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MGIPF-412 NAL/79



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

UNION GOVERNMENT (COMMERCIAL)

1981

PART VII

CENTRAL COAL WASHERIES ORGANISATION

ERRATA

<i>Page</i>	<i>Reference</i>	<i>For</i>	<i>Read</i>
5	Line 6 from bottom under 1976-77	17.48	17.58
8	Line 6 from top	Analysts	Analysis
12	1st column in the table	19 0-71	1970-71
15	Line 10 from top	Committe	Committee
21	Line 7 from bottom	(including escalation	(including escalation of Rs. 6.76)
25	Line 4 from bottom	months,	months'
26	Line 3 from top	bleow	below
27	Insert (Figures in lakh tonnes) above the table.		
28	Line 3 from bottom	Thirdly	'Thirdly,
29	Line 5 from bottom	Rs. 43.34	Rs. 42.34
33	Line 3 from bottom	Rs. 17.14 lakhs	Rs. 17.74 lakhs
37	Line 6 from top under Patherdih grade	WSH-II	WSH-III
48	Heading above table	paragraph 7.01	paragraph 6.00
48	Line 5 from top—column 10 and 11	year and	year end

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Report
of the
Comptroller
and
Auditor General
of India

Union Government (Commercial)

1981

Part VII

Central Coal Washeries Organisation

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PREFATORY REMARKS

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

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

1. Shri T. Rengachari, Chairman, Audit Board & Ex-officio Additional Deputy Comptroller and Auditor General (Commercial) upto 29th February 1980.
2. Shri P. P. Gangadharan, Chairman, Audit Board & Ex-officio Additional Deputy Comptroller and Auditor General (Commercial) with effect from 1st March 1980.
3. Shri K. S. Murthy, Member, Audit Board & Ex-officio Director of Commercial Audit, Ranchi upto 13th March 1978 and as Member, Audit Board & Ex-officio Director of Commercial Audit, Bangalore from 9th March 1979.
4. Shri M. Prem Kumar, Member, Audit Board & Ex-officio Director of Commercial Audit, Bangalore upto 23rd January 1979.
5. Shri A. Ghosh, Member, Audit Board & Ex-officio Director of Commercial Audit, Ranchi from 29th March 1978 to 10th May 1981.

(iii)

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

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

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

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

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

1. GENERAL

In order to meet the requirement of washed prime coking coal of Bhilai Steel Plant (BSP) and Rourkela Steel Plant (RSP) as well as the private sector steel plants, the Hindustan Steel Limited (HSL) had set up the following four central washeries :—

Name of Washery	Date of commissioning	Investment (Rs. in crores)	Remarks
(i) Dugda I	May 1962	18.79	For supply of raw coal, these washeries are linked with the different collieries of Bharat Coking Coal Limited as per details given in Annexure IA.
(ii) Dugda II	February 1969		
(iii) Bhojudih	November 1962	6.08	
(iv) Patherdiā	December 1964	7.32	

NOTE : Durgapur Steel Plant (DSP) has its own Washery.

The management of these washeries vests with the Central Coal Washeries Organisation (CCWO)—a constituent unit of the erstwhile HSL, now Steel Authority of India Limited (SAIL). In June 1972, a proposal mooted by Bharat Coking Coal Limited (BCCL)—another Government Company for transfer of the four washeries to it was agreed to, in principle, by HSL on the consideration that it would ensure better co-ordination between production of prime coal and supply of washed coal to Steel Plants. In a meeting held in the Ministry of Steel & Mines in January 1973, it was decided to treat the Washeries as an independent entity under the joint ownership of Hindustan Steel Limited (HSL) and Bharat Coking Coal Limited (BCCL) and the decision was reserved for Government approval. Pending transfer of ownership of CCWO to the proposed partnership firm, a power of attorney was given to the Chairman-cum-Managing Director, BCCL, on 23rd May 1973, enabling him to manage these Washeries with effect from 1st April 1973. The interim arrangement still (August 1981) continues

2. PRODUCTION PERFORMANCE

2.01 Need for washing of coal

For maintaining the efficiency of the blast furnaces and avoiding deleterious effect on steel making furnaces, coal with ash content not exceeding 17% ($\pm 0.5\%$) is required to be used in the steel plants. The coal, as is supplied by the collieries, however, contains higher ash percentage. Further, it also contains impurities like shale, sand, stone, etc. The main object of washing coal is, therefore, to remove its impurities and to separate coal with the desired ash percentage. The process adopted for removal of impurities and thereby reducing the ash percentage of washed coal begins with the crushing of coal (roughly 225 mm as it comes out of the mines) to generally two sizes *viz.* (i) below 75 mm and (ii) below 13 mm. Preliminary crushing releases the impurities associated with coal to some extent. The crushed coal of the various qualities is blended. As the impurities of coal have higher density (2.4 to 5.1) than that of good coal (1.25 to 1.30), jigs are used to separate the impurities from coal on the basis of density. The impurities thus separated are called rejects. For separating coal having higher ash content from that having lower ash content, bath washers (for sizes 75 to 6 mm) and cyclone washers (for sizes below 13 mm) are used depending upon washing characteristics. Coal of the desired ash percentage thus separated goes to the steel plants.

The Washeries are either three product washeries (as in the case of Patherdih and Dugda I) or two product washeries (as in the case of Bhojudih and Dugda II). In the case of a three-product washery, the portion of the coal after separation of clean coal and discarding of rejects is called 'Middlings' or 'fuel coal'. The ash percentage in the middlings depends on the quality of raw coal feed and is generally more than 35 per cent. In the case of a two-product washery, the entire arisings, after separation of clean coal, are generally termed as 'sinks/rejects'.

2.02 *Actual performance vs. rated capacity*

As per project report and notice inviting tenders, the input, output, yield percentage, etc. of the Washeries were projected as follows:—

	Input (In lakh tonnes)	Output (tonnes)	Yield (in %)	Ash percentage	
				In raw coal	In clean coal
Dugda I	24	17.47	72.79	21.30	15.10
Dugda II	24	13.20	55.00	26.00	17.00
Bhojudih	20	17.40	87.00	20.24	17.00
Patherdih	20	14.61	73.05	21.90	15.60

However, a High Powered Committee constituted in 1970-71 to go into the problems of Washeries, had, after considering the past performance and present deficiencies of the Washeries, recommended (February 1971) the adoption of following input capacities :

Dugda I	18 lakh tonnes per annum
Dugda II	20 lakh tonnes per annum
Bhojudih	17 lakh tonnes per annum
Patherdih	16 lakh tonnes per annum

The factors which led the Committee to recommend lower operating capacities as compared to higher initial installed capacities of these Washeries, were as follows:

General :

- (i) Deterioration in the quality and size of raw coal fed to these Washeries.
- (ii) Irregular supply of wagons for movement of raw coal to Washeries as well as for despatch of washed products from Washeries.

- (iii) Supply of non-standard wagons which the Washeries were unable to load mechanically.
- (iv) Non-availability of spare parts in time owing to diversity of washing schemes employed in the Coal Washeries to suit specific sizing and cleaning characteristics of different coking coals.
- (v) Irregular off-take of middlings.

Specific :

Dugda I.—Original capacity was based on the assumption that raw coal feed would have 20% of 6 mm—O fraction. This fraction was to be dealt with by Drag Tank Conveyor of 120 tonnes per hour (tph.). Owing to the increase in this fraction to 32—35 per cent by 1970-71, the feed rate had to be brought down to enable the Drag Tank Conveyor to deal with this fraction.

Dugda II.—This is a cyclone Washery. Owing to deterioration in the quality of raw coal feed, the yield of middlings was 47 per cent (1969-70) as against 40 per cent required for efficient separation in the cyclone Washery, thereby resulting in the reduction in hourly feed rate.

Patherdih.—The Plant, originally designed for 400 tonnes per hour (tph.), was subsequently modified to 500 tonnes per hour (tph.) but equipment specification of certain sections of the Plant and, in particular, of the slurry section, were left unchanged. The Washery was provided with only one thickener and its rated capacity to handle fine coal slurry was only 24 tonnes per hour. As a result of this deficiency, the feed rate was to be restricted to 400 tonnes per hour to avoid overloading and jamming of fine coal circuit.

As against the above referred parameters, actual performance was as follows :—

	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
DUGDA I								
Input (in lakh tonnes)	7.18	8.67	8.21	8.55	12.02	14.35	16.18	17.54
Output (in lakh tonnes)	4.80	6.10	5.70	5.80	6.96	7.45	9.34	10.28
Yield (%)	66.85	70.36	69.43	67.84	57.90	51.92	57.73	58.61
Ash in raw coal (%)	23.18	22.67	22.59	24.24	26.42	26.87	26.09	28.24
Ash in clean coal (%)	17.23	17.25	17.27	17.97	18.75	19.05	19.58	21.28
DUGDA II								
Input (in lakh tonnes)	13.33	11.66	11.70	11.08	13.86	15.85	18.55	19.16
Output (in lakh tonnes)	8.50	7.20	7.20	6.60	7.46	8.26	9.83	9.99
Yield (%)	63.77	61.75	61.54	59.57	53.82	52.11	52.99	52.14
Ash in raw coal (%)	24.27	24.60	24.83	26.62	28.90	29.45	29.10	30.52
Ash in clean coal (%)	17.30	17.19	17.54	18.24	19.21	20.20	19.73	20.49
BHOJUDIH								
Input (in lakh tonnes)	14.38	14.31	14.83	14.89	19.22	20.55	21.14	22.63
Output (in lakh tonnes)	12.10	12.20	12.60	12.20	15.63	16.58	16.88	17.35
Yield (%)	84.15	85.25	84.96	81.93	81.32	80.68	79.85	76.67
Ash in raw coal (%)	22.56	22.52	22.58	23.64	23.69	23.88	23.63	24.72
Ash in clean coal (%)	17.24	17.32	17.33	17.42	17.48	17.48	17.48	18.58
PATHERDIH								
Input (in lakh tonnes)	11.52	11.19	10.48	10.38	11.26	12.27	15.74	17.67
Output (in lakh tonnes)	7.40	7.40	7.10	7.10	7.94	8.61	10.67	11.55
Yield (%)	64.24	66.13	67.75	68.40	70.51	70.17	67.79	65.37
Ash in raw coal (%)	24.29	24.41	24.92	25.73	26.24	26.92	27.03	27.53
Ash in clean coal (%)	17.16	17.26	17.69	18.16	18.32	18.86	19.33	20.24

The following facts emerge from the above data :—

- (a) Dugda I, Dugda II and Patherdih did not attain the rated capacity as per project report, etc. in any of the years. Even the derated capacity was not achieved by these washeries in any of the years except Patherdih in 1977-78.

In respect of Bhojudih, while the actual input was below the original as well as derated capacity upto 1973-74, it was more than the derated capacity in 1974-75 and more than the original capacity during 1975-76 to 1977-78.

- (b) Capacity utilisation showed a continuous and marked upward trend in all the Washeries with effect from 1974-75.
- (c) While percentage yield of clean coal in respect of Dugda I, Bhojudih and Patherdih Washeries was less than the projected norm, that in respect of Dugda II was higher during 1970-71 to 1973-74.
- (d) Ash percentage in raw coal generally showed an upward trend ; it was also more than the projected norm in all the Washeries and in all the years except in respect of Dugda II during 1970-71 to 1972-73.

The under-utilisation of the installed capacity was attributed by the Management (November 1977/November 1979 and August 1981) to the following factors :—

1970-71

- (a) Short and irregular supply of box wagons by the Railways.
- (b) Irregular operation of belt conveyor transporting middlings from Dugda Coal Washery to Chandrapura Thermal Power Station of Damodar Valley Corporation.

- (c) Low off-take of middlings by Durgapur Thermal Power Station of Damodar Valley Corporation from Patherdih Coal Washery.
- (d) Lower demand of washed coal by Tata Iron and Steel Company (from Bhojudih & Patherdih Washeries).
- (e) Off-take of washed coal by Bhilai and Rourkela Steel Plants badly affected due to labour unrest and strike in South Eastern and Eastern Railways during July 1970 and February 1971 respectively ; input of coal to washeries was also affected.

1971-72

- (a) Short supply and delayed placement of box wagons in all the Washeries almost throughout the year.
- (b) Low off-take of middlings by Chandrapura Thermal Power Station through conveyor belt from Dugda Washeries (I and II).

1972-73

- (a) Power interruptions and load shedding.
- (b) Inadequate supply of raw coal in suitable type of wagons at Dugda I Washery (*see* paragraph 2.03.03).
- (c) Untimely and inadequate supply of wagons for disposal of washed products.

1973-74

- (a) Frequent power failures.
- (b) Shortage of box wagons.

1974-75

Power failure.

1975-76

Non-supply of box empties, power failure, electrical and mechanical breakdowns etc. and non-completion of some of the short term balancing facilities to be provided at Patherdih and Dugda Washeries.

1976-77 } Frequent power failure.
1977-78 }

2.03 *Efficiency and Productivity Analysts*

2.03.01 The installed capacity of the four Washeries was based on 300 working days in a year with 16 hours operation in a day i.e. 4,800 hours per annum. According to the Management, the rated input capacity of these Washeries could be achieved within 4,000 effective working hours per annum and the difference was accounted for by the idle time in-built in the operation due to various factors, such as minimum time required for starting, repair, etc.

Annexure 1 B incorporates the data relating to the actual available hours, hours actually worked and idle hours, etc. in respect of all the Washeries for the years 1970-71 to 1977-78. It will be seen from the details given therein that there was gradual improvement in the actual hours worked in all the Washeries. Hours actually worked reached the norm of 4,000 hours or exceeded this norm in 1977-78 in the case of Dugda I, in 1976-77 in the case of Dugda II, during 1974-75 to 1977-78 in the case of Bhojudih and during 1976-77 and 1977-78 in the case of Patherdih. Notwithstanding this, Dugda I, Dugda II and Patherdih Washeries did not attain the installed capacity. In the case of Bhojudih, however, the installed capacity was achieved.

2.03.02 *Quality of raw coal and yield percentage*

(1) *Quality of coal*

Apart from inadequate receipts, it will be noticed from data given in paragraph 2.02 that there was also deterioration in the quality of coal supplies in respect of ash content in raw coal. A monthwise analysis of ash content in raw coal received during

1972-73 to 1977-78 given in Annexure II will indicate that the percentage of ash content in raw coal was as high as 31.4 (Dugda II—September 1977), 28.9 (Dugda I—August 1977), 28.4 (Patherdih—June 1976, January 1978, August 1978) and 25.5 per cent (Bhojudih—October 1977). In this connection, the Management stated (June 1981) as follows :—

- (i) "There has been a general deterioration in the quality of raw coal supply to the washeries and this is due to mining the coals from lower seams. This has become inevitable because of continuous depletion of reserves of higher seam coking coals and less production from these sources. With the increased utilisation of the washeries, additional requirement of raw coal has to be obtained mostly from the lower seams. Further, after nationalisation, mining methods have also been changed and more and more mechanisation has been introduced both in respect of coking coal excavation operations and loading the same into wagons. After the introduction of mechanised mining, segregation of small pieces of stones from coals is not very practicable.
- (ii) The question of quality and quantity of washed coal was constantly under careful examination and close follow-up with the coal producing organisations."

With the taking over of coking coal mines and formation of BCCL, the system of joint sampling through public analysts had been dispensed with and sampling was being done at destination by the erstwhile HSL through its own officials at the CCWO, BSP and RSP with effect from the middle of 1972-73. In October 1974, however, BCCL contested the findings of the HSL about the inferior quality of coal supplied and it was decided to re-introduce the joint sampling system with a view to resolving the differences between the analytical result as determined by HSL and as reported by the mines. A public analyst was appointed for joint sampling and analysis of raw coal supplied to the Dugda I and II Washeries. However, the joint sampling system was

discontinued with effect from April 1976. The Management stated (August 1981) that whenever the collieries raise any doubt in analysis result determined at Washeries' end, joint sampling with the representative of colliery was being arranged.

(2) Yield

According to the data given in paragraph 2.02 the actual yield of clean coal was less than that envisaged in the Project Report in the case of Dugda I, Bhojudih and Patherdih Washeries in all the years and in the case of Dugda II during 1974-75 to 1977-78. According to the Management this was due to :

- feeding of washeries with coal from lower seams owing to depletion of reserves of higher seam coals in Jharia Coal-field.
- After nationalisation, percentage of coal mined with mechanised and solid blasting means has increased substantially. This has resulted in deterioration in quality of coal.

In regard to high ash content in the clean coal as compared to the projected norm of $17\% \pm 0.5\%$, a study on Statistical Quality Control methods was conducted in September 1970 by the Chief Director of National Sample Survey at the instance of HSL. In his report of November 1970, he pointed out that, according to the formula usually mentioned, one per cent reduction in ash involves a loss of 5 per cent of coal. Thus, about 40 per cent of coal has to be sacrificed to reduce ash from 25 per cent to 17 per cent. It was also suggested in the report that a study in depth should be made of the relationship between ash content and the quality of steel making operation so as to balance the losses, if any, associated with higher ash content against the gains resulting from higher recovery of coal to arrive at an optimum formula. The Management stated (December 1977) as under :—

“SQC studies on the relationship between ash content in coal and different blast furnace operating para-

meters were made in steel plants. These studies clearly indicated that every 1 per cent increase in ash content would, *inter alia*, result in higher coke consumption by 20 to 40 Kg. per tonne of hot metal and lowering in blast furnace productivity by about 4%. A case study in one of the steel plants showed that if the coal is washed to 19.0% ash instead of 17.5% ash, the coke requirement will go up by 9.4% while the coke availability will increase by 7.3% only.

Exact quantification of the gains resulting from higher recovery of coal has not been made and no optimum formula applicable to the entire steel industry worked out. For such an exercise, there is a need to carry out systematic and sustained studies in an experimental blast furnace. R & D unit proposes to acquire an experimental blast furnace for conducting such studies”.

In regard to experimental blast furnace, the Management stated (August 1981) as follows :—

“The proposal was dropped due to non-availability of adequate finance. Research and Development unit of SAIL has applied for UNDP assistance. Even with UNDP assistance, the experimental unit will not come up till 1985.”

2.03.03 Receipt of prime coking coal at washeries

The requirements of prime coking coal for the Washeries and the quantities actually received during the years 1970-71 to 1977-78 are given below :—

Year	Dugda I		Dugda II		Bhojudih		Patherdih		
	P	A	P	A	P	A	P	A	
	(In lakh tonnes)								
1	2	3	4	5	6	7	8	9	
1970-71	15.97	7.06	14.06	13.26	18.46	14.41	15.78	11.48	
1971-72	16.56	8.60	12.13	11.64	18.62	14.32	15.65	11.31	
1972-73	14.14	8.04	13.17	11.51	17.27	14.75	14.83	10.34	
1973-74	15.46	8.51	15.59	11.02	18.65	14.83	13.84	10.36	
1974-75	15.77	12.43	15.14	14.07	19.87	19.36	12.27	11.34	
1975-76	15.78	14.30	16.15	15.89	20.57	20.55	13.99	12.22	
1976-77	17.31	16.20	18.86	18.42	21.36	21.10	16.40	15.73	
1977-78	21.40	17.48	22.34	19.12	25.41	22.62	19.89	17.68	

NOTE : P indicates the quantity programmed and A denotes quantity actually received.

The Management stated (May 1974) that the shortfall in actual receipt of prime coal as compared to quantity programmed was mainly due to the failure of Railways to provide adequate transport, inadequate supply of raw coal in suitable type of wagons at Dugda I Washery, labour unrest and wild cat strike in Railways from time to time. The Management stated (September 1980) that during 1977-78, the programme was made 10% higher than the actual requirements of raw coal taking into account the vagaries of movement.

2.03.04 Supply of prime, medium and blendable coal to steel plants

The CCWO was responsible for procurement and supply of all categories of coal to the steel plants up to September 1975. Consequent on the Government's decision to transfer the CCWO to BCCL, the HSL decided (September 1975) to establish on behalf of the steel plants a separate unit viz. "Central Coal Supply Organisation" at Dhanbad with a view to co-ordinating the continued supply of raw and washed coal of the required quality and quantity to the steel plants. Accordingly, the organisation has been set up with effect from 1-10-1975 under a Chief Controller of Coal Supplies.

The following table indicates the quantities of prime coal and other coal programmed for supply to the steel plants and the quantities actually supplied during 1970-71 to 1977-78 :—

(Figures in lakh tonnes)

Name of the Plant	Year	Quantity programmed		Quantity supplied	
		Prime Coal	Other Coal	Prime Coal	Other Coal
Bhilai	1970-71	25.24	14.51	22.23	10.30
	1971-72	22.37	16.31	19.45	12.37
	1972-73	22.09	16.16	20.12	13.28
	1973-74	22.46	16.84	19.48	11.89
	1974-75	21.17	16.77	20.41	14.08
	1975-76	21.88	17.12	21.56	15.86
	1976-77	23.56	16.69	24.13	15.37
	1977-78	27.20	19.21	24.45	18.25

Rourkela	1970-71	18.11	8.22	15.44	5.08
	1971-72	15.94	8.78	11.70	6.59
	1972-73	13.58	10.92	11.79	8.78
	1973-74	12.18	10.50	11.63	9.19
	1974-75	11.50	11.62	12.36	9.71
	1975-76	12.43	11.32	12.70	11.03
	1976-77	10.91	11.70	10.88	11.20
	1977-78	12.83	12.06	11.93	11.83
Durgapur	1970-71	15.83	8.58	10.31	6.44
	1971-72	17.06	8.88	9.67	5.64
	1972-73	13.49	8.65	8.94	6.16
	1973-74	13.25	6.76	8.75	4.70
	1974-75	15.51	6.61	13.30	4.70
	1975-76	17.46	6.67	14.92	5.45
	1976-77	13.47	6.36	14.55	5.92
	1977-78	15.22	8.16	11.74	7.03

As a result of non-supply and erratic supply of required quantities of different categories of coal, the steel plants could not maintain the blend ratio of prime, medium and blendable coal as recommended by the Dutt Committee on "Rational and Equitable Distribution of coking coal" (August 1969).

The use of high volatile blendable coal to the extent of 15% and medium coking coal to the extent of 35% was recommended by the Dutt Committee with a view to conserving prime coking coal. The management, however, used a low percentage of blendable coal and medium coking coal as compared with the recommendations of the Dutt Committee. This led not only to a corresponding increase in the consumption of prime coking coal but also had its detrimental effect on the working of coke ovens and blast furnaces.

According to the Washeries Management, monthly allocation of different categories of coal was drawn up keeping in view the required sequence of supplies to the steel plants. It could not, however, be strictly adhered to on daily basis due to operational difficulties of the Railways and also inability of the Steel Plants

to unload the wagons regularly and expeditiously. In the event of accumulation of wagons at the steel plants, the Railways imposed restrictions on further loading and resorted to diversion of rakes to other steel plants.

2.04 *Consumption of raw materials and electricity*

In paragraphs 12.03 and 12.04 of Audit Report (Commercial) 1966, mention was made about non-adherence of the consumption norms in respect of magnetite and electricity, specified in the contracts entered into with the contractors.

In June 1971, HSL appointed a Committee to fix norms for consumption of principal items in the four Washeries. The Committee in its report (August 1971) fixed revised norms for consumption of various raw materials and electricity. The norms fixed by the Committee were accepted by the Management and were made applicable from 1972-73. In Annexure III comparison has been made of actual consumption of magnetite, water and electricity per tonne of raw coal input with the norms so fixed.

It will be seen from the Annexure that the consumption of magnetite, water and electricity in each Washery varied widely from year to year. The consumption of magnetite in Dugda I & II Washeries was generally more than the norms, while in Bhojudih and Patherdih Washeries it was less than the norms. The consumption of water was generally less than the norms except in Dugda II in 1970-71, 1971-72 and 1976-77, in Bhojudih washery in 1973-74 and in Patherdih washery in 1970-71, 1974-75 and 1975-76. The consumption of electricity was more in Dugda-I Washery in all the years, in Dugda-II during 1975-76 to 1977-78, in Bhojudih in 1970-71 and during 1974-75 to 1977-78 and in Patherdih Washery in 1971-72 and during 1973-74 to 1977-78.

The financial implication of excess consumption of magnetite and water works out to Rs. 17.74 lakhs. No norm for consumption of electricity per tonne of raw coal was fixed as the electricity

consumed will be more or less the same whether the plant runs at full rated capacity or below rated capacity. However, norms for consumption of electricity were fixed by the Norms Committee in terms of units per month. Based on monthly norms for consumption of electricity and monthly rated capacity of the Washery, the actual consumption of electricity per tonne turns out to be more than the norms thus arrived at. The financial implication of excess consumption of electricity during the above period works out to Rs. 2.41 crores.

In April 1973, the Management constituted another Committee to review the norms based on past experience and to suggest fresh norms for 1973-74. The Committee was expected to give its recommendation by May 1973. The Management have informed (August 1981) Audit that the Committee could not function as all its members had left the organisation and that another Committee has since been appointed in June 1981 and is likely to submit its recommendation in two or three months.

Apart from sudden and frequent power failures, excess consumption of magnetite, water and electricity has been attributed by the Management to the following factors :—

Magnetite

- (i) Design deficiency in the magnetite circuit inasmuch as no secondary Magnetite separators were provided for in Dugda II resulting in greater loss of magnetite.
- (ii) Deterioration in the quality of raw magnetite which necessitated increased consumption.
- (iii) Increased power interruptions.

Water

- (i) Increase in the moisture of fine coal due to percentage increase of fines in the raw coal feed.

- (ii) Use of water in ROM section for dust suppression, washing of plant, catering to the need of Railway marshalling yards.

Electricity

- (i) Change in the pattern of raw coal supply affecting the feed rate and output, thereby resulting in increase in power consumption per tonne.
- (ii) Increase in drive horse power of certain units especially in the middlings/fine coal and rejects circuit.
- (iii) Repeated and frequent starting of the machines due to higher incidence of power outages and load sheddings.
- (iv) Extra hour operations to cover partial production loss due to power failures, wagon shortages and breakdowns.
- (v) Addition of certain equipments in Dugda and Patherdih Washeries.

2.05 *Disposal of Middlings*

The Washeries at Dugda I and Patherdih are designed as three product washeries (*i.e.* clean coal, middlings and rejects).

In the case of two product washeries (Bhojudih and Dugda II), entire arising (which has average ash content of about 45 per cent) at Bhojudih is classified as rejects/sinks but arising of Dugda II (which also has average ash content of about 40 per cent) is classified as middling/by-product.

According to the policy laid down (January 1971) by the Government of India that the thermal power stations in the country should utilise inferior grades of coal and that those which are located near the coal washeries should utilise washery

middlings having an ash content upto 45 per cent, the four Washeries are linked to the following thermal power stations for disposal of middlings :—

- | | |
|-------------------------------------|--|
| 1. Dugda I Washery
(3 product) | } Chandrapura Thermal Power Station
of Damodar Valley Corporation
(DVC). |
| 2. Dugda II Washery
(2 product) | |
| 3. Bhojudih Washery
(2 product) | Santhaldih Power Station of West
Bengal State Electricity Board. |
| 4. Patherdih Washery
(3 product) | Chandrapura & Durgapur Thermal
Power Stations of Damodar Valley
Corporation (DVC). |

In this connection, following features deserve mention :—

(a) In accordance with the above policy, middlings from Dugda I and II Washeries were stacked together and were being supplied to the Chandrapura Thermal Power Station of DVC upto June 1973 when it was decided in consultation with representatives of various Ministries of the Government of India and DVC that no thermal power station would accept middlings of higher than $32 \pm 3\%$ ash and hence the middlings from Dugda II Washery should be sent to the power station only when the Washery was converted into a three product washery. Accordingly, Dugda I middlings were segregated at a cost of Rs. 8.90 lakhs during July 1973 to February 1974 and supplied to the DVC power station from February 1974 alongwith a part of fresh arisings.

Owing to space limitations, inability of Chandrapura Thermal Power Station (CTPS) to take fully the middlings of the third shift and occasional break-down of CTPS conveyor belts, a part of arisings of middlings of Dugda I Washery, however, continued to be stacked with middlings of Dugda II. The total quantity so dumped was 42.39 lakh tonnes upto 30th April

1978 (6.00 lakh tonnes valued at Rs. 1.43 crores of Dugda I and 36.39 lakh tonnes valued at Rs. 8.27 crores of Dugda II) valued at Rs. 9.70 crores (as on 30th April, 1978). The expenditure incurred towards dumping upto 30th April, 1978 amounted to Rs. 94.91 lakhs. The accumulated middlings/rejects are yet to be disposed of (August 1981). The Management stated (March 1977/August 1981) as follows :—

(i) "Accumulation of middlings stock has been going on since the disposal/sale arrangements could not be found out for all the quantities produced especially for Dugda II middlings. The stock of rejects is increasing and may continue since the same is not vendable."

(ii) Sale of middlings had picked up and a quantity of 7.32 lakh tonnes had been sold in 1978-79 and 1979-80.

(b) The Bhojudih Washery was commissioned in November 1962 whereas the Santhaldih Power Station went into commercial operation from June 1974. The rejects/sinks of this Washery have, however, not been accepted by the power station so far (August 1981) on account of high ash content (43 to 45%) as against its reported requirement of coal with a maximum ash content upto 32 per cent on rake-wise analysis. The entire arising (39.48 lakh tonnes not yet valued) during 1962-63 to 1977-78 (upto April 1978) has been dumped at a cost of Rs. 69.56 lakhs. The Management intimated (August 1981) that a quantity of 9.14 lakh tonnes had been sold in 1978-79 and 1979-80.

(c) The Technical Committee on Coal Washeries appointed by the Government of India in May 1970 had recommended (February 1972) that all the existing two product washeries should be converted (except where the middlings are not acceptable to power stations) to three product washeries according to a time bound programme and that all future washeries should be three product ones. The Management stated (March 1977)

that the above recommendation had been accepted in May 1975 by the Power of Attorney Holder and Coal India Limited and ratified by the Board of Directors of HSL. While Bhojudih Washery was converted into 3 product washery in June 1977, Dugda II Washery is expected to be converted by December 1981.

The Management stated (August 1981) as under :—

“The work for conversion of Dugda II into a three product washery was awarded to the Engineering Projects India Limited—EPI (A Government of India Enterprise) in March 1976 and as per terms of the contract the project was supposed to have been completed by September 1978. EPI are not able to complete the project in time due to the following main reasons :—

- (i) Non-availability of design drawings from M/s. KOPEX, Poland (Design Collaborators).
- (ii) Acute labour problem at site.
- (iii) Non-availability of matching steel sections.”

(d) A scheme for the upgradation of the fresh arisings of rejects/sinks of Bhojudih Washery and the entire arisings of middlings/by-products of Dugda II Washery at revised estimated cost of Rs. 12.90 lakhs and Rs. 364.5 lakhs was taken up in December 1975 and March 1976 respectively. The Management intimated (October 1979) that the project for upgradation of Bhojudih sinks was completed in June 1977 but the performance test could not be conducted due to defect in the crusher of the new circuit. The Management further stated (April 1981) that it has not been possible to conduct the performance test so far due to various operational difficulties.

As regards Dugda II Washery, Management's reply quoted in para (c) above refers.

2.06 Price for coking coal

The long term contracts entered into by the Washeries with private collieries during February 1970 to July 1971 for supply of coking coal were passed on to BCCL on its formation on 1st May 1972 after the nationalisation of coking coal mines. The payment for supplies of coal having average ash content above 30 per cent was being made by the Washeries to the private collieries at a token rate of Re. 1 per tonne.

The question of prices for supply of coal having more than 30 per cent ash content was considered by the Company and BCCL in September 1973, October 1974 and July 1975. The final settlement arrived at in July 1975 by the Company and BCCL provided as follows :—

<i>For Supplies Made Between</i>	<i>Price Agreed</i>
1-4-72 and 31-3-73	Rs. 28.66 per tonne (all inclusive)
1-4-73 and 14-11-73	Rs. 31.41 per tonne (including escalation charges of Rs. 2.75)
15-11-73 and 31-3-74	Rs. 38.17 per tonne (including escalation

It was also decided in July 1975 that the price for coal during 1974-75 having ash ranging from 24 to 28 per cent would be fixed at Rs. 50.40 per tonne and that of over 28 per cent but upto 35 per cent would be paid for at Rs. 43.12 per tonne.

The question of prices for supplies of coal having more than 35 per cent ash content was considered by the Company and

BCCL and the following settlement was arrived at in March 1979 :—

For Supplies Made During

1974-75—A lumpsum payment of Rs. 17 lakhs as an overall settlement.

1975-76 to 1977-78—Rs. 24.45 per tonne plus sales tax.

Based on the above decision, the company had paid a sum of Rs. 26.71 lakhs in April and May 1979 to BCCL for supplies made during 1974-75 to 1977-78.

In this connection the Management stated (August 1981) as under :—

“After 16-7-1979 raw coking coals supplied to the washeries having ash content more than 35 per cent are being treated as non-coking coal and their prices determined on the basis of useful Heat Value as per the formula laid down in the Government Gazette Notification No. 50408(F) dated 16-7-1979.”

3.00 *Loss of rebate*

The bills raised by the Bihar State Electricity Board for supply of electricity to Dugda and Patherdih Washerries, during March 1968 to February 1969, were not paid within the specified time. As a result, rebate to the extent of Rs. 1.66 lakhs admissible for timely payment, could not be availed of.

Further, a test check of records relating to payment of electricity charges disclosed that a total amount of Rs. 6.77 lakhs was lost on account of forfeiture of rebate and levy of surcharge for delayed payment during May 1976 to November 1978 in respect of Dugda, Patherdih and Bhojudih Washerries.

In this regard, the Management stated (October 79/ July 1980/August 1981) as follows :—

- (a) The matter regarding refund of Rs. 1.66 lakhs was being pursued with the Board.
- (b) There is a good chance of getting refund from Bihar State Electricity Board and West Bengal State Electricity Board to the tune of Rs. 6.05,745; remaining amount of Rs. 71,550 was mostly paid due to circumstances beyond the control of the Central Coal Washeries Organisation Management.

4.00 *Costing System and Analysis of Costs*

4.01 The Costing System prevalent in the Washeries is designed to work out the actual cost of washed coal which is treated as main product. No cost is worked out for middlings and rejects. While working out the actual cost of washed coal, credit for sale of middlings/rejects is afforded in the cost sheet prepared monthly/annually.

Based on the recommendation of the Norms Committee in August 1971, norms for consumption of principal items like electricity, water, magnetite were prescribed with effect from 1st April, 1972 for each Washery and standard costing was introduced from June 1972. Standard cost for 1975-76 and subsequent years was revised with reference to cost of raw coal, freight and budgeted production.

Cost of washed coal is estimated at the beginning of the year. The cost so worked out represents the estimated/target cost of the year and this is considered by the management as standard cost.

Monthly cost sheet is prepared for Patherdih and Bhojudih Washeries and a combined monthly cost sheet for Dugda I and II Washeries.

In addition to a monthly cost statement, an annual cost statement based on financial accounts is prepared. The variance reports analysing the causes of variation on the basis of standard cost are also prepared every month.

4.02 Annexure IV indicates the actual cost of washed coal per tonne as a percentage of Standard Cost during 1972-73 to 1977-78 separately for each Washery.

The standard cost and actual cost in 1975-76, 1976-77 and 1977-78 showed a steep increase over the data for earlier years. An analysis of variance made by the Management indicated that upto 1974-75 the unfavourable variance in all the washeries was mainly caused by increase in price of raw material, shortfall in production and expenditure variance. The position improved in 1975-76 when there was overall favourable variance, particularly in respect of 2 out of 3 washeries mainly attributable to usage and volume variance. During 1976-77 and 1977-78 unfavourable variances were due to increase in price of raw materials, shortfall in production and expenditure variance.

5. Manpower Analysis

5.01 The number of men employed in each Washery during 1970-71 to 1977-78 was as follows :—

Year	Dugda I & II	Bhojudih	Patherdih	Central office	Total
1	2	3	4	5	6
1970-71	1063(32)	570(19)	537(20)	364(30)	2534(101)
1971-72	1024(34)	569(20)	520(22)	385(36)	2498(112)
1972-73	1059(40)	529(24)	564(25)	404(40)	2556(119)
1973-74	1053(38)	566(18)	528(21)	421(43)	2568(120)
1974-75	1056(42)	571(20)	552(25)	420(45)	2599(132)
1975-76	1044(39)	605(21)	561(26)	426(46)	2636(132)
1976-77	1097(46)	615(28)	563(31)	352(29)	2627(134)
1977-78	1090(40)	609(24)	570(24)	358(33)	2627(121)

Note :—Figures in brackets indicate executives.

5.02 While reviewing the staff requirements in the Washeries, the Committee on Public Undertakings in paragraph 200 of its Thirty First Report (3rd Lok Sabha—April 1966) had observed that, considering the main responsibilities of the Washeries, the staff employed was on the high side and recommended that the standard force, which was then being finalised, should be worked out soon. The standard force for all the Washeries including Dugda II and Patherdih and Central office was fixed in July 1972 as under :—

Dugda	1061
Bhojudih	506
Patherdih	513
Central Office	371
Officers	137
TOTAL	<u>2588</u>

However, it will be seen from the data given above that actual staff strength during 1974-75 to 1977-78 was more than the strength fixed as standard force in July 1972.

6.00 Inventory Control

Annexure V indicates the inventory holdings of the Washeries at the end of 1970-71 to 1977-78. The following features of inventory control, deserve mention :—

- (i) There was heavy accumulation of middlings/rejects, especially at Dugda-II Washery. This was attributed by the Management (March 1977) to lack of sale/disposal arrangements.
- (ii) Inventory of stores and spares represented 22 to 34 months, consumption during 1970-71 to 1977-78.
- (iii) As at the end of 1977-78, the Organisation held stock of Rs. 385.28 lakhs worth of stores and spares, out of which stores and spares aggregating Rs. 56.10 lakhs

remained non-moving (April 1981). The washery-wise details of non-moving stores and spares are given below :—

(Rs. in lakhs)

Washery	Amount of non-moving stores and spares
Dugda I & II	26.70
Bhojudih	14.10
Patherdih	15.30

The efforts made by the Management so far (April 1981) for their disposal (through circulation of lists to other washeries, plants, BCCL and advertisement), have not proved successful.

The slow moving stores and spares have not been segregated by the Management on the ground that their rate of consumption varies depending upon the circumstances under which an equipment operates.

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(iv) *Stock of Middlings and Rejects*

Stock of middlings/rejects as at the end of year 1970-71 to 1977-78 (upto 30th April 1978) in respect of all the Central Coal Washeries is indicated below :—

	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
<i>Dugda—I</i>								
Middlings	..	..	0.03	0.65	1.78	4.02	5.05	6.15*
Rejects	1.68	1.99	2.23	2.48	3.17	4.04	5.17	6.28
<i>Dugda—II</i>								
Middlings	..	..	0.5	3.92	10.69	18.69	27.99	36.55*
Rejects	0.05	0.07	0.08	0.08	0.08	..	..	..
<i>Bhojudih</i>								
Rejects	18.29	20.27	22.49	24.96	28.38	32.27	36.42	39.48
<i>Patherdih</i>								
Middlings	0.21	0.20	0.20	0.23	0.38	0.32	0.39	1.53
Rejects	1.40	1.42	1.55	1.70	1.82	2.10	2.64	3.06

*NOTE : These figures also include the spillage inside plant. Hence there is a difference in these figures and those mentioned in para 2.05(a).

7.00 Profitability trends

(i) In regard to supply of washed coal to the steel plants of the Company, the Central Coal Washeries Organisation is functioning as a service unit and is recovering the actual cost of washed coal from the steel plants. The Committee on Public Undertakings in its Thirty First Report (3rd Lok Sabha—April 1966) and Forty-fifth report (4th Lok Sabha—April 1969) had recommended that if the Washeries were to work with maximum efficiency at minimum cost, they should function as independent commercial enterprises and show results comparable with other washeries in the country. The Ministry have not, however, implemented this recommendation on the following considerations given in their reply (October 1971) to the Committee :—

- (a) "Government fully share the Committee's emphasis that strenuous efforts should be made to bring down the cost of washing to the minimum in the Hindustan Steel Limited Coal Washeries. Government would also agree, in principle, that the cost of washing in Hindustan Steel Limited Washeries should compare favourably with that in other Washeries in the country, though, in actual practice, such a comparison of the cost of washing in Hindustan Steel Limited Washeries with that in other washeries would not be strictly of like with like. Other Washeries are pit-head Washeries whereas Hindustan Steel Limited Washeries are central Washeries. The sources also keep changing with passage of time."
- (b) "Secondly, coordination of movements and the cost of transportation of coal from the various collieries to the Central Washeries is high as compared to the cost incurred by pit-head Washeries on this account."
- (c) Thirdly capital investment per tonne of input in the case of a Central Washery is much higher because of additional marshalling yard facilities for incoming

coal and the cost of infra-structure which has to be borne by the Washery itself as against a pit-head Washery where the costs are distributed both over the mines and the Washery establishment”.

For supplies to outside parties, prices are negotiated with the customers, based on quarterly cost of production, capital investment, return on gross block, etc. With effect from 1-4-1969 a system of pooled prices for all washeries has been introduced.

The profit has arisen mainly due to sale of clean coal to parties other than the steel plants and the accounts of Coal Washeries showed a cumulative profit of Rs. 1095.99 lakhs as at the end of 30th April 1978 after taking into account the assessed value (Rs. 10.15 crores) of accumulated middlings of 44.23 lakh tonnes, as indicated below :—

Year	Profit (+) Loss (—) during the year	(Rs. in lakhs) Cumulative profit
1970-71	(+) 1.97	228.75
1971-72	(+)117.10 [@]	345.85
1972-73	(—) 42.58	303.27
1973-74	(+) 87.43	390.70
1974-75	(+)106.90	497.60
1975-76	(+)183.38	680.98
1976-77	(+)236.42	917.40
1977-78 (13 months)	(+)178.59	1095.99(*)

(*) The Profit of Rs. 1095.99 lakhs is before provision of Rs. 44.21 lakhs as Investment Allowance Reserve.

[@]This comprises of Rs. 43.34 lakhs representing profit on sales to outside parties, Rs. 24.11 lakhs on account of stock transfer to steel plants and Rs. 50.65 lakhs on account of prior period adjustment.

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(ii) The quantity of washed coal supplied to steel plants of the Company and outside parties during 1970-71 to 1977-78 (upto 30th April 1978) is indicated below :—

(In lakh tonnes)

Year	Quantities supplied to HSL Steel Plants	Quantities supplied to non HSL Steel Plants
1970-71	32.11	2.72
1971-72	31.39	3.65
1972-73	30.17	4.26
1973-74	27.70	5.50
1974-75	32.47	7.60
1975-76	34.01	9.38
1976-77	35.70	13.37
1977-78	34.75	17.39

(iii) The following table indicates the cost trends for the last eight years ending 30th April 1978

Year	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
Net sales realisation (Rs. in crores)	4.28	4.97	5.63	7.17	11.07	18.10	26.24	34.01
Cost of sales (Rs. in crores)	4.26	3.80	6.06	6.30	10.00	16.27	24.21	32.33
Percentage of cost of sales to net sales realisation	99.5	76.4	107.6	87.8	90.3	89.9	92.2	95.1

8. OVERALL SUMMARY

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

1. General

The Central Coal Washeries Organisation (CCWO) consists of 4 Washeries—Dugda I, Dugda II, Bhojudih and Patherdih—commissioned between May 1962 and February 1969 at a capital cost of Rs. 32.19 crores. These Washeries cater to the requirement of washed prime coking coal of Bhilai and Rourkela Steel Plants as well as the private sector steel plant.

In January 1973, it was decided, subject to Government approval, to treat these Washeries as an independent entity under the joint ownership of Hindustan Steel Limited (HSL) and Bharat Coking Coal Limited (BCCL). Pending approval of Government, a power of attorney was given to the Chairman-cum-Managing Director, BCCL, enabling him to manage these Washeries with effect from 1st April 1973. The interim arrangement still (August 1981) continues.

2. Production performance

(i) While annual input capacity of Dugda I and II was 24 lakh tonnes each, that of Bhojudih and Patherdih was 20 lakh tonnes each. However, following the recommendation of the High Powered Committee set up in 1970-71, these capacities were derated to 18, 20, 17 and 16 lakh tonnes respectively. An analysis of overall production performance of the Washeries for the years 1970-71 to 1977-78 revealed that :—

There was continuous and marked upward trend of capacity utilisation in all the Washeries from 1974-75 onwards, particularly in respect of Bhojudih Washery. In the case of Dugda I and II and Patherdih, performance was, however, still below the original/derated capacity upto 1977-78, except for Patherdih in 1977-78 in respect of derated capacity.

- The percentage of yield of clean coal in Dugda I, Bhojudih and Patherdih Washeries was less than the projected norm but in the case of Dugda II it was higher than the norm during 1970-71 to 1973-74.
- There was deterioration in the quality of raw coal received in the Washeries. The percentage of ash content in raw coal received was very high as compared to the projected norm.
- The receipt of prime coal in the Washeries was lower than the quantity programmed in all the years during 1970-71 to 1977-78.
- There was short and erratic supply of different categories of coal (prime, medium and blendable) to the steel plants due to which the latter could not maintain the blend ratio as recommended by the Dutt Committee (1969) ; this seriously affected the operation of coke ovens, blast furnaces, etc. in the steel plants.

(ii) *Consumption of raw materials, water and electricity*

A review of consumption data with the norms indicated that :—

- The consumption of magnetite in Dugda I and II Washeries was generally more than the norm while in the Bhojudih and Patherdih Washeries, it was less than the norm.
- The consumption of electricity was more in Dugda I in all the years, in Dugda II during 1975-76 to 1977-78, in Bhojudih in 1970-71 and during 1974-75 to 1977-78, and in Patherdih Washery in 1971-72 and during 1973-74 to 1977-78.
- The excess consumption of magnetite and water resulted in an extra expenditure of Rs. 17.14 lakhs while that of electricity Rs. 2.41 crores, during 1970-71 to 1977-78.

3. Disposal of middlings

The Washeries are linked to different thermal power stations for disposal of middlings. The following features in this regard deserve mention :—

- Upto June 1973 middlings of Dugda I and II Washeries were stacked together and were being supplied to the Chandrapura Thermal Power Station of Damodar Valley Corporation (DVC). Thereafter, it was decided that the middlings from Dugda II Washery containing higher ash content should be sent to the power station only when it was converted into a three product washery. Accordingly, Dugda I middlings were segregated at a cost of Rs. 8.90 lakhs during July 1973 to February 1974 and supplied to the DVC Power Station alongwith a part of fresh arisings. Owing to space limitation, inability of Chandrapura Thermal Power Station to take full quantity of middlings of the third shift and occasional breakdown of Chandrapura Thermal Power Station conveyor belts, a part of arisings of middlings of Dugda I, however, continued to be stacked with middlings of Dugda II. The total quantity so dumped at an expenditure of Rs. 94.91 lakhs was 42.39 lakh tonnes (6 lakh tonnes of Dugda I and 36.39 lakh tonnes of Dugda II) upto 30-4-1978, valued at Rs. 9.70 crores. The accumulated middlings/rejects are yet to be disposed of.
- The rejects/sinks of Bhojudih Washery were not accepted by the Santhaldih Power Station on account of its high ash content and the entire arisings of 39.48 lakh tonnes (not valued) during 1962-63 to 1977-78 had been dumped at a cost of Rs. 69.56 lakhs.
- Schemes for up-gradation of fresh arisings of rejects/sinks of Bhojudih Washery and the entire arisings of

middlings/by-products of Dugda II Washery were taken up in December 1975 and March 1976 respectively at the revised estimated cost of Rs. 12.90 lakhs and Rs. 364.5 lakhs respectively. The scheme for upgradation of Bhojudih sinks was completed in June 1977 but performance test could not be conducted so far due to defect in the crusher of the new circuit. The scheme for upgradation of the arisings of middlings/by-products of Dugda II Washery which was scheduled to be completed in September 1978, is now expected to be completed only by December 1981.

4. *Loss of rebate*

For failure to pay the electricity bills on due dates, etc. a sum of Rs. 8.43 lakhs was lost on account of loss of rebate and levy of surcharge.

5. *Man-power Analysis*

The actual staff strength employed in the Washeries during the years 1974-75 to 1977-78 was more than the standard force fixed in July 1972.

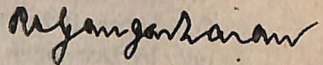
6. *Inventory Control*

The inventory of stores and spares held by the Washeries ranged from 22 to 34 months' consumption during 1970-71 to 1977-78.

7. *Profitability trends*

The unit is working as a service unit and is recovering the actual cost of washed coal from the Steel Plants. The unit has earned profit mainly on account of sale of clean coal to outside parties. It earned profits in all the years except in 1972-73 and the cumulative profit upto the end of 30th April 1978 amounted

to Rs. 10.96 crores, taking into account the assessed value of accumulated middlings of 44.23 lakh tonnes at Rs. 10.15 crores, as against the total investment of Rs. 32.19 crores.

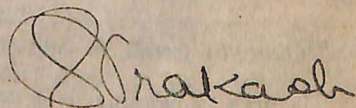


(P. P. GANGADHARAN)

New Delhi,
The 28 November, 1981

*Chairman, Audit Board and ^{EX-Officio}
Additional Deputy Comptroller
and Auditor General
(Commercial)*

Countersigned



(GIAN PRAKASH)

New Delhi,
The 28 November, 1981

*Comptroller and Auditor
General of India*

ANNEXURE I A
(Referred to in para 1)

Statement showing names of collieries supplying coal to the washeries and grade of coal supplied

Dugda I		Dugda II		P.atherdih		Bhojudih	
Name of Colliery	Grade	Name of Colliery	Grade	Name of Colliery	Grade	Name of Colliery	Grade
Madhuband	W-III	Sendra Bansjora	WSH-II/IV	Bastacolla	WSH-II	Amlabad	WSH-II/III/IV
Phularitand	W-II/W-III	Maheshpur	WSH-IV	Bagdigi	WSH-III	Bhowra	WSH-I/II/III
Kessurgarh	W-I/W-II	Mudidih	WSH-IV	Bhulan Bararee	WSH-I/III	Burragarh	WSH-I
Angarpathra	WSH-IV	Khas Kusunda	WSH-III/IV	Lodna	WSH-II	Munidih	WSH-III
Gaslitand	WSH-I/III	Gondudih	WSH-II	N. S. Lodna	WSH-III	Kankance	STL-II/WSH-II
Jogta	WSH-IV	East Katras	WSH-IV	Kujama	WSH-III	Murulidih/ Bhatdi	WSH-II/III
N. Tetturiya	WSH-IV	E. Angarpathra	WSH-IV	Ind./W. Ena	WSH-III	Hurriladih	WSH-II
S. Govindpur	WSH-III			E. Bhuggatdih	WSH-II/ STL-II	Simlabahal	WSH-III
K. Dharmaband	STL-II			Joyrampur	WSH-III	Balihari	STL-II
Kharkharee	WSH-III			S. Tisra	WSH-III	Kustore	WSH-III/ STL-I
K. Choitudih	WSH-II/IV			N. Tisra	WSH-III		
Murulidih/ Bhatdih	WSH-II/III			Ena	WSH-III		
Bhurangia Project	WSH-III			Golukdih	WSH-II		
Benedih	WSH-III			Alkusa (Gopali- chak) †	WSH-I/IV		
				Golukdih (GOCP)	W-II		

ANNEXURE I-B

(Referred to in paragraph 2.03.01)

Statement showing the number of hours for which the washeries actually worked.

Washery	Year	Actual hours available	Hours actually worked	IDLE HOURS									Total idle hours
				External reasons					Internal reasons				
				Power failure	Raw Coal shortage	Bunker full	Total (External)	Break down	Operational difficulties and maintenance hold ups	Other reasons	Total (Internal)		
1	2	3	4	5	6	7	8	9	10	11	12	13	
DUGDA I	1970-71	4934	1582	75	213	2141	2429	313	145	465	923	3352	
	1971-72	4951	2048	85	582	1042	1709	538	378	278	1194	2903	
	1972-73	5044	2179	405	256	594	1255	622	662	326	1610	2865	
	1973-74	5242	2209	427	389	760	1576	633	443	381	1457	3033	
	1974-75	5240	3258	287	205	301	793	437	359	393	1189	1982	
	1975-76	5335	3714	251	13	43	307	542	421	351	1314	1621	
	1976-77	5567	3816	88	4	104	196	825	442	288	1555	1751	
	1977-78	6137	4012	121	55	179	355	738	476	556	1770	2125	
DUGDA II	1970-71	4976	2502	67	..	1299	1376	344	267	497	1108	2474	
	1971-72	4962	2712	109	..	809	938	563	428	341	1332	2250	
	1972-73	5037	2694	407	45	479	931	594	429	389	1412	2343	
	1973-74	5293	2623	394	181	675	1250	637	367	416	1420	2670	
	1974-75	5250	3309	98	85	308	491	631	351	468	1450	1941	

	1975-76	5276	3770	61	21	57	139	671	327	369	1367	1506
	1976-77	5511	4176	71	6	114	191	490	343	311	1144	1335
	1977-78	6002	3940	108	85	219	412	705	438	407	1550	1962
BHOJUDIH	1970-71	4828	3078	26	199	607	832	282	358	278	918	1750
	1971-72	4916	3190	32	132	483	647	394	414	271	1079	1726
	1972-73	4852	3284	127	137	389	653	295	309	311	915	1568
	1973-74	5149	3250	147	280	759	1186	192	250	271	713	1899
	1974-75	5231	4060	99	76	161	336	195	350	290	835	1171
	1975-76	5421	4302	100	11	7	118	275	432	294	1001	1119
	1976-77	5499	4384	66	..	48	114	327	406	268	1001	1115
	1977-78	6315	4678	332	37	36	405	348	450	434	1232	1637
PATHERDIH	1970-71	4961	2913	39	88	861	988	399	363	298	1060	2048
	1971-72	4885	2860	36	..	780	816	496	437	276	1209	2025
	1972-73	5017	2832	206	..	413	619	760	484	322	1566	2185
	1973-74	5267	2922	277	74	409	760	761	515	309	1585	2345
	1974-75	5420	3239	251	29	238	518	765	537	361	1663	2181
	1975-76	5480	3447	101	67	444	612	621	468	332	1421	2033
	1976-77	5589	4101	68	7	163	238	611	301	338	1250	1488
	1977-78	6098	4482	201	40	304	545	478	245	348	1071	1616

ANNEXURE II

(Referred to in paragraph 2.03.02)

Statement showing month-wise average ash content in prime quality Coal received at washeries

Period	DUGDA—I			DUGDA—II			BHOJUDIH			PATHERDIH		
	Ash % in raw coal	Ash % in clean coal	Ash reduction	Ash % in raw coal	Ash % in clean coal	Ash reduction	Ash % in raw coal	Ash % in clean coal	Ash reduction	Ash % in raw coal	Ash % in clean coal	Ash reduction
1	2	3	4	5	6	7	8	9	10	11	12	13
1972-73												
April	22.5	17.2	5.3	24.9	17.3	7.6	22.2	17.4	4.8	24.5	17.3	7.2
May	22.5	17.2	5.3	24.5	17.3	7.2	21.8	17.3	4.5	24.3	17.4	6.9
June	22.3	17.2	5.1	24.8	17.4	7.4	22.1	17.2	4.9	24.1	17.4	6.7
July	22.2	17.1	5.1	25.2	17.5	7.7	22.1	17.3	4.8	24.5	17.3	7.2
August	22.5	17.1	5.4	25.3	17.6	7.7	22.6	17.3	5.3	24.6	17.5	7.1
September	22.4	17.4	5.0	24.8	17.6	7.2	22.8	17.5	5.3	24.5	17.6	6.9
October	22.6	17.4	5.2	25.0	17.5	7.5	22.5	17.3	5.2	25.3	18.0	7.3
November	22.5	17.5	5.0	24.6	17.6	7.0	22.5	17.3	5.2	25.5	18.1	7.4
December	23.1	17.5	5.6	24.6	17.8	6.8	22.3	17.3	5.0	24.9	17.5	7.4
January	22.7	17.1	5.6	24.7	17.8	6.9	22.6	17.3	5.3	25.6	17.8	7.8
February	22.8	17.3	5.5	24.7	17.6	7.1	23.5	17.4	6.1	25.1	18.1	7.0
March	23.0	17.3	5.7	24.9	17.5	7.4	24.0	17.3	6.7	26.1	18.3	7.8
Total	271.1	207.3	63.8	298.0	210.5	87.5	271.0	207.9	63.1	299.0	212.3	86.7
Average	22.59	17.27	5.32	24.83	17.54	7.29	22.58	17.33	5.25	24.92	17.69	7.23

1973-74

April	23.3	17.3	6.0	25.4	17.6	7.8	25.1	17.5	7.6	25.8	18.4	7.4
May	23.4	17.5	5.9	25.3	17.9	7.4	23.5	17.5	6.0	25.3	18.3	7.0
June	23.9	18.0	5.9	26.6	18.3	8.3	23.2	17.4	5.8	26.1	18.4	7.7
July	24.2	18.3	5.9	26.7	18.4	8.3	23.5	17.3	6.2	25.7	18.1	7.6
August	23.8	17.9	5.9	26.3	18.1	8.2	23.4	17.4	6.0	25.8	18.2	7.6
September	24.1	17.9	6.2	26.1	18.2	7.9	23.1	17.4	5.7	25.7	18.1	7.6
October	24.2	17.7	6.5	25.7	18.2	7.5	23.8	17.5	6.3	25.7	18.0	7.7
November	24.5	18.3	6.2	27.0	18.4	8.6	23.9	17.4	6.5	25.6	18.0	7.6
December	24.5	18.0	6.5	26.9	18.2	8.7	24.2	17.5	6.7	26.3	18.2	8.1
January	24.5	18.0	6.5	27.7	18.5	9.2	23.8	17.4	6.4	25.8	18.2	7.6
February	24.9	18.4	6.5	27.8	18.6	9.2	22.8	17.3	5.5	25.4	18.0	7.4
March	25.6	18.3	7.3	28.0	18.5	9.5	23.4	17.5	5.9	25.6	18.0	7.6
Total	290.9	215.6	75.3	319.5	218.9	100.6	283.7	209.1	74.6	308.8	217.9	90.9
Average	24.24	17.97	6.27	26.62	18.24	8.38	23.64	17.42	6.22	25.73	18.16	7.57

1974-75

April	25.9	19.1	6.8	28.1	18.8	9.3	23.6	17.6	6.2	25.7	18.0	7.7
May	25.4	18.1	7.3	29.0	18.5	10.5	23.5	17.5	6.0	25.9	18.1	7.8
June	26.0	18.7	7.3	28.6	18.8	9.8	23.7	17.4	6.3	25.8	18.1	7.7
July	25.8	18.6	7.2	28.2	18.7	9.5	23.5	17.5	6.0	25.7	18.2	7.5
August	25.5	18.5	7.0	28.6	18.6	10.0	23.6	17.5	6.1	26.0	18.3	7.7
September	26.7	19.0	7.7	29.1	19.4	9.7	23.9	17.5	6.4	26.4	18.5	7.9
October	27.1	19.1	8.0	29.4	19.7	9.7	24.0	17.5	6.5	26.4	18.4	8.0
November	28.1	19.8	8.3	30.4	20.9	9.5	23.5	17.5	6.0	26.3	18.4	7.9

1	2	3	4	5	6	7	8	9	10	11	12	13
December	27.1	18.9	8.2	29.5	19.7	9.8	23.6	17.4	6.2	26.4	18.5	7.9
January	26.8	18.4	8.4	29.3	19.1	10.2	23.5	17.5	6.0	26.8	18.4	8.4
February	26.6	18.5	8.1	29.1	19.0	10.1	24.0	17.5	6.5	26.9	18.5	8.4
March	26.0	18.3	7.7	28.5	19.3	9.2	23.9	17.5	6.4	26.6	18.4	8.2
TOTAL	317.0	225.0	92.0	347.8	230.5	117.3	284.3	209.7	74.6	314.9	219.8	95.1
Average	26.42	18.75	7.67	28.99	19.21	9.78	23.69	17.48	6.21	26.24	18.32	7.92

1975-76

April	27.0	18.8	8.2	29.1	19.6	9.5	24.0	17.5	6.5	27.1	19.0	8.1
May	26.8	18.7	8.1	29.2	19.6	9.6	23.9	17.5	6.4	27.3	19.0	8.3
June	26.7	18.9	7.8	29.1	20.0	9.1	24.0	17.5	6.5	27.4	18.9	8.5
July	26.5	18.9	7.6	29.0	19.8	9.2	23.7	17.4	6.3	26.3	18.7	7.6
August	26.7	18.9	7.8	29.3	20.0	9.3	24.2	17.5	6.7	26.7	18.7	8.0
September	27.0	19.0	8.0	29.1	20.0	9.1	24.3	17.5	6.8	26.7	18.6	8.1
October	27.1	19.0	8.1	30.2	21.0	9.2	23.8	17.5	6.3	26.7	18.5	8.2
November	27.1	19.2	7.9	30.6	20.9	9.7	23.8	17.5	6.3	27.1	18.6	8.5
December	26.2	19.1	7.1	29.4	20.4	9.0	23.7	17.5	6.2	26.5	18.9	7.6
January	27.1	19.4	7.7	29.7	20.4	9.3	23.9	17.5	6.4	26.9	19.3	7.6

February	27.0	19.3	7.7	29.2	20.2	9.0	23.6	17.5	6.1	27.2	19.0	8.2
March	27.2	19.3	7.9	29.5	20.5	9.0	23.6	17.4	6.2	27.1	19.1	8.1
TOTAL	322.4	228.5	93.9	353.4	242.4	111.0	286.5	209.8	76.7	323.0	226.3	96.8
Average	26.87	19.05	7.82	29.45	20.20	9.25	23.88	17.48	6.4	26.92	18.86	8.06

1976-77

April	27.30	19.60	7.70	29.30	20.00	9.30	23.40	17.40	6.00	27.20	19.10	8.10
May	26.70	19.20	7.50	28.50	19.80	8.70	23.40	17.50	5.90	27.30	19.40	7.90
June	26.20	19.10	7.10	28.40	19.60	8.80	23.60	17.20	6.40	28.40	19.70	8.70
July	26.10	19.50	6.60	29.20	20.10	9.10	23.60	17.50	6.10	27.40	19.40	8.00
August	25.50	19.00	6.50	28.50	19.60	8.90	23.50	17.50	6.00	27.50	19.90	7.60
September	26.10	19.60	6.50	29.00	19.50	9.50	23.60	17.60	6.00	26.70	18.90	7.80
October	26.60	19.80	6.80	29.00	19.70	9.30	23.50	17.70	5.80	26.40	18.40	8.00
November	27.00	20.00	7.00	29.50	19.90	9.60	23.90	17.90	6.00	26.80	19.20	7.60
December	27.00	19.60	7.40	29.50	19.40	10.10	24.00	17.70	6.30	26.90	19.90	7.00
January	27.10	19.70	7.40	29.10	19.30	9.80	23.90	17.60	6.30	26.80	19.80	7.00
February	27.20	19.60	7.60	29.50	19.80	9.70	23.90	17.40	6.50	26.10	19.10	7.00
March	27.50	20.20	7.30	29.70	20.00	9.70	23.30	17.90	5.30	26.90	19.10	7.80
TOTAL	320.30	234.90	85.40	349.20	236.70	112.50	283.60	210.90	72.60	324.40	231.90	92.50
Average	26.69	19.58	7.11	29.10	19.73	9.37	23.63	17.58	6.05	27.03	19.33	7.70

1	2	3	4	5	6	7	8	9	10	11	12	13
1977-78 (13 months)												
April	28.60	21.10	7.50	30.10	20.30	9.80	23.70	17.90	5.80	27.00	19.60	7.40
May	27.90	21.30	6.60	30.20	20.70	9.50	24.00	17.90	6.10	27.00	19.60	7.40
June	27.60	20.50	7.10	29.90	20.30	9.60	24.40	18.40	6.00	27.00	19.50	7.50
July	27.90	20.80	7.10	29.80	20.40	9.40	24.70	18.80	5.90	27.50	20.00	7.50
August	28.90	22.00	6.90	31.30	20.90	10.40	25.00	19.00	6.00	28.40	20.40	8.00
September	28.80	21.50	7.30	31.40	20.90	10.50	25.30	19.00	6.30	27.60	19.90	7.70
October	28.70	21.20	7.50	30.10	20.70	9.40	25.50	19.30	6.20	27.50	19.80	7.70
November	27.70	21.00	6.70	30.70	20.90	9.80	24.90	18.90	6.00	27.40	20.30	7.10
December	28.40	22.00	6.40	30.60	20.10	10.50	25.00	18.70	6.30	27.70	20.60	7.10
January	28.20	21.60	6.60	30.70	20.60	10.10	25.10	18.60	6.50	28.40	21.20	7.20
February	28.50	21.70	6.80	30.50	20.20	10.30	24.70	18.40	6.30	27.60	21.10	6.50
March	28.10	21.10	7.00	30.80	20.30	10.50	24.60	18.40	6.20	27.40	20.50	6.90
April	27.80	20.80	7.00	30.60	20.10	10.50	24.50	18.30	6.20	27.40	20.60	6.80
TOTAL	367.10	276.60	90.50	396.70	266.40	130.30	321.40	241.60	79.80	357.90	263.10	94.80
Average	28.24	21.28	6.96	30.52	20.49	10.03	24.72	18.58	6.14	27.53	20.24	7.29

ANNEXURE III
(Referred to in paragraph 2.04)

Statement showing the consumption of magnetite, water and electricity per tonne of raw coal input vis-a-vis the norms fixed by the Norms Committee

(Per tonne of raw coal input)

1	DUGDA I			DUGDA II			BHOJUDIH			PATHERDIH		
	Magnetite (kg.)	Water (Gallon)	Electricity (Kwh)	Magnetite (kg.)	Water (Gallon)	Electricity (kwh)	Magnetite (kg.)	Water (Gallon)	Electricity (kwh)	Magnetite (kg.)	Water (Gallon)	Electricity (kwh)
	2	3	4	5	6	7	8	9	10	11	12	13
Norms fixed by the CCWO (with effect from 1972-73)	1.08	73.40	519747 per month	1.08	45.37	812401 per month	0.67	79.00	769344 per month	1.40	87.00	423504 per month
<i>Actual Consumption</i>												
1970-71	1.71	68.00	520550 per month (8.7 KWH per tonne)	2.04	45.40	722042 per month (6.5 KWH per tonne)	0.69	73.00	778917 per month (6.5 KWH per tonne)	1.39	92.00	393600 per month (4.1 KWH per tonne)
1971-72	1.52	52.00	592450 per month (8.2 KWH per tonne)	1.82	49.80	651017 per month (6.7 KWH per tonne)	0.58	63.00	715500 per month (6.0 KWH per tonne)	1.88	74.00	428950 per month (4.6 KWH per tonne)
1972-73	1.70	53.99	567942 per month (8.3 KWH per tonne)	1.86	44.99	702000 per month (7.2 KWH per tonne)	0.51	73.02	729142 per month (5.9 KWH per tonne)	1.30	63.64	375533 per month (4.3 KWH per tonne)
1973-74	2.12	53.29	585225 per month (8.1 KWH per tonne)	2.18	45.35	719467 per month (7.6 KWH per tonne)	0.47	80.45	731108 per month (5.9 KWH per tonne)	1.12	70.15	449800 per month (5.2 KWH per tonne)
1974-75	1.65	47.00	621033 per month (6.2 KWH per tonne)	1.85	45.00	750750 per month (6.5 KWH per tonne)	0.42	61.25	912950 per month (5.7 KWH per tonne)	1.32	93.00	459783 per month (4.9 KWH per tonne)
1975-76	1.67	46.50	562042 per month (4.7 KWH per tonne)	2.85	45.25	871750 per month (6.6 KWH per tonne)	0.42	65.75	959000 per month (5.6 KWH per tonne)	1.30	100.50	460125 per month (4.5 KWH per tonne)
1976-77	1.09	47.00	849450 per month (6.3 KWH per tonne)	2.74	46.00	935229 per month (6.05 KWH per tonne)	0.25	54.25	968916 per month (5.5 KWH per tonne)	1.27	72.17	498433 per month (3.8 KWH per tonne)
1977-78	1.28	47.00	890492 per month (6.6 KWH per tonne)	3.55	45.30	928523 per month (6.3 KWH per tonne)	0.16	50.6	1009646 per month (5.8 KWH per tonne)	1.10	86.69	489323 per month (3.6 KWH per tonne)

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ANNEXURE IV

(Referred to in paragraph 4.02)

Statement showing the actual cost of washed coal per tonne as a percentage of standard cost

Year	Dugda I	Dugda II	Bhojudih	Patherdih
1972-73	110.8	110.8	107.8	111.2
1973-74	135.0	135.0	127.9	129.7
1974-75	152.9	152.9	148.9	147.4
1975-76	96.4	96.4	102.9	99.3
1976-77	90.0	90.0	106.8	101.9
1977-78	100.7	100.7	105.7	101.3

ANNEXURE V

(Referred to in paragraph 7.01)

Statement showing the inventory holdings of the Washeries

(Rs. in lakhs)

Year	Total inventories of raw materials, Stores and spares (excluding raw materials & Stores & spares in transit) finished & semi-finished products & other misc. stores	Stores & Spares (excluding in transit)		Raw materials (excluding in transit)	Finished & semi-finished products		Total consumption of stores & spares during the year	Total consumption of raw materials during the year	Year and inventories as number of months' consumption		Total sales (excluding excise duty, freight, etc.)	Finished & semi-finished stock (i.e. clean coal & middlings as number of months' sales)
		Foreign	indigenous		Clean Coal	Middlings/ rejects			Stores & spares	Raw materials		
1	2	3	4	5	6	7	8	9	10	11	12	13
1970-71	216.89	..	169.30	25.69	15.74	3.80	68.01	2059.62	29.89	0.15	428.19	0.55
1971-72	249.36	49.15	145.51	33.32	15.46	3.60	67.63	2053.41	34.54	0.19	496.77	0.46
1972-73	245.34	50.31	154.65	10.70	22.54	5.37	76.73	2107.09	32.05	0.06	563.42	0.59
1973-74	405.77	49.11	159.60	5.26	84.43	105.34	95.71	2488.52	26.17	0.03	717.22	3.18
1974-75	682.17	48.15	196.89	39.59	77.25	318.36	117.84	3535.63	24.95	0.13	1107.00	4.29
1975-76	1016.02	48.05	244.71	45.30	111.60	561.35	160.54	5502.19	21.88	0.10	1810.26	4.46
1976-77	1265.94	54.43	284.00	28.98	122.92	769.12	168.60	5856.38	24.09	0.06	2624.16	4.08
1977-78	1138.03	59.78	325.50	20.18	166.49	1014.58	216.53	7343.47	23.12	0.03	3400.85	4.51