



# **MADHYA PRADESH ELECTRICITY REGULATORY COMMISSION**

**'Urja Bhawan, Shivaji Nagar, Bhopal-462 016**

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## **ORDER**

**Dated : 29<sup>th</sup> November 2002**

**Petition No. 99/2002**

**IN THE MATTER OF  
PETITION FILED BY M.P.STATE ELECTICITY BOARD  
FOR DETERMINATION OF VARIABLE COST  
ADJUSTMENT (VCA) CHARGES  
AND  
APPROVAL OF FORMULA FOR COMPUTATION OF VCA.**

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Dated : 29<sup>th</sup> November 2002.

Madhya Pradesh State Electricity Board, - Petitioner  
Shakti Bhawan, Vidyut Nagar,  
Jabalpur – 482008

Vs

State of Madhya Pradesh, - Respondent  
Energy Department,  
Bhopal

and

All HT and LT Consumers of the State - Respondent.

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Shri. P.K. Mehrotra  
Chairman

Shri Syed Iqbal Husain  
Member (Power)

**ORDER**

Dated : 29th November 2002.

The Madhya Pradesh Electricity Regulatory Commission in exercise of the powers vested under Section 62 of Madhya Pradesh Electricity Regulatory Commission (Conduct and Business) Regulations 1999 read with Sections 9 and 26 of Madhya Pradesh Vidyut Sudhar Adhiniyam-2000, has vide order dated 26/09/2001 in the petition No. 4/2001, determined the tariff for supply of electricity to various category of consumers after considering the proposal submitted by MPSEB. In this order it was directed to the Board to bring up the formula on FCA Charges based on scientific principles before filing next tariff petition. The present petition has been filed by MPSEB in compliance with these directions.

## 2. **Background :**

In Madhya Pradesh, bulk of the power is produced from thermal power stations where coal is used as primary fuel and constitutes major component of cost of generation. A change in the cost of coal causes additional expenditure on the utility. The cost of fuel is subjected to unforeseen variation and for recovering additional cost on account of variation subsequent to last tariff revision a separate levy termed as 'Fuel Cost Adjustment (FCA)' was being recovered by the Board.

- 2.1 Till the year 1992, Board's tariff was based on the basic cost of 140 paisa for 1 Lakh kilo calories of heat value of the fuel delivered to the generating stations. For levy of FCA a variation factor of 0.065 paisa per unit was fixed by the Board for each 1% variation in the basic cost of fuel for one Lakh kilo calories. This variation factor was based on certain assumptions of thermal efficiency, transformation losses, T&D loss, Auxiliary consumption and other losses.
- 2.2 In the year 1992, the basic cost of fuel was 1430 paisa per lakh kilo calories and based on the aforesaid variation factor, FCA was worked out as 64 paisa per unit. Out of this, 60 paisa was merged in the tariff and remaining 4 paisa was left to be recovered in the form of FCA charges. With merging of fuel cost in the tariff and based on similar assumption, the new variation factor was worked out as 0.665 paisa per unit, which means for 1% variation in the basic cost of fuel over and above 1430 paise per lakh k.cal., FCA is to be increased or decreased by 0.665 paisa per unit.
- 2.3 In June 1999, cost of fuel for 1 lakh kilo calories was taken as 3077.01 paisa, which was almost 2.15 times higher than the basic fuel cost of 1430 paisa or in other words the rise was 115.17 percent over the basic fuel cost. By applying variation factor of 0.665 paisa per unit, the FCA was

worked out as 76.59 paisa per unit, which was continue until issue of tariff order dated 26.09.2001 by the Commission.

- 2.4 The FCA was being recovered from selected categories of consumers only by the Board based on the aforementioned variation factor. In the Tariff Order issued by the Board in March 1999 the scope for levy of FCA charges was extended to additional categories (domestic and power loom) and *on* adhoc basis FCA of 65 paisa per unit was levied on these categories.
- 2.5 It was observed by the Commission that the assumptions made by the Board for working out the variation factor of 0.065 paisa per unit particularly the efficiency of the generating units which was reportedly taken as 21.5% was very much on lower side compared to thermal efficiency of boilers using pulverized coal as fuel which are presently in use . Therefore, proposal for revision of FCA charges after June 1999 was not admitted by the Commission and the Board continued to levy the FCA charges applicable as in June, 1999. In the Tariff Order issued by the Commission in September 2001, the Board was directed to submit revised FCA formula based on scientific principles taking into consideration the improved efficiencies of the modern boilers.
- 2.6 In the tariff order dt. 26.9.2001 issued by the Commission, although the cost of fuel prevailing at the time of making tariff proposal by MPSEB had been included while making out the expenditure, which means that prevailing FCA charges automatically get merged in the tariff, but the tariff was segregated in two parts (one part shown as FCA), due to implication of electricity duty.

### **3. SUBMISSION OF PETITION AND TECHNICAL VALIDATION**

- 3.1 In compliance to the Tariff Order 2001-02, the Board filed a petition in April 2002. On receipt of the petition the Commission held a meeting on

28/06/2002 with the Board. In this meeting following issues were discussed in detail:

- i) Technical issues – Such as fuel cost, fuel efficiency, fuel composition, transit and storage losses, power purchase cost etc.
- ii) Accounting issues – Such as validation and authentication of accounting data through audits etc.,
- iii) Conceptual issues - Such as enlargement of scope of FCA, and
- iv) Proposal to recover additional FCA charges for the period from April 2001 to September 2001.

#### **4. SALIENT FEATURES OF THE PRESENT PETITION OF MPSEB**

In place of Fuel Cost Adjustment, the Board submitted proposal for variable cost adjustment to cover fluctuations in the elements of cost like fuel, power purchase, etc. between two tariff revisions, which other-wise have to wait till the next tariff revision. It was also stated by the Board, that the earlier FCA formula was not easily understandable by a common person, and also did not include the element of cost of power purchases and therefore there was a need for enlargement of scope.

- 4.1 The elements to be included in the VCA formula as proposed by the Board were increase in (a) Cost of fuel (b) Cost of power purchase (c) Cost of water (d) Taxes, duties, levies and others. The difference between the expenditure actually incurred and the expenditure approved in the tariff order was proposed to be passed on in full to the consumers as VCA charge.
- 4.2 VCA was proposed to be levied twice in a year; once in December and then in June. The proposal for fixation of the charges to be levied was to be submitted one month in advance based on the expenditure actually incurred.
- 4.3 VCA was proposed to be levied at uniform rate on all consumers except, Border villages and Crematoria.

- 4.4 The energy sold to be considered for the purpose of this levy was to be:
1. Metered sale of energy
  2. Assessed un-metered energy sale.
  3. Deemed sale of energy on account of excess T&D losses over the limit approved by the Commission.
- 4.5 The VCA rate was proposed to be calculated as under :-

$$\text{VCA Recovery Rate} = \frac{\text{Amount of VCA Recoverable (V)}}{\text{Energy sales}}$$

- 4.6 The amount of VCA (**V**) recoverable was proposed to be computed as under :

$$\mathbf{V} = \mathbf{V_f + V_p + V_z + V_v}$$

Where :

- V** : Amount of variable charge to be recovered.
- V<sub>f</sub>** : Amount of variable charge on account of fuel cost of own generation
- V<sub>p</sub>** : Amount of variable charge on account of changes in the cost of power purchased.
- V<sub>z</sub>** : Amount of variable charge on account of changes in the cost of unknown factors.
- V<sub>v</sub>** : Adjustment amount on account of previous VCA.

- 4.7 The amount of variable charge on account of fuel cost of own generation was proposed to be determined by the following formula :

$$\mathbf{V_f} = (\text{Actual Rate of Coal} \times \text{Quantity consumed} - \text{Approved Rate of Coal} \times \text{Approved Quantity})$$

+

(Actual Rate of Oil x Quantity consumed - Approved Rate of oil x  
Approved Quantity)

4.8 The unknown factors proposed by the Board to be considered for the purpose of VCA recovery are as hereunder:

- i) Change in the rate of levy of water charges,
- ii) Change in Tax structure
- iii) Major accidents, etc.

4.9 The total amount recoverable by way of VCA as per the formula proposed by the Board is indicated as Rs.60.52 crores and the projected sale for the period January to June 2002 has been indicated as 7617.46 MU. VCA is proposed to be levied on 96 percentage of projected sales. Accordingly VCA to be recovered has been calculated and indicated as 8.29 paisa per unit.

4.10 The amount of VCA to be passed-on to consumers due to increase in the power purchase cost can be determined by the following formula:

$$V_p = \text{Total Power Purchased (MU)} \times [P1 - P0] \div 1000$$

Where P1 & P0 are Approved and Actual Rate of Power purchase (Paise/Unit)

4.11 Collection efficiency and the number of units from which VCA is recoverable was proposed as 96% of the projected sales of the respective categories.

## **5. PUBLIC HEARING PROCESS.**

The petition was notified to the general public on 30.09.2002/ 01.10.2002 and objections/rejoinders were invited in a period of 18 days. Copies of the petitions were made available to the public. The petition was also placed on the website of the Commission.

5.1 Objections were received from 21 parties. List of these parties is at Annexure-II. Major objections are summarized as follows:

- (i) Fuel Cost Adjustment and not Variable Cost Adjustments be permitted.
- (ii) Except for increase in price, all other parameters should remain the same as approved by the Commission in last tariff order.
- (iii) Units sold considering approved T&D losses be considered for application of VCA.
- (iv) FCA be waived off for Water Supply Schemes.
- (v) The operation of FCA be allowed only once a year and the figures will be certified by Chartered Accountant before obtaining approval of the Commission.

5.2 A public hearing on the petition was held on 13/10/2002. The salient points mentioned by the participant in the public hearing are as follows.

- (i) It was expressed by the respondents that the formula for VCA has to be limited to elements of Fuel Cost unless otherwise expressly permitted to be revised by the Commission in the order to determine the tariff, as per section 26(8) of Vidyut Sudhar Adhiniyam 2000.

- (ii) The benchmarks fixed by the Commission in respect of fuel efficiencies, T&D losses etc. have to be retained while working out VCA/FCA and no changes thereof be permitted.
- (iii) FCA revision be once a year and should be final and no adjustments be carried forward.
- (iv) The FCA shall not be merged with tariff as it causes extra electricity duty burden on the consumer. The power loom consumers are charged subsidized FCA and this subsidization may be continued.
- (v) While working out specific consumption of Coal from the values of stations heat rate, the heat value of oil should be reduced.
- (vi) It was felt that FCA can be allowed if the price rise is above a certain percentage level. Normally contingency provisions are available in estimates for expenditure and to this extent FCA may not be allowed.
- (vii) The water charges, tax changes and accidents to plants should not be allowed in VCA. Insurance can take care of the same.
- (viii) The FCA allowed should be prospective and not retrospective.
- (ix) Long term contract be negotiated for supply of coal and oil to avoid necessity of VCA/FCA.
- (x) In case of Power purchase as costly power is purchased at the instance of the State Government, the extra charges should be borne by State Government.
- (xi) In case of power purchase and non payment of consequent bills, penal charges if any may not be passed on to consumer. Similarly, all changes have to be approved by the Commission.
- (xii) The industries feel that for their financial planning, stable tariff for an entire year is necessary. Therefore additional recovery in the form of FCA in the interim period should not be permitted.

## **6. OBSERVATIONS OF THE COMMISSION**

The Commission observed that widening the scope of FCA to VCA is legally permissible. The Commission also noted that the provisions of Section 26 (8)

of Vidyut Sudhar Adhinyam 2000 provides for revision of charges expressly permitted to be revised including any fuel surcharge formula as may be specified by the Commission.

The Commission is of the view that the VCA is really intended to recover the un-foreseen increase in cost between two successive tariff revisions.

- 6.1 The Commission is of the view that additional expenditure on account of items like fuel, power purchase, water charges, taxes and such unforeseen expenses necessary but not provided in the Tariff Order should only be allowed to recover through the VCA. The VCA is intended to take care of liquidity problems on account of additional expenditure incurred over and above the expenses approved at the time of tariff determination subject to such additional expenses limited to the extent admissible as per approved efficiency norms.
- 6.2 The formula proposed by the Board allows all the additional expenditure incurred by the Board on account of fuel etc. to be passed on to the consumers through VCA. This is not agreeable to the Commission. Actual expenditure should be limited to what is admissible as per the efficiency norms approved by the Commission. On whatsoever account the Board is unable to achieve targeted heat rate and other parameters fixed, the loss should be to their own account and not to the consumers' account. The proposed recovery of 8.29 paise per unit as additional VCA charges is, therefore, not admissible. Any change in the efficiency factor could only be permitted through Tariff Revision Petition, which the Board subsequently submitted.
- 6.3 Reduction of T&D loss is one of the most important performance parameters set by the Commission in the Tariff Order. The Commission is of the view that the mention of T&D loss component has to be made in the VCA formula. In case the Board does not achieve the reduction target of T&D loss, the

VCA recoverable should be reduced corresponding to the excess T&D loss i.e. if the actual losses were more than the losses allowed by the Commission in tariff order, the excess losses would be to the Board's account and VCA would not be levied on the same.

- 6.4 The incremental expenditure recoverable through VCA but not recovered shall be considered for recovery in the next tariff revision. The element of adjustment amount on account of previous VCA ( $V_V$ ) in the formula proposed by the Board is, therefore, not necessary, for the present.
- 6.5 The collection efficiency factor proposed by the Board in the VCA formula is not admissible as it has already been allowed in the last Tariff Order.

## 7. **COMMISSION'S ORDER**

In view of the above and taking into consideration all other relevant aspects and circumstances of this case, the Commission hereby passes the following order :

- 7.1 The formula for determination of Variable (Fuel & other) Cost Adjustment (VCA) charges as per Annexure-I is hereby approved subject to the conditions given below :-
- i) The approved formula is subject to review as the Commission may deem fit.
  - ii) Under the head  $V_Z$  the following charges only shall be permitted for recovery :
    - a) Change in the rate of levy of water charges,
    - b) Change in Tax structure, and
    - c) Any other unpredictable and unforeseen cost not envisaged at the time of tariff fixation.

- iii) Any such cost incurred by the Board by way of penalty, interest due to delayed payments etc. and due to their operational inefficiencies shall not be allowed.
- iv) The Basic nature of VCA formula shall be 'Adjustment' i.e. passing on the increase and the decrease as the case may be.
- v) ( $V_{PP}$ ) : Incremental cost of power purchase due to deviations in respect of tariff mix, power purchase at higher rate etc. shall be allowed only if it is justified to the satisfaction of the Commission.
- vi) The benchmark fixed by the Commission in the last Tariff Order shall be the basis for calculation of VCA charges. No change in the benchmark shall be permitted.
- vii) VCA charges will be levied on all categories of consumers except crematorium and border villages.
- viii) The levy of VCA charges shall be considered only after six months from the date of Tariff Order, which shall continue till the next tariff revision.
- ix) The adjustment amount on account previous VCA ( $V_V$ ), if any, shall be considered for admissibility during the next tariff revision.
- x) The data in support of the VCA claim shall be duly authenticated by a chartered accountant.

**Syed Iqbal Husain**  
**Member (P)**

**P.K. Mehrotra**  
**Chairman**

**VCA FORMULA**

(I) The amount of variable cost adjustment shall be computed as under

$$V = V_f + V_{pp} + V_z$$

Where,

- V** = Amount of variable charge in a specified period in Rs.  
**V<sub>F</sub>** = Amount of differential cost on account of fuels on own generation (Rs)  
**V<sub>PP</sub>** = Amount of differential cost on account of Power purchase (Rs.)  
**V<sub>Z</sub>** = Amount of variable charges on a account of unknown & unpredictable factors.

(II) **The VCA rate shall be calculated as,**

**V (Rs)**

$$\text{VCA Recovery Rate} = \frac{\text{V (Rs)}}{\text{Energy sales (KWH)}} \times 100$$

**(Paise/kWh)**

Where Energy sales consist of,

- (a) Metered sale of Energy.... (ES<sub>1</sub>)  
 (b) Assessment of unmetered sale .... (ES<sub>2</sub>)  
 (c) Deemed sale of Energy on account of excess T&D losses ...(ES<sub>3</sub>)  
 Less (d) Energy sale to the Exempted categories of consumers..(ES<sub>4</sub>)

The deemed sale of energy is equal to actual T&D losses minus losses allowed by the Commission. In case the figure is negative, the same may be ignored.

The recovery formula shall be as under:

$$\text{VCA Recovery Rate} = \frac{Q_C (R_{C2} - R_{C1}) + Q_0 (R_{02} - R_{01}) + Q_{PP} (R_{PP2} - R_{PP1}) + V_Z}{ES_1 + ES_2 + ES_3 - ES_4} \times 100$$

**(Paise/k WH)**

Qc = Quantity of coal consumed during the period in MT.

$$= \frac{SHRO}{NCV_0} \times \text{Generation (in MU)} \times (1 + L_0) \times 10^3$$

Qo = Quantity of oil consumed during the period in KL

= Generation (in MU) x specific oil consumption (ml/kWh) as approved by the Commission

[Qc and Qo will have to be calculated station wise & totaled.]

QPP = Quantity of power purchased during the period in kWh (Justifying the quantity purchased and mix of supply from various source other than fixed by the Commission). Quantity purchased due to reduction in self-generation will not be allowed. QPP will have to be worked out for each source of supply.

SHRO = Station heat rate as approved by the Commission in kcal./kWh.

NCV<sub>0</sub> = Approved calorific value of coal fired in kcal/kg.

L<sub>0</sub> = Transit & storage losses of coal as approved by the Commission.

RC<sub>1</sub> = Average rate of coal Ex. Power station coal yard as approved by the Commission for the period in Rs. / MT.

RC<sub>2</sub>\* = Average rate of coal Supplied Ex. Power station coal yard as per actual for the period in Rs. / MT.

RO<sub>1</sub> = Average rate of oil Ex. Power Station approved by the Commission for that period in Rs./K.L.

RO<sub>2</sub> = Average rate of oil actually supplied Ex. Power station during the period in Rs./ K.L.

RPP<sub>1</sub> = Average rate of power purchase as approved by the Commission in Rs./kWh.

RPP<sub>2</sub> = Average rate of power purchase during the period in Rs./kWh.

\* If the grade of coal supplied is inferior or superior to the grade considered in the last tariff order, then average rate of coal supplied (RC<sub>2</sub>) will be corresponding to the grade of coal considered by the Commission in the last tariff order.

## **Annexure – II**

<b>S.No.</b>	<b>Date of Receipt</b>	<b>Name of Party</b>	<b>Location</b>	<b>Category</b>
1	17.10.02	M.P. Cement Manufacturers Association O.P. Dokania	Satna	Association
2	17.10.02	M.P. Electricity Consumer Society – Gautam Kothari- Hon'ble Secy.	Indore	NGO
3	18.10.02	Fuel Consultants	Indore	Industrial
4	18.10.02	Association of Industries of M.P	Indore	Association
5	18.10.02	The Gwalior ICE Factory & Consumer	Gwalior	Industrial
6	18.10.02	The ICE Machinery Mart & Consumer	Gwalior	Industrial
7	18.10.02	M.P. Chambers of Commerce and Industry	Gwalior	Association
8	18.10.02	Ramchandra Jain- Consultant	Gwalior	Others
9	18.10.02	Gwalior Industries Association - Secy, Khalid Rehman	Gwalior	Association
10	18.10.02	Malanpur Industries Association – Rakesh Soni, President	Gwalior	Association
11	18.10.02	HEG Limited	Bhopal	Industrial
12	18.10.02	Federation of M.P. Chambers of Commerce and Industry	Bhopal	Association
13	18.10.02	The Malwa Pauer loom Weavers Association	Dewas	Association
14	18.10.02	Indore Power loom Cloth Manufacturers Association	Indore	Association
15	18.10.02	Association of Industries of M.P.	Dewas	Association
16	18.10.02	The Madhya Pradesh Textile Mills Association	Indore	Association
17	18.10.02	All India Manufacturers Organization, M.P. State	Indore	Association
18	18.10.02	National Centre for Human Settlements and Environment	Bhopal	NGO
19	19.10.02	Malanpur Industries Association J.K. Industries Ltd.	Bhind	Association
20	19.10.02	Vidyut Upphokta Congress	Indore	Association
21	18.10.02	Akhil Bhartiya Upphokta Congress	Bhopal	NGO