

**ODISHA ELECTRICITY REGULATORY COMMISSION
BIDYUT NIYAMAK BHAWAN,
PLOT NO. 4, CHUNOKOLI,
SHAILASHREE VIHAR, BHUBANESWAR-751021**

**Present: Shri U. N. Behera, Chairperson
Shri S. K. Parhi, Member
Shri G. Mohapatra, Member**

Case No. 43/2017

OPGC Limited	Petitioner
Vrs.		
GRIDCO Ltd. & Others	Respondents

In the matter of: An application under Section 86 (1) (f) of the Electricity Act, 2003 qua billing disputes with GRIDCO Limited regarding energy bills raised in accordance with Order dated 23.03.2017 passed in Case No. 62/2016.

For Petitioner: Shri Sitesh Mukharjee, Sr. Advocate and Shri Arjun Agarwal, Advocate, Shri Ritwik Mishra, GM, OPGC Limited.

For Respondents: Shri Ashok Samantaray, Sr. Consultant, Shri Sukanta Panda, Sr. GM (PP) and Ms. Susmita Mohanty, AGM, GRIDCO Ltd., Shri P.K. Pradhan, Shri R.P Mahapatra, and Mrs. Niharika Pattanayak, ALO, Department of Energy, Government of Odisha.

Nobody is present on behalf of Shri A.K. Sahani, Shri Ananda Kumar Mohapatra, M/s. Hindalco Industries Ltd. and M/s. MCL.

Date of Hearing: 04.08.2020

Date of Order:28.10.2020

ORDER

M/s. Odisha Power Generation Corporation Ltd. (OPGC) has filed the present petition challenging unilateral refusal of M/s. GRIDCO to honour its power bill in full in violation of the Commission's Tariff Order dated 23.03.2017 in Case No. 62/2016. The Petitioner states that this action of GRIDCO is contrary to Regulation 4.32 and 4.33 OERC (Terms and Conditions for Determination of Generation Tariff) Regulations, 2014. The Petitioner is to be paid energy charges basing on Gross Calorific Value (GCV) of coal measured on 'as fired' basis. In view of this GCV of coal is measured at the bunker end of the power station prior to being fired in the boiler of the power station. According to Regulation the Energy Charge Rate (ECR) is inversely proportional to the value of the as fired GCV of coal. It is not open for GRIDCO to contend that 'as billed' or 'as received' or any other norms to measure GCV should be applied. Regulation expressly stipulates for measurement of GCV on an 'as fired' basis which is well established and long standing industry practice.

2. The petitioner has further stated that as per the interim order dated 24.08.2017 the Petitioner had appointed an independent third party agency 'The Institute of Minerals and Material

Technology, Bhubaneswar (IMMT) for measurement of the 'as fired' GCV at the Petitioner's plant site the sampling for which was done in presence of the representatives of GRIDCO for three consecutive months. It is reported by the third party agency that 'as fired' GCV measured by them are within the range as claimed by the Petitioner. GRIDCO has accepted this report. The third party agency has collected the sample as per IS 436 part –I / Section 2. M/s. OPGC submitted that from the year 1999 up to 2014 CERC had been following 'as fired' norm of measuring GCV in its tariff Regulations. GRIDCO itself had paid NTPC Ltd. energy charges on the basis of 'as fired' GCV for the aforesaid period. Notably CERC has amended its Tariff Regulation for the control period FY 2014-19 to change the GCV norm from 'as fired' to 'as received' basis.

3. The petitioner has cited the following plausible reasons for wide variation between the GCV measured at the mine end and at the Petitioner's boiler end :

- (a) The analysis at coal company's end is done on Equilibrated moisture basis (60% relative humidity). The analysis at power plant end is done on 'as fired' basis considering total moisture. Hence, the very purpose and methodology for determination of GCV at mine loading end and at the boiler end are totally different and cannot be co-related. Coal is never subjected to equilibrated condition before its use in power plant, rather it is used in its original form. The actual moisture/ total moisture (TM) content of coal which was actually loaded, supplied and fired would always be higher than equilibrated moisture.
- (b) Manual sample collection process followed by CIMFR, third party agency, at the loading end is not efficient and truly representative of the IS standard prescribed for the purpose. If the sampling process is to be strictly adhered to then mechanical sampling is to be introduced by MCL.
- (c) The sample collected is not homogeneous both at loading and unloading points and presence of shale, stones and other impurities in coal are responsible for grade slippage.
- (d) The degradation due to stacking and handling resulting in drop in GCV up to the order of 100 – 150 Kcal/kg has been accepted by CEA.

Therefore, variation in GCV due to methodology of its determination, stacking and handling losses at power plant, sampling error, etc. contribute to more than 400 Kcal/kg in variation in the readings of 'as billed GCV' and 'as fired' GCV. Even there is wide variation in the report of CIMFR, the third party agency. M/s. CIL has also expressed its concern over it. In fact, in Report No.35 of 2016 CAG of India has acknowledged that the billing methodology

of CIL/MCL is starkly different from the “Industry Practice” followed by power producer. The impact of such difference in methodology is pegged at 280 to 350 Kcal/Kg in the CAG report. It is practically impossible through manual sampling to collect the representative sample from wagons both at loading points and unloading points as directed by the Commission in its interim order dated 15.01.2018. The Model Coal Supply Agreement is a statutory standard form of contract notified by the Ministry of Coal and any Generator willing to purchase coal from CIL/MCL has no option but to sign the same. There is no scope of negotiation of terms of Model Coal Supply Agreement by a generator. Resultantly, the FSA between OPGC and MCL is pari materia with Model Coal Supply Agreement notified by the Ministry of Coal.

4. M/s. OPGC has submitted that due to short payment by GRIDCO the Petitioner is unable to service its payment obligation to MCL for supply of coal. If the Petitioner continues to be reimbursed energy charges based on a fixed and notional GCV value against ‘as fired’ GCV the procurement of coal shall be affected.
5. M/s. OPGC has prayed the Commission to direct GRIDCO to reimburse the power bill on the basis of ‘as fired’ GCV of coal.
6. M/s. GRIDCO has vehemently opposed the above views of M/s. OPGC. It stated that even though the weighted average price of coal is gradually increasing year after year, the weighted average GCV of coal claimed by OPGC is constantly reducing over the successive years. There is too much difference in GCV values between CIMFER Report and claim of OPGC. M/s. GRIDCO further stated that the Petitioner has misinterpreted the definition of ‘as fired’ GCV of coal in the Regulation. It should be at the firing point i.e. inside the furnace. Nowhere in the Regulation it is mentioned that GCV of the coal is to be measured at the bunker end of the power station prior to being fired in the boiler of the power station. Since it is not possible to measure GCV of the coal during firing inside the furnace the relative humidity and temperature condition inside the furnace should be simulated in the GCV testing laboratory. In absence of that it would be proper to calculate the GCV on ‘equilibrated moisture’ method i.e. at 40⁰ temperature and 60% relative humidity which is more near to furnace condition. M/s. OPGC, on the contrary, has been measuring GCV at bunker end by ‘total moisture’ method. M/s. GRIDCO pointed out that during firing or ‘as fired’ condition the coal does not contain ‘total moisture’ in it. The Petitioner has already admitted that the tariff Regulations are silent on the methodology of finding out GCV of coal. GRIDCO stated that there is no such industry accepted norm that the GCV of coal for determination of energy charge should be on ‘total moisture basis’ as claimed by the Petitioner. The declared grade, grade slippage and third party GCV measurement etc. at coal

supply point at MCL end are only based on GCV measured on equilibrated moisture method. Therefore, for 'as fired' purpose the equilibrated moisture method should be adopted. GRIDCO further added that the GCV of coal determined at colliery end is converted to equilibrated GCV basing on the equilibrated moisture (equilibrated at 40⁰ temperature and 60% RH) while the total moisture is determined at the colliery end. The difference in total moisture and equilibrated moisture gives surface moisture which is to be dealt separately through compensation mechanism. GRIDCO submitted that sampling is required only for the purpose of ascertaining the quality of the coal. Therefore, samples collected at mine end truly represent the measure of supplied coal. During coal sampling it is observed that coal sample collection procedure followed by OPGC and IMMT is not as per the relevant IS. The point located at the bottom part of the feeder pipe between coal bunker and RC feeder from where OPGC is collecting the coal sample, is not the appropriate sampling point. Considering the fact that the coal sample collected from this point does not represent the delivered coal of the day and the coal source is also unknown. Moreover, as it is located at the bottom part of the feeder between coal bunker and RC feeder often coal is stagnant at this point and there is a chance of water accumulation. It further stated that if there is wide difference between the report of CIMFR and GCV of sample at bunker end, it is the internal matter between MCL and OPGC and may be sorted out within the ambit of agreed coal supply agreement. As per CIMFR, if it is not practically possible to draw samples up to the bottom of the wagon for which proper sampling of coal is not possible as per relevant IS and if higher GCV is measured due to drying up of the top coal, then it is a gain for MCL. It is also the responsibility of OPGC to ensure proper sampling of coal as per IS, as per Coal Supply Agreement as well as Guidelines for Third Party Sampling. In summary GRIDCO has prayed that as per Regulation 4.33 equilibrated moisture method of determination of GCV is the correct way.

7. One intervener Mr. P. K. Pradhan said that so far as determination of tariff of Unit I & II of OPGC is concerned the order of Hon'ble Apex Court holds good. OERC has limited role as they are to determine the tariff strictly as per the direction of Hon'ble Apex Court. The GCV of coal should be measured at the power house end and not at the firing point. The GCV of coal is to be measured on "as received basis" as per fuel supply agreement with MCL which is determined by a third party (CIMFR) and agreed by both OPGC and MCL. The difference between "as received" GCV and "as fired" GCV would be very marginal and would be solely on account of marginal loss of heat during the coal storage. Considering 3% heat loss for Indian coal, the average loss of heat value for 10 days storage would be about 3 Kcal/Kg. for typical coal having GCV value of 3500 Kcal/Kg. So any arbitrary practice of using "as

fired” GCV for SHR computation without proper guidelines for determining the same would only lead to inflated claim of coal consumption. Therefore, OERC may direct GRIDCO and OPGC to mutually discuss and evolve a solution specifically in case of station heat rate, specific oil consumption and plant load factor for calculation of variable cost as the claim of OPGC has an adverse impact on GRIDCO and on the consumers of the State. Mr. P. K. Pradhan further states that it would have been better if both OPGC and GRIDCO had engaged the same CIMFR as third party for analysis and determination of ‘as fired’ GCV, in the same process and procedure. In that case, the cause of huge deviation in GCV value could have been found out.

8. Another Respondent Mr. R. P. Mahapatra submitted that the Commission had determined the tariff for Unit-I and II of OPGC power station for FY 2017-18 in its order dated 23.03.2017 in Case No. 62/2016. OPGC had served the monthly energy bills for the month of April and May, 2017 based on Para 138 of the said order. GRIDCO did not pay the billed amount for the above months basing on “As fired” GCV but paid it on the basis of GCV of 3400 Kcal/Kg. which had been illustrated in OERC order. Hon’ble Supreme Court in CA No. 9485/2017 had set aside the tariff order of OERC for FY 2016-17 and had directed OERC to take into account the PPA for variable cost and the Regulation for other costs not reflected in the PPA . OPGC receives the coal from MCL at the mine end and transports the same through the MGR which is the part of the power plant. Therefore, GCV of coal as determined at the loading point (at the mine end) is the GCV at delivery point which is according to the requirement of PPA. If GCV of coal is accepted on “As Fired” basis which is mentioned in the Regulation, then it would be in contravention of Hon’ble Supreme Court’s order. OPGC is receiving huge benefits in tariff determination due to freezing of norms according to the Government notification dated 21.06.2008 and the original PPA and supplementary agreement dated 19.12.2012 which are related to escalation of O&M charges, normative level of availability, higher station heat rate and higher auxiliary consumption etc. Therefore, no additional benefit can be given to OPGC.
9. One of the respondents Mr. A.K. Sahani has stated that there are enough clauses in the FSA to save the consumers. If the dispute is not sorted out, the mater may be referred for arbitration under Section 158 of the Electricity Act, 2003.
10. During the course of hearing Mr. R. P. Mahapatra, Mr. P. K. Pradhan, OPGC and GRIDCO raised certain queries against M/s. MCL who was impleaded as a Respondent in this case. In its reply M/s. MCL has stated as follows:
 - (a) The procedure for determination of GCV of coal for the purpose of billing of a power plant during the year 1996 and also in 2012 is as per Indian Standard 1350 (Part – II).

- (b) In FSA between OPGC and MCL, there is no provision of testing of coal to be done at the power house end of the OPGC by the MCL. Therefore, neither MCL carries out any testing of coal at the power house end of OPGC nor MCL has any knowledge of OPGC doing the same. In year 2015 it was decided by the Ministry of Coal that sample will be collected and prepared by a single third party agency and both the power utilities and the coal companies may jointly appoint a third party i.e. CSIR CIMFR (a Government of India Organisation) to undertake the process of sampling and give report on various factors including the GCV. Accordingly a tripartite agreement dated 26.10.2016 was entered into between MCL, OPGC and CSIR CIMFR. As per the FSA and tripartite agreement dated 26.10.2016 sampling and testing is to be done at the loading point only. As stated by OPGC it had done sampling and analysis of coal at the unloading point (OPGC end) through IMMT on 13th and 14th November, 2018 and on comparing the result of the sampling and analysis done by IMMT vis-a-vis the sampling and analysis of the coal done at the loading point (MCL end) by CSIR-CIMFR high difference in GCV of coal was observed. The reason for the same is not known to the MCL. This aspect can only be answered by both the sampling and analysis agencies i.e. CSIR-CIMFR and IMMT. Therefore, the Commission may call for comments from those institutions.
- (c) MCL further stated that the FSA provisions on sampling were framed considering prevalent guidelines of coal controller who does it as per Clause 4 of Colliery Control Rule, 2004. Regarding adoption of automatic mechanical sampling, the same is an issue with administrative domain of supplier. GRIDCO cannot comment on the same. The report of CEA itself indicates that following BIS standard for sampling is not possible because of the time consumed in the process. After loading, ownership of the coal gets transferred to the purchaser. As solid fuel, coal is heterogeneous in nature. The difference of 60-70 Kcal is basically due to loss of moisture in storage and handling of coal which is unavoidable. The sample is to be collected within free loading time (of about three hours) defined by Indian Railways or else the consumer faces penal demurrage charge from railways. The coal controller organisation has conveyed the guidelines for reporting GCV on equilibrated method. The provision of FSA in respect of excess surface moisture is binding for both the parties i.e. MCL and OPGC and claim will be settled after reconciliation. However, during FY 2014-15 to 2018-19 no claim against excess surface moisture has been made by M/s. OPGC.

11. OPGC in its written submission has stated that statutory Regulation such as Tariff Regulation covers the field of GCV determination. It is not open to any of the Respondents to advance any contention contrary to the express terms of such Regulations. Thus, when Regulation 4.33 of the Tariff Regulation expressly stipulates the measurement of GCV on “as fired” basis, which is a well established and long standing industry practice the Respondents’ contentions that GCV should be measured by the Petitioner on any other basis (such as “as received” or “as billed by MCL”) is wholly without merit. GCV of coal for computing ECR cannot be frozen or pre-determined at a particular value as GCV of coal varies with each coal rake based on its inherent nature and is further influenced by different atmospheric, seasonal, mine end condition and other extraneous factors. The analysis at coal company’s end is done on equilibrated moisture basis and GCV so derived is used as a standard for the purpose of gradation of coal for billing purposes only. The analysis of power plant end is done on “as fired” basis considering total moisture and the GCV thus arrived is used for computing energy charge rate. Hence, the very purpose and methodology for determination of GCV at mine loading end and at the boiler end are totally different and cannot be co-related.
12. Since, there is a dispute between the parties with relation to methodologies of determination of GCV as per the interim order dated 20.07.2019 of the Commission a Technical Committee was formed with Respondents Shri R. P. Mahapatra, Shri P. K. Pradhan, officials of OPGC, OCPL, Hindalco and officials of OERC. The Scientist of IMMT and CIMFR made presentations before the Committee on 05.08.2019 and 09.08.2019 respectively. The summary of the presentation is as follows:
- a) Coal sampling is being carried out by CIMFR from the wagon top as per the methodology provided in FSA, which differs from the methodology in IS. This is followed for all NTPC plants as per CIMFR.
 - b) Coal companies measure and report Equilibrated GCV for billing purpose to have standardized pricing across the country.
 - c) The weightment of coal at the weighbridges of coal company and billing is inclusive of the total moisture present in it.
 - d) The total moisture of coal is reasonably higher than equilibrated moisture particularly in sub- bituminous coal available in Odisha due to presence of clay minerals.
 - e) There is a difference of around 130 Kcal/Kg. for 4% difference in moisture level between total moisture and equilibrated moisture that means there is a difference of about 32 Kcal/Kg. for 1% difference in moisture level.

- f) GCV at equilibrated moisture and total moisture are calculated by correcting the GCV of air dried coal to the respective moisture content.
 - g) Equilibrated GCV is not relevant in the power plant/industry as the coal that is fed to the boilers actually contributes to the heat generated and is with the Total Moisture. Hence the Equilibrated GCV for billing and TM basis GCV at firing end are acceptable methods of GCV determination.
 - h) Coal companies are not giving any compensation in case the surface moisture is <7% in dry season and <9% in wet season, indicating that these are the allowable surface moisture limits by the coal companies and most of the times coal will be supplied with this moisture content.
 - i) Considering average 8% Surface Moisture, the difference in GCV between equilibrated method and Total Moisture method will be around 260 Kcal/kg. Representatives of Hindalco also confirmed that they are getting a difference of @250 Kcal/kg when a coal sample is measured in these two methods. Hence around 250 Kcal/kg of GCV difference between Loading end and firing end is attributable to the method of GCV determination.
 - j) As given in the CERC Regulations, 85 Kcal/kg shall be considered for Storage and handling losses within the plant between as received coal in the plant and as fired coal.
 - k) The errors in sampling because of non-compliance of IS procedures were understood by the members, however the quantification for the same may not be arrived as there will be number of influencing factors.
13. We carefully heard the arguments and rival arguments of all the parties including opinions of experts. The bone of contention in this case is related to the calculation of Energy Charge Rate (ECR) of the power procured by GRIDCO from OPGC. After longstanding dispute in this matter, the Commission had finally redetermined the tariff for Unit-I and II of the petitioner vide case No.33 of 2018 dt.28.03.2019 for FY 2016-17, FY 2017-18 and FY 2018-19 pursuant to the judgment of the Hon'ble Supreme court of India dated 19.04.2018 in Civil Appeal No. 9485 of 2017. The Commission in the said order had directed as follows:

Directives of the Commission:

“40. The recovery of monthly Capacity Charges as approved by the Commission here shall be made as per the methodology stipulated in the PPA and GRIDCO Ltd. shall make payment after prudence check.

41. The operational norms like Auxiliary Consumption, Gross Station Heat Rate, and Consumption of Oil as indicated in Clause 8 of Schedule-II of the PPA and Price and GCV of Oil and Coal actually delivered to the power station as per Clause 7 of Schedule-II of the PPA shall be considered. Accordingly claims of monthly Energy Charges shall be made by OPGC and GRIDCO Ltd. shall make payment after prudence check of all parameters of energy charges like GCV and price of Coal & Oil etc.”

The capacity charge and energy charge are to be computed as per the above order of the Commission.

14. Heat energy contents of the coal and oil are converted to electrical energy in the power station. Heat energy content of the coal per kilogram varies at different points starting from the time of its mining till its firing in the furnace due to addition and release of moisture and other impurities during its handling. PPA between the parties at clause-7 of Schedule-II specifies that Gross Calorific Value of the coal and oil shall be determined “as delivered to the power station”. It is understood from the submission of the experts and parties that the GCV of coal is measured at mines end by a third party agency named CIMFR on “equilibrated method”. This is done to arrive at a standardized pricing of coal of a particular grade. But the heat energy available in the power station from the coal depends upon moisture content and other impurities. Therefore, GCV of coal measured at equilibrated method requires moisture correction for determination of heat content available for energy conversion. Therefore, if we apply a moisture correction formula on “as billed” GCV which is determined on equilibrated method, we can arrive at GCV on total moisture basis. CERC in petition No.279/GT/2014 dated 30.07.2016 has also adopted this method. This is because the measurement of GCV on total moisture basis at power station end is the practice generally followed by the industry and it determines the volume of coal the power station requires to generate a particular quantity of energy.

$$\text{GCV of coal as delivered to the power station (total moisture basis)} = \frac{\text{GCV} \times (1 - \text{TM})}{(1 - \text{IM})}$$

Where: GCV= Gross Calorific value of coal as billed by coal supplier
TM= Total moisture as per CIMFR report
IM= Inherent moisture as per CIMFR report

The above formula should form the basis of calculation of GCV of coal on “as delivered basis” for computation of energy charge. The above formula shall take care of total moisture in calculation of GCV which is the prevalent industry practice.

15. The old bill of OPGC should be modified accordingly from April, 2017 onwards for the entire tariff period. The value of IM and TM should be adopted from the third party CIMFR

report. The ECR should be calculated basing on the GCV so arrived. The issue of prompt payment rebate availed earlier by GRIDCO cannot be reopened now because of revision of bills since the old bill has been paid as per the prevailing tariff order. The arrear due to revised bills shall be paid by GRIDCO in 6 (six) equal monthly instalments to OPGC in addition to current bill.

16. Accordingly the case is disposed of.

Sd/-
(G. Mohapatra)
Member

Sd/-
(S.K. Parhi)
Member

Sd/-
(U.N. Behera)
Chairperson