

CENTRAL ELECTRICITY REGULATORY COMMISSION

EXPLANATION FOR THE NOTIFICATION ON ESCALATION FACTORS AND OTHER PARAMETERS, DATED 31.03. 2010

1. In pursuance of Clause 5.6 (vi) of Ministry of Power (MOP) Notification dated 19.1.2005 (as amended from time to time) on “*Guidelines for Determination of Tariff by Bidding Process for procurement of Power by Distribution Licensees*”, the CERC notifies various escalation factors and other parameters, every six months, for the purpose of bid evaluation and payment. The relevant Clause of the latest amendment to the competitive bidding guidelines dated 27.3.2009, is as under:

“2.23 *Sub-clause (vi) of clause 5.6 is replaced by the following:*

Following shall be notified and updated by the CERC every six months:

1. *Escalation rate for domestic coal. (Separately for evaluation and payment)*
2. *Escalation rate for domestic gas. (Separately for evaluation and payment)*
3. *Escalation rates for different escalable sub-components of energy charge for plants based on imported coal. (Separately for evaluation and payment)*
4. *Escalation rates for inland transportation charges for coal (Separately for evaluation and payment)*
5. *Escalation rates for inland transportation charges for gas (Separately for evaluation and payment)*
6. *Escalation rate for different escalable sub-components of energy charge for plants based on imported gas. (Separately for evaluation and payment)*
7. *Inflation rate to be applied to indexed capacity charge component.*
8. *Inflation rate to be applied to indexed energy charge component in cases of captive fuel source.*
9. *Discount rate to be used for bid evaluation.*
10. *Dollar-Rupee exchange variation rate. (For the purpose of evaluation)*
11. *Escalation for normative transmission charges (For the purpose of evaluation)”*

2. In addition to the above mentioned escalation factors and other parameters, the CERC notifies the matrix of transmission charges and losses as per Format 5.10 & 5.11 of the RFP of Standard Bidding Document of Case-1.

3. The explanation for the present notification applicable for the period from 1.4.2010 to 30.9.2010 is provided in the following paras.

4. The methodology that was used for computing the escalation factors and other parameters published in the earlier notifications (Notification dated 24.11.2006 and Notification dated 3.7.2009 and its Corrigendum dated 29.7.2009) has been used for computing the escalation factors and other parameters published in the present notification. The detailed methodology can be seen in the consultant's report (Revised as on 22 November 2006) followed by Explanation (General), Revised methodology (as per the Amendment to the Competitive Bidding Guidelines dated 27.3.2009) dated July 2009 and Explanation for Corrigendum dated 29.7.2009, available on CERC website (www.cercind.gov.in).

5. Escalation Factors and other parameters for Evaluation

The annual escalation factors and other parameters for bid evaluation have been computed based on the time series data for latest twelve calendar years i.e. for the period from 1998 to 2009. The steps followed while computing the escalation factors are as under.

Step 1: 3 years moving average data points computed based on year-wise index

Step 2: Annual Escalation factors computed based on 3 years moving average data points

Step 3: Mean escalation rate computed based on annual escalation factors

Step 4: In case of hybrid index, weights of various price indices applied on the computed mean escalation rates.

Computation of the escalation factors and other parameters for evaluation is as under:

(1) Escalation Rate for domestic coal (for Evaluation)

The escalation rate for domestic coal has been computed based on the time series data on Wholesale Price Index (WPI) for non-coking coal for the period from 1998 to 2009. The data on WPI for non-coking coal has been taken from the website of Ministry of Commerce & Industry. The escalation rate for domestic coal has been computed as under:

Year	WPI for Non-Coking Coal	3 Year Moving Average	Escalation Rate
1998	142.4		
1999	146.1		
2000	151.3	146.6	
2001	180.9	159.4	8.76%
2002	183.6	171.9	7.84%
2003	192.5	185.7	7.98%
2004	217.7	197.9	6.61%
2005	232.8	214.3	8.29%
2006	232.8	227.8	6.28%
2007	233.9	233.2	2.36%
2008	254.0	240.2	3.03%
2009	254.0	247.3	2.94%
		Mean	6.01%

The mean escalation rate computed in the above table (6.01%) is notified as escalation rate for domestic coal for evaluation.

(2). Escalation rate for domestic gas (For Evaluation)

The escalation rate for domestic gas has been computed based on the time series data on consumer price of gas for the period from 1998 to 2009. The data has been collected from Ministry of Petroleum & Natural Gas and GAIL (India) Ltd. Hybrid index based on 90% weightage to Consumer Price-Off-shore (Landfall point and On-shore) and 10% Consumer Price (North-Eastern States) has been used while computing the escalation rate for domestic gas as under:

Table-2: Escalation Rate for Domestic Gas (For Evaluation)							
Consumer Price-Off-shore (Landfall point and On-shore) (Rs./'ooo' cubic metre)				Consumer Price (North-Eastern States) (Rs./'ooo' cubic metre)			
Year	Consumer Price-Off-shore (Landfall point and On-shore) (Rs./'ooo' cubic metre)	3 Year moving average	Annual Escalation Rate (%)	Year	Consumer Price (North-Eastern States) (Rs./'ooo' cubic metre)	3 Year moving average	Annual Escalation Rate (%)
1998	2850			1998	1700		
1999	2850			1999	1700		
2000	2850	2850.00		2000	1700	1700.00	
2001	2850	2850.00	0.00	2001	1700	1700.00	0.00
2002	2850	2850.00	0.00	2002	1700	1700.00	0.00
2003	2850	2850.00	0.00	2003	1700	1700.00	0.00
2004	2850	2850.00	0.00	2004	1700	1700.00	0.00
2005	3025	2908.33	2.05	2005	1810	1736.67	2.16
2006	3200	3025.00	4.01	2006	1920	1810.00	4.22
2007	3200	3141.67	3.86	2007	1920	1883.33	4.05
2008	3200	3200.00	1.86	2008	1920	1920.00	1.95
2009	3200	3200.00	0.00	2009	1920	1920.00	0.00
Mean Escalation Rate			1.31	Mean Escalation Rate			1.38
				Weight	Mean Escalation Rate	Contribution to Index	
Mean escalation for consumer price (Off-shore)				0.90	1.31	1.18	
Mean escalation for consumer price (North-East)				0.10	1.38	0.14	
Annual Escalation Rate for Domestic Gas (%)						1.31	

The weighted average of mean escalation rate computed in the above table (1.31%) is notified as escalation rate for domestic gas.

(3) Escalation Rate for different escalable sub-components of energy charge for plants based on imported coal (for Evaluation)

(3.1) Escalation Rate for Imported Coal sub-component (For Evaluation)

The escalation rate for imported coal sub-component has been computed based on the data on the time series data on Barlow Jonker Index/Coalfax for the period from 1998 to 2009 as under:

Table-3.1: Escalation Rate for Imported Coal Sub-Component (For Evaluation)				
Component Index	Data Series	Mean Escalation Rate	Weight	Contribution to Index (%)
Barlow Jonker Index/Coal Fax	12 Years (Jan 1998 to Dec 2009)	16.40%	1.00	16.40%
Annual Escalation Rate				16.40%

(3.2) Escalation Rate for Transportation of Coal sub-component (For Evaluation)

The escalation rate for transportation of Coal sub-component has been computed based on the data on the time series data on Singapore 380 CST Bunker Fuel Index for the period from 1998 to 2009 as under:

Table-3.2: Escalation Rate for Transportation of Coal sub-Component (For Evaluation)				
Component Index	Data Series	Mean Escalation Rate	Weight	Contribution to Index (%)
Singapore 380 CST Bunker Fuel Index	12 Years (Jan 1998 to Dec 2009)	16.23%	1.00	16.23%
Annual Escalation Rate				16.23%

(3.3) Escalation Rate for Inland Handling of Coal sub-component (For Evaluation)

The escalation rate for Inland Handling of coal sub-component has been computed based on the data on the time series data on WPI and CPI for the period from 1998 to 2009. A hybrid index using 60% weightage to WPI and 40% weightage to CPI-IW has been used while computing the escalation rate as under:

Table-3.3: Escalation Rate for Inland Handling of Coal sub-Component (For Evaluation)				
Component Index	Data Series	Mean Escalation Rate	Weight	Contribution to Index (%)
Mean Escalation of WPI series	12 Years (Jan 1998 to Dec 2009)	5.11%	0.60	3.06%
Mean Escalation of CPI-IW series	12 Years (Jan 1998 to Dec 2009)	5.12%	0.40	2.05%
Annual Escalation Rate				5.11%

(4) Escalation rate for inland transportation charges for coal (For Evaluation)

The escalation rate for inland transportation charges for coal has been computed based on the time series data on coal freight rates for the period from 1998 to 2009. The data has been collected from Ministry of Railways. The data on coal freight rate for 100 km, 500 km, 1000 km, 2000 km and 3000 km has been used for computing the escalation rate for inland transportation of coal for distance upto 100 km, upto 500 km, upto 1000 km, upto 2000 km and beyond 2000 km respectively. The escalation rate for inland transportation charges for coal has been computed as under:

Year	Coal Freight Rate (Rs/Tonne) for 100 km	3 Year moving average	Annual Escalation Rate (%)
1998	95.53		
1999	98.85		
2000	101.30	98.56	
2001	103.30	101.15	2.63
2002	107.25	103.95	2.77
2003	108.40	106.32	2.28
2004	114.70	110.12	3.57
2005	116.80	113.30	2.89
2006	116.80	116.10	2.47
2007	116.80	116.80	0.60
2008	123.03	118.88	1.78
2009	125.10	121.64	2.33
Mean Escalation Rate			2.37

Year	Coal Freight Rate (Rs/Tonne) for 500 km	3 Year moving average	Annual Escalation Rate (%)
1998	360.60		
1999	373.08		
2000	382.33	372.00	
2001	389.98	381.79	2.63
2002	393.78	388.69	1.81
2003	394.40	392.72	1.04
2004	417.20	401.79	2.31
2005	424.80	412.13	2.57
2006	429.83	423.94	2.87
2007	431.50	428.71	1.12
2008	454.60	438.64	2.32
2009	462.30	449.47	2.47
Mean Escalation Rate			2.13

Year	Coal Freight Rate (Rs/Tonne) for 1000 km	3 Year moving average	Annual Escalation Rate (%)
1998	703.50		
1999	724.58		
2000	742.55	723.54	
2001	757.38	741.50	2.48
2002	754.20	751.38	1.33
2003	751.90	754.49	0.41
2004	795.33	767.14	1.68

Year	Coal Freight Rate (Rs/Tonne) for 2000 km	3 Year moving average	Annual Escalation Rate (%)
1998	1244.93		
1999	1279.08		
2000	1310.85	1278.28	
2001	1337.03	1308.98	2.40
2002	1367.83	1338.57	2.26
2003	1375.90	1360.25	1.62
2004	1455.33	1399.68	2.90

2005	809.80	785.68	2.42		2005	1481.80	1437.68	2.71
2006	823.98	809.70	3.06		2006	1521.70	1486.28	3.38
2007	828.70	820.83	1.37		2007	1535.00	1512.83	1.79
2008	873.10	841.93	2.57		2008	1617.20	1557.97	2.98
2009	887.90	863.23	2.53		2009	1644.60	1598.93	2.63
Mean Escalation Rate			1.98		Mean Escalation Rate			2.52
Table-4.5: Escalation Rate for Inland Transportation Charges for Coal (Beyond 2000 KM) (For Evaluation)								
Year	Coal Freight Rate (Rs/Tonne) for 3000 km		3 Year moving average		Annual Escalation Rate (%)			
1998	1580.98							
1999	1624.33							
2000	1664.70		1623.33					
2001	1698.03		1662.35		2.40			
2002	1751.03		1704.58		2.54			
2003	1765.90		1738.32		1.98			
2004	1867.83		1794.92		3.26			
2005	1901.80		1845.18		2.80			
2006	1948.15		1905.93		3.29			
2007	1963.60		1937.85		1.68			
2008	2068.83		1993.53		2.87			
2009	2103.90		2045.44		2.60			
Mean Escalation Rate					2.60			

The mean escalation rates computed in the above tables (2.37%, 2.13%, 1.98%, 2.52% and 2.60% respectively applicable for transportation of coal upto 100 km, upto 500 km, upto 1000 km, upto 2000 km and beyond 2000 km) are notified as annual escalation rates for inland transportation charges for coal for evaluation.

(5) Escalation rates for inland transportation charges for gas (For Evaluation)

The Escalation Rate for Inland Transportation Charges for Gas has been computed based on the time series data on transportation charges of gas along HVJ pipeline charged by GAIL for the period from 1998 to 2009. The data has been collected from Ministry of Petroleum & Natural Gas and GAIL (India) Ltd. The escalation rate for transportation of natural gas for evaluation has been computed as under:

Table-5: Escalation Rate for Inland Transportation Charges for Gas (For Evaluation)			
Year	Transportation charges along HVJ pipeline (Rs./'ooo' cubic metre)	3 Year moving average	Annual Escalation Rate (%)
1998	850		
1999	850		
2000	850	850.00	
2001	850	850.00	0.00
2002	1075	925.00	8.82
2003	1150	1025.00	10.81
2004	1150	1125.00	9.76
2005	1150	1150.00	2.22
2006	1150	1150.00	0.00
2007	1150	1150.00	0.00
2008	1031	1110.17	-3.46
2009	1010	1063.33	-4.22
		Mean	2.66

The mean escalation rate computed in the above table (2.66%) is notified as escalation rate for inland transportation charges for natural gas.

(6) Escalation rate for different escalable sub-components of energy charge for plants based on imported gas

(6.1) Escalation rate for Imported Gas sub-component

The escalation rate for imported gas sub-component for evaluation has been computed based on the time series data on Japan JCC LNG prices for the period from 1998 to 2009. The data has been subscribed from Platts. The escalation rate for imported gas sub-component has been computed as under:

Table-6.1: Escalation Rate for Imported Gas sub-component (For Evaluation)				
Component Index	Data Series	Mean Escalation Rate	Weight	Contribution to Index(%)
Japan LNG Price Index	12 years (Jan 1998 to Dec 2009)	11.89%	1	11.89%
Annual Escalation Rate				11.89%

The mean escalation rate computed in the above table (11.89%) is notified as escalation rate for imported gas sub-component.

(6.2) Escalation rate for transportation of Gas sub-component

The escalation rate for transportation of Gas sub-component has been computed based on the time series data on FOB prices of 380cst bunker fuel for the period from 1998-2009. The data has been subscribed from Clarkson Research. The escalation rate for transportation of gas sub-component has been computed as under:

Component Index	Data Series	Mean Escalation Rate	Weight	Contribution to Index(%)
Singapore Bunker Price Index	12 years (Jan 1998 to Dec 2009)	16.23%	1	16.23%
Escalation Rate for transportation of imported gas				16.23%

The mean escalation rate computed in the above table (16.23%) is notified as escalation rate for transportation of gas for evaluation.

(6.3) Escalation Rate for inland handling of Gas sub-component

The escalation rate for inland handling of gas sub-component has been computed based on the time series data on Wholesale Price Index (WPI) and Consumer Price Index for industrial workers (CPI-IW) for the period from 1998 to 2009. A hybrid index of WPI with 60% weightage and CPI-IW with 40% weightage is used while computing the escalation rate. The data on WPI and CPI-IW has been taken from the website of Ministry of Commerce & Industry and Labour Bureau. The escalation rate for inland handling of gas sub-component has been computed as under:

Table-6.3: Escalation Rate for Inland Handling of Gas sub-Component (For Evaluation)				
Component Index	Data Series	Mean Escalation Rate	Weight	Contribution to Index (%)
Mean Escalation of WPI series	12 Years (Jan 1998 to Dec 2009)	5.11%	0.60	3.06%
Mean Escalation of CPI-IW series	12 Years (Jan 1998 to Dec 2009)	5.12%	0.40	2.05%
Annual Escalation Rate				5.11%

The escalation rate computed in the above table (5.11%) has been notified as escalation rate for inland handling of gas sub-component.

(7) Inflation Rate To Be Applied To Indexed Capacity Charge Component (For Evaluation)

The inflation rate to be applied to indexed capacity charge component has been computed based on the time series data on Wholesale Price Index (WPI) and the Consumer Price Index for industrial workers (CPI-IW) for the period from 1998 to 2009. A hybrid index with 60% weightage to WPI and 40% weightage to CPI-IW has been used while computing the inflation rate. The inflation rate has been computed as under:

Table-7: INFLATION RATE TO BE APPLIED TO INDEXED CAPACITY CHARGE COMPONENT (FOR EVALUATION)							
Wholesale Price Index for All Commodities (Base 1993-94=100)				Consumer Price Index for Industrial Workers (Base 2001=100)			
Year	Index	3 yr Moving Avg	Escalation Rate	Year	Index	3 yr Moving Avg	Escalation Rate
1998	138.9			1998	87		
1999	143.8			1999	92		
2000	152.8	145.2		2000	95	91.4	
2001	160.7	152.4	5.01%	2001	99	95.2	4.14%
2002	164.7	159.4	4.57%	2002	103	99.1	4.03%
2003	173.4	166.3	4.31%	2003	107	103.0	3.96%
2004	184.9	174.3	4.85%	2004	111	107.1	3.95%
2005	193.7	184.0	5.54%	2005	116	111.3	3.95%
2006	203.0	193.9	5.37%	2006	123	116.6	4.76%
2007	212.8	203.2	4.80%	2007	131	123.1	5.63%
2008	232.2	216.0	6.31%	2008	142	131.8	7.01%
2009	236.8	227.3	5.22%	2009	157	143.2	8.64%
		Mean	5.11%			Mean	5.12%

				Mean Escalation Rate	Weight	Contribution to Index	
Wholesale Price Index for All Commodities				5.11%	0.6	3.06%	
Consumer Price Index for Industrial Workers				5.12%	0.4	2.05%	
Escalation Rate for Inland Handling Charges						5.11%	

The weighted average of mean inflation rate computed in the above table (5.11%) has been notified as inflation rate to be applied to indexed capacity charge component.

(8) Escalation Rate for Captive Mine Coal (For Evaluation)

Using the data for the period from 1998 to 2009 on CPI for industrial workers, WPI for all commodities and disaggregated WPI series for various commodities used in the captive mining, the escalation rate for captive mine coal has been computed as under.

Table-8.1: INFLATION RATE TO BE APPLIED TO INDEXED ENERGY CHARGE COMPONENT IN CASE OF CAPTIVE MINE COAL SOURCE (FOR EVALUATION)				
S.No	Component Index	Mean Escalation Rate(*)	Weight	Contribution to Index
1	Mean Escalation of WPI series for Tyres	1.60%	0.10	0.16%
2	Mean Escalation of WPI series for Heavy Machinery and Parts	4.72%	0.25	1.18%
3	Mean Escalation of WPI series for HSD Oil	11.59%	0.25	2.90%
4	Mean Escalation of WPI series for Matches, Explosives & Other Chemicals	2.38%	0.10	0.24%
5	Mean Escalation of WPI series for All Commodities	5.11%	0.10	0.51%
6	Mean Escalation of CPI-IW series	5.12%	0.20	1.02%
Escalation Rate for Captive Mine Coal				6.01%

(*) Detailed calculation can be seen in Tables 8.2 to 8.5 and Table-7 for WPI and CPI.

Table-8.2: Wholesale Price Index for Tyres (Base 1993-94=100)				Table-8.3: Wholesale Price Index for Heavy Machinery and Parts (Base 1993-94=100)			
Year	Index	3 yr Moving Avg	Escalation Rate	Year	Index	3 yr Moving Avg	Escalation Rate
1998	130.5			1998	138.0		

1999	128.0				1999	142.3		
2000	127.5	128.7			2000	148.3	142.9	
2001	123.2	126.2	-1.89%		2001	158.1	149.6	4.69%
2002	126.3	125.7	-0.45%		2002	161.3	155.9	4.23%
2003	120.6	123.4	-1.83%		2003	167.8	162.4	4.17%
2004	120.0	122.3	-0.86%		2004	178.7	169.3	4.23%
2005	121.4	120.7	-1.34%		2005	197.8	181.4	7.19%
2006	127.7	123.0	1.97%		2006	200.1	192.2	5.94%
2007	139.3	129.5	5.22%		2007	206.0	201.3	4.73%
2008	149.7	138.9	7.28%		2008	219.3	208.4	3.55%
2009	153.9	147.6	6.28%		2009	223.3	216.2	3.71%
		Mean	1.60%				Mean	4.72%

Year	Index	3 yr Moving Avg	Escalation Rate
1998	153.6		
1999	159.6		
2000	218.0	177.1	
2001	251.8	209.8	18.49%
2002	261.8	243.9	16.24%
2003	294.5	269.4	10.46%
2004	343.6	300.0	11.36%
2005	414.9	351.0	17.01%
2006	466.3	408.3	16.32%
2007	451.8	444.3	8.83%
2008	487.9	468.7	5.48%
2009	468.7	469.5	0.17%
		Mean	11.59%

Year	Index	3 yr Moving Avg	Escalation Rate
1998	123.2		
1999	122.9		
2000	122.8	123.0	
2001	126.8	124.2	0.98%
2002	128.1	125.9	1.40%
2003	129.2	128.0	1.69%
2004	129.3	128.9	0.65%
2005	127.8	128.8	-0.08%
2006	134.0	130.4	1.24%
2007	141.9	134.5	3.21%
2008	155.4	143.7	6.83%
2009	157.8	151.7	5.53%
		Mean	2.38%

(9) Discount Rate to be used for bid evaluation

Weighted Average Cost of Capital (WACC) has been considered as discount rate. The WACC has been computed as under:

$$\text{WACC} = \text{Cost of Debt} + \text{Cost of Equity}$$

Where,

$$\text{Cost of Debt} = 0.70 (\text{Market Rate of Interest}) \times (1 - \text{Corporate Tax Rate})$$

$$\text{Cost of Equity} = 0.30 (\text{Risk Free Rate} + b(\text{Risk Premium}))$$

The computation of WACC can be seen in the following table.

Table-9: DISCOUNT RATE TO BE USED FOR BID EVALUATION		
	Cost of Debt/Equity	WACC
1. Cost of Debt		
0.70(MR)x(1-CTR)	4.90	
2. Cost of Equity		
0.30((RF+b(RP)))	4.45	
Discount Rate (1+2)		9.35
Discount Rate has been computed based on the following assumptions		
Components of Debt/Equity		Assumptions (%)
Debt		70.00
Equity		30.00
Corporate Tax Rate (CTR)		30.00
Risk Free rate (RF)		7.02
Beta (b)		0.87
Equity Market Risk Premium (RP)		8.98
Market Rate of Interest (MR)		10.00

The Debt and Equity of 70:30 has been assumed based on CERC norms on Debt and Equity in its Tariff Regulations 2009-14. The basic corporate tax rate proposed in the GOI Budget for the year 2010-11 (i.e. excluding surcharge and cess) has been assumed while computing the discount rate. The 10 year GOI securities rate for the year 2009 has been taken as risk free rate. Based on the data on Bombay Stock Exchange (BSE) Indices for power sector and Sensex for the year 2009, beta value has been computed. The Equity market risk premium is derived from risk free rate for the year 2009 and the CERC norm for ROE (i.e. 16% post tax) in its tariff regulations 2009-14.

The WACC computed in the above table (9.35%) has been notified as discount rate for bid evaluation.

(10) Dollar-Rupee Exchange Variation Rate (For Evaluation)

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 2009 (both inclusive). A mean approach has been applied on 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. The computation of exchange variation rate can be seen in the following table.

Table-10 : DOLLAR-RUPEE EXCHANGE VARIATION RATE (FOR EVALUATION)			
Year	Rupees per unit of US Dollar	3 years moving average rate	Exchange Variation rate (%)
1998	41.27		
1999	43.05		
2000	44.94	43.09	
2001	47.19	45.06	4.58
2002	48.60	46.91	4.10
2003	46.58	47.46	1.17
2004	45.32	46.83	-1.31
2005	44.10	45.33	-3.20
2006	45.33	44.92	-0.92
2007	41.29	43.58	-2.99
2008	43.42	43.35	-0.52
2009	48.35	44.35	2.32
		Mean	0.36

The mean dollar-rupee exchange variation rate computed in the above table (0.36%) has been notified as dollar-rupee exchange variation rate for bid evaluation.

(11) Escalation for normative transmission charges (For Evaluation)

The escalation for normative transmission charges for evaluation has been computed based on the time series data on per unit transmission charges of Powergrid Corporation of India Ltd (PGCIL) for the period from 1998 to 2009. The data has been collected from PGCIL. The escalation for normative transmission charges has been computed as under:

Table-11: ESCALATION FOR NORMATIVE TRANSMISSION CHARGES (FOR EVALUATION)			
Year	Normative Transmission Charges (Rs/kwh)	3 year moving average	Annual Escalation Rate
1998	0.1085		
1999	0.1202		
2000	0.1313	0.1200	
2001	0.1285	0.1267	5.56%
2002	0.1358	0.1319	4.10%
2003	0.1455	0.1366	3.59%

2004	0.1313	0.1375	0.67%
2005	0.1369	0.1379	0.26%
2006	0.1543	0.1408	2.12%
2007	0.1733	0.1548	9.95%
2008	0.2010	0.1762	13.81%
2009	0.2277	0.2007	13.88%
Mean			5.99%

The mean escalation rate computed in the above table (5.99%) has been notified as escalation for normative transmission charges for bid evaluation.

(12) Matrix for Transmission Charges and Losses

The Transmission Charges Matrix and Transmission Loss Matrix has been prepared as per Format 5.10 & 5.11 of the RFP of Standard Bidding Document of Case-1 as follows.

(12.1) Transmission charges matrix

Transmission charges matrix has been computed based on the data on region-wise per unit transmission charges (i.e. excluding ULDC charges) and central sector energy collected from PGCIL. Using the calendar year data for the latest 5 years i.e. for the period from 2005 to 2009, average transmission charges has been computed as under:

Year	Region-wise Transmission Charges (Rs/Unit)				
	NR	WR	ER	NER	SR
2005	0.11	0.10	0.11	0.34	0.20
2006	0.14	0.11	0.14	0.33	0.21
2007	0.16	0.13	0.20	0.33	0.22
2008	0.19	0.17	0.20	0.34	0.24
2009	0.20	0.24	0.21	0.43	0.27
Average	0.16	0.15	0.17	0.35	0.23

The computed average region-wise transmission charges has been notified as transmission charges matrix.

(12.2) Transmission Loss matrix

Transmission loss matrix has been computed based on the data on region-wise transmission loss collected from NLDC. Using the calendar year data for the latest 5 years i.e. for the period from 2005 to 2009, average transmission loss has been computed as under:

Table-12.2: TRANSMISSION LOSS MATRIX					
YEAR	Region-wise Transmission Losses (%)				
	SR	NER	ER	WR	NR
2005	3.26	4.28	3.24	5.06	3.46
2006	4.02	3.88	2.99	4.38	3.98
2007	3.85	3.63	3.40	4.19	3.89
2008	4.13	3.68	3.70	5.05	3.99
2009	4.24	3.57	3.17	5.61	3.90
Average	3.90	3.81	3.30	4.86	3.84

The computed average region-wise transmission losses has been notified as transmission loss matrix.

6. Escalation Factors and other parameters for Payment

The annual escalation rates for payment have been computed based on latest twelve months data (weekly/monthly). The steps followed while computing the escalation rates are as under.

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

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

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

Step 4: In case of hybrid index, weights of various price indices applied on the computed annual escalation rate.

Computation of the escalation factors and other parameters for payment is as under:

(1) Escalation rate for Domestic coal component (for Payment)

The escalation rate for domestic coal for payment has been computed based on the data on WPI for Non-Coking coal for the period from Jan 2009 to Dec 2009. The escalation rate for domestic coal has been computed as under.

Period	WPI (Non-Coking Coal)
Jan-09	254
Feb-09	254
Mar-09	254
Apr-09	254
May-09	254
Jun-09	254
Jul-09	254
Aug-09	254
Sep-09	254
Oct-09	254
Nov-09	254
Dec-09	254
Average Index (Jan 09-Jun 09)	254
Average Index (July 09-Dec 09)	254
Half-Yearly Inflation	0.00%
Annual Inflation Rate	0.00%

The above computed escalation rate (0.00%) is notified as escalation rate for domestic coal for payment.

(2) Escalation rate for domestic gas (For Payment)

The escalation rate for domestic gas has been computed based on the data on consumer price of gas for the period from Jan 2009 to Dec 2009. The escalation rate for domestic gas for payment has been computed as under:

Period	Consumer Prices Off-shore (Landfall point and On-shore) (Rs./'ooo' cubic metre)	Consumer Prices For North-Eastern States (Rs./'ooo' cubic metre)
Jan-09	3200	1920
Feb-09	3200	1920
Mar-09	3200	1920
Apr-09	3200	1920
May-09	3200	1920
Jun-09	3200	1920

Jul-09		3200	1920
Aug-09		3200	1920
Sep-09		3200	1920
Oct-09		3200	1920
Nov-09		3200	1920
Dec-09		3200	1920
Average Index (Jan 09-Jun 09)		3200.0	1920.0
Average Index (July 09-Dec 09)		3200.0	1920.0
Half-Yearly Escalation		0.00%	0.00%
Annual Escalation		0.00%	0.00%
		Consumer Prices Off-shore	Consumer Prices For North-Eastern States
Capacity Esc Weights	1	0.90	0.10
Half-Yearly Inflation	0.00%	0.00%	0.00%
Annual Inflation Rate	0.00%	0.00%	0.00%

The annual escalation rate computed in the above table (0.00%) is notified as escalation rate for domestic gas for payment.

(3) Escalation Rate for different escalable sub-components of energy charge for plants based on imported coal (for Payment)

(3.1) Escalation Rate for Imported Coal (For Payment)

Table-3.1: ESCALATION RATE FOR IMPORTED COAL (FOR PAYMENT)				
Component Index	Data Series	Mean Escalation Rate (%)	Weight	Contribution to Index (%)
API 4	52 weekly data points from March 2009 to February 2010 (Friday Series)	37.57%	0.50	18.79%
BJI/Coalfax	52 weekly data points from March 2009 to February 2010 (Thursday Series)	37.79%	0.25	9.45%
Global Coal	52 weekly data points from March 2009 to February 2010 (Friday Series)	39.46%	0.25	9.86%
Annual Escalation Rate				38.10%

(3.2) Escalation Rate for Transportation of Imported Coal (For Payment)

Component Index	Data Series	Escalation Rate	Weight	Contribution to Index (%)
Singapore Bunker Price Index	Monthly data from March 2009 to February 2010	57.90%	1	57.90%
Annual Escalation Rate				57.90%

(3.3) Escalation Rate for Inland Handling of Imported Coal (For Payment)

The escalation rate for inland handling of imported coal has been computed based on the data on WPI and CPI-IW for the period from Jan 2009 to Dec 2009. A hybrid index of WPI with 60% weight and CPI-IW with 40% weight is used while computing the escalation rate. The data on WPI and CPI-IW has been taken from the website of Ministry of Commerce & Industry and Labour Bureau, respectively. The escalation rate for inland handling of imported coal has been computed as under:

Period		WPI	CPI
Jan-09		228.9	148.0
Feb-09		227.6	148.0
Mar-09		228.2	148.0
Apr-09		231.5	150.0
May-09		234.3	151.0
Jun-09		235.0	153.0
Jul-09		238.7	160.0
Aug-09		240.8	162.0
Sep-09		242.6	163.0
Oct-09		242.5	165.0
Nov-09		245.4	168.0
Dec-09		246.5	169.0
Average Index (Jan 09-Jun 09)		230.92	149.67
Average Index (July 09-Dec 09)		242.75	164.50
Half-Yearly Inflation		5.12%	9.91%
Annual Inflation		10.25%	19.82%
		WPI Component	CPI Component
Weights	1	0.6	0.4

Half-Yearly Inflation	7.04%	3.07%	3.96%
Annual Inflation Rate	14.08%	6.15%	7.93%

The annual inflation computed in the above table (14.08%) is notified as escalation rate for inland handling charges of imported coal for payment.

(4) Escalation rates for inland transportation charges for coal (For Payment)

The escalation for inland transportation charges for coal has been computed based on the data on coal freight rates for the period from Jan 2009 to Dec 2009. The data has been collected from Ministry of Railways. The data on coal freight rate for 100 km, 500 km, 1000 km, 2000 km and 3000 km has been used for computing the escalation rate for inland transportation charges for coal for distance upto 100 km, upto 500 km, upto 1000 km, upto 2000 km and beyond 2000 km respectively. The escalation rate for inland transportation charges for coal for payment has been computed as under:

Table-4: Escalation Rate for Inland Transportation charges for Domestic Coal (For Payment)					
Period	Coal Freight Index for 100 km	Coal Freight Index for 500 km	Coal Freight Index for 1000 km	Coal Freight Index for 2000 km	Coal Freight Index for 3000 km
Jan-09	125.1	462.3	887.9	1644.6	2103.9
Feb-09	125.1	462.3	887.9	1644.6	2103.9
Mar-09	125.1	462.3	887.9	1644.6	2103.9
Apr-09	125.1	462.3	887.9	1644.6	2103.9
May-09	125.1	462.3	887.9	1644.6	2103.9
Jun-09	125.1	462.3	887.9	1644.6	2103.9
Jul-09	125.1	462.3	887.9	1644.6	2103.9
Aug-09	125.1	462.3	887.9	1644.6	2103.9
Sep-09	125.1	462.3	887.9	1644.6	2103.9
Oct-09	125.1	462.3	887.9	1644.6	2103.9
Nov-09	125.1	462.3	887.9	1644.6	2103.9
Dec-09	125.1	462.3	887.9	1644.6	2103.9
Average Index (Jan 09-June 09)	125.10	462.30	887.90	1644.60	2103.90
Average Index (Jul 09-Dec 09)	125.10	462.30	887.90	1644.60	2103.90
Half-Yearly Escalation	0.00%	0.00%	0.00%	0.00%	0.00%

Annual Escalation Rate	0.00%	0.00%	0.00%	0.00%	0.00%
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The annual escalation rates computed in the above table (0.00%, 0.00%, 0.00%, 0.00% and 0.00% respectively applicable upto 100 km, upto 500 km, upto 1000 kms, upto 2000 kms and beyond 2000 kms) are notified as annual escalation rates for inland transportation charges for coal for payment.

(5) Escalation rate for inland transportation charges for gas (For Payment)

The Escalation Rate for Inland Transportation Charges for Gas has been computed based on the data on transportation charges of gas along HVJ pipeline charged by GAIL for the period from Jan 2009 to Dec 2009. The data has been collected from Ministry of Petroleum & Natural Gas. The escalation rate for transportation of natural gas has been computed as under:

Period	Transportation charges along HVJ pipeline (Rs./'ooo' cubic metre)
Jan-09	950
Feb-09	950
Mar-09	950
Apr-09	950
May-09	950
Jun-09	950
Jul-09	1069
Aug-09	1069
Sep-09	1069
Oct-09	1069
Nov-09	1069
Dec-09	1069
Average Index (Jan 09-Jun 09)	950
Average Index (July 09-Dec 09)	1069
Half-Yearly Inflation	12.53%
Annual Inflation Rate	25.05%

The annual escalation rate computed in the above table (25.05%) is notified as escalation rate for transportation charges of gas.

(6) Escalation rate for different escalable sub-components of energy charge for plants based on imported gas

(6.1) Escalation rate for imported gas (for Payment)

The escalation rate for imported gas for payment has been computed based on Japan JCC LNG price for the period from March 2009 to February 2010. The data has been subscribed from Platts. The computation of escalation rate for imported gas can be seen from the following table.

Table-6.1: Escalation Rate for Imported Gas (For Payment)				
Component Index	Data Series	Escalation Rate	Weight	Contribution to Index(%)
Japan LNG Price Index	Monthly data from March 2009 to February 2010	37.86%	1.00	37.86%
Annual Escalation Rate				37.86%

The annual escalation rate computed in the above table (37.86%) is notified as escalation rate for imported gas for payment.

(6.2) Escalation rate for transportation of imported gas (for Payment)

The escalation rate for transportation of imported gas has been computed based on FOB prices of 380cst bunker fuel for the period from March 2009 to February 2010. The data has been subscribed from Clarkson Research. The escalation rate for transportation of imported gas for payment has been computed as under:

Table-6.2: Escalation Rate for transportation of Imported Gas (For Payment)				
Component Index	Data Series	Escalation Rate	Weight	Contribution to Index(%)
Singapore Bunker Price Index	Monthly data from March 2009 to February 2010	57.90%	1	57.90%
Annual Escalation Rate				57.90%

The annual escalation rate computed in the above table (57.90%) is notified as escalation rate for transportation of imported gas for payment.

(6.3) Escalation rate for inland handling of imported gas (for Payment)

The escalation rate for inland handling of imported gas has been computed based on the data on WPI and CPI-IW for the period from Jan 2009 to Dec 2009. A hybrid index of WPI with 60% weight and CPI-IW with 40% weight is used while computing the escalation rate. The data on WPI and CPI-IW has been taken from the website of Ministry of Commerce & Industry and Labour Bureau, respectively. The escalation rate for inland handling of imported gas has been computed as under:

Table-6.3: ESCALATION RATE FOR INLAND HANDLING OF IMPORTED GAS (FOR PAYMENT)			
Period		WPI	CPI
Jan-09		228.9	148.0
Feb-09		227.6	148.0
Mar-09		228.2	148.0
Apr-09		231.5	150.0
May-09		234.3	151.0
Jun-09		235.0	153.0
Jul-09		238.7	160.0
Aug-09		240.8	162.0
Sep-09		242.6	163.0
Oct-09		242.5	165.0
Nov-09		245.4	168.0
Dec-09		246.5	169.0
Average Index (Jan 09-Jun 09)		230.92	149.67
Average Index (July 09-Dec 09)		242.75	164.50
Half-Yearly Inflation		5.12%	9.91%
Annual Inflation		10.25%	19.82%
		WPI Component	CPI Component
Capacity Esc Weights	1	0.6	0.4
Half-Yearly Inflation	7.04%	3.07%	3.96%
Annual Inflation Rate	14.08%	6.15%	7.93%

The annual inflation computed in the above table (14.08%) is notified as escalation rate for inland handling charges of imported gas for payment.

(7) Inflation Rate to be applied to Indexed Capacity Charge Component (For Payment)

The Inflation Rate to be applied to Indexed Capacity Charge Component has been computed based on the data on WPI and CPI-IW for the period from Jan 2009 to Dec 2009. A hybrid index of WPI with 60% weight and CPI-IW with 40% weight is used while computing the escalation rate. The data on WPI and CPI-IW has been taken from the website of Ministry of Commerce & Industry and Labour Bureau, respectively. The inflation rate has been computed as under:

Table-7: INFLATION RATE TO BE APPLIED TO INDEXED CAPACITY CHARGE COMPONENT (FOR PAYMENT)			
Period		WPI	CPI
Jan-09		228.9	148.0
Feb-09		227.6	148.0
Mar-09		228.2	148.0
Apr-09		231.5	150.0
May-09		234.3	151.0
Jun-09		235.0	153.0
Jul-09		238.7	160.0
Aug-09		240.8	162.0
Sep-09		242.6	163.0
Oct-09		242.5	165.0
Nov-09		245.4	168.0
Dec-09		246.5	169.0
Average Index (Jan 09-Jun 09)		230.92	149.67
Average Index (July 09-Dec 09)		242.75	164.50
Half-Yearly Inflation		5.12%	9.91%
Annual Inflation		10.25%	19.82%
		WPI Component	CPI Component
Capacity Esc Weights	1	0.6	0.4
Half-Yearly Inflation	7.04%	3.07%	3.96%
Annual Inflation Rate	14.08%	6.15%	7.93%

The annual inflation computed in the above table (14.08%) is notified as Inflation Rate to be applied to Indexed Capacity Charge Component.

(8) Inflation Rate to be applied to indexed energy charge component in cases of captive fuel source (For Payment)

Using Consumer Price Index for industrial workers (CPI-IW), Wholesale Price Index for all commodities (WPI-All Commodities) and disaggregated WPI series for various commodities used in the captive mining, the inflation rate to be applied to indexed energy charge component in cases of captive fuel source has been computed.

Table-8: INFLATION RATE TO BE APPLIED TO INDEXED ENERGY CHARGE COMPONENT IN CASE OF CAPTIVE MINE COAL SOURCE (FOR PAYMENT)							
Period		WPI	CPI	Wholesale Price Index			
				Tyres	Matches Explosive	Heavy Machinery & Parts	High Speed Diesel Oil
Jan-09		228.9	148.0	151.0	160.8	222.1	476.1
Feb-09		227.6	148.0	151.0	159.4	222.1	451.1
Mar-09		228.2	148.0	151.0	155.9	222.1	452.2
Apr-09		231.5	150.0	153.9	155.9	221.8	452.2
May-09		234.3	151.0	154.9	157.0	221.6	452.2
Jun-09		235.0	153.0	155.0	157.0	222.7	452.2
Jul-09		238.7	160.0	154.9	157.0	224.7	481.4
Aug-09		240.8	162.0	154.9	157.1	224.8	481.4
Sep-09		242.6	163.0	155.0	157.5	224.6	481.4
Oct-09		242.5	165.0	155.0	158.8	224.4	481.4
Nov-09		245.4	168.0	155.0	158.8	224.5	481.4
Dec-09		246.5	169.0	155.0	158.8	224.4	481.4
Average Index (Jan 09-Jun 09)		230.92	149.67	152.80	157.67	222.07	456.00
Average Index (July 09-Dec 09)		242.75	164.50	154.97	158.00	224.57	481.40
Half-Yearly Inflation		5.12%	9.91%	1.42%	0.21%	1.13%	5.57%
Annual Inflation		10.25%	19.82%	2.84%	0.42%	2.25%	11.14%
		WPI Component	CPI Component	Tyres Component	Explosives Component	Machinery Component	HSD Component
Weights	1	0.1	0.2	0.1	0.1	0.25	0.25
Half-Yearly Inflation	4.33%	0.51%	1.98%	0.14%	0.02%	0.28%	1.39%
Annual Inflation Rate	8.66%	1.02%	3.96%	0.28%	0.04%	0.56%	2.79%

The annual inflation computed in the above table (8.66%) is notified as inflation rate to be applied to indexed energy charge component in cases of captive fuel source.

7. The data series for API 4, Global Coal Index, Barlow Jonker Index/Coalfax, Platts Gas Price Index and Singapore 380 CST Bunker Fuel Price index has been analysed by CERC. The data is not made available for public dissemination since it is paid for and is sourced on a single user subscription.
