REPORT OF THE COMPTROLLER AND AUDITOR GENERAL OF INDIA

UNION GOVERNMENT
NO. 6 (COMMERCIAL) OF 1993

STEEL AUTHORITY OF INDIA LIMITED
BOKARO STEEL PLANT

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OVERVIEW

I. INTRODUCTION

Bokaro Steel Ltd. was incorporated in January 1964 to implement a project for production of 1.7 million tonnes of ingot steel after stage I and 4 million tonnes after stage II. It was merged with SAIL in May 1978.

(Para 1)

II. PROJECT

There was delay of 86 months in completion of stage I due to poor planning, inadequate control over construction activities and delay in obtaining Government clearances. Against the estimated cost of Rs.620.63 crores the final cost of stage I was Rs.981.34 crores. It was ascribed partly to reliance on indigenous resources and generating experience in Indian technical personnel in setting up projects i.e to the learning curve. Inspite of such learning curve the completion of all the units of stage II of the project which was to be completed by 1977 was delayed by 11 years. The cost of stage II was Rs.2198 crores against the estimated cost of Rs.947.24 crores.

(Para 2)

III. PRODUCTION

Production of steel was much less than the installed capacity of 4 million tonnes per annum, till recently. During the years 1978 to 1992, the shortfall in production amounted to 4.7 million tonnes which was attributed to various technical shortcomings.

(Para 3.1)

The production in Coke Oven and Blast Furnace was also less than the rated capacity even after including the production of off grade metal in blast furnace. Further, the coking time was higher than the projected time. The actual

CHAPTER 1

INTRODUCTION

In December 1965, a project report was prepared for setting up a steel plant in Bokaro, in two stages i.e. an initial ingot steel making capacity for 1.7 million tonnes per annum and later expansion to 4 million tonnes. The report was accepted in March 1966 by the Government. Bokaro Steel Limited was incorporated on the 29th January 1964. It was later merged with SAIL on 1st May 1978.

Several agencies were engaged in setting up the plant as designers and consultants. The construction work of stage I was started in April 1968. The construction of the Plant was reviewed by the Committee on Public Undertakings in their 68th Report (Fourth Lok Sabha) in April 1970.

CHAPTER 2

PROJECT

2.1 Stage I of the construction was mostly completed by February 1978 vis-a-vis the scheduled completion date which was December 1970. The delay of 86 months in completion was due to delay in receipt of equipment, inadequate control over construction activities, faulty assessment of the volume of work involved and of the capacity of the various agencies engaged in the construction as also procedural delays in obtaining Government sanctions, import clearances etc.

Government approval to the project was accorded on 17th November 1966 for an estimated cost of Rs.620.63 crores for the Stage I. The final cost was Rs.981.34 crores, which was approved by the Government in May 1978. The cost over run was attributed to poor estimation of costs, implementation failures, delay in sanctioning revised estimates of Stage I by the Government, non-availability of cement and steel and labour unrest.

2.2 The first three steel plants in the country were installed on turnkey basis. But, Bokaro was conceived as a non-turn key project to enable Indian Engineers to gain experience in setting up steel plants. Many equipments and high quality refractories were manufactured in the country. A part of the cost and time overrun was ascribed by the Management and the Ministry to the learning curve in Stage I.

2.3 Stage II i.e the project for expansion of the capacity of the plant to 4 million tonne per annum was taken up in 1971. Estimates for Rs.947.24 crores were approved by the Government in May 1978. The revised estimates for Rs.1637.55 crores were approved by the Government in April 1983. The

final cost for Rs.2198.40 crores are still to be approved by Government (1992).

All the units of the expansion project should have been completed by March 1977 except for one which was to be completed by June 1979. There was delay of 4 to 11 years in the commissioning of the various units and the cost overrun was Rs.1251.16 crores.

The delay was attributed by the Management to delay in receipt of equipment from suppliers, financial constraints and delays in implementation. Despite the learning curve in Stage I, in the Stage II adequate detailed preparation was not done and scope of work changed substantially during implementation.

Ministry stated (June 1992) that a number of suppliers in different countries were involved and detailed engineering and implementation underwent changes. Inspite of precautions and coordination of activities, project could not be completed as per schedule.

CHAPTER 3

PRODUCTION PERFORMANCE

3.1 Steel Melting Shop:

The production of steel in recent years is given below:-

(Figures in lakh tonnes)

Year	Installed Capacity	Targetted Production	Actual production-	Percentage of actual production-to	
				Installed capacity	Targetted Production
1.	2.	3.	4.	5.	6.
1980-81					
Steel Ingots	25.00	18.20	9.23	36.92	50.71
Saleable Steel	13.55	15.00	8.44	62.29	56.27
1986-87					
Steel Ingots	31.08	26.50	20.56	66.15	77.58
Saleable Steel	20.90	21.20	17.45	83.49	82.31
1987-88					
Steel Ingots	31.08	25.60	24.18	77.79	94.45
Saleable Steel	24.50	21.85	19.68	80.32	90.07
1988-89					
Steel Ingots	33.30	28.00	27.71	83.21	98.96
Saleable Steel	26.25	23.20	22.77	86.74	98.15
1989-90					
Steel Ingots	40.00	33.00	26.54	66.35	80.42
Saleable Steel	31.56	27.94	23.25	73.66	83.21
1990-91					
Steel Ingots	40.00	34.00	28.06	70.15	82.53
Saleable Steel	31.56	28.00	24.26	76.87	86.64
1991-92					
Steel Ingots	40.00	33.00	34.17	85.43	103.55
Saleable Steel	31.56	27.00	27.30	86.50	101.11

The shortfall in production compared to installed capacity was attributed by the management mainly to lack of off-take of steel, power restriction, lower availability of converter due to premature failure of lining, poor availability of SMS grade of Lime Stone, break-down of equipments, poor quality of Coke and labour problems.

Due to poor off-take of basic grade hot metal for use in Steel Melting Shop, hot metal was diverted to Pig Casting Machine.

Management stated (July 1990) that the reasons were non-availability of converters to produce steel because of low lining life and less utilisation of converters due to technological abnormalities and logistic control.

During the years 1978-79 to 1991-92 against 473593 hours available, converters worked for only 242209 hours. The loss of production was 46.89 lakh tonnes.

Management stated (July 1990) that right from the date the shop was commissioned i.e. from 1976-77 till 1987-88 the production has not been upto the norms. The main reasons were non-availability of converter because of low lining life and less utilisation of converter because of a number of delays. Major delays were due to technological abnormalities, mould set movement, hot metal shortage and mechanical and electrical break-downs.

A new technique of spiral lining was developed in January 1989 by Research and Development Centre but was discontinued after March, 1989.

Normal tap to tap time of the 100 tonne converter is 60 minutes per heat and that of 300 tonne converter is 80 minutes per heat. In practice the actual tap to tap time of 100 tonne converters was longer i.e. between 70 to 86 minutes.

The Management attributed (June 1983) the increase in tap to tap time to high silicon content in hot metal which necessitated adoption of double de-slagging which in turn consumed additional time, increase in heat weight and logistics problem.

3.2 Coke Oven Batteries:

Capacity for the following sizes of coke was created in the batteries in the two stages.

	(in lakh tonnes)	
	1.7 MT Stage	4 MT Stage
BF Coke size 25 mm & above	20.90	34.80
Coke Breeze size 15-25 mm	00.84	01.40
Coke Breeze size 0 to 15 mm	02.23	03.71

The rated capacity, the targetted production and actual production of BF (Blast Furnace) coke 25 mm and above are given below.

(Figures in lakh tonnes)

Year	Rated Capacity	Targetted Production	Actual output
1978-79	20.90	20.55	16.56
1979-80	20.90	20.26	17.23
1980-81	20.90	21.15	16.75
1981-82	23.22	25.67	20.48
1982-83	26.12	25.97	22.47
1983-84	29.82	25.43	23.48
1984-85	33.33	25.36	22.90
1985-86	34.80	28.91	24.67
1986-87	34.80	28.25	24.80
1987-88	34.80	26.96	26.62
1988-89	34.80	26.80	25.59
1989-90	34.80	27.32	23.34
1990-91	34.80	27.11	21.96
1991-92	34.80	24.56	24.48

On the shortfall in production compared to installed capacity the Management stated (July 1990) that the production was regulated as per the requirement of Blast Furnace and inter plant transfers.

During the years 1978-79 to 1991-92 the coking time ranged between 18.52 to 23.49 hours against 16.1 to 16.9 hours estimated in project report. The higher coking time leading to lesser production was due to poor quality of coal and poor organisation and management.

3.3 Blast Furnace:

The rated capacity of the three blast furnaces in Stage I was to be 18.5 lakh tonnes of basic grade and 8.85 lakh tonnes of foundry grade hot metal. After Stage II annual production was envisaged at 37 lakh tonnes of basic grade and 8.85 lakh tonnes of foundry grade hot metal.

The rated capacity, targetted production and actual production of hot metal during the years from 1978-79 to 1991-92 are given below:-

(Figures in lakh tonnes)

Year	Rated Capacity	Targetted Production	Actual Production of hot metal			Total hot metal	Off grade to total hot metal (%)	% age of production to rated capacity
			Basic grade	Foundry grade	Off grade			
1978-79	27.35	26.66	5.52	12.38	1.10	19.00	5.79	69.47
1979-80	27.35	25.00	3.86	11.19	1.89	16.94	11.16	61.94
1980-81	27.35	23.25	2.53	12.65	1.60	16.78	9.54	61.35
1981-82	35.05	25.00	4.58	15.59	1.75	21.92	7.98	62.54
1982-83	36.60	28.00	5.09	14.55	2.30	21.94	10.48	59.95
1983-84	36.60	26.00	4.98	13.90	3.87	22.75	17.01	62.16
1984-85	36.60	25.20	4.51	15.91	3.58	24.00	14.92	65.57
1985-86	44.30	29.00	5.76	14.17	5.31	25.24	21.04	56.98
1986-87	45.85	32.50	8.39	13.67	6.07	28.13	21.58	61.35
1987-88	45.85	33.30	7.13	18.06	6.04	31.23	19.34	68.11
1988-89	45.85	35.00	17.23	7.34	7.64	32.21	23.72	70.25
1989-90	45.85	38.00	17.26	6.70	8.04	32.00	25.13	69.79
1990-91	45.85	38.50	11.71	11.16	9.80	32.67	30.00	71.25
1991-92	45.85	35.00	15.71	8.35	12.67	36.73	34.49	80.11

The actual production, which included off-grade hot metal was lower than the rated capacity and targetted production during all the years. Percentage of production of off-grade hot metal to the total hot metal produced ranged from 5.79% to 34.49% during the years 1978-79 to 1991-92.

The production below capacity and increase in off grade metal were attributed by the Ministry (June, 92) to lower furnace availability due to poor off take of hot metal and break downs. Poor and inconsistent quality of coke and raw materials and non-availability of sufficient quantity of sinter were also the causes. Blast Furnace operation is a

Name of the mills	Year	Input (Lakh Tonnes)	Output (Lakh Tonnes)	Scrap arising (in tonnes) As per D.P.R.	Actual
Slabbing Mill				11.25%	
	1980-81	10.11	8.56	113737	154633
	1986-87	19.35	16.40	217688	217182
	1987-88	23.63	19.76	265838	299476
	1988-89	26.66	22.72	299925	312254
	1989-90	26.18	22.40	294525	299207
	1990-91	27.38	23.45	308025	311022
	1991-92	32.16	27.63	361800	356460
Hot Strip Mill				0.5%	
	1980-81	7.79	7.52	3895	25302
	1986-87	16.09	15.61	8045	28298
	1987-88	19.52	18.92	9760	29236
	1988-89	22.73	22.02	11365	42397
	1989-90	23.40	22.66	11700	41726
	1990-91	24.97	24.20	12485	46546
	1991-92	27.95	27.07	13975	52527
Pickling Line Mill				3.4%	
	1980-81	1.64	1.56	5576	7945
	1986-87	2.76	2.56	9452	18689
	1987-88	3.66	3.41	12444	23020
	1988-89	4.92	4.58	16728	22498
	1989-90	5.68	5.29	19312	34692
	1990-91	6.97	6.53	23698	40427
	1991-92	9.61	9.04	32674	52183
Tandem Mill				0.1%	
	1980-81	2.68	2.66	268	1286
	1986-87	2.56	2.54	256	497
	1987-88	3.38	3.37	338	710
	1988-89	4.56	4.54	456	1500
	1989-90	5.27	5.24	527	1230
	1990-91	6.43	6.39	643	3139
	1991-92	8.93	8.81	893	9897
Skin Pass Mill				0.2%	
	1980-81	1.49	1.49	298	736
	1986-87	2.49	2.48	498	1524
	1987-88	3.34	3.33	668	923
	1988-89	4.40	4.36	880	4026
	1989-90	5.20	5.05	1040	15109
	1990-91	5.52	5.34	1104	17401
	1991-92	7.21	6.88	1442	33434

The arising of scrap was higher in Slabbing Mill due to improper deoxidation and in Hot Strip Mill and other Finishing Mill due to formation of cobble and equipment problems.

Ministry stated (June 1992) that the weigh-scales of ferro alloys charging systems behaved erratically resulting in the poor deoxidation in Steel Melting Shop. In the Hot Strip Mill, there was problem of dead and worn out table rolls which had since been replaced.

3.8 Slabbing Mill:

The Slabbing Mill with rolling capacity of 4 million tonnes steel ingots was commissioned in December 1974. The connected facilities like soaking pits were commissioned in phases between December 1974 to February 1985. The production over the years is given below:-

(Figures in lakh tonnes)

Year	Rated Capacity	Annual target	Annual production	Percentage of production to	
				Rated capacity	Annual target
1980-81	14.65	16.32	8.56	58.43	52.45
1986-87	21.55	22.03	16.40	76.10	74.44
1987-88	26.79	21.80	19.76	73.76	90.64
1988-89	28.70	23.91	22.72	79.16	95.02
1989-90	34.49	28.48	22.40	64.95	78.65
1990-91	34.49	29.07	23.45	67.99	80.67
1991-92	34.49	27.79	27.63	80.11	99.42

The plant did not produce to its rated capacity or meet the target in any of the years.

3.9 Hot Strip Mill:

Hot Strip Mill is designed to roll the slabs received from the Slabbing Mill. The Hot Strip Mill was commissioned in December 1975.

3.12 Untested Quality Product:

Production of untested products for sale as off-grade products showed an increasing trend in recent years.

Year	Tested *HRC	Untested off grade *HRC	% off grade to tested		Tested CR Coil	Untested CR Coil	% of untested to tested	
			Norm	Actual			Norm	Actual
1984-85	541577.2	30869.1	6.5	5.70	281256.2	9336.9	5	3.32
1985-86	557397.2	29080.4	6.5	5.22	188223.6	7271.4	5	3.86
1986-87	561698.9	83242.5	6.5	14.82	143500.7	12457.5	5	8.68
1987-88	785554.9	116208.8	6.5	14.79	212395.8	17008.5	5	8.01
1988-89	929670.0	59659.9	6.5	6.42	254207.2	29709.0	5	11.69
1989-90	891658.2	62231.0	6.5	6.98	312732.7	24940.7	5	7.98
1990-91	858953.2	73488.6	6.5	8.55	338552.3	25912.5	5	7.65
1991-92	826515.1	27697.9	6.5	3.35	464872.7	31775.3	5	6.84

*HRC - Hot Rolled Coils

Further, special quality steel valued at Rs.16.23 crores was treated as scrap and down graded during the years 1987-88 to 1989-90.

3.13 Coke Oven by products

The yield of ammonium sulphate in the plant linked to coke oven battery ranged between 6 to 9.4 Kg. per tonne of dry coal charge as against the original norm of 11.66 Kg. per tonne and the revised norm of 9.5 Kg. per tonne. The loss amounted to Rs. 26.72 crores during the years 1981-82 to 1991-92, compared to original norm. The yield of crude tar ranged between 24.50 Kg. per tonne to 27.20 Kg. per tonne as against the norm of 32 Kg. per tonne and revised norm of 29 Kg. per tonne. Loss was Rs.82.26 crores during the years 1979-80 to 1991-92, compared to original norm.

Management stated (July 1990) that volatile matter in coal turned out to be lower than norm and with use of imported coal the yield of Crude Tar and Ammonium Sulphate came down further.

The consumption of Sulphuric Acid should have been 770 kg. for production of one tonne of Ammonium Sulphate, but the excess consumption of acid during the years 1979-80 to 1991-92 valued Rs.1.95 crores. The excess was attributed to non-availability of equipment like saturator centrifuge belt conveyor.

Further, the production of Naphthalene from distilled tar during the years 1984-85 to 1991-92 was only 30.50 % to 48.06 % of anticipated production.

3.14 Sulphuric Acid Plant

The annual requirement of Sulphuric Acid was estimated to be 35,200 tonnes per annum after Stage I and 69,600 tonnes after Stage II.

Two plants with an annual capacity of 42,000 tonnes each were to be set up. The first unit for production of Sulphuric Acid was commissioned in February 1978 and the second unit in January 1980. The cost of both the units was Rs. 7.09 crores.

The production of Sulphuric Acid during the years 1980-81 to 1991-92 was only 24.89 to 39.53% of the capacity. The annual requirement for Sulphuric Acid was met by operating only one unit in all the years. The other unit has been lying idle.

Management stated (July 1990) that by using 35 to 40% imported coal in Coke Oven, production of Ammonium Sulphate was less and less Sulphuric Acid was consumed.

The second acid plant was commissioned only in January 1980. In the beginning of 1979, the plant was aware that hydrochloric acid would be better for pickling. Though Management decided to go in for hydrochloric acid pickling instead of Sulphuric Acid pickling in the future, it was not

very confident of managing a hydrochloric acid plant and the second Sulphuric Acid Plant was set up.

3.15 **Ingot Moulds and Bottom Plates:**

The production of ingot moulds was less than rated capacity during the years 1979-80 to 1991-92 (except for 1987-88) and the production of bottom plates was less than rated capacity during the years 1988-89 to 1991-92. But, consumption of ingot moulds and bottom plates was very high compared to the norms, despite measures like better tapping temperature control, higher mould cycle time, increased air cooling of the moulds and stricter quality control taken by the Management in 1983 which made little impact on the consumption of ingot moulds during the years 1984-85 to 1991-92.

The extra expenditure due to excess consumption of ingot moulds and bottom plates from 1979-80 to 1990-91 amounted to Rs.56.94 crores.

Management stated (July 1991) that the consumption of ingot mould was higher because of the inability to provide required air cooling after stripping and before water quenching. This was due to non-availability of adequate number of ingot cars and lack of consistency in the quality of mould received from various sources. High temperature heats and improper teeming practice also contributed to higher consumption of ingot moulds and bottom plates.

3.16 Thirteen Diesel Hydraulic locos 350 H.P., valuing Rs.1.28 crores, which were purchased in 1969 for use in the Hot Metal site of Blast Furnace were lying idle due to inherent defects and lack of spare parts. Management stated (July 1990) that they were imported from Czechoslovakia and are being replaced with 1400 HP DLW Varanasi Locomotives.

One Stripper valuing Rs. 12.23 lakhs was received in November 1970 from USSR and was erected in the Stripper Yard in March 1973. It could not be used and has been lying idle as type of steel ingots for its use have not been produced since December, 1973.

Management stated (July 1990) that the type of ingot was not produced for operational reasons.

3.17 On 12.2.1982, two electric locomotives were purchased for Rs.106 lakhs. The first locomotive was received on 31.5.1985 and the second loco on 10.8.1985. The first locomotive broke down after running for a few hours because of defects in design. It was re-commissioned on 2.8.1990. The second loco also broke down within a month and is under repair still (June 1992).

3.18 Value of gas generated in the converter which was not used but was flared off amounted to Rs.1.34 crores from June, 1983 to March, 1988.

3.19 Coal imported by Paradeep and Haldia Ports weighed short by 2,04,873 tonnes compared to what was paid for. Value of shortage during the years 1985-86 to 1991-92 amounted to Rs.31.73 crores.

3.20 The utilisation of a ropeway set up at a cost of Rs.7.7 crores in November, 1981 varied from 0.4% and 26% during the years 1981-82 to 1987-88. As a result, coal was transported by road incurring extra expenditure of Rs. 11.35 crores during the years 1982-83 to 1987-88.

Management stated (July 1990) that density of coal was higher than envisaged in the design.

3.21 On the energy consumption rates in the plant not comparing favourably with plants abroad, the reasons were attributed by the Management to the poor quality of coal.

CHAPTER 4

RAW MATERIALS MANAGEMENT

4.1 The Steel Plant obtains its raw materials i.e. iron ore, lime stone, dolomite etc. from its captive mines as given below:

Iron Ore

i) Kiriburu Iron Ore Mines
ii) Meghahatuburu Iron Ore Mines
iii) Gua Iron Ore Mines
iv) Bolani Iron Ore Mines

Flux

i) Kuteshwar Limestone Mines
ii) Bhawanathpur Limestone Mines
iii) Tulsidamar Dolomite Mines

The iron ore comes mainly from Kiriburu and Meghahatuburu. They became captive mines of Bokaro Steel Plant from May, 1978.

4.2 Iron ore:

The ore reserve in Meghahatuburu was estimated at 111 million tonnes and its development was approved by the Government in February, 1978 at an estimated cost of Rs.51.39 crores. The actual expenditure was Rs.115.10 crores, but the development was completed during 1985-86 vis-a-vis target of July, 1980.

The quantity of iron ore (lump and fines) raised, the quantity received at the plant and the quantity purchased from outside as also quantity actually consumed during the years 1979-80 to 1991-92 are given below:-

Rated Capacity of mines as per D.P.R. (in lakh tonnes)

	Lump	Fines
Upto 1984-85	17.50	25.00
w.e.f. 1985-86	30.90	54.60

(Figures in lakh tonnes)

Year	Quantity of iron ore raised by the captive mines		Quantity received at the plant from the mines		Quantity purchased from outside sources		Quantity of iron ore consumed	
	Lump	Fines	Lump	Fines	Lump	Fines	Lump	Fines
1979-80	8.73	9.43	8.76	11.91	4.38	2.36	12.63	13.61
1980-81	9.11	9.28	6.97	12.49	4.65	2.86	10.79	15.08
1981-82	10.68	10.84	11.01	13.65	2.89	9.52	13.52	22.06
1982-83	11.60	15.81	12.13	15.75	1.79	7.57	13.50	22.33
1983-84	11.51	13.97	11.28	13.54	1.56	10.89	13.33	22.07
1984-85	9.51	10.58	8.86	10.60	6.24	16.04	14.31	23.98
1985-86	11.80	12.06	11.95	10.85	1.88	14.72	15.92	25.73
1986-87	15.19	11.27	14.57	11.76	3.59	14.82	18.14	25.38
1987-88	19.22	21.51	18.10	17.13	2.30	14.52	19.91	29.46
1988-89	18.30	21.68	18.55	21.16	3.58	8.82	20.75	31.36
1989-90	18.45	30.51	17.58	27.83	5.73	5.58	20.35	31.38
1990-91	14.57	21.79	12.62	24.20	5.41	10.33	17.34	35.28
1991-92	18.75	28.92	16.59	28.01	1.53	13.18	15.74	40.71

The production at Kiriburu Iron Ore Mines as a percentage of rated capacity of mines (17.50 lakh tonnes Lumps and 25.00 lakh tonnes fines) ranged between 40.35% and 64.50%. In Meghahatuburu Iron Ore Mines, production ranged between 8.05% and 55.21% of the rated capacity (13.40 lakh tonnes lumps and 29.60 lakh tonnes fines).

Management attributed the shortfall in production in the two mines to the reasons given below:-

(a) Kiriburu Iron Ore Mines

i) Non-availability of Quaternary crusher
ii) Power interruptions
iii) Jamming in Primary Crusher
iv) Break-down in Primary Crusher
v) Over-time restrictions
vi) Low availability of drills, shovels, dumpers.
vii) Less off take

(b) Meghahatuburu Iron Ore Mines.

i) Shortage of Manpower
ii) Inadequate equipments
iii) Break-down of equipments
iv) Basic design and erection defects
v) Flowability problem could not be solved

Because of low production of ore, purchase of substantial ores at higher cost involving additional expenditure of Rs.61.92 crores had to be made during the years 1980-81 to 1990-91.

Management stated (July 1990) that purchases were the result of failure of Railway to supply adequate wagons. Some quantity of ore had to be purchased alongwith the manganese ore as a part of contractual obligations. Purchase had to be resorted to, to avoid loss of production in steel plant.

4.3 One of the contracts for development, stipulated a ceiling of 5% on the escalation but the ceiling was withdrawn and cost over-run beyond 5% and to the extent of Rs.10.46 crores was incurred. Management stated (July 1990) that the ceiling clause was withdrawn in view of the fact that there was a change in design and increase in scope of work due to sophistication in system more than that envisaged in the contract. But, an Enquiry Committee appointed in May 1987 attributed the cost over run to tardy process of approval of drawings, slow release of drawings and under estimation of costs.

Ministry stated (February, 1993) that on the basis of the report of Enquiry Committee some of the agencies, who were given contracts were also responsible for the time and cost over run but it has not been found feasible to apportion the responsibilities.

4.4 **Lime Stone:**

The requirement of high grade lime stone was met from the captive mines at Kuteshwar and low grade lime stone used in Blast Furnaces and Sintering Plant from captive mines at Bhawanathpur.

The Kuteshwar mine reserve was estimated at 10 million tonnes. Shortfall in extraction was 3 million tonnes during

the years 1979-80 to 1991-92. The management procured 6.64 lakh tonnes of lime stone from outside at additional expenditure of Rs.8.04 crores during 1987-88 to 1990-91.

The reserve of lime stone in Bhawanathpur area was 97 million tonnes and a capacity for extraction of 3.8 million tonnes per annum was to be developed. After crushing, screening and sizing 2.9 million tonnes of saleable lime stone per annum was expected from an investment of Rs.14.59 crores, excluding cost of railway lines. The operating cost was estimated at Rs.13.55 per tonne of saleable lime stone.

First stage of development was to be completed by January, 1973 but was delayed by 6.5 years due to delay in issue of drawings and specifications, delay in supply of major equipments and delay in completion of civil works. First stage was sanctioned by Government for Rs.7.80 crores but was completed at a cost of Rs.13.63 crores. The second stage of development was expected to cost Rs.38.82 crores. It did not achieve the designed capacity of 1.45 million tonnes per annum. Due to poor utilisation of the capacity of crushing and screening the cost per tonne of lime stone raised was as high as Rs.269.72 per tonne (1991) against Rs.212.97 per tonne for procurement from raising manually through contractor. Further the plant did not meet the quality required for Blast Furnace. Purchase of lime stone from others resulted in additional expenditure of Rs.4.27 crores upto 1990-91.

Management stated (July 1990) that shortfall in despatches from mines was because of poor availability of railway wagons necessitating purchase from outside.

Bhawanathpur mines was to supply 2.345 million tonnes per annum to three steel plants by 1994-95. But original specification for lime stone was changed due to deterioration in the quality of Indian coal (high ash

content). Higher alkali content was noticed in lime stone. Crushing problems in Sintering Plant due to higher hardness of lime stone were noticed resulting in decision to introduce higher grade lime stone in mixed flux. Continuance of extraction from Bhawanathpur mines depended on technical requirements of the steel plant and also industrial relations with 1600 labour in the mines. Final decision on extraction from the mines in future was still to be taken (June 1992).

4.5 As a result of wrong billing accepted without check, the mine paid an excess amount of Rs.1.47 crores as electricity charges upto 1987-88.

4.6 Spirally welded steel pipes worth Rs.46.17 lakhs procured between December 1984 and September 1986 were lying unutilised at the mines. Management stated (July 1990) that the mining layout underwent change. A portion of the pipes were utilised in the plant.

4.7 Two Drills valuing Rs.23.20 lakhs and one shovel valuing Rs.24.13 lakhs were procured between 1969 and 1972 and commissioned in April 1980. But after commissioning the shovels were not utilised. Management stated (July 1990) that the drills were a failure and were condemned and written off in March 1987.

4.8 Production of Dolomite in Tulsidamar Mines was always less than the target during the years 1979-80 to 1988-89. Due to shortfall in production, 9.35 lakh tonnes were purchased from outside at additional cost of Rs.2.19 crores from 1981-82 to 1988-89.

4.9 **Inventory:**

The stock of stores and spares as on 31st March, 1992 represented 9.61 months consumption. For items under

automatic procurement system the stock holding in March 1990 was more than the norms fixed.

Advance to suppliers amounted to Rs.82.90 crores as on 31st March, 1992. The supply of goods had not been adjusted for several years from such advances and credit balances in the books amounting to Rs.89.05 crores were to be adjusted.

The stores and spares included many non-moving items as indicated below:-

(Rs. in crores)

Year	Unmoved items for more than 3 years	Surplus declared during the year	Surplus items at the end of the year	Total Col. (2+4)	Disposal of surplus items
1987-88	53.43	2.55	8.31	61.74	0.37
1988-89	52.34	1.80	8.78	61.12	1.33
1989-90	46.54	2.31	10.30	56.84	0.79
1990-91	32.34	22.86	31.82	64.16	1.35
1991-92	39.03	0.92	27.53	66.56	5.21

The stock of non-moving and surplus items and their disposal was very slow.

Management stated (June 1991) that they were trying to reduce the level of stores and spares to 9 to 10 months' consumption and the surplus stores which were causing concern would be disposed of soon.

The shortages revealed during physical verification was on the increase from 1987-88.

A Committee noted in June 1991 that the main factors contributing to discrepancy in the stock of raw materials were as under:-

- Weighment of wagons without waiting for excess water to drain out.
- Inaccuracies in weigh bridges.
- Loss of moisture during transit,

- Transit losses,
- Handling losses,
- Left over quantities in the wagons after tippling,
- Booking of consumption on derived basis,
- Mix up of raw materials in stacks.

The Committee recommended in relation to coking coal, the strengthening of supervision at the loading point, maintenance and calibration of weigh bridges, weighment after the water is drained out, care in weighment, an independent inspection agency for supervision of loading & weighment, 100% weighment of all incoming wagons at plant and rechecking of marked and tare weight of the wagons. All Plants were to have in-motion weigh bridge on the return line. For imported coal it recommended proper supervision of wagon loading by transport & shipping staff, recoveries from contractors of dead freight based on weight found at destination, refixing of carrying capacity of BOX 'N' wagons, BOX 'C' wagon being loaded upto maximum extent, debit on Plant being raised by Transport and Shipping only for invoiced quantity and as per Bill of lading quantity, and rake-wise plant weighment being analysed for appropriate remedial action. On Iron Ore the Committee recommended that wagons be cleaned at the mines before loading. On Manganese Ore, loading point supervision was to be strengthened and made more effective. On Ferro Alloys, it recommended that suppliers ensure despatch of materials under clear R/R and with an escort (at the cost of SAIL) where materials were despatched by Rail.

CHAPTER 5

FINANCIAL PERFORMANCE

5.1 In the earlier years, the running of the plant resulted in losses from 1972-73 to 1980-81 excepting for a small profit of Rs.1.76 crores in the year 1976-77. Due to improvement in performance thereafter despite the accumulated loss of Rs.144.88 crores till 1980-81, the cumulative profit (net of losses) stood at Rs. 1264.49 crores as on 31st March 1992. Following reliefs allowed to the Plant accounted for profit of Rs.298.50 crores:-

i) Moratorium of Rs.198.50 crores on repayment of loan instalments and interest by the Government of India on loans given upto 31st March 1978,

ii) Waiver of interest on Government loans amounting to Rs.89.56 crores and

iii) Credit for Rs.10.44 crores from Steel Development Fund on account of decontrol of certain steel items during 1980-81.

But, the profit would have been higher had the production performance been better.

5.2 Housing:

The profit generated were computed after providing for significant increase in expenditure on housing for about 68% of the employees. The number of houses stood at 34,686 as on 31st March, 1992. The revenue realised from the providing

housing did not keep in step with the increase in expenditure on housing, and increase in wage levels, as indicated below:-

(Rs. in crores)

Year	Expenditure on housing	Income from housing	Deficit	Deficit as subsidy at Rs. per employee/year
1985-86	14.79	3.67	11.12	2148
1986-87	15.75	4.69	11.06	2153
1987-88	17.88	4.80	13.08	2540
1988-89	21.66	5.41	16.25	3184
1989-90	27.01	5.79	21.22	4170
1990-91	37.11	6.57	30.54	5992
1991-92	33.00	8.59	24.41	5227

5.3 Man Power:

The profit was also arrived at after providing for the expenditure on excess manpower. The manpower required for production of 4 million tonnes per annum was assessed at 30,434 for Works (operation) but number employed was more, as given below:-

	Number of employees as on 31st March				
	1988	1989	1990	1991	1992
i)Operation	33468	33450	32761	33303	33398
ii)Construction	3891	3247	2911	2634	2362
iii)Services	14080	14225	15066	10616*	10941*
*(excluding number in mines)					
Total:	51439	50922	50738	46553	46701

The plant is expected to achieve 95% to 100% of the rated capacity of 4 million tonnes only in 1993-94. The labour productivity was low compared to the estimates in the project report.

The Management stated (June 1991) that productivity was low, but the level of technical and non-technical manpower employed already was adequate and no additional manpower would be recruited to achieve production of 4 million tonnes per annum.

(U N ANANTHAN)
Additional Deputy Comptroller and Auditor General-cum-Chairman, Audit Board

New Delhi

The 6 JUL 1993

Countersigned

(C G SOMIAH)
Comptroller and Auditor General of India

New Delhi

The 6 JUL 1993