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MGIPF-412 NAL/79



**REPORT OF THE**

**COMPTROLLER AND AUDITOR GENERAL  
OF INDIA**

**UNION GOVERNMENT (COMMERCIAL)**

**1981**

**PART VI**

**ALLOY STEELS PLANT  
DURGAPUR**

## ERRATA

<i>Page</i>	<i>Reference</i>	<i>For</i>	<i>Read</i>
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13	Table-item (d)	insp cted	inspected
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31	Note below table	ex p rt	export
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48	Annexure V-line 6 of heading in column 2	st res	stores

# REPORT OF THE

COMPTROLLER AND AUDITOR GENERAL  
OF INDIA

UNION GOVERNMENT (COMMERCIAL)

1981

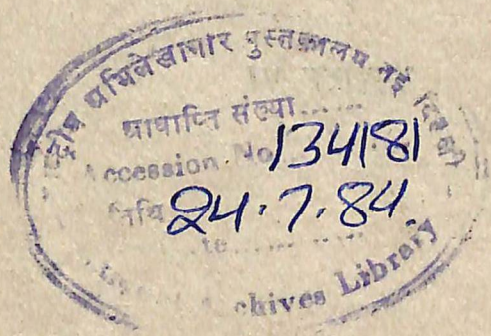
PART VI

ALLOY STEELS PLANT  
DURGAPUR

REPORT OF THE  
COMPTROLLER AND AUDITOR GENERAL  
OF INDIA

UNION GOVERNMENT (COMMERCIAL)

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AND STAFF PAY  
CHAPTER

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## PREFATORY REMARKS

It was mentioned in Paragraph 6 of the Prefatory Remarks contained in the Report of the Comptroller and Auditor General of India—Union Government (Commercial), 1981—Part III—Bhilai Steel Plant, that the Reports on the working of other units of the erstwhile Hindustan Steel Limited were under finalisation.

2. This Report contains the results of appraisal undertaken by the Audit Board of the working of Alloy Steels Plant, Durgapur—another constituent unit of the erstwhile Hindustan Steel Limited. The Report has been brought up to date by incorporating data upto 1977-78. In this case, the Audit Board consisted of the following members :—

1. Shri T. Rengachari, Chairman, Audit Board and Ex-officio Additional Deputy Comptroller and Auditor General (Commercial) upto 29th February, 1980.
2. Shri P. P. Gangadharan, Chairman, Audit Board and Ex-officio Additional Deputy Comptroller and Auditor General (Commercial) with effect from 1st March, 1980.
3. Shri K. S. Murthy, Member, Audit Board and Ex-officio Director of Commercial Audit, Ranchi upto 13th March, 1978 and as Member, Audit Board and Ex-officio Director of Commercial Audit, Bangalore from 9th March, 1979.
4. Shri M. Prem Kumar, Member, Audit Board and Ex-officio Director of Commercial Audit, Bangalore upto 23rd January, 1979.

(iv)

5. Shri A. Ghosh, Member, Audit Board and Ex-officio Director of Commercial Audit, Ranchi from 29th March, 1978 to 10th May, 1981.
6. Shri T. K. Krishna Das, Member, Audit Board and Ex-officio Director of Commercial Audit, Ranchi with effect from 11th May, 1981.
7. Shri B. R. Sule, Executive/Managing Director, Mahindra and Mahindra Limited, Bombay, Part-time Member.
8. \*Prof. N. S. Ramaswamy, Director, Indian Institute of Management, Bangalore—Part-time Member upto 4th June, 1981.

3. The Report was finalised by the Audit Board after taking into account :—

- (a) the result of discussions held with the representatives of the Ministry of Steel and Mines and Steel Authority of India Limited at its meeting held on 15th and 16th June, 1981; and
- (b) the additional information furnished by the Ministry/Steel Authority of India Limited in July/September 1981.

4. The Comptroller and Auditor General of India, wishes to place on record the appreciation of the work done by the Audit Board and acknowledges with thanks the contribution, in particular, of Shri B. R. Sule, the Part-time technical Member, who is not an officer of the Indian Audit and Accounts Department.

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\* Prof. N. S. Ramaswamy did not attend the meeting. He ceased to be a part-time member consequent upon appointment of Shri R. P. Billimoria, Managing Director, Billimoria Consultants (P) Ltd., New Delhi *vide* Government of India; Ministry of Steel and Mines (Department of Steel) letter No. 48044(1)/73-Coy. 1/SAIL-1/Vol. II dated the 5th June 1981.

## 1. ALLOY STEELS PLANT

### 1.01 General

Alloy Steels Plant having a capacity of one lakh tonnes of steel ingots (60,000 tonnes of saleable steel) was set up at Durgapur in December 1968 at a total cost of Rs. 65.82 crores as one of the constituent units of Hindustan Steel Ltd. (HSL). No detailed Project Report was prepared for the plant of 1 lakh tonne capacity; instead the Detailed Project Report prepared by M/s. M. N. Dastur & Co. for a production of 80,000 tonnes of steel ingots was treated as the basis for increasing the capacity to 1 lakh tonnes. In March 1973, HSL became a subsidiary of Steel Authority of India Limited (SAIL). It was decided at that time to constitute Alloy Steels Plant as a separate company. Durgapur Mishra Ispat Limited was accordingly incorporated as a subsidiary of SAIL to take over the functions of Alloy Steels Plant. However, transfer of assets and liabilities of Alloy Steels Plant did not take place and the Plant continued to function as a part of HSL. Under the "Public Sector Iron and Steel Companies (Restructuring) and Miscellaneous Provisions Act 1978" the Steel Authority of India Limited was restructured from 1st May, 1978. HSL stood dissolved under this Act and Alloy Steels Plant was transferred to SAIL as one of its constituent units with effect from 1st May, 1978.

The main units of the Plant, their dates of commissioning, input and output details are given in Annexure-I. The product-mix of the Plant as envisaged is given below :—

	In the form of			Total (Figures in tonnes)
	Billets and sections	Forgings	Sheets and plates	
(1) Tool Steel . . . . .	3,300	250	50	3,600
(2) Constructional steel including ball bearings . . . . .	22,400*	2,500	1,000	25,900
(3) Stainless and heat resisting steel . . . . .	3,000	..	15,000	18,000
(4) High speed steel . . . . .	1,400	350	500	2,250
(5) Die block sheets . . . . .	..	750	..	750
(6) Carbon tool steel . . . . .	7,300	250	1,950	9,500
TOTAL . . . . .	37,400	4,100	18,500@	60,000

\*Includes ball bearings 2500 tonnes.

@Comprises cold rolled stainless sheets—13425 tonnes, hot-rolled plates and sheets—5175 tonnes (3600 tonnes non-stainless and 1575 tonnes stainless).

Based on order position, the quantity to be produced under each category is determined annually.

### 1.02 Expansion Scheme

On the expectation that the installed capacity of the existing plant would be increased to 3 lakh tonnes steel ingots by 1970-71, the Blooming and Billet Mill was initially set up with an installed capacity of rolling 3 lakh tonnes of ingots on 3 shift basis. However, Metallurgical & Engineering Consultants (India) Ltd. (MECON) was asked to prepare a pre-investment feasibility report for the expansion of the existing plant only in June 1975, which was submitted by MECON in March 1976. As this involved a major investment decision which would have taken time, the HSL Board approved (January 1977), in principle, installation of a 50 tonne Electric Arc Furnace with minor

conditioning facility (known as stage I expansion) at an estimated cost of Rs. 8.46 crores for running a second shift in the Blooming and Billet Mill, so as to raise its input from 85,740 tonnes to 1,42,000 tonnes. This was approved by SAIL in March 1977.

In May 1977, M/s. M. N. Dastur & Co. were appointed as consultants for stage I expansion at a fee of Rs. 35 lakhs. The work was scheduled to be completed by August 1979 but is still in progress.

The Management stated (July 1981) that the erection of the furnace was complete but commissioning and final testing could be done only after the arrival of commissioning engineers of the supplier. The other items like Fume extraction, billet grinders, etc. would be progressively installed thereafter. An expenditure of Rs. 7.21 crores has been incurred upto June 1981.

It was further stated that stage II expansion scheme needed to meet the demand of quality requirement of the products from the customers, for improvement of yield, reduction in cost of production and increasing the capacity in the process to 2,60,000 tonnes of liquid steel, had been approved by Board of Directors of SAIL at an estimated cost of Rs. 46.75 crores in August 1978. This scheme had been revised and updated in the third quarter of 1980-81 at an estimated cost of Rs. 65.98 crores (including margin money). The revised scheme was approved by Government in July 1981.

As the expansion of the plant has not materialised so far, it has resulted in under utilisation of the capacity of the Blooming and Billet Mill.

## 2. *Production Performance*

2.01 The Plant started integrated production in 1968-69. As against the rated capacity of 1 lakh tonnes of steel ingots and 0.58 lakh tonnes of saleable steel upto 1973-74, 0.57 lakh

tonnes during 1974-75 and 0.56 lakh tonnes from 1975-76 onwards (after taking into account the diversion of steel ingots to Rourkela Steel Plant as mentioned in Annexure I), the actual production during 1970-71 to 1977-78 was as follows :—

(Figures in lakh tonnes)

	1970-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78
<i>Steel Ingots :</i>								
Budgeted Production.	0.91	0.91	0.78	0.75	0.82	0.82	0.83	0.90
Actual Production.	0.51	0.56	0.61	0.55	0.78	0.90	0.95	0.97
<i>Saleable Steel :</i>								
Budgeted Production.	0.52	0.52	0.45	0.43	0.45	0.45	0.42	0.46
Actual Production.	0.35	0.29	0.32	0.35	0.37	0.47	0.52	0.49

According to the Management, shortfall in production (as compared to rated capacity) was mainly due to equipment breakdown, labour troubles and power restrictions. In addition, Sheet Mill Complex was also responsible in restricting production *vide* details given in para 2.03.07.

A product-wise analysis of production *vis-a-vis* that contemplated in the Project Report is given in Annexure-II. It will be noticed from the details given therein that because of order position, product pattern did not conform to the stipulation made in the Project Report. For instance, stainless and heat resisting steel, a high priced item was to constitute 30 per cent (18,000 tonnes) of the rated production of 0.60 lakh tonnes. Actual production during 1972-73 to 1977-78, however, ranged from 2,727 tonnes in 1972-73 to 8,291 tonnes in 1976-77. The production of carbon and alloy constructional steel was more than the quantum of 23,400 tonnes anticipated in the Project Report, in all the years.

In regard to lower production of different grades of steel other than constructional steel, the Management stated (December 1977) as under :—

- (a) "The products of ASP are tailor made. The plant also depends on the actual need of various grades and sizes of materials in the country as also their availability from other sources including import. So standing in competition with other alloy steel producers, ASP has to adjust the product-mix on a continuous basis keeping the plant's viability and loading of individual production units in mind.
- (b) The limitation of the Sheet Mill and Bar Mill has also got a direct bearing on the product-mix followed by the Plant."

2.02 The loss of contribution margin due to production lost by internal and external causes, as worked out by the Plant during 1974-75 to 1977-78, is given in Annexure III. It will be seen therefrom that the Plant suffered a total loss of contribution margin of Rs. 5.50 crores during these years due to these causes.

### *Unit-wise Performance*

#### *2.03 Steel Melting Shop (SMS)*

2.03.01 There are two Steel Melting Shops. While Steel Melting Shop I with a capacity of 0.88 lakh tonnes is intended to produce, apart from carbon constructional and alloy constructional steel, high alloy steels like ball bearing steel, die block etc., Steel Melting Shop II with a capacity of 0.12 lakh tonnes produces high speed steels, alloy tool steels, stainless steels, all alloy constructional and special steels except vacuum de-gassing heats. While SMS II makes these steels on regular basis, some alloy tool steels are also being made in SMS I.

The budgeted and actual production in both the shops during 1970-71 to 1977-78 were as follows :—

(Figures in thousand tonnes)

	1970-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78
<i>S.M.S. I</i>								
Budgeted	78.5	78.7	66.0	63.2	70.2	70.2	71.0	76.7
Actual	38.0	45.5	47.9	45.0	64.4	75.2	79.7	81.0
<i>S.M.S. II</i>								
Budgeted	12.0	12.0	11.5	11.8	11.8	11.8	12.0	13.3
Actual	12.6	10.7	12.7	10.3	13.9	15.1	15.1	16.3

It will be seen that, while production in SMS II had exceeded the rated capacity in all the years except in 1971-72 and 1973-74, the production in SMS I was less than the capacity. The Management stated (July 1981) that SMS II had achieved more than 90 per cent of capacity during 1976-77 and 1977-78 and that attainment of this performance for furnace of the size of 50 tonne was considered as normal, even with all the inputs available.

### 2.03.02 Consumption of raw materials

The requirement of scrap and other raw materials for producing 1 lakh tonnes of steel ingots is indicated in Annexure I. As against the norm of 900 kgs. of scrap and 229 kgs. of Ferro Alloys per tonne of steel ingots, actual consumption of these items varied widely as indicated below :—

Input of Scrap & Ferro Alloys per tonne of Steel Ingot	Actual usage							
	Norm	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	
(a) Purchased Scrap (Kgs.)	630	621	1066	679	645	571	606	
(b) Revert Scrap (Kgs.)	270	283	347	338	393	478	453	
(c) Ferro Alloys (Kgs.)	229	71	101	88	75	85	75	



### 2.03.03 *Production of Spade Ingots*

The Plant produces spade ingots in Steel Melting Shop I; these are manufactured from a special type of steel requiring vacuum de-gassing, and annealing and are supplied to Rourkela Steel Plant for manufacture of heat treated special plates.

Budgeted and actual production and despatches of spade ingots during 1970-71 to 1977-78 were as follows :—

	1970-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78
<i>Production (in tonnes)</i>								
Targets	5000	5000	5000	5360	6500	6500	6500	7200
Actual	2378	3720	4381	1155	313	4845	7375	5597
<i>Despatches (in tonnes)</i>								
Targets	5000	5000	4250	5000	6000	6000	6000	7200
Actual	1885	3523	3952	1108	119	4788	6952	5555

Shortfall in production was largely attributed to erratic/restricted power supply except in the years 1973-74 and 1974-75. In 1973-74, it was due to (a) non-availability of an imported additive (accutherm) required to minimise rejection, (b) inadequate supply of coke oven gas and (c) breakdown of Vacuum De-gassing Unit in February 1974. The breakdown of Vacuum De-gassing Unit was also responsible for abnormally low production in 1974-75. A committee constituted in June 1974 to ascertain the cause of breakdown etc., could not identify the exact reason for breakdown but mentioned a number of probable reasons any one of which could have been responsible for breakdown. German experts who were called for setting right the equipment, were of the opinion that the breakdown might have occurred due to prolonged holding of ladle containing liquid metal during de-gassing even though such events were in-frequent.

### 2.03.04 *Blooming and Billet Mill*

As mentioned in paragraph 1.02, this Mill has a capacity of rolling 3 lakh tonnes of steel ingots. However, under the one lakh

tonne stage, it is intended to roll 85,740 tonnes of steel ingots per annum. Actual input was, however, lower than the projected input of 85,740 tonnes in all the years during 1970-71 to 1977-78, except in 1976-77; the data relating to actual input, output, scrap arisings, etc., are given below :—

(Figures in tonnes)

Year	Actual input	Actual output		Total	Scrap arising	Scale arising and burning loss
		Billets for further processing (cogged and re-cogged)	Billets or sale after finishing			
1970-71	54204	26602	14575	41177	11181	1846
1971-72	47605	25042	11725	36767	7633	3205
1972-73	55079	28918	13822	42740	8815	3524
1973-74	55653	27408	15964	43372	8744	3537
1974-75	65423	36072	15321	51393	9636	4394
1975-76	83828	41157	24600	65757	12360	5711
1976-77	90049	42228	27973	70201	13725	6123
1977-78	85115	37896	27480	65376	14150	5589

The shortfall in input was mainly due to non-availability of steel ingots from the Steel Melting Shop. The following aspects of the operational performance of this Mill, however, deserve mention :

- (a) According to the Flow Chart, a process loss of 16,990 tonnes representing 19.8 per cent of the total input was envisaged; separate figures for wastage, discard and rejects as well as scale and burning loss were not indicated. Actual process loss in the form of scrap arisings and scale arisings and burning loss was, however, 24 per cent in 1970-71, 22.8 per cent in 1971-72, 22.4 per cent in 1972-73, 22.1 per cent

in 1973-74, 21.4 per cent in 1974-75, 21.6 per cent in 1975-76, 22.4 per cent in 1976-77 and 23.2 per cent in 1977-78.

- (b) The inspection of billets produced indicated that, except in 1970-71, the rejection was much higher than the norm of 8 per cent (6.5 per cent due to material defects and 1.5 per cent due to mill defects) fixed by the Management as an internal target in March 1973. In fact, the percentage of rejection has shown an upward trend, as will be evident from the data given below :—

	(Quantity in tonnes)							
	1970-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78
(a) Quantity inspected	13,550	13,327	32,259	34,098	38,405	49,780	53,716	52,732
(b) Quantity rejected	965	1,150	2,618	3,227	4,461	6,632	6,630	7,296
(c) Percentage of rejection	7.1	8.6	8.1	9.5	11.6	13.3	12.3	13.8

The Management indicated (December 1977/July 1981) the following reasons for high and increasing trend of rejections :—

- (i) Due to change of market pattern as also to meet the customers' specific demands, the Plant has to gradually go in for higher quantities of sophisticated products leading to increase in the percentage of rejection.
- (ii) The Plant being a very capital intensive one, has to undertake production of difficult grades of steel which other alloy steel producers with lesser investment and better viability are reluctant to take up due to high in-process rejection. This leads to increased rejection.

- (iii) The quality requirement of the customers is gradually becoming more and more rigid and stringent.
- (iv) The conditioning facilities of the Plant are based on technologies of early sixties and are not sufficient for full reclamation of the materials rejected on account of surface defects.

It has further been stated (July 1981) as follows :—

“The overall rejection is greatly influenced by the product-mix, input of material and also the metallurgical parameters during melting and further processing. The metallurgical parameters being large in number (more than 12/13), their inter-action is so complex and uncertain that it cannot be pinpointed that a particular reason is responsible for such rejection. Efforts are constantly made to control this parameter as far as possible to achieve better results.”

#### 2.03.05 *Forge Shop*

(1) The Forge Shop is designed for :—

- process cogging of high speed and other high steel ingots.
- forging of tool and die steels which cannot be rolled due to size and/or shape.
- forging of jobbing orders which do not justify rolling on account of small through-put.
- finish-forging of die blocks, large size rounds and shapes of high speed and other highly alloyed steels.

As against the rated capacity of 7,970 tonnes of forged products (3870 tonnes of semis for sending to Conditioning Shop and 4100 tonnes of saleable forgings), the budgeted and

actual production during the eight years ended 31st March, 1978 were as given below :—

(Figures in tonnes)

	1970-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78
<i>Budgeted Production</i>								
For transfer to Conditioning Shop	NA	NA	630	600	475	470	900	1060
Saleable	5000	4850	4500	4000	3760	4000	3900	4200
<i>Actual Production</i>								
For transfer to Conditioning Shop	419	1235	795	358	1876	1258	1705	1562
Saleable	3453	2325	1733	2002	2026	3200	3782	3567

The Management stated (July 1981) that the reasons for shortfall in production were poor availability of Press Complex, frequent breakdown of the mobile equipments attached to 5 tonne hammer and non-acceptance of the bonus scheme by the workmen of Forge Shop. Some details about poor availability of Press and Hammer are given in the succeeding paragraph.

(2) The Forge Shop consists of one 2000 tonnes Press and 4 pneumatic hammers of 5 tonnes, 2 tonnes, 500 Kgs. and 250 Kgs. It will be seen from the table below that percentage of hours utilised to available hours was appreciably low in respect of 2000 tonnes press and 5 tonnes hammer :—

	1971-72	72-73	73-74	74-75	75-76	76-77	77-78
<i>Percentage of hours utilised to available hours</i>							
(i) 2000 tonnes press	54	34	48	46	36	61	48
(ii) 5 tonne hammer	43	28	34	39	53	60	54

As per the Annual Operational Statistics of the Plant for 1971-72 to 1973-74, a major portion of low percentage of hours utilised to available hours was due to the break-down of the Press/Hammer. In the statistics for 1974-75 to 1977-78, low utilisation was ascribed to mechanical delays.

The poor availability of 2000 tonne press was attributed by the Management (November 1974) to dependence on imported spares for day to day maintenance. While emphasising the need for improvement in organisation, planning and technical know-how, the Management further stated (November 1977) as follows :—

“Press is one of the very highly complicated equipments of ASP. The maintainability of the equipment is extremely poor. The equipment has also become obsolete in the sense that such equipment are not commonly used elsewhere including Japan. As a result, the availability of spares for the equipment is also poor. Initially attempts were made to substitute the imported parts indigenously. This has not materialised upto the expectation and ASP is still to find out adequate Nos. of sources for indigenous substitutes for most of the spare parts.”

The Management also confirmed (February 1980) that :—

“the development of the indigenous spares to replace imported material is not yet upto the mark. Anyhow various parties are trying in this line. In the meantime, the water hydraulic Press is going to be converted to oil hydraulic system and after this modification the press performance is expected to improve.”

According to the information furnished in July 1981, preliminary acceptance tests of the converted system had been carried out on 16th June, 1981 and trial forging was in progress.

(3) It was noticed that the rejection was appreciably higher than the norm of 6 per cent as indicated below :—

(Figures in tonnes)

	1970-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78
(a) Quantity initially rejected	190	256	286	539	885	954	943	785
(b) Quantity salvaged	..	..	143	317	592	585	311	303
(c) Quantity finally rejected	190	256	143	222	293	369	632	482
(d) Percentage of rejections to quantity inspected	6.3	9.0	7.2	10.6	9.1	9.3	12.2	10.0

The high rejections in inspection were attributed by the Management (December 1977 and February 1980) to :—

- (i) Production of bigger sections with more weight, which, when rejected, increase the quantity of rejection.
- (ii) Forging of critical grades.
- (iii) Customers' stringent quality requirements.
- (iv) Higher production of stainless and tool steels necessitate production of more wash heats. As these were handled by the Forge Shop only, there was increase in rejections.
- (v) Poor maintainability of the 2,000 tonne press affecting quality of production.
- (vi) Very bad condition of hydraulic pumps.
- (vii) Erratic behaviour of the 2,000 tonne press.

2.03.06 *Bar Mill*

(1) The Bar Mill complex is designed to produce on 3-shift basis 34,210 tonnes, out of which 32,400 tonnes of finished steel will be for sale and the balance 1,810 tonnes for being transferred to conditioning shop. As the Mill is operated on two shift basis, the production capacity of this Mill will be around 22,000 tonnes.

The budgeted production and actual production during 1970-71 to 1977-78 were, however, generally much less than the rated capacity as indicated below :—

	(Figures in tonnes)							
	1970-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78
(a) Budgeted Production (Saleable)	24000	21550	17400	18400	18145	17590	15750	16755
(b) Actual Production (Saleable)	15894	12880	13537	13537	16166	18732	21327	18270

Market constraints relating to demand for economic lot size, industrial relations problems and some inherent design deficiencies were responsible for operation of the Mill below the capacity. When the design deficiencies were brought to the notice of Government in January 1970, a high level Enquiry Committee (known as the Dutt Committee) was set up to go into the defects, to determine the various lapses and fix responsibility. The Committee pointed out (November 1970), the following major deficiencies :—

- (i) Motor tripping in the Bar Mill was due to low power of the motor. The motor was not powered to take heavier sections for rolling.
- (ii) On account of layout deficiency, there were inadequate facilities for handling coils and shearing them.



- (iii) The guarantee tests in the contract for the Bar Mill stipulated rolling of only constructional steel although the Mill was intended to roll primarily alloy steels.

The Committee held the Japanese suppliers (M/s. Jascon) and the consultants (Dastur and Co.) mainly responsible for these defects. No action could, however, be taken against the Consultants (M/s. Dastur and Co.) as the consultancy agreement with them did not provide for any penalty clause. As regards Japanese suppliers (M/s. Jascon), they supplied (March 1972) a stand-by motor at a concessional price of Rs. 11.35 lakhs (50 per cent cost). After the procurement of the stand-by motor (for stand No. 3), there was improvement in production of certain sizes and grades of steel the production of which was earlier not taken up.

The Management stated (March 1977) that the Plant was now rolling all critical grades in the size of 28 mm to 45 mm except high speed steel for which rolling from 32 mm to 45 mm was not being done. It was further clarified in July 1981 that the production of high speed steel had been stopped due to poor yield and uneconomic production.

## (2) Rejections

It will be seen from the data given below that rejections were much higher during 1975-76 to 1977-78; the Management have not fixed any norms for rejections :—

	1970-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78
(i) Quantity rejected (in tonnes)	740	446	582	363	612	1596	1721	1630
(ii) Percentage of rejections to quantity inspected	4.7	3.4	4.1	2.8	3.7	8.1	7.9	8.6

The Management stated (December 1977) that the reasons for rejections in the case of the Blooming and Billet Mill were applicable in this case also. The Ministry stated (October 1978) that the rejection percentage from 1975-76 onwards was higher since 100 per cent inspection had been resorted to instead of the earlier system of percentage inspection due to changed market situation and stringent customer requirements.

### 2.03.07 *Sheet Mill*

(1) The Sheet Mill consists of two main units, viz. hot rolling unit comprising 3 Hi Mill and 2 Hi Mill and cold rolling unit containing Sendzimir Mill. The product mix of the Mills is 5,175 tonnes of hot rolled plates and sheets and 13,425 tonnes of cold rolled sheets. It may be mentioned that the cold rolling unit was designed to produce 6,525 tonnes of sheets and plates of 18 and 20 gauge thickness in addition to 6,900 tonnes of sheets and plates of 22, 24 and 26 gauge thickness. As mentioned in the succeeding paragraph, the equipment of the cold rolling unit was not properly tested and no guarantee about its capacity was obtained from the supplier. As a result, the inability of the Rolling Mill to produce thinner gauges of sheets and plates could not be detected in time. The demand in the country being for thinner gauges, the capacity of the Rolling Mill remained virtually unutilised rendering the investment (Rs. 7.86 crores) unproductive.

### (2) *Deficiencies in Design*

The Project Report prepared by the Consultants (M/s. M. N. Dastur and Co.) in 1960 for 80,000 tonnes of ingot steel (48,000 tonnes of saleable steel) envisaged that the Sheet Mill Complex would produce 17,300 tonnes of plates and sheets (including 5,700 tonnes of cold rolled stainless sheets of 0.5 mm to 6 mm thickness) per annum. The Project Report provided for a Hand Sheet Mill. In a meeting held in September 1961 between the representatives of the Company, Technical Advisers

to the Plant (M/s. Atlas) and the consultants (M/s. Dastur and Co.), the Technical Adviser's representative emphasised that the Sheet Mill operations were obsolete because the quality of the product was much inferior to continuous rolled strip and this was particularly important if the Indian stainless product was to be exported in a highly competitive market. However, a decision to instal the hand sheet mill was taken by Government considering the initial capital cost and tonnage and the fact that the finished product would be consumed internally in the beginning and not exported. It was, however, decided (February 1963) to increase the capacity of the Plant to 1,00,000 tonnes of ingot steel (60,000 tonnes of finished products). After discussion with the consultants, the capacity of the Sheet Mill was changed in 1963 to 18,600 tonnes per annum to suit the market demand and to improve profitability. This quantity included 13,425 tonnes of cold rolled sheets of 18 to 26 gauge thickness and 5,175 tonnes of hot rolled plates and sheets of 8 to 26 gauge thickness and this was incorporated in the contract (September 1963) with the suppliers of equipment (M/s. Jascon).

For this purpose, a cold rolling Mill of Sendzimir make was obtained in place of a hand sheet mill as originally proposed; the fact that the Sendzimir Mill was not capable of giving sufficient production in the absence of back and front tension was overlooked, with the result that the plant got an expensive Sendzimir Mill which could be utilised as a hand sheet mill only.

The 3 Hi and 2 Hi Mills constituting the hot rolling unit were commissioned in March 1968 and June 1968 respectively and final acceptance test was conducted in November 1969. The cold rolling unit consisting of the Sendzimir Mill was commissioned in April 1968. As this unit was found not capable of producing more than 3,500 tonnes of 20 gauge sheets, the matter was reported to the Ministry who constituted (March 1970) an inquiry committee for determining the lapses leading to reduction in capacity and for fixing responsibility therefor. The various lapses

and the responsibility therefor, as identified by the Committee in its report of November 1970, are mentioned below :—

Unit	Deficiencies/ failures	Primary responsibility	Secondary responsibility
<i>Hot Rolling Mill</i>			
(1) Furnaces	(a) <i>Layout defects</i>	M/s. Dastur & Co. (Consultants)	M/s. JASCON of Japan (suppliers of equipment) M/s. ATLAS of Canada (Production Advisers)
	(i) Higher Level vis-a-vis rolling mill		
	(ii) Distance from the Mill stand		
	(b) <i>Equipment defects</i>		
	(i) Slow movement of Discharge mechanism	M/s. AMCO of Canada (Suppliers)	(i) M/s. Dastur & Co. (ii) M/s. ATLAS
	(ii) Inability to accommodate long length sheets		
(2) 2 HI Mill	(a) Malfunctioning of the side guards, trimmers, etc.	M/s. JASCON (Suppliers)	M/s. Dastur & Company
	(b) Absence of energised roller		
	(c) Shortfall in the capacity of the Mill		
Cold Rolling Mill	Inadequate test procedure for final acceptance	Hindustan Steel Ltd.	M/s. Dastur & Company

It was also pointed out by the Committee that the deficiencies were intrinsic in nature and were not capable of rectification by improvement in organisation and operation of the Plant.

The following were the other findings/recommendations of the Committee and the action taken by Management :—

Findings/recommendations

- (a) The equipment of the Cold Rolling unit was tested only on the basis of theoretical calculations due to non-availability of stainless steel sheets of requisite size and gauge. According to the Committee, the Company could have made an attempt to import some stainless steel sheets of requisite size for the purpose of conducting acceptance tests. It was also observed that the capacity of the Mill had not been guaranteed either by JASCON or Sendzimir & Company.
- (b) The Hindustan Steel Limited had adequate time, after commissioning the Mills, to bring the deficiencies to the notice of the Consultants before the termination of consultancy on 22-9-69. This was not done.
- (c) As the Consultancy agreement did not provide for action against the Consultants for any failure on their part, the Committee suggested that they should be advised to render free service for rectification/modification, etc., to the extent considered necessary by the Company.
- (d) The services of the Production Advisers (M/s. Atlas) were not properly utilised by the Company. The Committee, therefore, recommended that Hindustan Steel Limited should ensure that full advantage was taken of their services for the remaining part of the agreement. The agreement expired in March 1973.
- (e) Efforts should be made to assess, on a realistic basis, the capacity of the Sheet Mill Complex as soon as possible if necessary, by importing stainless steel sheets of requisite size and thickness.

The Plant imported 8.87 tonnes of sheets of three different specifications at a cost of Rs. 1.51 lakhs from Japan in August 1973 for testing the capacity of the Sendzimir Mill. The tests were stated to have been carried out in April 1976 and the report is under study (July 1981).

The agreement with M/s. AMCO was prematurely terminated (December 1967) during construction and compensation obtained from them. So far as M/s. JASCON are concerned, they gave

a rebate of Rs. 15.66 lakhs (being 15 per cent of the value of the 2 Hi Mill) as a gesture of goodwill. This was accepted by Government in December 1971. Out of this, Rs. 3 lakhs were authorised to be spent on energisation of feeder tables of the 2 Hi Mill and the balance for purchase of spares. The Management stated (November 1977) that a further compensation of 75 million yens was received for the rejection of the side trimmer of the 3 Hi Mill and the total compensation including the compensation for deficiency in the performance of the 2-Hi Mill came to around Rs. 31 lakhs.

### (3) Actual Production

As against the rated production of 3,600 tonnes of non-stainless hot rolled plates and sheets, 1,575 tonnes of stainless hot rolled plates and sheets and 13,425 tonnes of stainless cold rolled sheets, actual production of stainless cold rolled sheets and hot rolled plates and sheets (non-stainless) was very low, as indicated below :—

Products	(Figures in tonnes)							
	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
Non-stainless hot rolled plates and sheets.	1558	895	1911	169	246	146	49	71
Stainless hot rolled plates and sheets.	1666	1733	2358	3714	4915	5670	5903	5861
Stainless cold rolled sheets.	300	252	297	142	96	148	272	234

The following table incorporates the data relating to import of stainless sheets during 1970-71 to 1977-78. Failure of Sheet Mill Complex to produce according to capacity was one of the

reasons for imports. Information regarding import of plates was not available :—

	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
(a) Quantity (tonnes)	14,572	12,048	10,356	11,475	20,217	7,276	7,669	7,110
(b) Value (Rs. in lakhs)	870.47	813.26	808.11	917.68	1968.22	931.74	1026.28	640.74

*Source* : Monthly statistics of the Foreign Trade of India published by Director General of Commercial Intelligence and Statistics, Calcutta.

### 2.03.08 Conditioning Shop

#### *Non-utilisation of Bar Peeling and Turning Machine for round bars*

On the recommendation of Production Advisers (M/s. Atlas) endorsed by the Consultants (M/s. Dastur and Co.) and a Plant Technical Committee, a Centreless Bar Peeling and Turning Machine, with an annual rated capacity of 3,000 tonnes (@ 10 tonnes per day for 300 working days) was installed in September 1967 at a cost of Rs. 14.07 lakhs (including foreign exchange of Rs. 8.85 lakhs), for peeling and turning round bars of high speed steel, stainless steel and constructional alloy steel received from the Rotary Bar Straightener installed in the same shop. The Peeling and Turning Machine could, however, be utilised for small quantities ranging between 7 tonnes and 145 tonnes a year (approx. 500 tonnes upto May 1977) during 1968-69 to 1977-78.

The Management stated (January 1975) that originally it was designed to peel the round semis for use in the Bar Mill. As the Bar Mill could be conveniently fed with square blooms/billets of all sizes and grades, the necessity of producing round semis was never felt.

The Ministry stated (April 1977), in this connection, as follows :—

“The Bar Peeling Machine was under-utilised because of the low market demand for round bars from the Blooming and Billet Mill and the development of a more economic process flow through which bars could be rolled in the Bar Mill.....A proposal for increasing the utilisation of the capacity of the Blooming and Billet Mill is under consideration and it is expected that with the operation of the Blooming and Billet Mill in two or three shifts and with customer preference growing for sized peeled bars (free from surface defects) of high valued steel such as high speed steels and stainless steels, the loading pattern of the machine will improve”.

As mentioned in paragraph 1.02 expansion scheme with a view to utilising the capacity of Blooming and Billet Mill is yet (July 1981) to be implemented.

#### 2.04 Review of performance by Action Committee

The Action Committee appointed by Government in December 1971, after considering the major constraints pointed out by the Management (April 1973) in operating the Plant to rated capacity, had recommended (1974) in its draft report installation of the following additional facilities :—

	Estimated cost (Rs. in lakhs)
(i) Installation of a Jobbing Mill in Bar Mill . . . . .	500
(ii) Coil Handling facilities . . . . .	16
(iii) Coil drawing facilities . . . . .	200
(iv) Extension of Sheet Mill Building by one new bay . . . . .	46
(v) Installation of additional Re-heating Furnace for Forge Shop . . . . .	15
(vi) Extension of Mould Stripper Bay and provision of a higher capacity EOT crane . . . . .	33
(vii) New Steel Foundry . . . . .	Not estimated



In this connection, SAIL stated (December 1977) as follows :—

“.....even when the deliberations of the Action Committee were in progress, the question of expansion of the Alloy Steels Plant was under consideration and the services of MECON had been commissioned to prepare a Pre-Investment Feasibility Report on the Expansion of Alloy Steels Plant. With the commissioning of MECON for ASP expansion, it was implied that all the schemes that were under consideration by the Action Committee will be further examined by them. This being so, the draft recommendations of Action Committee were not pursued”.

It was noticed that, even while placing the constraints before the Action Committee in April 1973, action on the following three items of work approved by the Board on 17th April, 1973 had already been taken up :—

Items	Present position
(a) Additional 100 tonnes capacity Bogie Hearth Furnace in Steel Melting Shop-I (Estimated cost Rs. 14.00 lakhs).	(a) Order for supply, erection, Commissioning etc. was placed in June 1973 at a cost of Rs. 8.21 lakhs. Erection was completed in June 1977. Furnace was finally accepted on 6th March 1980 and is working satisfactorily.
(b) Additional stripper machine in the stripper bay (Estimated cost Rs. 34.00 lakhs).	(b) Order for an indigenous stripper machine was placed on 8th October, 1978. According to Management, machine was expected to be commissioned by October 1981.
(c) Additional annealing furnace in Sheet Mill (Estimated cost Rs. 62.50 lakhs).	(c) Order could not be placed as the party to whom letter of intent was issued, regretted its inability to supply the annealing furnace.

The Management stated (July 1981) that further investment in Sheet Mill would be done after studying the impact of production of stainless steel in the Salem Steel Plant.

### 2.05 Idle Equipment

Committee appointed by the General Manager in June 1975 to review the surplus/unutilised equipment, had reported (April and September 1976) as follows :—

Group (i) Equipment which could find alternative use in the plant—13 items, valued at Rs. 29.99 lakhs (gross).

Group (ii) Equipment which might be useful on expansion of the Plant—14 items valued at Rs. 82.15 lakhs (gross).

Out of these, 4 items valued at Rs. 20.32 lakhs were considered unserviceable in June 1977.

Group (iii) Equipment which should be disposed of—16 items valued at Rs. 35.70 lakhs (gross).

Annexure IV incorporates the details of certain cases of idle equipment referred to in the Committee's Report as well as other cases not referred to in the report of the Committee. According to the details given therein, equipments of the aggregate value of Rs. 1.10 crores have been lying idle since the date of acquisition/installation, etc.

### 2.06 Consumption of stores and spares

The value of consumption of stores and spares as compared with the total expenditure incurred on the production of steel during 1970-71 to 1977-78 was as follows :—

Year	(Rupees in crores)							
	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78 (13 months)
Value of consumption of stores and spares.	2.68	2.76	2.82	3.31	5.26	7.69	8.51	7.58
Total expenditure on the production of steel.	20.94	23.21	25.26	29.61	39.87	48.23	53.41	57.52
Percentage of consumption of stores and spares to expenditure on production.	12.80	11.90	11.16	11.17	13.20	15.95	15.94	13.18

A Committee appointed by SAIL had observed (October 1973) that it was possible to bring down progressively the consumption of spares to the extent of 5 to 10 per cent per annum from 1975-76 onwards by introducing systematic forward planning for spares, stores and tools and regular inspection of machinery, etc.

In this connection, the Management stated (July 1981) as follows :—

“Most of the mills of the ASP went into full operation from 1968-69 and it was possible to assess correctly the requirement of the spares in the mills after a few years of experience. From 1975-76 onwards when this experience was acquired, systematic planned maintenance was introduced alongwith a system of annual indenting of spares keeping in view the requirement for capital repair, preventive maintenance and a small percentage for the unforeseen breakdown. This has given good result and reduction in the consumption of stores and spares has been observed in the subsequent years.”

### 3. *Scrap Arisings*

Scrap is an important arising in the production of alloy steel. It arises in the form of steel scrap mainly in the Rolling Mills.

At a production level of 1 lakh tonne steel ingots, return steel scrap was estimated at 27,000 tonnes and purchased steel scrap at 63,000 tonnes.

The actual arisings of steel scrap, its consumption etc. during 1970-71 to 1977-78 were as follows :—

(Figures in tonnes)

Year	Total arising	Consumption in Steel Melting Shop	Closing stock
1	2	3	4
1970-71	20,576	13,648	10,645
1971-72	19,743	14,950	15,437
1972-73	23,936	17,153	22,220
1973-74	22,694	19,186	33,503
1974-75	25,792	26,479	32,816
1975-76	34,010	35,495	31,331
1976-77	38,815	45,342	24,804
1977-78 (13 months)	39,254	48,044	16,014

The value of stock of scrap held on 30th April, 1978 amounted to Rs. 0.94 crore.

It was also noticed that scrap arising as percentage of total production of steel ingots was more than that envisaged in the material balance for rated production of 0.60 lakh tonnes of finished steel.

#### 4. Costing

The Plant follows the process costing system. At the beginning of the year, estimated cost in respect of repetitive and important products are prepared with reference to the budgeted production and it is treated as standard cost. As and when necessity for preparing standard cost of a product/grade other than repetitive and important products, arises, it is calculated with reference to the data available in the Standard Cost Book and Product Manual.

A comparative study of the actual cost with the standard cost fixed, in the manner indicated above, during the year 1970-71 to 1977-78 revealed the following trend :—

- (a) Actual cost was more than the standard cost upto 1973-74.

- (b) Standard cost was raised appreciably in 1974-75. From this year onwards, actual cost was, by and large, lower than the standard cost.
- (c) Owing to the production being lower than the rated capacity, there was appreciable unabsorbed fixed cost during the years 1970-71 to 1977-78. This resulted in increase in the cost of production as indicated below :—

Year	1970- 71	1971- 72	1972- 73	1973- 74	1974- 75	1975- 76	1976- 77	1977- 78 (13 months)
(a) Unabsorbed fixed cost (Rs. in lakhs)	141.91	111.80	121.82	155.35	88.68	51.33	27.94	14.34
(b) Increase in cost of production per tonne of ingot. (Rupees)	280.55	198.80	201.01	280.39	113.17	56.83	29.47	13.54

### 5. Man Power Analysis

5.01 For a rated production of one lakh tonnes of ingots, the Management had assessed (prior to 1965-66) the following man power for the Works Department in the Plant :—

Technical Executives	343
Technical Non-Executives	2,891
Non-Technical	1,433
<b>Total</b>	<b>4,667</b>

In November 1968 the Board of Directors froze the strength of the Works Department at 240 Executives and 3,075 Non-Executives. However, actual man power in position during

1970-71 to 1977-78 was far above this number as indicated below :—

	31-3-71	31-3-72	31-3-73	31-3-74	31-3-75	31-3-76	31-3-77	31-3-78
Officers (Executives)	385	409	478	539	557	565	614	613
Others (Non-Executives)	4422	4857	5175	5278	5297	5360	5361	5425
<b>TOTAL</b>	<b>4807</b>	<b>5266</b>	<b>5653</b>	<b>5817</b>	<b>5854</b>	<b>5925</b>	<b>5975</b>	<b>6038</b>

In addition, the following personnel were employed in administration and township :—

	1970-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78
Men in Position	842	878	974	1024	1018	968	972	1019

NOTE :—Does not include the man power employed in construction activities.

The increase in man power has been attributed by the Management to commissioning of new units and re-organisation of maintenance set-up and strengthening of different areas of control.

## 5.02 Labour Productivity and Cost

(a) No norms have been laid down for labour productivity so far. Actual production per employee of the Works Department for the years 1970-71 to 1977-78, however, varied as follows :—

Year	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
Ingot production per employee (in tonnes)	10.52	10.67	10.72	9.49	13.39	15.24	15.87	16.11

(b) The incidence of labour cost (direct and indirect) per tonne of steel ingot during 1970-71 to 1977-78 compared as follows :—

(Rupees in lakhs)								
	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
1	2	3	4	5	6	7	8	9
(i) Executives	47.70	71.20	75.60	85.70	101.60	128.38	120.66	142.90
(ii) <i>Non-executives of operation and maintenance Department :</i>								
(a) Wages and Salaries	158.40	177.10	202.70	232.40	305.68	353.08	349.06	416.46
(b) Overtime	16.40	17.60	22.40	31.20	41.52	40.25	27.33	35.86
(c) Incentive	16.40	18.00	22.40	23.20	41.26	51.55	65.10	61.78
(iii) <i>Non-executives of General Administration :</i>								
(a) Wages and Salaries	40.60	47.80	60.50	67.30	82.28	91.78	117.63	148.10
(b) Overtime	5.60	8.30	11.50	15.20	20.10	13.51	5.83	7.57
						1.63	3.07	3.22
						(Incentive)		
<b>TOTAL</b>	<b>285.10</b>	<b>340.00</b>	<b>395.10</b>	<b>455.00</b>	<b>592.44</b>	<b>680.18</b>	<b>704.07</b>	<b>831.30</b>
Cost per tonne in rupees	563.62	605.19	651.95	823.35	756.07	753.11	742.58	784.64

## 6. Inventory Control

6.01(i) The inventory holdings of the Plant as at the end of 1970-71 to 1977-78 are indicated in Annexure V.

(ii) The value of stock of saleable and other products together with the quantum for the years 1970-71 to 1977-78 were as follows :—

Year As on 31st March	1970-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78*
1	2	3	4	5	6	7	8	9
Quantity (in tonnes).	17,454	14,746	15,501	9,866	12,408	13,014	14,971	16,686
Value (Rs. in crores)	7.30	7.66	7.74	6.54	8.06	8.98	11.97	9.61

\*As on 30th April.

While the sales office of the Company held the view that the accumulation of stock in the Plant was due to the liberal import policy followed by Government, the Management stated (May 1974) that "There was no cancellation of order on this account nor was there any accumulation of stock because of the imports".

On the basis of the Company's representation, the import policy for 1972-73 was suitably modified by the Ministry and an officer of the Company was inducted into the Supplementary Licensing Committee constituted by Government in order to ensure that the items cleared by the Committee for import were beyond the manufacturing range of the Plant.

(iii) The stock of stores and spares included a number of non-moving and slow-moving items. Out of the total stock of stores and spares of Rs. 18.69 crores in hand as on 30-4-1978, stores and spares of the value of Rs. 4.55 crores had not moved for the last two years or more.

#### 6.02 Physical verification

Physical verification of raw materials, stores and spares and finished and semi-finished products is conducted by a separate unit placed under the control of Financial Adviser and Chief Accounts Officer of the Plant. The stores and spares are verified physically on perpetual inventory system so as to cover all the items once in three years, the physical verification of raw materials



and semi-finished stock is conducted once every year and that of finished stock twice in a year. The results of physical verification conducted during 1970-71 to 1977-78 are indicated below :—

(Rupees in lakhs)

Year	Stores and spares		Raw materials			Finished/semi-finished products	
	Excess	Shortage	Excess	Normal shortage	Abnormal shortage	Excess	Shortage
1	2	3	4	5	6	7	8
1970-71	1.63	2.09	..	..	..	..	53.99
1971-72	0.43	..	..	..	1.28	..	45.50
1972-73	2.39	2.40	..	..	1.09	146.78	119.38
1973-74	0.74	0.42	0.84	..	25.69	..	9.32
1974-75	2.89	1.52	0.81	..	0.57	16.60	15.37
1975-76	8.17	4.96	0.18	0.97	..	64.61	61.13
1976-77	7.08	2.83	2.12	..	69.47	70.10	99.96
1977-78	2.14	1.23	20.15	1.90	40.76	50.45	45.50

NOTE : From 1972-73 onwards the excess/shortages found in stockyards and export yards are also included in the above figures.

With a view to detecting abnormal handling loss, the Plant appointed, in July 1974, a Committee to suggest norms for handling losses of various raw materials.

The Committee submitted its report in May 1977, which was approved by HSL Board in March 1978.

### 7. Profitability Trends

(i) The fixation of prices of alloy steels does not require the approval of the Joint Plant Committee and is decided by the Company itself. The prices are fixed after taking into account the level of production, the cost of production, the return on investment and the competitors' current prices, etc.

On the basis of capital cost of Rs. 65.82 crores incurred in setting up the Plant with a capacity of 1 lakh tonne ingots, investment per tonne of ingot steel works out to Rs. 6582. The Plant continued to incur losses since inception upto 1973-74 and the cumulative loss upto that year amount to Rs. 41.02 crores.

The Plant, however, earned a profit of Rs. 1.96 crores in 1974-75, Rs. 3.98 crores in 1975-76, Rs. 4.07 crores in 1976-77 and Rs. 2.14 crores in 1977-78, thus bringing down the cumulative loss to Rs. 28.87 crores.

The profit earned during 1974-75 to 1977-78 is inclusive of the profit or loss allocated to the Plant on common trading activities, as mentioned below :—

Year	(Rupees in crores)			
	1974-75	1975-76	1976-77	1977-78
Profit (+)/Loss (—) allocated on common trading activities.	(+)0.39	(+)0.45	(—)0.10	(—)0.23

(ii) The following table indicates the cost trends for the last 5 years ending 30th April 1978 :

Year	(Rs. in crores)		
	Net sales realisation	Cost of sales	Percentage of cost of sales to net sales realisation
1973-74	21.99	27.15	123.5
1974-75	35.17	33.61	95.6
1975-76	44.26	40.73	92.0
1976-77	47.02	42.85	91.1
1977-78	52.10	49.75	95.5

## 8. Overall Summary

The following are the important features emerging out of the detailed analysis given in the preceding paragraphs.

### (1) GENERAL

Alloy Steels Plant having a capacity of one lakh tonnes of steel ingots (60,000 tonnes of saleable steel) was set up at Durgapur in December 1968 at a total cost of Rs. 65.82 crores. Blooming and Billet Mill of the Plant Complex was, however, installed with a capacity of rolling 3 lakh tonnes of ingots on 3 shift basis on the expectation that capacity of Plant would be increased to 3 lakh tonnes of steel ingots by 1970-71. Certain sections of the Plant e.g. Bar Mill and Sheet Mill were found defective as per details given in the Report and summed up later on in this paragraph.

First stage expansion involving an estimated outlay of Rs. 8.45 crores was approved by SAIL in March 1977 only. This was intended to run a second shift in the Blooming and Billet Mill so as to increase its input from 85,740 tonnes to 1,42,000 tonnes per annum. The scheme is still under construction (July 1981) and an expenditure of Rs. 7.21 crores has been incurred upto June, 1981.

Proposal for further expansion of the capacity of Plant to 2.60 lakh tonnes of liquid steel was approved by the SAIL Board in August, 1978 and by the Government in July 1981. Meanwhile, capacity of Blooming and Billet Mill continues to be under-utilised.

### (2) PRODUCTION PERFORMANCE

#### (i) Overall analysis

An analysis of overall production performance for the years 1970-71 to 1977-78 revealed the following :—

- While production of steel ingots showed a perceptible improvement from 1974-75 onwards and reached

the figure of 0.97 lakh tonnes in 1977-78, that of saleable steel showed marked improvement in 1975-76 and reached the peak figure of 0.52 lakh tonnes in 1976-77, it again declined to 0.49 lakh tonnes in 1977-78. In both the cases, the rated capacity was yet to be attained.

- Because of order position, production of high priced items was much less than the stipulations made in the Project Report. This was attributed by the Management to competition from other producers, as a result of which it had to adjust the product mix on continuous basis as well as the limitation of the Sheet Mill and Bar Mill which had a direct bearing on the product mix followed by the Plant.

According to the Plant Management, external (shortage of power) and internal causes (industrial disputes and down-time due to equipment break-downs, etc.) accounted for a loss of contribution margin of Rs. 5.50 crores during 1974-75 to 1977-78 (upto 30th April 1978).

#### (ii) *Unit wise performance*

The performance of various units of the Plant was as follows :—

##### (A) *Steel Melting Shop (SMS)*

Plant has two Steel Melting Shops—Shop-I having a capacity of 0.88 lakh tonnes and Shop-II having a capacity of 0.12 lakh tonnes. While the production in Shop-II had exceeded the rated capacity in all the years except in 1971-72 and 1973-74. Shop-I was yet to attain the rated production.

Actual consumption of scrap and ferro alloys per tonne of steel ingots varied widely from the norms during 1973-74 to 1977-78.

Production of spade ingots for manufacture of heat treated special plates was taken up in Shop-I with effect from 1969-70. Production was less than the targets in all the years except 1976-77 and was largely attributed to erratic/restricted power supply and break down of Vacuum De-gassing unit in February 1974.

### (B) *Blooming and Billet Mill*

Apart from under-utilisation of capacity (3 lakh tonnes per annum) of this Mill for lack of expansion of other complex of the Plant, even the capacity of 85,740 tonnes of rolling per annum envisaged under the existing set-up, was not achieved during 1970-71 to 1977-78, except in 1976-77, owing to non-availability of steel ingots from the Steel Melting Shop. Notable features of the operational performance of this Mill were :—

- Actual process loss in the form of scrap arisings and burning loss ranged from 21.4 per cent to 24 per cent of actual input as against the projected norm of 19.8 per cent.
- As against the norm of 8 per cent, actual rejection on inspection of billets ranged from 8.1 per cent to 13.8 per cent during 1971-72 to 1977-78. In fact, the percentage of rejection had showed continuously an upward trend.

### (C) *Forge Shop*

Actual production during 1970-71 to 1977-78 was less than the rated capacity (7,970 tonnes per annum) as well as budgeted production. The shortfall in production was attributed by the Management to low availability of equipment, non-acceptance of bonus scheme by the workmen, etc.

The percentage of rejection in inspection ranged from 6.3 per cent to 12.2 per cent as against the norm of 6 per cent in all the years.

(D) *Bar Mill*

The Bar Mill was designed to produce on 3 shift basis 34,210 tonnes of bars (32,400 tonnes for sale and 1,810 tonnes for transfer to conditioning shop). As the Mill is operated on 2 shifts, the capacity works out to 22,000 tonnes per annum. Actual production was, however, less than the rated capacity of 22,000 tonnes.

The shortfall was attributed to shortage of orders and orders of economic lot sizes, certain inherent design deficiencies, etc. A high level enquiry committee appointed by the Government to go into the design defects had held the Suppliers (Jascon) and the Consultants (Dastur and Company) mainly responsible for the defects. While the suppliers supplied a standby motor at a concessional price of Rs. 11.55 lakhs (50 per cent), no action could be taken against the Consultants due to absence of penalty clause in the agreement with them.

As against the rejections ranging from 2.8 per cent to 4.7 per cent during 1970-71 to 1974-75, rejections during 1975-76 to 1977-78 were 8.1 per cent, 7.9 per cent and 8.6 per cent respectively.

(E) *Sheet Mill*

The Sheet Mill consists of two main units viz. hot rolling unit and cold rolling unit having a capacity of 5,175 tonnes of hot rolled plates and sheets and 13,425 tonnes of cold rolled sheets.

There were serious design defects both in the hot rolling unit and cold rolling unit and the enquiry committee appointed by the Government had held (November 1970) :—

- The Consultants (Dastur and Company), suppliers of the equipment (Jascon and AMCO) and produc-

tion Advisers (ATLAS) responsible for the design defects in hot rolling unit; the Consultants (Dastur and Company) and Management responsible for the adoption of inadequate test procedure for final acceptance of cold rolling unit.

- The deficiencies in the units as intrinsic in nature and not capable of rectification.

The Management were able to recover Rs. 43.36 lakhs from the Suppliers (Jascon and AMCO) as compensation. No compensation could, however, be recovered from ATLAS and M/s. Dastur and Company.

Further, the fact that the cold rolling mill of Sendzimir make was not capable of giving sufficient production in the absence of back and front tension, was over-looked, with the result that the plant got an expensive Sendzimir mill which could be used only as a hand mill. Accordingly, actual production was very low in all the years 1970-71 to 1977-78. This was also one of the reasons for import of stainless sheets, etc. during the corresponding period.

The Plant imported 8.87 tonnes of sheets of three different specifications at a cost of Rs. 1.51 lakhs in August 1973 for testing the capacity of the Sendzimir mill. The tests were carried out in April 76 but the report was under study (July 1981).

### (3) SCRAP ARISING

Scrap arising in the production of steel was more than that envisaged in the material balance in all the years 1970-71 to 1977-78.

### (4) MAN POWER ANALYSIS

- Actual strength in works department of the plant was more than the strength fixed by the Management (prior to 1965-66) and by the Board in November 1968.
- No norms for productivity were laid down.

(5) *INVENTORY CONTROL*

- A number of equipment were lying idle since their installation. Value of such equipment aggregated to Rs. 1.10 crores.
- Large quantity of saleable and other products were held in stock in all the years. The total value of stores and spares not moved for the last two years or more amounted to Rs. 4.55 crores out of the total stock of stores and spares of Rs. 18.69 crores held on 30th April 1978.

(6) *PROFITABILITY TRENDS*

The Plant had been incurring losses since inception to 1973-74; during 1974-75 to 1977-78, it, however, earned profits. The cumulative loss upto 30th April 1978 amounted to Rs. 28.87 crores as against the total investment of Rs. 65.82 crores made in the original Plant Complex.

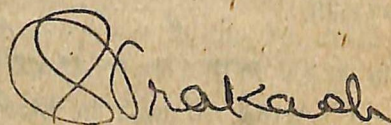


(P. P. GANGADHARAN)

*Chairman, Audit Board and  
Ex-Officio Additional Deputy  
Comptroller and Auditor General  
(Commercial)*

New Delhi,  
The 30 November, 1981

Countersigned



(GIAN PRAKASH)

New Delhi,  
The 30 November, 1981.

*Comptroller and Auditor General  
of India*

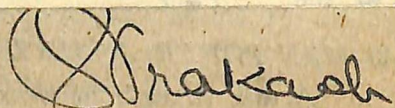


**ANNEXURE I**  
(Referred to in paragraph 1.01)

*Statement showing the main units of the plant, their dates of commissioning and the input and output of these units* (Figures in tonnes)

Sl. No.	Unit	Number	Date of commissioning	Input	Output	Distribution of output	Remarks
1	2	3	4	5	6	7	8
1.	Steel Melting Shop.	@2 (No. I with 2 furnaces of 50 tonne each and No. II with one furnace of 10 tonne)	Nov., 67  Jan., 65	Scrap (From DSP and open market) 63000 Return scrap 27000 Ferro alloying elements. 22910 Limestone 4500 Lime 6000 Fluorspar 1800 Other fluxes, carburisers, etc. 2140	1,00,000 (ingots)  10,000 (Slag)	(i) 85,740 Blooming and Billet Mill. (ii) 2,260 Bar Mill (iii) 12,000 Forge Shop  <u>1,00,000</u>	@ Apart from these, there are two 2 Tonne and one 1/2 tonne Induction Furnaces in SMS II to be operated as and when required. The rated capacity is, however, fixed with reference to the three main furnaces.
2.	Forge Shop	Press 1 unit Hammer 4 units	Oct., 66 Dec., 65	12,000 ingots (from SMS)	7,970 (Forged products)	(i) 3,870 To Conditioning Shop (ii) 4,100 For sale <u>7,970</u>	
3.	Blooming & Billet Mill.	One unit	Nov., 67	85,740 (Ingots)	68,750 (Billets)	68,750 To Conditioning Shop.	
4.	Bar Mill	One unit	Dec., 66	37,880 (From Conditioning Shop) 2,260 (From SMS) <u>40,140</u>	(i) 32,400 (Bars) (ii) 1,810 (Bars) <u>34,210</u>	32,400 For sale to conditioning shop 1,810 <u>34,210</u>	
5.	Conditioning Shop			68,750 Billets (from blooming mill) 3,870 (from Forge Shop) 1,810 (Bars from Bar Mill) <u>74,430</u>	(i) 65,880 (Billets etc.) (ii) 5,000 (Big rounds) <u>70,880</u>	(i) 28,000 To Sheet Mill (ii) 37,880 To Bar Mill 5,000 Big rounds for sale <u>70,880</u>	
6.	Sheet Mill		March, 68			**18,500 For sale (saleable products)	**Hot Rolled Plates and Sheets. Non stainless 3600 Stainless 1575 5175 Cold Rolled sheet—stainless . 13425
	(i) 3 Hi Hot Rolled Mill.	1 unit		28,000 (from Conditioning Shop)	18,500 (Sheets and Plates)		
	(ii) 2 Hi Hot Rolled Mill	2 units					
	(iii) Cold Rolled Sheet Mill (Z mill) with annealing and pickling	1 unit					
							Total 18600 Or 18500

NOTE :- With effect from 1969-70, the Alloy Steels Plant has been supplying spade ingots to the Rourkela Steel Plant for manufacture of special plates (120 sets of special plates per annum upto October 1974 and 180 sets of special plates per annum from November 1974 onwards). For this purpose, according to the Management, 4,155 tonnes of ingots per annum were to be supplied upto October 1974 and 6,233 tonnes per annum thereafter. In view of this, the rated production of saleable steel (60,000 tonnes) would decrease by 2,493 tonnes per annum upto October 1974 and 3,740 tonnes per annum from November 1974 onwards.



(GIAN PRAKASH)

Comptroller and Auditor General  
of India

New Delhi,  
The 30 November, 1981.

## ANNEXURE II

(Referred to in paragraph 2.01)

*Statement showing product-wise analysis of production vis-a-vis that contemplated in the Project Report*

(Quantity in tonnes)

Critical Projected Grade Groups	Product mix	Actual Production					
		1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
Carbon Construction } Alloy Construction }	23400	9228	8247	6112	8884	8184	5656
		19391	21036	22942	28866	33198	32458
Ball Bearing	2500	315	905	898	1727	1234	2287
Die Block	750	158	211	188	139	417	153
Total Steels & carbon Steel	13100 (3600+9500)	143	239	411	198	430	316
High Speed Steel	2250	133	217	256	70	116	66
Stainless and heat resisting steel	18000	2727	4203	5868	6943	8291	7884
Valve		12	16	18	1	1	..
<b>TOTAL</b>	<b>60000</b>	<b>32107</b>	<b>35074</b>	<b>36693</b>	<b>46828</b>	<b>51871</b>	<b>48820</b>

ANNEXURE III  
(Referred to in paragraph 2.02)

*Statement showing loss of contribution margin*

Year	Particulars	(Quantity in tonnes)			Total
		External causes Shortage of Power	Industrial disputes	Others (downtime due to equipment breakdown etc.)	
1974-75	Saleable Steel	373	2488	3713	6574
1975-76	"	828	529	..	1357
1976-77	"	29	..	96	125
1977-78 (Upto April, 1978)	"	665	1302	146	2113

NOTE :— The loss of contribution margin resulting from loss of production during 1974-75, 1975-76, 1976-77 & 1977-78 was Rs. 3.82 crores, Rs. 0.60 crore, Rs. 0.06 crore and Rs. 1.03 crores respectively.

## ANNEXURE IV

(Referred to in paragraph 2.05)

*Statement showing the details of idle equipment*

(A) Cases of equipments referred to in the Committee's Report :—

Brief particulars of the equipment	Cost (Rs. in lakhs)	Reasons on account of which the equipment is lying idle along with present position
1	2	3
<i>(a) Steel Melting Shop</i>		
<i>(i) High Frequency Induction furnaces—3 Nos. (including one received free of cost as a replacement. (Group ii).</i>	12.27	These furnaces were located in 1965-66 in SMS II with the idea of developing new grades. In July 1981 Management stated that as grades could be developed in 10 tonne furnace-use of this furnace for development of grades was not considered economical. It was further stated that as Action Committee did not recommend foundry facilities in the expansion stage, these furnaces were to be disposed of.
<i>(b) Forge Shop</i>		
<i>(i) Slow Cooling pits—2 Nos. (Group ii).</i>	3.49	These were installed for "slow cooling" of high speed steels and other critical grades after each heating. These have not been utilised mainly due to shortage of coke oven gas for dispositioning purposes. As reheating and other dispositioning furnaces were found adequate to take care of the production load, these pits were dismantled and parts used as spares elsewhere and steel structurals are awaiting disposal.

1	2	3
(ii) Salt Bath Annealing Furnace—2 Nos. (Group-ii).	6.74	Salt Bath Annealing Furnaces which were installed as part of main plant are lying unutilised as the production of tool bits or supply of tool steel bars in heat treated condition is not required. The Committee in its report of April 1976 finally recommended these furnaces as 'may be useful under the expanded scope of the plant'. In the subsequent review of March 1979, these equipments have been recommended to be disposed of, considering that there is no possibility of the equipment being profitably used in the near future. Action is being taken for disposal.
(c) Sheet Mill Complex		
(i) Batch Reheating Furnace (Group-ii).	5.00	High Power Committee has recommended that this furnace should be maintained in a good condition till the scope of stage III expansion is finalised.
(ii) Charging Table of Conditioning Shop (ii) Furnace (Group-iii).	4.03	Utilisation of this equipment was not found necessary, as 5 mm plates could be rolled in 3-Hi and 2-Hi mills. Efforts to dispose it of having failed it is contemplated to segregate certain parts which could be utilised in other units of the plant and the balance has to be auctioned.
(iii) Nitrogen Generator (Group-iii).	2.05	As the equipment could not give satisfactory result during final acceptance test, the case has been referred to arbitration; award is awaited (July 1981).
(iv) Roll Heat—4 Nos. 100 mm rolls (Group-iii).	0.39	Declared surplus and since disposed of.

1	2	3
(v) Transfer Table and Cross transfer 2-Hi make—2 sets (Group-ii).	3.38	Efforts to dispose of the equipment having failed, these assets were dismantled and stored in equipment pits for further utilisation, if at all required under the expanded scope of the Plant.
(vi) Lift-off Furnace (Group-iii)	6.67	As the equipment could not give satisfactory result during final acceptance test, the case has been referred to arbitration. Award is awaited (July 1981).
(vii) Side Trimmer for Sheet Mill (Group-iii).	10.82	Equipment was not finally accepted and the supplier paid the compensation. It is awaiting disposal (July 1981).
(viii) Cylindrical Grinding Machine for Sheet Mill (Group-iii).	3.74	Owing to non-working of the side trimmer, this has been declared surplus and is awaiting disposal (July 1981).
<i>(d) Conditioning Shop</i>		
(i) Sand Blasting Machines—2 Nos. (Group-ii).	13.46	These were imported for removing scales from the surface of the billets, sheets and plates but could not be used because of inherent design defects. The Management stated (July 1981) that non-availability of proper quality of sand also posed a problem. Operation of these machines with proper quality of sand would have been very costly and was not, therefore, used.
(ii) Rotary Bar Straightener—1 No. (Group-i).	10.09	The machine was purchased to handle 25 mm to 100 mm rounds of alloy steels. The machine has not been used so far for want of enough load due to lesser tonnage of round rolling in Blooming and Billet Mill. The rounds are presently sent to the Heat Treatment and Bar

1	2	3
		Finishing Mill for further processing. Management stated (July 1981) that it was expected that with the increased utilisation of the Blooming and Billet Mill, sufficient load will be generated for utilisation of this machine.

(B) Equipments not covered by the Report of April 1976

Item	Value	Remarks
(i) Three Grinding Polishing Machines imported in August 1971 and erected in December 1972.	Cost Rs. 21.70 lakhs including foreign exchange component of Rs. 10.62 lakhs.	The Ministry stated (October 1978) that non-utilisation was mainly due to change in the demand pattern resulting in lack of orders for finished polished stainless steel sheets.
(ii) Dynamic Fatigue Testing Machine.	Rs. 3.73 lakhs.	The machine was procured against rupee payment even though consultants had recommended acceptance of another offer. The machine was also not in accordance with specifications and on account of its height could not also be accommodated in the laboratory building which was in advanced stage of construction. Further, utility of the machine was also doubted by the consultants. The machine was erected in August 1969 in a new building constructed for this purpose at a cost of Rs. 1 lakh. The machine could not be put to use after erection because of certain operational defects. Guarantee of the machine had expired even before erection.
		The Management stated (July 1981) that the machine was



1

2

3

(iii) Guillotine Shear—1 No. Rs 1.29  
lakhs

rectified in 1973 and that it was being used for generating data on fatigue behaviour on certain grades of steel to popularise the grades besides testing on customers' specific requirements.

In November 1969 the machine was shifted to the Sheet Mill from Steel Melting Shop where it had been installed in Aug. 1968 for cutting stainless steel sheets below 8 mm size. Management stated (July 1981) that this shear was thought to be used for cutting scrap sheets into thin strips in exact widths, which was not possible in the existing shears and for which demand in the market was reported. However, it was seen that the market demand could be met by using the shears already installed and cutting to the exact width was not required. Hence, it was not considered necessary to use this machine. However, this can be used as and when necessary.

(iv) Fixtures for Forge Shop (ring legs and adapter plates). Rs. 1.09 lakhs

These were purchased for the manufacture of rings in the 2000 tonnes press but were found unsuitable owing to design deficiencies. A new set of ring stand was fabricated locally at a cost of Rs. 0.12 lakh and is being used.

## ANNEXURE V

(Referred to in paragraph 6.01)

## Statement showing the Inventory holding of the Plant

(Rs. in crores)

Year	Total inventories of raw materials, stores and spares (excluding in transit) finished & semi-finished products and other misc. stores	Stores and spares (excluding in transit)	Raw materials (excluding in transit)	Finished/semi-finished products (including in transit)	Total consumption of stores and spares during the year (including expenditure during construction)	Total consumption of materials during the year (including expenditure during construction) <sup>1</sup>		Year end inventories as No. of months' consumption		Total sales excluding excise duty, freight, etc.	Finished and semi-finished stock as number of months' sales	Finished and semi-finished stock as number of months' sales (on tonnage basis)
						Stores and spares	Raw materials	Stores and spares	Raw materials			
1	2	3	4	5	6	7	8	9	10	11	12	
1970-71	22.50	6.21	8.38	7.78	2.68	5.33	27.77	18.86	13.80	6.76	6.7	
1971-72	28.37	8.69	10.98	8.61	2.76	5.69	37.74	23.14	14.25	7.25	8.0	
1972-73	27.03	9.73	8.20	9.00	2.82	6.31	41.43	15.59	16.06	6.73	7.8	
1973-74	25.24	10.88	6.89	7.41	3.31	8.15	39.48	10.15	21.99	4.04	4.5	
1974-75	30.84	13.77	5.58	11.40	5.26	13.03	31.40	5.14	35.17	3.89	8.6	
1975-76	37.98	17.85	8.77	11.26	7.69	15.02	27.84	7.01	44.26	3.05	6.2	
1976-77	37.33	18.21	6.25	12.77	8.51	18.42	25.66	4.07	47.02	3.26	4.75	
1977-78 (13 months)	32.81	18.69	2.81	11.18	7.58	20.33	32.06	1.80	50.10	2.79	6.04	

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