



Standard Operating  
Procedure  
for  
Captive Power Plants  
utilizing Coal allotted  
under  
SHAKTI B(ii)

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**Thermal Project Planning & Development Division  
Central Electricity Authority  
New Delhi**

## **Standard Operating Procedure (SOP) for Captive Power Plants (CPPs) for utilizing coal allotted under SHAKTI B(ii)**

### **A. Introduction:**

1. As per the Minutes of the Meeting (MoM) of the Inter-Ministerial Committee (IMC) to make recommendations on issues that are arising or are likely to arise during the course of implementation of the SHAKTI policy, held on 15.02.2021, the following was recommended:

*“In view of the fact that the benefits of lower cost power coal is to be transferred to the consumers and in view of the provisions of para B (ii) of SHAKTI Policy, power producers including captive power producers, having a valid long term PPA as per B (ii) of SHAKTI Policy be permitted to participate in the linkage auctions to the extent of the existing PPA, subject to the condition that Ministry of Power shall issue and monitor appropriate SOP/guidelines/directions/Rules to ensure that coal supplied to the CPPs under SHAKTI B (ii) is being used by the CPPs only against the PPA for which it has been allowed coal linkage and there is no diversion/misuse of such coal.”*

2. Accordingly, following Standard Operating Procedure (SOP for utilizing Coal by Captive Power Plants (CPPs) allotted under SHAKTI B(ii) shall be followed.
3. Member (Thermal)/Chief Engineer (Thermal Project Planning & Development Division) will be the authority for carrying out the functions prescribed under.
4. Further, the following SOP may be reviewed in future as per experience gathered in due course.

### **B. Information required from applicants/ participating entity:**

5. After signing of the FSA(s) with the Coal Company under SHAKTI B(ii) auction, the successful CPP Bidder is required to furnish information to CEA regarding the power plants like, Installed Capacity, Long Term PPA capacity of the CPP, Normative Auxiliary Consumption, Station Heat Rate, details of existing linkage, if any, Coal Quantity allotted under SHAKTI B(ii),  $GCV_{ARB}$  and their stock at the end of previous month in the format enclosed at Annex-I.
6. Similarly, the successful CPP Bidder would require to submit the month wise information with documentary proof, regarding Energy Charge, coal grade, coal  $GCV_{ARB}$ , opening stock, receipts in the month and closing stock in format enclosed at Annex-II.  $GCV_{ARB}$  need to be calculated for each coal source as per provisions mentioned at Annex-III. Further, weighted

average  $GCV_{ARB}$  for the month can be considered for the same coal source. The successful CPP Bidder also need to submit scheduled energy of the power plant(s) to the Discom(s) against each long term PPA in the format enclosed at Annex-IV. All the data for each month need to be furnished on quarterly basis and certified by the power plant. The month wise information of the completed quarter shall be furnished by 15<sup>th</sup> day of the following month.

7. Further, following information would be obtained every month from Regional Power Committee Secretariats (RPCs)/Regional Load Despatch Centers (RLDCs/State Load Despatch Centers (SLDCs), who are responsible for accounting of energy of the power plant.
  - (a) Actual Generation in the month, in the format enclosed at Annex-V.
  - (b) Ex- bus schedule of the generator to various Discoms, in the format enclosed at Annex-VI.
8. Similarly, information would be sought from each Coal Company regarding month wise quantity and grade of coal supplied to the successful CPP Bidder in a quarter against FSA signed under SHAKTI B(ii) auction as per format enclosed at Annex-VII.

### **C. Methodology:**

9. After receipt of data as mentioned in Section-B, following steps would be carried out:
  - (i) Using Gross Calorific Value ( $GCV_{ARB}$ ) (kcal/kg) of the different coal sources and Station Heat Rate (SHR) (kcal/kwh), specific coal consumption (SCC) (kg/kwh) will be calculated ( $SCC = SHR/GCV$ ).
  - (ii) Total Coal consumption in the quarter (CCQ) will be calculated by adding opening stock of the coal on first day of the quarter and receipt of coal in the quarter, then subtracting closing stock of the coal on last day of the quarter.
  - (iii) Gross Generation (GG) will be calculated by dividing the coal consumption per quarter by the Specific Coal Consumption for each coal source (mine, existing linkage, SHAKTI coal, eauction etc.). ( $GG_i = CCQ_i/SCC_i$ ).
  - (iv) Ex bus scheduled energy to Discoms (SCH) including generation from SHAKTI linkage coal and Actual Generation in million units (MUs) provided by the power plants would be verified from the data provided by the RPCs/RLDCs/SLDCs. In case of mismatch in the data provided by the generator and RPCs, data provided by RPCs/RLDCs/SLDCs would be considered as final.

- (v) Actual generation from each coal source (ACF) will be calculated by apportioning total actual generation (AG) into the ratio of fuel wise gross generation as obtained in step (iii) above (i.e.  $ACF_i = (GG_i / \sum GG_i) \times AG$ ). Actual Generation with SHAKTI Coal (ACSh) will be sum of ACF from different sources of coal under SHAKTI B(ii).
- (vi) Actual Generation with SHAKTI Coal (ACSh) will be compared with the scheduled export to Discoms (SCE). The difference between SCE and ACSh will be termed as Deviation  $D = SCE - ACSh$ .
- (vii) Percentage deviation will be calculated by dividing it by SCE and multiplying by 100. For compliance of the Guidelines, the value of D should not be negative.
- (viii) At the same time, the Station Heat Rate, the Gross Calorific Value (GCV) and the Energy Charge Rate (ECR) of the plant will also be monitored for coherence among the three as higher Station Heat Rate and a lower GCV will lead to higher ECR and the plant will not qualify in the Merit Order Despatch.

**D. Treatment of deviations:**

10. Deviations calculated at para 9(vii) will be treated as follows:

- (a) Considering errors in measurements/ normative values of various parameters etc., the deviation percentage in the range of  $\pm 2\%$  will not be treated as violation. However, the permissible deviation limit shall be reviewed after one year.
- (b) If the D is negative i.e. the power plant has utilized more SHAKTI coal in the quarter against scheduled energy under eligible PPA indicating diversion of SHAKTI Coal, then as a one-time measure, power plant will have to compensate the same amount of deviation coal by the end of next quarter.
- (c) However, in case of the non-compliance of the use of SHAKTI coal next time, the FSA of the successful CPP bidder shall be terminated and the CPP bidder will not be allowed to participate in any linkage auction scheme.

**Information to be furnished by the successful CPP Bidder to CEA**

- (A) Name of the Power Plant:
- (B) Installed Capacity (Unit wise) (IC):
- (C) Long Term PPA Capacity:
- (D) Name of the Discom(s):
- (E) Normative Auxiliary Consumption (AUX %):
- (F) Station Heat Rate (kcal/kwh) (SHR):
- (G) Fuel information at the end of recent month:

<b>S. No.</b>	<b>Fuel</b>	<b>Grade</b>	<b>Gross Calorific Value (GCV<sub>ARB</sub>) (kCal/kg)</b>	<b>Closing stock as on last day of the month (MT)</b>
1.	Existing Linkage			
2.	Linkage under SHAKTI B(ii)			
3.	Captive Mine			
4.	Any other.....			

**Quarterly information to be furnished by the successful CPP Bidder to CEA for the power plant using coal under SHAKTI B(ii)**

- (A) Quarter:
- (B) Installed Capacity (Unit wise) (in MW):
- (C) Normative Auxiliary Consumption (AUX %):
- (D) Station Heat Rate (kcal/kwh) (SHR):
- (E) Total generation schedule in the month (MUs) (SCH):
- (F) Ex-bus Actual generation in the month (MUs) (AG):
- (G) Fuel information:
- (H) Month wise Energy Charge Rate (ECR) of the plant:

S. No.	Fuel	Grade	Gross Calorific Value (GCV <sub>ARB</sub> ) (kCal/kg)	Opening Stock as on 1 <sup>st</sup> day of the month (MT)	Receipt in the month (MT)	Closing stock as on last day of the month (MT)	Specific Coal Consumption (SCC) (kg/kwh)
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Month-1:.....							
1.	Existing Linkage						
2.	SHAKTI B(ii) Linkage						
3.	Captive Coal Mine						
Month-2:.....							
1.	Existing Linkage						
2.	SHAKTI B(ii) Linkage						
3.	Captive Coal Mine						
Month-3:.....							
1.	Existing Linkage						
2.	SHAKTI B(ii) Linkage						
3.	Captive Coal Mine						

**Note:**

- 1.Relevant documents as proof of the figures in column (d) to (g) need to be furnished by the participating entity duly certified by the power plant.

**Provisions for calculation of GCV<sub>ARB</sub>**

1. The GCV of domestic coal at loading end (mine end) is determined on equilibrated basis (60% RH and 40° C). Therefore, the actual GCV received & fired in boiler (GCV<sub>ARB</sub>) is different than the equilibrated GCV (GCV<sub>EM</sub>) determined at the loading point. Hence, the GCV of coal may be considered after allowing an adjustment for total moisture as per the formula given as under:

$$GCV_{ARB} = [GCV_{EM} \times (100 - TM)] / (100 - EM)$$

Where:

GCV<sub>ARB</sub> = Gross Calorific Value of coal after moisture correction (kcal/kg),

GCV<sub>EM</sub> = Gross Calorific Value of coal on Equilibrated basis (60% RH & 40° C) (kcal/kg),

TM = Total moisture (in%),

EM = Equilibrated moisture (in%).

2. Further, in accordance with the provisions of Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019, the Transit and Handling loss of coal for pithead thermal power station as 0.2 % of the coal quantity and that of non-pit head station as 0.8 % of the coal quantity can be considered. However, these losses are pertaining to the quantity of the coal and does not have any impact on the GCV of the coal.
3. GCV of the coal is decreased over a period as a result of the storage in the coal yard. Consequently, CERC Tariff Regulation 2019 has stipulated that GCV of the coal as received in kCal/kg is reduced by 85 Kcal/Kg on account of variation during storage at generating station.

Accordingly, GCV<sub>ARB</sub> calculated at point (1) above may be adjusted in line with above referred provisions of CERC regulation.

**Ex bus Scheduled energy of the power plant to be submitted by the successful CPP Bidder for each month:**

**Quarter.....**

<b>Buyer</b>	<b>Energy Scheduled in Month-1 (MU)</b>	<b>Energy Scheduled in Month-2 (MU)</b>	<b>Energy Scheduled in Month-3 (MU)</b>
<b>(a)</b>	<b>(c)</b>		
Discom 1			
Discom 2			
Discom 3			
.			
.			
<b>Total Scheduled Energy (SCH)</b>			

Note: The information need to be furnished by the successful CPP Bidder duly certified by the power plant.



**Annex-V**

**Data of Actual Generation of a power plant to be provided by RPCs/RLDCs/SLDCs responsible for accounting of energy**

Month:

Name of the Power Plant:

Actual Generation in the month (in MWh):

Date	Time Blocks									Sum
	1	2	3	4	5	.	.	.	96	
1.										
2.										
3.										
.										
.										
.										
.										
Last day of the month										

**Annex-VI**

**Data of Scheduled Generation of a power plant to be provided by RPCs/RLDCs/SLDCs responsible for accounting of energy**

Month:

Name of the power plant:

Ex bus scheduled energy of the power plant:

Date	Buyer	Time Blocks									Sum
		1	2	3	4	5	.	.	.	96	
1.	Discom 1										
1.	Discom 2										
1.	Discom N										
.											
.											
.											
.											
Last day of the month	Discom 1										
	Discom 2										
	Discom N										

**Details of SHAKTI Coal Supplied by the Coal Company in the Quarter.....**

Details of Coal Allocation

1. Name of Specified End Use Plant:
2. Capacity of EUP:
3. Name of the Coal Company:
4. FSA Signing Date:
5. Source of Coal Allocation:
6. Mode of Coal Supply:
7. Source Grade:
8. Quantity Allocated under FSA:
9. Quantity ear marked for the quarter:

Details of Coal Supply in Quarter.....

<b>S. No</b>	<b>Month</b>	<b>Name of the Coal Mine</b>	<b>Coal Grade</b>	<b>Month wise Quantity earmarked (000' Ton)</b>	<b>Quantity Lifted/ Supplied in the month (000' ton)</b>
1.	Month-1				
2.	Month-2				
3.	Month-3				
Total					