Staff Paper on the
Revised Methodology for Application of the Escalation Rates for Payment, Dated 10.4.2018

I: Background

In pursuance of Clause 5.6 (vi) of Ministry of Power (MOP) Notification dated 19.01.2005 (as amended from time to time) on Guidelines for Determination of Tariff by Bidding Process for Procurement of Power by Distribution Licensees, the Central Electricity Regulatory Commission (CERC) notifies various escalation rates including the escalation rate for domestic coal, every six months, for the purpose of bid evaluation and payment (from 1.4.2014 onwards only for payment).The Commission, for the first time, notified the escalation rates for payment for indexed capacity charge component, imported coal, and captive coal mine source on 22nd November 2006 applicable for the period from October 2006 to March 2007 and for domestic coal, domestic gas etc., on 3rdJuly 2009 applicable for the period from April to September 2009. The methodology for computing the escalation rate for imported coal was changed in December, 2013. However, there has been no change in the methodology for application of the escalation rate since 2006.

2.   The methodology for computing the escalation rate and its application developed in 2006 (EXPLANATION (GENERAL) – REVISED IN NOVEMBER 2006) is as under;

> *"5. --------The method used so far was to calculate percentage variation in the value of index of one week/month over the previous week/month and obtain annual escalation by summing up of all such weekly/monthly percentage variations over the period of one year. Analysis reveals that this method leads to aberration because the base value shifts from week (/month) to week (/month). This aberration is common to computation of all escalation rates and inflation rates for the purpose of payment. The escalation rates used for the purpose of evaluation are free from this aberration. One way to remove the aberration in <u>the computation of escalation/inflation rates for payment is to compute escalation/inflation rate for application in the current year by comparing variation in the average annual value of the relevant index over the preceding two years. However, using average annual value of indices for preceding two years as mentioned above would lead to considerable time lag between capturing price trend and its application for payment, which may not be desirable. Therefore, an alternative has been worked out in which averaging of index can</u>*

*be done on semester (half-yearly) basis rather than on annual basis. **Thus, escalation/inflation rate can be computed by finding variation in average value of an index for say July-Dec 2006 as compared to average value of the index for Jan-June 2006 for working out future payments.** However, since the Commission is required to notify annual escalation/inflation rates, the rates worked out based on half yearly average values will have to be doubled. A sample calculation of computation of escalation rates and simulation of results obtained from their application is enclosed as Annex. This revised methodology of computation shall be applied uniformly for all escalable components and sub-components of charges including:*

(a) Indexed capacity charge component
(b) Imported Coal subcomponent of energy charge
(c) Transportation subcomponent of energy charge
(d) Inland handling subcomponent of energy charge
(e) Indexed energy charge component in case of captive mine based projects

6. Date of announcements and corresponding data points

6.1 There will be no change in so far as date of publication of annual escalation rate is concerned. The date of publications for all escalation /inflation rates shall continue to be as under:

Date of announcement	Application period
1st week of April	1st April to 30th September
1st week of October	1st October to 31st March

6.2 The data points for inflation rate for indexed capacity charge and escalation rates for inland handling subcomponent of energy charge &indexed energy charge for captive mine project shall be as under:

Data set for announcements to be made in 1st week of April	Data set for announcements to be made in 1st week of October
Average of relevant index for the preceding period of 1st Jan to 30th June and 1st July to 31st December	Average of relevant index for the preceding period of 1st July to 31st Dec and 1st Jan to 30th June

6.3 In order to utilize most recent information to the extent feasible, the data points for escalation rates of imported coal and bunker fuel shall be as under:

Data set for announcements to be made in 1st week of April	Data set for announcements to be made in 1st week of October
Average of relevant index for the preceding period of 1st March to 31st August and 1st September to 28/29th February	Average of relevant index for the preceding period of 1st September to 28/29th February and 1st March to 31st August

7. Calculation of Inflation rate for payment

7.1 Based on the above methodology, the inflation rate w.e.f. 1st October 2006 is worked out as under:

Period	WPI	CPI
Jul-05	195.3	116.6
Aug-05	194.6	116.2
Sep-05	197.2	117.1
Oct-05	197.8	118.4
Nov-05	198.2	119.4
Dec-05	197.2	118.8
Avg (Jul-Dec 05)	**196.7**	**117.7**
Jan-06	196.3	119.0
Feb-06	196.4	119.0
Mar-06	196.8	119.0
Apr-06	199.0	120.0
May-06	201.3	121.0
Jun-06	203.1	123.0
Avg (Jan-Jun 06)	**198.8**	**120.2**
Half-yearly Inflation	1.07	2.06
Annual Inflation	**2.14**	**4.11**
Annual Inflation Rate = (0.6 x InflWPI+ 0.4 x InflCPI)		**2.93**

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

Example:

October Announcement (Financial Year 2006-07)
Annual Inflation rate: 2.93%
Monthly Rate = 2.93/ 12 = 0.2442%
Base Value for the month of September 2006 = 100 (say)
Starting Base Value for the six month period of the year = 100
Escalated Value for Month N (N=1 to 6) = Starting Base Value + N*(Base Value for the Financial year *Monthly Rate)
               = 100+N*(100*0.2442%)
Thus, escalated values for the months of October 2006 to March 2007 will be 100.2442, 100.4883, 100.7325, 100.9767, 101.2208 and 101.4650 respectively. The last value i.e. 101.4650 shall become base value for the period of April-September 2007 and so on."

3.   Schedule-6 of model PPA under Case-1 has further clarified on the application of the Escalation Rate as under:

"6.   SCHEDULE 6: ESCALATION INDEX

6.1.1   The index ("Escalation Index") to be applied for escalation of Quoted Escalable Capacity Charges, Quoted Escalable Energy Charges, Quoted Escalable Inland Transportation Charges, Quoted Escalable Overseas Transportation Charges and Quoted Escalable Fuel Handling Charges shall be computed by assuming that as on the date of the Bid Deadline (for Quoted Escalable Energy Charges, Quoted Escalable Inland Transportation Charges, Quoted Escalable Overseas Transportation Charges and Quoted Escalable Fuel Handling Charges) and Scheduled Delivery Date (for Quoted Escalable Capacity Charges) or Revised Scheduled Delivery Date, as the case may be, the value of such Escalation Index is 100. Thereafter for each Month after the Bid Deadline (for Quoted Escalable Energy Charges, Quoted Escalable Inland Transportation Charges, Quoted Escalable Overseas Transportation Charges and Quoted Escalable Fuel Handling Charges) and Scheduled Delivery Date (for Quoted Escalable Capacity Charges) or Revised Scheduled Delivery Date, as the case may be, the value of the Escalation Index shall be computed by applying the per annum inflation rate specified by CERC for payment of Escalable (or indexed) Capacity Charge and Escalable Energy Charge, as per the provisions of this Agreement.

6.1.2   For the avoidance of doubt, it is clarified that if the prevailing inflation rate for Quoted Escalable Energy Charges specified by CERC is 4.7% per annum, then at the end of the first Month after the Bid Deadline, the value of the Escalation Index shall be 100.3917 [i.e. 100 * (1 + 0.047/12)]. The value of the Escalation Index at the end of the Nth Month after the Bid Deadline shall be calculated as: 100 * (1 + N*0.047/ 12) for Quoted Escalable Energy Charges. The value of the inflation rate shall be modified as and when specified by the CERC and the base value (100 in this case) shall be modified at the beginning of each Contract Year to be the Escalation Index at the end of the previous Contract Year. The value of the Escalation Index shall be calculated up to the fourth decimal point.

6.1.3   The different per annum escalation rates will be specified by CERC for the following, which shall be revised only at the end of every six months:

a) Quoted Escalable Capacity Charges;

b) Quoted Escalable Energy Charges separately for captive-coal based, linkage based coal, imported coal, domestic (pipeline) gas and imported R-LNG;

c) Quoted Escalable Inland Transportation Charges (except for hydro plants);

d) Quoted Escalable Overseas Transportation Charges, separately for imported coal and imported R-LNG; and

e) Quoted Escalable Fuel Handling Charges, separately for imported coal and imported R-LNG.

*6.1.4   In case due to any reason, CERC discontinues the publication of any of the
inflation rate(s) mentioned above, the Procurer(s) and the Seller shall replace the
above inflation rate(s) with inflation rate(s) which shall be computed on the same
basis as was being used by CERC to estimate their notified inflation rate."*

4.   CERC notifies various escalation rates every six months which are applied by the
generating companies and distribution licensees on the escalable components of the tariff
for the purpose of payment. As per the methodology being currently adopted, the data set
for preceding one year are being used for calculation of index notified in the first week
of April and October every year. Various stakeholders (Case-1 bidders) through petitions
and representations have sought for revision in the existing methodology of application
of the escalation rates to remove the lag, submitting that the existing methodology is
resulting in under recoveries in the payments made by procurers.

5.   In view of the petitions/representations, the issue has been examined. There are
two types of lags (i) lag in the availability of data at the time of notification of the
escalation rate (at present 3 months lag); and (ii) lag in the application of the escalation
rate (9 months lag i.e. including 3 months lag in the data). This staff paper is an attempt
to address these issues.

II: Present methodology for Application of the escalation rate

6.   For computing the escalation rates notified in April 2017, the latest one year data
from January to December 2016 (in case of imported coal and gas the latest one year
data is from March 2016 to February 2017) is used and the computed escalation rate is
applied from April 2017. Similarly for computing the escalation rates notified in October
2017, the latest one year data from July 2016 to June 2017 (in case of imported coal and
gas the latest one year data is from September 2016 to August 2017) is used and the
computed escalation rate is applied from October 2017.

III: Proposed methodology for Application of the escalation rate

7.   Lag in the availability of data that is used for computing the escalation rate
cannot be avoided. However, the lag in the application of the escalation rate can be
addressed by following an appropriate methodology.

8.   Taking inflation as an example, an illustration has been made on computation and application of annual inflation rate in the following box.

Computation and Application of Annual Inflation

The inflation rate in India is generally calculated using Wholesale Price Index (WPI)/Consumer Price Index (CPI), as a percentage change in the price index over time. The formula for calculating the annual inflation over the course of the year is as under:

{(Current year price index - Previous year price index) / Previous year price index} X 100

If the current year (2016-17) price index is 110 and the previous year (2015-16) price index is 100, the method of calculation of Inflation for the year 2016-17 is as under:

{(110-100)/100} X 100 = 10%

The resulting inflation rate for the one-year period is 10%, meaning thereby the general level of prices rose by approximately 10% in 2016-17. Therefore, the inflation rate would be applicable for the year 2016-17.

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9.   Following the illustration in the above box, a new method is proposed for changing the period of application of the escalation rate to address the lag in the application. The escalation rate notified in April 2018 for which data for the period January to December 2017 is used is to be made applicable for the period from July 2017 to December 2017. Similarly, the escalation rate to be notified in October 2018 for which data for the period July 2017 to June 2018 is used is to be made applicable for the period from January 2018 to June 2018. A comparative picture of the present method of application and proposed method of application has been provided in the following table:

Notification and Application of the Escalation rate			
Notification	**Data used for the Notification**	**Present Method of Application (Application Period)**	**Proposed Method of Application (Application Period)**
April 2018 Notification	January to December 2017	April to Sept 2018	July to December 2017 *[The escalation rate during January-March 2018 shall be provisionally considered as per October 2017 notification.* *The payment index during April-September 2018 shall provisionally remain at the same level as March 2018 till October 2018 notification.]*
October 2018 Notification	July 2017 to June 2018	October 2018 to March 2019	January to June 2018 *[The payment index during the period July 2018-March 2019 shall provisionally remain at the same level as June 2018 till April 2019 notification.]*

10.   The new method as proposed above (i.e. changing the period of application of the escalation rate), would substantially address the problem of time lag.

11.   Under the new method, the issue of settlement of the differences in escalation rates already claimed and the notified escalation rates needs to be addressed. For example, for the period July to December 2017, the escalation already claimed for the period needs to be trued up based on the escalation rate notified in April 2018. In following the new method, the adjustments in payments between generating companies and procurers would be made through supplementary bills or future bills. Further, the escalation rate during January-March 2018 which has already been fixed through October 2017 notification shall remain provisional till October 2018 notification is issued. In a similar way, the index during April-September 2018 shall provisionally remain at the same level as arrived at for March 2018 till the October 2018 notification.

12.   At present, different data points are being used for different escalation rates. For example, for April 2017 Notification, data from January to December 2016 is used in case of the escalation rate for domestic coal, domestic gas etc., whereas the data from March 2016 to February 2017 is used in case of imported coal, imported gas etc. It is proposed that the data used for the notification should be taken uniformly for all the escalation rates. For example, for April 2018 Notification, data from January to December 2017 should be taken uniformly for all the escalation rates.

13.   Comments of stakeholders are invited on the above issues presented in the staff paper.

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