to 1 : 31,680 50,000 scales against the target of 91,793 sq. km. Besides, 4611 sq. km. of large scale mapping (from 1 : 10 : 000 to 1 : 31,680 scale) and 170 sq. km of detailed mapping (1 : 10,000 scale) are expected to be carried out during the year against a target

Mineral Investigations :

6. A total of 120,408 metres of drilling is expected to be carried out against a target of 139,429 metres during the year which includes about 41,255 metres in coal.

(1) *Coal*

7. Regional exploration by drilling and mapping was carried out in 18 coalfields in Assam, West Bengal, Bihar, Madhya pradesh and Andhra Pradesh with the deployment of 51 drills. Reserves estimated during this period in different coalfields are of the order of 83.843 million tonnes.

(2) *Base metal ores* :

8. Investigations for basemetal ores by drilling were continued in different parts of Rajasthan, West Bengal, Bihar, Haryana, J&K, Madhya Pradesh, Maharashtra, Andhra Pradesh, Karnataka and U.P. in Rajasthan a reserve of 1.50 million tonnes of ore with 2% copper was estimated in Banwas block of Khetri copper belt; 1 million tonnes with 1.2% copper in Baleswar in Sikar district and 0.90 million tonnes with 1.26% copper in Wari "C" block of Chitorgarh district. Significant lead-zinc-copper mineralisation has been obtained in several lodes in Rewara prospect of Bhilwara district, Rajasthan. In Maharashtra, a probable reserve of 3.21 million tonnes with 0.77% copper has been estimated in Thaneswar area of Chandrapur district. In Alababalli area, Hassan district, Karnataka, 5 lodes containing copper mineralisation have been delinerated, having a tenative reserve of 2.19 million tonnes with average grade of 0.93% copper. In Gorubathan area of Darjeeling district, West Bengal, a probable reserve of 2.188 million tonnes having 4.17% lead and 4.89% zinc with significant association of magnetite, copper, silver, cadmium, etc., has been estimated.

(3) *Bauxite* :

9. After completing the regional assessment of bauxite resources in the East-Coast in Andhra Pradesh and Orissa, estimating a resource of 1628 million tonnes, several bauxite cappings in Vishakapatnam, Koraput and Kalahandi districts were investigated. In Surguja area in M.P., a reserve of 3 million tonnes of Gr. I bauxite and 10.25 million tonnes of Gr. III and above were estimated in Gharhat and Kudag blocks respectively. Reconnaissance survey revealed the presence of high grade refactory quality bauxite in the Keshkal plateau of Bastar district, M.P.

(4) *Iron Ore* :

10. In Bihar-Orissa sector investigation for iron ore in Jhilling-Langlota sector indicated recoverable reserve of 48.622 million

tonnes. Drilling was resumed in Appahatu-Banspani in November, 1977 where a tentative reserve of 6.32 million tonnes was estimated. Out of seven blocks in Rowghat area, Bastar district, M.P., drilling and pitting completed in 'A' block revealed a reserve of 180 million tonnes with +62% iron. Drilling in selected areas in Bellary Hospet sector, Karnataka was continued. So far a reserve of 3.3 million tonnes has been estimated for Zone I. For Zones II, IV & V, inferred reserves of 16.2 m. tonnes, 3.6 m. tonnes and 13.5 m. tonnes respectively have been tentatively estimated. In Goa, at Borde and Sarvona areas, exploratory drilling was commenced encountering mostly soft powdery and lateritised type ores.

(5) *Manganese Ore* :

11. Exploration for manganese in lease-hold areas of Bonai Keonjhar belt in Orissa revealed a fairly continuous mineralised area over 1.30 sq. km. at Siljora 'B' block, wherein a tentative reserve of 3.10 million tonnes has been indicated. In Roida, a tentative reserve of 1.566 million tonnes was estimated. Exploration in the lease-hold areas of MOIL in Balaghat and Bhandara districts, M.P. was continued. In Chikla area drilling has indicated that ore zone ctntinues in depth for more than 90 m. over a strike length of 1.5 km with an average of 6 m. width. In Ukwa areas the ore horizon is about 1.6 m. in thickness and a total of 6.5 million tonnes of in Situ ore reserves were estimated.

(6) *Chromite* :

12. Investigation for Chromite in Saruabil and Nausahi-Boula areas in Orissa was continued. In Bhimtanagar area, reserve of about 26 million tonnes has been estimated. In Boula, two lodes, have been explored for 0.6 km. and 0.3 km down to 100 m. and 85 m. respectively and the reserve tentatively estimated for these lodes are 1.72 and 0.21 million tonnes. Investigation for chromite was resumed in Dras-Kargil area of Ladakh.

(7) *Vanadium* :

13. Investigation for vanadiferous-magnetite in Shimoga district, Karnataka was continued and a probable insitu reserve of 4.2 million tonnes of magnetite with 0.8 to 1% V_2O_5 has been estimated. A reserve of 0.54 million tonnes of float ore with 0.8 to 1% V_2O_5 has also been established.

(8) *Chromium-Nickel bearing magnetite*

14. Drilling in Pukhpur block, Tuensang district, Nagaland for ocmplex chromium nickel bearing magnetite was commenced in December, 1977.

(9) *Limestone/Dolomite* :

15. Investigation for limestone in Shelta-Khasimara area, Meghalaya and Malkapuram area, Andhra Pradesh was continued, where reserves of 244 million tonnes and 5 million tonnes respectively have been estimated. Drilling was started in Purulia district of West Bengal.

(10) *Gold* :

16. Investigation for gold was continued in Mallappakonda and Chigargunta areas Chittor district, A.P. and Hutti Gold field in Karnataka. In Gadag Gold field, work was in progress and a potential zone extending over a considerable distance has been identified.

(11) *Diamond* :

17. Washing of pipe rock material was continued in Wajrakarur area in Anantapur district, A.P.

(12) *Phosphorite* :

18. Drilling for apatite was continued in Beldih in Purulia district, West Bengal and a probable reserve of 1.95 million tonnes with 10.37% P_2O_5 was estimated. Drilling was continued in Jhabua district and Sagar district of M.P. In Jhabua district inferred reserves of 4.5 million tonnes have been estimated.

(13) *Potash* :

19. Drilling for potash was continued in the Nagaur basin, Rajasthan. In a borehole at Lakhasar in Churu district, 104 m. thick halite horizon was intersected with minor amount of potash bearing minerals like polyhalite and sylvite.

(14) *Barytes* :

20. In Mangampeta, Cuddapah district, A.P. an additional resere of 6.61 million tonnes (tentative) of all grades of barytes was estimated thus bringing the total reserve to 64.23 million tonnes.

(15) *Graphite* :

21. Investigation by drilling was continued in Vadakode area, Ernakulam district of Kerala, Chitre in Sikkim and in Sirar Parsor in Almora district (U.P.) A new graphite occurrence at Adveli near Vadakode in Ernakulam district, Kerala was also examined. In Chitre, preliminary drilling indicated that the lump variety is of superior grade, with 70-80% graphite (F.C.) while flaky variety has 30-40% F.C.

(16) *Other Minerals* :

22. Investigation by drilling was continued for Sillimanite in Sonapahar area (Meghalaya), tungsten in Chendapathar area Bankura district, W.B., Kyanite in Bhandara district of Maharashtra and molybdenite in Sikar district, Rajasthan.

Geotechnical Investigations :

23. Nearly 200 items of Geotechnical investigations are expected to be taken up during the year in connection with the river valley projects, slope stability, coastal erosion, geoseismology, landslide and environmental studies connected with urban and industrial development complexes.

Geophysical investigations :

24. During 1978-79, 46 field investigations are expected to be carried out in different parts of the country. Geophysical investigations employing magnetic, self-potential, electromagnetic and induced polarization methods were conducted for base-metals in 18 areas. Mineralization was encountered in Hutti area (A.P.). In Singhana area, Jhunjhunu district (Rajasthan) extension of sulphide mineralization at depth has been indicated from induced polarization results. Drilling in geophysical anomaly zones near Rub in Subansiri district (Arunachal Pradesh) has struck good quality polymetallic ores. Gravity, magnetic, deep resistivity and explosion seismic surveys were undertaken for structural-cum-basin studies and for coal in 8 areas. Eight investigations were carried out for other minerals. Interesting induced polarization anomaly zones have been delineated in Kolar schist belt. In Sargipalli area (Orissa) self potential surveys have delineated the extension of the graphite body of Dhokaman mine. Ultrabasic bodies within laterite have been located by gravity surveys between Tomka mines and Salandi in Cuttack and Keonjhar district of Orissa, which may be associated with chromite. Geophysical surveys were conducted for geothermal resources in two areas in Haryana. Six investigations were conducted for civil engineering and geotechnical project sin Hyderabad, Bangalore, Jaipur, Ajmer and

Kanya-Kumari. Three geophysical investigations were conducted for groundwater in Kerala, Meghalaya and Tamil Nadu.

25. In Marine geophysics, processing and interpretation of magnetic data obtained in the R/V Gaveshani's XXIX cruise between Vengurla and Ratnagari off the west coast of India was carried out.

Geothermal Investigations :

26. Geothermal investigations were continued in the parvati Valley and Beas Valley geothermal fields (H.P.), Sohna (Haryana) and also in the West Coast of Maharashtra and Alakananda Valley. In the west Coast hot spring area of Maharashtra, geological, geohydrological and geophysical surveys were continued. Geohydrological mapping of Tamane hot spring area revealed that individual trap flow contacts and the trap laterite contacts are favourable geomorphic features for zones of saturation of prominent seepages.

Glaciological investigations :

27. In Gara glacier expedition, Kinnaur (H.P.) water discharge measurements were continued and in Neh Nar (J&K), mass balance studies were continued by ablation observations. In Gor Garang glacier expedition (H.P.) mass balance studies were completed and in Zemu glacier (Sikkim) multidisciplinary expedition was taken up.

Brahamaputra Basin Studies :

28. Multidisciplinary studies are in progress since February 1978 for construction of a barrage across Brahmaputra to direct, 3000 cusecs of water from Brahmaputra into the Ganga System. As a part of this programme an area of 0.25 sq. km at Joghighopa has been geotechnically mapped on 1 : 1000 scale and wash samples from drill holes in the river bed examined. At the barrage site and the canal head regulator and alignment, 6352 resistivity observations, 98 resistivity soundings and 14 Nos. hammer seismic shots have been taken. An area of 7,255 sq. km has been photogeologically evaluated with field check. Airphoto interpretation of an area of 3320 sq. km. besides the above, has also been carried out. Hydrogeological mapping has been carried out over an area of 500 sq. km with observation of water levels of 174 wells and collection of 103 water samples.

RESEARCH INVESTIGATIONS

Petrology :

1.29. In the Central Petrological laboratories research on 12 items involving petrology, mineralogy, lake geology and astrogeology was continued besides 21 research items in different regional laboratories.

Mineral Physics :

1.30. About 597 samples including rocks and ores, clays, fossils, etc., were analysed involving 1800 determinations. Besides, research work on topofacie transformation in minerals, structure analysis of silicate minerals, geothermometry of sulphide deposits, quantitative analysis of minerals and neutron activation analysis of rock samples were carried out.

Geochronology and Isotope Geology :

1.31. Field work in connection with geochronology and related geochemistry of granite emplacement and metamorphism in the Himalayas and Rajasthan was carried out and 95 samples from the Indus-Tectonic Zone and Ladakh diorite complex have been collected. 90 whole-rock samples for Rb/Sr. method and 65 XRF determination of Rb/Sr ratios were processed. 67 runs were taken in the Nuclide Solid Source Mass Spectrometer for the determination of Sr. isotopic compositions. Separation and ion exchange purifications of 3 samples of lead from Bhutan were carried out. The age of the volcanic glass from J&K was determined. Seven K-Ar ages were being finalised. 37 norm computations and other geochemical calculations for anorthosite and related rocks of Indian Shield have been carried out.

Palaeontology :

1.32 In the Central Palaeontology and Stratigraphy Division, studies on (i) Quaternary biostratigraphy of Narmada and Son Valley, (ii) Tertiary sediments of Darjeeling district (iii) Nanno fossils, (iv) Tertiary Mollusca, (v) Microfossils from marine and recent beach sediments (vi) Marine Tertiary Vertebrates of Gujarat (vii) Upper Cretaceous and lower Tertiary Shelf sediments of Manipur (viii) Jammu Limestone (ix) Neogene/Quaternary boundary and (x) Benthonic Forminifera, were carried out. Research work in different regional laboratories on microfaunal and sedimentological studies, mannoplanktons from the Miocene

sediments of Saurashtra, stromatolites and palaeontology with reference to the Plio-Pleistocene boundary were undertaken.

Museum and Curatorial Work :

1.33 Specimen of Hexaprotodon (skull) were arranged for exhibition in the Indian Museum and details of the construction of life size model of *Allosaurus* in the premises of Natural History Museum, Delhi were worked out.

Chemical Laboratory :

1.34. In the regional, divisional and central headquarter chemical laboratories, analysis of rocks, minerals and ores samples was undertaken. Besides, research work on (i) XRF method of analysis of cassiterite and determination of tin in cassiterite, (ii) studies on the determinations of trace elements in sea water by ion exchange and atomic absorption method, (iii) studies on determination of trace elements in Sewage samples by extraction Atomic absorption spectometry, and (iv) determination of Niobium and tantalum by XRF method were undertaken.

Field Technique Research :

1.35. Field technique research Unit continued investigations in different parts of the country to determine path-finder elements, etc. to aid mineral prospecting. Studies were continued on (i) fluorometric survey (ii) development and application of vapour detection technique (iii) integrated geological, geochemical and geophysical surveys (iv) sediments sampling (v) geochemical studies, etc.

Off shore mineral Exploration and Marine Geology :

1.36. Regional programme of exploration of the continental shelf including geological mapping of the continental shelf between Vengurla and Ratnagiri of West Coast, study of prodeltaic region of Godavari and Krishna rivers was undertaken. Work was also continued on ilmenite and other minerals from black sands off Ratnagiri and Konkan Coast, the sediment movement of Goondapur and Bhaktal ports and effects of dredging lagoon sands on the erosion of the islands.

1.37. Research programmes in marine geology included study of organic carbon in the bottom sediments off Andaman Islands, grain size analysis of Oceanovex-I samples, Manganese Nodules from Indian Ocean and Geotechnical study of the grab samples

from the Gulf of Kutch collected on I.N.S., Darshak during 1974-75.

Photogeology and Remote Sensing :

1.38. Photogeological mapping of 1200 sq. km area along Kerala Coast and 1500 sq. km area in parts of Brahmaputra basin was carried out. Work was continued in connection with (i) Indian Space Research Organisation-Geological Survey of India (ISRO-GSI) Collaboration Projects.

1.39. Landsat imagery interpretation map and aeromagnetic anomaly map of Rakha-Mosabani copper mine area, Bihar, was prepared. Interpretation of 1 : 50,000 scale enlargement of Landsat imagery of Zawar area, Rajasthan was also carried out.

Map Division :

1.40. The programme of compilation and publication of definitive series of National Geological and Mineral maps was continued. The maps under various stages of processing include Geological Quadrangle Maps, Geological and Mineral Atlas of India, Geotechnical Map of India, revised Geological Map of India, Mineral Resources Map, etc. Map (1 : 5 M Scale) of South and East Asia is under print. Revision of the Geological Map of South and East Asia (1 : M. scale) was in progress.

Publication Division :

1.41. Activities of G.S.I. and findings in research work are published regularly in the form of Bulletins, Memoirs and Records apart from special issues of publications. A new publication relating to Annual Review of the progress in the previous year has been published.

Geodata Centre for minerals and Earth Sciences :

1.42. One of the primary responsibilities of G.S.I. is the collection, collation, utilisation and dissemination of Earth Science data. Realising its importance a Geodata Centre for minerals and earth sciences has been set up. A system of coding, storage and retrieval of geological data by EDP methods is being developed. Abstracting and documentation of data from unpublished reports of the department on mineral investigations and systematic mapping in a standard proforma has been taken up.

Training Institutes :

1.43. Geological Training Institutes at Raipur, provided orientation training of high professional standards to 60 trainee officers. The third course during 1979-80 will train 100 newly recruited geologists.

Construction Programme :

1.44. A major programme relating to construction of office-cum-laboratory buildings for the GSI offices located in different parts of the country is underway. Efforts are being made to complete the construction activity within the next 3-4 years.

Budget

1.45. The Plan and Non-Plan Budget Estimates (1978-79) for Geological Survey of India were Rs. 11.50 crores and Rs. 22.28 crores respectively. Against this, the Revised Estimates (1978-79) are Rs. 8.34 crores and Rs. 18.35 crores respectively. The shortfall in expenditure is mainly due to difficulty in recruiting sufficient number of technical personnel required for the different programmes. Since the posts could not be filled, the expenditure on salaries, travel expenses, office expenditure, etc. was correspondingly less. It has been possible to attract a large number of suitable candidates in the Geologists' examination (1978) and it is expected that the problem of shortage of technical personnel will substantially be alleviated in the next year.

The Plan and Non-Plan Budget Estimates (1979-80) are Rs. 13.06 crores and Rs. 21.10 crores respectively. The major physical targets of the programme are 99,320 Sq. Kms. of systematic mapping; 6,821 sq. Kms. of large scale mapping; and 1,47,450 mtrs. of drilling. One of the important items in the next years' programme is the completion of the aero-magnetic survey of the Sone-Narmada 'lineament". A large programme for construction of functional and residential buildings is also being undertaken.

Training in Hindi under the Hindi Teaching Scheme, etc.

1.46. During the period 111 officers were nominated for Praveen, 83 for Pragya and 4 for special Course under the Hindi Teaching Scheme. One LDC was nominated for Hindi Typewriting and another for Hindi Stenography. Out of 175 communications received in Hindi 30 were replied in Hindi. 23 Hindi

letters were translated into English and 120 Notifications were translated from English to Hindi. 40 Name-plates, etc., were made in bilingual.

Audit observations and paras

1.47. A total of 7644 audit observations and items involving an amount of Rs. 65,81,698 were carried forward from the previous year and 379 paras were pending settlement. During the period it has been possible to vacate 448 items amounting to Rs. 64,06,000 and 221 paras.

CHAPTER II

MINERAL EXPLORATION CORPORATION LIMITED

INTRODUCTION

2.1 The Mineral Exploration Corporation Limited was set up on 21st October, 1972 in the public sector to undertake the work of detailed mineral exploration. The Corporation's activities are of two types viz.,

(i) Contractual work for undertakings both in the public and private sector; and

(ii) promotional projects undertaken with the approval of the Government, the cost of which is met by the Central Government.

ORGANISATION

2.2 The Corporation with its headquarters at Nagpur functions under the overall supervision of a Chairman-cum-Managing Director, who is assisted by Divisional Heads.

PERFORMANCE AND PROGRAMMES

2.3 Targets and achievements for the past four years are set out in the following table :—

Item	1975-76		1976-77		1977-78		1978-79	
	Target	Achievement.	Target	Achievement.	Target	Achievement.	Target	Achievement (upto Dec. 78)
1	2	3	4	5	6	7	8	9
1. Drilling (in metres)	90275	71948	100650	99464	150090	135137	183700	131524
2. Mining (m.)	2302	1856	4338	5375	6710	6542	7900	5447
3. Value of Works (in Rs./ Lakhs)	436.94	350.71	560.19	622.95	866.00	825.73	1008.12	596.76

*Realisation upto Nov, 1978.

It will be seen that the Corporation has steadily increased its output from year to year. The value of the work has also correspondingly increased. A statement giving mineralwise distribution of work done and reserves established during the year 1977-78 and 1978-79 is enclosed at Annexure I. The major part of the resources were deployed on exploration of coal, in which a total of 71655 metres of drilling was carried out (upto October, 1978). The next major item related to bauxite, where drilling for the same period amounted to 20542 metres. Exploration of the East Coast bauxite area is continuing.

2.4 The improved performance is also reflected in the financial results of the Company. In the years 1974-75 and 1975-76 the Corporation had incurred losses to the extent of Rs. 85.11 lakhs and Rs. 73.28 lakhs respectively. The Company, for the first time, made a profit of Rs. 105.12 lakhs in the year 1976-77. During 1977-78 also, a profit of Rs. 102.45 lakhs has been made.

2.5 The requirements of capital expenditure of the Company are met partly from internal resources and partly by equity contribution by the Government of India. Promotional projects are paid for by the Government on the basis of approved schedule of rates. The payments on account of equity and promotional work made to the Company are shown in the table below :—

(Rs. in crores)

Year	Payments Equity	Promotional
1974-75	3·64	0·61
1975-76	4·00	1·64
1976-77	3·40	1·25
1977-78	3·50	1·68
1978-79 (Estimated)	Nil	4·40

The paid-up capital at the end of 1978-79 is expected to be Rs. 17.99 crores as against the authorised capital of Rs. 25 crores.

2.6 During 1979-80, the Corporation has set itself a target of 1,90,000 metres of drilling and 8,000 metres in Mining.

HIGHLIGHTS OF WORK DONE DURING 1978-79 (UPTO OCT, 78).

Coal

2.7 Major portion of the resources of the Corporation continued to be employed for exploration of Coal both coking and non-coking. A total of 71,655 metres of drilling was carried out (upto October, 78) in 45 blocks in Bihar, M.P., Maharashtra and West Bengal out of which 13 were taken up during the year. Coal reserves totalling 1,218,55 million tonnes(i.e. 150.30 m. tonnes of coking coal and 1068.25 m. tonnes of non-coking Coal) were established.

Iron Ore

2.8 In Chiria Iron Ore Project Singhbhum district, Bihar, 109 metres of exploratory mining was done to strengthen the reliability of the reserves of 1970 million tonnes established earlier. In the Bellary-Hospet area of Karnataka 533 metres of exploratory mining and in Thakurani Iron Ore mines, Orissa, 652 m.+134 cu. m. of exploratory mining was done.

Bauxite

2.9 Detailed exploration in the East Coast Bauxite areas of Jerrela (Korukonda) in A.P. Panchpatmali, Pottangi, Gandhamardan in Orissa was continued and a total of 20,542 metres of drilling and 124 metres of pitting has been done. Exploration under Phase-I in Gandhamardan has already been completed and the Report is under preparation. The Report on exploration for Saparla Blocks 3 & 2 of the Chintapalle area in Andhra Pradesh was submitted to the Government and a total of 72.58 million tonnes of bauxite ore reserves containing 47.69% AI_2O_3 and 2.18% Sio_2 were established.

Limestone

2.10 265 metres of drilling in the Siju area of Maghalaya has been done. Exploration report for Jaggayyapeta Limestone (A.P.) was submitted in December, 1977 and reserves of 36.77 million tonnes of flux grade limestone were established in this area.

Dolomite

2.11 Exploration report on the work done in the Machkot-Tiria area of Baster District (M.P.) was submitted to Steel Authority of India Ltd. in December, 1977 establishing 53.69 million tonnes of flux grade dolomick reserves.

Copper-Lead-zinc

2.12 A to tal of 340 m + 221 cu. m., (comprising 162m. + 221 cu.m. of level development) in Askot in U.P. and 178 m. (comprising 76 metres of shaft/sinking and 102 m. of level development) in Dikchu in Sikkim was done.

Lead-zinc

2.13 On completion of work in the Ganekha area of Bhutan, exploratory pitting and trenching was taken up in the adjoining Chakula area and 300 m, of pitting and 2245 cu.m of trenching was done.

Copper

2.14 A total of 1228 metres of exploratory drilling was done in Malanjkhand in Madhya Pradesh and 57 metres of shaft sinking and 11 metres of level development was done in Kesarpur Orrisa. Copper mineralisation was encountered in the inclined shaft as per expectations and further work is in progress.

Managanese

2.15 Pitting was contined in the private lease holds of Bonai-Keonjhar area of Orissa and a total of 737 metres of pitting was done. The Geological Survey of India is engaged in geological work and reserve estimation in this area.

Chromite

2.16 A total of 7083 metres of exploratory drilling was done, The geological work and reserves estimation is being done by Geological Survey of India.

Mine Construction

2.17 During the year 1978-79, mine construction work was done in three projects viz. Tirodi Manganese in Balaghat district (M.P.) and west Mochia 5th level and 8th level in the Zawar area of Rajasthan. A total of 541 metres of mining comprising 175 m. of shaft sinking/raising and 366 m. of level development was done upto October, 1978.

Statistical information regarding representation to SC and ST candidates in the services of M.E.C. Limited.

2.18 The information regarding representation to the SC and ST in the services of the M.E.C.L. is as under :—

(Statement showing the total number of employees and the number of Scheduled Castes and Scheduled Tribes among them as on 31-12-1978)

Group	Total number of employees	Scheduled Castes	Scheduled Tribes	Remarks if any
A	257	11	1	..
B	21	3	NIL	..
C	1047	124	60	..
D (Excluding Sweepers)	95	24	6	..
D (Sweepers)	3	3	NIL	..

OFFICIAL LANGUAGE IMPLEMENTATION PROGRAMME

2.19 In pursuance of Government's policy of extending the use of Hindi for official purposes, many steps were taken by the Corporation. The Anual Reports of the Company are published both in English and Hindi. For the Season started from 3-7-78, 18 employees of the Corporation were nominated for different Hindi Classes. Office orders, circulars, office memorandum are translated into Hindi. Rubber stamps and name plates of officers and Division are in Hindi also. Advertisements for recruitment were published in Hindi. A Hindi version of quarterly magazine entitled 'Khanij Gaveshan' depicting various activities of M.E.C.L. is also published.

ANNEXURE I

Mineral wise Distribution of work done and Reserve Established

Sr No.	Mineral	1977-78			1978-79			Remarks
		Drilling (M)	Mining (M)	Reserves established (Million tonnes)	Drilling (M)	Mining (M)	Reserves established (Million tonnes)	
1	2	3	4	5	6	7	8*	9
1.	Coal	108 908	..	1129·38	71 655	..	1218·55	..
2.	Bauxite	11 593	218	71·10	20 542	124	72·58	
3.	Iron Ore	2 263	2229m+ 745cu.m	..	..	1294m+ 134cu.m	814·45	
4.	Limestone	2 740	..	36·77	265	..	..	Work in progress
5.	Dolomite	1 518	..	53·69	..	..	..	..
6.	Copper-Lead Zinc	..	573M+ 1096cu.m	..	..	304M+221 cu.m	..	Work in progress
7.	Lead Zinc		1966M+ 1374cu.m	5·93	..	300M+ 2245cu.m	..	Reserves will be estimated by GSI
8.	Copper	4 275	155M+ 6 cu.m.	62·64	1 228	— 68	..	
9.	Manganese		740	..	..	769	..	Reserves will be estimated by GSI
10.	Magnesite	..	148m+23cum.	..	..	..	..	Reserves will be estimated by GSI
11.	Chromite	3 840	..	53·32	7 083	..	..	..
12.	Nickel	..	..	..	..	..	..	..
Total		135 137	6002M+ 1412·83 3244cu. M i.e.6542		100 774	3459M+ 2349cu. M	2109·58	..

Note : The reserves indicated in Col.5, 8 are as given in the reports submitted during the year but in certain cases are based on the work carried out in the previous years and include the tentative estimates given in interim report.

CHAPTER III

INDIAN BUREAU OF MINES

General :

3.1 The Indian Bureau of Mines has the following main functions :

(a) Compilation of data on the occurrence and production of minerals;

(b) Supervision of mining activities in the country with the objective of conserving and properly utilising mineral resources;

(c) Enforcement of the Mineral Conservation and Development Rules, 1958; and

(d) Carrying out of mineral beneficiation investigations on laboratory and pilot plant scale.

Organisational Set Up :

3.2 The Headquarter of the IBM is at Nagpur. Broadly the organisation has four Divisions;

(a) Mines Control and Conservation of Minerals;

(b) Technical Consultancy, Mining Research and Publication;

(c) Mineral Economics and Ore Dressing; and

(d) Administration.

4.3 The Bureau has 11 regional offices in the country. In addition, laboratory and pilot plant facilities for ore dressing are available at Nagpur. New facilities are being set up at Ajmer and Bangalore.

Sakient work of the Bureau in 1978 is detailed below :

Technical Consultancy Services :

3.4 During this period nine investigations were completed and fortyseven were in progress. The figures for the corresponding

period in 1977 were twentyeight and twentythree respectively. The more important investigations completed include the preliminary assessment of a Chromite mine in Orissa; preliminary assessment for a Wollastonite mine in Udaipur, and beneficiation of low grade Rock Phosphate ore from Mussoorie (U.P.) and Jhamarkotra (Rajasthan).

3.5 On the basis of the investigation conducted by the Bureau on ore samples of Jhamarkotra sent by the Rajasthan State Mines and Minerals Ltd., the Company is Planning to set up a pilot plant of 200 TPD capacity, before installing a large scale commercial plant.

Inspection of Mines :

3.6 During the period 720 inspections were carried out for the enforcement of the Mineral Conservation and Development Rules, 1958. In addition, nine detailed studies, eleven regional mineral development studies, sixteen mining geological studies, three studies of mineral rejects, and thirty special studies were carried out.

3.7 During these inspections 1451 violations of the Mineral Conservation and Development Rules, 1958 were detected and pointed out to lessees; and 431 have been rectified. Show cause notices were issued to 216 parties, and 56 parties were prosecuted. 31 parties were convicted.

3.8 Twentythree cases of relaxation of Rule, 21 of Mineral Conservation and Development Rules 1958, which requires a lessee to employ a Mining Engineer, were considered. Relaxation were granted in thirteen cases. Approval for stoping was given in twentythree cases. In 674 cases suggestions were given to mine owners for proper development of mines, and out of these in 142 cases, the suggestions have been implemented.

Preparation of Mineral Maps :

3.9 Under the scheme to prepare a mineral map of the Chromite bearing leaseholds, work has been completed for eight of the mineral districts in the country. These districts included 29 leases with a leased area of 10700 Hectares.

Research on Special Mining Problems :

3.10 The following four important mining research studies, were conducted during the period :—

(1) Determination of productivity norms of various mining operations and machinery for the Balaghat Mines of Manganese Ore (India) Ltd. ;

(2) Study conducted on iron ore/limestone mines for ore fragmentation and improvement of blasting efficiency;

(3) Study on mica bearing pegmatite for locating economic deposits of mica; and

(4) Study of use of concrete mat in mica.

Beneficiation of Low Grade Ores and Analysis of Ores/Minerals :

3.11 During the period under report fourteen ore dressing investigations, 11540 chemical analysis, and 585 minerological investigations were completed. The figures in the corresponding period in 1977 were twentythree, 12,196 and 50 respectively. At present 53 ore dressing investigations are in progress.

3.12 The more important investigations include beneficiation by floatation of sillimanite ore from Maghalaya; beneficiation of silica sand from Pondaghat to make it suitable for glass manufacture; extraction of heavy minerals (Ilmenite, Zircon, Monazite, Rutile), from sand found in the river Sabari in Bastar District.

3.13 Ore Dressing laboratories with pilot plant facilities are being set up at Ajmer and Bangalore. The erection of equipment at Ajmer is likely to be completed in 1979. The construction of the building at Bangalore is due to start very soon.

Publications :

3.14 Under the Mineral Conservation and Development Rules, information regarding production, value, stocks, despatches, was obtained from the mines and compiled in various classifications. This information was published in the journals of the Bureau.

3.15 During the period under report the Bureau released Indian Minerals Year Book—1972 and 1973; Bulletins of Minerals Statistics upto Jan-Feb; 1978 (bi-monthly); Quick Release Mineral Statistics upto July 1978 (monthly); Mineral Statistics of India upto April, 1978 (half-yearly); Mineral Stocks, 1978; and Foreign Trade in Minerals and Metals, 1976.

Monograph and Bulletins :

3.16 A monograph on bauxite was released. A Bulletin on Cement Industry in India, with particular reference to raw material requirement, and a Hindi version of the publication "Use and Care of Rock Drills in opencast Operations", were released.

Inventory of Mineral Resources :

3.17 Work of updating of the inventory as on 1-1-1975 in respect of bauxite, china clay, fireclay, copper, lead, zinc, magnesite, sillimanite, Apatite, rock phosphate, pyrite pyrrhotite and sulphur was in progress.

Market surveys of Minerals :

3.18 The market Survey on Talc—Steatite—soapstone was completed. Work was continued on the study of production and consumption of Copper and Zinc.

Training of officers and staff :

3.19 The Training Cell conducted refresher courses for Technical Assistants, Stenographers, Personal Assistants, and Group-D officials. Course on Ore Dressing Mineral Economic and Statistics, Technical Consultancy, Publications and Mining Research, for the executives of other Divisions, were also conducted. A Hindi Karyashala for the technical officers and staff is continuing. Thirty three officers of the Department were deputed for training courses at various training centres in India.

Advisory Role :

3.20 The Bureau continued to advise the Central and State Governments on matters concerning export and import policies on minerals; fiscal levies and cesses; mineral consumption and industrial utilisation; substitute minerals; recovery of by-products and co-products; planning for mineral exploration and exploitation; demand and supply of important inputs in mining industry; grant and renewal of mining leases, etc. Assistance was also rendered to private parties, institutions and foreign organisations regarding mineral production, consumption and other statistics.

Audit Objections :

3.21 Upto 20th November, 1977, 35 audit objections involving an amount of Rs. 13,57,161 were pending and during the

period from 20-11-1977 to 31-3-1978, 11 more audit objections involving an amount of Rs. 91,472 were added, thus making a total of 46 audit objections against the Indian Bureau of Mines, Nagpur involving Rs. 14,48,633. Out of these 46 audit objections, 25 objections involving Rs. 1,05,372 have been finally settled thus leaving a balance of 21 audit objections involving Rs. 13,43,261.

CHAPTER IV

ADMINISTRATION OF MINING LAWS AND MINERAL DEVELOPMENT

Administration of Mining Laws

4.1 The Mines and Minerals (Regulation and Development) Act, 1957, Mineral Concession Rules, 1960 and Mineral Conservation and Development Rules, 1958, are administered by this Department. A Committee to review the Mineral Conservation and Development Rules, 1958, has recently completed its work and the recommendations made by it are being examined in consultation with the State Governments and Mining Associations.

Mineral concessions

4.2 The total number of pending mineral concession proposals arising from references from the State Governments under Section 5 and 8 of the Mines and Mineral, (Regulation and Development) Act, 1957 as on 1-1-1978 was 233. 243 such proposals were received till 31-12-1978 and 348 disposed of, leaving 128 proposals pending on that date.

Revision applications

4.3 Central Government entertains revision applications under Section 30 of the Mines and Mineral (Regulation/Development) Act, 1957 against orders passed by the State Government. A Joint Secretary from the Department of Mines and a Joint Secretary from the Ministry of Law together perform the quasi-judicial functions of the Central Government under the provision.

4.4 There has been a substantial increase in the rate at which fresh revision applications were received during the year. The pendency of such applications increased from 448 on 1-1-78 to 509 as on 21-12-78. During this period, 1541 revision applications were received compared to only 1,136 received during the whole of the previous year. The disposal during this period was 1,480.

Mining Leases (Modification of Terms) Rules, 1958

4.5 These Rules have been framed under Section 16 of the MMRD Act, 1957, to enable modification of pre-1949 leases,

68 mining leases were modified during the year upto 28-2-79 leaving a balance of 814, a majority of which relate to the Union Territory of Goa. The work of modification continued to be done part-time during the earlier part of the year by the Controller, Indian Bureau of Mines, and subsequently by one of the Regional Controllers of Mines. As some orders of modification issued in respect of mining leases in Goa have been challenged in a Court of law, further work of Modification in respect of leases in that area is held up.

Mineral Advisory Council :

4.6 A new Mineral Advisory Council has been constituted in place of the erstwhile Mineral Advisory Board, whose tenure had expired in December, 1976.

Mineral Production :

4.7 The value of mineral production in India during 1978 is estimated at Rs. 1313.88 crores. It remained almost at the same level as in the previous years, viz. Rs. 1317.97 crores and Rs. 1317.69 crores in 1976 and 1977 respectively. A statement showing the mineral production and value thereof during the period, 1974 to 1978 is given at Annexure-I.

4.8 During 1978, mineral fuels contributed Rs. 972.78 crores or 74%, metallic minerals Rs. 171.14 crores or 13% and non-metallic minerals Rs. 169.96 crores or 13% of the total value of minerals production. Among the States, Bihar occupied the first place in the value of mineral production with a share of 29%, followed by Madhya Pradesh 15%, West Bengal 12%, Gujarat 10% and Assam 9%, during the year 1978.

Foreign Trade in Minerals :

4.9 The quantities and values of minerals imported and exported during the period 1974-77 are shown in Annexure-II and III respectively.

4.10 The total value of imports of minerals increased from Rs. 1386.49 crores in 1976 to Rs. 1713.19 crores in 1977, Petroleum (crude) accounted for Rs. 1284.46 crores or 75.0%, followed by uncut diamonds Rs. 287.60 crores or 16.7% of the total value of imports in 1977.

4.11 The total value of exports of minerals rose from Rs 547.26 crores in 1976 to Rs. 744.34 crores in 1977. Diamond

(mostly cut) was the principal mineral exported from India and its share in the total export earnings was Rs. 375.37 crores or 50.4%, followed by iron ore Rs. 252.12 crores or 33.9%, mica Rs. 23.71 crores or 3.2%, precious and semi-precious stones Rs. 19.69 crores or 2.65% and chromite Rs. 16.70 crores or 2.2 per cent.

4.12 *Mica* industry is basically export-oriented but for various reasons like the use of transistorised devices and replacement by reconstituted mica and synthetic products, the export trade in mica has been stagnant. Together with this, the mica industry has been facing certain other problems which have resulted in closure of a number of mica mines, especially in Bihar.

4.13 *Barytes* has acquired considerable importance in the field of exports. The major use of barytes is as an ingredient of circulation muds in rotary drilling of oil and gas wells. It is also used in the manufacture of glass, paint, rubber and chemical industries. Since 1974, there has been a spurt in the exports of this mineral which accounted for Rs. 922 lakhs in the year 1977. Efforts are being made to export barytes in processed form with a view to maximising export earnings. The export of this mineral has been partially decanalised with effect from 1-4-1978. Export is allowed to the MMTC and the mine-owners holding leases as on 31-3-1978 upto a quantity not exceeding their own production, subject to a floor price mechanism.

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4.8 During 1978, mineral fuels contributed Rs. 972.78 crores or 74%, metallic minerals Rs. 171.14 crores or 13% and non-metallic minerals Rs. 169.96 crores or 13% of the total value of minerals production. Among the States, Bihar occupied the first place in the value of mineral production with a share of 29%, followed by Madhya Pradesh 15%, West Bengal 12%, Gujarat 10% and Assam 9%, during the year 1978.

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MINERAL PRODUCTION (Important

Mineral	Unit of Quantity	1974		1975	
(1)	(2)	Quantity (3)	Value (4)	Quantity (5)	Value (6)
All mainerals(Value)			8,640,994		12,274,026
Asbestos	Tonne	23,685	5,824	20,586	7,781
Apatite	"	12,034	1,432	30,338	3,896
Phosphorite	"	438,940	170,222	455,243	163,047
Barytes	"	146,490	3,167	226,099	9,244
Bauxite	"	1,114,491	30,840	1,274,432	34,060
Chromite	"	394,913	58,309	500,294	157,656
Coal	'000 tonnes	84,102	4,260,365	95,911	6,756,509
Lignite	"	3,044	136,414	2,822	148,615
Copper ore	Tonne	1,428,640	155,821	1,834,039	195,902
Diamond	Carat	20,975	12,366	19,994	12,684
Dolomite	Tonne	1,195,134	32,442	1,457,278	43,756
Fireclay	"	802,853	10,244	671,927	9,669
Fluorite (graded)	"	3,749	3,767	3,067	3,600
Fluroite (conc.)	"	8,879	9,903	11,598	13,834
Gold	Kilogram	3,145	125,369	2,825	127,990
Gypsum	Tonne	1,073,491	15,538	816,124	12,960
Iron ore	'000 tonnes	35,545	598,208	41,794	766,971
Kaolin	Tonne	427,460	19,212	370,768	19,503
Kyanite	"	42,217	9,607	52,673	13,680
Lead Conc.	"	11,035	15,859	15,117	25,264
Limestone	'000 tonnes	25,969	408,876	26,553	509,645
Magnesite	Tonne	265,532	21,553	313,453	29,735
Manganese ore	"	1,503,892	98,050	1,605,363	134,032
Mica Crude (P)	"	13,804	24,263	11,501	24,392
Natural gas[2]	Million cubic metres	1,010	36,450 (e)	1,252	45,960
Petroleum (crude)	'000 tonnes	7,490	1,720,428	8,283	2,276,168

1974 TO 1978
Minerals)

Value in Rupees Thousand

1976		1977(P)		1978 (Estimated)	
Quantity	Value	Quantity	Value	Quantity	Value
(7)	(8)	(9)	(10)	(11)	(12)
	13,179,747[1]		13,176,928[1]		13,138,829[1]
24,119	10,104	20,389	7,374	18,910	7,531
38,280	5,918	35,361	6432	29,350	5,582
644,058	174,654	698,488	171,909	803,261	195,176
235,068	12,218	324,036	16,362	315,379	17,610
1,448,961	42,893	1,511,751	44,616	1,526,868	52,696
402,111	196,146	352,234	169,519	257,131	124,668
100,876	7,122,689	100,297	7,076,780	102,012	7,180,613
3,895	184,806	3,632	165,927	3,880	184,955
2,394,345	238,213	2,566,150	234,962	2,078,581	222,072
20,487	9,987	18,297	12,388	16,358	7,410
1,886,167	59,384	2,136,772	61,466	2,179,407	61,176
665,567	11,396	716,511	12,244	703,886	11,956
3,643	4,478	3,543	4,820	3,507	5,020
13,980	18,146	15,209	24,586	13,384	21,472
3,132	150,116	2,854	136,265(e)	12,626	125,290
726,831	15,590	775,266	16,562	785,828	16,478
43,868	863,966	42,482	865,094	37,040	849,073
437,942	24,402	434,499	23,241	404,084	24,149
48,820	16,472	43,458	13,258	24,800	7,763
15,856	32,302	16,746	35,410	17,248	36,662
29,891	584,777	30,201	550,142	30,265	513,635
329,698	30,021	403,146	54,369	412,725	53,731
1,834,697	164,659	1,843,005	175,936	1,485,721	156,547
9,485	22,101	9,149	21,612	9,069	21,723
1,514	52,760	1,545	55,090	1,308	50,010
8,430[3]	2,316,564 (e)	8,696[3]	2,391,400 (e)	8,408[4]	2,312,200

(*Contd.*)

(1)	(2)	(3)	(4)	(5)	6)
Pyrites	Tonne	35,660	8,202	50,633	11,646
Sillimanite	Tonne	2,950	1,013	8,278	2,604
Steatite	Tonne	292,896	11,603	217,353	8,581
Zinc Conc.	"	29,117	42,506	39,150	59,262
Other major minerals (Value)			46,154		56,164
Minor-minerals (Value)			546,987		589,216

(P)=Provisional (e)=estimated

Note (a) The production data for the year 1978 have been estimated on year 1977 and for the period January-September, 1977 and Janu-

(b) Data except for coal, lignite, petroleum (crude), natural gas and Bureau of Mines, under M. C. D. R., 1958.

(c) Source for Coal..... Coal Controller, Calcutta.
Lignite..... Neyveli Lignite Corporation Ltd.,
Petroleum (crude) & Natural gas } Ministry of Petroleum & Chemicals and Fertilizers, New Delhi.
Minor minerals State Governments.

(d) The value is in terms of pit head value.

1. Excluding the value of petroleum (crude) produced from
2. Figures of natural gas relate to gas utilised.
3. In addition 185,000 tonnes of petroleum (crude) was reported tonnes during 1977.
4. Excluding production of 2,565,000 tonnes of petroleum of average production during January-September, 1978 as it

ANNEXURE I (*Contd.*)

(7)	(8)	(9)	(10)	(11)	(12)
47,531	12,902	31,085	7,808	41,965	9,414
14,859	5,068	14,894	5,122	13,680	4,402
220,461	9,822	236,504	10,935	275,730	12,909
45,322	81,070	46,563	86,320	68,448	126,263
	63,456		76,312		77,976
	642,667		642,667(e)		642,667(e)

pro-rata basis taking into consideration actual production for the ary-September, 1978.

minor minerals are based on the returns received by the Indian

and Gujarat Mineral Development Corpn. Ltd.

Bombay High Off-shore.

from Bombay High Off-shore during 1976 and 1,438,000

(crude) from Bombay-High Off-shore estimated on the basis could not be done on pro-rata basis.

ANNEXURE II

EXPORTS OF M INERALS DURING 1974 TO 1977

Value in thousand rupees

Minerals	Unit of Quantity	1974		1975		1976		1977	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity (Provisional)	Value
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
All Minerals (value)			3,128,803		3,985,526(R)		5,472,590(R)		7,443,430
Asphalt & Bitumen	Tonne	150	118	1	1	15,199	13,250	924	919
Barytes	,,	144,578	32,945	173,610	66,372	151,426(R)	77,024	177,188	92,276
Bauxite	,,	18,264	2,879	14,320	4,499	21,190	3,624	47,665	12,128
Bentonite	,,	11,602	4,853	9,665	4,261	12,631	6,855	18,538	8,858
Chromite	'000 tonnes	301,390	80,829	370,719(R)	188,302(R)	277,798	263,163	167,057	167,049
Coal	Tonne	389	42,475 (R)	425	142,379	478(R)	123,242	623	124,877
Coke	—	14,791	3,413	15,389	8,272	24,313	10,591	14,818	3,780
Diamond (mostly cut)	Tonne	N.A.	870,452	N.A.	356,428	N.A.	1,876,326	N.A.	3, 753,681
Dolomite	—	4,446	409	3,369	434	5,946	734	7,497	1,088
Emerald (Uncut) (u)	Tonne	N.A.	6,934	N.A.	6,299	N.A.	5,781	N.A.	3,310
Felspar	—	9,600	2,205	6,509	1,824	11,983	3,355	13,533	3,638
Ilmenite 1=	Tonne	118,634	20,801	68,975	14,814	120,727	29,941	76,699	14,761
Iron Ore	,,	21,900	1,367,841	22,796	2,064,610	23,403	2,324,692	23,191	2,521,212
Kaolin	'000 tonnes	3,239	1,707	1,818	1,269	3,778	2,913	5,265	4.186
Kyanite	Tonne	25,159	12,146	23,579	17,976	11,391	10,538	8,830	8,065
Limestone	,,	60,727	1,165	121,258	2,308	219,172(R)	6,278(R)	139,063	3,329
Magnesite	,,	15,775	7,342	9,698	5,948	8,240	5,745	13,078	9,555
Manganese Ore	,,	1,034,603	157,774	793,359	169,315	714,438	159,509	554,375	132,296
Mica	,,	35,548	238,302	34,679	189,245	22,158(R)	240,917	23,212	237,092
Precious & Semi-precious stones n.e.s. (natural) 2	—		189,088				204,553		196,902
Quartz (natural)	Tonne	N.A.	1,000	N.A.	179,993	N.A.	2,602	N.A.	3,014
Sillimanite	,,	5,892	827	2,929	1,365	6,520	642	9,329	620
Steatite	,,	829	6,114	100	129	455	5,540	550	12,251
Stone (Building & Mountalgranite etc.)	,,	11,565	40,023	7,158	4,348	8,783	67,705	18,000	94,929
Sulphur (mostly sublimed precipitated etc.)	,,	171,950	16,548	56,910	22,551	155,392	13,673	183,263	2,080
Others (value)	,,	1,060	20,613	704	12,963 19,621	799	13,397	9,083	31,534

1 Includes beneficiated ilmenite exported to the U.S.A.

2 Excluding pearls and synthetic gem stones.

(u) Under re erence.

N.A. Not available.

n.e.s. Not elsewhere specified.

(R) Revised.

ANNEXURE III
IMPORTS OF MINERAL

Mineral	Unit of Quantity	1974		1975		1976		1977	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
All Minerals (Value)			10,618,324(R)		11,627,498(R)		13,864,948(R)		17,131,855
Antimony ore & concentrates	Tonne	717	6,075	724	8,482	1,523(u)	13,378(u)	1,453	21,577
Asbestos	,,	60,176	131,339	41,514	112,879	47,167	171,010	65,968	282,335
Borax	,,	5,343	5,762	18,996	23,442	11,504	13,177	10,446	15,811
Copper ore and concentrates	,,	4,495	24,252	25,368	47,703	—	—	—	—
Cryolite & Chiolite	,,	—	—	—	—	1,961	8,264	300	1,309
Diamond (Uncut)		N.A.	494,597	N.A.	694,888	N.A.	1,400,017	N.A.	2,875,976
Diamond Industrial (including bort)	Kilogram	98	14,861	159	18,772	96	10,387	140	15,612
Emerald (Uncut)		N.A.	474,60	N.A.	40,842	N.A.	60,017	N.A.	78,288
Fluorspar	Tonne	16,857	12,648	4,206	3,519	4,062	2,888	4,753	3,603
Graphite (Natural)	,,	780	1,615	404	1,377	647	2,793	698	3,299
Lead ore & conc.	,,	18	104	30	369	145	1,759	20	262
Manganese ore Milled for dry cell primary battery	,,	2,776	3,603	5,430	7,302	190	296	5,048	8,933
Petroleum (Crude)	000 tonnes	13,972	9,004,726	13,669	9,792,000	14,032(R)	11,436,913(R)	14,850	12,844,600
Rock phosphate (APATITE)	Tonne	1,106,161	462,348	567,314	324,838	471,521	238,715	951,032	427,125
Precious & Semi-precious stones (Uncut)[1]		N.A.	6,960	N.A.	4,569	N.A.	3,991	N.A.	3,092
Sulphur		588,113	347,693	617,115	452,276	588,763	348,931	767,346	381,828
Tungsten ore and concentrates	Tonne	255	7,957	258(R)	14,702(R)	517(R)	30,318(R)	428	42,191
Zinc ore and concentrates	,,	10,321	16,202	23,079	47,575	38,493	89,372	19,001	31,675
Others (value)	,,		30,222		31,963		32,722		94,339

(1) Excluding pearls and synthetic stones.
(u) Under reference.
N.A. Not available.
.. Negligible
(R) Revised.

Value in thousand rupees

CHAPTER V

ALUMINIUM

General

5.1 Aluminium production in the current year 1978-79, at 213,729 tonnes, is a significant improvement over the previous year's output of 179,000 tonnes. Although this year's production may be a new record, it represents only 67% utilisation of the installed smelting capacity (321,000 tonnes) in the country, and is only marginally higher than the previous record production of 209,000 tonnes in 1976-77 when 78% of smelting capacity, which was 266,000 tonnes, was utilised.

5.2 Continued imposition of power cuts on aluminium smelters has inhibited aluminium production and necessitated imports on a large scale to bridge the gap between demand and domestic supply. The demand for aluminium in 1978-79 has been estimated at 250,000 tonnes. Arrivals against imports ordered have added 33,000 tonnes to the supplies from domestic production of 213,729 tonnes. Imports will be continued in the coming year with a view to ensuring that constraints of power supply to aluminium smelters do not impede the progress of transmission and distribution schemes of the power sector and production in other areas which require the use of commercial grade aluminium.

5.3 Aluminium is a power-intensive industry, requiring power in constant quantity round the clock. About one-half of the aluminium available is presently used in transmission and distribution and rural electrification programmes. Given the requisite power supply to work the already installed aluminium smelting capacity in the country of about 321,000 tonnes, the demand for aluminium in 1979-80 can be met from domestic sources. However, at present, owing to short supply of power by the Madhya Pradesh Electricity Board, the Korba Smelter of the public sector Bharat Aluminium Company Limited is being utilised only to the extent of 33%. The smelter located at Renukoot in Uttar Pradesh is receiving only 35 MW of power from the Uttar Pradesh State Electricity Board, and this is short of requirement by 50 MW. The smelter situated in Belgaum (Karnataka) is subject to a 28%

power cut. In the context of the inadequacy of power supply, augmentation of the level of imports to supplement domestic availability of aluminium in 1979-80 when the projected demand will increase to 325,000 tonnes, is inevitable.

New Aluminium Pricing Policy

5.4 Following a comprehensive cost study of the aluminium industry, a new aluminium pricing policy was introduced effective from the 18th October, 1978 replacing the dual pricing policy in vogue since the 15th July, 1975. Under the new policy, price control on total aluminium production has been introduced. The retention price fixed for ingots for individual primary aluminium producers covers the full cost of production and provides for a post-tax return on networth, the quantum of return being related to capacity utilisation. Price control is confined to ingots and EC grade wire rods, wire bars and billets. The stipulation that aluminium producers should supply 50% of their production in the form of electrical conductor grade metal for meeting the requirements of the power sector, continues.

5.5 As an integral part of the new aluminium policy, the excise duty structure in respect of aluminium has also been rationalised. The previous system of differential excise duty on electrical conductor grade and commercial grade metal has been replaced by a uniform excise duty at 40% *ad valorem* (Basic) +5% (Special). The specific duty at Rs. 2,000 per tonne on E.C. grade aluminium required to be supplied under 'Levy' under the previous policy and at Rs. 800 per tonne on the remaining 50% of production which was free from 'Levy' has been removed. With the introduction of a uniform and reduced level of excise duty for the entire metal production, the scheme of subsidy to State Electricity Boards, which was introduced to neutralise the higher level of excise duty on levy aluminium used in the conductors bought by them, has been withdrawn.

5.6 The combined effect of the above changes is that the cost of EC grade aluminium to Cable/Conductor manufactures will be cheaper by about Rs. 500 per tonne of ingot. Under the new policy, the price of commercial grade aluminium ingot has been reduced by about Rs. 1360/- per tonne. Following this reduction, the primary producers of aluminium reduced the price of aluminium circles used for manufacture of utensils catering to the weaker sections of society, by about Rs. 370 per tonne from the

beginning of December, 1978. The Ministry of Finance has abolished the specific duty of Rs. 840 (including Rs. 40 as element of special excise duty) per tonne of utensil grade aluminium circles with effect from 6th December, 1978 resulting in a total reduction in the price of aluminium circles to utensil manufactures by about Rs. 1300/- per tonne. The Department of Mines had a meeting with the associations of aluminium secondary manufacturers rollers and some leading utensil manufacturers and impressed upon them the need to effect corresponding reduction in the utensil price to the actual consumers. The representatives of the associations/utensil manufacturers have assured that they would pass on the benefit to the consumers.

Smelting Capacity

5.7 The details of existing aluminium smelters and schemes for expansion, are given below :—

Name of the Company	Location	Existing installed capacity	Additional new schemes approved or under implementation
1	2	3	4
		Tonnes	Tonnes
(A) Public Sector			
Bharat Aluminium Company Ltd.	Korba (Madhya Pradesh)	100,000	..
(B) Private sector			
(a) Indian Aluminium Company Ltd.	1.Hirakud (Orissa)	20,320	..
	2.Alwaye (Kerala)	15,850	..
	3.Belgaum (Karnataka)	60,000	..
(b) Hindustan Aluminium Corpn. Ltd.	Renukoot (Uttar Pradesh)	100,000	20,000
(c) Madras Aluminium Company Ltd.	Mettur (Tamil Nadu)	25,000	..
		321.170	20,000

Bharat Aluminium Company Limited

5.8 The Bharat Aluminium Company Limited (BALCO), a public sector undertaking under the Department of Mines, was incorporated on the 27th November, 1965 with the main object of constructing, operating and managing Aluminium Projects. The authorised capital of the Company is Rs. 150 crores, and the subscribed capital, as on 31-3-78, amounted to Rs. 133.53 crores. Loans from the Government of India amounted to Rs. 123.95 crores.

5.9 A review of the different projects under implementation by BALCO and the progress made during 1978-79 is outlined in the succeeding paragraphs.

Korba Aluminium Project

5.10 The Korba Aluminium Complex is based on the Amarkantak and Phutkapahar bauxite bearing areas in Madhya Pradesh as the main sources of supply of bauxite and power from the M.P. grid. It has been designed to produce 200,000 tonnes per annum of alumina to feed the smelter which has a primary metal capacity of 100,000 tonnes per annum. The downstream facilities of 85,000 tonnes include production of aluminium semi-fabrication in the form of rolled products, extrusions and electrical conductor grade wire rods.

5.11 The revised cost of the project is Rs. 275.5 crores.

5.12 The Alumina plant was commissioned in April, 1973. The first cell house of the smelter, representing 25,000 tonnes of primary metal capacity, was commissioned in May, 1975. The commissioning of the second cell house of the smelter (25,000 tpa) which was got ready in June 1976, could take place only in September, 1977 owing to delay in the release of power by the Madhya Pradesh Electricity Board. The third and fourth cell houses (or pot lines) of the smelter, each of which has an annual capacity of 25,000 tonnes, are ready since December, 1977 and August, 1978 respectively. The commissioning of these Cell Lines is awaiting power supply from the Electricity Board.

5.13 During 1977-78, production of alumina amounted to 116,460 tonnes and that of primary aluminium metal 31,841 tonnes, as compared to 104,370 tonnes of alumina and 24,853 tonnes of metal in the earlier year 1976-77. Power supply from MPEB is inadequate even for operating two cell lines of the smelter. Apart from the reduced power availability, frequent

fluctuations in power supply have affected the level of primary aluminium production of electrical Conductor grade purity. During 1978-79 alumina production is 126,650 tonnes and aluminium metal production is 33,451.

5.14 The Properzi Unit for the fabrication of Electrical Conductor grade wire rods, which was commissioned in February 1976, produced 13,327 tonnes of wire rods during 1977-78 as against 10,057 tonnes during 1976-77. The output of this unit in 1978-79 has been maintained at the previous year's level. With a view to meeting the growing demand for wire rods from units engaged in the manufacture of cables/conductors for the power sector, an order has been placed for supply of another Properzi Unit of 25,000 tpa capacity, which is expected to be commissioned by the end 1979.

Operating Results

5.15 The turn-over from the production of the Korba Plant during 1977-78 amounted to Rs. 33.73 crores including Rs. 29 lakhs realised from the export of alumina. During 1978-79 the turn-over will be around Rs. 47 crores including about Rs. 7.40 crores from export of alumina.

5.16 The operating results of BALCO during the last two years are given below :—

Year	(Rupees in lakhs)	
	Loss	
1976-77	361.28	(After providing for depreciation amounting to Rs. 533 lakhs).
1977-78	390.65	(After providing for depreciation amounting to Rs. 680 lakhs).

The main reasons for the loss in 1977-78 were :—

(a) Delay in the commissioning of second potline of Smelter for want of power.

(b) Non-commissioning of third potline of Smelter owing to non-supply of power by Madhya Pradesh Electricity Board, and

(c) Power cuts and erratic power supply seriously affecing production of metal and also consumption norms.

Import of Aluminium

5.17 For bridging the gap between demand and domestic production of aluminium, during the second half of 1977-78 about 9,000 tonnes of aluminium was imported and distributed by BALCO. About 33,000 tonnes of imported aluminium out of the total order placed has been received for distribution during 1978-79. The fiscal levy on the imported metal is adjusted so as to match the sale price of imported metal with the sale price of metal produced indigenously.

Progress of Construction

(a) *Profile and Tube Shop*

5.18 The 800-tonne extrusion press is scheduled to be commissioned in April/May of 1979 and the two other presses, namely, 2500-tonne and 3150-tonne presses, are expected to be commissioned from January, 1980 and July, 1980 respectively.

(b) *Sheet Rolling Shop*

5.19 It is expected that the Rolling Mill will be commissioned progressively from September, 1979.

East Coast Projects

5.20 With a view to exploiting the large bauxite deposits recently discovered in the East Coast encompassing Orissa and Andhra Pradesh, two feasibility studies have been commissioned by BALCO. The scope of the study in respect of the Orissa bauxite deposits will include a 600,000—800,000 tpa alumina plant with bauxite mining and a 150,000—180,000 tpa aluminium smelter. This study has been assigned to M/s. Aluminium Pechiney of France. The study in respect of Andhra Pradesh bauxite deposits will cover the setting up of an alumina plant of about 600,000 tpa with captive bauxite mining facilities. This feasibility study has been assigned to M/s. TSVETMETPROMEXPORT of USSR. The feasibility study reports are expected to be available by the middle of 1979. Investment decisions will be taken thereafter, in the course of the year. A major part of the alumina output from these two plants will be exported.

Feasibility Studies for the following have also been commissioned as an integral part of the investigations under way for exploiting the East Coast bauxite deposits :—

(i) Captive Power Plant of about 600-660 MW;

(ii) A Captive Caustic Soda/Chlorine Complex (140,000 tpa);

(iii) System of transportation, bulk handling and ship loading at vizag Port.

5.21 *New Schemes*

Foil Plant

BALCO had engaged the services of M/s. Hunter Engineering Company of USA for the preparation of a feasibility study for a 6,000 tpa aluminium foil plant. The report has been received and is under examination.

5.22 *Management of Industrial Undertaking at Jaykay Nagar*

Under Section 18 AA of the Industries (Development and Regulation) Act, 1951, the Central Government issued an order on 1st May, 1978 appointing Bharat Aluminium Company Ltd. as the "Authorise Person" to take over the management of the closed industrial undertaking at Jaykaynagar belonging to the Aluminium Corporation of India Ltd. BALCO took over the management on 2nd May, 1978 and has overhauled the fabrication units at Jaykaynagar for re-starting them.

5.23 The Plan outlays on various schemes of BALCO for 1979-80 are as under :—

Continuing Schemes.	(Rs. in Crores)
1. Korba Aluminium Smelter & Fabrication Plants . .	6.87
2. Balancing & Additional equipment for Korba Alumina Plant & Mines	1.50

5.24 BALCOs Targets of production for 1979-80

(i) Bauxite	500,000	Tonnes
(ii) Alumina	150,000	tonnes
(iii) Aluminium Metal	50,000	tonnes

5.25 Statistical information regarding representation to SC and ST candidates in the services of BALCO.

The information is given in the following statement :—

(Statement showing the total number of employees and the number of Scheduled Castes and Scheduled Tribes among them as on 31-12-1978.

Group	Total number of employees	Scheduled Castes	Scheduled Tribes	Remarks if any
A	479	11	1	
B	262	7	2	
C	2783	229	266	
D(Excluding Sweepers) . .	2068	409	369	
D (Sweepers) . . .	130	87	4	

CHAPTER VI

HINDUSTAN COPPER LIMITED

6.1 India does not have many rich deposits of copper ore. However, in order to minimise dependence on imports, Hindustan Copper Limited (HCL) was constituted on 9.11.1967 with the specific responsibility of developing the various copper deposits in the country. Subsequently, the undertaking of the Indian Copper Corporation Ltd., Singhbhum (Bihar), was taken over by Government in 1972 and entrusted to Hindustan Copper Limited. Since then, copper is a fully nationalised industry.

6.2 The authorised share capital of HCL is now Rs.100/- crores and its projects are the Indian Copper Complex (Ghatsila), and Rakha Copper Project in Bihar, the Khetri Copper Complex and other small copper mines (Dariba and Chandmari) in Rajasthan. In addition, the company is developing the Malanjkhand copper deposit in Balaghat District (Madhya Pradesh).

6.3 The outlays proposed for Annual Plan 1978-79 and 1979-80 for HCL are as below:—

(Rs in crores)

S.No.	Item	Revised Estimates 1978-79	Budget Estimates 1979-80
1.	Continuing Schemes	14.51	22.68
2.	New Schemes	—	—
	Sub Total :	14.51	22.68
3.	Replacements and Renewals	6.00	6.00
	TOTAL :	20.51	28.68

6.4 The production figures with regard to ore and metal are given below:—

(Unit Tonnes)

S. No.	Item	Production 1977-78 (Actual)	Production 1978-79 (Anticipated)
1	2	3	4
1.	Ore raised	2334476	2418000
2.	Ore milled	2343818	2400000
3.	Blister Copper	21021	23800
4.	Cathodes	21446	19780
5.	Wire Bars	18240	19400*

*Quantity will vary depending on sale of cathodes.

Indian Copper Complex, Ghatsila (Bihar)

6.5 The work on expansion scheme of Surda to raise the mine production from 1000 tonnes per day to 1300 tonnes per day has been completed. There was, however, a set back in regard to the expansion scheme for Mosaboni Mine owing to acute shortage of explosives and unsatisfactory power supply position during the first half of 1978-79.

6.6 The Precious Metal Refinery at Ghatsila continues to produce gold and silver as bye-products. Upto December, 1978, 95 Kg. of gold and 660 Kg. of silver were produced. The bye-product plant at Ghatsila also produced 3.75 tonnes of selenium and 209 tonnes of Nickel sulphate upto December, 1978. The company has also produced 10499 tonnes of kyanite from its Lapsoburu Kyanite Mines upto December, 1978.

Rakha Copper Project Phase-I (Bihar)

6.7 Rakha Copper Project (Phase-I) is being developed for the production of 1000 tonnes of ore per day; a matching Concentrator Plant has also been set up. The rated capacity of the mine is expected to be achieved by 1979-80.

Khetri Copper Complex (Rajasthan)

6.8 This is a major project of HCL, covering the development of Khetri and Kolihan mines and Concentrator, Smelter, Refinery and Acid-cum-Fertilizer Plants.

6.9 Khetri Flash Smelter has been facing certain operational and technical problems due to which the plant has been operating at a relatively low efficiency. With a view to overcoming the problems and improving the performance of the Smelter, HCL had obtained the services of M/s Furukawa Co. Ltd., a reputed firm of Japanese Consultants. The technical assistance rendered by M/s Furukawa has already resulted in improvement in the plant operations. Some of the long-term recommendations of the consultants have been implemented during the last plant shut-down in September—November 1978. The plant operations are expected to improve further in the coming months.

6.10 The Phosphoric Acid Plant has gone into production in November, 1978 and production of triple super phosphate also commenced. In the absence of Phosphoric Acid Plant earlier, the available sulphuric acid was being utilised for the manufacture of single super phosphate.

Dariba Copper Project (Rajasthan)

6.11 This is a small project for the production of 100 tpd of ore. A matching Concentrator has also been installed. The production of ore upto December, 1978 has been averaging around 120 tonnes per day, thus exceeding its rated capacity.

Chandmari Copper Project (Rajasthan)

6.12 This is a small open-cast mine having rated capacity of 500 tonnes of ore per day. A scheme to expand the mine's capacity from 500 tpd to 1000 tpd is at present under implementation.

Malanjkhand Copper Project (Madhya Pradesh)

6.13 This will be the country's first large size open-cast mine in hard rock and has been planned for ultimate production of 2 million tonnes of ore, equivalent to about 23,000 tonnes of copper metal per annum. The project will comprise the mine and a matching Concentrator Plant. The concentrates to be produced at Malanjkhand will be smelted at the Khetri smelter. The estimated total cost of the project is Rs. 91.90 crores.

6.14 Preparatory work on the project was started in July, 1977. However, the activities at the project had to be restricted substantially owing to limited allocation of funds during the

first half of 1978-79. HCL was given clearance in early November, 1978 to go ahead with the work and necessary funds have also been made available. The project is expected to go into commercial operation during 1982-83.

6.15 A task force was appointed in September, 1977 for drawing up a detailed scheme for protection of the interests of tribals in the Malanjkhand area.

Financial Results

6.16 The turn-over of HCL during the last three years has been as under:

(Rupees lakhs)

1975-76	3,777.46
1976-77	8,232.00
1977-78	8,078.00

6.17 The operating results of the company during the last three years are indicated below:

(Rupees lakhs)

	Profit/Loss before taxes	Profit/ Loss after taxes
1975-76	(—)230.00	(—)230.00
1976-77	200.95	200.95
1977-78	(—)3,111.39	(—)3,111.39
1978-79 (estimated)	(—)1,072.00	(—)1,072.00

(—) Loss)

6.18 The operating results during 1977-78 recorded a net loss of Rs.31.11 crores. One of the important factors responsible for the adverse operating results during that year was the reduction in the average net realisable price of copper metal from Rs.21,900 per tonne during 1976-77 to Rs.20,000 per tonne during 1977-78. Other factors responsible were, revaluation of the stock, on the basis of their realisable sale value, increase in the cost of production and drop in the volume of saleable product compared to the previous year.

During the year 1978-79, the operating results are expected to result in a net loss of Rs. 10.72 crores. This has mainly arisen on account of the following reasons:

1. 52 days labour strikes at Khetri Copper Complex which started on 25-2-1978 and ended on 17-4-78. The blister production at that unit could only be resumed from 10.5.78.
2. 37 days labour strike at Rakha Copper Project in September—October, 1978.
3. Acute shortage of explosives which particularly affected the operations at Indian Copper Complex during the first half of 1978-79.
4. Unsatisfactory power supply position which adversely affected the production at Indian Copper Complex.
5. Break-down of refinery transformer which affected cathode production for more than three weeks at Indian Copper Complex.

Industrial Relations

6.19 Industrial relations at both Khetri Copper Complex and Indian Copper Complex, Ghatsila remained disturbed during the year 1978-79. The labour strike at Khetri and at Rakha Copper Project, referred to above, have resulted in considerable loss of production. The management of HCL is making all-out efforts to improve industrial relations at both Khetri and Ghatsila.

6.20 Statistical information regarding representation to SC and ST candidates in the services of HCL:

The information is given in the following statement :—

Name of Undertaking : HINDUSTAN COPPER LIMITED

(Statement showing the total number of employees and the number of Scheduled Caste and Scheduled Tribe among them as on 31-12-78).

Group	Total No. & Employees	Scheduled Castes	Scheduled Tribes	Remarks if any.
A	*821	33	8	*Including 17 assistant engineers trainees and Management trainees
B	482	18	8	
C	12385	1489	1307	
(excluding Sweepers)	576	576	Nil	
D	9208	812	4340	

CHAPTER VII

HINDUSTAN ZINC LIMITED

7.1 Hindustan Zinc Limited (HZL), a public sector undertaking with an authorised capital of Rs.100 crores, operates the following units:—

A. *Smelters*

1. Zinc Smelter, Debari (Rajasthan).
2. Lead Smelter, Tundoo (Bihar).
3. Zinc and Lead Smelters, Visakhapatnam (Andhra Pradesh).

B. *Mines*

1. Zawar Group of Mines (Rajasthan).
2. Maton Rockphosphate Mine (Rajasthan).
3. Rajpura-Dariba Mines (Rajasthan).
4. Sargipalli Lead Deposits (Orissa).
5. Agnigundala Lead Mines (Andhra Pradesh).

7.2 The outlays proposed for annual plans of Hindustan Zinc Ltd. for 1978-79 and 1979-80 are as below:—

(Rs. in crores)

Sl. No.	Item	Revised Estimates 1978-79	Budget Estimates 1979-80
1.	Continuing Schemes	21.76	14.09
2.	New Schemes	0.84	3.39
	Sub Total	22.60	17.48
3.	Replacement and Renewals	5.66	8.00
	Total :	28.26	25.48

7.3 There has been substantial improvement in production of ore as well as metals during 1978-79. The production figures are given below:—

(Figures in tonnes)

Product	1977-78 Actuals	1978-79 Actuals up to Oct.'78	1978-79 Anticipated (Nov Mar) 1978-79	Total for 1978-79 (Estimated
Ore raised	9,40,526	6,10,753	5,14,247	11,25,000
Zinc Metal	33,501	28,746	24,954	53,700
Lead Metal	7,543	5,986	5,214	11,200

7.4 *Zinc Smelter, Debari (Rajasthan)*

With the completion of the expansion in 1976-77, the installed capacity of the Debari Zinc Smelter (Rajasthan) is 45,000 tonnes per annum of zinc. However, available capacity this year is only two-third due to revamping of the old Plant. By-product sulphuric acid from the Roaster Plant and rockphosphate from captive Maton Mines are presently used for production of single super-phosphate fertilizer but will be used hereafter for production of 26,600 tonnes of P_2O_5 as phosphoric acid. Mechanical erection and no-load trials of all equipment of the Phosphoric Acid Plant has since been completed and the plant is being commissioned.

7.5 *Lead Smelter, Tundoo (Bihar).*

The Lead Smelter at Tundoo (Bihar) is being operated at the expanded capacity of 8,000 tonnes per annum of lead.

7.6 *Vizag Smelter (Andhra Pradesh)*

The Vizag Smelter with rated capacity to produce 30,000 tonnes of zinc and 10,000 tonnes of lead per annum has entered the production phase with the commissioning of zinc circuit in March, 1977. Phase-I of the Lead Plant at about 60% of capacity was commissioned in January, 1978. The second phase of Lead Plant which will ensure full capacity will be completed by May, 1979. The first phase of the Zinc Oxide Plant, namely sludge drying installation, was put on trial runs in March, 1978; erection of the remaining plant has been mechanically completed.

7.7 *Balaria Mine Project (Rajasthan)*

For meeting the major part of additional zinc concentrate requirement of the expanded Debari Zinc Smelter, a 2000 tonnes per day new mine has been established at Balaria with ore treatment facilities which entered the production phase in October, 1977.

7.8 *Zawarmala Mine Project (Rajasthan)*

The exploration carried out so far in this deposit is adequate to provide the requisite level of confidence of ore reserves for investment decision. Government has, however, decided that this project be treated as a 'Project on Shelf', ready for execution at the appropriate time.

7.9 *Baroi Mine (Rajasthan)*

To improve the confidence level of ore reserves at Baroi a scheme for detailed exploration has been drawn up by the Company and sanctioned by Government.

7.10 *Maton Rockphosphate Mine (Rajasthan)*

HZL has also been operating a captive rockphosphate mine at Maton (near Udaipur). It is being developed for a capacity of 600 tonnes per day with matching facilities for beneficiation. The mine construction and mill erection (first stream—300 TPD) have already been completed. Installation of the second stream for doubling the capacity of beneficiation plant to 600 TPD is expected to be completed by the 2nd quarter of 1979-80.

7.11 *Rajpura-Dariba Mines (Rajasthan)*

Development of this mine to produce and beneficiate 3,000 tonnes of ore per day is in progress. The mine is expected to develop to its planned capacity by 1982.

7.12 *Sargipalli Mine (Orissa)*

HZL had submitted a project report for development of this mine to produce 500 tonnes per day of lead ore and setting up of a matching concentrator. This scheme has been approved by Government.

7.13 *Agnigundala Lead Project (Andhra Pradesh).*

The Agnigundala Lead Project has been taken over from Hindustan Copper Limited by Hindustan Zinc Ltd. w.e.f. 15th October, 1978. The mine is operating at a level of 120 tonnes per day of lead ore with a matching concentrator. A scheme for doubling the capacity of both the mine and concentrator (Stage-II) is presently under investigation.

Financial Results

7.14 The turnover of the company during the last 3 years is indicated below:—

Year	Rs. in lakhs
1975-76	2865.91
1976-77	2413.08
1977-78	3810.19

7.15 The company made the following profits during the last 3 years:—

Year	Rs. in lakhs Before tax	After Tax
1975-76	1019.98	429.98
1976-77	355.09	355.09
1977-78	1.82	1.82
1978-79 (Estimated)	(—)38.07	(—)38.07

7.16 The profitability during 1977-78 was adversely affected due to steep fall in the price of zinc ingots by an average of Rs. 2,485 per tonne resulting in reduction in sales realisation to the extent of Rs.6.81 crores, besides reduction in inventory value of zinc ingots by about Rs.3.64 crores. Consumption of concentrates imported earlier under long-term agreements at higher rates also increased the cost of production to the extent of about Rs.3 crores. Inspite of the aforesaid adverse factors the company has been able to earn a marginal profit on account of improved operational efficiency, cost consciousness, good industrial relations and streamlining of organisational structure.

7.17 During 1978-79, the company anticipates a net loss of Rs.38.07 lakhs which is largely due to continued lower sales

realisation, increase in excise duty due to 5% additional duty, loss in production due to power cuts and breakdown of plants and increase in cost of inputs—power, stroes and spares and chemicals etc.

Industrial Relations

7.18 The industrial relations remained generally cordial at all units of the company.

7.19 Statistical information regarding representation to SC and ST candidates in the services of HZL:—

The information is given in the following statement :—

Statement showing the total number of employees and the number of Scheduled Castes and Scheduled Tribes among them as on 31-12-1978.

Group	Total number of employees	Scheduled Castes	Scheduled tribes	Remarks, if any
Group-A	562	20	4	
Group-B	234	6	1	
Group-C (excluding Sweepers)	7774	966	1562	
Group-C (Sweepers)	129	127		
Group-D (excluding Sweepers)	221	21	6	
Group-D (Sweepers)	..	..	..	

CHAPTER VIII

BHARAT GOLD MINES LIMITED

8.1 The erstwhile Kolar Gold Mining Undertakings (KGMU) in Karnataka State was a departmentally run undertaking under the Department of Economic Affairs of the Ministry of Finance upto 31.7 71 when it was transferred to the Department of Mines in the Ministry of Steel and Mines with effect from 1.8.71. The KGMU was converted into a public sector undertaking known as Bharat Gold Mines Limited (BGML) w.e.f. 1.4.1972 under the Department of Mines and it took over the former departmentally worked K.G.M.U.

8.2 The authorised share capital of the company is now Rs. 25 crores.

8.3 The quantity of ore milled, gold and silver extracted and average extraction grade of ore milled during 1976-77, 1977-78 and 1978-79 (upto December) are given below :—

	1976-77	1977-78	1978-79 (upto December)	
			Target	Actual
Ore Milled (tonnes)	3,85,781	3,72,676	73,93,982	2,63,576
Gold Extracted (gms)	22,04,160	19,41,106	14,44,670	12,74,378
Grade (gms/tonnes)	5.71	5.21	4.91	4.84
Silver Extracted (gms.)	1,65,933	1,42,927	By-product	1,08,503

The shortfall in production of gold during April-December, 1978 compared to the target is due to the following reasons :—

(i) Fall in grade of ore in Mysore and Nundydroog mines;

(ii) Rockbursts and ground control problems;

(iii) Breakdowns in mining machinery and power supply.

Financial Results

8.4 The working results of the company for the last 2 years and estimated results for current year are as below :—

	Loss(Rs. lakhs)
1976-77	134.34
1977-78	214.18
1978-79 (Estimated)	142.40

The increase in the loss in 1977-78 compared to the previous year was attributable mainly to drop in production.

Pricing of Gold and Payment of Subsidy

8.5 The entire gold production by the company is made over to the Government at the I.M.F. price of Rs. 84.40 per 10 gms. which is much lower than the internal market price and the international market price of gold. As such, in order to enable the company to cover the revenue deficit which resulted mainly due to lower sale proceeds, BGML was paid subsidy to the extent of Rs. 425 lakhs and Rs. 400 lakhs for the first two years of its incorporation i.e. 1972-73 and 1973-74 respectively, on ad-hoc basis. Subsequently the question of continuance of subsidy and the quantum thereof, was reviewed and it was decdied that from 1974-75, the company should be paid a subsidy to the extent of the difference between the IMF price at which Government buys the gold from the company and the prevalent international market price of the gold. On this basis subsidy to the extent of Rs. 634.85 lakhs and Rs. 557.35 lakhs was paid to the company for the years 1974-75 and 1975-76 respectively. Inspite of the payment of subsidy on the basis of the above formula, BGML continued incurring losses. Therefore, a revised formula was implemented w.e.f. 1.10.1976 according to which the Government has been purchasing gold from the company at a price which is equal to the cost of production of the mine in 1975-76 plus a 12% return on its capital and reserves subject to a periodical review of cost of production by the Govt. which will take into account increase in costs of production in the mines. This will, however, be subject to a minimum price equal to the average international price during the preceding month and a maximum price equivalent to the average international price in the preceding month plus 25%. The India Govt. Mint, Bombay actually makes payments on the basis of the ruling I.M.F. price and the balance due to BGML, in accordance with the new pricing formula, is paid by Government as subsidy. The details of the amount of subsidy paid to BGML on the basis of this formula during the years 1976-77 to 1978-79, are indicated below :—

	(Rs. lakhs)
1976-77	731.03
1977-78	910.81
1978-79 (Esti ated)	1025.00

Plan Schemes

8.6 The outlays proposed for Annual Plan 1978-79 and 1979-80 for BGML are as below :—

S.No.	Item	Rs. lakhs	
		Revised Estimates 1978-79	Budget Estimates 1979-80
1.	Continuing Schemes	116.46	180
2.	New Schemes	47.61	140
3.	Replacements and Renewals	63.21	63
	Total :	227.28	383

8.7 *Diversification*

(a) BGML has also been continuing its diversification activities. The workshops of the company manufactured and supplied various items of equipment to other public sector undertakings, in addition to meeting its own requirements. The manufacture of T.C.T. Drill rods by the Central Workshops (Mechanical) was maintained at a level commensurate with outside orders and internal consumption.

(b) During the year 1977-78, 751.510 Kgs. of silver was recovered from film wastes of Hindustan Photo Films Manufacturing Company Limited, Ootacamund.

(c) With its mining expertise acquired over the years, BGML has undertaken mine construction and shaft sinking contracts at Kolihan for Hindustan Copper Limited at Mailaram for Andhra Pradesh Mining Corporation and for Manganese Ore (India) Ltd. at Kandri Mines.

Exploration Activities in and Around KGF.

8.8 With the close co-operation of GSI, exploration activities continued in the following areas in search of new gold prospects :—

(i) Mallappakonda and Chigarakunta hill area in Southern Extension of K.G.F.

(ii) Manighatta area, Northern Extension of KGF.

(iii) Betrayaswamy Block of KGF.

(iv) The old workings at Ajjanahalli (Karnataka) were examined and surveyed.

(v) Re-opening of Yappamana Mines at Ramagiri Gold Field (Andhra Pradesh).

Industrial Relations

8.9 Industrial relations during the year remained peaceful and cordial (by and large) except on a few occasions when some work-men participated in demonstrations and sproadic hartals demanding wage revision which has since been settled with the workers by mutual negotiations and with the approval of Government.

8.10 Statistical information regarding representation on SC/ST candidates in the services of BGML :—

The information is given in the following statement :—

BHARAT GOLD MINES LIMITED

(A Government of India/Enterprise)

Statement showing the total number of Employees and the number of Scheduled Castes and Scheduled Tribes amongst them as on Ist January, 1979

Group	Total No. of Employees	Scheduled Castes	Scheduled Tribes	Remarks
1	2	3	4	5
Group-A	100	10	1	
Group-B	159	9	1	
Group-C	4103	2146	10	
Group-D (excluding sweeper)	6766	3747	26	
Group-D (sweeper)	561	294	..	

CHAPTER IX

SIKKIM MINING CORPORATION

9.1 Sikkim Mining Corporation, a joint venture of Government of India and State Government of Sikkim, has been working the Bhotang poly-metal ore deposit at Rangpo in Sikkim. The ore is treated for production of copper, lead and zinc concentrates.

9.2 At present, the authorised and paid-up capital of the Corporation are Rs. 100 lakhs and Rs.57.35 lakhs respectively. The share capital is jointly held by the State Government of Sikkim and Government of India in the ratio 51 : 49 respectively.

9.3 *Production Performance*

(Unit Tonnes)

Year	Copper Concentrates			Zinc concentrates			Lead concentrates		
	Target	Production	Shortfall	Target	Production	Shortfall	Target	Production	Shortfall
1977-78	840	440	400	360	121	239	240	83	157
1978-79	840	2	838	360	0.50	359.50	240	0.50	239.50
1979-80	420	..	..	180	..	..	120	..	..

9.4 *Reasons for Short-fall in Production.*

Lack of power has been posing operational problems. Production of concentrates has ceased ever since December, 1977, and the plant could work only for 8 months during 1977-78 owing to power restrictions and power interruptions. In the current year, i.e. 1978-79, the power position continues to be alarming and, consequently, the production is at a standstill. Anticipating this standstill-position for the rest of the year, the production shortfall has been projected as above.

9.5 It is expected that the power supply will improve in 1979-80 after the commissioning of Lower Lagyap Hydel Project which is in progress near Ranipool in Sikkim.

CHAPTER X

PRODUCTION OF NON-FERROUS METALS

10.1 The production statistics of the following non-ferrous metals and gold are given in Table 1(a) to 1(d) :—

(a) Aluminium (separately for EC and CG grades)—Table 1(a).

(b) Copper (separately for Blister Copper, Copper Cathodes and Wire Bar)—Table 1(b);

(c) Zinc and Lead—Table 1(c);

(d) Gold—Table 1(d).

In each Table, the quantity produced in the fiscal year 1978-79 (estimated) is compared to fiscal year 1977-78. The targets for 1979-80 (fiscal) have also been indicated and compared with estimated production in 1978-79; in each comparison, the increase is shown in absolute as well as percentage terms.

10.2 The production of the following metals for the calendar year 1974 to 1978 is also shown in Charts :—

(i) Aluminium	Chart3
(ii) Copper	Chart4
(iii) Zinc and Lead	Chart5

(Unit : Tonne)

TABLE-1 (a)

1978-79 PRODUCTION STAT IST ICS

Item : Aluminium Metal

Producer : Alumimium Industry (Public and privat sector)

(Unit : Tonnes)

I	II	III	IV
Period	E.C.	C.G.	Total
(A)			
(a) 1978-79 (Estimated)	1,15,000	1,00,000	2,15,000
(b) 1977-78 (Actual)	98,968	79,570	1,78,538
(i) Increase in (a) over (b)	16,032	20,430	36,462
(ii) Percentage of Increase	16.2	25.7	20.4
(B)			
(c) 1979-80 (Target)	1,30,000	1,10,000	2,40,000*
(i) Increase in (c) over (a)	15,000	10,000	25,000
(ii) Percentage of Increase	11.5	10.0	10.4

*Achievement depends on power supply which is subject to wide fiuctuations at present.

TABLE 1 (b)

1978-79 PRODUCTION STATISTICS

Item : COPPER METAL

Producer : HINDUSTAN COPPER LIMITED (Public sector)

(Unit : Tonnes)

I Period	II Blister Copper	III Copper Cathodes	IV Wirebar
(A)			
(a) 1978-79 (Estimated)	23800	19780	19400*
(b) 1977-78 (Actual)	21021	21446	18240
(i) Increase/ decrease in (a) over (b)	2779	(—)1666	1160
(ii) Percentage of increase/decrease	13%	(—)8%	6%
(B)			
(c) 1979-80 (Target)	30000	27000	26500*
(i) Increase/decrease in (c) over (a)	6200	7220	7100
(ii) Percentage of increase/decrease.	26%	37%	37%

(*) The actual quantity of wire bar to be procuced will depend upon the sale of cathodes.

TABLE 1 (c)

1978-79 PRODUCTION STATISTICS

Items : ZINC AND LEAD

Produser : (i) HINDUSTAN ZINC LTD. (Public Sector)

(ii) COMINCO BINANI ZINC LTD. (Private Sector)

(unit : Tonnes)

Period	Zinc			Lead
	HZL	CBZL	Total	HZL
(A)				
(a) 1978-79 (Estimated)	53,000	14,000	67,000	11,200
(b) 1977-78 (Actual)	33,501	9,627	43,128	7,543
(i) Increase in (a) over (b)	19,499	4,373	23,872	3, 657
(ii) Percentage of increase	58.2%	45,42%	55.35%	48.48%
(B)				
(c) 1979-80 (Target)	59,000	14,000	73,000	15,000
(i) Increase in (c) over (a)	6,000	..	6,000	3,800
(ii) Percentage of increase	11.32%	..	8.95%	33,92%

TABLE 1 (d)

1978-79 PRODUCTION STATISTICS

Item : GOLD

Producers: (i) BHARAT GOLD MINES LIMITED

(ii) HUTTI GOLD MINES COMPANY LIMITED

(unit Kilogrames)

Period	Bharat Gold Mines Limited	Hutti Gold Mines Company Limited
(A)		
(a) 1978-79 (Estimated)	1,930	780
(b) 1977-78 (Actual)	1941	855
(i) Increase/decrease in (a) over (b)	(—)11	(=)75
(ii) Percentage of increase/decrease	(—)1%	(—)9%
(B)		
(c) 1979-80 (Target)	1,963	1,084
(i) Increase/decrease in (c) over (a)	33	304
(ii) Percentage of increase/decrease	2%	39%

CHAPTER XI

SCIENCE & TECHNOLOGY PROGRAMMES

11.1 Research and Development programmes on a planned basis, through formulation of Science and Technology Plan programme were given due recognition during the Fifth Plan period. The S&T projects taken up by the public sector units/organisations under the Department of Mines were identified as a result of deliberations of various groups formed for the purpose some years ago. During the Fifth Five Year Plan period, some projects were taken up for execution. In order to have proper planning in this field, Government have constituted an inter-Ministerial Standing Committee on Science and Technology Plan Inplementation under this Department which would serve as a nodal point for evolving an integrated approach, examining and reviewing the R&D programme in the areas of mineral development and non-ferrous metallurgy. The Committee will also review the objectives of R & D programmes proposed by different undertakings/organisations under the Department and decide about priorities amongst the various programmes for implementation. It will also establish the scope of work in this area between different organisations keeping in view the work already being done in the various national laboratories and the teaching institutions in the mineral and metallurgical field. The Committee will also be responsible for monitoring the progress of sanctioned schemes and evaluating the results.

11.2 Broadly, there are two types of R&D programmes, i.e. those relating directly to the production of the undertakings and those which are industry-wide, basic and of long range nature. For example, in the latter category would fall such programmes as relating to the development of indigenous technology for production of alumina and aluminium which means development of process, know-how, basic engineering etc.

11.3 A large number of projects of the public sector undertakings, organisations under the Department and outside like the Indian School of Mines and the Gujarat Mineral Development Corporation were sanctioned by this Committee in its four meet-

ings held since its inception in April, 1978. A brief summary of the schemes sanctioned is given below along with the outlay :—

(i) *Hindustan Copper Limited*

(i) Improvement of copper quality with recovery of impurity metals as valuable bye- products,—Rs 25 lakhs.

(ii) Improved steel support for mines, to develop collapsible type of steel supports in the underground mines strong enough to withstand the effect of blasting for supporting vulnerable areas for improving mine productivity—Rs 10 lakhs.

(iii) Improved tunnel support to develop a new support which is light, strong and easily transportable underground—Rs 10 lakhs.

(iv) Long hole raising in mines to allow completion of drilling in one stretch at the beginning of the raising operations from a safe working location—Rs 24 lakhs.

(v) Project on improved fragmentation to study the degree of fragmentation best suited to loading, hauling and ore handling equipment—Rs 4 lakhs.

(vi) Gypsum as a substitute for cement in hydraulic back filiing at Khetri and Kolihan mines—Rs 85,000.

(vii) Improving breaking efficiency of quartzites at Kheri and Chandmari mines by using Al Cl_3/NaCl solution during diamond core drilling, non-core long hole drilling etc. to reduce cost of drilling—Rs 1 lakh.

(viii) Recovery of tellurium from the copper electrolytic refinery slime—Rs 5.35 lakhs.

(ix) Recovery of Cobalt from the Indian Copper Complex converter slag—Rs 15.50 lakhs.

(x) Recovery of copper by dump leaching of low grade oxide and lean sluphide copper ores in order to design the actual dump leaching arrangement at Malanjkhand—Rs 17 lakhs.

(II) *Hindustan Zinc Limited*

(i) Augmentation of facilities in extractive metallurgy at a total cost of Rs. 52 lakhs. The objective is to enhance capability to effect process improvement. This

includes recovery of metal values from various residues generated in the process plants.

Additional amount of Rs 33.50 lakhs for the continuing scheme regarding augmentation of facilities for ore dressing and agglomeration.

(III) *Indian Bureau of Mines*

(i) Establishment of Central Ore Dressing Laboratory and pilot plant at Nagpur at a cost of Rs 185 lakhs, in order to treat larger lots of samples by gravity, magnetic and flotation techniques to evolve parameters and flow sheets for commercial plants.

(ii) Research on mica pegmetites—Rs 9.40 lakhs.

(IV) *Geological Survey of India*

(i) Development of magnetotalluric methods—Rs 18.60 lakhs.

(ii) Development of induced Polarisation of resistivity equipment & Model studies—Rs. 5.85 lakhs.

(iii) Development of Geophysical Instrumentation and techniques of geothermal exploration—Rs 4.89 lakhs.

(iv) Experimental analysis of geometrical properties of ripples etc.—Rs 3.63 lakhs.

(v) Application of experimental deformation techniques—Rs 2.37 lakhs.

(vi) Studies on Indian Bauxite—Rs 1.08 lakhs.

(vii) Singhbhum Sulphides mineralisation—a comparative study of regional geochemistry and development of exploration technique—Rs 33.31 lakhs.

(viii) Geochemistry of base metal sulphide and associated rocks—Rs 79.30 lakhs.

(ix) Development of analytical techniques for regional Geochemical Survey—Rs 6.00 lakhs.

(x) New Experimental Approach—Geothermometry for West Coast—Thermal Water—Rs 1.80 lakhs.

(xi) Establishment of Geo-data Centre for mineral & earth sciences—Rs 252.55 lakhs.

(V) *Bharat Aluminium Company*

Bench scale and pilot plant testing facilities costing—Rs 110/- lakhs.

(VI) *Gujarat Mineral Development Corporation*

Pilot plant for beneficiation of poly-metal sulphide ores—Rs. 45 lakhs.

(VII) *Indian School of Mines, Dhanbad*

(i) Beneficiation of low grade deposits of Kyanite—Rs 5.04 lakhs.

(ii) Preliminary survey of leaching of phosphate, sulphide and oxide ores by Bacterial means to ascertain the behavioural pattern of different bacteria on phosphate rock, sulphides like pyrite, chalcopyrite and oxides like manganese ores, hematite and chromite—Rs. 6.30 lakhs.

(iii) Geochemistry of ores deposits including geochronological studies of mineralised belts in the Singhbhum belt—Rs. 5.87 lakhs.

(iv) Ground behaviour in the mining of a copper deposit by post pillar method at Mosaboni Surda Mines of Hindustan Copper Limited, Ghatsila to enable mine Planning at reduced costs with enhanced safety—Rs. 2.68 lakhs.

(VIII) *Mineral Exploration Corporation*

(i) Down-the Hole Drilling for Mineral Exploration to replace conventional dry drilling for faster work at reduced cost—Rs. 15 lakhs.

(ii) Conventional drilling with airflush for mineral exploration in order to replace conventional dry drilling for faster work at reduced cost—Rs. 16.21 lakhs.

11.4 The Research and Development projects sanctioned under the S&T. Programme of the Deptt. in previous years have made significant progress. The progress of these projects is being periodically reviewed by the Science & Technology Sub-Committees appointed by the Deptt. Some of the more important schemes under this Deptt. are described below :—

I. *Bharat Gold Mines Ltd.*

(i) *Seismic Project*

This scheme consists of a net-work of Geophones field, amplifiers etc. on surface coupled to multichannel magnetic

taperecorder/stereo replay systems etc. The signals from rock bursts that occur in and around the mining areas in the Kolar Gold Fields are picked up and recorded. This would help in delineating areas of high seismic activity underground and in planning better mining methods for safe & economic exploitation of gold deposits. As this project is for basic study on problems of rock bursts and the means to control them with a view to carry out mining at depths consistent with safety, it will be not only beneficial to BGML but also to many other mining concerns who face similar problems of Strata control and rock burst. The project is being carried out in collaboration with Bhabha Atomc Research Centre, Bombay and was started in 1976-77. The instrumentation is scheduled to be completed by 31.3.79.

(ii) *Pilot Plant for recovery of Scheelite from Tailing Dumps*

The study for recovery of Scheelite, a strategic mineral, from the tailng dumps was taken up by BGML with the assistance of Indian Bureau of Mines in 1976-77. Successful and satisfactory investigations have been completed and scheelite concentrates of acceptable grade have been produced in the pilot plant. Samples of these concentrates have been supplied to users.

(iii) *Pilot Plant for Investigation on extraction of Scheelite from run of mine ore.*

With the encouraging results obtained on the investigations conducted on the tailing dump sands, similar investigations on the Scheelite rich ore in the mines are being done, where it is possible to mine separately, instead of diluting with other lean ores from the mines. This will be treated separately in the Pilot Plant and the tailings after scheelite recovery will be put back into the present mill circuit for extraction of gold in the usual manner. The project was started in April, 1978 and is scheduled to be completed by March, 1980. A large scale Pilot plant has been sanctioned.

II. *Hindustan Copper Limited*

Improvement in Copper Refining Process by the use of high current density and periodic reverse current.

The project was sanctioned in March, 1976. Installation of the pilot plant is nearing completion and the investigations would start immediately after the pilot plant is commissioned by the beginning of 1979-80. The project has been phased over a period of 5 years.

III. *Hindustan Zinc Limited*

Augmentation of facilities for ore dressing and agglomeration.

The project was sanctioned in January '77 and laboratory equipments for carrying out research programmes have been procured. The Pilot Plant for ore dressing is to be set up at Debari and is expected to be ready by 1979-80.

IV. *Indian Bureau of Mines*

Augmentation of ore dressing and agglomeration in Indian Bureau of Mines.

Under this scheme started in 1977-78 ore dressing laboratories and Pilot plants are to be set up at Ajmer and Bangalore and the ore dressing facilities at Nagpur would be augmented. It is expected that the laboratory at Ajmer will start operating by December, 1979. Action is in hand to procure equipment for all the three laboratories, including Nagpur.

CHAPTER XII

PROGRESSIVE USE OF HINDI

12.1 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 1978-79.

12.2 During the year (a) three meetings of Official Language Implementation Committee and (b) three meetings of reconstituted Hindi Salahakar Samiti of the Ministry of Steel and Mines, were held. In these meetings, the position regarding use of Hindi in the Secretariat, the subordinate offices and the Public Sector Undertakings of the Department was reviewed and recommendations of appropriate measures for improvement, wherever required, were made.

12.3 Official Language Implementation Committees also functioned with periodical meetings in both the two Subordinate Offices of the Department i.e. the Indian Bureau of Mines, Nagpur and Geological Survey of India, Calcutta (including its regional offices) as well as in the public sector undertakings, of the Department viz. Bharat Aluminium Company Ltd.; New Delhi, Hindustan Zinv Ltd., Udaipur, Mineral Exploration Corporation, Nagpur and Bharat Gold Mines Ltd.; Oorgaum, Karnataka.

12.4 Besides, the quarterly progress reports relating to use of Hindi received from the subordinate offices and public sector undertakings were reviewed and their attention were drawn towards the removal of the shortcomings found in the reports.

12.5 During the year under report, the Hindi Officer inspected a number of Offices to review the position regarding use of Hindi and suggested measures to solve the difficulties, wherever required. Besides, Check point under the supervision of Hindi Officer is also functioning in the Department.

12.6 During the year, 1,070 original letters were sent in Hindi to the Central Government Offices, State Governments and private individuals in region 'A' & 'B'. Since July, 1978, about 60% originating correspondence is being done in Hindi which is according to the target fixed for the purpose by the Department

of Official Language for the year 1978-79. During this period, 2,782 letters were received in Hindi and out of them, 1,213 letters were required to be replied. Except for some letters of statutory nature all were replied to in Hindi.

12.7 One periodical each from the four Public Sector Undertakings of the Department is published bilingually i.e. both in Hindi and English viz. 'BALCOVARTA' from Bharat Aluminium Company Ltd., TAMRA SANDESH from Hindustan Copper Ltd., ZINC SAMACHAR from Hindustan Zinc Ltd. and KHANIZ GAVESHAN from Mineral Exploration Corporation. The Indian Bureau of Mines also issued some of its publications in Hindi.

12.8 A Hindi Officer has been appointed in the Indian Bureau of Mines. Action for filling up the posts of Hindi Translators and Hindi Typists in Indian Bureau of Mines is continuing. Selection of a Hindi Officer in Mineral Exploration Corporation has been made. Necessary amendment in the recruitment rules to the posts of Hindi Translators in G.S.I. which were vacant since long, has been made and it is expected that by the end of the year under report appointments to these posts will be made. Action is also being taken to procure more Hindi typewriters in these offices.

12.9 Efforts were continued to get the non-Hindi knowing employees trained to acquire working knolwedge of Hindi under Hindi Teaching. As on 30th September, 1978 about 80% staff of the Department had working knowledge of Hindi and only 19 employees (including Officers) were required to be trained in Hindi. A programme for imparting Hindi training to the remaining employees by 1980-81 has been chalked out. The employees of the subordinate offices also avail of the facilities under Hindi Teaching Scheme. About 80% employees of Indian Bureau of Mines, G.S.I. northern region, Lucknow and Western Region, Jaipur possess working knowledge of Hindi. They have been advised to train all the remaining employees in Hindi by 1980-81. In Bharat Gold Mines Ltd. 47 and 19 employees have passed Hindi Prabodh and Praveen Examination respectively after completing the Hindi Training in classes run by the Company. Prabodh Classes are also being run at Khetri Copper Complex of Hindustan Copper Ltd. Arrangement for adult education also exists there. Two of their training courses are in Hindi medium.

12.10 In order to increase the interest of the employees in Hindi, a number of interesting Hindi magazines and newspapers are made available in the Library.

12.11 Hindi workshops for imparting practical training in Hindi noting and drafting are running in the Secretariat, the Indian Bureau of Mines, the Hindustan Zinc Ltd. and Bharat Aluminium Co. Ltd.

12.12 With a view to encourage the employees to make progressive use of Hindi in official work, a scheme of cash award has also been introduced in the Secretariat of the Department. Arrangements are also being made to introduce the cash award Scheme in other offices under the Department.

12.13 Many standard forms of common use in the Department and in its both the subordinate offices have been translated into Hindi and given to concerned sections/offices for use.

LIST OF CHARTS

Chart No. 1

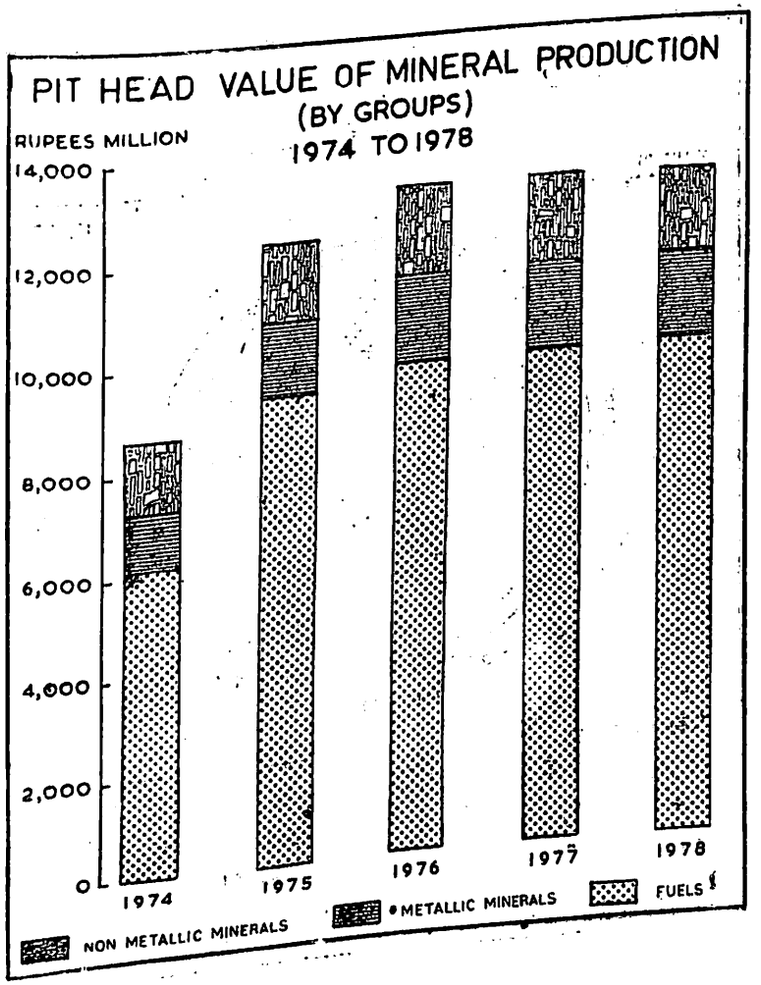
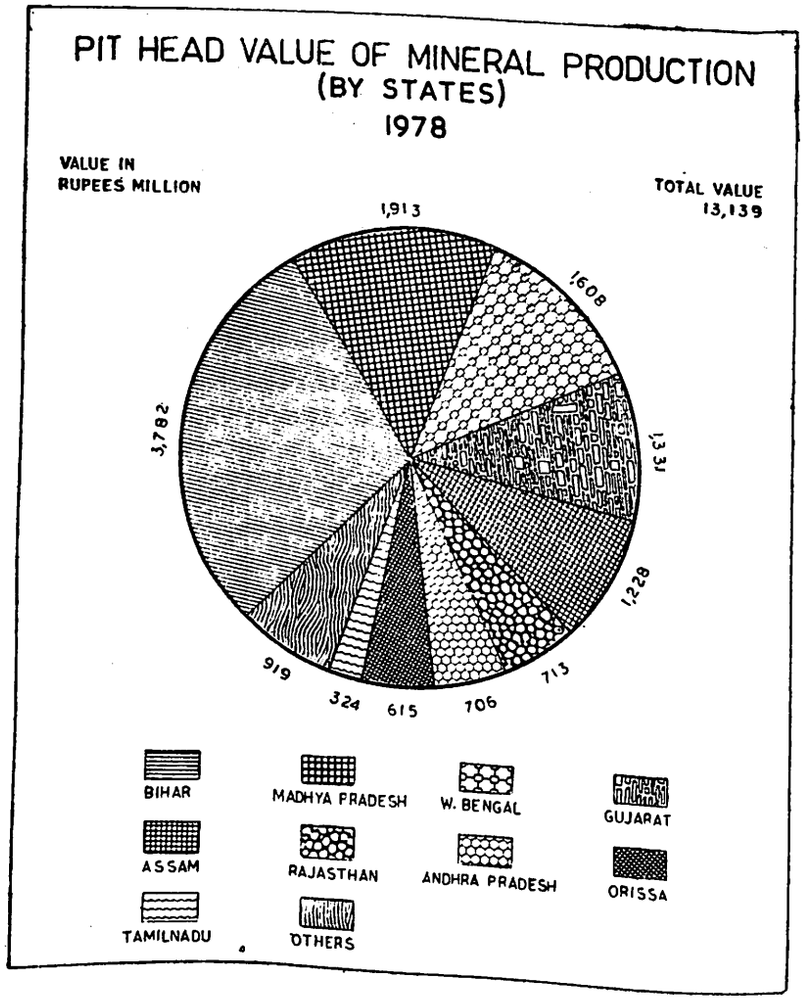

PIT HEAD VALUE OF MINERAL PRODUCTION
(BY GROUPS)
1974 TO 1978
RUPEES MILLION
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1974
1975
1976
1977
1978
NON METALLIC MINERALS
METALLIC MINERALS
FUELS

Chart No. 2



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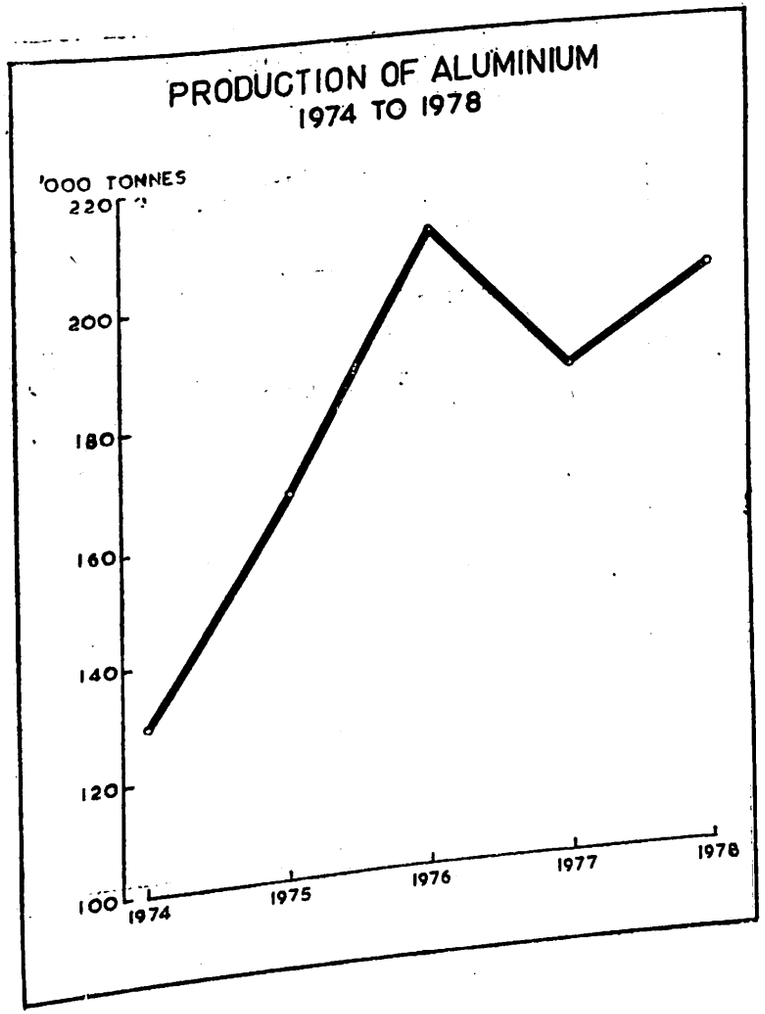

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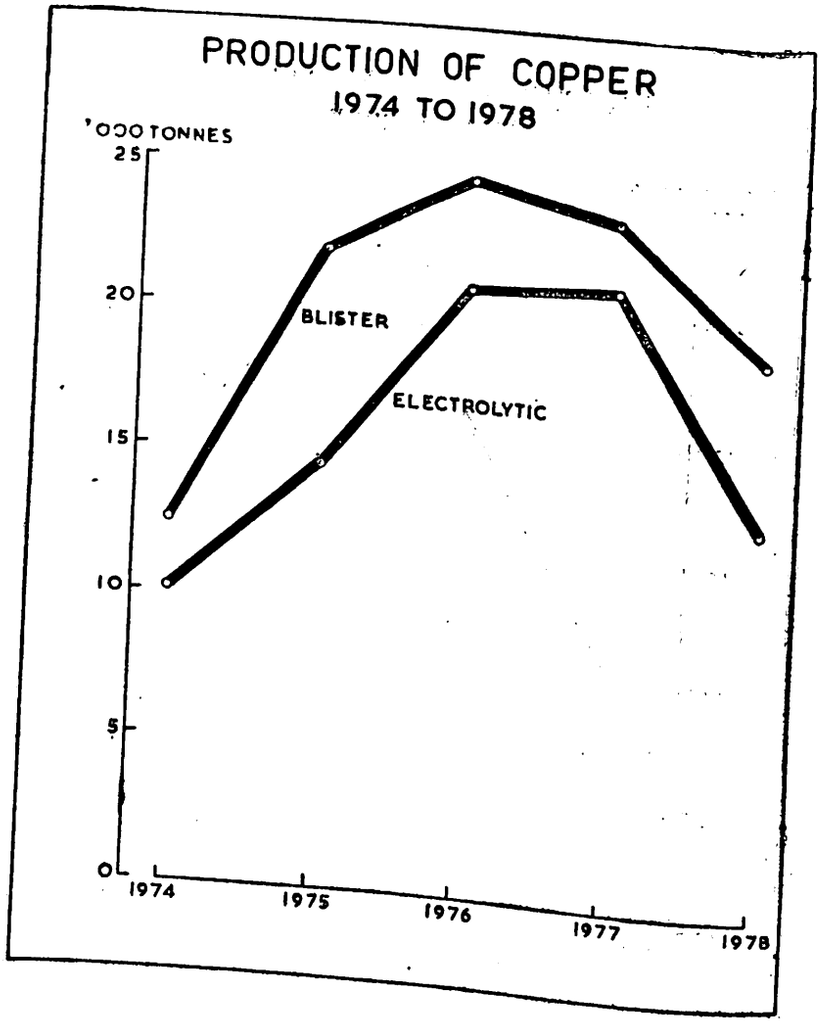

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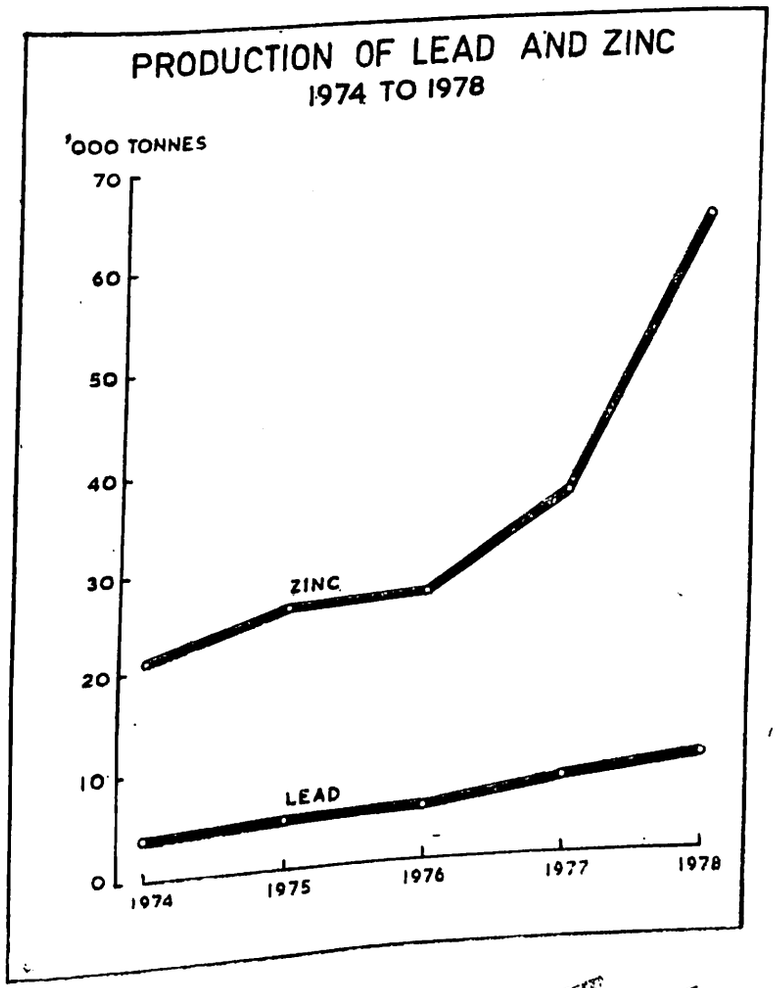

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