

## EXPLANATION (GENERAL) – REVISED IN OCTOBER 2006

The Ministry of Power (MOP), vide its Notification dated, 19.01.2005, issued *Guidelines for Determination of Tariff by Bidding Process for Procurement of Power by Distribution Licensees*. These guidelines have been amended dated 30.3.2006 and 18.8.2006. **These guidelines provide that the CERC shall notify and update the Escalation Rate for Coal and Gas, Inflation Rate based on WPI and CPI, Discount Rate and Exchange Variation Rate, for the purpose of bid evaluation as well as for payment.** The relevant provisions of the MOP guidelines read as under:

Clause 4.11 of guidelines provides as follows:

*“ 4.11 Where applicable, the energy charges payable during the operation of the contract shall be related on the base energy charges specified in the bid with suitable provision for escalation. In case the bidder provides firm energy charge rates for each of the years of the contract term, the same shall be permitted in the tariffs.*

*(i) In cases other than the cases where captive fuel source is offered or cases where the procurer mandates use of imported fuels in case 2 queries, the energy charges shall be payable in accordance with fuel escalation index used for evaluation of the bid. In case of bids based on net heat rate, the price of fuel shall be taken as stipulated under para 4.2. However, the fuel escalation will be subject to any administered price mechanism of Government or independent regulatory price fixation in case of fuel produced within the country. The applicable indices for relevant fuels shall be identified in the RFP documents.*

*(ii) The energy charges may feature separate non-escalable (fixed) and escalable (indexed) components in case of a procurement query where the procurer offers a captive fuel source (such as a captive coal mine) for concurrent development and production of power. The ratio of minimum and maximum energy charges (including both the non-escalable component and escalable component incorporating escalation as per index being used for evaluation) over the term of PPA shall not be less than 0.5 to avoid excessive frontloading or backloading. The index for escalable component of energy charge in such a case would be as notified by the CERC under para 5.6(vi).*

*(iii) In cases where the procurer mandates use of imported fuel for use in a coastal power station in case-2 procurement query, the bids may be invited for base energy charge for the first year to be escalated as per the indices identified in the RFP. Such energy charge would have following three components:*

*a) Imported fuel component in US Dollars/unit.*

*b) Transportation of fuel component in US Dollars/unit.*

*c) Inland fuel handling component in Indian Rupees/unit*

*Each of these components may have separate non-escalable (fixed) and escalable (indexed) sub-components. The escalation indices for escalable sub-components of these three components would be as notified by the CERC under para 5.6(vi).*

*It is clarified that the bidders would have option to quote firm energy charge rates for each of the years of the contract.”*

**Sub-clause (iv) of clause 5.6 is as follows:**

*“The bids shall be evaluated for the composite levelled tariffs combining the capacity and energy components of the tariff quoted by the bidder. In case of assorted enquiry for procurement of base load, peak load and seasonal power, the bid evaluation for each type of requirement shall be carried out separately. The capacity component of tariffs may feature separate non-escalable (fixed) and escalable (indexed) components. The index to be adopted for escalation of the escalable component shall be specified in the RFP.*

*For the purpose of bid evaluation in cases other than where a captive fuel source is offered, median escalation rate of the relevant fuel index (as identified in the RFP) in the international market or domestic market for the last 30 years for coal and 15 years for gas/LNG (as per CERC’s notification in (vi) below) shall be used for escalating the energy charge (or the derived energy charge in cases referred to in para 4.2) quoted by the bidder. If data of 30/15 years are not available, the same shall be taken for maximum number of available years. The provisions of para 4.11 (iii) would also apply to evaluation of bids in cases where procurer mandates use of imported fuel for coastal power stations. However, in cases where the bidder quotes firm energy charges for each of the years of proposed supply, the energy charges proposed by the bidder shall be adopted for bid evaluation.*

*Where the procurer offers a captive fuel source (such as a captive coal mine) for concurrent development and production of power, the provisions of para 4.11 (ii) would apply.*

*The rate for discounting the combination of fixed and variable charges for computing the levellised tariff shall be as notified by CERC keeping in view prevailing rate for 10 year Government of India securities. This rate is to be specified in the RFP.”*

2. The clause 5.6(vi) of the guidelines provide for following escalation rates to be notified by CERC every six months separately for the purpose of bid evaluation and payment:

- (i) Escalation rate for domestic coal. (Separately for evaluation and payment)
- (ii) Escalation rate for domestic gas. (Separately for evaluation and payment)
- (iii) Escalation rates for different escalable sub-components of energy charge for plants based on imported coal. (Separately for evaluation and payment)
- (iv) Escalation rate for different escalable sub-components of energy charge for plants based on imported gas. (Separately for evaluation and payment)
- (v) Inflation rate to be applied to indexed capacity charge component.
- (vi) Inflation rate to be applied to indexed energy charge component in cases of captive fuel source.
- (vii) Discount rate to be used for bid evaluation.
- (viii) Dollar-Rupee exchange variation rate. (For the purpose of evaluation)

3. The Commission had published the draft escalation rates on 29.9.2006 on its website seeking comments/suggestions of the stakeholders including state regulatory commissions in respect of the above rates excluding (i), (ii) & (iv). In response, comments from the following have been received.

<b>S.No</b>	<b>Name of the Entity/Stakeholder</b>
1	The Tata Power Company Ltd
2	Reliance Energy Ltd
3	DSP Merrill Lynch
4	CLP Power India
5	Bangalore Chamber of Industry & Commerce
6	L&T
7	Integrated Coal mining Ltd
8	Lanco Group Ltd
9	AES India
10	Gujarat Electricity Regulatory Commission

4. The stakeholders have not made any comments on the proposal of the Commission in respect of Inflation rate to be applied to indexed capacity charge component, Discount Rate, and Dollar-Rupee exchange variation rate and appears to be comfortable with the rates proposed.

The explanation and methodology for arriving at various rates for the purpose of bid evaluation and payment is given below.

**5. Discount rate to be used for bid evaluation**

Keeping in view the 10 year GOI securities rate for the latest year 2005-06 (7.16%) and the market expectation, it is proposed to notify the Discount Rate of 10.60% for the purpose of bid evaluation.

**6. Inflation rate to be applied to indexed capacity charge component**

**6.1 General Methodology:** As notified earlier, the index for bid evaluation and payment purpose shall be a hybrid index comprising of the Wholesale Price Index (WPI) and the Consumer Price Index (CPI) as follows:

$$0.6 * \text{Inflation based on WPI} + 0.4 * \text{Inflation based on CPI}$$

**6.2 Inflation Rate for Bid Evaluation:**

**6.2.1** The escalation factors are to be based on previous twelve years calendar year data and shall be updated once a year, with data relating to the previous calendar year. Accordingly, rates would be revised in the first week of April every year. However the first publication is being made in October, 2006.

**6.2.2** A mean approach has been applied on the data series. Further, to smoothen out the data series, the annual escalation factors have been calculated on data points obtained using a three year moving average on the annual calendar year data.

**6.2.3** The inflation rate for bid evaluation for the current announcement has been calculated based on the data for the calendar years from 1994 to 2005 (both inclusive). The computation can be seen in the following tables.

Component Index	Data Series	Mean Escalation Rate	Weight	Contribution to index
WPI	12 years (Jan 1994 to Dec 2005)	4.96%	0.6	2.98%
CPI	12 years (Jan 1994 to Dec 2005)	5.98%	0.4	2.39%
<b>Proposed Inflation Rate for Bid Evaluation</b>				<b>5.37%*</b>

Wholesale Price Index (Base 93-94)			
Year	Value	3 yr Avg	Escalation
1994	111.2		
1995	120.2		
1996	125.6	119.0	
1997	131.3	125.7	5.63%
1998	138.9	131.9	4.96%
1999	143.8	138.0	4.60%
2000	152.8	145.2	5.19%
2001	160.7	152.4	5.01%
2002	164.7	159.4	4.57%
2003	173.4	166.3	4.31%
2004	184.9	174.3	4.85%
2005	193.7	184.0	5.54%
		<b>Mean</b>	<b>4.96%</b>

Consumer Price Index for Industrial Worker (Base 01-02)			
Year	Value	3 yr Avg	Escalation
1994	60		
1995	66		
1996	72	66.1	
1997	77	71.8	8.70%
1998	87	79.0	9.90%
1999	92	85.4	8.22%
2000	95	91.4	7.01%
2001	99	95.2	4.14%
2002	103	99.1	4.03%
2003	107	103.0	3.96%
2004	111	107.1	3.95%
2005	116	111.3	3.95%
		<b>Mean</b>	<b>5.98%</b>

### 6.3 Inflation Rate for Payment

6.3.1 It is proposed to publish the annual escalation rate bi-yearly for application in the coming six month period.

Date of Announcement	Application Period
1 <sup>st</sup> Week of April	1 <sup>st</sup> April to 30 <sup>th</sup> September
1 <sup>st</sup> Week of October	1 <sup>st</sup> October to 31 <sup>st</sup> March

6.3.2 The methodology for calculating the annual escalation rate is illustrated in the table below:

<b>Data Set for October 2006 Announcement</b>	<b>Data Set for April 2007 Announcement</b>
Summation of 12 monthly escalation factors calculated from 13 monthly average data points ranging from June 2005 to June 2006	Summation of 12 monthly escalation factors calculated from 13 monthly average data points ranging from Dec 2005 to Dec 2006

6.3.3 Based on the above methodology the inflation rate for the indexed capacity charge for the current period is computed as follows:

<b>Period</b>	<b>WPI</b>	<b>Inflation based on WPI</b>	<b>CPI</b>	<b>Inflation based on CPI</b>
June, 05	193.20		114.25	
July, 05	194.60	0.72	116.20	1.71
August, 05	195.30	0.36	116.63	0.37
September, 05	197.20	0.97	117.06	0.37
October, 05	197.80	0.30	118.36	1.11
November, 05	198.20	0.20	119.44	0.91
December, 05	197.20	-0.50	118.79	-0.54
January, 06	196.30	-0.46	119.00	0.18
February, 06	196.40	0.05	119.00	0.00
March, 06	196.80	0.20	119.00	0.00
April, 06	199.00	1.12	120.00	0.84
May, 06	201.30	1.16	121.00	0.83
June, 06	203.10	0.89	123.00	1.65
<b>1 Year Inflation (July-June)</b>	<b>197.77</b>	<b>5.03</b>		<b>7.43</b>
<b>Annual Inflation Rate (0.60 x InflWPI + 0.40 x InflCPI)</b>				<b>5.99</b>

**6.3.4 Application of inflation rate for payment:** The annual inflation rate applicable for the six month period would be converted to a monthly rate by dividing by 12. It will then be applied on a simple basis (not compounding) for the following sixth month period on the base value for the financial year. This is illustrated in the example given below:

**Example:**

**October Announcement (Financial Year 2006-07)**

Annual Inflation rate: 12%

Monthly Rate = 12% / 12 = 1%

Base Value for the financial year = 100

Starting Base Value for the six month period of the year = 100

Escalated Value for Month N (N=1 to 6) =

$$\begin{aligned} & \text{Starting Base Value} + N * (\text{Base Value for the Financial year} * \text{Monthly Rate}) \\ & = 100 + N * (100 * 1\%) \end{aligned}$$

If the escalation is to be applied from the month of December, then the escalated values for the December, January, February and March will be 101, 102, 103 and 104, respectively. From April onwards a new financial year starts and therefore, the base value for the new financial year shall be 104.

#### **April Announcement (Financial Year 2007-08)**

Yearly rate: 15%

Monthly Rate = 15% / 12 = 1.25%

Base Value for the financial year = 104

Starting Base Value for the six month period of the year = 104

Escalated Value for Month N (N=1 to 6) =

$$\begin{aligned} & \text{Starting Base Value} + N * (\text{Base Value for the Financial year} * \text{Monthly Rate}) \\ & = 104 + N * (104 * 1.25\%) \end{aligned}$$

Thus the escalated values for the following six months, April to September, will be 105.30, 106.60, 107.90, 109.20, 110.50 and 111.80 respectively.

#### **October Announcement (Financial Year 2007-08)**

Yearly rate: 9%

Monthly Rate = 9% / 12 = 0.75%

Base Value for the financial year = 104

Starting Base Value for the six month period of the year = 111.80

Escalated Value for Month N (N=1 to 6) =

$$\begin{aligned} & \text{Starting Base Value} + N * (\text{Base Value for the Financial year} * \text{Monthly Rate}) \\ & = 111.80 + N * (104 * 0.75\%) \end{aligned}$$

Thus the escalated values for the following six months, October to March, will be 112.58, 113.36, 114.14, 114.92, 115.7 and 116.48 respectively.

## 7. Dollar-Rupee exchange variation rate (For the purpose of evaluation)

7.1 The exchange rate of the Indian Rupee vis-à-vis the US Dollar has been taken from the website of the Reserve Bank of India. The data has been taken for the period from the Calendar Year 1998 to 2005 (both inclusive). If we consider the data more than the period mentioned (say 10 years) we are arriving at a very high rate of exchange variation rate and if we consider the data less than the period mentioned (say 3 years) we are arriving at the a negative variation rate.

7.2 A mean approach has been applied on data series. Taking the annual data, 3 year moving average rate has been computed, based on which annual exchange variation rate has been computed. Mean value has been computed based on annual exchange variation rate. The computation can be seen in the following table.

Year	Rupees per unit of US Dollar	3 years moving average rate	Exchange Variation rate
1998	41.2677		
1999	43.0508		
2000	44.9398	43.0861	
2001	47.1857	45.0588	4.58
2002	48.5995	46.9083	4.10
2003	46.5819	47.4557	1.17
2004	45.3165	46.8326	-1.31
2005	44.1000	45.3328	-3.20
	<b>Mean Value</b>		<b>1.07</b>

Source: RBI, Handbook of Statistics on Indian Economy.

7.3 Accordingly, the mean variation rate of **1.07%** as computed above is proposed for the purpose of bid evaluation.

## 8. Sub-components of energy charges for imported coal based projects and escalable energy charge component of captive coal mine

Explanation regarding escalation rates for various sub-components of energy charges for imported coal based projects and escalable energy charge component of captive coal mine based projects is provided in the revised consultant report.