

CENTRAL ELECTRICITY REGULATORY COMMISSION
New Delhi

Staff Paper

on

**Methodology for Computing
“Deterrent Charges” for maintaining lower coal stock
by coal based thermal generating stations**

May 2022



I: Background

During the recent months, coal stock at many coal based thermal generating stations were reported as lower than the coal stocking norms specified by the Central Electricity Authority (CEA). Such low coal stock led to lower declared availability by the generating stations, which in turn forced States to purchase power from alternate sources at higher rates. Thus, failure to maintain coal stock as per norms impacts the availability of the plant and the power supply to the beneficiaries, thereby forcing the concerned to procure power from alternate sources, which are often costlier. The failure of the generating stations to maintain coal stock as per norms, thus gets transferred to the consumers in the form of higher cost of procurement of power from alternate sources.

2. In order to avoid such low coal stock situations and considering that the coal supply by coal companies and coal consumption by generating stations vary from season to season, the Central Electricity Authority (CEA) has revised the coal stocking norms for coal based thermal power generation stations w.e.f. 6.12.2021.

3. As per the revised coal stocking norms, coal based pit-head thermal power plants are required to maintain coal stock in the range of 12 days to 17 days, depending on the month of the year, as against prevailing coal stock norm of 15 days. Power plants situated away from the mines i.e. the non-pit head plants are required to maintain coal stock in the range of 20 days to 26 days compared to the prevailing coal stock norms of 20 days to 30 days. The revised coal stocking norms specified by the CEA are as under:

Month	Coal Stock to be maintained by the power plant during the month (in number of days)	
	PIT HEAD	NON-PIT HEAD
April	17	26
May	17	26
June	17	26
July	14	22
August	13	21
September	12	20
October	13	21
November	14	22
December	15	23



January	16	24
February	17	26
March	17	26

4. The CEA has suggested disincentives for thermal power plants in the event the availability of any coal based power plant is lower than the Normative availability (as per prevailing CERC/SERC Regulations/Norms, as applicable) due to lower stock of coal maintained by the power plant as compared to the norm specified by the CEA. The CEA has suggested as under:

a) **Power plant designed on domestic coal:** In the event, the availability is less by 5% or more from the Normative Availability (as applicable) on quarterly basis, the fixed charge shall be reduced to the extent of shortfall in Normative Availability and in addition, the reduction below the Normative Availability shall be multiplied by a factor of 0.2 (i.e. levy of additional 20% due to reduced availability) to determine the charges payable for non-maintenance of coal stock on quarterly basis.

b) **Power plant designed on imported coal:** In the event the availability is less by 5% or more from the Normative Availability (as applicable) on quarterly basis, the fixed charge shall be reduced to the extent of shortfall in Normative Availability and in addition, the reduction below the Normative Availability shall be multiplied by a factor of 0.5 (i.e. levy of additional 50% due to reduced availability) to determine the charges payable for non-maintenance of coal stock on quarterly basis.

c) Further, in case the availability is less by 25% or more from the Normative Availability (as applicable) on quarterly basis, the fixed charge shall be reduced to the extent of shortfall in Normative Availability and in addition, the reduction is beyond 25% below the Normative Availability shall be multiplied by a factor of 1 (one) (i.e. levy of additional 100% due to reduced availability) to determine the charges payable for non-maintenance of coal stock on quarterly basis.



II: Present Regulations of CERC

5. Regulation 14 of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 (hereinafter referred to as “the 2019 Tariff Regulations”) provides for two-part tariff for supply of electricity from a thermal generating station, namely, capacity charge and energy charge. Regulation 15 of the 2019 Tariff Regulations provides for computation of annual fixed charges of thermal power plants. Regulation 49 of the 2019 Tariff Regulations specifies Normative Annual Plant Availability Factor (NAPAF) for thermal power plants and Regulation 42 of the 2019 Tariff Regulations provides for computation and recovery of monthly Capacity Charges by thermal generating stations as per actual monthly plant availability w.r.t. NAPAF. Regulation 14, Regulation 15 and Regulation 42 of the 2019 Tariff Regulations are extracted below:

“14. Components of Tariff: (1) The tariff for supply of electricity from a thermal generating station shall comprise two parts, namely, capacity charge (for recovery of annual fixed cost consisting of the components as specified in Regulation 15 of these regulations) and energy charge (for recovery of primary and secondary fuel cost and cost of limestone and any other reagent, where applicable as specified in Regulation 16 of these regulations).”

“15. Capacity Charges: The capacity charges shall be derived on the basis of annual fixed cost. The Annual Fixed Cost (AFC) of a generating station or a transmission system including communication system shall consist of the following components:

- (a) Return on equity;*
- (b) Interest on loan capital;*
- (c) Depreciation;*
- (d) Interest on working capital; and*
- (e) Operation and maintenance expenses:*

Provided that Special Allowance in lieu of R&M, where opted in accordance with Regulation 28 of 2019 Tariff Regulations, shall be recovered separately and shall not be considered for computation of working capital.”

“42. Computation and Payment of Capacity Charge for Thermal Generating Stations: (1) The fixed cost of a thermal generating station shall be computed on annual basis based on the norms specified under these regulations and recovered on monthly basis under capacity charge. The total capacity charge payable for a generating station shall be shared by its beneficiaries as per their respective percentage share or allocation in the capacity of the generating station. The capacity charge shall be recovered under two



segments of the year, i.e. High Demand Season (period of three months) and Low Demand Season (period of remaining nine months), and within each season in two parts viz., Capacity Charge for Peak Hours of the month and Capacity Charge for Off-Peak Hours of the month as follows:

$$\text{Capacity Charge for the Year (CCy)} = \text{Sum of Capacity Charge for three months of High Demand Season} + \text{Sum of Capacity Charge for nine months of Low Demand Season}$$

(2) The Capacity Charge payable to a thermal generating station for a calendar month shall be calculated in accordance with the following formulae:

$$\text{Capacity Charge for the Month (CCm)} = \text{Capacity Charge for Peak Hours of the Month (CCp)} + \text{Capacity Charge for Off-Peak Hours of the Month (CCop)}$$

III: The Proposed Methodology

6. In order to recover full annual fixed charges, it is the obligation of the Generating company to arrange sufficient fuel for its generating stations as per norms and maintain the availability of the plant as per the relevant regulations.

7. Therefore, it is proposed that if coal based generating stations fail to maintain coal stock as per the revised coal stocking norms as specified by the CEA, the AFC of such generating stations is reduced. The existing regulations already provide for the reduction in AFC on account of actual plant availability being lower than NAPAF. Accordingly, the following provision is proposed to be inserted after Regulation 42 (7) of the 2019 Tariff Regulations.

“42(8) (i) In case, the Plant Availability in any month is short by more than 5 % but up to 25 % of NAPAF and average coal stock availability for the last three months (month for which reduction in capacity charges are computed and two months preceding that month) is lower than the average coal stock norms specified by CEA for the respective three months:

a) The reduction in capacity charges for the month for thermal plants designed on domestic coal =

$$0.2 \times \text{AFC}_{\text{Month}} \times \left(1 - \frac{\text{PAFM}_{\text{Actual}}}{\text{PPAFM}_{\text{NAPAF}}}\right) \times \left(1 - \frac{\text{Average Coal Stock for last three months in no. of days}}{\text{Average Coal Stock for last three months in no. of days as per CEA}}\right)$$



b) The reduction in capacity charges for the month for thermal plants designed on imported coal =

$$0.5 \times AFC_{\text{Month}} \times \left(1 - \frac{PAFM_{\text{Actual}}}{PPAFM_{NAPAF}}\right) \times \left(1 - \frac{\text{Average Coal Stock for last three months in no.of days}}{\text{Average Coal Stock for last three months in no.of days as per CEA}}\right)$$

(ii) In case, the Plant Availability in any month is short by more than 25 % and average coal stock availability for last three months (month for which reduction in capacity charges are computed and two months preceding that month) is lower than the average coal stock norms specified by CEA for the respective months:

The reduction in capacity charges for the month for thermal plants designed either on domestic coal or imported coal =

$$AFC_{\text{Month}} \times \left(1 - \frac{PAFM_{\text{Actual}}}{PPAFM_{NAPAF}}\right) \times \left(1 - \frac{\text{Average Coal Stock for last three months in no.of days}}{\text{Average Coal Stock for last three months in no.of days as per CEA}}\right)$$

Where,

AFC_{Month} = AFC determined for respective month as per NAPAF

$PAFM_{NAPAF}$ = Normative Monthly availability as per regulations (NAPAF)

$PAFM_{\text{Actual}}$ = Monthly availability as per declared capacity

Provided that the above reduction in capacity charges for the month shall be adjusted in the invoice of the same month.

Provided further that the above reduction in capacity charges shall be effected from first calendar day of the third month after the notification of these regulations.”

IV. Illustrations

8. **Shortfall in Plant availability factor is more than 5 % but less than 25 % of NAPF during a month – Plant designed on domestic coal**

Suppose the plant availability, coal stock availability and NAPAF of a pit head plant designed for domestic coal is as follows:



Month	Plant Availability Declared (%)	NAPAF (%)	Actual Average Coal Stock (Number of days)	Coal stock norms as per CEA (Number of days)
September	84.0	83	14	12
October	81.0	83	12	13
November	74.7	83	10	14
Average			12	13

Computation of reduction in capacity charges for the month of November shall be as follows:

$$\text{The shortfall in availability of plant in November} = \left(\frac{0.83-0.747}{0.83} \right) = 10.00 \%$$

The shortfall is more than 5 % but less than 25 %. Considering the AFC for the month of November as Rs.100 Cr, the reduction in capacity charges for the month of November shall be computed as under:

$$= 0.2 \times 100 \times \left(\frac{13-12}{13} \right) \times \left(\frac{0.83-0.747}{0.83} \right) = 0.1538 \text{ Cr} = \text{Rs.15.38 lakhs}$$

9. Shortfall in Plant availability factor is more than 5 % but less than 25 % of NAPF during a month – Plant designed on imported coal

Suppose the plant availability, coal stock availability and NAPAF of a non-pit head plant designed for imported coal is as follows:

Month	Plant Availability Declared (%)	NAPAF (%)	Actual Coal Stock (Number of days)	Coal stock norms as per CEA (Number of days)
June	87.0	85	22	26
July	81.0	85	24	22
August	68.0	85	20	21
Average			22	23

Computation of reduction in capacity charges for the month of August shall be as follows:



The shortfall in availability of plant in August = $\left(\frac{0.85-0.68}{0.85}\right) = 20.00\%$

The shortfall is more than 5 % but less than 25 %. Considering the AFC during the August as Rs.100 Cr, the reduction in capacity charges for the month of August shall be as under:

$$= 100 \times 0.5 \times \left(\frac{23-22}{23}\right) \times \left(\frac{0.85-0.68}{0.85}\right) = 0.4247 \text{ Cr} = \text{Rs.42.47 lakhs}$$

10. Shortfall in Plant availability factor is more than 25 % of NAPF during a month – Plant designed on domestic coal as well as imported coal

Suppose the plant availability, coal stock availability and NAPAF of a non-pit head plant designed either for domestic coal or for imported coal are as follows:

Month	Plant Availability Declared (%)	NAPAF (%)	Actual Coal Stock (Number of days)	Coal stock norms as per CEA (Number of days)
November	86.0	85	18	22
December	82.0	85	19	23
January	59.5	85	26	24
Average			21	23

The shortfall in availability of plant in January = $\left(\frac{0.85-0.595}{0.85}\right) = 30.00\%$

The shortfall in plant availability is more than 25 %. Considering the AFC during the January as Rs.100 Cr, the reduction in capacity charges for the month of January shall be

$$= 100 \times \left(\frac{23-21}{23}\right) \times \left(\frac{0.85-0.595}{0.85}\right) = \text{Rs.2.609 Cr}$$

V. Stakeholders' Comments and Suggestions

11. Comments and suggestions are invited from the generating companies and other stakeholders on the proposed methodology. Based on the responses received, the staff will seek appropriate directions from the Commission on the matter.

