

Draft Methodology for computing Annual Escalation Rate for Escalable Transmission Charges for Evaluation and Per Annum Inflation Rate for Payment of Escalable Transmission Charges

1. The guidelines on "Tariff based Competitive Bidding for Transmission Service" (as amended up to 10th October, 2008) issued by Ministry of Power, Government of India under section 63 of the Electricity Act 2003, provide that the transmission tariff structure shall have two components – one escalable and the other non-escalable (See para 7 of the guidelines). Following these guidelines, the explanation for applicable escalation rates has been provided in the Standard Request for Proposal (RFP) and Standard Transmission Service Agreement (TSA) documents. While Standard RFP contains explanation about the applicable escalation rate for the evaluation purpose, Standard TSA contains explanation about the applicable escalable rate for payment purpose.

2. Clause 3.3.1.3 (a) in the Standard RFP document states the following:

"For the purpose of comparison of the Financial Bids, the Quoted Escalable Transmission Charges of each bidder shall be uniformly escalated as per the escalation rate mentioned below. However, for the purpose of actual payment of Transmission Charges, such escalation rate shall be applied as per the provisions of the TSA.

S.No.	Head	Value
1	Annual Escalation rate applicable to Quoted Escalable Transmission Charges	This shall be as per the rate notified by the CERC, applicable on the seventh day prior to the Bid Deadline
2	Discount rate for computation of Levelized Transmission Charges	This shall be as per the rate notified by the CERC as applicable for generation projects, applicable on the seventh day prior to the Bid Deadline"

3. Schedule 7 of the Standard TSA states the following:

*".....the value of the Escalation Index shall be computed by applying the per annum **inflation rate specified by CERC** for payment of Escalable Transmission Charges,"*
[emphasis added]

4. In view of the above provisions, the Central Electricity Regulatory Commission (CERC) proposes to notify escalation rate and the inflation rate exclusively in the context

of procurement of transmission services under competitive bidding. A draft methodology for computing annual escalation rate for escalable transmission charges and per annum inflation rate for payment of escalable transmission charges has been developed by CERC. While the detailed methodology for the same is contained in the Annexure, the salient features are discussed in the succeeding paragraphs.

5. Methodology for determining the escalation rate for evaluation purposes

5.1 The escalation rate to be applied to quoted escalable transmission charges has been computed based on the time series data on WPI and (CPI) for the period of past 12 years. Composite series, using 45% weight to WPI and 55% weight to CPI has first been developed, which then has been used for computing the escalation rate. The reason for combining WPI and CPI is that the escalation in costs that the bidders of transmission projects would face is mainly on account of Operation and Maintenance (O&M) expenditure which is represented by WPI (for commodities/consumables/etc.) and CPI for (wages/salaries of personnel).

5.2 The methodology that has been used for computing the escalation rate is the same as is being followed for computing the escalation factors that the CERC is notifying at present under MOP Guidelines for Determination of Tariff by Bidding Process for Procurement of Power by Distribution Licensees, i.e. the method of minimum mean square error, the mathematical formulation of which is as given below:

e: annual escalation rate in percent = $g \times 100$, where:

$$g: \text{escalation factor} = [\exp\{\{(6 \times \sum_{t=2}^n (t-1) \times \ln R_t\} / \{(n-1) \times n \times (2n-1)\}\}] - 1$$

- $R_t = (Y_t / Y_1)$
- $Y_t =$ "t" th observation
- $Y_1 =$ initial observation
- $n =$ number of observations

6. Methodology for determining the inflation rate for payment purposes

6.1 The per annum inflation to be applied to Escalable Transmission Charges for Payment purposes has been computed based on the data on WPI and CPI for the latest twelve months (weekly/monthly). Composite series, based on WPI with 45%

weight and CPI with 55% weight has first been developed, which then has been used for computing the inflation rate. The steps followed while computing the inflation rate are as under.

Step 1: Average index values for the appropriate six months period computed.

Step 2: A half-yearly inflation rate computed based on the average six months index.

Step 3: Annual inflation rate computed by multiplying half-yearly inflation rate by two.

Step 4: The annual inflation rate for parameters that require combining of two or more series in pre-determined proportion has been determined by combining each data point of two or more series in the pre-determined proportion to arrive at a composite new single series and then the annual inflation rate has been determined based on this composite new single series.

ANNEXURE

(1) Methodology for determining the escalation rate for evaluation purposes

The escalation rate to be applied to quoted escalable transmission charges has been computed based on the time series data on WPI and CPI for the past 12 years. The data on WPI and CPI has been taken from the website of Ministry of Commerce & Industry and Labour Bureau, respectively. In the example below, data from 1999 to 2010 has been used. Composite series, using 45% weight to WPI and 55% weight to CPI has first been developed, which then has been used for computing the escalation rate as under:

Composite Series: Average Index for escalable transmission charges					
Year	WPI for All Commodities	CPI for Industrial Workers	Proportion of WPI Component in Total Cost	Proportion of CPI Component in Total Cost	Composite Series
1999	76.79	92	45%	55%	84.92
2000	81.59	95	45%	55%	89.10
2001	85.80	99	45%	55%	92.98
2002	87.92	103	45%	55%	96.27
2003	92.60	107	45%	55%	100.53
2004	98.72	111	45%	55%	105.50
2005	103.37	116	45%	55%	110.19
2006	109.59	123	45%	55%	116.92
2007	114.94	131	45%	55%	123.64
2008	124.92	142	45%	55%	134.13
2009	127.86	157	45%	55%	143.93
2010	140.08	176	45%	55%	159.79

ANNUAL ESCALATION RATE FOR ESCALABLE TRANSMISSION CHARGES FOR EVALUATION						
Year No. (t)	Year	Composite Series	Yt/Y1 =Rt	Ln Rt	Year -1 (t-1)	Product [(t-1) x (Ln Rt)]
1	1999	84.92				
2	2000	89.10	1.05	0.05	1	0.05
3	2001	92.98	1.09	0.09	2	0.18
4	2002	96.27	1.13	0.13	3	0.38
5	2003	100.53	1.18	0.17	4	0.67
6	2004	105.50	1.24	0.22	5	1.08

7	2005	110.19	1.30	0.26	6	1.56
8	2006	116.92	1.38	0.32	7	2.24
9	2007	123.64	1.46	0.38	8	3.00
10	2008	134.13	1.58	0.46	9	4.11
11	2009	143.93	1.69	0.53	10	5.28
12	2010	159.79	1.88	0.63	11	6.95
A = Sum of "product" column						25.51
B= 6 times (6 x A)						153.08
C= (n-1) x n x (2n-1); n = No. of Years of data = 12						3036.00
D = B/C						0.05
g (Exponential Factor) = Exponential (D) -1						0.05
e = Annual Escalation Rate (%) = g x 100						5.17

The annual escalation rate computed in the above table (5.17%) has been notified as escalation rate for escalable transmission charges for evaluation.

(2) Methodology for determining the per annum inflation rate for escalable transmission charges for payment purposes

The per annum inflation rate for Escalable Transmission Charges for Payment has been computed based on the data on WPI and CPI for industrial workers by taking the data for the period from July 2010 to June 2011. The data on WPI and CPI has been taken from the website of Ministry of Commerce & Industry and Labour Bureau, respectively. Composite series, based on WPI with 45% weight and CPI with 55% weight has first been developed, which then has been used for computing the inflation rate. The inflation rate has been computed as under:

ANNUAL INFLATION RATE FOR ESCALABLE TRANSMISSION CHARGES FOR PAYMENT			
Period	WPI	CPI	Composite Series
Jul-10	141	178	161.35
Aug-10	141.1	178	161.40
Sep-10	142	179	162.35
Oct-10	142.9	181	163.86
Nov-10	143.8	182	164.81
Dec-10	146	185	167.45
Jan-11	148	188	170.00
Feb-11	148.1	185	168.40
Mar-11	149.5	185	169.03

Apr-11	152.1	186	170.75
May-11	152.4	187	171.43
Jun-11	153.1	189	172.85
Average Index (July 10-Dec 10)			981.21
Average Index (Jan 11-Jun 11)			1022.44
Half-Yearly Inflation			4.20%
Annual Inflation			8.40%

The annual inflation rate computed in the above table (8.40%) is notified as per annum inflation rate for Escalable Transmission Charges for Payment.
