



**REPORT OF THE
COMPTROLLER AND AUDITOR GENERAL
OF INDIA**

FOR THE YEAR 1972-73

(COMMERCIAL)

GOVERNMENT OF WEST BENGAL

ERRATA

Sl. No.	Page	Reference to para, line, etc.	<i>For</i>	<i>Read</i>
1.	1	Serial No. 6 of the High- lights on the working of Government Companies	Capital	Capital
2.	3	Para 5—Guarantees—1st line	loan	loans
3.	23	Para 3.17—1st line of page	Customs	customs
4.	24	Para 4.4 Table—serial No. 1—column 2	78.00	78.00
5.	26	Para 4.7—20th line	pipe joint etc.	pipe joint,
6.	28	Para 4.11—4th line	(Phthalic	(phthalic
7.	30	Para 4.14—2nd column of table	Coal	coal
8.	33	Para 4.22—3rd line	down time	down-time
9.	37	Para 4.32—1st line	table	table
10.	43	Para 4.45—table-heading	Ortho-dichlorobenz- zene	Ortho-dichlorobenz
11.	44	Para 4.46—sub-para (b) 1st line	pipe-lines	pipelines
12.	47	Para 4.52—table—last item under head Caustic soda	lahhs)	lakhs)
13.	47	—do—Last item under head Chlorine.	lahhs)	lakhs)
14.	50	Para 4.60—1st line	Word 'The' appearing before "Engineers India Limited" may be omitted.	
15.	51	Para 4.65—3rd line	(Cost	(cost
16.	70	Para 8.4—2nd line	context.	context,
17.	77	Para 2—sub-para(i) 1st line	paid-ul	paid-up
18.	82	Para 3.2—sub-para(i) 3rd line	(0.52lakh).	Rs. (0.52 lakh).
19.	82	Para 3.2—sub-para (iv)— 3rd line	rope-way	ropeway
20.	87	Para 4.5, sub-para (f) 1st line	pipe-line	pipeline
21.	87	Para 4.5, sub-para (f) 2nd line	pipe-line	pipeline
22.	103	Annexure B	Figures of 714.34, 50.58 and 7.08 appear- ing in columns 12, 13 and 14 against West Bengal Financial Corporation may be deleted.	

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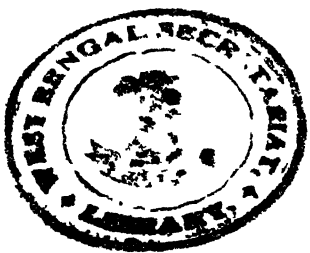
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PREFATORY REMARKS

Government commercial concerns, the accounts of which are subject to audit by the Comptroller and Auditor General of India, fall under the following categories :—

- (i) Government Companies;**
- (ii) Statutory Corporations; and**
- (iii) Departmentally managed commercial undertakings.**

This Report deals with the results of audit of the accounts of Government Companies and Statutory Corporations including West Bengal State Electricity Board. The Report of the Comptroller and Auditor General of India (Civil) contains the results of audit relating to departmentally managed commercial undertakings.

2. In the cases of Government Companies, audit is conducted by professional auditors appointed on the advice of the Comptroller and Auditor General, but the latter is authorised under Section 619(3)(b) of the Companies Act, 1956 to conduct a supplementary or test audit. He is also empowered to comment upon or supplement the report submitted by the professional auditors. The Companies Act further empowers the Comptroller and Auditor General to issue directive to the auditors in regard to the performance of their functions. In November 1962 such directives were issued by him to the auditors for looking into certain specific aspects of the working of Government Companies. These were revised in December 1965 and February 1969.

3. There are, however, certain companies in which Government have invested funds but the accounts of which are not subject to audit by the Comptroller and Auditor General.

4. In respect of Calcutta State Transport Corporation, North Bengal State Transport Corporation and West Bengal State Electricity Board the Comptroller and Auditor General is the sole Auditor, while in respect of West Bengal State Warehousing Corporation and West Bengal Financial

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Corporation, he has the right to conduct the audit of the concerns independently of the audit conducted by the professional auditors appointed under the respective Acts. Separate Audit Reports are forwarded to the State Government annually in respect of Calcutta State Transport Corporation, North Bengal State Transport Corporation and West Bengal State Electricity Board for being presented to the State Legislature in terms of the provisions contained in the relevant Acts under which they are constituted.

5. The points brought out in this Report are those which have come to notice during the course of test audit of the accounts of the above undertakings. They are not intended to convey or to be understood as conveying any general reflection on the financial administration of the undertakings concerned.

CHAPTER I
SECTION I
GOVERNMENT COMPANIES

Introduction

There were 12 Companies of the State Government as on 31st March 1973 as against 10 Companies as on 31st March 1972. Two new companies, viz. West Bengal Mineral Development and Trading Corporation Limited and West Bengal State Textile Corporation Limited were incorporated during 1972-73.

Out of these, the accounts of three Companies, viz. West Bengal Dairy and Poultry Development Corporation Limited, West Bengal Agro-Industries Corporation Limited and Westinghouse Saxby Farmer Limited for 1972-73 were not received till June 1974. Hence, the figures for these three companies as at the close of 1971-72 have been adopted for the purpose of comparison and their working results have been shown separately. The accounts of the two newly formed companies were not due.

2. Highlights on the working of Government Companies :

1. Number of Government Companies as on 31st March 1973	12
2. Number of Companies which prepared accounts for 1972-73	7
3. Paid-up capital of the 7 Companies as on 31st March 1973	Rs. 2,735.97 lakhs
4. Long-term loans of the 7 Companies as on 31st March 1973	Rs. 5,727.83 ,,
5. Reserves and surplus (uncommitted) of the 7 Companies as on 31st March 1973	Rs. 45.23 ,,
6. Capital invested in the 7 Companies as on 31st March 1973	Rs. 8,509.03 ,,

7. Gross assets of the 7 Companies as on 31st March 1973	Rs.	11,188.73 lakhs	
8. Capital employed in the 7 Companies as on 31st March 1973	Rs.	5,566.86	„
9. Net sales/business of the 7 Companies as on 31st March 1973	Rs.	2,792.27	„
10. Sundry debtors of the 7 Companies as on 31st March 1973	Rs.	578.93	„
11. Inventories as on 31st March 1973 of the 7 Companies .	Rs.	836.93	„
12. Total net loss suffered by the 7 Companies as on 31st March 1973 :			
(i) during the year	Rs.	363.38	„
(ii) cumulative	Rs.	2,748.95	„
13. Percentage of value of business/sales to capital employed during 1972-73 of the 7 Companies		50.16	
14. Percentage of sundry debtors to sales of the 7 Companies as on 31st March 1973		20.73	
15. Percentage of inventories to sales of 7 Companies as on 31st March 1973		29.97	
16. Cash and Bank balances :			
(a) Cash and bank balance as on 31st March 1973 (7 Companies)	Rs.	863.33 lakhs	
(b) Outstanding balance of cash credit resorted to by one company as on 31st March 1973 (nil by six others)	Rs.	29.67	„
17. Employment Statistics :			
Salaries and wages, etc. charged to accounts as on 31st March 1973 of 7 Companies	Rs.	537.97	„

3. Paid-up capital

The aggregate of paid-up capital of the 7 Companies that submitted accounts was Rs. 2,735.97 lakhs at the end of 1972-73, representing an increase of Rs. 25.01 lakhs over the capital of these companies at the end of 1971-72.

The aggregate of paid-up capital of the three other companies whose accounts for 1972-73 were not received was Rs. 340.03 lakhs at the end of 1971-72 representing an increase of Rs. 65.23 lakhs over the capital of these companies at the end of 1970-71.

4. Loans

The long-term loans obtained by the 7 companies under review stood at Rs. 5,727.83 lakhs at the end of 1972-73 representing an increase of Rs. 669.84 lakhs over that at the end of 1971-72.

The total long-term loans of the three other companies which did not submit accounts for 1972-73 was Rs. 231.40 lakhs at the end of 1971-72 representing an increase of Rs. 106.62 lakhs over their loan at the end of 1970-71.

5. Guarantees

The Government guaranteed loan to the extent of Rs. 370.00 lakhs during 1972-73 in respect of two companies of which Rs. 220 lakhs were in respect of bonds issued by one company.

6. Profits

According to the annual accounts submitted by the 7 Government Companies, there was a total net loss of Rs. 363.38 lakhs during 1972-73 as against a total loss of Rs. 645.35 lakhs during 1971-72, thereby showing a reduction of loss to the extent of Rs. 281.97 lakhs. Only one company (*viz.* West Bengal Small Industries Corporation Limited) showed a profit of Rs. 9.14 lakhs which amounted to 18.6 per cent of its paid-up capital of Rs. 49.11 lakhs. The 6 other companies with a paid-up capital of Rs. 2,686.86 lakhs sustained losses aggregating Rs. 372.52 lakhs.

In the case of the following companies the cumulative loss was more than their paid-up capital :

		1972-73	
		Paid-up capital	Cumula- tive loss
		<i>(Rupees in lakhs)</i>	
1.	Kalyani Spinning Mills Limited	158.21	368.97
2.	Durgapur Chemicals Limited	391.40	585.37

Two of the three companies which did not submit accounts for 1972-73 (*viz.* West Bengal Dairy and Poultry Development Corporation Limited and West Bengal Agro-Industries Corporation Limited) had shown a total net profit of Rs. 2.98 lakhs against their paid-up capital of Rs. 315.03 lakhs in 1971-72 and the third (*viz.* Westinghouse Saxby Farmer Limited) a loss of Rs. 72.09 lakhs against its paid-up capital of Rs. 25.00 lakhs. The cumulative loss of the latter company then was Rs. 272.00 lakhs which was about 11 times of its paid-up capital. The overall loss of these 3 companies at the end of financial year 1971-72 was Rs. 69.11 lakhs as against Rs. 75.77 lakhs at the end of 1970-71, thereby showing a reduction of loss to the extent of Rs. 6.66 lakhs.

7. Return on capital invested and capital employed

A synoptic statement showing the summarised financial results of the working of these Companies (comprising profits/losses as disclosed in accounts and interest on long-term loans) *vis-a-vis* the capital invested comprising the paid-up capital, long-term loans and free reserves is given in Annexure A. The statement also depicts the return (comprising net profit/loss and interest on all borrowings including short-term loans) on capital employed which comprises net fixed assets and working capital. The following position emerges from the above analysis :

1. (a) Capital invested in 7 Companies upto 1972-73	Rs. 8,509.03 lakhs
(b) Return on capital invested	Rs. (—) 51.98 ..
2. (a) Capital invested in 3 other companies upto 1971-72	Rs. 652.07 ..
(b) Return on capital invested	Rs. (—) 57.17 ..
3. (a) Capital employed in 7 Companies upto 1972-73	Rs. 5,566.86 ..
(b) Return on capital employed	Rs. (—) 36.89 ..
4. (a) Capital employed in 3 other companies upto 1971-72	Rs. 463.89 ..
(b) Return on capital employed	Rs. (—) 46.68 ..

8. Rate of growth

(a) Paid-up capital and reserves and surplus

The aggregate of paid-up capital, reserves and surplus of the 7 Companies decreased marginally in 1972-73 as compared to 1971-72 as indicated below :

Sl. No.	Name of the Company	Paid-up capital and reserves and surplus			Percentage of rate of growth	
		1970-71	1971-72	1972-73	1971-72	1972-73
| (Rupees in lakhs)						
1.	Electro-Medical and Allied Industries Limited . . .	25.00	25.00	25.00	..	..
2.	Kalyani Spinning Mills Limited	215.75	216.09	191.24	0.15 (—)	11.49
3.	West Bengal Industrial Development Corporation Limited	93.29	99.88	98.27	7.06 (—)	1.61
4.	Durgapur Projects Limited .	1994.26	1993.98	1993.98 (—)	.014	..
5.	Durgapur Chemicals Limited	332.05	371.40	396.40	11.85	6.73
6.	State Fisheries Development Corporation Limited . . .	20.24	27.24	27.20	34.58 (—)	0.14
7.	West Bengal Small Industries Development Corporation Limited	45.50	49.11	49.11	7.93	..
		2,726.09	2,782.70	2,781.20		

(b) Gross assets

The total gross assets of the 7 Companies increased by 9.56 per cent during 1972-73 as indicated below :

Sl. No.	Name of the Company	Total gross assets		Percentage of rate of growth
		1971-72	1972-73	
<i>(Rupees in lakhs)</i>				
1.	Electro-Medical and Allied Industries Limited	29.07	32.81	12.87
2.	Kalyani Spinning Mills Limited	628.58	638.59	1.59
3.	West Bengal Industrial Development Corporation Limited	112.99	458.84	306.09
4.	Durgapur Projects Limited	7886.29	8297.31	5.21
5.	Durgapur Chemicals Limited	1371.70	1395.15	1.71
6.	State Fisheries Development Corporation Limited	36.37	48.13	32.33
7.	West Bengal Small Industries Corporation Limited	147.09	317.90	116.13
		10,212.09	11,188.73	9.56

(c) *Value of business*

(i) The rate of growth of value of production/business varied in 1972-73 compared to 1971-72 as indicated below :

Sl. No.	Name of the Company	Value of Production/ business			Percentage of rate of growth	
		1970-71	1971-72	1972-73	1970-71	1971-72
<i>(Rupees in lakhs)</i>						
1.	Electro-Medical and Allied Industries Limited	1.74	3.03	9.10	74.14	200.33
2.	Kalyani Spinning Mills Limited	245.78	248.35	351.17	1.05	41.40
3.*	West Bengal Industrial Development Corporation Limited . . . . .	..	..	..	..	..
4.	Durgapur Projects Limited .	1260.99	1282.14	1735.30	1.68	35.34
5.	Durgapur Chemicals Limited .	112.13	47.93	81.59	57.25	70.23
6.	State Fisheries Development Corporation Limited	0.57	0.47	0.38	(—) 17.54	(—) 19.15
7.	West Bengal Small Industries Corporation Limited	307.36	410.52	614.73	33.56	49.74
		1,928.57	1,992.44	2,792.27		

*The nature of the Company is to finance industrial development. As such no figures have been indicated.

(ii) The percentages of value of business to capital employed in 1972-73 as compared to 1971-72 are indicated below :

Sl. No.	Name of the Company	1971-72			1972 73		
		Value of business	Capital employed	Percentage of value of business to Capital employed	Value of business	Capital employed	Percentage of value of business to Capital employed
		<i>(Rupees in lakhs)</i>			<i>(Rupees in lakhs)</i>		
1.	Electro-Medical & Allied Industries Limited	3 03	21.12	14.34	9.10	22.38	40.66
2.	Kalyani Spinning Mills Limited	248.35	201.18	123.44	351.17	187.97	186.82
3.	West Bengal Industrial Development Corporation Limited . .	..	92 60	..	..	427.85	..
4.	Durgapur Projects Limited .	1282.14	3834.75	33.43	1735.30	4123.94	42.07
5.	Durgapur Chemicals Limited .	47.93	676.25	7.10	81.59	584.70	13.95
6.	State Fisheries Development Corporation Limited . .	0.47	32.22	1.46	0.38	30.43	1.25
7.	West Bengal Small Industries Corporation Limited . .	410.52	85.21	481.76	614.73	189.59	324.24

9. Sources of funds

(a) *Internal sources*—Funds generated by seven Companies from internal sources in 1971-72 and in 1972-73 are indicated below :

Sl. No.	Name of the Company	1971-72		1972-73	
		Internal sources	Percentage to total funds	Internal sources	Percentage to total funds
		<i>(Rupees in lakhs)</i>		<i>(Rupees in lakhs)</i>	
1.	Electro-Medical and Allied Industries Limited	0.67		0.60	
2.	Kalyani Spinning Mills Limited	30.69		1.96	
3.	West Bengal Industrial Development Corporation Limited	2.44		0.55	
4.	Durgapur Projects Limited	220.80		271.22	
5.	Durgapur Chemicals Limited	45.34		62.57	
6.	State Fisheries Development Corporation Limited	0.20		0.16	
7.	West Bengal Small Industries Corporation Limited	3.94		10.08	
		304.08	30.76	347.14	25.75

(b) *External sources*—Funds received by the above Companies from external sources in 1971-72 and 1972-73 are also indicated below :

Sl. No.	Name of the Company	1971-72		1972-73	
		External sources	Percentage to total funds	External sources	Percentage to total funds
		<i>(Rupees in lakhs)</i>		<i>(Rupees in lakhs)</i>	
1.	Electro-Medical and Allied Industries Limited	4.31		4.51	
2.	Kalyani Spinning Mills Limited	92.78		38.28	
3.	West Bengal Industrial Development Corporation Limited	15.21		346.25	
4.	Durgapur Projects Limited	354.39		279.98	
5.	Durgapur Chemicals Limited	163.21		156.07	
6.	State Fisheries Development Corporation Limited	20.03		15.37	
7.	West Bengal Small Industries Corporation Limited	34.59		160.73	
		684.52	69.24	1001.19	74.25

10. Inventories

Inventories of 7 Companies as on 31st March 1973 are indicated below. As on 31st March 1973 the total inventories amounted to Rs. 836.93 lakhs and represented 29.97 per cent of net sales of Rs. 2,792.27 lakhs.

Sl. No.	Name of the Company	Inventories	Sales	Percentage of inventories to sales
<i>(Rupees in lakhs)</i>				
1.	Electro-Medical and Allied Industries Limited	9.87	9.10	108.46
2.	Kalyani Spinning Mills Limited	83.72	351.17	23.84
3.	*West Bengal Industrial Development Corporation Limited . . . . .	..	..	..
4.	Durgapur Projects Limited	489.39	1735.30	28.20
5.	Durgapur Chemicals Limited	95.33	81.59	116.84
6.	State Fisheries Development Corporation Limited	0.07	0.38	18.42
7.	West Bengal Small Industries Corporation Limited	158.55	614.73	25.79
		836.93	2792.27	29.97

*The nature of the Company is to finance industrial development. As such no figures have been indicated.

11. Sundry Debtors/Sales

The figures of sundry debtors and sales for the last two years are given below :

Sl. No.	Name of the Company	1971-72			1972-73		
		Sundry debtors	Sales/business	Percentage of debtors to sales	Sundry debtors	Sales/business	Percentage of debtors to sales
		(Rupees in lakhs)			(Rupees in lakhs)		
1.	Electro-Medical and Allied Industries Limited . . .	1.72	3.03	56.76	5.07	9.10	55.71
2.	Kalyani Spinning Mills Limited	29.95	248.35	12.06	42.33	351.17	12.05
3.	West Bengal Industrial Development Corporation Limited .	0.24	..	..	0.24	..	.
4.	Durgapur Projects Limited .	504.68	1282.14	39.36	514.79	1735.30	29.67
5.	Durgapur Chemicals Limited .	16.00	47.93	33.38	14.57	81.59	17.86
6.	State Fisheries Development Corporation Limited . .	..	0.47	..	..	0.38	..
7.	West Bengal Small Industries Corporation Limited . .	9.52	410.52	2.32	1.93	614.73	0.31
		<u>562.11</u>	<u>1992.44</u>	28.21	<u>578.93</u>	<u>2792.27</u>	20.73

SECTION II
DURGAPUR CHEMICALS LIMITED

1. Introduction

1.1. A provisional agreement was entered into between the Government of West Bengal and Krebs and Cie of France in July 1961 for setting up a chemical plant in Durgapur with a view to utilising benzene and naphthalene from the coke oven plants of Durgapur Projects Limited and other coke oven plants in the vicinity. The agreement was finalised and Krebs were appointed as Engineering Consultants in August 1962 and were entrusted with the construction and commissioning of the plant.

1.2. Durgapur Chemicals Limited was incorporated on 31st July 1963 under the Companies Act, 1956 to take over from the Government of West Bengal and Durgapur Projects Limited the chemical project jointly sponsored and developed by the State Government and two other companies in the private sector, namely, Bengal Chemicals and Pharmaceuticals Limited and Indian Alkalies Limited. The assets and liabilities of the project were taken over by the newly incorporated Company with effect from 1st September 1963 at an approximate purchase price of Rs. 35 lakhs. The transfer deed has not yet been executed (April 1974) nor has the purchase price been finalised.

1.3. According to the detailed project report prepared by Krebs in March 1964 and approved by the Board in June 1964, the project envisaged setting up the following plants for manufacture of various primary and secondary products :

Primary and secondary products	Rated capacity (in M.T.)	Estima- ted salcable quantity after captive consump- tion (in M.T.)	End uses of the-products
1	2	3	4
I. Phthalic Anhydride Plant			
Phthalic Anhydride (Primary)	3300	3300	Dyes, plasticizers and paint , industries

1	2	3	4
II. Caustic/Chlorine Plant			
Caustic Soda (Primary)	10050	2630	Soap, rayon, hydrogenated oil, paper and pulp and textile yarn industries.
Chlorine (Primary)	8910	840	Bleaching powder, paper, textile, water & sewage treatment plant/industries.
Hydrochloric Acid	2000	2000	Food & starch, hydrolysis, pick- ling of metals and petroleum industries.
III. Phenol Plant			
Synthetic Phenol (Primary)	6600	6200	Plastic, pharmaceutical resin, petroleum, detergent, photo- graphic and synthetic fibre industries.
Ortho-Dichlorobenzene (Secondary)	190	190	As a fumigant for soil, cloth, foodgrains, etc.
Para-Dichlorobenzene (Secondary)	330	330	Termite control in wood.
Ortho-Oxidiphenyl (Secondary)	270	270	Synthetic rubber, germicides, insecticides and textile indus- tries.
Para-Oxidiphenyl (Secondary)	135	135	Dyes, resins, fungicides, textile and rubber industries.
Diphenyl oxide (Secondary)	198	198	As a perfume for soaps, oils and as heat transfer fluid.
IV. Pentachlorophenol Plant			
Pentachlorophenol (Primary)	990	990	Preservation of wood, yarn, jute, rubber, latex and leather industries.

2. Capital structure

2.1. The authorised capital of the Company is Rs. 5 crores divided into 50 lakhs equity shares of Rs. 10 each. The paid-up capital of Rs. 391.40 lakhs on 31st March 1973 is entirely subscribed by the State

Government except for one share each held by the two private companies referred to earlier. In addition, the State Government granted from time to time unsecured loans totalling Rs. 782.79 lakhs upto 31st March 1973. The interest accrued on the loans upto 31st March 1973 but not paid amounted to Rs. 186.52 lakhs. About Rs. 242 lakhs out of the capital to be invested till the stage of commercial production was expected to be financed by financial institutions as long-term loans and by the general public as equity capital. To start with, no capital came from these sources; the responsibility for financing the project was taken over by the Government.

2.2. The cost of plant and equipment, purchased during September 1964 to May 1965 from France and other European countries on deferred payment under the Indo-French credit terms against two separate agreements (October 1963), worked out to F.F. 31.11 millions and included the following other charges :

Pre-shipment financing charges	F.F. 10,60,863
Credit insurance charges	F.F. 17,36,904
Interest on deferred payments	F.F. 58,41,875
	F.F. 86,39,642

These other charges amounted to 38.45 per cent of the technical price of plant and equipment (F.F. 2,24,69,480). The amount outstanding under deferred payment was F.F. 9.06 millions (Rs. 137.77 lakhs) as on 31st March 1973, but the deferred liability has not been reassessed in the accounts consequent on the devaluation of the Rupee (June 1966) and the Franc (March 1973)

Upto 31st March 1973, F.F. 39,59,433 payable to the Consultants on account of principal, credit insurance, etc. have become overdue but have not been paid (March 1974).

2.3. The Company obtained a loan of Rs. 3 crores in April 1973 at 10-11 per cent interest from a nationalised bank for financing the rectification/modification of the existing plants (Rs. 2 crores) and for expansion of the capacity of the caustic/chlorine plant from 30 to 45 M.T. per day (Rs. 1 crore) as per recommendations of an Expert Committee. The Company has also been availing overdraft facility from the same

bank upto a ceiling of Rs. 50 lakhs on the usual terms and conditions, on hypothecation of certain specified stores. The State Government had guaranteed the repayment of these loans. One of the conditions prescribed by the Government (May 1973) for utilising the loan funds was that a project report was to be prepared. But Rs. 8.02 lakhs were spent during April to July 1973 on the purchase of boilers, etc. even before a project report was prepared in January 1974.

2.4. The debt equity ratio of the Company was 2 : 1 in all the three years ending with 31st March 1973.

2.5. As compared to gross turnover, borrowings of the Company were disproportionately heavy with consequent heavy burden of interest liability, as indicated below :—

Year	Borrowings	Gross turnover	(In lakhs of Rupees)	
			Interest liability	Interest liability as a percentage of gross turnover.
1969-70	614 01	112 18	22 13	19 73
1970-71	654 13	112 13	37.98	34 04
1971-72	732 79	47 93	41 69	86 98
1972-73	782.79	81 59	45.43	55.68

3. Collaboration and construction

3.1. Under the Engineering Contract Agreement entered into between the State Government and Krebs on 17th August 1962, (later on assigned to the Company in July 1963), the Consultants were required to render the following assistance :

- (a) providing a complete lay-out of the factory, including requirements of raw materials, utilities, storage, transport, etc.,
- (b) providing detailed engineering drawings, specifications and data for all plants and equipment,
- (c) rendering technical advice and services for the purchase of plant and equipment, namely, preparation of tender documents, assessment of quotations, advice on selection of suppliers and inspection before shipment, etc.,

- (d) supervising the construction, erection, assembly, guarantee test and start-up of plant and equipment by deputing experts as needed,
- (e) training an adequate number of Indian personnel in the factories of Krebs and their associates, and
- (f) providing within a year a comprehensive project report including cost estimates and economic study.

Krebs were to guarantee the rated capacity of each manufacturing unit and the quality of the product before handing over the plant. The penalty recoverable for non-fulfilment of guarantee due to failure on the part of the Consultants was limited to 12 per cent of the total fees to be paid to them under the agreement (F.F. 4 millions or Rs. 40 lakhs).

3.2. A group of engineers was required to be sent by the Company to France to liaise with Krebs and choose the suppliers of equipment on whom orders could be placed. The Company stated in January 1970 that the group could not be sent and Krebs were asked to arrange for supply of plant and equipment for which they were paid 4 per cent of the F.O.B. value of supplies as handling charges. The total amount so paid was F.F. 0.86 million (Rs. 8.49 lakhs). Krebs justified these charges on the ground that (a) they assumed a financial responsibility on account of failure on the part of any supplier, and (b) they undertook the supplementary work of dealing individually with various suppliers and the consequent paper work. Nonetheless, invitation of tenders, assessing the technical suitability of the offer and choosing the suppliers were normal functions of the Consultants for which a lump sum amount of F.F. 4 millions was provided under the agreement. The additional financial responsibility claimed to have been assumed by Krebs was also not very material since even otherwise Krebs were responsible together with the associated suppliers or manufacturers for any default or defect in the machinery supplied.

3.3. Under the agreement Krebs were required to obtain quotations wherever possible from at least three manufacturers and scrutinise them with as much care and detail as they would examine offers for their own supply. They were also to pass on to the Company any rebate or commission obtained from the suppliers. But there was no indication that tenders were invited nor did the Company obtain any documentary evidence to satisfy itself about the reasonableness of the prices.

3.4. Owing to delay in construction, an Enquiry Committee was appointed by the State Government in May 1967 to enquire into the progress of construction and erection of the plants. The Committee observed (August 1967) as follows :

- (a) The payment of consultancy fees amounted to about 6½ per cent of the cost of the project excluding land, interest, etc. This was too high especially when Krebs did not submit the project report in time and did not take the trouble of preparing tender specifications or scrutinising the tenders. The Committee felt that Krebs had charged about 100 per cent more than what was reasonable.
- (b) The project report submitted by Krebs in March 1964 could hardly be called a project report and was at best a programme for a chemical plant.

3.5. A Foreign Equipment Supply Contract Agreement was signed with Krebs in October 1963 indicating the total technical price (pre-devaluation price: F.F. 22.27 millions or Rs. 241.89 lakhs) of the plant and equipment to be supplied from France and other European countries, the pre-shipment financing charges, interest charges and the schedule of payments under the credit terms. The contract also stipulated that the items would be inspected by Krebs at the manufacturers' works before shipment and that Krebs would guarantee free replacement/repairs of defective parts within twelve months of the start-up but not later than October 1966.

3.6. A separate Consultancy Contract Agreement was entered into (November 1963) with Krebs-India for arranging the fabrication and procurement of equipment and accessories to be purchased from within India. The services to be rendered were similar to those covered by the Engineering Contract Agreement and should thus be deemed to have been covered by the lump sum payment of F.F. 4 millions under that agreement. But the agreement with Krebs-India provided for payment of Rs. 8 lakhs for these services. This amounted to payment again for the services already covered by payment. The Enquiry Committee observed (August 1967) that legal advice should be taken to examine whether Krebs were entitled to these payments and added that any well established firm of consultants in India could have done much better and at a lower cost than Krebs-India. It was not clear whether action was taken on this recommendation, and if so, what the legal advice was.

3.7. Two Delegation Agreements—one under the Consultancy Contract and the other under the Equipment Supply Contract—were entered into with Krebs in November 1965 laying down the terms and conditions of Krebs' specialists and technicians to supervise the erection, start-up, etc. According to the Delegation Agreement under the Consultancy Contract, erection work was to be executed by the Company under the technical supervision of Krebs' delegates. For this purpose Krebs were to send to India, at the Company's cost, engineers and specialists upto 97 man months and more, if needed. Erection was to be completed within 24 months of departure of the first delegate (or 1st November 1965 whichever was earlier) and the start-up within 6 months of completion of erection of each unit. If this was delayed, the Delegation Agreement was to be extended under mutually agreed modified terms.

3.8. The Delegation Agreement under the Equipment Supply Contract provided for firm rates of remuneration to the manufacturer's delegates to be sent by Krebs for supervision of erection, start-up and trial runs. But these rates were revised upwards once in April 1967 and again in May 1968.

3.9. These Delegation Agreements had been entered into in pursuance of the Engineering Contract Agreement which stipulated that the salaries and approved allowances of the delegates would be paid in Indian currency. But this condition was altered in the Delegation Agreement and the salaries were paid in French currency.

3.10. As per the schedule indicated in the project report, production was to commence from early 1966. Due to delays in erection and commissioning, the Krebs technicians had to extend their stay. This cost the Company Rs. 29.10 lakhs as salaries and allowances during the extended period upto March 1971.

3.11. The various contracts were not very precise in clearly apportioning the responsibilities of the collaborators in the selection of plant and equipment, inspection and start-up according to an agreed schedule, etc. Since the collaborators had virtually been given a free hand in the selection of plant and equipment both in India and abroad the Enquiry Committee were of the view that Krebs had done the job on turn-key basis. But the advantages accruing out of turn-key contract were not availed of. For example, in purchasing a boiler plant in India, their advice was not

accepted, hence diluting their responsibility (*vide* paragraph 4.6). Similarly in regard to erection, Krebs' responsibility was only in the nature of technical supervision. As a result of ambiguity in apportioning responsibilities, Krebs could not be held liable for the delay of about 19 to 47 months in commissioning the plants and for the extra cost on account of prolonged stay of their experts. The Management informed the Estimates Committee (January 1970) that Krebs could not be held responsible as there was no provision under the contract to recover the additional money paid to the Consultants due to non-fulfilment of the target dates for commissioning of the different units.

3.12. The table below indicates the scheduled dates of commissioning of the plants as per the project report, the subsequent revisions from time to time and the actual dates of commissioning.

Name of plant	Scheduled date of commissioning	Subsequent revisions						Actual date of commissioning
		1st	2nd	3rd	4th	5th	6th	
1. Phthalic Anhydride Plant	June 1966	Dec. 1966	Dec. 1967	Jan. 1968	..	..	..	January 1968
2. Caustic/Chlorine Plant.	"	"	"	April 1968	..	..	..	April 1968
3. Phenol Plant	"	"	"	July 1968	April 1969	October 1969	May 1970	May 1970
4. Pentachlorophenol Plant	"	"	"	"	"	"	"	June 1969

As it was anticipated that it might not be possible to adhere to even the revised target dates for commissioning the plants, a short term and a long term programmes of action were agreed upon in a meeting held on 19th April 1969 with Krebs to ensure commissioning by end of October 1969. If Krebs failed to perform their part, the expenses on account of Krebs' delegates and the cost of replacement of parts or equipment were to be on Krebs' account. Since the guarantee tests were not conducted till October 1969, the State Government held in December 1970 that salaries and allowances of Krebs should not have been paid beyond 30th June 1969. Rupees 10.51 lakhs paid for July 1969 to March 1971 was sought to be recovered from them. During this period Krebs also used additional spares and equipment from the stock of the Company to complete the job but the cost thereof, which should have been recovered from Krebs,

could not be assessed as the Company did not maintain records of issue of such spares. Krebs were also to pay for some equipment which were not replaced by them and, therefore, these had to be replaced later by the Company. Rupees 8.78 lakhs representing 16 per cent of the consultancy fees has not yet (March 1974) been paid to the Consultants, but this is much less than the Company's claim for recovery from them, viz., Rs. 10.51 lakhs due to fees paid to delegates for their over-stayal, cost of spares used, etc.

3.13. The Management attributed (July 1967) the delay in commissioning the plants to the following factors :

- (a) Delay in receipt of project report from Krebs. There were also delays in receipt of drawings from Krebs.
- (b) Delay of about 18 months from April 1962 to October 1963 in finalising the Foreign Equipment Supply Contract between the Company and the Consultants due to prolonged negotiations.
- (c) Tardiness on the part of Krebs-India in processing indigenous equipment and utilities.
- (d) Delay in completing the structural works due to scarcity of heavy structural steel and non-availability of fabricated indigenous equipment.
- (e) Delay in receipt of supply of tanks and vessels from a sub-contractor in France.
- (f) Delay in the receipt of boilers and erection of the steam stations which had delayed the commissioning of the phthalic anhydride plant by about a year.
- (g) Delay in procurement of mercury which incidentally involved an additional expenditure of Rs. 79 lakhs due to price rise in the meantime.
- (h) Time taken in correcting faulty designs and construction of foundations and engineering works, partly due to poor supervision by the civil engineering department and partly due to wrong drawings received from Krebs.

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- (i) Absence of a well qualified project organisation in the initial stages to tackle all the technical problems.
- (j) Defects and failures noticed during guarantee test runs especially in the phenol plant and pentachlorophenol plant.

3.14. In respect of drawings particularly, the collaborators made frequent changes, in some cases as many as 22, which ultimately delayed the commissioning of the plant. No responsibility was fixed by the Company for delays on the ground that there was no provision in the Engineering Contract for recovery from the Consultants of losses due to frequent changes in drawings. The matter was proposed to be examined in consultation with the solicitors of the Company, but it could not be ascertained whether this was done as the relevant papers were not made available.

3.15. The Enquiry Committee observed that the proposal from Krebs for setting up the chemical plant was not examined by any technical committee or expert on behalf of the authorities. According to the Enquiry Committee this resulted in excess expenditure on fees, inordinate delay in the erection of the plant, faulty foundation, irregular receipt of drawings and possibly unwise selection of contractors with regard to the boiler plant which delayed the commissioning of at least a part of the plant by about a year.

3.16. In the project report, the total cost of the project was estimated (June 1964) by the Company at Rs. 790 lakhs. The table below indicates the estimates of the project cost as per project report of June 1964 and those as revised from time to time together with the actual expenditure incurred upto 31st March 1973 for the project.

(Rupees in lakhs)

As per project report (June 1964)	First revision (1964-65)	Second revision (1965-66)	Third revision (1970-71)	Actual expenditure as on 31st March 1973
790	900	1,100	1,347	1,503

3.17. The reasons for the revisions of estimates at various stages were stated (April 1970) to be as follows :

The first revision of estimates was made in 1964-65 to include the provision for items like (i) unprecedented rise in the cost of mercury (Rs. 79 lakhs) and (ii) additional regulatory duty on imports @ 10 per cent

on all imports together with a general increase on the Customs tariff and general rise in price level (Rs. 31 lakhs).

The second revision in 1965-66 was due to (i) devaluation of the rupee in June 1966 (Rs. 180 lakhs) and (ii) additional cost of procurement of indigenous equipment (Rs. 20 lakhs).

The third revision in 1970-71 was necessitated by provision for (i) working capital (Rs. 106 lakhs) and (ii) additional expenditure on land, buildings, boiler, etc. (Rs. 141 lakhs).

3.18. The variations between the latest revised estimates and actuals were stated to be due to delay in execution of project resulting in additional establishment and operational cost, salaries for foreign consultants and other associated factors.

4. Production performance

A. Phthalic anhydride plant

4.1. Phthalic anhydride is produced by the oxidation of liquid naphthalene at 500° C in a reactor with a fixed bed of catalyst with mercury as the coolant. The plant came into commercial operation in January 1968. The guarantee test run conducted by Krebs in March 1968 was reported to have shown an annual yield of 3597 M.T. as against the rated output of 3300 M.T.

4.2. The table below indicates the actual production since inception upto 1972-73 :

Year	Actual production (in M.T.)	Percentage of production to rated capacity
1968-69	1,660	50.30
1969-70	1,592	48.24
1970-71	1,287	39.00
1971-72	493	14.94
1972-73	447	13.52

The performance of the plant has been progressively going down and it slumped from 1971-72.

4.3. According to the Management, the reasons for the poor performance were as follows :

- (a) Inferior grade and short supply of naphthalene used. The Company considered in April 1970 the setting up of a plant to purify indigenous naphthalene. The idea was, however, given up due to additional expenditure and consequent increase in cost of production.
- (b) Frequent explosions in the oxidation chamber due to impurities in the naphthalene used.
- (c) Frequent failures in the supply of power.
- (d) Inadequate steam supply.
- (e) Gradual deterioration of the catalytic mass.
- (f) Production could not be stepped up because large quantities of phthalic anhydride were imported during 1970-71 and 1971-72 following liberalisation of the import policy.

4.4. Naphthalene required for production of phthalic anhydride was to be procured, as per the project report, from Durgapur Projects Limited and other projects in the vicinity. The following table shows the specifications of naphthalene required to be used in the plant (as per Engineering Contract Agreement) and analysis of supplies received from Durgapur Projects Ltd., Hindustan Steel Ltd., and from Japan :

Particulars	Required specification	Durgapur Projects Limited	Hindustan Steel Limited	Japan
1. Melting point	78.00 minimum	77.5 to 79	78.5 to 79.5	79.610c
2. Water content (percentage)	0.2 maximum	0.1 to 1.8	Trace to 0.2	Trace
3. Distillation range between 215 to 219 ⁰ c (percentage)	95 minimum	94 to 95	95 to 97	97.4
4. Nonvolatile matter (percentage)	0.2 maximum	0.158 to 0.8	0.072 to 0.36	0.05
5. Ash content (percentage)	0.10 maximum	0.016 to 0.32	0.022 to 0.18	0.013

During 1968-69, 1970-71 and 1972-73 on account of explosions due to impurities in naphthalene, the plant was shut-down for 483, 490 and 753 hours respectively. To minimise the incidence of explosions, 1113.750 M.T. of naphthalene of superior quality was imported from Japan in 1970-71 and 1971-72. The imported naphthalene was cheaper (Rs. 1050 per M.T.) as compared to the indigenous material (Rs. 1800 per M.T.). The Management stated (March 1974) that the specification contained in the Engineering Contract did not mention the iron and sodium content of naphthalene. Naphthalene supplied by Durgapur Projects Limited contained high percentage of iron and sodium and was found unsuitable for production purposes. Purchase of Naphthalene is now being made from Hindustan Steel Limited, the iron and sodium content thereof being less. The Management was, however, of the view (April 1974) that in the existing conditions explosion could not be avoided altogether.

4.5. Although the log-books showed that the plant was shut down for 744 hours during 1972-73 owing to shortage of naphthalene, the stock records did not show that there was such shortage during the period the plant was shut down.

4.6. According to the project report, the plant was expected to make available to other plants 38 M.T. of steam per day obtained in the process of condensing the mercury vapours. But it could not generate the required quantity of steam because the plant was operating at lower than rated capacity; on the other hand the plant has been a net consumer of steam since June 1969. The reasons given for the excess consumption of steam were heavy radiation loss of steam because of the pattern of pipeline installations adopted, leakages from level gauge and pipe joints, and frequent shut-downs/start-ups due to power failures. The project had provided for three coal fired Lancashire boilers of 3 M.T. per hour capacity at a total cost of Rs. 18.42 lakhs. These were purchased from Texmaco, although the Consultants had not recommended this source. Texmaco did not also conduct any performance or efficiency tests of the boilers to the Company's satisfaction. During June 1969 the effective steam-generating capacity was found to be only 5 to 6 M.T. per hour as against the total requirement of 16.2 M.T. per hour for the simultaneous start-up of all the units. An Expert Committee, appointed by Government in February 1973 to examine the condition of the plants and machinery and to suggest steps for rectification and modifications, observed in their report (June 1973) that the efficiency of the boilers had considerably deteriorated due to indifferent

maintenance and use of inferior quality of coal. The Company's laboratory was not equipped for measuring the calorific value of the coal used. The mechanical stokers also broke down frequently due to non-availability of coal of proper size, which in turn affected combustion and coal consumption adversely.

4.7. When the inadequacy of steam generating capacity in the boiler plant was noticed in the middle of 1969, the Consultants had recommended installation of another coal fired boiler with a capacity of 10 M.T. per hour. But the Company ordered during July 1972 and February 1973, two coal/oil fired Lancashire boilers of 3 M.T. per hour capacity each and two Wanson instant evaporation boilers of 2.5 M.T. per hour capacity each. The Expert Committee was not happy with this decision since boilers of Wanson instant evaporation type had an inherent deficiency in the design which required a complete blow-down of the boiler water in the steam coil once in each shift, thereby interrupting steam supply for about half an hour for every 8 hours causing a fluctuation in the steam pressure. Engineers India Limited which prepared an economic and feasibility report during January 1974 for the rectification of defects and expansion of the plant, also did not agree with the choice, capacity and the type of boilers ordered by the Company in 1972-73, but since it was too late to revise the decision they recommended in their report that for better utilisation the boilers should be operated in groups linked with various plants. Engineers India Limited also indicated that the phthalic anhydride plant required 2.5 M.T. of steam per hour and the high steam consumption was partly due to heavy leaks in level gauge, pipe joint etc. The extra expenditure on account of excess steam consumption was estimated to be Rs. 2.38 lakhs per year. The four new boilers have not been installed yet (August 1974) but after their installation the total availability of the steam is expected to be about 17 M.T. per hour (as against the requirement of 16.2 M.T.) even if one boiler remains as standby.

4.8. As per the project report, 0.110 M.T. of catalyst was required each year for production at the full rated capacity. Since the catalyst was also a consumable item, it had to be refilled periodically. But such refilling was done only twice—in June 1970 and June 1973 ever since the plant was commissioned. As the operating staff in the Company did not have the expertise for refilling the catalyst, the services of an expert from France were used on both the occasions. The Expert Committee, while

pointing out the need for more frequent refilling of the catalyst mass, recommended (June 1973) that the Company's staff should be got thoroughly trained by the supplier's specialist.

4.9. The annual rated capacity was based on a daily output of 10 M.T. for 330 days in a year, which implied a down-time of about 9.6 per cent. The actual down-time ranged from 79.9 per cent in 1972-73 to 27.9 per cent in 1968-69. The reasons for loss of operating hours were broadly as follows :

(Figures in number of operating hours)

Reasons	1968-69	1969-70	1970-71	1971-72	1972-73
(a) General maintenance . . .	961	562	598	545	359
(b) Instrument trouble . . .	157	27	131	412	476
(c) Steam shortage . . .	581	663	938	..	146
(d) Power failure . . .	49	18	51	200	3817
(e) Mechanical trouble . . .	10	..	180	..	445
(f) Water shortage . . .	45	..	..	190	..
(g) Explosion . . .	483	52	490	..	753
(h) Gas failure . . .	..	46	..	..	..
(i) Delay in starting the plant . . .	..	88	..	..	..
(j) Replacement of catalyst . . .	..	..	365	..	..
(k) General strike . . .	..	..	480	..	..
(l) Reboiler D. 101 bulged out . . .	..	..	..	5107	..
(m) Shortage of raw materials . . .	..	..	..	..	744
(n) Others . . .	155	1519	100	..	260
Total down-time during the year.	2441	2975	3333	6454	7000
Percentage of idle plant hours to total plant hours*	27.86	33.96	38.04	73.67	79.90

*Total plant hours calculated on the basis of 3 shifts working for 365 days.

4.10. Operating hours were lost mostly because of plant breakdowns. No preventive maintenance schedule had been introduced in the plant, nor had the requisite manual been obtained from the Consultants yet. A team of experts from the Fertiliser Corporation of India and the plant suppliers inspected the plant in May 1972 and observed that no preventive maintenance was being carried out at all and only breakdowns were attended to as and when these happened. According to the team the maintenance problems were caused by corrosion, process troubles, use of cooling water without corrosion inhibitors and absence of lubrication schedule. The team also observed that maintenance could be improved if there was an adequate stock of necessary spares, but no action had been taken by the Management to ensure their availability. Most of the initial spares supplied along with the plant had been consumed by the Consultants during start-up and commissioning and had not been replaced (vide Paragraph 3.12). The Expert Committee felt (June 1973) that this did not exonerate the Company for not planning the procurement of spares after the plant was taken over. The Committee were surprised that spares were being purchased without any policy or programme. The Committee attributed the frequent breakdowns and the extensive damage to the absence of an objective policy for procurement of spares and recommended the evolution of a rational spares policy and inventory management. Engineers India Limited reiterated this view in January 1974. Concrete action has yet (August 1974) to be taken to implement these recommendations.

4.11. The following table indicates that naphthalene consumption has been excessive as compared to the norms, though during the guarantee test runs the actual consumption ratio demonstrated was 10.25 (naphthalene) to 10 (Phthalic anhydride) as against 11 to 10 stipulated in the contract :

Year	Actual output of phthalic anhydride (In M.T.)	Standard consumption of naphthalene	Net input of naphthalene	Excess consumption	Actual consumption of naphthalene to 10 M.T. of product	Cost of naphthalene consumed in excess (Rs. in lakhs)
1967-68 . . .	367	404	536	132	14.60	0.79
1968-69 . . .	1660	1826	2033	207	12.24	1.48
1969-70 . . .	1592	1751	2040	289	12.77	4.72
1970-71 . . .	1287	1416	1796	380	13.95	2.77
1971-72 . . .	493	542	647	105	13.12	0.87
1972-73 . . .	447	492	790	298	17.67	3.76
				1411		14.39

The excess consumption of 1411 M.T. of naphthalene involved additional cost of Rs. 14.39 lakhs. Had this quantity been converted into phthalic anhydride as per norms the Company could have earned an additional Rs. 73.46 lakhs in sales.

4.12. The Management attributed (February 1974) the excess consumption to :

- (a) higher percentage of tar content in the naphthalene used,
- (b) evaporation loss at molten stage due to high temperature,
- (c) loss in plant storage due to sublimation and evaporation in high ambient temperature, and
- (d) evaporation due to frequent shutdowns and start-ups where some time elapsed before an optimum production and reaction point was reached.

4.13. In the absence of metering arrangements, there was no effective control over the consumption of utilities. The allocation/apportionment of the cost of utilities in the cost sheets was stated to have been made on the basis of technical estimates, without approval of the Board of Directors. However, the consumption of utilities allocated to the phthalic plant showed that the consumption ratios were much in excess of the norms prescribed in the project report, as indicated below :

Consumption norm per M.T. of phthalic anhydride	Actual consumption				
	1969-70	1970-71	1971-72	1972-73	
Power hours (K.W.H.)	1200	1592	1655	1296	1912
Steam (M.T.)	(—)3	8 16	9	22	57
Gas (Cubic metres)	203	650	702	2184	3415

The excess consumption of utilities involved an expenditure of Rs. 21.63 lakhs. The Management stated (April 1974) that till normal production at sustained level was achieved in all plants, the actual consumption would not be comparable with the norms set out in the project report.

4.14. The annual requirement of coal for the steam boilers, as per the project report, was 4000 M.T. with all the plants working to full capacity. But the actual consumption was as follows even though the plants were not working to the full rated capacity :

Year	Consumption of Coal (In M.T.)	Excess consumption (In M.T.)
1968-69	6102	2102
1969-70	7644	3644
1970-71	6658	2658
1971-72	7473	3473
1972-73	6935	2935
TOTAL		14,812

The excess consumption of coal during 1968-69 to 1972-73 involved additional expenditure of approximately Rs. 5.91 lakhs. This was attributed by the Management to :

- (i) high percentage of dust and slag content,
- (ii) high percentage of ash and moisture,
- (iii) low burning velocity and low heat content, and
- (iv) large percentage (nearly 35 per cent) of unburnt combustible matter in the cinders.

The Company had to use low grade coal because of shortage of acceptable grade. Although the Director/General Manager of the Company had directed in May 1970 that the percentage of combustible matter in the cinders should be improved in order to minimise the unburnt coke content in the cinders, no effective steps had been taken in this regard and no analysis was carried out to assess the percentage of unburnt combustible matter.

4.15. As indicated in Paragraph 4.10, one of the causes of corrosion was the use of cooling water without corrosion inhibitors. This led to frequent leakage of the tube bundle of the oil cooler with loss of large

quantity of mobiltherm. The experts of Fertiliser Corporation of India had suggested (April 1972) that the cooling water should be chemically dosed and, therefore, cooling water cycle had to be isolated from the water supplied from Durgapur Projects Limited. Engineers India Limited recommended (January 1974) similar measures for improving the quality of cooling water, but necessary action is yet (August 1974) to be taken.

4.16. According to Engineers India Limited, which conducted (January 1974) an economic and viability study of the rectification and expansion schemes, the major bottlenecks in attaining the rated capacity were low storage capacity for raw phthalic, corrosion, damages and leakage in various parts and inadequacy of steam. Earlier in June 1972, the Management had estimated that Rs. 9.5 lakhs would be necessary to rectify these defects. According to Engineers India Limited the rectification of defects required Rs. 22.77 lakhs and the expansion of the capacity from 10 to 20 M.T. per day, another Rs. 250 lakhs. They also indicated that the plant could earn a gross revenue of Rs. 193.10 lakhs per year before depreciation and taxes, if the product could be sold at Rs. 9500 per M.T. (the market price in March 1974 was Rs. 18,500 per M.T.) and the working results could be further improved if instead of naphthalene, ortho-xylene was used as feed-stock.

B. Caustic/Chlorine Plant

4.17. The plant produces caustic soda and chlorine by the electrolytic dissociation of common salt using the mercury cathode process. Hydrogen obtained as by-product is used in the plant itself and some chlorine is used to manufacture hydrochloric acid and calcium hypochlorite. The caustic soda fusion plant, an adjunct installed in April 1968 at the total cost of Rs. 19.04 lakhs to produce caustic soda solid and flakes, has not been working since February 1970 due to damage of condensers, concentrators, pipe-lines, etc., and poor stock of heating media. The Management stated (February 1974) that necessary spares were expected shortly. Thereafter trial runs would be made to detect other deficiencies, if any.

4.18. The plant came into commercial operation in April 1968. The guarantee test run conducted by Krebs in April and May 1968 was reported to have indicated the yield of chlorine and caustic soda at the rate of 8,950 M.T. and 10,092 M.T. per annum against the rated output of 8,910 M.T. and 10,050 M.T. respectively.

4.19. The table below indicates the actual production since inception up to 1972-73 :

Year	Actual production (in M.T.)		Percentage of pro- duction to rated capacity	
	Caustic soda	Chlorine	Caustic soda	Chlorine
1968-69	2,252	1,573	22.40	17.65
1969-70	1,729	1,190	17.20	13.35
1970-71	1,639	1,265	16.30	14.19
1971-72	2,183	1,622	21.72	18.20
1972-73	2,476	1,534	24.63	17.21

The plant has not been able to achieve even 25 per cent of its rated capacity of production.

4.20. In the annual reports, the Management attributed the shortfall in production to the following :

- (a) the project provided for a major portion of chlorine and caustic soda to be used in the manufacture of phenol and pentachlorophenol. The phenol plant was not commissioned till May 1970. The pentachlorophenol plant which was commissioned in June 1969 could not be operated at its full rated capacity due to lack of market of the product,
- (b) frequent shutdown of the phenol plant coupled with fluctuation in market demand for liquid chlorine,
- (c) corrosion of the sophisticated equipment/instrument and pipe-lines due to infiltration of chlorine following a strike by employees in August 1970,
- (d) absence of a strong managerial team,

- (e) inherent defects and imbalances in plant and machinery,
- (f) shortages of chlorine cylinders and chlorine storage tanks, and
- (g) non-availability of sufficient salt, power and steam.

4.21. The plant was designed to produce 10,050 M.T. of caustic soda of rayon grade on 100 per cent concentration basis. As per the Engineering Contract Agreement, caustic soda was to be of the strength of 50 per cent concentration. The percentage of concentration achieved during guarantee test was between 40 and 51. But ever since the plant was taken over, it produced caustic soda of 30 per cent concentration only. The Company sold 22,265 M.T. of caustic soda at 30 per cent concentration up to November 1973. Had the Company been able to produce the same quantity at 50 per cent concentration, it would have earned additional sales revenue of Rs. 46.81 lakhs. The Management stated (December 1973) that the cells to be operated at 50 KA were expected to produce caustic soda lye of a strength of 50 per cent. The normal running voltage for 50 KA operation was 4.1 to 4.2 volts. Even at a load of 35 KA, the cell voltage had gone up to 4.6 volts and in some cases up to 5.2 volts. This was due to anode consumption and non-adjustment of the anodes ever since inception. According to the Management, operation at higher voltage involved risk to the plant apart from very high consumption of energy. Under the current loading at 35 KA operation, the concentration achieved was only 30 per cent and the Management stated that this could not be avoided until cell maintenance was done.

The Expert Committee pointed out (June 1973) that ever since commissioning no cell maintenance work had been done. They added that the graphite anodes in the mercury cells had to be replaced and secondary grids regenerated immediately. The Committee also recommended that after replacement of anodes and grids, cathode discs were required to be changed since they were partially corroded. Engineers India Limited also corroborated (January 1974) this finding. Anodes for four cells were replaced up to August 1974, and the Management stated (April 1974) that on receipt of the accessories the other anodes would be replaced.

4.22. The annual rated capacity was based on a daily output of 27 M.T. of chlorine and 30.6 M.T. of caustic soda for 330 days in a year, which implied a down-time of about 9.6 per cent. The actual down time was

67.7 per cent in 1970-71 and 49.3 per cent in 1972-73. The reasons for loss of operating hours were broadly as follows :

(Figures are in hours)					
Reasons	1968-69	1969-70	1970-71	1971-72	1972-73
(a) Want of chlorine storage tank capacity	4,441	3,498	734	1,041	154
(b) Mechanical trouble	495	—	463	1,803	3,929
(c) Explosion	410	—	—	—	—
(d) Power failure	17	441	231	119	87
(e) Steam failure	—	380	—	—	—
(f) Maintenance	—	819	—	1,437	148
(g) Plant trouble	—	339	845	480	—
(h) General strike	—	—	751	188	—
(i) Want of feed-stock (salt)	—	—	2,801	—	—
(j) Water shortage	—	—	88	97	2
(k) Dry air	—	—	6	—	—
(l) Others	—	166	10	—	—
Total down-time during the year	5,363	5,643	5,929	5,165	4,320
Percentage of idle plant hours to total plant hours*	61.18	64.41	67.68	58.96	49.31

* Plant hours calculated on the basis of 3 shifts working for 365 days.

Operating hours were lost mostly because of want of chlorine storage space up to 1969-70, for want of feed-stock in 1970-71, and plant break-downs 1971-72 and 1972-73.

4.23. The project report had provided for only 100 cylinders for disposal of saleable chlorine after meeting the requirements of the phenol and pentachlorophenol plants. The Company had procured 137 cylinders, most of which were retained by the customers beyond the permissible time limit. As per terms and conditions of sale, if the customers did not return the cylinders within the stipulated period they were liable to pay rental charges at Rs. 100 per cylinder per month or part thereof. A scrutiny of the records for 1970-71 to 1972-73 showed that Rs. 0.70 lakh were realisable from the customers who had retained cylinders beyond the rent-free period.

But no claims were preferred. The Company did not maintain any record to show the movement of cylinders during 1968-69 and 1969-70. The cylinders were not physically verified. 78 cylinders were lying with the customer as at the end of March 1974.

4.24. Though the plant had three chlorine storage tanks of 84 M.T. capacity each, these could not be filled up to their full capacity as the measuring instruments attached to the tanks had gone out of order in August 1970 and were not repaired up to April 1974. As a result, disposal of additional chlorine created a bottleneck.

4.25. The Expert Committee (June 1973) and Engineers India Limited in January 1974 recommended the installation of two more storage tanks and augmentation of chlorine cylinder fleet by 300 to cope with the increased production of chlorine. The Management stated (April 1974) that orders for 375 cylinders (cost Rs. 33.10 lakhs) had been placed and supplies were expected during 1974. The Expert Committee observed that increased production of hydrochloric acid could partly ease the chlorine disposal problem. As the industrial licence did not provide for the Company marketing hydrochloric acid, the Company applied (December 1973) to the Government of India for revising the existing industrial licence and to increase the capacity for manufacturing hydrochloric acid from 5 M.T. to 15 M.T. per day after the expansion of the caustic/chlorine plant. The licence has not yet (August 1974) been revised.

4.26. Although the log-book showed that the plant was shutdown for 2801 hours during 1970-71 owing to shortage of salt, the stock records did not show that there was any shortage of salt

4.27. The project report envisaged availability of common salt in due course from the Contai Sea Board since proposal for large scale manufacture of salt for industrial purposes were stated to be under consideration of Government. Meanwhile, salt from Tuticorin (carried from Calcutta to Durgapur either by rail or by road) was to be used. But out of 27,914 M.T. of salt purchased up to 31st March 1973, 270 M.T. were procured from Contai and the rest from west coast (Jamnagar, Gandhidham). The Management stated that the Contai salt was not suitable as the grains were not of the required size (3 to 6 M.M.). Carriage of salt by rail from the west coast involved transport cost of Rs. 101 per M.T. as against purchase price of Rs. 28 to 30 per M.T. Difficulties in availability of wagons also affected supplies necessitating emergency purchases at Rs. 170 to 185 per M.T. on several occasions. Emergency purchases of 1600 M.T. of salt from the

local market involved an extra expenditure of Rs. 0.81 lakh. Transport of salt in open wagons, because of non-availability of covered wagons, particularly in monsoon, resulted in short receipt of 1175 M.T. of salt valued at Rs. 1.59 lakhs during 1969-70 to 1971-72.

4.28. The project report stipulated that 32.5 M.T. of salt would be recovered each day from the phenol plant to be reused in the caustic/chlorine plant along with salt purchased. For this purpose a salt recovery unit had been installed (May 1970) within the phenol plant at a total cost of Rs. 23.68 lakhs. But the unit could not be operated to its full capacity due to corrosion and only 1036 M.T. of salt could be recovered during 1969-70 to 1971-72. This was not, however, used in the caustic/chlorine plant. According to the Management the recovered salt was very fine and choked the outlet of the brine saturator. Besides, this salt was considered to be unsuitable for use in the caustic/chlorine plant as it could not be freed of phenol due to process deficiencies. Out of 1036 M.T., 478.970 M.T. were found short during physical verification at the end of each year from 1970-71 to 1972-73 leaving a balance of 557 M.T. which was valued at Rs. 0.44 lakh in the books although it was unusable.

4.29. Engineers India Limited in their report (January 1974) pointed out that the price at which the Company was procuring salt was almost the highest for any caustic soda plant in the country. In view of the very high cost of salt they suggested recovery of salt from phenol plant and reusing it in the plant. They also suggested coastal shipping of salt in bulk from Tuticorin up to Calcutta and thereafter in barges to Durgapur through the D.V.C. Canal, in order to bring down the cost. The Company is yet to implement this suggestion (August 1974).

4.30. The following table indicates that salt consumption has been excessive as compared to the norms :

(Figures are in M.T.)

Year	Actual out put of chlorine	Net actual input of salt	Standard consumption at the rate of 1.8 : 1	Excess consumption	Actual consumption ratio
1968-69	1,573	4,114	2,831	1,283	2.6
1969-70	1,190	4,244	2,142	2,102	3.6
1970-71	1,265	3,756	2,277	1,479	3.0
1971-72	1,622	5,748	2,920	2,828	3.5
1972-73	1,534	7,660	2,761	4,899	5.0

The excess consumption of 12,591 M.T. of salt during the above period involved an extra expenditure of Rs. 16.25 lakhs.

The excess consumption of salt was attributed by the Management (February 1974) to :

- (a) bad condition of the brine filter,
- (b) bad condition of the brine pump,
- (c) handling loss due to damage in salt conveyer belt,
- (d) inferior quality of salt used due to non-availability of good quality salt,
- (e) need for pre-washing for using in production,
- (f) frequent plant shutdowns requiring frequent draining of brine from cells resulting in wastage of salt, and
- (g) frequent shutdowns and start-ups which prevented optimum production conditions to be maintained.

4.31. 737 M.T. of salt valued at Rs. 1.18 lakhs were rejected during 1970-71 and 1971-72 on the basis of analysis report but were ultimately accepted and used in the plant. The grain size of the salt was so fine and the magnesium content so high that it often led to choking of the brine saturator and thereby the brine outflow was gradually minimised.

4.32. The following table indicates that lime consumption has been excessive as compared to the norms :

(Figures are in M.T.)

Year	Net input	Actual output of chlorine	Standard consumption at the ratio of 0.067:1	Excess consumption of lime	Actual consumption ratio
1968-69	363	1,573	105	758	0.55
1969-70	865	1,190	79	786	0.73
1970-71	455	1,265	84	371	0.36
1971-72	653	1,622	108	545	0.40
1972-73	1,247	1,534	102	1,145	0.81
				3,605	

The excess consumption of 3,605 M.T. of lime involved an extra expenditure of Rs. 3.21 lakhs.

The excess consumption was attributed by the Management (April 1974) to :

- (a) frequent and high rate of degassing of chlorine from storage tank and cylinders,
- (b) degassing of storage tank to enable it to receive liquid chlorine as the metering instrument was out of order,
- (c) bad condition of lime strainer,
- (d) poor quality of lime and very low calcium oxide content,
- (e) transmission of higher quantum of gas to hypo section due to low liquefaction efficiency of chlorine,
- (f) diversion of huge quantity of chlorine to lime section due to frequent stoppage and start-up of the plant, and
- (g) degassing of both liquid chlorine and chlorine gas very often to lime section due to bad condition of chlorine pipe-line, chlorine valve and leaky pipe lines.

4.33. A calcium hypochlorite unit (capacity : 1500 M.T. per annum) was installed in April 1968 within the plant to produce calcium hypochlorite containing 50 grams per litre of active chlorine to be used as a bleaching agent and for water purification. The Management stated (April 1974) that the plant was installed in the hope that the product could be sold. As there was no market for calcium hypochlorite the product was being drained out. No assessment could be made of the loss on this account in the absence of records showing the quantity of calcium hypochlorite produced and drained out. Efforts were being made to find out market for the product.

4.34. According to the norms suggested by the Consultants, viz. 0.175 kg. of mercury per M.T. of chlorine, 1.257 M.T. of mercury should have been consumed for production of 7184 M.T. of chlorine during 1968-69 to 1972-73. The actual quantity written off in the accounts on the basis of technical estimate was 5.111 M.T. which worked out to 0.701 Kg. per M.T. of chlorine produced. The excess consumption of 3.854 M.T. of mercury cost the Company Rs. 4.90 lakhs. Engineers India Limited estimated (January 1974) that the Company was incurring an additional expenditure of Rs. 3.10 lakhs a year due to excess consumption of mercury.

4.35. The first test run conducted from 29th April 1968 to 1st May 1968 for an effective duration of 34 hours and 9 minutes had to be interrupted

repeatedly because of power failure and bad quality of salt. During the second test run conducted from 9th May 1968 to 11th May 1968 for an effective duration of 38 hours and 5 minutes further troubles were noticed due to bad quality of salt, trouble in supplies of milk of lime to the hypochlorite plant and in the turbodrier motor. The guarantee test run was satisfactory in the rectifier section and electrolysis section but not in the brine treatment and hypochlorite section. Nonetheless, the plant was taken over by the Company despite the test run having been conducted in two spells for a duration of 72 hours 14 minutes as against a continuous run of 72 hours at full load as required under the contract. Besides, the entire plant was not tested with all the sections working together satisfactorily, which was essential in the case of a chemical plant run on a continuous process. When the plant was taken over, it was understood that Krebs would provide the necessary assistance in rectifying defects; the Company merely wrote to Krebs in January 1972 pointing out that nothing was done by them in this regard.

4.36. In regard to utilities the consumption was excessive as compared to the norms. In the absence of metering arrangements, the Company had no control over the consumption of utilities and the allocation/apportionment of the cost of utilities to different units of the plant was stated to have been made on the basis of technical estimate without approval of the Board of Directors. The consumption as shown in the cost sheets was as follows :

	Consumption norm per M.T. of chlorine	Actual consumption			
		1969-70	1970-71	1971-72	1972-73
Power (KWH)	4,410	3,516	3,768	6,275	6,201
Steam (MT)	Nil	3	3	12	2
Gas (Cubic meters)	110	120	9	15	27

The excess consumption of the utilities (on the basis of allocation) involved an extra expenditure of Rs. 26.30 lakhs.

4.37. In the project report there was no provision for consumption of steam by caustic/chlorine plant, but steam was consumed in the plant since

provision of steam, specially during winter, was considered necessary on technical grounds.

4.38. Though the guarantee tests demonstrated that the plant obtained a consumption rate of power at 3,125 KWH per M.T. of chlorine produced against the contractual figure of 3445 \pm 2.5 per cent, the actual consumption was much in excess. This was attributed by the Management (December 1973) to high voltage of the cells and non-adjustment of the graphite anodes (*vide* paragraph 4.21).

4.39. As per the project report, 27 M.T. of liquid chlorine was required to be produced against every 30 M.T. of caustic soda lye produced daily in the plant. But the production of chlorine was much below this norm as shown in the following table :

(Figures in M.T.)

Particulars	1968-69	1969-70	1970-71	1971-72	1972-73
Rated capacity of:					
1. Caustic Soda lye . . .	10050	10050	10050	10050	10050
2. Chlorine	8910	8910	8910	8910	8910
Actual production of caustic soda	2252	1729	1639	2183	2228
Production of chlorine as per standard ratio of 30 : 27. .	2027	1556	1475	1965	2228
Actual production of chlorine .	1573	1190	1265	1622	1534
Quantity of chlorine produced short/draind out	454	366	210	343	694
Loss of revenue (in lakhs of Rupees)	2.04	1.65	0.95	1.54	3.12

The above table indicates that the Company had produced less or drained out 2067 M.T. of chlorine valued at Rs. 9.30 lakhs and absorbed the same in the milk of lime which resulted in excess consumption of lime also.

4.40. With a view to making this plant to some extent independent of phenol plant, the Expert Committee recommended (June 1973) that some additional balancing equipment should be procured. They suggested immediate attention to be given to concrete structure of the Brine Section and the foundation of turbodrier. But these recommendations are yet to be implemented (August 1974). According to the report of Engineers India

Limited (January 1974), the major bottlenecks in attaining the rated capacity were :

- (i) high voltage across the cells,
- (ii) non-repair and non-maintenance of some major equipment like brine pumps, brine filters turbodriers, etc., and
- (iii) problems related to sales of the product.

Earlier (June 1972) the Management had estimated that Rs. 45.30 lakhs would be necessary to rectify the defects. According to Engineers India Limited, rectification of the defects required an expenditure of Rs. 31.78 lakhs and the expansion of the capacity from 30 to 45 M.T. per day of caustic soda further Rs. 100 lakhs were needed. They also indicated that the plant would earn a gross revenue of Rs. 50.50 lakhs per year before depreciation and tax, if the caustic soda and chlorine could be sold at Rs. 1,425 and Rs. 450 per M.T. respectively (market price in March 1974 was Rs. 1600 and Rs. 450 respectively) and suggested adoption of the following steps for improving the economics :

- (a) to operate the plant independently of the phenol plant,
- (b) to lower the cost of power by obtaining a special concessional rate for power utilised for electrolysis at 4.5 paise per KWH and at 6.5 paise per KWH for rest of the power,
- (c) to utilise fully the inbuilt extra capacity of the plant, and
- (d) to recover salt from phenol plant and use the same in the caustic chlorine plant.

4.41. There was demand for caustic soda lye, flakes and solid in the internal market as well as abroad. Enquiries were received by the Company during 1970-71 to 1972-73 for export of caustic soda flake and solid, but the Company could not meet the demand due to break-down of the caustic fusion plant since February 1970.

4.42. The Expert Committee had observed (June 1973) that increased production of hydrochloric acid could ease out partly the chlorine disposal problem. The Committee also observed that unless the cost of power was reduced, the plant capacity was increased to 45 M.T. of caustic soda per day and the plant was operated within the prescribed norms of consumption of inputs, no profit could accrue from this plant. Engineers India Limited pointed out (January 1974) that most of the caustic soda and chlorine was

meant for captive consumption in the phenol plant and hence the performance of the caustic/chlorine plant suffered due to occasional stoppage or slowing of production in the phenol plant. As caustic soda and chlorine were both in short supply in the country, it was suggested that the Company should make realistic assessment of captive consumption and arrange short term supply contracts to sell the balance.

4.43. As per the project report (June 1964) an annual profit of Rs. 13.45 lakhs was expected from the caustic/chlorine and phenol sections taken together, whereas the profit from the caustic/chlorine plant alone, had it been operated independently of the phenol plant, was assumed to be Rs. 52.92 lakhs. Engineers India Limited in their feasibility report for rectification of defects and expansion of the plant estimated an annual gross profit of Rs. 50.50 lakhs before depreciation and tax. But they also pointed out that even at full capacity and consumption of raw materials and utilities at designed rate, the plant could just break-even after taking into account depreciation and tax. This was because of the high cost of power and the high capital cost (Rs. 484 lakhs) due to the inbuilt extra capacity and other associated factors. They recommended that steps should be taken to negotiate a special rate for power used in electrolysis, specially in view of intended expansion and the high power factor and load factor in such plants. The economics were also expected to improve if the plant capacity was expanded to 75 M.T. per day, provision for which already existed. As an immediate measure, they suggested expansion of the capacity to 45 M.T. per day which required the acquisition of only a rectifier transformer costing about Rs. 25.47 lakhs. As already indicated (in paragraph 2.3) the Company obtained (April 1973) a loan of Rs. 1 crore from their bankers for financing the first phase expansion of the plant.

C. Phenol Plant

4.44. Chloro-benzene is produced by reacting chlorine with benzene and then it is turned into phenol with the reaction of caustic soda. Chlorine and caustic soda are obtained from the caustic/chlorine plant. Other by-products like para-dichlorobenzene are also obtained. Salt, another by-product, was intended to be recovered and used in the caustic/chlorine plant. The plant has the following five units:—(a) phenol distillation, (b) phenol high pressure, (c) mono-chlorobenzene, (d) salt recovery, and (e) residue recovery unit.

4.45. The annual rated capacity of 6600 M.T. of synthetic phenol was based on a daily output of 20 M.T. for 330 days in a year. But the

plant has not been able to achieve even 15 per cent of its rated capacity so far. The table below indicates the actual production of synthetic phenol and other secondary products during 1969-70 to 1972-73 :

Product	Actual production (In M.T.)	Percentage of production to rated capacity.
1	2	3
<i>Phenol (rated capacity—6600 M.T.)</i>		
1969-70	745	11.3
1970-71	366	5.5
1971-72	455	6.9
1972-73	702	10.6
<i>Para-dichlorobenzene (rated capacity—330 M.T.)</i>		
1969-70	4	1.2
1970-71	12	3.6
1971-72	31	9.4
1972-73	37	11.2
<i>Ortho-dichlorobenzene (rated capacity—190 M.T.)</i>		
1970-71	12	6.3
1971-72	15	7.9
1972-73	23	12.1
<i>Ortho-oxidiphenyl (rated capacity—270 M.T.)</i>		
1970-71	1	—
1971-72	15	5.5
1972-73	8	2.9

	1	2	3
<i>Para-oxidiphenyl (rated capacity—135 M.T.)</i>			
1971-72		5	2.0
1972-73		3.7	1.5
<i>Diphenyl-oxide (rated capacity—198 M.T.)</i>			
1969-70		29	1.4
1970-71		10	5.0
1971-72		38	19.2
1972-73		31	15.6

4.46. The Management attributed the shortfall in production to the following :

- (a) Defects, deficiencies and imbalances suffered by the plant from its very inception. The mono-chlorobenzene unit failed during start-up in July 1968 due to defective material used in construction. The other units of the plant, which were tried one after the other by the Consultants also failed to run smoothly due to defective construction, design defects, faults in the pipeline, etc. The series of failures were persisting even after the plant was taken over in May 1970 after guarantee tests and trial runs.
- (b) Damage to pneumatic instruments and pipe-lines due to infiltration of chlorine following a strike by employees in August 1970. As a result, the plant was being operated by manual controls.
- (c) Absence of a strong managerial team.
- (d) Perpetual operational difficulties and non-availability of sufficient feed-stock (particularly benzene), power and steam.

4.47. The Consultants did not conduct the guarantee tests and trial runs by running all the units and sections of the plant as an integrated plant. This, according to the Management and the Engineers India Limited, resulted in the plant being taken over without ironing out all the short-comings and defects. Though the Consultants had agreed (May 1970)

to rectify the defects and failure and render other assistance to ensure steady production, nothing was done by them in this regard. The Company had no further hold on the Consultants to enforce this agreement because there was no provision in the Engineering Contract.

4.48. The annual rated capacity was based on 330 working days in a year which implied a down-time of 9.6 per cent. The following table shows that the actual down-time amounted to over 70 per cent :

Reasons	(In hours)		
	1970-71	1971-72	1972-73
General maintenance	120	412	720
Shortage of steam	720	—	2370
Strike	672	—	—
Mechanical trouble	600	1186	1988
Non-availability of feed-stock	5712	1440	1207
High level in acid stock tank	—	3230	—
Total down-time during the year	7824	6268	6285
Down-time as a percentage of total plant hours*	89.3	71.5	71.7

*Plant hours calculated on the basis of three shifts working for 365 days.

4.49. The above table indicates that the idle plant hours during 1970-71 were mostly on account of non-availability of feed-stock, viz., chlorine, caustic soda and benzene. Chlorine and caustic soda were being produced in the caustic/chlorine plant and, as stated earlier, the working of the caustic/chlorine plant was affected owing mainly to difficulty about disposal of chlorine. The stock record showed no shortage of benzene as such during the year, but getting benzene of the required quality, viz., pure nitration grade with sulphur content not exceeding 0.03 per cent, was difficult.

4.50. During 1971-72 the idle plant hours were mostly due to inadequate storage space for acid in the storage tank (52 per cent), non-availability of feed-stock (23 per cent), and mechanical/instrument failures (19 per cent). During 1972-73, the mechanical/instrument failures accounted for the bulk of the down-time (32 per cent). As already

indicated in paragraph 4.20, the overall condition of the instrumentation in the entire plant was unsatisfactory due to ingress of chlorine in August 1970, the loss having been estimated to be Rs. 15.84 lakhs.

4.51. The Expert Committee observed (June 1973) that inadequate maintenance was partly responsible for the poor condition of instruments and recommended an improvement in the standard of maintenance. The experts from the Fertiliser Corporation of India and Krebs, who visited the plant in April/May 1972, came to similar conclusions and recommended complete replacement of the damaged instruments and certain measures to improve the standard of maintenance. The recommendations have not been implemented so far (August 1974). However, Rs. 2 crores were earmarked (April 1973) for modernisation/rectification schemes for replacement of the instruments.

4.52. The guarantee tests conducted by the Consultants during July 1968 to May 1970 indicated that consumption of benzene was 1150 Kg. as against the contractual figure of 1100 Kg. per M.T. of phenol produced. The norms prescribed in the project report for consumption of inputs were 1.1 M.T. of benzene, 1.2 M.T. of caustic soda lye (100 per cent concentration) and 1.1 M.T. of chlorine for every M.T. of phenol produced. Actual consumption of those materials was, however, much in excess of the norms and the excess of consumption in the phenol plant had cost the Company Rs. 38.49 lakhs during the last four years as shown below :

		(In M.T.)			
		1969-70	1970-71	1971-72	1972-73
1		2	3	4	5
Actual output of phenol	. . . .	745	366	455	702
<i>Benzene</i>					
Actual consumption	. . . .	1654	697	1086	1471
Standard consumption at 1.1:1	. . . .	820	403	501	772
Actual input/output ratio	. . . .	2.2	1.9	2.4	2.1
Consumption in excess of norms	. . . .	834	294	585	699
Cost of material consumed in excess (Rupees in lakhs)	. . . .	6.89	2.01	3.77	5.22

	1	2	3	4	5
<i>Caustic soda</i>					
Actual consumption		2057	501	565	1174
Standard consumption at 1.2:1		894	439	546	842
Actual input/output ratio		2.8	1.4	1.2	1.7
Consumption in excess of norms		1163	62	19	332
Cost of material consumed in excess (Rupees in lakhs)		10.89	0.60	0.20	3.69
<i>Chlorine</i>					
Actual consumption		1190	475	801	1189
Standard consumption at 1.1:1		820	404	500	772
Actual input/output ratio		1.6	1.3	1.8	1.7
Consumption in excess of norms		370	71	301	417
Cost of material consumed in excess (Rupees in lakhs)		1.67	0.32	1.35	1.88

4.53. According to Engineers India Limited, the high rate of consumption was due to non-operation of the dephenolisation section of brine and the high losses of phenol along with by-products and hydrochloric acid. A report by the Deputy Production Manager (July 1973) indicated that in normal running conditions, the plant was getting only 6.9 M.T. of phenol by charging 11.5 M.T. of benzene, 13.2 M.T. of caustic soda lye (on 100 per cent basis) and 11.6 M.T. of chlorine. On this basis the extent of excess consumption of materials was well over 50 per cent as shown below :

(In Kilogrammes)

Input	Standard consumption per M.T. of phenol	Actual consumption	Excess consumption as a percentage over norm
Benzene	1100	1667	51.5
Caustic soda	1200	1913	59.4
Chlorine	1100	1681	52.8

4.54. The Management stated (July 1973) that the excess consumption was the result of the following factors :

- (a) Failure of the Ratio Controlling Instrument which controls the ratio of monochlorobenzene and caustic soda in the emulsion going to the high pressure pump, owing to which the Company was getting only 130 to 140 gms. of phenol per litre of the reaction mixture against the norm of 180 gms. As a result, more diphenyl oxide is produced at the expense of phenol. As per project report raw diphenyl oxide should be produced at 2 per cent of phenol. Against this, raw diphenyl oxide was produced to the extent of 24 to 25 per cent of phenol. The consequent loss of production of phenol was assessed to be about 1.4 M.T. for every 10 M.T. of phenol produced.
- (b) As the salt recovery section was not functioning the Company was forced to drain out brine, which contained 1 per cent phenol and 20 per cent salt. The loss due to such draining was assessed by the Management to be about 1 M.T. of phenol for every 10 M.T. of phenol produced, apart from the loss due to non-recovery of salt (*vide* paragraph 4.57).
- (c) The phenol residue recovering section of the plant, installed at the cost of Rs. 49.46 lakhs, was not working since May 1970 because of lack of steam. As a result, the phenol content (30 per cent) and oxidiphenyl (55 per cent) could not be recovered by distilling. Non-working of this section also led to a loss of recoverable phenol and oxidiphenyl valued Rs. 7.15 lakhs during 1970-71 to 1972-73. The loss of phenol on this count was estimated by the Management to be about 0.7 M.T. for every 10 M.T. of phenol produced.

4.55. Apart from these there were losses from leakage of joints and tubes due to corrosion, vent losses and evaporation losses which had upset the economics of running the plant. The Deputy Production Manager had also reported (July 1973) to the Board of Directors that if the recommendation of the Expert Committee had been implemented (*vide* paragraph 4.51) these losses could have been minimised. According to the Management (April 1974) damage of ratio controlling instrument and density meter coupled with the problem in dephenolisation of brine

accounted for high consumption of caustic soda lye. Excess consumption of chlorine was stated (April 1974) to be partly due to formation of higher chlorinated products and partly due to the problem of dephenolisation of brine.

4.56. There was no effective control over the consumption of utilities as there was no metering arrangement. The allocation/apportionment in the cost sheets showed excess consumption over the norms fixed in the project report, resulting in an extra expenditure of Rs. 17.67 lakhs during 1970-71 to 1972-73 as shown below :

Utilities	Normal consumption	Actual consumption per M.T. of phenol produced		
		1970-71	1971-72	1972-73
<i>Power</i>				
(KWH)	725	5733	1892	936
<i>Steam</i>				
(M.T.)	5	29	37	37
<i>Gas</i>				
(Cubic metres)	1050	686	3629	4954

4.57. As stated in paragraph 4.28, the salt recovery unit remained shutdown almost since start-up. As a result, 8942 M.T. of brine water containing 1 per cent phenol and 20 per cent salt were drained out during the period April 1970 to December 1973 involving a loss of Rs. 5.5 lakhs representing the cost of recoverable materials.

4.58. The Expert Committee recommended (June 1973) the following steps to set right the salt recovery section :

- (a) replacement of the tube bundles in the vapour condenser, the vapour condenser of the second effect evaporator, the condenser head tank and the seal pot, which were all badly corroded,
- (b) replacement of the evaporator circulating pump, slurry pump, condensate pump, the brine pump and the centrifuge feeding device including the electric motor, and
- (c) replacement of defective and corroded piping and valves.

The Expert Committee were of the view that corrective measures should be taken immediately to avoid further damage to the plant and equipment. But these recommendations were not implemented up to August 1974.

4.59. The Management stated (April 1974) that the salt recovery unit was not being operated due to shortage of steam and that it was planned to put the unit into operation as soon as steam became available after the new boilers were installed.

4.60. The Engineers India Limited pointed out (January 1974) that the salt recovery section required major capital investment for line-up since there had been considerable damage due to corrosion during the long period the plant was lying idle without maintenance.

4.61. The experts from Fertiliser Corporation of India and Krebs, who visited the plant in April-May 1972 had also highlighted the unsatisfactory condition of the plant due to lack of regular preventive maintenance and cleaning. The Management estimated in June 1972 that Rs. 55.08 lakhs were necessary to rectify the defects in the phenol plant and provide for modifications and additions including a buffer stock of spares valued at Rs. 11 lakhs. The Management stated (April 1974) that the defects and imbalances in the plant were being rectified.

4.62. Even according to the project report, the phenol plant was not an economic proposition. The caustic/chlorine plant and phenol plant, taken together, were expected to earn a profit of Rs. 13.43 lakhs a year, whereas the caustic/chlorine plant alone was expected to earn Rs. 52.92 lakhs a year had it been operated independently of the phenol plant. The Directors' Committee which considered the project report in June 1964 had apprehended that the production process adopted would be more expensive in initial outlay than other modern processes. The Enquiry Committee also observed that the proposal for a phenol plant with caustic soda as raw material should not have been accepted and that the Company was losing a major part of the profit produced in the caustic/chlorine plant by producing phenol and other secondary products. In order to reduce these losses, the Consultants included, at the cost of Rs. 32.34 lakhs, a plant for producing pentachlorophenol using phenol as the raw material. As indicated in paragraphs 4.66 to 4.68, this plant remained idle due to lack of demand for pentachlorophenol.

4.63. The Plant Management, which considered that the phenol plant was mainly responsible for the heavy losses incurred by the Company, proposed in May 1973 that only the monochlorobenzene section should be operated and the rest of the plant should be shut down. But the Board of Directors decided (June 1973) that pending identification of reasons for wastage of caustic soda and benzene, at least 100 M.T. of saleable monochlorobenzene and 50 M.T. of phenol should be produced per month as that would not only assist the disposal of chlorine but also earn some revenue. Engineers India Limited reported (January 1974) that the Company would incur a loss of Rs. 101.57 lakhs a year if the plant was completely shut down, and that there would be practically no reduction in losses if the plant operated at the existing high consumption levels and produced 7 M.T. of phenol per day. The loss could, however, be reduced to Rs. 64.11 lakhs if it could achieve consumption of raw materials and utilities at designed rates. It was considered worthwhile to run the plant by improving its operation in order to avoid damage to equipment due to non-operation.

4.64. The phenol plant needs benzene of pure nitration grade with sulphur content not exceeding 0.03 per cent. At the time of the setting up of the plant it was envisaged that benzene obtained from the coke oven plants of the Durgapur Projects Limited and other coke oven plants in the vicinity, would be utilised. However, the benzene from the Durgapur Projects Limited was not suitable because of its high sulphur content. Benzene from the Durgapur Steel Plant (Hindustan Steel Limited) was considered suitable, but the Hindustan Steel Limited intimated in January 1972 that it would not be able to supply as it was intended to use benzene as fuel in its own plants. Engineers India Limited in their report of January 1974 pointed out that the moisture content of benzene supplied by Hindustan Steel Limited was high which resulted in serious corrosion and equipment failure in the chloro-benzene section. This was not considered by the Management up to that time. The Management is examining the possibility of reduction in the sulphur content in the benzene supplied by the Durgapur Projects Limited (August 1974).

D. Pentachlorophenol Plant

4.65. Pentachlorophenol is produced by the reaction of chlorine and phenol in a nickel reactor with hydrochloric acid as a by-product. The plant (Cost : Rs. 32.34 lakhs) was put into commercial operation in June 1969.

Against the rated capacity of 990 M.T. per annum, the plant produced only 129 M.T. during June 1969 to March 1973, as indicated below :

Year	Actual production (M.T.)	Percentage of production to rated capacity
1969-70	113	11.41
1970-71	—	—
1971-72	—	—
1972-73	16	1.61

4.66. Since April 1970, the plant remained completely idle, except for producing only 16 M.T. in 1972-73. Poor demand of the product was stated by the Management to be the reason for idleness of the plant. The product was, therefore, further processed into sodium pentachlorophenate as and when there was demand for the same. Out of the total production of 129 M.T. of pentachlorophenol, 7 M.T. were sold up to 1972-73, and 112 M.T. were converted into 114 M.T. of sodium pentachlorophenate of which 98 M.T. were sold.

4.67. This plant was included in the project report in order to reduce the loss incurred by the phenol plant. It was anticipated that a profit of Rs. 25.18 lakhs per year would be earned from the pentachlorophenol plant. Engineers India Limited, however, pointed out that the plant would break-even if it was run at 39 per cent of its capacity. They also indicated that the plant could earn a gross income of Rs. 27.43 lakhs per year before depreciation and tax, if market for the product could be developed and the product sold at Rs. 7000 per M.T. (the market price in March 1974 was Rs. 8,400). They stated that there was possibility to develop the market, specially for wood preservation, weedcides and for water treatment, etc.

4.68. As no market for the product could be found in India, the Management decided in 1969-70 to explore possibilities of export with the help of the Export Promotion Council, D.G.T.D. and other exporting houses. But no concrete results could be achieved. The purpose of investing about Rs. 32.34 lakhs on the plant has not so far been achieved.

4.69. The plant could also produce 2 M.T. of hydrochloric acid of commercial grade (33 per cent concentration) per day. As this acid

could only be used in pickling and metallurgical industries, its disposal has been posing a problem since consumers are stated to be hesitant to use the acid produced in the pentachlorophenol plant.

E. Idle plant and machinery

4.70. The table below indicates the major items of plant and machinery which were lying idle for a long time :

Name of the plant	Date from which lying idle	Value (Rs. in lakhs)	Remarks
1. Phenol residue recovery plant	1970-71	49.46	The unit was installed within the phenol plant to distil fully the phenol and other by-product content in phenol. The unit could not be run due to shortage of steam (<i>vide</i> paragraph 4.54)
2. Pentachlorophenol plant	April 1970	32.34	The plant installed in June 1969 has been lying idle since April 1970 for want of market for the product (<i>vide</i> paragraph 4.66)
3. Salt recovery plant	May 1970	23.68	The plant was installed within the phenol plant to recover salt from brine water for re-use in the caustic chlorine plant. The plant could not be run due to corrosion of various parts (<i>vide</i> paragraph 4.28)
4. Caustic fusion plant	February 1970	19.04	The plant was installed within the caustic chlorine plant for production of caustic soda solid and flakes (<i>vide</i> paragraph 4.17)
5. Sulphuric acid concentration plant	April 1968	10.60	The plant was installed within the caustic/chlorine plant to re-concentrate the diluted acid. Since inception no weak sulphuric acid has ever been reconcentrated because only one out of the three turbo-driers was functioning due to failure of the lead lining and the shaft and cone of the rotating basket. This plant was not covered by the guarantee of Krebs.

Name of the plant	Date from which lying idle	Value	Remarks
		<i>(Rs. in lakhs)</i>	
5. Sulphuric acid concentration plant (contd.)	April 1968	10.60	During April 1967 to March 1972, the Company had to purchase 460 M.f. of sulphuric acid valued at Rs. 1.53 lakhs to meet its requirements.
6. Drum making plant	March 1965	6.96	The plant procured in March 1965 was not installed at all as the Management considered (August 1964) that the scheme was not economically viable.
7. Econo-veyor	January 1968	0.47	The plant was purchased for the purpose of handling naphthalene in the phthalic anhydride plant. The plant could not be run due to inferior quality of dogchains and excessive wear and tear of the trolley wheel. In August 1969 the Management ascertained that the handling of naphthalene by the equipment was more expensive. Repairs of the equipment were, therefore, abandoned.

5. Manpower and organisational set-up

5.1. Organisation

The Board of Directors consist of a Chairman, a Director/Chief Executive Officer and 10 Directors. In terms of the Articles of Association, one Director was to be nominated by each of the two private sector companies mentioned earlier. The relevant provision was, however, modified in August 1969 and thereafter all the Directors are being appointed by the Government.

5.2. The executive functions of the Company are being carried out by the following principal officers :

- | | |
|--------------------------------------|---|
| (1) Director/Chief Executive Officer | Day to day functional responsibility of the Company. |
| (2) Secretary | Secretarial functions, local management at Calcutta and to keep liaison between the Company and the Government. |
| (3) General Manager (Works) | Local management at Durgapur and production. |
| (4) Controller of Finance | Accounts, budget, finance and internal audit. |

In addition, a Committee of Management comprising 5 members of the Board of Directors was constituted in February 1973 to look after implementation of Board's policy directives and other important matters. Besides, there are executives to look after the following branches :

- (i) Production, (ii) Maintenance, (iii) Material Management, (iv) Sales and Commercial, and (v) Laboratory.

5.3. The Expert Committee stated (June 1973) that one of the main reasons for the Company's problems was that during the planning and execution stage of such a complex chemical project, there was no strong project engineering organisation. The Committee was of the view that unless immediate measures were taken to strengthen the organisation and have a proper administration to ensure efficiency at all levels, the proposed programme of rectification/modification/expansion, even after successful implementation, would not have any permanent impact on production and viability of the Company.

5.4. The Consultants had furnished a "Factory Management Organisation Chart" for running of each section of the factory, including ancillary services. After scrutinising the chart, the Management considered (June 1964) that the organisation suggested by the Consultants was inadequate for proper running of the entire Plant. The Enquiry Committee could not go into the organisational aspect in depth but recommended (August 1967) that the staff pattern suggested by the Consultants should be followed and that no further additions made under any category until a full study was carried out. Such a study has not, however, been carried out.

5.5. The table below indicates the strength of staff recommended by the Consultants, the staff re-assessed and approved by the Board in June 1964 and the actual staff strength as on 31st March of the last three years ending 1972-73 :

Category	Staff recommended by Consultants (March 1964)	Strength approved by the Company (June 1964)	Actual staff strength		
			As on 31st March		
			1971	1972	1973
Technical	406	602	769	769	743
Non-technical		104	155	160	169

5.6. In the project report the requirement of manpower was assessed on the basis of an annual turnover of Rs. 70,436 per man engaged on production. The manpower was re-assessed in June 1964 on the basis of an annual turnover of Rs. 49,668 per employee. The average turnover, however, was less than these expectations as would be seen from the following table :

	1970-71	1971-72	1972-73
Sale value of production (Rupees in lakhs)	130.95	114.30	81.47
Total number of employees in position	924	929	912
Average turnover per employee (Rupees)	14,172	12,304	8,934
Number of employees engaged on production	769	769	743
Average turnover (Sale value of production per employee on production in rupees)	17,028	14,864	10,966

5.7. A Production Bonus Scheme was introduced from 1st June 1970. Under this scheme, production bonus became due when production reached 36.4, 38, 38 and 45 per cent of the rated capacities of the phthalic anhydride, caustic/chlorine, phenol and pentachlorophenol plants respectively. However, a minimum bonus of Rs. 20 per month was payable even when the production fell below the prescribed base.

5.8. The base points in the bonus scheme were not fixed with reference to standard production, standard hours, etc. The following observations were made by the Cost Auditors in April 1972 on the bonus scheme :

- (a) The base point of incentive scheme had poor correlation with the efficiency of the plant capacity. Thus, it served neither the objective of profit sharing scheme nor did it adhere to the principle of payment by results.
- (b) Break-even point should have received due consideration in formulating the scheme. The minimum bonus of Rs. 20 per month was paid even when the plant operated below break-even point or even when remaining fully idle/closed.
- (c) The scheme failed to ensure productivity. On the contrary, it increased the fixed cost as the bonus scheme fell in line more with the idea of attendance bonus.

5.9. The expenditure on account of overtime during the three years up to 1972-73 is shown below :

	1970-71	1971-72	1972-73
Expenditure on salaries and wages (Rupees in lakhs) .	34.74	39.95	44.74
Expenditure on overtime (Rupees in lakhs) . . .	4.27	6.76	7.71
Percentage of overtime to salaries and wages . . .	12.3	16.9	17.2

5.10. The table given below indicates the incidence of expenditure on salaries and wages and overtime payments against the value of production achieved during the three years ending 1972-73. Although there was a slump in production during 1971-72, the expenditure on salaries and wages was higher than that in 1970-71. As a result, the percentage of expenditure on salaries and wages to the value of production was 68.9 against 42.9 in 1970-71. Simultaneously, the overtime payments also increased to 11.6 per cent of the value of production in 1971-72 against 5.3 per cent during 1970-71. With the improvement in production during 1972-73 the percentage of salaries and wages came down to 53.3, although the

expenditure was higher than that in 1971-72. Similarly, the expenditure on overtime payments was also higher in 1972-73.

	1970-71	1971-72	1972-73
	(Rupees in lakhs)		
Value of production	81.02	58.11	84.13
Expenditure on salaries and wages	34.74	37.95	44.74
Salaries and wages as percentage of value of production	42.9	68.9	53.3
Expenditure on overtime	4.27	6.76	7.71
Overtime payment as a percentage of value of production	5.36	11.6	9.1

6. Purchases and Inventory control

6.1. The Company has not prepared any Purchase Manual nor laid down a well set purchase procedure, though it was stated (May 1973) that the Committee of Management would evolve a purchase procedure very shortly. In practice, purchases of value above Rs. 25,000 each are being made on the basis of open tenders and after obtaining approval of the Committee of Management.

6.2. The main items of purchase are salt, naphthalene, benzene, coal and packing materials. Naphthalene and benzene are purchased from Durgapur Projects Limited and Hindustan Steel Limited at prices mutually agreed upon, but no long-term contracts have been entered into since the phthalic anhydride plant is yet to achieve production at any sustained level. The average purchase prices were as under :

Year	(Price per M.T.)	
	Benzene	Naphthalene
	Rs.	Rs.
1969-70	826.48	1631.28
1970-71	684.18	729.95
1971-72	643.52	828.34
1972-73	746.82	1263.16

6.3. Coal is obtained from the Coal Mining Authority Limited at their prices fixed for different grades. Earlier, purchases were made on the basis of limited tenders invited from collieries and agents. As regards salt, purchases are normally made on the basis of advertised tenders except for emergent local purchases. The average prices paid were as under :

Year	Price per M.T.	
1968-69	Rs. 147.40	Prices have been taken from the physical verification report.
1969-70	Rs. 92.19	
1970-71	Rs. 162.46	
1971-72	Rs. 79.68	
1972-73	Rs. 158.58	

6.4. The following persisting deficiencies were noticed during audit of store records and accounts :

- (1) The minimum, maximum and re-ordering level of stores and spares were not fixed.
- (2) The Company did not compile any Stores Manual.
- (3) No material budget based on production schedule and preventive maintenance schedule for the Company as a whole was prepared, nor did each section/plant submit a comprehensive indent of material required by it.
- (4) The stores items were not analysed agewise or valewise for effecting cost reduction and inventory control. This resulted in an accumulation of non-moving and slow-moving items valuing about Rs. 11.35 lakhs, out of a total stores holding of Rs. 49.05 lakhs, as on 31st March 1973, as indicated below :

	Value (Rupees in lakhs)
(a) Stores which did not move for three years or more	6.75
(b) Stores which did not move for two years or more but less than three years	1.41
(c) Stores which did not move for one year or more but less than two years	3.19
	11.35

The internal auditors reported (November 1973) that the physical stock position as on 31st March, 1973 included 307 items of stores which could not be evaluated for want of rates.

- (5) No bin cards were maintained. The numerical ledgers were discontinued from 1st April, 1972. There were approximately 10,000 items of stores and because of the non-maintenance of numerical ledgers reconciliation of the priced stores ledgers with the numerical ledgers was not possible. Stores accounting for 1973-74 was in arrears for about 6 months up to the date of audit (March 1974).
- (6) There was no proper storage system, with the result that the materials were exposed to weather and risk of deterioration. Naphthalene had been stored in the open ground during 1967-68 and 1968-69 due to non-availability of covered space and about 107 M.T. (value Rs. 1.75 lakhs) were found short during physical verification in 1969-70. As the salt storage building was also open on all four sides and the floor level of the building was much lower than that of the surrounding area appreciable quantities were being washed by rain water. The Management stated (February 1974) that a proposal for rectifying this defect was under consideration.
- (7) Finished products were not physically handed over by production sections to store, but entries in the stores account were made on the basis of report from the plants.
- (8) No account was maintained for plant and machinery and imported spare parts. Imported spares valued at Rs. 381 lakhs were directly booked to fixed assets at the construction stage. Spares valued at Rs. 16 lakhs supplied by the Consultants with the original plant and machinery to serve as two years' requirements were also not accounted for. The internal auditors submitted in June 1969 a list of imported spares found in the stores and with various plants during physical verification, but bin cards or stores accounts in respect of the items

had not been maintained. No accounts were maintained in respect of spares valuing about Rs. 19.50 lakhs imported since August 1970.

The Management stated that records in respect of imported spares could not be maintained since the materials were located at different site stores attached to individual plants. The Consultants, who were asked for the reasons for non-maintenance of records of imported spares, informed the Management in July 1968 that the list of spares was an exhaustive one covering innumerable items and since many items had been damaged or stolen during and after erection, these were immediately replaced from the existing stock of spares to complete the job. It was, thus, difficult for them to indicate as to how many such items had been additionally used. They also added that because of modification/revision of piping layout during erection, additional items of piping/fittings had been utilised from the stock of spares thereby reducing the quantity of spares originally supplied. The Expert Committee also pointed out (June 1973) that the Company had no spares procurement policy and spares were obtained without any programme. The Committee also observed that in a plant of that type, special care should have been taken to keep vital spares always available at hand and quite a few of the problems of damage to equipment and frequent break-downs could well be attributed to absence of any objective policy of procurement of spare parts.

- (9) No physical verification of spares including imported spares, stores materials including materials with fabricators, mercury and chlorine cylinders was carried out. Physical verification of mercury was stated to be in progress (April 1974).
- (10) Physical inventory of civil and consumable stores and raw materials taken by a firm of Chartered Accountants at the end of the period 1968-69 to 1972-73 revealed both shortages and excesses, and were transferred to the 'Stores Adjustment Suspense Account' pending investigation. The net effect of shortages (Rs. 10.73 lakhs) and excess (Rs. 0.04 lakh) till the end of 1972-73 was transferred to the suspense account.

6.5. The following table indicates the comparative position of the inventory and its distribution at the close of each of the last three years :

(In lakhs of rupees)

Value at the end of

Particulars	1970-71	1971-72	1972-73
Raw materials	7.27	7.41	6.94
Stores and spare parts including material with fabricators	25.50	42.16	49.05
Work-in-process	15.78	5.81	20.36
Finished goods	10.85	30.99	18.98
	59.40	86.37	95.33

Stock of raw materials at the close of 1972-73 was equivalent to 2.4 months' consumption as compared to 3.4 months' consumption in 1971-72 and 2.2 months' consumption in 1970-71.

The work in process at the end of 1972-73 represented 2.9 months' value of production at cost as against 1.2 months' and 2.3 months' during 1971-72 and 1970-71 respectively.

The finished goods represented about 2.8 months' sales during 1972-73 as compared with 7.8 months' and 1.2 months' sales during 1971-72 and 1970-71 respectively.

Shortages of finished products

6.6. Physical verification conducted during 1970-71 to 1972-73, showed the following excesses and shortages of various finished products. The value of net shortages (Rs. 37.78 lakhs) was written off in the accounts

of the respective year without any investigation and orders of the competent authority.

Product	Quantity found		Value of net shortage (Rupees in lakhs)
	Excess (in M.T.)	Short	
Phthalic anhydride	0.958	79.419	4.56
Caustic soda lye	53.272	148.192	0.89
Chlorine	70.970	566.137	2.23
Caustic soda flakes	Nil	2.221	0.03
Hydrochloric acid	353.190	1854.798	3.38
Synthetic phenol	1.332	50.480	1.59
Monochlorobenzene	80.303	718.756	18.75
Diphenyl oxide	Nil	14.185	1.32
Phenol residue	Nil	38.738	0.39
Para-dichlorobenzene	4.132	6.473	0.08
Para-oxidiphenyl	7.196	8.547	0.06
Pentachlorophenol	Nil	64.613	4.50
			37.78

The Board of Directors had set up (September 1971) a sub-committee to institute a thorough investigation into the matter. The investigation has not yet been completed (August 1974).

Shortage/loss of mercury

6.7. 2.5 M.T. of mercury were poured into each of the 18 cells of the caustic/chlorine plant when it was commissioned. The General Manager reported in December 1973 that only 16 of the 18 cells were in operation and the other two cells were not having any mercury. There was thus a loss of 5 M.T. of mercury valued at Rs. 6.36 lakhs. When four cells were opened in March 1969 and December 1970, 0.592 M.T. of mercury valued at Rs. 0.75 lakh was found short. Out of this, 0.337 M.T. valued at Rs. 0.43 lakh was suspected by the Management to have been stolen. The Management stated (December 1970) that the matter was under investigation and that necessary adjustment would be made after physical verification during 1971-72. No such verification was completed upto April 1974 nor was the shortage investigated.

6.8. The Expert Committee had recommended (June 1973) that a 250 Kg. weighing device should be placed in the mercury cell room to facilitate weighing during cell maintenance, and the installation of the distillation unit for distilling mercury butter from the cells should be expedited. These recommendations are yet to be implemented (August 1974).

6.9. The Management stated (February 1974) that security measures were being taken to the extent practicable and that efforts were being made to post CISF personnel. Actual weightment of mercury in the cells was also stated to be in progress.

7. Marketing and sales

7.1. The Company is marketing its own products and has no selling agency or authorised distributors. Since the Company's products have to compete with those of other producers and imported products, the selling prices are fixed, according to the Management, on the principle of "what the traffic can bear". The marketing policy initially adopted required sales to be made to actual users in the State, preferably small sector units followed by other industrial units in the State, industries in other States and to traders.

7.2. Due to liberal imports of phthalic anhydride, disposal of indigenous material became extremely difficult since July 1971. Therefore, the Company lowered the selling price of the product from Rs. 5800 to 4500 per M.T. with effect from 15th September 1971. In spite of this, sales did not pick up as the imported material was cheaper. There was an accumulation of 350 M.T. of phthalic anhydride at the end of 1971-72 and the Directors' Report for 1971-72 indicated that the plant had to be shut-down for about a year due to complete capture of the home market by the imported material. The prolonged shut-down resulted in loss of production of nearly Rs. 1 crore.

7.3. In April 1972 the Board of Directors, considering that the prevailing downward trend in price of phthalic anhydride was a purely temporary phenomenon, decided to dispose of the accumulated stock after allowing discount upto a maximum of 10 per cent on the existing price to bulk consumers. A manufacturing unit of Calcutta offered to lift 350 M.T. out of the accumulated stock and further 300 M.T. from current production at Rs. 4,100 per M.T. to be delivered at their godown at

Dum Dum with 45 days credit against a letter of credit which they were enjoying since inception. The contract was entered into in May 1972. As the customer failed to lift the material as per the delivery schedule, there was further accumulation of stock of 270 M.T. (approximately). To avoid deterioration in the quality of the product, to maintain the level of production and also to meet the financial stringency, the Company entered into a contract in December 1972 with a trader for an *ad hoc* sale of 300 M.T. at Rs. 4,000 per M.T. ex-works and further 2000 M.T. during the two years period commencing from 1st February 1973 at 80 to 100 M.T. per month at Rs. 4,500 per M.T. less 6 per cent discount. The purchaser deposited the full payment in advance of Rs. 12 lakhs against the *ad hoc* order for 300 M.T. and lifted 158.2 M.T. upto January 1973. In the meantime, because of better demand for the product, the Company raised the price from Rs. 4500 to Rs. 5800 with effect from 15th February 1973 and informed the purchaser accordingly on 23rd February 1973. The long term contract was cancelled.

7.4. The selling price per M.T. of phthalic anhydride fixed by the Company from time to time was as follows :

	Rate per M.T.
	----- Rs.
With effect from—	
25th January 1968	6500
6th April 1968	6250
16th April 1971	5800
15th September 1971	4500
15th February 1973	5800
3th May 1973	6800
17th July 1973	9500
17th January 1974	11500
7th March 1974	18500

The Company had stated that pricing was being done on the principle of "what the traffic can bear". However, there appeared to be no definite arrangement under which it could keep itself informed of the prices fixed

by other competitors. The selling prices fixed during 1972-73 and 1973-74 were found to be lower than the rates quoted in the Bombay market.

In reply to an enquiry from the Government regarding the possibility of increasing the selling price of phthalic anhydride, the Company informed Government (May 1973) that the then selling price Rs. 6800 per M.T. was based on 60 per cent utilisation of plant capacity, current wages and other expenses and a reasonable profit. With better plant utilisation to the extent of 80 per cent the profitability was anticipated to increase further. However, the actual production during 1972-73 and 1973-74 was only 13.52 per cent and 48.9 per cent of the rated capacity. Thus, the selling price was fixed not on the basis of actual performance even though the ruling market price was higher and the Company as a whole was incurring heavy loss.

7.5. In February 1974 it was brought to the Company's notice by Audit that during December 1972 to January 1974, the Company had lost approximately Rs. 124 lakhs in sales income due to fixation of selling prices much less than the ruling market prices. Thereafter the price was enhanced to Rs. 18,500 in March 1974, but even then it was lower than the ruling market price of Rs. 22,000 per M.T. as reported in the Chemical Weekly.

7.6. Upto March 1973 the Company sold 5467 M.T. of caustic soda lye, the selling prices having been revised as under from time to time.

	Prices (Rupees per M.T.)
Upto 14th September 1971	936
From 15th September 1971	972
15th October 1971	1050
15th February 1973	1110
2nd April 1973	1425

It appeared, however, that prices quoted by other competitors were much higher. For example, in June 1968, the competitors' price ranged from Rs. 1,050 to Rs. 1,120 per M.T.

7.7. As stated earlier, the Company had no arrangement under which it could keep itself informed of the prices prevailing in the Bombay market. The selling prices fixed were lower than the rates fixed by other competitors. When it was brought to the Company's notice by Audit in February 1974 that during January 1969 to January 1974, it had lost approximately Rs. 4.64 lakhs in sales revenue of phenol due to lower selling prices, the Management stated that since production was very erratic, the Company could not keep its commitment to the customers and that the prices in Bombay which was the main consumption centre were highly competitive during 1971-72 and 1972-73.

7.8. The Company was faced with a problem of disposal of chlorine which was being sold at Rs. 450 per M.T. ever since 1968-69. The Management expected that during 1974 after receipt of 375 more chlorine cylinders, for which orders were placed, sales of chlorine would improve. Substantial quantities of chlorine were wasted upto 1972-73 as indicated in paragraph 4.39.

7.9. The Company sold 1898 M.T. of hydrochloric acid (both synthetic and commercial grade) upto March 1973. The selling prices were fixed as under :

Upto 14th September 1971	. . . . .	Rs. 110 per M.T.
From 15th September 1971	. . . . .	Rs. 150 per M.T.
From 15th February 1973	. . . . .	Rs. 230 per M.T.

There was some consumer resistance to hydrochloric acid produced in the pentachlorophenol plant and as on 31st March 1973, 26.108 M.T. of this acid were lying unsold.

7.10. Out of the other by-products of the phenol plant, only in the case of di-phenyl oxide the Company had difficulty in selling as the product was coloured. The problem was aggravated by larger production because of a defect in the plant (*vide* paragraph 4.54). The unsold stock of 61 M.T. as on 31st March 1973 was valued at Rs. 5.63 lakhs.

7.11. There was no demand in the market for pentachlorophenol. The production was discontinued and the plant had remained idle since 1970-71.

7.12. Although the approved policy of the Company was to sell its products preferably to small scale users in the State, the customer composition during the 3 years ending 1972-73 in respect of some important products was as under :

(Figures in M.T.)

Purchaser	Phthalic anhydride	Phenol	Caustic soda 100% basis	Chlorine
Total sales	2,187	1,684	3,705	1,291
Sales to small scale units	25	16	9	4
Sales to Government undertakings	Nil	Nil	388	181
Sales to larger units	2,004	1,547	277	383
Sales to traders	158	121	2,031	723

During May 1972 to August 1973, small scale users who had applied to the Company for supplies of 233 M.T. of phthalic anhydride were not allotted any quantity.

7.13. As the phenol and oxidi-phenyl content in the phenol residue could not be recovered for want of steam (*vide* paragraph 4.54) 159 M.T. of phenol residue were sold to a trader of Bombay at Rs. 1000 per M.T. upto 31st March 1973. Besides, 390.012 M.T. of phenol was sold to the same trader during 1971-72 at Rs. 3000 per M.T. as against the Company's selling price of Rs. 3200 as this purchaser had agreed to take over the products as and when stocks were available. Similar bulk sales at less than the selling prices were made in the following cases :

Product	Quantity (In M.T.)	Company's selling price	Range of actual sale price	Loss (In lakhs of rupees)
		Rs.	Rs.	
Caustic soda lye sold to two firms during 1970-71	300	936	344 to 860	0.23
Chlorine sold to two parties during 1970-71	129.6	450	344 to 400	0.13
Phenol sold to four parties during 1970-71 and 1971-72	464	3,200	3,000 to 3,150	0.87
Phthalic Anhydride sold to seven parties during 1968-69 to 1972-73	2,860.2	4,500 to 5,600	4,000 to 5,500	7.81

7.14. In reply to an enquiry as to why the Company could not adopt the system of inviting tenders from intending buyers of its products, the Company explained to the Government (February 1973) that this might not have resulted in obtaining the best prices and might have facilitated some traders with adequate financial backing to corner the supplies to the detriment of the interest of small scale actual users in the State. It was further stated that there was no major flaw in the practice followed and that the only drawback in the sales policy was the inability of the Company to ensure steady production due to various technical and other troubles, and to meet any contractual obligation in regard to selling specified quantities as per time schedule.

7.15. The following table indicates the volume of book debt and sales :

As on	Book debts	Sales	Percentage of book debts to sales
<i>(In lakhs of rupees)</i>			
31st March 1971	31.29	112.13	27.9
31st March 1972	16.00	47.93	33.4
31st March 1973	14.57	81.59	17.8

Normally all sales to private parties are being made against advance payments or letters of credit and Government departments are allowed open credit.

8. Financial position

8.1. The table below summarises the financial position of the Company under broad headings for the last three years ending 1972-73.

Liabilities	<i>(Rupees in lakhs)</i>		
	1970-71	1971-72	1972-73
1	2	3	4
(a) Paid up capital (including share deposit)	327.05	366.40	391.40
(b) Reserves and Surplus	5.00	5.00	5.00
(c) Borrowings	827.09	865.92	920.56
(d) Trade dues and other liabilities	262.19	332.40	408.83
TOTAL	1,421.33	1,569.72	1,725.79

Assets

	1	2	3	4
(e) Gross block		1,777.56	1,162.98	1,191.27
(f) Less depreciation		151.57	194.27	254.73
(g) Net fixed assets		1,025.90	968.71	936.54
(h) Capital work-in-progress		25.32	25.08	0.66
(i) Current assets, loans and advances		131.55	173.07	194.76
(j) Miscellaneous expenses		13.21	10.57	8.46
(k) Accumulated loss		225.26	392.29	585.37
TOTAL		1,421.33	1,569.72	1,725.79
Capital employed		722.39	676.25	584.70
Net worth		93.57	(—) 31.46	(—) 197.43

NOTE : (1) Capital employed represents net fixed assets plus working capital.

(2) Net worth represents paid-up capital plus reserves and surplus less intangible assets.

8.2. Working results

The Company incurred a loss of Rs. 183.52 lakhs in 1972-73 as against Rs. 181.72 lakhs in 1971-72 and Rs. 169.63 lakhs in 1970-71.

8.3. The Company suffered from shortage of working capital with the result that its current assets and the loans and advances it had obtained were inadequate to meet the trade dues and current liabilities during all the three years :

Year	Current assets, loans and advances	Trade dues and current liabilities
	(Rupees in lakhs)	
1970-71	131.55	262.19
1971-72	173.07	332.40
1972-73	194.76	408.83

8.4. The percentage of turn-over to capital employed is an indication of the efficiency of the utilisation of capital. Viewed in this context, the efficiency of capital utilisation was the lowest in 1971-72 :

	1970-71	1971-72	1972-73
Percentage of turn over to capital employed	15.52	7.09	13.95

8.5. Value of production

The value of production during the last three years was as follows:

	(In lakhs of rupees)		
	1970-71	1971-72	1972-73
(i) Sales (excluding sales tax)	112.13	47.93	81.59
(ii) Closing stock of finished goods and work-in-process (at cost)	26.59	36.80	35.80
(iii) Opening stock of finished goods and work-in-process (at cost)	57.70	26.62	36.80
(iv) Value of production (i) + (ii) - (iii)	81.02	58.11	84.13

The percentage of the value of production to total net assets registered a decline from 5.70 in 1970-71 to 3.70 in 1971-72 and 4.87 in 1972-73.

8.6. Expansion scheme

With a view to putting the operations on a base of sound economic viability, the Company decided during 1968-69 to take up the following expansion programmes :

- (a) expansion of phthalic anhydride plant by 200 per cent.
- (b) expansion of the caustic/chlorine plant by 50 per cent and
- (c) installation of a new phthalate plasticiser plant of capacity of 6000 M.T. per annum.

The capital cost involved was estimated to be about Rs. 5 crores in all. The letters of intent in respect of such expansions expired in December 1972 and have not been revalidated yet (April 1974).

8.7. The Expert Committee observed (June 1973) that there was in-built provision for expansion of the phthalic anhydride and caustic/chlorine plants and, therefore, any expansion programme would be comparatively cheap. The Committee suggested that the Company should seriously consider undertaking diversification programme with a view to utilisation of surplus chlorine. They also suggested that attention should be given to the items which were good chlorine consumers like benzene-hexachloride, lindane, etc., and that the manufacture of ammonium chloride

utilising ammonia from the Fertiliser Corporation of India, Durgapur Projects Limited or Hindustan Steel Limited should be taken up. The Committee were, however, of the view that it might be difficult for any firm other than the original suppliers to undertake the expansion job.

8.8. In the first phase, the Company took up the expansion of the caustic/chlorine plant from 30 M.T. to 45 M.T. per day. The Board of Directors decided (April 1974) to appoint Engineers India Limited which had earlier prepared a feasibility and viability report for the renovation and expansion of the plant to take up this work. For expansion of the caustic/chlorine plant, negotiations were in progress with Heavy Electricals (India) Limited, Bhopal to purchase and instal a rectifier unit. Tenders invited on 20th November 1973 for expansion of the phthalic plant were under the consideration of the Management (April 1974). The Board of Directors in their meeting held in September 1973 decided that the General Manager (Works) should prepare a preliminary report on installation of a small plant for phthalate plasticiser. The report has not yet (April 1974) been submitted for consideration of the Board.

8.9. As regards the overall economics, Engineers India Limited observed (January 1974) that if all the plants were operated at rated capacity, all the products and by-products were sold, and the consumption of raw materials and utilities was limited at designed rates, it would be possible to earn Rs. 111.54 lakhs as net profits after charging depreciation. If the phenol and pentachlorophenol plants were operated only at 35 and 33 per cent of their rated capacity and the balance caustic soda and chlorine were sold, the gross profit would be reduced to Rs. 107.52 lakhs. If the phenol and pentachlorophenol plants were closed down, the gross profit before tax would be Rs. 57.48 lakhs. In that case, even if the phthalic anhydride plant alone was to continue operation with the existing excess consumption of raw materials and utilities, the gross profit would be converted into a loss of Rs. 8.49 lakhs assuming that the caustic chlorine plant worked at full capacity and at designed ratios.

9.1. *Costing system*

The following deficiencies have been noticed in the costing system followed :

- (1) Costs of various products were ascertained on historical basis long after the financial accounts were closed. Hence, the costing did not serve the purpose for which the cost sheets were prepared.

- (2) No standard costing system has yet (April 1974) been introduced though the Management had planned to introduce it from April 1971.
- (3) Variances were not analysed and investigated in order to take remedial steps. Unit cost of each item of expenditure was not worked out and compared with the norms in the project report and previous month/year's expenditure.
- (4) Cost accounts were not reconciled with financial accounts.
- (5) System of budgetary control has not yet been introduced (April 1974).
- (6) Chargeable expenses, such as power, water, gas, steam, etc. were allocated to each product not on the basis of actual consumption shown by meters but on the basis of technical estimates certified by plant authorities.

Other overhead expenses were allocated on the basis of sales turnover or production targets/achievement. In respect of the basis of allocation/apportionment, neither the approval of the Board of Directors were obtained nor were these reviewed from time to time.

- (7) There was no time recording clock or ticket system to control attendance and working hours of the employees.
- (8) History sheets of the various items of plant and equipment indicating the life, progressive utilisation, etc. were not maintained.
- (9) Idle capacity cost was not segregated even though plant utilisation was very poor.

9.2. The cost of production on the basis of the cost sheets maintained and the selling prices of the principal products, per M.T., for the last three years, were as follows :

(Figures in Rupees per M.T.)

Products	1970-71		1971-72		1972-73	
	Cost of production	Selling price	Cost of production	Selling price	Cost of production	Selling price
Phthalic anhydride	7,430	5,800	9,439	4,800	15,548	5,800
Caustic soda	2,682	972	2,304	1,050	2,873	1,110
Chlorine	3,356	430	2,889	450	1,164	450
Synthetic phenol	14,086	3,200	9,148	3,950	12,607	4,500

9.3. *Internal audit*

There was no proper internal audit system upto 1967-68. In their 63rd meeting held on 29th June 1968, the Board of Directors expressed grave concern over the affairs of the Finance and Accounts Department and called for a review of its scope and functions and decided to appoint a firm of Chartered Accountants to function as internal auditors of the Company. But the functions of the two firms of Chartered Accountants, who acted as internal auditors during the period from July 1968 to March 1972, were limited only to routine checking of the accounting work and did not cover other items of work allotted to them as per terms of their appointment, viz., (a) advising the Management on the need for introducing an effective system of budgetary control, (b) reconciliation of inventory, (c) streamlining the existing accounting and administrative procedure and assisting in their introduction. The internal auditors pointed out several irregularities in the accounts for immediate attention of the Management, but no action appears to have been taken to avoid the recurrence of these irregularities.

An Internal Audit Manual outlining the scope and programme of work to be carried out by the internal audit department has not been drawn up by the Company so far (April 1974). An Internal Audit Officer was appointed in August 1973 but his functions were not defined. His work was limited to investigation of items allotted by the Management from time to time.

9.4. There was no Accounting Manual indicating in detail the procedure for the maintenance and compilation of accounts, the duties and responsibilities of various officials and the delegation of financial powers.

9.5. *Township*

As on 31st March 1973 the Company owned 412 quarters of different types (including 14 shops and stalls) of book-value Rs. 56.09 lakhs, in its township. In addition, 109 quarters were taken on rent from the State Government at an annual rent of Rs. 47,338. Fiftysix quarters owned by the Company had been under unauthorised occupation of some employees mostly detected in 1971-72.

9.6. Observations of the Company Auditors

Some of the persisting major irregularities pointed out by the Company Auditors in their Supplementary Report are given below :

- (1) The deficiencies in the system and procedure consisted mainly in the areas of accounting of stores, finished products, preparation of salaries and wage sheets, recovery of charges, advances, sanctioning of medical benefits, payment to labour contractors, movement of cylinders, containers, and obtaining stamped receipts in support of payments.**
- (2) Adjustment of several balances were pending for several years. Investigations ordered by the Management and consequential adjustments were not completed.**
- (3) The property plant registers were not upto date and reconciled with financial books. The registers for furniture, fan, electrical equipment or properties for guest house and office equipment and laboratory were neither maintained nor any schedule was prepared on the basis of physical verification.**
- (4) There was no definite system for writing off of balances, disallowing discounts and refunds.**
- (5) Classification of materials and stores was not made. Further, there was no planning for procurement and the purchases were not based on a budget. Maximum, minimum and reordering levels of stores items were not determined. List of approved suppliers were not maintained. Financial powers for purchase orders were overstepped by splitting up some of the total purchases into smaller purchase orders which were within the limit.**
- (6) The costing system merely confined itself to cost ascertainment and failed to generate cost-consciousness within the organisation.**
- (7) Verification of railway charges, *i.e.*, freight, demurrage, damage and deficiencies and reconciliation of freight with the quantum of materials received at the plant site were not made.**

- (8) The Management did not take any action on excesses and shortages revealed in each year as a result of physical verification of raw materials and stores, except deciding to investigate the differences and transferring the value of net shortage to Stores Adjustment Suspense Account.
- (9) Finished products were accounted for on the basis of physical inventory, the resultant shortages being adjusted automatically. Physical verification of cylinders, spare parts and machinery was not done.

CHAPTER II
SECTION III
STATUTORY CORPORATIONS

Introduction

There were five Corporations as on 31st March 1973, viz. West Bengal State Electricity Board, Calcutta State Transport Corporation, North Bengal State Transport Corporation, West Bengal Financial Corporation and West Bengal State Warehousing Corporation.

The accounts of North Bengal State Transport Corporation for 1969-70 onwards have not been received in audit so far (August 1974). In terms of section 33(4) of Road Transport Corporations Act, 1950, the State Government is required to lay before the State Legislature the certified accounts of the Corporation and the audit report thereon.

Under Section 31(10) of the Warehousing Corporations Act, 1962, accounts of the State Warehousing Corporation together with audit report thereon were required to be placed before the Annual General Meeting of the Corporation within six months of the close of financial year. But the accounts of West Bengal State Warehousing Corporation for 1971-72 onwards have not been received in audit so far (August 1974).

2. Paid-up Capital

(i) West Bengal State Electricity Board

The West Bengal State Electricity Board does not have any paid-up capital. Its capital requirements are met from loans obtained from the State Government and others and from the bonds issued to the public, the latter having been guaranteed by the State Government both in regard to repayment of capital and payment of interest. The loans and bonds outstanding as at the end of 1971-72 and 1972-73 were :

(Rupees in lakhs)

Year	Loans		Bonds	Total
	State Government	Others		
1972-73	7,588.29	3,053.86	2,852.54	13,494.69
1971-72	7,535.43	1,883.06	1,610.73	11,029.22

(ii) Other Corporations

The contribution towards capital by State Government to Calcutta State Transport Corporation was Rs. 608.46 lakhs at the end of both 1970-71 and 1971-72.

The North Bengal State Transport Corporation has no share capital. The Government of West Bengal and Railways have been advancing capital for running the Corporation. Such advances upto 31st March 1968 amounted to Rs. 129.91 lakhs. The Government made a further advance of Rs. 6.00 lakhs as loan capital during 1968-69. The total amount so advanced upto the end of 1968-69 was as follows :

	<i>(Rupees in lakhs)</i>
(i) Government of West Bengal	120.91
(ii) Railways	15.00
TOTAL	<u>135.91</u>

The paid-up capital of West Bengal Financial Corporation stood at Rs. 150.00 lakhs at the end of 1971-72 and 1972-73 and was contributed as follows :

	<i>(Rupees in lakhs)</i>
(i) State Government	56.77
(ii) Reserve Bank of India	20.00
(iii) Industrial Development Bank of India	25.00
(iv) Scheduled banks and industrial investors	45.00
(v) Others	3.23
	<u>150.00</u>

The paid-up capital in respect of West Bengal State Warehousing Corporation stood at Rs. 58.00 lakhs in both the years 1969-70 and 1970-71, contributed equally by the Government of West Bengal and by the Central Warehousing Corporation.

3. Loans

The long term loans obtained by Calcutta State Transport Corporation stood at Rs. 1,717.44 lakhs at the end of 1971-72 representing an increase of Rs. 547.14 lakhs over the loan of this Corporation at the close of 1970-71.

The North Bengal State Transport Corporation had no long term loans upto 1968-69.

The total long term loans including bonds and debentures in case of West Bengal Financial Corporation stood at Rs. 560.26 lakhs at the close of 1972-73 representing a reduction of Rs. 29.37 lakhs from that at the close of 1971-72.

The West Bengal State Warehousing Corporation had no long term loans as at the end of 1970-71.

4. Working Results

A synoptic statement showing the summarised financial results is given in the Annexure B. The statement indicates the position with reference to the latest accounts available in comparison to that in the preceding year.

SECTION IV

SANTALDIH THERMAL POWER PROJECT

Introduction

1.1. As shortfall in power supply in the State to the extent of 898 M.W. was expected by 1970-71, the Government of West Bengal decided in December 1964 to set up a super thermal power station during the Fourth Five Year Plan.

2. Project report

2.1. In a Report prepared in April 1964 the West Bengal State Electricity Board had proposed the setting up of a 1000 M.W. super thermal power station at Santaldih in Purulia District, comprising four units of 250 M.W. at a total cost of Rs. 92.06 crores, of which Rs. 45.53 crores was required in foreign exchange. Santaldih was chosen because of the following locational advantages :

- (a) It was well connected by rail and road.
- (b) Out of the annual fuel requirement of 3.25 million M.T. 1.39 million M.T. of middlings could be met from the coal washeries located within 20 kilometres.
- (c) The estimated cost of middlings was only Rs. 19.10 per M.T. against Rs. 44 per M.T. for the run of mine coal.
- (d) The middlings could be transported economically from the washeries to the power station either by conveyor belts or by aerial ropeways.
- (e) Adequate water would be available from Tenughat Dam to be constructed by the Government of Bihar about 95 K.M. from the plant site, pending completion of which water from the Konar Dam could be used.

Besides, the use of middlings as fuel in the thermal plant, though it had a higher ash content as compared to run of mine coal, was in accordance

with the national fuel policy indicated by the Government of India in June 1965.

2.2. The Central Water and Power Commission advised the State Electricity Board in October 1964 for installation of four units of 120 M.W. in the initial stage since steam generators, turbo-generators and condensers of that capacity would be available indigenously while the 250 M.W. units would have to be imported. The project estimates were, therefore, revised in December 1965 to Rs. 108.07 crores (of which Rs. 35.32 crores were in foreign exchange) in order to provide four units of 120 M.W. in the first stage (Rs. 60.50 crores) and two Units of 250 M.W. in the second stage (Rs. 47.57 crores). Though this showed an increase in the overall estimated expenditure by Rs. 16.01 crores (17 per cent), the estimated foreign exchange content decreased by Rs. 10.21 crores.

2.3. The Planning Commission approved (September 1966) in principle the first stage of four units of 120 M.W. and indicated that Rs. 47 crores would be made available to the State Government for the project during the Fourth Plan period to cover the commissioning of the first two units and for taking advance action on the third and fourth units. In the meantime, because of the devaluation of the Rupee in June 1966, increase in customs duty on imports and on the basis of the latest information available on prices, the estimate for the first stage was increased in April 1967 from Rs. 60.50 crores to Rs. 75.56 crores. As the installation of the third and fourth units was postponed (October 1971) by the Central Water and Power Commission to the Fifth Plan period, the project estimate for the first stage was further revised in March 1972 to Rs. 86.90 crores. The revised estimate has, however, not been approved so far (July 1974) by the Board. Salient features of the three project reports/estimates and break-up of the project estimates of 1967 and 1972 are indicated in Annexures 'C' and 'D' respectively. Detailed reasons for the increase in the estimated cost have not been intimated.

3. Consultancy agreement

3.1. A consultancy agreement was entered into with Kuljian Corporation (India) Private Ltd. in May 1966 for setting up the power station. The agreement was drawn up by a Committee consisting of the Chairman, the Electrical Engineer Member and the Chief Engineer after obtaining legal opinion and financial advice. It was approved by the Board in April 1965. This firm was chosen because they had done much preliminary work to help

the Board in preparing the earlier reports of 1964 and 1965 and were already acting as Consultants for another thermal power station then being set up by the Board at Bandel.

3.2. As per the agreement the consultancy service was broadly in two stages. The first stage comprised the setting up of four units of 120 M.W. each and the preliminary work for the entire project. The second stage comprised the setting up of two units of 250 M.W. each later. The terms and conditions of the services in the second stage were to be laid down later. For services in the first stage the Consultants were to be paid Rs. 142.73 lakhs being 2.75 per cent of the estimated total cost of the first phase, viz., Rs. 51.9 crores excluding the cost of land, township, etc. Out of this, Rs. 20 lakhs were to be paid in U.S. Dollars. Apportionment of charges among the various services to be rendered was as follows :

- (i) Preparation of a feasibility and project report including investigation into the feasibility of fuel and cooling water supply as well as disposal of ash (0.52 lakh).
- (ii) Review of the basic technical features of thermal generating units and boilers and assistance to the Board in price negotiations with suppliers/designers and finalisation of all design parameters [cost included under item (iii) below].
- (iii) Preparation of detailed engineering drawing as also field working drawings and transmittal of drawings and technical data (Rs. 77.33 lakhs including Rs. 7.10 lakhs in foreign exchange).
- (iv) Drawing up of tender specifications for all civil engineering works, electrical and mechanical plant and equipment for the complete power station including coal conveyor/aerial rope-way (Rs. 12.98 lakhs).
- (v) Assistance for purchase including evaluation of all tenders (Rs. 7.79 lakhs).
- (vi) Assistance and guidance in inspection of major equipment at manufacturers' works and in expediting the deliveries (Rs. 2.59 lakhs of which Rs. 1.50 lakhs in foreign exchange).
- (vii) Management and supervision as agents of the Board of all civil works construction except the colony and other ancillary buildings (Rs. 33.74 lakhs including Rs. 7.8 lakhs in foreign exchange).

- (viii) Assisting the Board in supervision of erection of mechanical and electrical plant and equipment, advising and giving necessary guidance to ensure conformity to specification and good workmanship [cost included in item (vii) above].
- (ix) Assisting the Board in supervision of the trial run and commissioning of the plant (Rs. 7.78 lakhs including Rs. 3.60 lakhs in foreign exchange).

3.3. Although the agreement provided for payment of consultancy charges proportionately with the progress of work, the actual payments upto August 1973 (including the retention money of 5 per cent deducted from the bills) amounted to Rs. 102.48 lakhs or 71.8 per cent of the consultancy charges as detailed below :

Particulars of items of work	Ceiling amount payable	Actual payment upto August 1973
	<i>(Rupees in lakhs)</i>	
Feasibility and project report	0.52	0.49
Detailed engineering and drawing	77.33	56.00
Tender specification, draft contract, etc.	12.98	10.76
Purchase assistance	7.79	6.87
Inspection and follow-up	2.59	Nil
Supervision of construction	33.74	23.86
Initial operation	7.78	Nil
	<u>142.73</u>	<u>97.98</u>
	(including Rs. 20 lakhs in foreign exchange)	
	Retention money	4.50
		<u>102.48</u>

3.4. Upto August 1973, even the first of the four units had not been commissioned (the first unit was inaugurated in October 1973 and the commercial operation commenced in January 1974). More specifically, in respect of units III and IV, out of 76 contracts to be entered into for the

electrical and mechanical items, only 30 had been finalised upto August 1973. As regards civil works in respect of these units, contracts for only concrete foundation work had been placed, but no significant progress had been made in the work. Thus, the payments to the Consultants were not proportionate to the actual progress of work.

3.5. The agreement authorised the Consultants to act as agents of the Board in the matter of civil works in the plant area, but there was no clear division of responsibility between the Consultants and the Board's Engineers. The agreement did not provide for any liability of the Consultants (who had either prepared or vetted the designs of all the plants and equipment) to ensure that the plants were capable to work upto the designed capacity and could be operated with the fuel for which these were designed. The agreement appears to have contributed to the blurring of responsibilities with the result that no particular party could be held liable for delays in commissioning or consequent loss of revenue. For example, while the choice of plant and the designs and specifications of all equipment were made by the Consultants the orders for the supplies were placed by the Board, as a result of which the Consultants could not be held responsible for delays in the receipt of equipment. Even in the case of civil works in the plant area, contracts were entered into by the Board with parties approved by the Consultants and the works were carried out under the supervision of the Consultants. As regards erection, it was to be done by the Board and the Consultants were only to assist and supervise in the erection and trial runs.

4. Project Implementation

4.1. A letter of intent was issued in May 1965 to Heavy Electricals (India) Limited, Bhopal for the purchase of turbo generators and condensing plants required for all the four units of 120 M.W. The price was fixed, in consultation with the Government of India, at Rs. 4.5 crores plus Rs. 25 lakhs for the general engineering equipment for each of the first two units. The delivery was to be so timed as to enable the commissioning of the first unit in January 1969 and other units at the interval of 4 months. Although sufficient material was required to be delivered at site by November 1967 to enable the commissioning of the first unit in January 1969, some critical items like blank flanges, valves and gas cylinders were not delivered till August 1973. Supply of the second unit has not yet been completed (July 1974). The contract did not provide for any liquidated damages or penalty for delay in supplies. A firm order for Units III and IV was placed in October 1970 at Rs. 4.90 crores and Rs. 6.15 crores respectively. This

meant a cost increase of Rs. 1.55 crores as compared to the price paid for the first two sets.

4.2. The order for four steam generators was placed on ACC-Vickers-Babcock Ltd. on 11th May 1967 through the Director General, Supplies and Disposals at a total cost of Rs. 625.89 lakhs plus £ 32.79 lakhs. Due to rephasing of the project, two steam generators on order required for units III and IV were diverted to Chandrapura Power Station of Damodar Valley Corporation. These were ordered again on 25th November 1970 at a total cost of Rs. 400.84 lakhs plus £ 17.18 lakhs. The order for units III and IV involved extra expenditure of Rs. 87.89 lakhs and £ 0.78 lakh as compared to the order for the first two units.

4.3. It was decided (February 1967) to entrust the erection of the four steam generators also to ACC-Vickers-Babcock Ltd. at Rs. 158.21 lakhs. Because of the diversion of two steam generators to the Damodar Valley Corporation, the erection contract was limited to two (July 1969) at a price of Rs. 100 lakhs negotiated by the Board. The contract for the erection of the remaining two was placed on this company in March 1971 for Rs. 115 lakhs. This involved an increased expenditure of Rs. 56.79 lakhs as compared to the rates initially agreed upon.

4.4. The anticipated dates for commissioning of the various units of the project are indicated below :

	Project Report December 1965	Revised Report April 1967	Revised Report 1972
<i>120 M.W. units</i>			
Unit I . . .	January 1970	January 1970	Second quarter of 1973
Unit II . . .	May 1970	May to July 1970	Fourth quarter of 1973
Unit III . . .	September 1970	December 1971	Fourth quarter of 1975
Unit IV . . .	January 1971	June 1972	Fourth quarter of 1976
<i>250 M.W. units</i>			
Unit V . . .	July 1971	No provision has been made.	
Unit VI . . .	January 1972	—do	

4.5. The progress of work on the project appears to have been affected on account of the following factors :

- (a) Although the Planning Commission had cleared in October 1966 installation of two units of 120 M.W. each during the Fourth Plan period and had allotted the requisite funds, the State Government could not decide upto 1969 whether one unit or two units should be installed. This affected the project planning as well as procurement schedules and the project estimate had to be revised taking into account variation in price and delay in availability of equipment.
- (b) There was continuous resistance from the local people in the matter of acquisition of land.
- (c) The project report had provided for a 400 K.V. transmission system and tenders for transmission equipment were invited accordingly towards the end of 1967. But early in 1968, in view of the uncertainty about the number of units to be installed, it was decided to have 132 K.V. transmission system. The decision was further revised in January 1969 to provide for a 220 K.V. transmission system. The procurement of equipment comprising generator, transformers, lightning arrestors, circuit breakers, etc., which were long delivery items were, thus, delayed.
- (d) Manufacture of 120 M.W. units was being undertaken in the country for the first time and hence there was more delay than could be normally anticipated in developing drawings and in entering into suitable collaboration with foreign manufacturers by the Indian suppliers.
- (e) There was a general scarcity of steel, more particularly of the special types and dimensions required by the project.
- (f) It was considered that drawing water from the Damodar river at the site chosen was not technically suitable due to the heavy presence of sand and hence a water supply system was designed in 1965 to draw water from Panchet Reservoir through pipes and canal. After further investigations necessitated by land acquisition problems, the plan was revised (March 1969) to provide for drawing of water from Damodar

by means of an intake pump through pipe-line. Clearance for laying the pipe-line across the Gowai river on the piers of the railway bridge was received from the Railways only in June 1972. Anticipating delay in laying the pipeline, an alternative emergency pipeline under the river bed was provided in October 1972 at the cost of Rs. 2.75 lakhs.

4.6. In addition, delays in the supplies of materials and in construction of civil works also contributed to the delay in implementing the project. Some of these are given below :

- (a) Certain civil works relating to the power house building for units I and II estimated to cost Rs. 45.64 lakhs were entrusted to Bengal Builders & Traders Pvt. Ltd. between October 1969 and April 1972 on the recommendation of the Consultants. The works were to be completed by June 1972 and May 1973—for units I and II respectively to ensure timely commissioning of the generating units. While taking stock of the progress upto June 1972, the Consultants found that the progress of work was poor and attributed the poor progress to the financial handicap of the contractors. They completed the work relating to the first unit in September 1973 at the cost of Rs. 28.92 lakhs. Work for the second unit is still in progress (July 1974).
- (b) Two major contracts of Rs. 54.53 lakhs for civil work in connection with the coal handling system, miscellaneous structures and building in the power plant to be completed by March 1971 and December 1972 were entrusted to the Central Engineering Syndicate. The progress of work was unsatisfactory. The Consultants attributed (July 1972) the poor progress in work to the financial handicap of the contractor. The contractor could complete the work by September 1973 and was paid Rs. 60.90 lakhs.

In the two cases mentioned above, the contract did not provide for an imposition of penalty or liquidated damages for delayed completion of the work.

- (c) Two contracts for construction of foundation in the main building and in the turbo-generator section were awarded to Gannon Dunkerley & Co. Ltd. at Rs. 58.05 lakhs. Although

these works were expected to be completed between October 1968 and June 1969, the works were completed only in March 1972 and March 1973 respectively. The delay could not be attributed entirely to the contractors, but the question of recovering penalty for such portion of the delay as could be attributed to them was not pursued by the Management, although provided for in the contract. No reasons are on record for not initiating action in this regard.

- (d) Orders for the fabrication and erection of nine steel tanks were placed with the Rehabilitation Industries Corporation Ltd. (a Government of India Undertaking) in May 1969 at Rs. 4.40 lakhs. The work was to be completed by August 1970, but the contractors indicated (April 1971) their inability to carry out the order. The work was then withdrawn and awarded on the recommendation of the Consultants to Associated AESBY in April 1971 at the same amount. As this firm failed to furnish the requisite bank guarantee and performance bond, the order was cancelled and awarded to NGT Engineering Private Ltd. in May 1972 at a negotiated and estimated cost of Rs. 3 lakhs. The work was actually completed in respect of the first unit in July 1973. No penalty was imposed on the first two defaulting contractors for failure to complete the work.
- (e) Erection work of certain high pressure piping in respect of units I and II was awarded to Kessels Power Engineers (P) Ltd. in May 1971 on the recommendation of the Consultants at Rs. 21.52 lakhs. The work was to be completed by October 1972. The firm commenced work at the site in November 1971 and completed work valued at Rs. 1.90 lakhs up to August 1972. The Consultants observed in August 1972 that the Contractor would be able to complete the work by June 1973, if some financial assistance was extended for them. The following assistance was given to the firm with the approval (September 1972) of the Board :
- (i) Deduction of 10 per cent from the progressive bills as stipulated in the original agreement was dispensed with and the previous deductions were refunded.
 - (ii) Rupees 60,000 were advanced to the firm as loan bearing interest @8½ per cent and some building materials valued

approximately Rs. 20,000 were also supplied, the cost to be recovered along with the loan.

- (iii) The cost of some additional tools valuing Rs. 40,000 required for expediting work were agreed to be advanced as loan on the basis of *pro forma* invoices.

In spite of this assistance, the performance of the contractor was found poor by the Consultants and several works were withdrawn in March 1973 and re-awarded to others. Although the estimated value of work in respect of the first unit was Rs. 11.45 lakhs, the total expenditure incurred upto September 1973 amounted to Rs. 16.67 lakhs when the work relating to this unit was completed. The excess of Rs. 5.22 lakhs was due to payment at higher rates.

- (f) The order for erection of two 120 M.W. turbo-generator units was placed (October 1970) on the lowest tenderer at Rs. 7.74 lakhs, although he had no previous experience in this regard. The erection work was to be completed in 10 months for the first unit and 14 months for the second unit. The Consultants had initially recommended that the orders should be placed on the highest tenderer who had quoted Rs. 28 lakhs. The Board decided (February 1971) on the representation of the lowest tenderer to withdraw some of the items of work and allow an overall increase of 25 per cent of the contract value as idle time because of delay in arrival of Erection Supervisor of the suppliers and the turbine house crane was not ready. The revised work order was issued (May 1971) to the contractor for Rs. 8.33 lakhs. The items of work withdrawn and carried out departmentally were estimated (June 1971) to cost Rs. 18.80 lakhs and an additional expenditure of Rs. 10 lakhs was also estimated to be necessary for retention of the supervisory personnel beyond the stipulated period i.e., 10 months from July 1971. The total estimated cost thus amounted to Rs. 37.13 lakhs as against Rs. 28 lakhs quoted by the highest tenderers. As the site was made available to the contractor only in February 1971, he could not complete the work within the stipulated time. The entire electrical work and a portion of the mechanical work of the first unit was withdrawn from the contractor on 1st April 1973 and

got done partly departmentally and partly by other agencies. For the erection of the first unit Rs. 5.58 lakhs were paid to the contractors and in addition, Rs. 6.22 lakhs were paid as supervisory charges for 27 months to Heavy Electricals (India) Ltd. The actual cost of departmental work could not be ascertained as requisite records were not maintained. The erection of the first unit was completed in September 1973, but the work on the second unit had not been taken up till then.

- (g) Tenders were invited in December 1967 for the demineralising plant. Out of five tenders received, the fourth lowest tender for Rs. 3.92 lakhs was accepted by the Board on 17th December 1968 but the order was placed by the Project Engineer on 15th March 1969, although the quotation was valid only up to 28th February 1969. As the firm refused to extend the validity period unless the price was increased by 25 per cent fresh tenders were invited in May 1969. Three tenders were received and an order was placed on the lowest tenderer at Rs. 5.80 lakhs in July 1970. The firm failed to take up the work even seven months after the order was placed but asked for a price increase of 3 per cent and financial assistance in the form of advance payments against drawings and import licence and supply of steel at J.P.C. rates. The Board decided in February 1971 not to agree to these terms and placed the order on the highest tenderer in April 1971 at a total price of Rs. 8.14 lakhs. The Chief Executive of the Board was of the opinion that the order against the first tender should have been placed by the Project Engineer within the validity period viz., 28th February 1969. Had this been done there would have been a saving of Rs. 4.22 lakhs, and even if the price increase of 25 per cent had been accepted there would have been a saving of Rs. 3.34 lakhs besides eliminating the delay in installation of the plant which was earlier expected to be installed by January 1970 but was actually installed in March 1973.

5. Profitability anticipation

5.1. The project report of 1965 envisaged that the four 120 M.W. units would come into commercial operation at intervals of 4 months commencing from January 1970. The capital expenditure for the four units

was estimated at Rs. 60.50 crores and by the third year of operation, i.e., by 1971-72, the project was expected to become self-financing, yielding a return of 13.5 per cent on the capital outlay.

5.2. In the revised estimates of 1972 the capital cost of the project was enhanced to Rs. 80.90 crores and two units were to commence commercial operation in 1973-74. The third and fourth units were to be available only by the last quarter of 1975 and 1976 respectively. It was anticipated that with the commissioning of the first two units in 1973-74 the project would earn a revenue of Rs. 697.3 lakhs. With the commissioning of the other units in the succeeding years, it was estimated that the deficit would decrease and that the accumulated deficit on revenue after meeting interest charge on capital (less cost of township and spares) would be wiped out by 1981-82, i.e., in the ninth year of operation. As against a return of 13.5 per cent anticipated in 1965 project report, a return of 10.9 per cent was anticipated in the 1972 estimates. Nevertheless, because of the successive postponement of the commissioning schedule of the four units and consequent prolonged construction period a revised profitability analysis is being prepared by the Consultants at the request of the Board (September 1974)

5.3. The postponement of the commissioning schedule of the plant from January 1970 to December 1973 has resulted in loss of revenue. As per a recent assessment by the State Planning Board, the value of production lost between June 1972 and May 1973 would amount to about Rs. 24 crores.

5.4. One of the main considerations for erecting the super thermal power station at Santaldih was the availability of middlings at a cheap rate which could be transported easily to the site. However, an analysis of the middlings from the Bhojudih Washery of the Hindustan Steel Limited indicated (March 1973) that it was unsuitable for use because of a high admixture of free sand and shale. Hence, the project authorities have not yet (July 1974) purchased the middlings from the Bhojudih Washery. The coal handling plant acquired at Rs. 1.56 crores included conveyor arrangement from the Bhojudih Washery to the plant site (cost : Rs. 20.71 lakhs), but this plant has not been installed. Grade II slack coal is being purchased at higher cost to run the first unit (August 1974).

SECTION V

OTHER TOPICS OF INTEREST

1. Revenue Collection—West Bengal State Electricity Board

1.1. The following table indicates the extent of arrears in collection of revenue for the last three years ended 31st March 1973 :

Year	Revenue collected during the year	Arrear revenue pending collection at the end of the year
<i>(In crores of Rupees)</i>		
1970-71	18.05	4.98
1971-72	23.60	5.94
1972-73	26.11	5.70

The Board has not maintained yearwise and consumerwise analysis of the dues.

1.2. While the unrealised revenues amounted to about Rs. 5 crores at the end of each of the last three years, the Board had to borrow money to meet its cash requirements. During 1973-74, for example, the Board had to avail of cash credit arrangements to the extent of Rs. 5.16 crores (upto December 1973) from the commercial banks and paid Rs. 22.42 lakhs as interest charges thereon.

1.3. Many claims became time-barred due to delay in taking action for recovery. A few instances noticed by Audit in which the Board could not recover claims of Rs. 1.12 lakhs are mentioned below :

(a) Bihar Potteries Limited

The consumer had not paid the dues towards the annual minimum guaranteed revenue from 1964-65 onwards and upto February 1967 the amount due for recovery was Rs. 45,467. Supply was discontinued on 18th February 1967 for non-payment of dues. But no legal action was taken until 22nd June 1969 to realise the dues or to protect the claim being

time-barred. The Court admitted (June 1969) the Board's claim for Rs. 28,635 representing dues for 1966-67 and held the dues for the prior years (Rs. 16,832) as time-barred. Eventually, the case was settled out of Court for Rs. 16,190 and the Board waived the recovery of the balance Rs. 12,445.

(b) *Kalyanji Movji & Co.*

The dues on account of energy supplied from May 1967 to September 1969 amounted to Rs. 75,510. Though the supply was disconnected on 22nd November 1967, the bulk supply agreement was terminated with effect from 1st September 1969 and, till then, only the minimum guarantee charges were due for recovery. The Legal Adviser had suggested in April 1970 legal action; such action was initiated only in January 1972 to recover the dues. By that time Rs. 28,560 due for 1967-68 became time-barred.

(c) *Coal Products Limited*

The shortfall in the annual minimum guaranteed revenue amounting to Rs. 10,008 for 1965-66 was due from the consumer. The Board did not take any legal action to recover the dues before they became time-barred in April 1969. The supply was disconnected on 12-10-1971.

(d) *Bengal Refractories (P) Limited*

The party did not pay Rs. 24,425 being the shortfall of annual guaranteed revenue pertaining to the years 1960-61, 1961-62 and 1962-63. The Board did not take any legal action to protect its claim which became time-barred between April 1964 and April 1966. The supply was not disconnected. The Board stated (February 1973) that they were negotiating with the party for recovery of the arrear amount. Current dues are, however, being paid by the party.

(e) *Jamgram Coal Co. (P) Limited*

The party did not pay Rs. 24,180 being the shortfall of annual minimum guaranteed revenue pertaining to the years 1961-62, 1962-63 and 1963-64. The Board did not take any legal action to protect its claim which became time-barred between March 1966 and April 1969. The supply has not yet been disconnected (July 1974).

(f) *Administrator, Asansol Municipality (Water Works)*

Rupees 8,457 being the shortfall of annual minimum guaranteed revenue pertaining to the year 1962-63 was not paid by the party. No legal action has been taken by the Board to recover the dues and the claim became

time-barred in April 1966. The Board stated (February 1973) that action was being taken to disconnect the line.

2. Short accountal of dismantled copper wire

West Bengal State Electricity Board.—Due to frequent theft of copper wire, the Board decided (March 1971) to dismantle the copper conductors of the 236.5 km high tension transmission line between Chord Road Substation and Krishnanagar via Haringhata and Ranaghat and to replace them with Aluminium Core Steel re-inforced conductors. The dismantling was done during August 1971 and March 1972 without preparation of survey report. 131.54 kms conductors were dismantled departmentally and 105 kms through a contractor appointed on negotiation basis. In both the cases, the material salvaged was not weighed as and when it was dismantled.

2,36,541 metres of copper wire (1,42,161 Kgs.) valuing Rs. 20.61 lakhs had been used on this line. Out of this, 43,900 metres (26,373 Kgs.) valuing Rs. 3.82 lakhs of wire were stolen, prior to dismantling. Thus, 1,92,641 metres (1,15,788 Kgs.) valuing Rs. 16.79 lakhs should have been accounted for. But the actual quantity of dismantled wire accounted for was only 1,52,208 metres (91,477 Kgs.) valuing Rs. 13.26 lakhs, leaving a shortage of 40,433 metres (24,311 Kgs.) valuing Rs. 3.53 lakhs. The matter was brought to the notice of the Board in October 1972; their reply is still awaited (June 1974).

3. Building of bus bodies

Calcutta State Transport Corporation.—The Corporation has a modern and well-equipped workshop at Belghoria for building bus bodies. A management consultancy firm engaged in 1964 to undertake a work study and formulate a system of incentive payment on the basis of norms of output in the various sections of the workshop assessed (1964) that the Body Building Shop with 352 workers could turn out 41.25 units in 200 hours of normal working hours each month. Construction of a new single-decker bus body was reckoned as one unit, and construction of other types of bodies or renovation work was converted on the basis of an approved formula into this unit. But a Committee of its own officers, appointed by the Corporation in 1968, to consider the grievance of the workers regarding the staffing pattern in the workshop fixed the capacity of the Shop at 30 units per month which was accepted (March 1969) by the Corporation.

3.2. The actual performance of the Body Building Shop during the last four years, when the staff strength varied from 405 to 414, was as follows :

Year	Output in units
1969-70	182.34
1970-71	186.06
1971-72	270.28
1972-73	252.30

The output during this period varied from 37 to 55 per cent of the capacity as assessed by the consultancy firm and 50 to 75 per cent of the capacity assessed by the Committee. The low output was attributed by the Management (August 1972) mainly to "labour unrest, lack of discipline and literal collapse of the Administration from 1967-68".

3.3. Substantial sums were paid as overtime wages and incentive upto 1972-73 as indicated below :

Year	Output in units	Average number of workers	Wages and allowances exclusive of (incentive overtime and honorarium)*	Over time/incentive/honorarium	Percentage of overtime, etc. to wages and allowances
			Rs.	Rs.	
1966-67	162.09	413	6,92,524	38,402 (O.T.)	5.50
1967-68	182.70	427	8,83,815	1,180 (O.T.)	0.13
1968-69	158.25	422	9,71,693	1,32,695 (O.T.)	13.65
1969-70	182.34	413	10,58,807	43,608 (O.T.) 1,30,042 (honorarium)	16.40
1970-71	186.06	411	11,22,148	1,83,842 (Incentive) 44,267 (O.T.) 24,132 (honorarium)	22.48
1971-72	270.28	408	11,07,993	4,80,317 (Incentive) 81 (O.T.)	43.36
1972-73	252.30	408	12,48,104	4,80,000 (Incentive)	38.46

*NOTE : 'Honorarium' and 'incentive' were used as synonymous terms by the Management.

3.4. The Corporation introduced with effect from November 1969 an incentive scheme under which workers were paid honorarium at the following rates :

Month's production	Honorarium admissible
Upto 15 units	Nil
16 to 20 units	Rs. 3800 per unit
21 units and above	Rs. 4200 per unit

The minimum production level prescribed to qualify for the incentive was 36 per cent of the capacity as assessed by the consultancy firm and 50 per cent of that assessed by the committee. The Director in charge of Engineering and Stores had pointed out in March 1969 that normal production (around 20 units) had been achieved during January to April 1967 when the supply of raw materials was not in any way better, and had recommended the norm to be fixed accordingly. There were no reasons on record for adopting a lower production level for the incentive scheme.

3.5. A test check of the incentive payments during July 1972 to December 1973 showed that there was overpayment of Rs. 3.67 lakhs due to erroneous and unauthorised basis adopted for conversion of work on various types of bodies into units of construction. No reply has been received (July 1974) from the Corporation on this point which was brought to its notice in February 1974.

3.6. The incentive payments to the workers amounted to Rs. 19.95 lakhs (including the overpayment of Rs. 3.67 lakhs) during December 1969 to February 1974. But the records showed that in several months the incentive payments were made in excess of the amount admissible as per actual outturn achieved in those months, on the grounds of anticipated completion of the incomplete units in the succeeding months. Such inadmissible payments, which were not adjusted in the subsequent months when the jobs were completed, amounted to Rs. 1.76 lakhs upto February 1974 (out of which Rs. 42,000 are included in the figure of Rs. 3.67 lakhs mentioned above).

3.7. While the Body Building Shop was not operating to its full capacity, the Corporation got 186 single-decker and 105 double-decker bodies built

from private firms during 1971-72 and 1972-73. As regards double-decker bodies, tenders were invited in May 1972 for construction of 30 bodies. Subsequently, the Corporation decided (August 1972) to change the design and specification to convert the upper deck into first class and requested all the tenderers in a meeting held on 4th and 5th August 1972 to submit revised rates. On the basis of the revised rates received, orders were placed on one Bombay firm and three Calcutta firms in September 1972 for building 60 double-decker bodies. These included two firms in Calcutta whose higher rate (Rs. 58,000) per body was accepted in preference to the lower rate quoted by a firm in Hyderabad (Rs. 52,150 per body). Taking into account the estimates of tax and the cost of transportation of chassis and completed bodies, the price preference to the Calcutta firms amounted to Rs. 2.32 lakhs.

3.8. The order was increased from 60 (double-decker) bodies to 105 bodies in January 1973 i.e. after three months of placing the original order. The Hyderabad firm had, however, offered a lower rate per body if the number ordered exceeded 50.

3.9. In this connection, it may be mentioned that the Bombay firm built 46 bodies in their Ahmedabad workshop and charged an extra amount of Rs. 44,868 on account of the additional cost involved in transporting them from Bombay to Ahmedabad and then to Calcutta. When the payment was disputed by the Corporation in May 1973, the Chairman indicated that he had permitted the firm to divert the chassis to Ahmedabad.

3.10. As regards the construction of 135 single-decker bodies (approximate cost : Rs. 44 lakhs), quotations were invited in July 1971 from three firms in Bombay instead of calling open tenders. In August 1971 a firm in Madras was also invited to quote but no enquiries were sent to local firms. After negotiation orders were placed on 16th September 1971 and 20th September 1971 respectively for the construction of 50 single-decker bodies each on one firm in Bombay and one firm in Madras at Rs. 29,800 per body. The remaining 35 bodies were decided to be constructed in the workshop of the Corporation. However, when some local firms represented on 7th September 1971, quotations were also invited from eight local firms and orders were placed with one of them on 29th October 1971 for construction of 21 bus bodies at Rs. 29,000 per body, the remaining 14 to be constructed in the Corporation's own Workshop. The 14 bodies constructed in the Corporation's Workshop cost on an average Rs. 27,486 per body which was lower than that paid to the private firms.

3.11. In April 1972, the work of construction of another 65 single-decker bus bodies was awarded to the same three Bombay, Madras and Calcutta firms without calling for fresh quotations, at Rs. 30,070, Rs. 32,000 and Rs. 32,050 (i.e. with increases of Rs. 270, Rs. 2,200 and Rs. 3,050) respectively. The increases included additional excise duty. No break-up of the increases in rates was given by the parties and, therefore, it could not be ascertained in audit how much amount was charged for additional excise duty. In the previous orders (in the case of 121 single-deckers) such excise duty was provisionally paid to all the parties at Rs. 672, subject to production of documentary evidence. No such evidence was, however, submitted by the parties. In spite of this, the three firms were again allowed increases in rates.

3.12. In all the cases the approval of the Board was not obtained before placing the orders. *Ex post facto* approval of the Board was obtained, as indicated below :

	Date of placing order	Date of approval by the Board
105 Double-deckers	1-9-72 19-1-73	3-3-73
121 Single-deckers	16-9-71 20-9-71 29-10-71	3-4-72
65 Single-deckers	7-4-72	8-7-72

3.13. A Government of India Undertaking located in Calcutta had offered in November 1971 to construct single-decker bus bodies at Rs. 29,800 per body and confirmed this rate again in March 1972 but no order was placed on it on the ground that its delivery performance to other parties was bad. The above firm was constructing all-aluminium single-decker bus bodies for Delhi Transport Undertaking, Bihar State Road Transport Corporation and Harbour Master, Andamans. The passing over of this lower offer involved an estimated additional expenditure of Rs. 2.68 lakhs on the 65 bodies constructed by the private firms.

3.14. No reply has so far (September 1974) been received from Government to whom the matter was reported in October 1973.



(T. B. NAGARAJAN)

Accountant General, West Bengal.

12 DEC 1974

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1974

Countersigned.



(A. BAKSI)

NEW DELHI,

The

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Comptroller and Auditor General of India.

13 DEC 1974