Chapter III

Performance Audit relating to Power Sector Enterprises

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West Bengal Power Development Corporation Limited and The Durgapur Projects Limited

3 Fuel Management in Thermal Power Stations of West Bengal

3.1 Introduction

Thermal Power Stations (TPS) convert fuels such as coal, natural gas *etc.* to electric power. In India, almost 90 *per cent* of thermal electricity is generated from coal.

Further, according to the Energy Plan and Action Plan for West Bengal (December 2019), coal-based capacity is expected to continue as the major source of electricity generation until 2040. The total installed generation capacity of thermal power plants in West Bengal was 14,691 MW [Central: 6913 MW (NTPC-2,100, DVC-4,813) State: 5,295 MW and Private Sector: 2,483 MW] as of March 2020**.**

In the State, there are six TPS, comprising 22 generating units[33] commissioned between September 1965 and December 2016, under The West Bengal Power Development Corporation Limited (WBPDCL) and The Durgapur Projects Limited (DPL), both Companies wholly owned by the Government of West Bengal (GoWB). WBPDCL, a generating company as defined under section 2 (28) of the Electricity Act 2003, was incorporated in July 1985, while DPL was set-up in September 1961. Presently, WBPDCL operates five TPS located at Kolaghat, Bakreswar, Bandel, Santaldih and Sagardighi with a total installed capacity of 4,745 MW.[34] Similarly, DPL operates one TPS at Durgapur with installed capacity of 550 MW.[35]During 2015-20, these six TPS generated 1,21,694.46 million units[36] (MU) of electricity against target of 1,70,604.01 MU and available capacity of 1,84,528.51 MU.

Together, these six TPS generated 99,753.44 MU (50.16 *per cent*) of the 1,98,862.17 MU of total power requirement of the State during 2016-20.

3.2 Organisational Structure

WBPDCL and DPL are PSEs that function under the Department of Power and Non-Conventional Energy Sources (DPNCES), Government of West Bengal (GoWB). The management of WBPDCL is vested with a Board of Directors (BoD) consisting of two Non-Executive Directors, five Independent Directors and seven Executive Directors, including the Chairman and Managing Director. The Chairman and Managing Director is the Chief Executive of the Company and is assisted by the Director (Regulatory Affairs), Director (Mining), Director (Finance and Accounts), Director (HR), Director

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[33] *Capacities of 60 MW – two, , 210 MW – 11, 215 MW-one, 250 MW – three, 300 MW – three, 500 MW – two*

[34] *KTPS- 1,260 MW (6x210 MW); BkTPS:- 1,050 MW (5 x 210 MW); STPS:- 500 MW (2x250 MW); BTPS:- 335MW {(2x60 MW)+(1x215 MW)}; SgTPS:- 1600 MW {(2x300 MW)+(2x500 MW)}*

[35] *Unit 6 – 110 MW (Decommissioned), unit 7 –300 MW and Unit 8 – 250 MW.*

[36] *Also known as million Kilowatt hours (mKwh*)

(Projects) and Director (Operation and maintenance) *etc*. in managing day to day operations.

The Management of DPL is given to a BoD consisting of eight Directors, including the Chairman and the Managing Director. The General Manager heads the operations of the TPS and reports to the Director (Operations) at Kolkata who exercises overall supervision over the operation of the TPS. In December 2017, the GoWB decided that DPL would be a wholly owned subsidiary company of WBPDCL, which became effective from April 2019.

3.3 Audit Objectives

Audit of Fuel Management in Thermal Power Stations would assess whether -

i. All six TPSs had effectively ensured fuel security through long term fuel linkages/ fuel supply agreements (FSA) for procurement of fuel, *viz*., coal and oil as well as their economic and efficient inventory management.
ii. Proper procedures were adopted for assessing quality and quantity of coal/ fuel oil.
iii. Proper controls existed for monitoring consumption of coal and ensuring that actual heat rate conformed to the norms fixed by WBERC and the thermal efficiency achieved was as per the design parameters.

3.4 Scope and Methodology of Audit

The pilot study on the Performance Audit (PA) on 'Fuel Management in Thermal Power Stations in West Bengal' was conducted for Kolaghat Thermal Power Station (KTPS) and DPL in January/February 2019. Thereafter, audit was conducted across six TPSs from March 2019 to March 2021 in different phases. The audit was expected to be completed by September 2019. However, at the request of WBPDCL, audit was kept in abeyance from June 2019 to November 2019 due to the closing of annual accounts and audit certification process. Further, due to exigencies on account of COVID pandemic and West Bengal Assembly Elections 2021, the audit process became further delayed. The scope covered Fuel Management of the six TPSs for the five years from April 2015 to March 2020. Audit methodology involved scrutiny of agreements with coal companies and suppliers/Indian Railways, WBERC guidelines/orders, Coal Distribution Policy, Agenda/ Minutes of meetings of BoD and interaction with the Management.

An entry conference was held on 20 March 2019 with Department of Power (DoP), WBPDCL and DPL to discuss the audit objectives, audit criteria, scope and methodology of PA. The audit findings were discussed at an Exit Conference held on 01 October 2021. It was attended by the Additional Chief Secretary to the Government of West Bengal, Department of Power; Chairman and Managing Director WBPDCL, Managing Director DPL and other senior Officers/ Management of the Department and SPSEs. The responses have been suitably incorporated in this Report.

3.5 Audit Criteria

The audit criteria *inter-alia*, were derived from the following -

a) National Electricity Policy (2005), New Coal Distribution Policy (2007) etc. issued by Government of India.

b) Tariff regulations/ orders, fuel related guidelines and norms including the technical parameters for fuel consumption by WBERC.

c) Central Electricity Authority (CEA) norms/guidelines. Energy Plan/ Energy Action Plan for West Bengal, Energy/ Fuel Audit Reports of WBPDCL/ DPL, good practices followed by other generating companies.

d) Agenda/ Minutes of meetings of Boards of Directors and Board level sub-committees.

e) Fuel Supply Agreements (FSAs)[37] with coal/oil companies for supply of coal/ oil and agreements with Indian Railways for transportation of coal.

f) Contracts/ agreements for import of coal and beneficiation (washing) of coal.

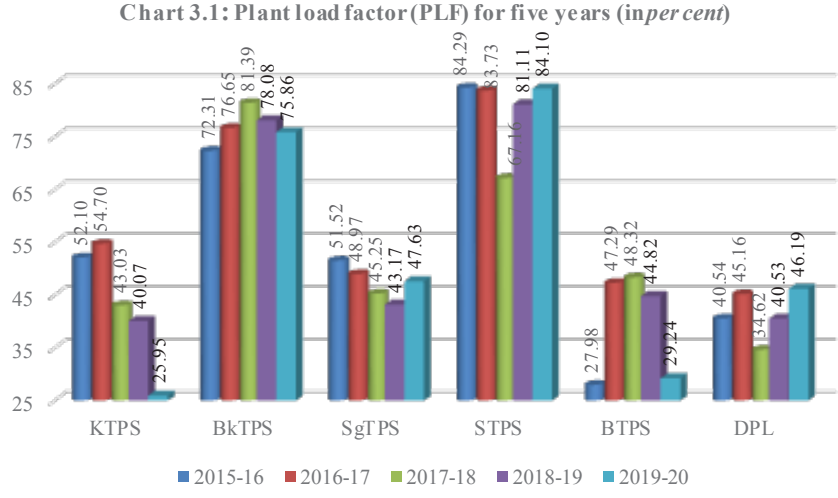
3.6 Operational Performance

3.6.1 Plant Load Factor

As per definition of Central Electricity Regulatory Commission, 'Plant Load Factor' or '(PLF)' in relation to a thermal generating station or unit for a given period means the total sent out energy corresponding to scheduled generation during the period, expressed as a percentage of sent out energy corresponding to installed capacity in that period.

PLF is commonly considered as a measure of the capacity utilisation of a power plant. A low PLF indicates that the power station is not being used at its optimal capacity. This would increase the unit cost of the power produced, making it unattractive for purchase by DISCOMs. The Plant Load Factor of the six TPSs for five years from 2015-16 to 2019-20 is summarised in **Chart 3.1** below:

Chart 3.1: Plant load factor (PLF) for five years (in *per cent*)



As per WBERC regulations, normative PLFs are 80 *per cent* for Bakreswar Thermal Power Station (BkTPS), Santaldih Thermal Power Station (STPS), Sagardighi Thermal Power Station (SgTPS), 75 *per cent* for Durgapur Thermal Power Station (DPL), 72 *per cent* for Bandel Thermal Power Station (BTPS) and 70 *per cent* for Kolaghat Thermal Power Station (KTPS). STPS achieved the normative PLF in four out of five years, BkTPS in one out of five years

[37] *FSA is a comprehensive coal supply agreement between coal producing company and power generating company. FSA also include terms and condition of coal quality and quantity, supply, payment, deductions etc.*

whereas KTPS, SgTPS, BTPS and DPL did not achieve normative PLF in any of the years due to coal shortage, low system demand and lack of maintenance.

3.6.2. Working Results

The details of working results like cost of generation of electricity, revenue realisation, net surplus/ loss and earnings and cost *per* unit of operation for WBPDCL and DPL from 2015-16 to 2019-20, are given in ***Appendix - 8***.

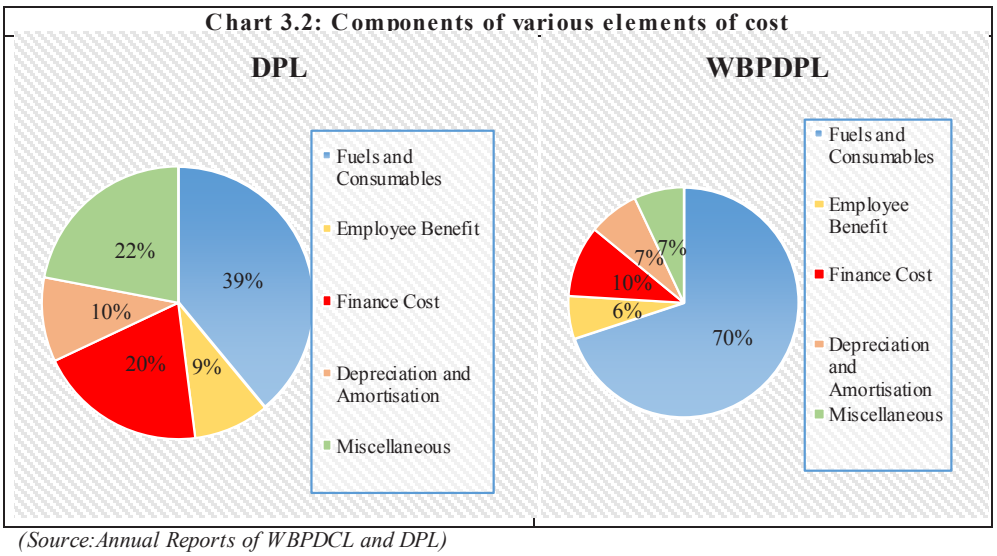
As may be seen from ***Appendix – 8*** in WBPDCL the revenue realisation per unit increased from ₹ 3.83 to ₹ 5.04 per unit in 2015-16 to 2019-20. However, during the same period fixed cost per unit increased from ₹ 1.16 to ₹ 1.71 per unit, mainly due to increase in interest & finance charges, employees cost and depreciation. The variable cost per unit in WBPDCL increased from ₹ 2.87 (2015-16) to ₹ 3.45 (2018-19) per unit during review period mainly due to excess consumption of coal and increase in price of coal; however, the unit variable cost decreased from ₹ 3.45 (2018-19) to ₹ 3.32 (2019-20) per unit due to production from captive coal mines.

In DPL the revenue realisation per unit decreased from ₹ 5.84 to ₹ 4.22 per unit in 2015-20. However, during the same period fixed cost per unit increased from ₹ 3.71 (2015-16) to ₹ 4.45 (2017-18) per unit mainly due to increase in interest & finance charges, employees cost and depreciation and again decreased to ₹ 3.84 (2019-20) due to decrease in finance cost and other expenses. The variable cost per unit in DPL decreased from ₹ 3.43 (2015-16) to ₹ 2.92 (2017-18) per unit during review period mainly due to decrease in production of energy and again increased to ₹ 3.15 (2019-20) per unit due to excess consumption of coal and increase in price of coal.

Elements of cost of power generation

Fuel & Consumables and interest & finance charges constitute the major elements of cost of generating power in respect of both DPL and WBPDCL. The percentage break-up of costs for 2015-20 is given below:

Chart 3.2: Components of various elements of cost



(Source:Annual Reports of WBPDCL and DPL)

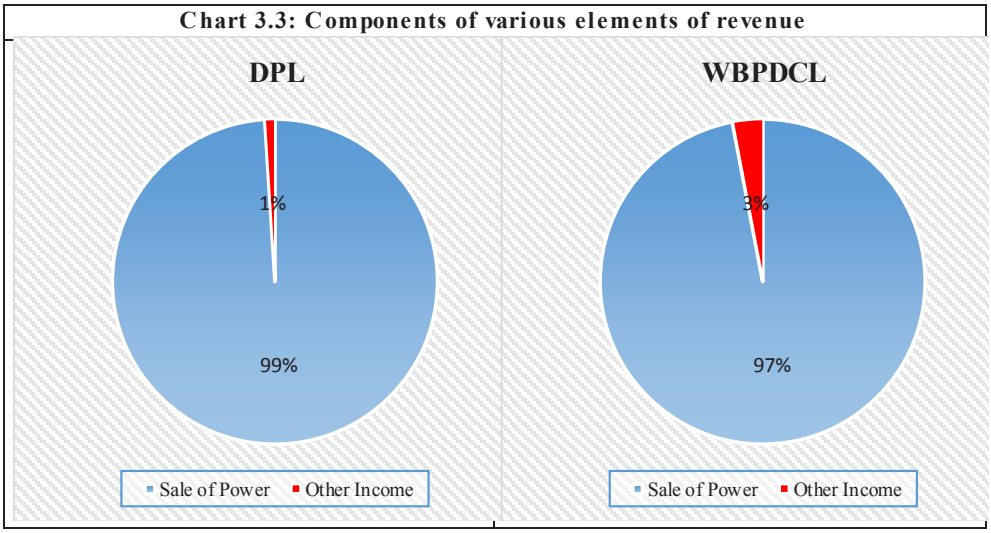
The Durgapur Projects Limited had three business segments namely, Power Station, Coke Oven Group of Plants and Water Works. Sub-segments of the Power Business comprised of Generation, Transmission and Distribution. Coke

Oven Group of Plant (COGP) was shut down (2015). DPL has to bear the employee cost of COGP. Further, Unit 8 (250 MW) was commissioned in 2014. Power demand did not increase during that period and the installed capacity was double of its generation (2016). Since, there was no Power Purchase Agreement between WBSEDCL and DPL for sale of surplus power of DPL to WBSEDCL, the DPL was forced to shut down the units. This led to huge finance cost to the company. Therefore, Miscellaneous Cost (21 *per cent*), Finance Cost (23 *per cent*) and Employee Benefit Cost (7 *per cent*) are accounted as major cost elements of DPL rather than fuel cost. Therefore, cost structure of WBPDCL is more representative of power sector than DPL.

Elements of revenue

Sale of Power constitutes the main source of revenue. The percentage break-up of revenue for 2015-20 is given below:

Chart 3.3: Components of various elements of revenue

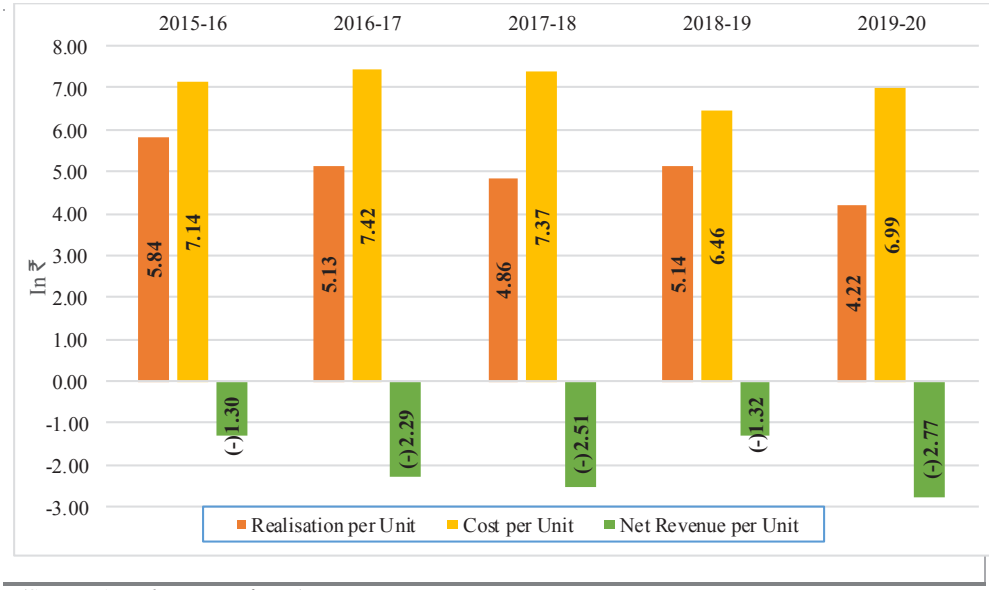


(Source:Annual Reports of WBPDCL and DPL)

Recovery of cost of operations

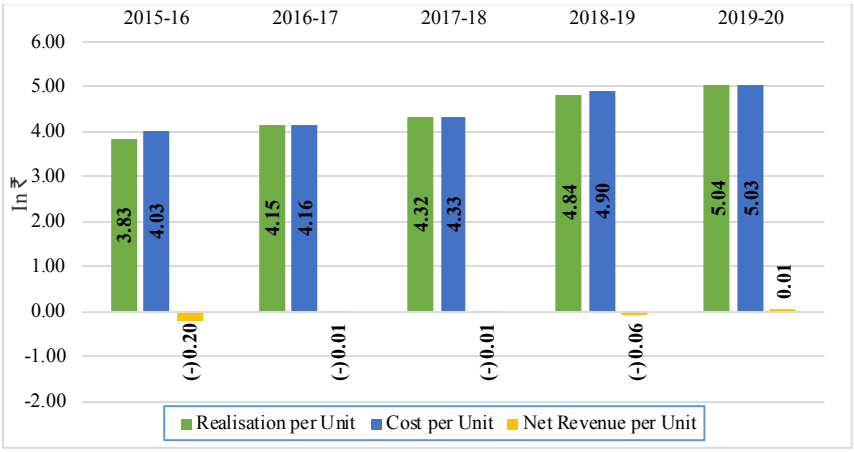
The net revenue per unit of DPL and WBPDCL are depicted below:

Chart 3.4: DPL



(Source: Annual Reports of DPL)

Chart 3.5 WBPDCL



(Source: Annual Reports of WBPDCL)

3.7 Procurement of Coal/ Oil

3.7.1 Procurement of coal

West Bengal Electricity Regulatory Commission (WBERC) fixes power generation targets for TPSs annually considering the capacity of plants, average PLF and past performance. Accordingly, each TPS works out coal requirement on the basis of generation targets and past coal consumption trends. The Ministry of Coal (MoC), GoI notified the New Coal Distribution Policy (NCDP) in October 2007, outlining the policy framework for distribution of coal to various categories of coal consumers, including power stations. Coal is primarily procured by WBPDCL and DPL through Fuel Supply Agreements (FSAs) with Bharat Coking Coal Limited (BCCL), Eastern Coalfields Limited (ECL), Central Coalfields Limited (CCL) and Mahanadi Coalfields Limited (MCL), e-auction, imports and agencies such as Metal Scrap Trade Corporation Limited (MSTC) and West Bengal Mineral Development and Trading Corporation Limited (WBMDTCL). The details of coal procurement are depicted in ***Appendix - 9***. The observations on procurement of coal are discussed below:

3.7.1.1 Fuel Supply Agreements (FSA)

Execution of FSA between coal companies and consumers of coal became mandatory under NCDP 2007. FSA between coal companies and consumers of coal lays down conditions regarding contracted quantity and quality of coal to be supplied, procedure for checking quality of coal, sources of supply, commercial terms, provisions for short supply of coal by the coal companies to Generation Companies (GENCOs), short lifting of coal by GENCOs *etc*. Two versions of FSA were signed, one for stations commissioned prior to 31 March 2009 (regarded as existing consumers under NCDP) and another for stations commissioned after 31 March 2009 (called new consumers under NCDP). Subsequently for reducing the cost of power generation, Central Electricity Authority (CEA) issued (June 2016) methodology for optimal utilisation of domestic coal. According to this methodology, States would use their coal optimally in the power stations of the state power utility within the

aggregated limits of Annual Contracted Quantity (ACQs) as mentioned in FSAs. This process would not only ensure adequate availability of coal to all TPSs, but also reduce the transportation cost, thereby reducing the variable charges. Accordingly, WBPDCL and DPL executed (April 2017) supplementary coal supply agreements with the subsidiaries of Coal India Limited (CIL) (i.e. BCCL, ECL, MCL and CCL) as sellers and CIL as a Coordinator for the said purpose. The FSAs, *inter-alia,* stipulated that the movement of coal would be through railways. In the event, movement of coal through railways is not feasible, review would be made jointly in the matter of road transport. DPL procured coal mainly through FSAs during 2015-20 while WBPDCL besides FSAs, procured coal through imports, e-auction using MSTC e-auction platform and agencies *viz*. MSTC and WBMDTCL through tender.

In the Exit Conference, the Government, *inter alia*, stated that the coal companies are monopolies. In this connection, Audit noticed that WBPDCL had, in Case No. 37 of 2013, contended before the Competition Commission of India (CCI) about the abuse by the coal companies of their dominant position with respect to imposing clauses of the FSAs on power stations and actual quality and quantity of coal supplied. However, WBPDCL did not participate in the subsequent hearings of CCI for reasons not spelt out.

Performance incentive/ compensation for excess/short lifting of coal paid under FSA

WBPDCL and DPL entered into FSAs with Coal companies for 20 years from 1 April 2009 covering all six TPS. These FSAs, *inter-alia*, provided that WBPDCL/ DPL: -

- would pay incentive to the coal suppliers for lifting of coal in excess of ninety *per cent* of Annual Contracted Quantity (ACQ);
- would pay compensation for short lifting of coal less than ninety *per cent* of ACQ;
- could re-allocate the ACQ of one TPS among the remaining TPSs.

Receipt of coal against the principal FSA allotment during 2015-20 revealed that WBPDCL paid incentive[38], amounting to ₹ 237.72 crore for excess procurement of coal ranging from 4.42 *per cent* to 45.67 *per cent* of FSA quantity ***(Appendix - 10)***. However, WBPDCL did not pay any compensation for short lifting of coal ranging from 3.49 *per cent* to 93.33[39] *per cent* of FSA quantity during 2015-20. Audit also observed that WBPDCL did not impose penalty on CCL to the tune of ₹ 111.07 crore for short supply of coal for the years 2017-18 and 2018-19.

During 2015-16 to 2019-20, DPL short lifted coal from MCL ranging from 41.11 *per cent* to 67.78 *per cent* and paid compensation of ₹ 13.60 crore. DPL also paid incentive amounting to ₹ 3.86 crore due to excess procurement of coal from BCCL and ECL.

The Government stated (October 2021) that, in respect of WBPDCL, there were no captive coal mines or coal linkages for 1,460 MW (30.77 per cent of aggregate installed capacity) from 2015-16 to 2017-18. To maintain generation,

[38] *Performance Incentive: - As per clause no 3.12 as per FSA.*

[39] *From CCL in 2016-17.*

coal beyond 90 *per cent* of ACQ was drawn, leading to payment of incentives. Moreover, due to acute cash flow problem, WBPDCL was not able to make advance payments to the coal companies or maintain irrevocable revolving letters of credit with them, as required under the FSAs. Consequently, while there was short supply of coal, no penalty could be imposed on coal companies since payment conditions of FSA were not fulfilled Government added that in respect of DPL, the amounts of incentive for 2017-18 and 2019-20 and compensation for 2016-17 and 2017-18 had not yet been reconciled with the coal companies. These delays of up to four years indicated the lackadaisical approach of the management. The reply also overlooks the fact that WBPDCL failed to execute short-term bridge linkage as discussed at **Paragraph 3.7.1.3 (ii)**.

Further, at the Exit Conference, the Government also stated that fund constraints had occurred as WBERC had allowed only partial realisation of regulatory assets by power SPSEs .

3.7.1.2 Linkage with coal mines

(i) Stations having linkage with coal mines

The Ministry of Coal (MoC), GoI allocated (March 2015/ May 2016), seven coal mines in favour of the WBPDCL namely (i) Tara (E&W), Paschim Bardhaman (ii) Barjore, Birbhum (iii) Gangaramchawk & Gangaramchawk Bhadulia, Birbhum (iv) Kasta (East), Birbhum (v) Barjora (N), Bankura, (vi) Deocha Pachami (June 2018), Birbhum, all in West Bengal, and (vii) Panchhwara (N) in Jharkhand. Out of the above, Kasta (East) is a schedule III coal mine, which means that it is a coal mine that is not ready to operate.

WBPDCL had selected (May 2016/ August 2016) Mine Developers & Operators (MDOs) through open tendering process (during October 2015 to February 2016) for operation of all the allotted mines excepting Kasta (East). Of these, mining operations commenced in three mines –Panchhwara (N), Jharkhand, Barjora (N), Bankura and Barjore, Birbhum. As per approved mine plan, schedule of coal production was to be commenced in 2017-18. However, actual coal production started in 2018-19. Actual coal produced in said three (3) mines was 22.76 lakh MT till March 2020.

In their reply (October 2021), the Government cited issues relating to Mining Plans, forest clearance and appointment of MDO and stated that the pre-mining work like removal of overburden, dewatering etc. created problems beyond the control of the WBPDCL. At the Exit Conference also, the Government attributed the delays to the need to obtain fresh statutory clearances, contrary to the understanding that the existing clearances would remain valid. The Government's contention was not valid, since these issues should have been within WBPDCL's knowledge as the previous MDO was a joint venture company in which both WBPDCL and DPL were shareholders.

DPL was allotted (February 2015) Trans Damodar Coal mine at Barjora, Bankura district through e-auction. DPL appointed (March 2015) previous allottee, *viz,* WBMDTCL as Advisor-cum-Mining Agent for operation of the said coal block on payment of consultancy fee and reimbursement of actual expenses. However, mining operations did not commence till March 2020 due to delays in possessing land and in obtaining permission from Coal Controller,

crop compensation and rehabilitation issues, revision of land values etc. As per agreement between WBMDTCL and DPL, WBMDTCL would act as an agency of DPL and DPL would reimburse all expenses towards mining activities to WBMDTCL. DPL reimbursed ₹ 34.37 crore (₹ 26.85 crore for salary and wages of workers and ₹ 7.52 crore for other expenses) to WBMDTCL upto March 2020 as per the decision made (April 2015) by the Minister-in-Charge, Power and NES Department. At the Exit Conference, the Government stated that production had resumed in December 2020.

(ii) Failure to execute short term Bridge Linkage

Ministry of Coal, GoI issued (February 2016) policy guidelines for grant of Bridge Linkage to specified TPS of Central and State PSEs which had been allotted schedule-III coal mines under the Coal Mines Special Provisions Act, 2015 and coal blocks allotted under the Mines and Minerals Development and Regulation Act (MMDR Act). Bridge Linkage would act as a short-term linkage to bridge the gap between the coal requirement of Central and State PSEs and start of production from the allotted coal mine/ block. Linkage would come to an end after a period of three years from the date of allotment of coal mine/ block. WBPDCL was allotted one Schedule–III coal mine in May 2016 and hence bridge linkage would be valid upto April 2019.

Audit observed that WBPDCL requested (June 2018) MoC, GoI for Bridge Linkage of 65 lakh MT per annum for three years till Kasta (East) and Deocha Pachami coal blocks become fully operational. Standing Linkage Committee for Power Sector (SLC), GoI observed (December 2018) that TPSs for which bridge linkage was requested by WBPDCL were linked to six[40] other Schedule-II mines (i.e., operative coal mines) in addition to Kasta (East) Schedule III mine. As such SLC rejected the proposal and directed (December 2018) WBPDCL to resubmit the proposal after linking specified capacity of the TPS to Schedule-III coal blocks only i.e., Kasta (East). Accordingly, WBPDCL revised and submitted (January 2019) fresh linkage to MoC, GoI. In the meantime, the allotted Schedule- II coal mines became operational and the linkage period also lapsed. Thereafter, the management did not pursue further.

Audit observed that

(i) WBPDCL submitted (December 2017) their initial linkage proposal with a delay of 20 months from the date of allotment (May 2016) of Schedule-III coal mine.

(ii) WBPDCL did not submit the linkage proposal according to Bridge Linkage guidelines. Bridge linkage was available for Schedule-III coal blocks only, while WBPDCL also included Schedule-II coal block in their application.

As such delay in appeal and non-quantification of coal requirement for Schedule-III coal blocks only resulted in deprival of benefit of Bridge Linkage coal allotment for WBPDCL. In the absence of bridge linkage, WBPDCL had to procure coal through agencies by incurring extra expenditure. Consequently, against the total shortage of coal of 130 lakh MT (i.e. 65 lakh MT per annum for two years) during 2017-19, WBPDCL procured 54.50 lakh MT through agencies (other than FSA) by incurring an extra expenditure of ₹ 1,226.09 crore

[40] *Pachhwara North, Barjora North, Barjore, Gangaramchawk, Tara (East &West)), and Deocha Pachami*

for procurement of coal. This was calculated in audit as the difference between actual price paid for non-FSA coal and average FSA price of coal procured for 54.50 lakh MT.

The Government, in their reply, stated (October 2021) that there was constant persuasion and follow up by WBPDCL and the Department of Power, Government of West Bengal to obtain coal through bridge linkage. They added that it was not clear how Audit determined that the Ministry of Coal would have provided bridge linkage for the entire application quantity of 65 lakh MT.

The reply was not tenable since WBPDCL had, initially, submitted (December 2017) the linkage proposal belatedly after 20 months from the date of allotment (May 2016) of Kasta mine and even then had not submitted the proposal according to Bridge Linkage guidelines. Further, Audit calculated the loss on the quantum of coal procured from non-FSA sources and not on the bridge linkage quantity applied for by WPBDCL

3.7.1.3 E-auction of Coal

To meet the shortage of coal stock due to absence of bridge linkage, WBPDCL participated in spot e-auction of ECL through MSTC auction platform. Audit observed:

a) ECL offered 35 rakes of G4 grade coal from Asansol area at a price of ₹ 6,180 per MT through spot e-auction. WBPDCL bagged (November 2017) nine rakes for SgTPP and six rakes for BkTPP through the spot e-auction at a price of ₹ 7,512.19 per MT (Railway Receipt quantity: 30,731.22) and ₹ 7,890.09 per MT (RR quantity: 20,640.03 MT), respectively. The aggregate value of the sale was ₹ 46.48 crore, after deducting Earnest Money Deposit (EMD). It was observed that the average procurement cost of coal from different agencies (excluding FSA and e-auction) by WBPDCL during 2017-18 for SgTPP and BkTPP were ₹4,671.52 per MT and ₹ 4,758.87 per MT respectively. Moreover, average procurement cost of imported coal was ₹ 5,818 per MT during 2017-18 which was far below the e-auction coal price during the same period. So, there was no justification for procuring coal at higher price through e-auction when imported coal was available from the same agency at lower cost. This led to payment of extra expenditure amounting to ₹ 15.19 crore.

   Audit observed that WBPDCL failed to conduct third party sampling by Central Institute of Mining and Fuel Research (CIMFR) for the above cases for determining the actual grade of e-auction coal even though ECL provided the said facility. Out of 15 rakes purchased (November 2017), SgTPP received G5 grade while BkTPP received G6 grade instead of G4 grade of coal. As a result, WBPDCL suffered a loss of ₹ 9.07 crore on account of grade slippage for the two-spot e-auctions.

b) Similarly, SgTPS received (March to May 2018) 42 rakes from ECL through the spot e-auction (February 2018) with aggregate RR quantity of 1,38,877.32 MT at an average e-auction price of ₹ 7,591.22 per MT. Audit observed that the average procurement cost of coal from different agencies by WBPDCL (excluding FSA and e-auction) during 2017-19 for SgTPS was ₹ 4,911.02 per MT. This led to extra expenditure amounting

to ₹ 37.22 crore. WBPDCL procured coal as there was no FSA for STPS unit-6, BkTPS unit-5 and SgTPS unit 3 & 4. Further, WBPDCL failed to materialise the bridge linkage or procure imported coal in time.

The Government stated (October 2021) that it had permitted (August 2017) WBPDCL to import only two lakh MT of coal against proposal for four lakh MT. To meet the shortfall, WBPDCL went in for coal procurement through e-auction, which initially did not have provision for third party sampling. Subsequently, WBPDCL engaged QCI, an approved agency for third party sampling.

The reply is not acceptable since WBPDCL's proposal (July 2017) was for coal purchase of four lakh MT, consisting of 1.80 lakh MT imported coal through agencies and 2.20 lakh MT of indigenous coal through MSTC. Against proposal of 1.80 lakh MT, Government had approved purchase of two lakh MT of imported coal. Moreover, although ECL had notified (August 2017/ January 2018) buyers to undertake third party sampling at loading end, WBPDCL was not able to avail the offer since the coal was urgently needed at the TPS. This indicates that WBPDCL lacked an inventory policy to ensure availability of adequate coal of the desired quality to run the TPS, leading to purchases at higher rates through e-auction.

3.7.1.4 Loss in fuel procurement from other sources

Loss in coal procurement from MSTC and WBMDTCL

In order to meet the gap between actual requirement and supply of coal from CIL, WBPDCL placed (June 2017/September 2017/ November 2017) purchase orders on Metal Scrap Trade Corporation Limited (MSTC) for procurement of indigenous coal in three tranches. In the said orders, there was a clause which *inter-alia* stipulated that coal sampling and testing would be done on rake-to-rake basis and in case any coal supplied did not meet the mentioned grade specification, there shall be a penalty and payment shall be deducted accordingly.

Meanwhile, MSTC intimated (November 2017) WBPDCL that a vendor had come with a suggestion in the tender and requested for change in the penalty clause on basis of average grade of entire quantity of all rakes to be supplied to a single plant instead of rake-to-rake basis. In accepting the proposal from MSTC, WBPDCL changed (December 2017) the penalty clause without the approval of Board of Directors.

Subsequently, during the period from December 2017 to August 2019 WBPDCL placed purchase orders on MSTC/WBMDTCL for procurement of 22.75 lakh MT of indigenous coal with changed penalty clause based on overall average grade quality of coal of all rakes despatched to a particular plant. It was observed in Audit that due to change in mode of calculation for penalty from rake-to-rake basis to overall average of all rakes basis, WBPDCL suffered a loss of ₹ 49.19 crore (₹ 38.95 crore from MSTC and ₹ 10.24 crore from WBMDTCL) as detailed in ***Appendix – 10A & 10B***.

The Government stated (October 2021) that no bid was received on the first auction date. MSTC advised WBPDCL to extend validity of the tender and amend the penalty clause. Consequently, WBPDCL had, with approval of the competent authority, extended the bid date and amended the penalty clause.

However, it is seen that the Board approved the purchase order on MSTC in November 2017 with sampling to be done on rake to rake basis; however, subsequent amendment of this clause was not found to be approved by the Board of Directors.

3.7.2 Procurement of Oil

Fuel oil is required at power stations to facilitate initial start-up of the boiler, stabilisation of flame at low load with pulverised coal as fuel. During the years 2015-20, WBPDCL and DPL procured 2,01,109 KL and 10,817 KL of Light Diesel Oil (LDO) valuing ₹ 899 crore and ₹ 45.98 crore, respectively.

DPL procured fuel oil from Indian Oil Corporation Ltd (IOCL), Hindustan Petrochemical Corporation Ltd (HPCL) and Bharat Petroleum Corporation Ltd (BPCL) as and when required through tender without any standing contract or agreement with the oil companies. During 2015-18, DPL purchased three rakes of LDO from HPCL for power plants at a cost of ₹ 34.91 crore. Audit observed that at the time of tendering the offer price of HPCL was lower compared to other oil companies. Due to delay in placement of order by DPL for reasons not on record, the validity of the offer price had lapsed and HPCL increased the offer price. As a result, DPL incurred an extra expenditure to the tune of ₹ 2.02 crore for procurement of oil.

Procedure for LDO procurement by WBPDCL included issuing of limited enquiry, receiving of quotation, selection of vendor, advance payment to vendors and placing of orders and receiving the LDO at respective plants. Scrutiny of records relating to LDO procurement revealed that, in WBPDCL, it took 4 to 373 days from receiving the indent to actual delivery during the period 2015-20.

Audit observed that the rates of LDO (Basic price and Landed price) were revised fortnightly by the oil companies, and the rates prevalent during the loading date were considered for billing. In 69 out of 87 cases (*i.e.* 79.31 *per cent*) the oil companies had delivered oil after the scheduled delivery period ranging between one and 123 days during 2015-20. As the rates of LDO were revised fortnightly, there was an increase in basic price ranging between 0.72 *per cent* and 33.40 *per cent*. Due to delay in dispatching order by oil companies, the price of LDO (at basic price) as per Letter of Order amounting to ₹717.62 crore was billed at ₹ 725.33 crore. As a result, WBPDCL had to pay ₹ 7.71 crore to the oil companies in excess of enquired/ ordered price.

Such repeated instances of delayed delivery may have been prevented had WBPDCL executed agreements with oil companies rather than ad-hoc purchase.

At the Exit Conference, the Government stated that the possibility of entering into long-term agreements with oil companies will be explored.

Recommendations

WBPDCL and DPL may-

1) ***monitor enforcement of the conditions and clauses of the FSAs so as to ensure adequate and timely supply of quality coal for power generation.***
2) ***review and rationalise the procedures for procurement of coal beyond FSA quantity and through e-auctions etc.***

3.8 Assessment of Quality and Quantity of coal/ fuel oil

In coal fired power stations, coal of appropriate quality is essential for proper combustion and operational efficiency of the boiler. Pricing of coal also depends on its quality or 'Grade'. Grade of Coal varies on the basis of Gross Calorific value[41] (GCV). Grade-wise GCV is notified by CIL. As per FSA, coal grades were defined from G5 (exceeding 5,800 Kcal/kg to 6,100 Kcal/kg) to G17 (2,200 Kcal/kg to 2,500 kcal/kg). Accurate assessment of quality and quantity of coal is crucial for appreciating the adequacy and efficiency of inputs of the power station.

3.8.1 Quality of Coal and Grade slippage

Clause S. 6.0 of the tripartite agreement among GENCOs, suppliers and CIMFR for quality monitoring at loading end specified that Council of Scientific and Industrial Research (CSIR) – Central Institute of Mining and Fuel Research (CIMFR), Dhanbad would be wholly responsible for collection, preparation and analysis (Moisture, Ash and GCV on equilibrated basis) of coal in the context of FSA.

Audit observed that DPL (2017-18 to 2019-20) and BkTPS (2015-19) under WBPDCL received coal rakes from BCCL, ECL and MCL, which were not analysed by the CSIR-CIMFR at loading points. The coal companies billed those coal rakes on the basis of the declared grade[42]. DPL and BkTPS made payments as per FSA against these un-analysed coal on the basis of declared grade.

From the unloading end sampling analysis reports, Audit observed that the actual grade of the coal supplied was below the declared grade of coal. Clause No. 4.7.6 of FSA stipulated that in the event of sample not being collected from despatches, the weighted average of the most recent results available in any preceding month against respective source and grade would be adopted. Assessment of Quality of Coal is the basis of raising bills. However, DPL/WBPDCL did not take any action to inform coal companies for corrective action. In absence of detailed records from the management, audit calculated the loss on the basis of difference in rates of actual grade of coal and declared grade of coal. It was found that DPL and BkTPS had incurred a loss of ₹ 73.49 crore and ₹ 64.77 crore, respectively towards payment against the lower grade of coal received.

The Government stated (October 2021) that under the FSAs, coal companies raise invoices according to the GCV of coal at loading end. WBPDCL had engaged CSIR-CIMFR for doing the sampling at loading end. Moreover, generation companies that challenge the invoiced grade, based on unloading end sampling, face counter measures from coal companies such as upgrading of the referee samples through third party sampling. Further, DPL maintained liaison with coal companies to obviate instances of non-sampling and made efforts to maximise gains during the reconciliation process. The reply does not address the issue of coal not being sampled at loading end and reasons thereof.

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41 "*Gross Calorific Value" in relation to a thermal power generating station means the heat produced in Kilo Calorie by complete combustion of one Kg of solid fuel.*

42 *Declared Grade means the particular grade(s) of Coal mined from any seam or section of a seam in the Seller's collieries from which Coal is produced and supplied under this Agreement, as declared by CI or the Seller.*

3.8.2 Procurement of low-grade coal/grade slippage

Clause 11.2.2 of the FSA stipulated that the seller would issue regular credit notes on account of grade slippage[43] to the extent of difference in the base price of declared grade and analysed grade of coal within seven days of acceptance of results under joint signature. In case of analysed grade being higher than the declared grade, bonus/claim would be raised by the seller.

Each TPS has been designed for using a particular grade range of coal. Use of specified grade of coal ensures optimisation of power generation and cost economies. Audit observed that grades of coal received from collieries were often inferior or ungraded coal.

During 2016-18, DPL received coal from different collieries of ECL and BCCL, which was of inferior grade compared to billed grade. DPL claimed ₹ 29.08 crore towards grade differences during the period from 2016-17 to 2017-18, of which ₹ 28.84 crore was accepted on the basis of settlement of claim. Thus, the balance ammount of ₹ 23.86 lakh was disallowed without any reason. BkTPS claimed ₹ 36.20 crore from BCCL during 2015-19, towards grade slippage against which ₹ 29.97 crore only was accepted by the BCCL, while balance amount of ₹ 6.23 crore was disallowed without citing any reasons. No further communication to realise the disallowed amount was found on records.

VAT, Cess are calculated on *ad-valorem* basis. Therefore, while claiming grade slippage, the component of VAT, Cess paid is also required to be claimed. It was observed that DPL during the period from April 2016 to June 2017 did not include five *per cent* VAT component while determining claim for grade slippage, while it included Goods and Service Tax (GST) component from July 2017 onwards. Resultantly, DPL had to suffer a loss to the tune of ₹ 47.06 lakh.

Moreover, CIL communicated (April 2017) to the Government of West Bengal (GoWB) that National Mineral Exploration Trust (NMET) cess, District Mineral Foundation (DMF) cess and GST are calculated on ad valorem basis and such dues required to be adjusted for grade slippage during final claim. Audit further observed that DPL and BkTPS did not claim other duties (i.e. royalty, NMET, DMF and GST) amounting to ₹ 4.92 crore and ₹ 3.60 crore on grade slippage. Therefore, the coal companies did not adjust other duties amounting to ₹ 4.92 crore and ₹ 3.60 crore while issuing credit notes on grade slippage to DPL and BkTPS respectively.

The Government agreed (October 2021) with the findings and stated that WBPDCL had taken up with coal companies to finalise the reconciliation process. Moreover, as no specific reference to refund of taxes and duties was provided in the FSAs, realisation of the tax component for downgraded coal was difficult.

3.8.3 Ungraded Coal

Clause 4.1 and 4.2 of the FSA stipulated that the quality of coal delivered should conform to the specifications given in schedule-II (i.e., G5-G17) and the seller would make adequate arrangements to assess the quality of coal and monitor

[43] *Coal grade is declared each year by an independent scientific agency, when on sampling the coal grade is found to be lower than declared grade, it is called Grade Slippage.*

the same to endeavour that un-graded coal was not loaded into the purchaser's containers. If the seller dispatched any quantity of such coal, the purchaser would limit the payment towards cost of such coal to ₹ 1/- (Rupee one only) per tonne. Royalty, cess, sales tax, etc. would, however, be paid as per the declared grade.

The details of ungraded coal received by WBPDCL below the specification mentioned in the FSA (i.e. below 2,200 Kcal per Kg) from different subsidiaries of CIL are depicted in the **Table 3.1** below.

Table 3.1: Statement showing excess payment made in spite of receipt of ungraded coal during 2015-20.

Name of TPS	RR Weight (MT)	Actual Payment (₹in crore)	Payment @ Re. 1 (₹in crore)	Excess payment (₹in crore)
BkTPS	5,34,534.65	48.21	0.05	48.16
STPS	3,443.72	0.64	0.01	0.63
Total	**5,37,978.37**	**48.85**	**0.06**	**48.79**

It is evident from the above table that during the period 2015-20, two TPS of WBPDCL received 5.38 lakh MT of ungraded coal with declared grade value was ₹ 48.85 crore. Audit observed that WBPDCL had reviewed the grades of coal received and found it to be ungraded. Yet, it had made payment at the price of the declared grade. Since this coal was below the grade as mentioned in FSA, the payment should have been made at the rate of ₹ 1 per MT in line with the clause of FSA, i.e., ₹ 0.06 crore. However, WBPDCL made payments as per declared grade cost resulting in excess payment of ₹ 48.79 crore.

The Government accepted (October 2021) the observation.

3.8.4 Efficiency of conversion of fuel to electricity

In a typical coal-fired thermal station, the steam turbine generator system converts only 36 *per cent* of the energy in the fuel to electrical energy. The efficiency of generation is further affected by variation in fuel consumption, variation in calorific value of coal, non-achievement of desired Station Heat Rate (SHR), departure of operational parameters from design values variation in fuel composition, inadequate maintenance, inaccuracies in control systems/ instruments, etc. as discussed in subsequent paragraphs:

3.8.4.1 Variation in consumption of fuel

(i) Excess Consumption of fuel

Fuel cost constitutes about 70 *per cent* of the total generation cost of a coal-based power station and has a major impact on cost of supply of power to consumers. Inefficiencies in fuel management raise the cost of power generation and consequently, the power tariff to consumers.

WBERC allowed ₹ 2.31 and ₹ 2.04 as fuel cost per kilo watt hour to WBPDCL and DPL, respectively. The average fuel cost of WBPDCL and DPL turned out to be ₹ 2.83 per kilo watt hour and ₹ 2.50 per kilo watt hour constituting 70.13 *per cent* and 39.51 *per cent* respectively of the revenue expenditure incurred during 2015-20. This excess cost beyond WBERC norms is attributed

to excess consumption of coal and oil over the norms, excess auxiliary power consumption beyond norms, high unburnt fuel due to low fineness of coal, etc. WBPDCL and DPL booked the extra cost under regulatory assets while filing APR with WBERC. However, ultimately, any fuel cost escalation would have the impact of raising power tariff for the consumers.

(ii) Electricity consumption by station auxiliaries in excess of norms

WBERC issued (July 2013) specific normative parameters for auxiliary consumption of power at WBPDCL and DPL and generation cost of the electricity used as auxiliary consumption would be allowed by the WBERC accordingly. During 2015-20, for all five TPS of WBPDCL, WBERC allowed 9 to 9.95 *per cent* of the power generated to be used as auxiliary consumption. Against this norm, the actual auxiliary power consumption of five TPSs of WBPDCL ranged between 8.50 and 11.85 *per cent* during 2015-20 resulting in consumption of 7.57 lakh MT of coal valued at ₹ 284.70 crore ***(Appendix-11)*** for such excess auxiliary power consumption.

Similarly, the actual auxiliary consumption of DPL ranged between 9.02 and 12.02 *per cent* during 2015-20, against the norms of 8.50 to 9 *per cent* allowed by WBERC resulting in excess auxiliary consumption of 0.33 lakh MT of coal valued at ₹ 34.38 crore ***(Appendix-11).***

The reasons for excess auxiliary power consumption in TPS were attributed to poor maintenance leading to excessive power consumption by station auxiliaries, tube leakages, tabular Air pre-heater (APH) blockages etc. Poor coal quality resulting in forced outages leading to high number of start-ups also contributed to excess auxiliary power consumption.

At the Exit Conference, the Government stated that auxiliary consumption in WBPDCL has been brought down in 2020-21 by improved overhauling, increased maintenance and replacement of existing motors with energy efficient motors in the auxiliary equipment like coal mills *etc*. The Government further stated (October 2021), in its reply, that DPL was operating as a generating company since January 2019 and had, therefore, approached (February 2021) to review the existing norms for auxiliary energy consumption. These responses showed that the auxiliary consumption was, indeed, controllable to within permissible norms.

(iii) Unburnt coal

Imperfect combustion leads to discharge of unfired pulverised coal along with ash, resulting in increase in volume of fly ash as well as high level of fuel consumption due to wastage. Pulverised coal fed into the furnace may not burn completely due to lack of adequate oxygen, lack of thorough mixing and improper size of coal particles after pulverisation (*i.e.* low fineness of coal). The partial combustion of coal and existence of unburnt carbon, due to excessive infiltration of air overloads the Induced Draft (ID) fans, resulting in lack of sufficient air for thorough mixing of coal in the furnace. Scrutiny in audit revealed that the coal cost for the excess unburnt carbon in fly and bottom ash amounted to ₹ 119.51 crore during 2015-20. The statement showing excess unburnt coal in fly ash and bottom ash at six TPS is tabled in **Table 3.2**.

Table 3.2: Statement showing excess unburnt coal in fly and bottom ash at six TPS

TPS	Year	Unit No	Design norm		Excess unburnt coal over norms		Amount of excess unburnt coal (₹ in crore)
			Fly Ash	Bottom Ash	Fly Ash	Bottom Ash	
DPL	2015-20	VII	1.43	1.43	0.07 to 0.87	2.87 to 4.67	13.56
		VIII	1.35	1.35	0.15 to 0.95	2.95 to 4.75	
KTPS	2015-20	I to VI	2.00	2.00	0.45 to 1.21	1.55 to 4.09	35.68
SgTPS	2015-20	I to IV	0.50	1.50	0.65 to 1.09	0.05 to 2.97	18.61
BTPS	2015-19	I to IV	2.33	9.90	8.97	10.40	9.07
		V	2.33	4.30	0.07 to 0.77	2.70 to 5.50	5.24
BkTPS	2015-19	I to VI	1.50	1.50	0.21 to 0.48	-	5.55
STPS	2015-19	V & VI	1.20	1.20	0.40 to 3.30	3.24 to 7.58	31.80
Total							**119.51**

Coal consumption during the year x [(% of Unburnt Coal)- [Design Norms unburnt coal] x average rate of coal.

It may be seen from the above table that the coal cost for the excess unburnt carbon in fly and bottom ash amounted to ₹ 119.51 crore during 2015-20. It was observed that in KTPS, the non-achievement of the required fineness of coal after pulverization mainly contributes to the unburnt coal in the fly ash and bottom ash. As per design parameters, the Coal Mills are required to achieve coal fineness of (i) 70 *per cent* pass through 200 MESH[44] and (ii) 93 *per cent* pass through 50 MESH. It was observed in KTPS that mills regularly failed to achieve 200 MESH fineness target during 2015-20.

Thus, the entire cost of excess unburnt coal (amounting to ₹ 119.51 crore during 2015-20) became a waste to the SPSEs. Reasons for excess unburnt coal was attributed to higher infiltration of air, poor coal mill performance, not taking up frequent coal mill maintenance, non-replacement of grinding ring and ball in due time, non-replacement of coal burners, nozzles *etc*.

The Government replied (October 2021) that WBPDCL had already adopted methods like preventive maintenance, mill fines monitoring, checking of burner nozzles and mill overhauling for performance improvement. Moreover, with the availability of coal with high GCV, low volatile matter and low ash content to WBPDCL and DPL from captive coal mines, their performance has now improved significantly. At KTPS and BTPS, however, the percentage of unburnt coal continued to remain high, since their generating units were almost 30 years old.

3.8.4.2 Variation in calorific value of coal

The required GCV of coal varied according to the boiler design of the respective TPS. The details of coal grade required as per Boiler design *vis-a-vis* the GCV

[44] *Higher the mesh number, smaller the size of the coal particles passing through the sieve. As per the Operating Manual of the Mill, coal should be pulverized in such small particles that 70 per cent of the pulverized coal should pass through the 200 MESH and 93 per cent of the pulverized coal should pass through the 50 MESH.*

of coal received by the six TPS during 2015-20 is depicted in the **Table 3.3** below:

Table 3.3: Statement showing GCV of coal as per Boiler design vis-a-vis GCV of coal received by the six TPS during 2015-20.

Sl. No.	Name of TPS	Units	Year	GCV of coal as per boiler design (kcl/ kg)	Actual calorific value of coal received (kcl/ kg)
1.	DPL		2015-20	4,000-4,100	3,452.63-4,603.00
2.	BkTPS		2015-19	3,900-4,200	3,558.63-4,160.72
3.	KTPS		2015-20	4,445-4,450	3,110.36-3,419.75
4.	STPS		2015-19	3,900	3,501.99-4,233.08
5.	SgTPS	(I & II)	2015-20	4,100	3,490.04-4,450.22
	SgTPS	(III & IV)		3,300	3705.40-4,170.41
6.	BTPS	I to IV	2015-19	4,500	3,297.12-3,701.50
	BTPS	V		4,000	

The difference between calorific value of coal required (as per the boiler design) and the calorific value of coal received by the six TPSs led to excess coal consumption, poor thermal efficiency, consumption of fuel in excess of norms fixed by WBERC *etc*.

In their reply, the Government explained (October 2021) that FSA does not ensure supply of coal as per boiler design. Moreover, coal is received from multiple sources and hence, GCV varies widely. Further, blending of different varieties of coal is dependent on availability of coal stocks of good and bad quality at all times. This led to excess coal consumption and poor thermal efficiency.

The issues raised in the reply are prevalent in the coal sector which should have been taken into account in the operational processes.

3.8.4.3 Non Achievement of designed thermal efficiency

Performance of a TPS is the aggregate of the performance of all its generating units. This is measured by Thermal Efficiency (TE) of each unit *i.e.,* efficiency of conversion of thermal energy to electrical energy. TE is the aggregate of boiler and turbine efficiencies. The manufacturer(s) of the boilers and turbo-generators declared specific design parameters and specified TE for each unit of the six TPS at the time of their construction. The unit-wise actual TE achieved against the TE as per design parameters for the five years from 2015-20 are as follows:

Table 3.4: Statement showing achievement of TE by TPS against designed parameter

TPS	Unit	TE as per design parameter	Actual TE achieved
DPL	VII	46.50	13.40 - 30.29
	VIII	44.17	
KTPS	I –IV	36.00	30.73 - 32.64
	V-VI	35.82	

TPS	Unit	TE as per design parameter	Actual TE achieved
BTPS	I–IV	28.21	26.21 - 30.87
	V	35.41	31.08 - 31.90
SgTPS	I-II	39.99	34.43 - 36.90
	III-IV	37.03	31.43 - 35.43
BkTPS	I-V	38.41	31.74 - 39.20
STPS	V-VI	38.39	34.76 - 35.36

From the above table, it was observed that except BkTPS and BTPS (I-IV) all the units in the remaining TPS failed to achieve the designed TE. The reasons attributed to the failure were incomplete combustion and radiation losses, decreased coal mill fineness, poor mill/burner performance, dry flue gas[45] loss, leakage in economiser tubes, fall in air ingress etc. All these factors led to higher consumption of coal. In case of BTPS (Unit-V) the reason for failure were higher equipment outages, deviation from designed coal, constraints of OEM spares etc.

The Government stated in reply (October 2021) that WBPDCL had taken up internal energy audit, condition-based maintenance and monitoring, equipment overhauling and scheduled overhauling of units etc to improve thermal efficiency. The number of instances of tripping was also brought down in 2020-21. The reply showed that improvements in thermal efficiency were achievable through remedial measures that could have been implemented previously.

3.8.4.4 Excess consumption of fuel

(i) Excess consumption of coal

Performance of a TPS is finally determined by the Station Heat Rate[46] (SHR). Scrutiny in audit revealed that during 2015-20, the value of the coal consumed in excess of norms fixed by WBERC by the six TPS amounted to ₹ 1,358.12 crore (**Table 3.5**).

Table 3.5 : Statement showing excess consumption of coal by six TPS

Year	Plant	Unit No	Normartive SHR (kcal/kwh)	Actual SHR range	Excess Coal consumption (in lakh MT)	Value ₹ in crore
2015-20	DPL	VII	2,345	2,872.50 to 3,125.40	14.99	519.74
		VIII	2,425			
2015-18	BkTPS	I - V	2,470	2,387.92 to 2,505.72	1.02	39.04
2015-20	KTPS	I - VI	2,700	2,715.74 to 2,742.66	2.39	82.90
2015-20	STPS	V - VI	2,425	2,432.41 to 2,473.97	1.02	36.40
2015-19	BTPS	I- V	2,725 - 3,050	2,832.00 to 3,077.40	2.67	114.46
2015-20	SgTPS	V - VI	2,276 - 2,345	2,349.76 to 2,694.04	11.62	565.58
Total						**1,358.12**

[45] *Flue gases are the mixture of gases that are produced from the combustion of coal.*

[46] *The energy required in Kilocalories to generate one Kilowatt hour (or unit) of electricity.*

The main reasons for excess consumption of coal were frequent outages, partial load operation due to absence of standby mills, deviation from designed coal, OEM spares constraints etc.

The Government stated in their reply (October 2021) that, SHR was being monitored centrally by WBPDCL. In addition, internal energy audit, condition-based maintenance and monitoring, equipment overhauling, scheduled overhauling of units, boiler tube replacement at various plants, decommissioning of old units, *etc.* had been undertaken recently to improve SHR, which confirms the audit observation that timely ameliorative steps would have reduced excess consumption of coal.

(ii) Excess Oil consumption

WBERC issued (July 2013) specific normative parameters for oil consumption at WBPDCL and DPL. During 2015-20, for all five TPS of WBPDCL, the actual consumption ranged between 1.71 ml/kwh to 7.47 ml/kwh against the norms of 1.00 ml/kwh to 2.15 ml/kwh, resulting in excess consumption of 73,255.46 KL oil valued at ₹ 332.25 crore ***(Appendix-12)***.

Similarly, actual consumption of oil in DPL varied between 0.54 ml/kwh and 238.96 ml/kwh against the norms of 1.00 ml/kwh to 2.7 ml/kwh resulting in excess consumption of 4,663.59 KL oil valued at ₹ 22.44 crore. Audit observed that the reasons for excess oil consumption in the TPSs were frequent tripping, poor coal stock requiring oil support for restarting, frequent outages, tube leakages, frequent coal feeder belt slippage, mill break down, furnace disturbance, improper maintenance etc.

The Government stated (October 2021) that WBPDCL had monitored the reasons for specific oil consumption in excess of norms and eradicated the reasons. Consequently, there was steady improvement in oil consumption and all TPS achieved 0.45 ml/ kwh in 2020-21. Further, DPL had also reduced oil consumption through remedial measures such as bringing down breakdown of equipment. It is not clear why such steps to curb excess oil consumption were not being implemented by the TPS as a matter of due process.

Recommendation

WBPDCL and DPL may exercise proper controls for monitoring consumption of coal and oil in every TPS.

3.9 Coal Supply Management

3.9.1 Coal Stock at stations

One of the important functions of fuel management is to ensure uninterrupted supply of coal so that generation loss due to coal shortage does not arise. Coal was required for 'declared capacity' (DC) of the station, even though the beneficiaries (power GENCOs) may not schedule the power from the station. TPS has to inform Declared Capacity to the State Load Despatch Centre regarding daily generation of power. Daily coal requirement is based on the maximum of the requirement for average actual consumption of the plant for last 7 days or requirement for installed capacity of plant at 55 *per cent* PLF, whichever

is higher. Daily coal stock at all six TPSs were monitored at Corporate Office through an online system where stations provided data relating to their daily consumption and the quantity as well the quality of stock maintained.

The new methodology for monitoring of coal stock at coal based thermal TPS proposed (November 2017) that the daily coal requirement of a plant will be the average coal consumption of previous seven days (rolling average), in order to capture precise consumption of the plant. As per this methodology, coal stock less than seven days consumption is considered as critical level and coal stock less than four days consumption is considered as super-critical.

Details of critical and super critical levels stock position during the period from 2015-16 to 2019-20 are given below in **Table 3.6**:

Table 3.6: Critical and super-critical levels stock position during the period from 2015-16 to 2019-20

Name of TPS	2015-16		2016-17		2017-18		2018-19		2019-20	
	Critical	Super critical	Critical	Super critical	Critical	Super critical	Critical	Super critical	Critical	Super critical
	(Number of days)									
BkTPS	73	33	82	15	42	142	32	219	NA	NA
KTPS	0	0	18	0	64	232	26	281	43	91
SgTPS	70	NA	153	NA	327	NA	317	NA	NA	NA
STPS	292	0	23	61	86	160	88	162	NA	NA
BTPS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DPL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

During 2015-16, the stock level was at super-critical level in BkTPS for 33 days. Similar situation prevailed in BkTPS, KTPS and STPS ranging from 15 days to 281 days during the years 2016-17 to 2019-20. Audit also observed that individual units under different power stations were shut down from time to time during the period from 2015-16 to 2019-20 due to poor coal stock.

Further, audit also observed that WBPDCL had no inventory policy on fuel to aid unimpeded power generation despite having FSAs. The inventory assessment, planning and procurement were inadequate and ineffective and this resulted in loss of generation as discussed in the following paragraph:

3.9.2 Generation loss due to coal shortage

WBERC fixed normative Plant Availability Factor[47] (PAF) for the generating TPSs and allowed recovery of the capacity charges[48] on the basis of actual PAF through Annual Performance Review of the concerned year. The **Table 3.7** shows the PAF achieved against the PAF fixed by WBERC, forced outage (the period for which the plant was kept under unplanned shutdown) and loss of capacity charges by the six TPS during 2015-20.

[47] *PAF means the average of the daily Declared Capacities (DCs) for all the days during the period expressed as percentage of the installed capacity in MW less the normative auxiliary energy consumption.*

[48] *Capacity charge is a fixed charge linked with scheduled energy generation.*

Table 3.7: Statement showing loss of capacity charges due to poor coal stock

TPS	Unit Nos.	PAF as per WBERC norms (in *percent*)	Normative Plant availability based WBERC norms at Col. (3) (calculated in lakh hours)	Forced outage (in lakh hours)	Actual PAF (in lakh hours)	Actual PAF achieved (*per cent*)	Forced outage due to poor coal stock/quality (in lakh hours)	Loss of capacity charges due to poor coal stock /quality (₹ in crore)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
DPL	VII & VIII	85	0.75	0.33	0.42	31.82 - 69.17	0.17	586.69
BkTPS	I to V	85	1.49	0.22	1.27	54.68 - 84.26	0.07	130.20
BTPS	I to V	70 - 85	1.16	0.50	0.66	13.01 - 70.00	0.01	11.35
SgTPS	I to IV	85	1.34	0.55	0.79	20.87 - 74.31	0.23	1,012.42
KTPS	I to VI	75	1.97	1.16	0.81	22.36 - 75.00	0.10	122.61
STPS	V & VI	85	0.60	0.08	0.51	25.85 - 82.96	0.01	18.63
Total			**7.31**	**2.84**	**4.46**		**0.59**	**1,881.90**

From the above table it was observed that during 2015-20, out of 7.31 lakh aggregate available hours fixed by WBERC as PAF, the six TPS were not available for generation for 2.84 lakh hours (39 *per cent* of the norms), due to frequent forced outages. Out of 2.84 lakh hours, the TPS were shut down for 0.59 lakh hours due to poor coal stock/quality. As a result, though the TPS had not achieved the normative PAF fixed by WBERC, they had recovered excess capacity charges of ₹ 1,881.90 crore for 0.59 lakh hours while raising monthly power bills during 2015-20. This led to burdening consumers with higher electricity tariffs.

The reasons attributed to the forced outages were as follows:

- Unit Nos. VI of DPL had frequent forced outages and was in long forced outage from December 2013 to March 2017 due to replacement of boiler platen outlet heater. In June 2017, Unit No. VI was synchronised again but finally in November 2017 it tripped. The West Bengal Pollution Control Board (WBPCB) ordered not to run it and since then it remained shut down during the period covered under audit.
- Unit No. VII and VIII had frequent forced outages due to poor coal stock, poor coal quantity and low system demand as DPL has no agreement with Power Distribution Company for evacuation of power generated.
- Similarly, BkTPS, KTPS, STPS, BTPS and SgTPS had frequent forced outages due to poor coal stock, poor coal quality and inadequacy of coal. Further, these five TPS failed to achieve the normative PAF due to instances of water wall tube leakage, boiler tube leakages, economiser tube leakages, GT replacement work, flame failure, very high furnace pressure, platen super heater leakages, boiler water wall tube leakage, high turbine bearing vibrations, dust leakages from wind box, vacuum pump problem, bus change over, high shaft vibration, etc.

The Government accepted (October 2021) the observation. They added that since April 2015, WBPDCL was entirely dependent on supplies of coal from coal companies. To maintain normative PLF, aggregate annual coal required by WBPDCL was 24 MMT, while total ACQ quantity was only 14.08 MMT. While TPS were unable to generate electricity due to shortage of coal, loss on account of fixed charges were unavoidable. However, as the cost of keeping machinery idle would have had greater adverse effects on WBPDCL's finances coal procurement at higher prices was preferred. Also, DPL lacked the funds to stockpile coal during the summer months to compensate poor coal supplies by coal companies during the monsoon months.

The reply is not tenable, since WBPDCL had not applied for bridge linkage of 6.50 MMT in the prescribed manner and in due time, which could have reduced the need for coal from non-FSA sources.

3.9.3 Unweighed Coal

Clause 5.2 of Fuel Supply Agreement (FSA) stated that only in the absence of weighment of coal on electric weighbridge at the loading end, the weight recorded at the purchaser's electronic weighbridge with an electronic printout facility at the unloading point, would be taken as final. In that case the purchaser would have to submit the associated electronic printout to the seller within thirty (30) days from the date of Railway Receipt (RR), beyond which time, the weight of consignment would be considered on RR basis.

It was observed that WBPDCL had received (as per RR quantity) unweighed coal from the coal companies to the tune of 10.87 lakh MT. However, at unloading end, weight of the said unweighed rakes was 9.69 lakh MT. Subsequently, WBPDCL claimed shortage quantity of coal from the coal companies for 1.18 lakh MT valuing ₹ 40.72 crore as per FSA. Out of this, coal valuing only ₹ 10.55 crore was adjusted through joint reconciliation with the coal companies and the remaining coal valuing ₹ 30.17 crore (of which ₹ 29.96 crore *i.e.* 99 *per cent* pertained to earlier period) was not adjusted/refunded due to lack of persuasion and follow up.

Further, during 2015-19, WBPDCL failed to submit the associated electronic printouts to the seller within the stipulated norm of FSA, *i.e*, thirty (30) days from the date of Railway Receipts (RRs) as per the provisions of FSA for 4,418.84 MT of unweighted coal in 13 cases. Consequently, WBPDCL suffered a loss of ₹ 1.32 crore due to delay in registering claim of unweighted coal rakes.

During 2016-20, DPL received 15 rakes of coal from BCCL which was not weighted at loading end. DPL did not claim short receipt of coal for 1,227.24 MT coal as per the above mentioned clause. As a result, DPL incurred a loss of ₹ 32.66 lakh.

The Government stated (October 2021) that WBPDCL's unsettled claims of ₹ 30.17 crore towards unweighted wagons appear as disputed amounts in the periodic reconciliation with coal companies. At DPL, the rakes could not be weighed at the unloading end, since, there were problems with the in-motion weighbridge at DPL. The reply is not acceptable, as 99 per cent of unsettled claims pertain to earlier period, which have not been accepted by the coal companies.

3.9.4 Loading of wagons with optimum capacity

Railways charge tariffs according to the carrying capacity of the wagons even if the wagon is loaded below their carrying capacity. Hence, to optimise costs, it is important to load coal wagons to their full carrying capacity. Clause 10.1/10.2 of FSA stipulated that any penal freight for overloading charged by the Railways for any consignment should be payable by the purchaser. However, if overloading was detected from any particular colliery, consistently during three succeeding months, on due intimation from the purchaser to that effect, the seller should undertake remedial measures. Further, in case of under loading below the permissible carrying capacity of a wagon (stencilled carrying capacity or carrying capacity based on actual tare weight), the seller would bear the difference in freight charges between the permissible carrying capacity plus an extra two tonnes less the freight payable as per actual recorded weight of coal loaded.

Audit observed that during 2015-20, six[49] TPSs incurred over-loading charges of ₹ 27.96 crore. Further, DPL incurred under-loading charges of ₹1.84 crore during 2017- 20. WBPDCL and DPL should have intimated the coal companies to take a note of the same for future compliance as per the above mentioned clause. However, the management did not take any action in this regard.

The Government stated (October 2021) that WBPDCL had engaged a liaising agency to prevent overloading with a penalty clause included in the contract with liaising agency for any incidence of overloading; DPL, however, still had no control over deviations in load weight.

Audit observed that WBPDCL had engaged a liaising agency in July 2019, while DPL had still not taken any remedial action. Analysis of incidence of overloading between August 2019 and March 2020, did not show any improvements. Improvements, if any, will be seen in subsequent audit.

3.9.5 Excess expenditure towards coal freight due to non-execution of agreement with BCCL

WBPDCL had signed (November 2016) FSA with Central Coalfields Limited (CCL) for an Annual Contracted Quantity (ACQ) of 12 lakh MT coal per annum. Thereafter, WBPDCL noticed that the coal movement from CCL was very dismal and irregular i.e. not a single rake was despatched during March 2017. During the last four months of 2016-17, only 18 per cent of ACQ was despatched. Accordingly, WBPDCL requested (April 2017) Coal India Limited (CIL) to shift of 12 lakh MT coal in ACQ to Bharat Coking Coal Limited (BCCL), another subsidiary of CIL from CCL due to (i) irregular supply of coal from CCL, (ii) coal movement from BCCL being satisfactory and (iii) to arrest the incentive payment that otherwise would have to be paid to BCCL for excess supply of coal beyond the existing BCCL ACQ quantity. In response, CIL approved (May 2017) the same.

Audit observed that despite repeated requests (June/ September 2017) from BCCL, WBPDCL did not execute the agreement for shifting of the CCL ACQ quantity to BCCL for reasons not on record. The coal movement of CCL was still poor as a result WBPDCL was bound to procure their quota of CCL coal

[49] *DPL:₹ 2.75 crore, KTPS ₹ 7.78 crore, BkTPS:₹ 7.94 crore, BTPS:₹ 6.13 crore, SgTPS 1.78 crore, STPS: ₹1.58 crore*

from other subsidiary companies resulting in excess expenditure towards freight cost (BCCL's coal mines was nearer to the power plants than CCL's coal mines) on coal to the tune of ₹ 5.84 crore (₹ 3.50 crore for KTPS and ₹ 2.34 crore for BkTPS) for the period 2017-19. Further, during the year 2017-18 and 2018-19, WBPDCL received lesser quantity of coal i.e. 15.33 lakh tonnes[50] from CCL against its ACQ. To meet this short supply of coal, WBPDCL had to procure costlier coal from MSTC and WBMDTCL[51] which resulted in excess expenditure to the tune of ₹ 235.95 crore. Moreover, WBPDCL had not imposed penalty of ₹ 111.07 crore on CCL as mentioned in **Paragraph 3.7.1.2**.

The Government explained (October 2021) that while the supply from CCL improved, the supply from BCCL had reduced. Therefore, the ACQ in the FSAs was not revised. However, this is at variance with the audit observation that BCCL had offered (June/ September 2017) to supply additional coal, if ACQ quantity was shifted from CCL to BCCL, on which no action was taken.

3.9.6 Oversized Coal

Clause 4.6.1 of FSA stipulated that the purchaser should inform the seller all incidents of receipt/presence of oversized coal, as compared to specifications laid down in Schedule-II (top size of coal- 250 mm), for any specific consignments, immediately on its detection at the delivery point and/or unloading point and the seller should take all reasonable steps to prevent the loading of oversize coal at their end.

During 2015-20, three TPS[52] of WBPDCL received 1.59 lakh MT of oversized coal from the coal companies and incurred avoidable crushing charges amounting to ₹ 2.87 crore. DPL did not maintain records of receipt of oversized coal.

The Government accepted (October 2021) and stated that WBPDCL had lodged complaints and taken up the issue with the colliery. Developments were awaited (October 2021).

3.9.7 Stones and Shales

In the supply of coal, some quantities of stones/shales are unavoidable. Such stones/shales are segregated by the plant authority and discarded after weighing. Refund claims are subsequently lodged with the coal companies in line with Clause 9.1 of the FSA which stipulates that the seller should adjust, the entire quantity of stones and shales supplied, through regular credit notes to the purchaser at 100 *per cent* of the entire weighted average base price of the analysed grade of coal applicable for the month in which stones and shales were supplied.

During 2015-20, WBPDCL and DPL had received stone/shale boulders from the coal suppliers which were segregated/discarded by the plant authority after weighing. Details of stone/ shale boulders received by WBPDCL and DPL and amount reconciled there against are as following:

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[50] *This quantity is also included in the quantity of coal referred to under bridge linkage at* ***Paragraph 3.7.1.3.***

[51] *West Bengal Mineral Development Trading Corporation Limited.*

[52] *BkTPS (11,426.73 MT), KTPS (1.48 lakh MT) and SgTPS (36,645) incurred crushing charges amounting to ₹ 0.29 crore, ₹ 1.48 crore and ₹ 1.10 crore, respectively.*

Table 3.8: Stones/Shale/ Boulders received during 2015-20

Name of TPS	Stone Received (MT)	To be Reconciled (₹ in crore)	Reconciled (₹ in crore)	Difference (₹ in crore)
WBPDCL	**55,814.21**	**19.57**	**5.40**	**14.18**
BkTPS	11,229.40	3.49	1.98	1.52
STPS	28,856.38	10.16	2.22	7.94
KTPS	7,945.41	2.67	0.48	2.20
BTPS	1,112.76	0.49	0.04	0.44
SgTPS	6,670.26	2.76	0.68	2.08
DPL	**18,507.29**	**4.84**	**2.45**	**2.39**
Total	**74,321.50**	**24.41**	**7.85**	**16.57**

Audit observed that an amount of ₹ 16.57 crore was still due for settlement with the coal companies. WBPDCL and DPL should initiate steps for settlement of the same.

The Government stated in their reply (October 2021) that WBPDCL would follow-up for settlement of the differential amount while DPL would settle the matter through joint reconciliation with coal companies.

3.9.8 Demurrage

Ministry of Railways (MoR), GoI issued (December 2005) a circular which allowed free time for loading and unloading of different types of wagons at goods sheds and siding allowing seven hours permissible free time for unloading of BOXN[53] wagons and two and half hours permissible free time for unloading of BOBR[54] wagons. The detention of wagons beyond the free permissible time would attract demurrage charges to be paid to railway authorities.

The demurrage charges levied by MoR, GoI and paid by WBPDCL and DPL during 2015-20 is tabulated below:

Table 3.9: Demurrage paid to Railways during 2015-20

Name of plant	Demurrage Charges levied by Railways	Demurrage Charges waived by Railways	Demurrage Charges paid
BkTPS	13.30	4.23	9.07
STPS	5.67	1.13	4.54
KTPS	54.29	9.33	44.96
SgTPS	9.64	1.59	8.05
BTPS	13.80	1.71	12.09
DPL	10.54	2.47	8.08
Total	**107.24**	**20.66**	**86.79**

Audit observed that the reasons of payment of demurrage were attributed to internal issues of TPS *viz*, inefficient working of coal unloading units of the power plants, insufficient illumination, non-functioning of old wagon tippler, time consumed in manual unloading, shortage of manpower, hopper jam

[53] *A type of open wagon.*

[54] *Bogie Open Bottom Rapid Discharge Hopper. These wagons are built exclusively for movement of coal with unique feature of unloading from bottom.*

problem and power house problems. Further, issues relating to non-availability of loco engine, unplanned release of wagons, defective wagons, etc. were not taken up with railways.

Further, audit observed that during the year 2015-16, BkTPS paid service tax on gross demurrage charges without considering waiver received by the Railway Authority on gross demurrage charges, which resulted in excess payment of service tax on waiver portion of demurrage charges to the tune of ₹ 40.82 lakh.

It was also observed that the Railway Authorities computed demurrage charges considering two hours free unloading time instead of two and half hours for BOBR wagons at BkTPS which was not in line with the circular. The local management of BkTPS without verifying the demurrage bills, made an excess payment of demurrage charges amounting to ₹ 31.83 lakh (2015-19) to the Railways.

The Government stated (October 2021) that WBPDCL had brought down demurrage in 2020-21 with regular monitoring. Similarly, DPL had taken internal measures to bring down demurrage. It appears that ineffective monitoring was a major reason for payment of avoidable demurrage charges by TPS.

3.9.9 Missing/Unconnected Wagons

Rakes which were originally assigned to any TPS but diverted elsewhere are referred to as missing wagons. Similarly, the rakes meant for other destinations are also received occasionally by TPS which are referred to as unconnected wagons. Clause 11.4/ 11.5 of the FSA stipulated that in case of diversion of rakes en-route or missing wagons, bills should be paid to the coal companies by the original consignee. Further the parties (WBPDCL/DPL and coal suppliers) should jointly reconcile all payments made for the monthly coal supplies during the year and should issue credit/debit notes for the amount falling due, if any, as assessed during reconciliation.

During 2015-20, WBPDCL and DPL had missing and diverted wagons, details of which are as follows:

Table 3.10: Diverted and Missing Coal wagons during 2015-20

TPS	Quantity (lakh MT)	Value (₹ in crore)	Quantity (lakh MT)	Value (₹ in crore)	Payable(+)/ Receivable(-) (₹ in Crore)
	Diverted		Missing		
BkTPS	12.41	441.56	21.38	697.66	(-) 256.10
STPS	1.23	39.89	0.79	33.55	6.34
KTPS	10.67	409.03	5.21	180.48	228.55
SgTPS	4.53	169.89	14.15	623.50	(-) 453.61
BTPS	15.28	559.83	4.79	187.18	372.65
Total WBPDCL	**44.12**	**1,620.20**	**46.32**	**1,722.37**	**(-)102.17**
DPL	**3.40**	**102.51**	**1.44**	**35.92**	**66.59**

From the above table, it was observed that WBPDCL had not received 46.32 lakh MT coal valuing ₹ 1,722.37 crore due to missing wagons and 44.12 lakh MT

coal valuing ₹ 1,620.20 crore was received through diverted/unconnected wagons during 2015-20. Thus, WBPDCL did not realise ₹ 102.17 crore from Railways due to non-reconciliation of missing/diverted wagons in time.

Similarly, during 2015-20, DPL received 3.40 lakh MT of coal valuing ₹ 102.51 crore from diverted wagons while 1.44 lakh MT of coal valuing ₹ 35.92 crore was missing. The reconciliation of this had not yet been done and ₹ 66.59 crore was payable by DPL to Railways (February 2020).

The Government stated (October 2021) that WBPDCL periodically took up reconciliation with both Eastern and South Eastern Railways, subject to availability and deputation of manpower by Railways. In both WBPDCL and DPL, the process of reconciliation was completed for different years for each TPS. Audit, however, observed that reconciliation was taken up by TPS for periods ranging from upto March 2015 to March 2019 and no TPS had taken up the exercise for 2019-20.

3.9.10 Transit Shortage

As per clause 5 of FSA, for dispatch of coal by rail, all the wagons loaded for the purchaser would be weighed at the loading end at the electronic weigh-bridge of the seller and electronic printout of the actual weight recorded would be provided. Such weighment would be final and binding for determination of the quantity delivered. The purchaser, however, would have the right to witness the weighment of the wagons at the weigh-bridge, if desired.

WBERC allowed the transit loss of 0.50 *per cent* for BkTPS and DPL, and 0.80 *per cent* for other four TPS. Audit observed that during 2015-20, WBPDCL had received less quantity of coal against the Railway Receipt (RR) quantity at unloading end for BkTPS, KTPS, BTPS, SgTPS and STPS. This exceeded the admissible transit loss by 1.69 *per cent*, 1.78 *per cent*, 1.57 *per cent*, 0.98 *per cent* and 3.03 *per cent*, respectively. As per the said clause, WBPDCL could not claim for transit shortage, over and above the WBERC norms, in fuel cost through the tariff, but could have made arrangements to reduce the transit shortage of coal. As a result, during 2015-20 in five TPS, WBPDCL suffered an aggregate loss of ₹ 307.57 crore due to non-recovery of excess transit shortage through tariff ***(Appendix-13).***

Similarly, the shortage of coal received by DPL during 2015-18 varied between 0.79 *per cent* and 3.25 *per cent* against the RR quantity. Thus, DPL suffered a loss of ₹ 32.55 crore towards transit loss over and above the standard norm of 0.50 *per cent* allowed by WBERC.

The Government accepted (October 2021) the findings and stated that WBPDCL had taken corrective action to bring down transit shortages by subsequently engaging liaison agents from August 2020. Moreover, DPL was also exploring the same option.

3.9.11 Use of washed coal

The WBPDCL engaged (March 2016), Global Coal and Mining Private Limited (GCMPL) for beneficiation of coal[55] from Mahanadi Coalfields Limited (MCL). The scope of work included taking delivery of G13/ G14 grade raw coal from

[55] *Beneficiation of coal is a process by which the quality of raw coal is improved.*

the mines at IB valley area and Lakhanpur area of MCL, transportation of the raw coal to washery, beneficiation of the raw coal etc. to meet the required parameters. It was also stipulated that recovery/yield of washed coal should be minimum 72 *per cent* in comparison with raw coal. However, the recovery/ yield of washed coal was changed from 72 *per cent* to 69.61 *per cent* from 1 April 2017 in subsequent amendment order dated 24 September 2018. Apart from this, the delivery of coal from MCL was also changed from G-13 to G-14 from the same date.

In this connection, Audit observed that :-

1. During August 2016 to August 2019, WBPDCL issued Delivery Order (DO) to GCMPL for lifting of 43,34,799 MT raw coal, against which GCMPL actually lifted 42,47,549.38 MT of raw coal *i.e*., a short lifting of 87,249.62 MT raw coal. Clause no. 14.4 of the work order stipulates that the party must be able to lift the entire DO quantity without fail, otherwise penalty at the rate of five *per cent* of notified basic price of raw coal shall be applicable on unlifted quantity. However, WBPDCL did not impose any penalty on GCMPL for the short lifting of raw coal, which resulted in loss of ₹ 29.20 lakh.
2. The work order allowed (i) minimum 72/ 69.61 *per cent* yielding/ recovery of washed coal from raw coal (ii) one *per cent* transit loss in terms of equivalent quantity of raw coal to GCMPL. However, during the period of entire contract WBPDCL received 29,23,746.44 MT washed coal from GCMPL which was equivalent to 41,75,335.88 MT of raw coal. So, in terms of raw coal, GCMPL failed to supply 72,344.07 MT (42,47,567.19 MT- 41,75,223.12 MT) coal to the WBPDCL valuing ₹ 11.46 crore (72344.07 MT x ₹1,583.87).
3. WBERC allowed transit loss of coal at the rate of 0.50 *per cent* for BkTPS, 0.80 *per cent* for BTPS and 0.80 *per cent* for KTPS whereas WBPDCL allowed the transit loss at the rate of one *per cent* to GCMPL. As a result, WBPDCL incurred a loss to the tune of ₹ 1.64 crore.

The Government stated (October 2021) that some of the issues were not yet settled and the contract was yet to be closed. Moreover, there was no penalty clause in the contract for short delivery of washed coal. Due to this, the loss on account of short delivery of washed coal cannot be made good.

Recommendations

WBPCDL and DPL may

1) ***take proper and prompt persuasion with coal companies and railways in claiming adjustments/ settlement of bills towards grade slippage, ungraded coal, un-weighted coal, stone/ boulders, wagons etc.***
2) ***introduce an efficient system for unloading of wagons to avoid demurrage.***

3.10 Conclusion

WBPDCL and DPL together produce just over 50 *per cent* of the power requirement of the State. Between them they operate six coal based TPS with

aggregate capacity of over 5,000 MW. The primary cost component of power generation is fuel cost, which is about 70 *per cent* for WBPDCL whereas it is only 39 *per cent* in DPL. Other costs are higher in case of DPL as the unit was to shut down frequently due to surplus power.

Procurement of coal through long term bilateral Fuel Supply Agreements (FSAs) with coal companies at fixed prices became mandatory as per the New Coal Distribution Policy 2007. Accordingly, 88 *per cent* of coal in these PSUs was bought under FSAs. The balance is procured through e-auction from other agencies like MSTC Limited and West Bengal Mineral Development and Trading Corporation Limited.

WBPDCL has been allotted seven captive coal mines (2015/2016), three of which have just started production in 2018-19 and the coal mine linked with DPL is yet to start production.

Audit observed that in several cases the power companies made payments on declared grade of coal instead of actual grade of coal supplied under FSAs and thereby incurred losses by paying more for lower grade of coal. Use of lower grade of coal in TPS also led to lower thermal efficiency. WBPDCL also had to procure coal from other agencies at higher cost because it could not avail bridge linkage of coal offered by GoI, in the interim period, before the captive coal mines allotted started production.

The TPS were also not able to monitor supply of oversize coal and thereby incurred extra cost on their crushing. Further, they did not claim for refund on account of stones and shales in the coal stock as permitted in FSAs.

Coal stock at the TPS in WBPDCL were not efficiently monitored and it was found that coal stocks were critical (less than seven days consumption) and super-critical levels (less than four days consumption). Shortage of coal was one of the main reasons for frequent forced outage for which TPS had recovered excess capacity charges, to that extent, under tariff orders of WBERC for 2015-20.

The Power SPSEs also had to pay demurrage to the railways due to manpower shortage and logistic problems at the unloading sites of the power stations. Reconciliation with railways on account of missing coal wagons was also pending.

The TPS were facing issues of imperfect combustion of coal in their furnaces, non-achievement of thermal efficiency, excess consumption of auxiliary power and excess consumption of oil. These were attributed to frequent outages, improper coal milling, use of lower grade coal and inadequate maintenance of plants. As a result, consumption of coal was higher than WBERC norms which added to the overall cost of power.

Audit observed various inefficiencies of the Power SPSEs, including those that were the result of ineffective monitoring of due processes, which resulted into higher generation cost of power and ultimately, the burden of higher cost was passed to the consumer by way of higher electricity tariffs.