NEW ESCALATION RATES AS PER THE AMENDMENT TO THE COMPETITIVE BIDDING GUIDELINES DATED 27.3.2009 – METHODOLOGY AND COMPUTATION OF THE ESCALATION RATES

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 rates, every six months, for the purpose of bid evaluation and payment. The MOP, vide Resolution, dated 27.3.2009 issued an amendment to these guidelines and the CERC is now required to notify various rates as per the amendment in addition to the rates notified in the past. **The new rates are required for Case 1 Bidding (where the location, technology, or fuel is not specified by the procurer)**. The relevant Clause 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)"*

The Commission, in its earlier notifications has published the above rates excluding the rates at Sr.No.1 (for payment), 2, 4, 5, 6, and 11. The rates at Sr.No.4, 5, and 11 are new additions as per the amendment. The rates to be notified by CERC in addition to the rates notified in the earlier notifications are as under:

1. *Escalation rate for domestic coal. (for payment)*
2. *Escalation rate for domestic gas. (Separately for evaluation and payment)*
3. *Escalation rates for inland transportation charges for coal (Separately for evaluation and payment)*
4. *Escalation rates for inland transportation charges for gas (Separately for evaluation and payment)*
5. *Escalation rate for different escalable sub-components of energy charge for plants based on imported gas. (Separately for evaluation and payment)*
6. *Escalation for normative transmission charges (For the purpose of evaluation)*
7. *Matrix of transmission charges and*
8. *Matrix of transmission losses*

The methodology that was used for computing the rates published in the earlier notifications (Source: consultant's report Revised dated 22 November 2006, available at CERC website) and the methodology used for computing the new rates to be published by CERC as per the amendment to the MOP guidelines dated 27.3.2009 is similar. The methodology for computing the new rates and the computation of the rates is as under:

I: ESCALATION RATES FOR BID EVALUATION

The annual inflation rates and escalation rates for bid evaluation have been computed based on the time series data for latest twelve calendar years. The steps followed while computing the rates 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.

1. Escalation rates for inland transportation charges for coal (For Evaluation)

The transportation of coal to power plants takes place mainly by rail and the Ministry of Railways notifies freight rates for transportation of coal from time to time. The coal freight rates are available for different distances from 1 km to 5000 km. The coal freight rates are sensitive to different distances and are telescopic in nature. The rates are higher when the distance is more and the rates are lower when the distance is less. Keeping the existing location of power plants from the distance of coal mines, the escalation rate for inland transportation for coal has been computed for different distances. The data on coal freight rate for 1000 km, 2000 km and 3000 km has been used for computing the escalation rate for inland transportation upto 1000 km, upto 2000 km and beyond 2000 km respectively.

Name of the Index: Single index based on freight rates notified by Ministry of Railways from time to time.

Source/Publisher: GOI, Ministry of Railways (website: www.indianrailways.gov.in)

Description: The escalation rate for inland transportation of coal has been computed based on the time series data on coal freight rates for the latest 12 years i.e. for the period from 1997 to 2008.

Reasons: Single Index is recommended for the following reasons:

- There is no single freight rate available for transportation of coal through out India. The coal freight rates are available for different distances from 1km to 5000 km.
- To cover the freight rates for different distances, three separate indices used for computing the escalation rate for inland transportation of coal for three different distances.
- The coal freight rates are sensitive to different distances and are higher when the distance is more and are lower when the distance is less. The computed escalation rates are also in the same direction. Therefore, the rates applicable to the upper end of the distance are taken while computing the escalation rates for transportation of coal.

The escalation rate for inland transportation of coal has been computed as under:

Escalation Rate for Inland Transportation Charges for Coal (up to 1000 KM) (For Evaluation)			
Year	**Coal Freight Rate (Rs/Tonne) for 1000 km**	**3 Year moving average**	**Annual Escalation Rate**
1997	703.50		
1998	703.50		
1999	724.58	710.53	
2000	742.55	723.54	1.83
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
2005	809.80	785.68	2.42
2006	823.98	809.70	3.06
2007	828.70	820.83	1.37
2008	873.10	841.93	2.57
		Mean	**1.91**

Escalation Rate for Inland Transportation Charges for Coal (Up to 2000 KM) (For Evaluation)			
Year	**Coal Freight Rate (Rs/Tonne) for 2000 km**	**3 Year moving average**	**Annual Escalation Rate**
1997	1254.30		
1998	1244.93		
1999	1279.08	1259.43	
2000	1310.85	1278.28	1.50
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	1481.80	1437.68	2.71
2006	1521.70	1486.28	3.38
2007	1535.00	1512.83	1.79
2008	1617.20	1557.97	2.98
		Mean	**2.39**

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**
1997	1592.90		
1998	1580.98		
1999	1624.33	1599.40	
2000	1664.70	1623.33	1.50
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
		Mean	**2.48**

The mean escalation rates computed in the above tables (1.19%, 2.39% and 2.48% respectively applicable upto 1000 km, upto 2000 km and beyond 2000 km) are proposed as annual escalation rates for inland transportation charges for coal for evaluation.

2. Escalation rate for domestic gas (For Evaluation)

The main producers of natural gas in India are (i) Oil & Natural Gas Corporation Ltd (ONGC) (ii) Oil India Ltd (OIL) (iii) Joint Ventures (JVs) of Tapti, Panna Mukta and Ravva; and (iv) Reliance Industries Ltd and others. GAIL (India) Ltd is the main gas supplier.

Prior to 1987, gas prices were fixed by ONGC/OIL. W.e.f. 30.1.1987, the gas price is being fixed by Government of India (GOI). The price of APM gas of ONGC and OIL was last revised effective 1.7.2005 and is valid till date. All available APM gas would be supplied to only the power and fertilizer sector consumers along with the specific end users. The price is linked to a calorific value of 10000 K.cal/cubic metre. The Ministry of Petroleum and Natural Gas (MOP&NG) has been regulating the allocation and pricing of gas produced by ONGC and OIL by issuing administrative orders from time to time. Petroleum and Natural Gas Regulatory Board (PNGRB) is now regulating the refining, processing, storage, transportation, marketing and sale of natural gas.

Petroleum and Planning Analysis Cell of MOP&NG publishes the statistics relating to consumer and producer prices of natural gas and transportation charges of natural gas along HVJ pipeline. Other than HVJ pipeline, GAIL/transporters are permitted to negotiate transportation charges with the consumers.

Name of the Index: Hybrid index based on 75% weightage to Consumer Price-Off-shore (Landfall point and On-shore) and 25%Consumer Price (North-Eastern States).

Source/Publisher: GOI, Ministry of Petroleum & Natural Gas (website: www.petroleum.nic.in) and GAIL (India) Ltd (www.gailonline.com).

Description: The escalation rate for domestic gas has been computed based on the time series data on consumer price of gas for the latest 12 years i.e. for the period from 1997 to 2008.

Reasons: A hybrid index is recommended for the following reasons:

- There is no single price available for gas
- The gas produced in the north-east is relatively less than the gas produced in the rest of India. For this reason, less weightage is given to the consumer price for North-Eastern States (25%) and more weightage is given to Consumer Price-Off-shore i.e. Landfall point and On-shore (75%).
- Instead of producer price of natural gas, Consumer price of natural gas has been used for computing the escalation rate for two reasons: (i) there is a subsidy component involved between the producer price and consumer price; and (ii) the consumer price is the price at which the supplier supplies the natural gas to various consumers and this is exclusive of transportation charges of gas.

The computation of escalation rate for domestic gas can be seen in the following table.

Escalation Rate for Domestic Gas (For Evaluation)								
Consumer Price-Off-shore (Landfall point and On-shore)					Consumer Price (North-Eastern States)			
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
1997	2850				1997	1700		
1998	2850				1998	1700		
1999	2850	2850.00			1999	1700	1700.00	
2000	2850	2850.00	0.00		2000	1700	1700.00	0.00
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
		Mean	**1.31**				**Mean**	**1.38**
					Weight	**Mean Escalation Rate**	**Contribution to Index**	
Mean escalation for consumer price (Off-shore)					0.75	1.31	0.98	
Mean escalation for consumer price (North-East)					0.25	1.38	0.34	
Annual Escalation Rate for Domestic Gas (%)							**1.32**	

The mean escalation rate computed in the above table (1.32%) is proposed as annual escalation rate for domestic gas.

3. Escalation rates for inland transportation charges for gas (For Evaluation)

The natural gas produced in India and imported natural gas is being transported mainly by GAIL at the rate prescribed by the MOP&NG/PNGRB. Petroleum and Planning Analysis Cell of MOP&NG publishes the statistics relating to transportation charges of natural gas along HVJ pipeline. Other than HVJ pipeline, GAIL/transporters are permitted to negotiate transportation charges with the consumers. The data on transportation charges other than the HVJ pipeline is not available at present. For this reason the escalation rate for transportation charges of gas has been computed based on the transportation charges charged by GAIL along HVJ pipeline.

Name of the Index: Single index based on the transportation charges of gas along HVJ pipeline charged by GAIL.

Source/Publisher: GOI, Ministry of Petroleum & Natural Gas (website: www.petroleum.nic.in) and GAIL (India) Ltd (www.gailonline.com).

Description: 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 latest 12 years i.e. for the period from 1997 to 2008.

Reasons: A Single index is recommended for the following reasons:

- GAIL is the main transporter of gas in India and HVJ pipeline is the major pipeline for transportation of gas.

The escalation rate for transportation of natural gas for evaluation has been computed as under:

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**
1997	850		
1998	850		
1999	850	850.00	
2000	850	850.00	0.00
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	1150	1150.00	0.00
		Mean	**3.51**

The mean escalation rate computed in the above table (3.51%) is proposed as escalation rate for inland transportation charges for natural gas.

Note: In future there may be more players for supply of gas. The escalation rate is required to be revised based on the data on transportation charges of gas charged by suppliers of gas other than GAIL.

4. Escalation rate for different escalable sub-components of energy charge for plants based on imported gas

4.1 Escalation rate for Imported Gas sub-component

There is no published data available on historical FOB/CIF price of imported LNG in India. Therefore, a proxy has been taken for computing the escalation rate for imported gas sub-component. The Japan JCC LNG CIF price has been used as proxy for price of imported LNG in India.

In the context of price of imported LNG in India, it has been discussed with the team of researchers of Platts (the well known price index developer). In February 2009, Platts has launched Asian LNG spot prices under the benchmark name Japan/Korea Market (JKM) and is planning to launch Platts Indian LNG spot prices very soon. Platts recommended Japan JCC LNG price as proxy for price of imported LNG in India. From February 2009 onwards one can use Platts Asian LNG spot prices (JKM) as proxy for price of imported LNG in India till the period India LNG spot prices available in the market.

Name of the Index: Single index based Japan JCC NLG CIF price.

Source/Publisher: Platts (website: www.platts.com)

Description: The escalation rate for imported gas sub-component for evaluation has been computed based on the time series data on Platts Japan JCC LNG prices for the latest 12 years i.e. for the period from 1997 to 2008.

Reasons: A Single index is recommended for the following reasons:

- One can take weighted average index using price indices of futures and related assessments of NYMEX Henry Hub and UK NBP or JCC Crude Oil price (which is being used at present) in addition to Platts Japan JCC LNG price. The import of LNG in Japan is similar to import of LNG in India.

- Japan JCC LNG price is the CIF price which includes transportation through shipping. Unlike transportation by pipeline in USA and in European countries, the transportation of LNG in Asian countries is similar to transportation of LNG in India.
- The major exporting countries of LNG are Algeria, Qatar, Indonesia, Malaylsia, Australia, whereas, the major importers are Japan, South Korea, Taiwan and Western Europe. India is relatively close to four of the world's top five countries in terms of proven gas reserves, viz. Iran, Qatar, Soudi Arabia and Abu Dhabi.
- Platts provides services to various clients including Federal Energy Regulatory Commission (FERC).

The escalation rate for imported gas sub-component has been computed as under:

Escalation Rate for Imported Gas component (For Evaluation)				
Component Index	**Data Series**	**Mean Escalation Rate**	**Weight**	**Contribution to Index(%)**
Japan LNG Price Index	12 years (Jan 1997 to Dec 2008)	9.64%	1.00	9.64%
Proposed Escalation Rate				**9.64%**

The mean escalation rate computed in the above table (9.64%) is proposed as escalation rate for imported gas sub-component.

Note: In future, the index on price of LNG may be required to be revised for two reasons: (i) the transportation of LNG in India may take place through pipelines; and (ii) historical Asian LNG spot price/India LNG spot price may be available.

4.2 Escalation rate for transportation of Gas sub-component

There is no published data available on transportation of gas. Therefore, a proxy has been taken for computing the escalation rate for transportation of gas sub-component. The Singapore 380 CST Bunker Fuel Price has been used as proxy.

Singapore is a major fuelling point for shipping in the Asian region, and fuel prices in Singapore are seen as leading indicators. The Singapore 380 CST Bunker Fuel Price

indicates the FOB prices of 380cst bunker fuel (also referred to as IFO 380) ex Singapore wharf. Clarkson Research Services provides statistical research and analysis for Clarkson shipping brokers as well as offering research to the wider market commercially. Clarkson research has a long history of prices available.

Name of the Index: Singapore 380 CST Bunker Fuel Price.

Source/Publisher: Clarkson Research

Description: 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 (also referred to as IFO 380) ex Singapore wharf, for the latest 12 years i.e. for the period from 1997-2008.

Reasons: Single index is recommended for the following reasons:

- Fuel prices form a significant component of total ocean freight costs.
- The main considerations are consumption of bunker fuel used by a ship's main engines and a marine diesel oil used to run generators on a vessel while in port.
- Most vessels have unified fuel systems, which allow for use of bunker fuel at sea to power auxiliary engines, while others use diesel also for this duty.
- Various grades and specifications of bunker fuel are available, but shipping brokers and consultants usually refer to the cheaper and heavier 380cst grade when tracking bunker fuel prices.
- Clarkson Research is a reputable supplier of shipping data.
- Singapore is a major fuelling point for shipping in the Asian region, and fuel prices in Singapore are seen as leading indicators.

The escalation rate for transportation of gas sub-component has been computed as under:

Escalation Rate for transportation sub-component (For Evaluation)				
Component Index	**Data Series**	**Mean Escalation Rate**	**Weight**	**Contribution to Index(%)**
Singapore Bunker Price Index	12 years (Jan 1997 to Dec 2008)	17.95%	1.00	17.95%
Proposed Escalation Rate				**17.95%**

The mean escalation rate computed in the above table (17.95%) is proposed as escalation rate for transportation of gas for evaluation.

4.3 Escalation Rate for inland handling of Gas sub-component

There is no representative index for inland handling of fuel (gas) because it is generally handled in many ways. The choice of an appropriate index or indices is difficult. A hybrid index of Wholesale Price Index (WPI) and Consumer Price Index for industrial workers (CPI-IW) is used while computing the escalation rate for inland handling of gas sub-component.

Name of the Index: Hybrid index based on 60% weightage to WPI and 40% weightage to CPI-IW.

Source/Publisher: GOI, Ministry of Commence and Industry (website: www.eaindustry.nic.in)

Description: The escalation rate for inland handling of gas sub-component has been computed based on the time series data on WPI and CPI-IW for the latest 12 years i.e. for the period from 1997 to 2008.

Reasons: Hybrid index is recommended for the following reasons:

- The WPI, published by Ministry of Commence and Industry, is the most widely used price index in India which captures price movements in a comprehensive way. It is an indicator of movement in prices of commodities in all trade and transactions and is used for computing inflation.

- The CPI-IW, published by Labour bureau is also most widely used price index in India which purport to measure the temporal change in the retail prices of fixed basket of goods and services being consumed by the large group, working class. It is an important indicator of the retail price situation in the country. This index would closely mirror the labour costs which would be a significant proportion of total inland handling costs.

The escalation rate for inland handling of gas sub-component has been computed as under:

ESCALATION RATE FOR INLAND HANDLING SUB-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**
1997	131.3				1997	77		
1998	138.9				1998	87		
1999	143.8	138.0			1999	92	85.4	
2000	152.8	145.2	5.19%		2000	95	91.4	7.01%
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%
		Mean	**5.11%**				**Mean**	**4.94%**
					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					4.94%	0.4	1.98%	
Inflation Rate for indexed capacity charge							**5.04%**	

5. Escalation for normative transmission charges (For Evaluation)

The CERC determines the Annual Transmission charges of each asset of Powergrid Corporation of India Ltd (PGCIL) by its various orders. Based on the CERC orders, PGCIL compiles the annual transmission charges of all assets. The transmission charges, as reported by PGCIL, are inclusive of income tax, incentive and FERV. The data on annual transmission charges of PGCIL has been used for computing the escalation for normative transmission charges.

Name of the Index: Single index based on normative transmission charges of PGCIL

Source/Publisher: Powergrid Corporation of India Ltd (website: www.powergridindia.com)

Description: The escalation for normative transmission charges for evaluation has been computed based on the time series data on transmission charges of PGCIL for the latest 12 years i.e. for the period from 1997 to 2008.

Reasons: The single index is recommended for the following reasons:

- PGCIL is the only inter-state transmission entity in India.
- The annual transmission charges of PGCIL allowed by CERC on normative basis.
- The transmission charges are different for different assets of transmission and are different in different regions. Asset-wise index can be made but not practicable.
- The data on annual transmission charges for all assets has been taken for the purpose of computing the escalation rate for normative transmission charges.

The escalation for normative transmission charges has been computed as under:

ESCALATION FOR NORMATIVE TRANSMISSION CHARGES (FOR EVALUATION)			
Year	**Normative Transmission Charges (Rs Crs)**	**3 Year moving average**	**Annual Escalation Rate**
1997	1168.45		
1998	1494.39		

1999	1736.38	1466.41	
2000	2185.61	1805.46	23.12
2001	2126.87	2016.28	11.68
2002	1983.93	2098.80	4.09
2003	2132.33	2081.04	-0.85
2004	2270.28	2128.84	2.30
2005	2753.16	2385.25	12.04
2006	3162.32	2728.58	14.39
2007	3953.39	3289.62	20.56
2008	4493.38	3869.70	17.63
		Mean	**11.66**

The rate computed in the above table (11.66%) has been proposed as escalation for normative transmission charges for evaluation.

II: ESCALATION RATES 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 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 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.

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

The Wholesale Price Index (WPI) is the most widely used price index in India. It is the only general index capturing price movements in a comprehensive way. The WPI for Non-Coking coal is available at disaggregated level and is used for computing the escalation rate for domestic coal component for payment.

Name of the Index: Single index based on WPI for Non-Coking coal

Source/Publisher: GOI, Ministry of Commence and Industry (website: www.eaindustry.nic.in)

Description: 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 January 2008 to December 2008.

Reasons: Single index is recommended for the following reasons:

- The WPI for Non-coking coal is published by Government of India.
- The index is available on a weekly basis with the shortest possible time lag

The escalation rate for domestic coal has been computed as under.

ESCALATION RATE FOR DOMESTIC COAL (FOR PAYMENT)	
Period	**WPI (Non-Coking Coal)**
Jan-08	254.0
Feb-08	254.0
Mar-08	254.0
Apr-08	254.0
May-08	254.0
Jun-08	254.0
Jul-08	254.0
Aug-08	254.0
Sep-08	254.0
Oct-08	254.0
Nov-08	254.0
Dec-08	254.0
Average Index (Jan 08-Jun 08)	254.0
Average Index (July 08-Dec 08)	254.0
Half-Yearly Inflation	0.00%
Annual Inflation	0.00%

The above computed escalation rate (0.00%) has been proposed as escalation rate for domestic coal for payment.

2. Escalation rates for inland transportation charges for coal (For Payment)

As mentioned above, the transportation of coal to power plants takes place mainly by rail and the Ministry of Railways notifies freight rates for transportation of coal from time to

time. The coal freight rates are available for different distances from 1 km to 5000 km. The coal freight rates are sensitive to different distances and are telescopic in nature. The rates are higher when the distance is more and the rates are lower when the distance is less. Keeping the existing location of power plants from the distance of coal mines, the escalation rate for inland transportation for coal has been computed for different distances. The data on coal freight rate for 1000 km, 2000 km and 3000 km has been used for computing the escalation rate for inland transportation upto 1000 km, upto 2000 km and beyond 2000 km respectively.

Name of the Index: Single index based on freight rates notified by Ministry of Railways from time to time.

Source/Publisher: GOI, Ministry of Railways (website: www.indianrailways.gov.in)

Description: The escalation for inland transportation of coal has been computed based on the data on coal freight rates for the period from January 2008 to December 2008.

Reasons: Single Index is recommended for the following reasons:

- There is no single freight rate available for transportation of coal through out India. The coal freight rates are available for different distances from 1km to 5000 km.
- To cover the freight rates for different distances, three separate indices used for computing the escalation rate for inland transportation of coal for three different distances.
- The coal freight rates are sensitive to different distances and are higher when the distance is more and are lower when the distance is less. The computed escalation rates are also in the same direction. Therefore, the rates applicable to the upper end of the distance are taken for computing the escalation rate for transportation of coal.

The escalation rate for inland transportation of coal for payment has been computed as under:

Escalation Rates for Inland Transportation Charges for Coal (For Payment)			
Period	**Coal Freight Rate (Rs/Tonne) for 1000 km**	**Coal Freight Rate (Rs/Tonne) for 2000 km**	**Coal Freight Rate (Rs/Tonne) for 3000 km**
Jan-08	828.70	1535.00	1963.6
Feb-08	828.70	1535.00	1963.6
Mar-08	828.70	1535.00	1963.6
Apr-08	828.70	1535.00	1963.6
May-08	828.70	1535.00	1963.6
Jun-08	828.70	1535.00	1963.6
Jul-08	828.70	1535.00	1963.6
Aug-08	828.70	1535.00	1963.6
Sep-08	828.70	1535.00	1963.6
Oct-08	828.70	1535.00	1963.6
Nov-08	828.70	1535.00	1963.6
Dec-08	887.90	1644.60	2103.9
Average Index (Jan 08-June 08)	828.70	1535.00	1963.60
Average Index (Jul 08-Dec 08)	838.57	1553.27	1986.98
Half-Yearly Esclation	1.19%	1.19%	1.19%
Annual Escalation	2.38%	2.38%	2.38%

The annual escalation rates computed in the above table (2.38%, 2.38% and 2.38% respectively applicable upto 1000 kms, upto 2000 kms and beyond 2000 kms) are proposed as annual escalation rates for inland transportation charges for coal for payment.

3. Escalation rate for domestic gas (For Payment)

The main producers of natural gas in India are (i) Oil & Natural Gas Corporation Ltd (ONGC) (ii) Oil India Ltd (OIL) (iii) Joint Ventures (JVs) of Tapti, Panna Mukta and Ravva; and (iv) Reliance Industries Ltd and others. GAIL (India) Ltd is the main gas supplier.

Prior to 1987, gas prices were fixed by ONGC/OIL. W.e.f. 30.1.1987, the gas price is being fixed by Government of India (GOI). The price of APM gas of ONGC and OIL was last revised effective 1.7.2005 and is valid till date. All available APM gas would be supplied to only the power and fertilizer sector consumers along with the specific end users. The price is linked to a calorific value of 10000 K.cal/cubic metre. The Ministry of Petroleum and Natural Gas (MOP&NG) has been regulating the allocation and pricing of gas produced by

ONGC and OIL by issuing administrative orders from time to time. Petroleum and Natural Gas Regulatory Board (PNGRB) is now regulating the refining, processing, storage, transportation, marketing and sale of natural gas.

Petroleum and Planning Analysis Cell of MOP&NG publishes the statistics relating to consumer and producer prices of natural gas and transportation charges of natural gas along HVJ pipeline. Other than HVJ pipeline, GAIL/transporters are permitted to negotiate transportation charges with the consumers.

Name of the Index: Hybrid index based on 75% weightage to Consumer Price-Off-shore (Landfall point and On-shore) and 25%Consumer Price (North-Eastern States).

Source/Publisher: GOI, Ministry of Petroleum & Natural Gas (website: www.petroleum.nic.in) and GAIL (India) Ltd (www.gailonline.com).

Description: The escalation rate for domestic gas has been computed based on the data on consumer price for the period from January 2008 to December 2008.

Reasons: A hybrid index is recommended for the following reasons:

- There is no single price available for gas
- The gas produced in the north-east is relatively less than the gas produced in the rest of India. For this reason, less weightage is given to the consumer price for North-Eastern States (25%) and more weightage is given to Consumer Price-Off-shore i.e. Landfall point and On-shore (75%).
- Instead of producer price of natural gas, Consumer price of natural gas has been used for computing the escalation rate for two reasons: (i) there is a subsidy component involved between the producer price and consumer price; and (ii) the consumer price is the price at which the supplier supplies the natural gas to various consumers and this is exclusive of transportation charges of gas.

The escalation rate for domestic gas for payment has been computed as under:

ESCALATION RATE FOR DOMESTIC GAS (FOR PAYMENT)			
Period		**Consumer Prices Off-shore (Landfall point and On-shore) (Rs./'ooo' cubic metre)**	**Consumer Prices For North-Eastern States (Rs./'ooo' cubic metre)**
2008-01		3200	1920
2008-02		3200	1920
2008-03		3200	1920
2008-04		3200	1920
2008-05		3200	1920
2008-06		3200	1920
2008-07		3200	1920
2008-08		3200	1920
2008-09		3200	1920
2008-10		3200	1920
2008-11		3200	1920
2008-12		3200	1920
Average Index (Jan 08-Jun 08)		3200.0	1920.0
Average Index (July 08-Dec 08)		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	0.75	0.25
Half-Yearly Inflation	0.00%	0.00%	0.00%
Annual Inflation	**0.00%**	0.00%	0.00%

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

4. Escalation rates for inland transportation charges for gas (For Payment)

The natural gas produced in India and imported natural gas is being transported mainly by GAIL at the rate prescribed by the MOP&NG/PNGRB. Petroleum and Planning Analysis Cell of MOP&NG publishes the statistics relating to transportation charges of natural gas along HVJ pipeline. Other than HVJ pipeline, GAIL/transporters are permitted to negotiate transportation charges with the consumers. The data on transportation charges other than the HVJ pipeline is not available at present. For this reason the escalation rate for transportation charges of gas has been computed based on the transportation charges charged by GAIL along HVJ pipeline.

Name of the Index: Single index based on the transportation charges of natural gas along HVJ pipeline charged by GAIL.

Source/Publisher: GOI, Ministry of Petroleum & Natural Gas (website: www.petroleum.nic.in) and GAIL (India) Ltd (www.gailonline.com).

Description: Escalation Rate for Inland Transportation Charges of Gas has been computed based on the data on transportation charges of gas along HVJ pipeline charged by GAIL for the period from January 2008 to December 2008.

Reasons: A Single index is recommended for the following reasons:

- GAIL is the main transporter of gas in India and HVJ pipeline is the major pipeline for transportation of gas.

The escalation rate for transportation of natural gas has been computed as under:

ESCALATION RATE FOR INLAND TRANSPORTATION CHARGES FOR GAS (FOR PAYMENT)	
Period	**Transportation charges along HVJ pipeline (Rs./'ooo' cubic metre)**
Jan-08	1150
Feb-08	1150
Mar-08	1150
Apr-08	1150
May-08	1150

Jun-08	1150
Jul-08	1150
Aug-08	1150
Sep-08	1150
Oct-08	1150
Nov-08	1150
Dec-08	1150
Average Index (Jan 08-Jun 08)	1150
Average Index (July 08-Dec 08)	1150
Half-Yearly Inflation	0.00%
Annual Inflation	0.00%

The annual escalation rate computed in the above table (0.00%) is proposed as escalation rate for transportation charges of gas.

Note: In future there may be more players for supply of gas. The escalation rate is required to be revised when the data is available on transportation charges of gas charged by suppliers of gas other than GAIL.

5. Escalation rate for different escalable sub-components of energy charge for plants based on imported gas

5.1 Escalation rate for imported gas sub-component (for Payment)

There is no published data available on historical FOB/CIF price of imported LNG in India. Therefore, a proxy has been taken for computing the escalation rate for imported gas sub-component. The Japan JCC LNG CIF price has been used as proxy for price of imported LNG in India.

In the context of price of imported LNG in India, it has been discussed with the team of researchers of Platts (the well known price index developer). In February 2009, Platts has launched Asian LNG spot prices under the benchmark name Japan/Korea Market (JKM) and is planning to launch Platts Indian LNG spot prices very soon. Platts recommended Japan JCC LNG price as proxy for price of imported LNG in India. From February 2009 onwards one can use Platts Asian LNG spot prices (JKM) as proxy for price of imported LNG in India till the period India LNG spot prices available in the market.

Name of the Index: Single index based Japan JCC NLG CIF price.

Source/Publisher: Platts (website: www.platts.com)

Description: The escalation rate for imported gas sub-component for payment has been computed based on Platts Japan JCC LNG price for the period from March 2008 to February 2009.

Reasons: A Single index is recommended for the following reasons:

- One can take weighted average index using price indices of futures and related assessments of NYMEX Henry Hub and UK NBP or JCC Crude Oil price (which is being used at present) in addition to Platts Japan JCC LNG spot prices. The import of LNG in Japan is similar to import of LNG in India.
- Japan JCC LNG price is the CIF price which includes transportation through shipping. Unlike transportation by pipeline in USA and in European countries, the transportation of LNG in Asian countries is similar to transportation of LNG in India.
- The major exporting countries of LNG are Algeria, Qatar, Indonesia, Malaylsia, Australia, whereas, the major importers are Japan, South Korea, Taiwan and Western Europe. India is relatively close to four of the world's top five countries in terms of proven gas reserves, viz. Iran, Qatar, Soudi Arabia and Abu Dhabi.
- Platts provides services to various clients including Federal Energy Regulatory Commission (FERC).

The computation of escalation rate for imported gas can be seen from the following table

Escalation Rate for Imported Gas component (For Payment)				
Component Index	**Data Series**	**Escalation Rate**	**Weight**	**Contribution to Index(%)**
Japan LNG Price Index	Monthly data from March 2008 to February 2009	12.81%	1.00	12.81%
Proposed Escalation Rate				**12.81%**

Note: From February 2009 onwards the data on Platts Asian LNG spot prices (JKM) will be available. For the future notifications the escalation rate for imported gas for payment will be computed based on Platts Asian LNG spot prices in place of Japan JCC LNG price, the appropriate proxy for imported LNG in India.

5.2 Escalation rate for transportation of gas sub-component (for Payment)

There is no published data available on transportation of gas. Therefore, a proxy has been taken for computing the escalation rate for transportation of gas sub-component. The Singapore 380 CST Bunker Fuel Price has been used as proxy.

Singapore is a major fuelling point for shipping in the Asian region, and fuel prices in Singapore are seen as leading indicators. The Singapore 380 CST Bunker Fuel Price indicates the FOB prices of 380cst bunker fuel (also referred to as IFO 380) ex Singapore wharf. Clarkson Research Services provides statistical research and analysis for Clarkson shipping brokers as well as offering research to the wider market commercially. Clarkson research has a long history of prices available.

Name of the Index: Singapore 380 CST Bunker Fuel Price.

Source/Publisher: Clarkson Research

Description: The escalation rate for transportation of imported gas sub-component has been computed based on FOB prices of 380cst bunker fuel (also referred to as IFO 380) ex Singapore wharf, for the period from March 2008 to February 2009

Reasons: Single index is recommended for the following reasons:

- Fuel prices form a significant component of total ocean freight costs.
- The main considerations are consumption of bunker fuel used by a ship's main engines and a marine diesel oil used to run generators on a vessel while in port.

- Most vessels have unified fuel systems, which allow for use of bunker fuel at sea to power auxiliary engines, while others use diesel also for this duty.
- Various grades and specifications of bunker fuel are available, but shipping brokers and consultants usually refer to the cheaper and heavier 380cst grade when tracking bunker fuel prices.
- Clarkson Research is a reputable supplier of shipping data.
- Singapore is a major fuelling point for shipping in the Asian region, and fuel prices in Singapore are seen as leading indicators.

The escalation rate for transportation of gas sub-component for payment has been computed as under:

Escalation Rate for transportation sub-component (For Payment)				
Component Index	**Data Series**	**Escalation Rate**	**Weight**	**Contribution to Index(%)**
Singapore Bunker Price Index	Monthly data from March 2008 to February 2009	-89.75%	1.00	-89.75%
Proposed Escalation Rate				**-89.75%**

The annual escalation rate computed in the above table (-89.75%) is proposed as escalation rate for transportation of gas for payment.

5.3. Escalation rate for inland handling sub-component (for Payment)

As mentioned above, the annual escalation rate for payment has been computed based on latest twelve months data. A hybrid index comprising of the Wholesale Price Index (WPI) and the Consumer Price Index (CPI) has been considered for arriving at the escalation rate for inland handling sub-component.

Name of the Index: Hybrid index based on 60% weightage to WPI and 40% weightage to CPI-IW.

Source/Publisher: GOI, Ministry of Commence and Industry (website: www.eaindustry.nic.in)

Description: The escalation rate for inland handling of gas sub-component has been computed based on the data on WPI and CPI-IW for the period from January 2008 to December 2008.

Reasons: Hybrid index is recommended for the following reasons:

- The WPI, published by Ministry of Commence and Industry, is the most widely used price index in India which captures price movements in a comprehensive way. It is an indicator of movement in prices of commodities in all trade and transactions and is used for computing inflation.
- The CPI-IW, published by Labour bureau is also most widely used price index in India which purport to measure the temporal change in the retail prices of fixed basket of goods and services being consumed by the large group, working class. It is an important indicator of the retail price situation in the country. This index would closely mirror the labour costs which would be a significant proportion of total inland handling costs.

The escalation rate for inland handling sub-component has been computed as under:

ESCALATION RATE FOR INLAND HANDLING SUB-COMPONENT (FOR PAYMENT)			
Period		**WPI**	**CPI**
2008-01		218.1	134.0
2008-02		219.9	135.0
2008-03		225.5	137.0
2008-04		228.5	138.0
2008-05		231.1	139.0
2008-06		237.4	140.0
2008-07		240.0	143.0
2008-08		241.2	145.0
2008-09		241.5	146.0
2008-10		239.0	148.0
2008-11		234.2	148.0
2008-12		229.7	147.0
Average Index (Jan 08-Jun 08)		226.8	137.2
Average Index (July 08-Dec 08)		237.6	146.2
Half-Yearly Inflation		4.79%	6.56%
Annual Inflation		9.57%	13.12%

		WPI Component	CPI Component
Capacity Esc Weights	**1**	0.6	0.4
Half-Yearly Inflation	**5.50%**	2.87%	2.62%
Annual Inflation	**10.99%**	5.74%	5.25%

The annual escalation rate computed in the above table (10.99%) is proposed as escalation rate for inland handling charges of gas for payment.

III: MATRIX OF TRANSMISSION CHARGES AND LOSSES

As per the Amendment of the MOP Guidelines, the Commission is also required to specify/notify the matrix of transmission charges and losses. Transmission charges matrix has been computed based on the data on region-wise transmission charges collected from PGCIL. Using the calendar year data for the latest 5 years average transmission charges has been computed as under:

TRANSMISSION CHARGES MATRIX					
Year	**Region-wise Transmission Charges (Rs/Unit)**				
	NR	**WR**	**ER**	**NER**	**SR**
2004	0.10	0.09	0.12	0.35	0.19
2005	0.11	0.10	0.12	0.41	0.21
2006	0.12	0.12	0.16	0.50	0.22
2007	0.16	0.14	0.21	0.45	0.22
2008	0.17	0.19	0.21	0.43	0.24
Average	**0.13**	**0.13**	**0.17**	**0.43**	**0.22**

The computed average region-wise transmission charges has been proposed as transmission charges matrix for bid evaluation.

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 average transmission loss has been computed as under:

TRANSMISSION LOSS MATRIX					
YEAR	Region-wise Transmission Losses (%)				
	SR	NER	ER	WR	NR
2004	3.16	4.42	2.85	5.43	3.63
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
Average	**3.68**	**3.98**	**3.24**	**4.82**	**3.79**

The computed average region-wise transmission losses has been proposed as transmission loss matrix for bid evaluation.

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