

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

No.L-1(1)/2009-CERC

Coram

- 1. Dr. Pramod Deo, Chairperson**
- 2. Shri R.Krishnamoorthy, Member**
- 3. Shri S.Jayaraman, Member**
- 4. Shri V. S. Verma, Member**

In the matter of

Six Monthly review of UI price Vector of Unscheduled Interchange charges including UI Cap rate and additional UI charges

DRAFT ORDER

Regulation 5 of the Central Electricity Regulatory Commission (Unscheduled Interchange charges and related matters) Regulations, 2009 (hereinafter "the UI Charges regulations") notified on 30.3.2009, provides as follows:

"5. Unscheduled Interchange (UI) Charges:

The charges for Unscheduled Interchange for all the time-blocks when grid frequency is between 50.3 Hz and 49.2 Hz shall be payable for over-drawal by the buyer or the beneficiary and under-injection by the generating station or the seller and receivable for under-drawal by the buyer or the beneficiary and over-injection by the generating station or the seller and shall be worked out on the average frequency of the time-block at the rates given hereunder:-

Average frequency of time block (Hz)		UI Rate
Below	Not below	(Paise per kWh)
----	50.30	0
50.30	50.28	12
50.28	50.26	24
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-----	-----	-----
50.04	50.02	168
50.02	50.00	180
50.00	49.98	192

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-----	-----	-----
49.52	49.50	480
49.50	49.48	497
49.48	49.46	514
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-----	-----	-----
49.24	49.22	718
49.22	49.20	735
49.20		735

(Each 0.02 Hz step is equivalent to 12.0 paise/kWh in the 50.3-49.5 Hz frequency range and to 17.0 paise/kWh in the 49.5-49.2 Hz frequency range)

Provided that Unscheduled Interchange rate shall be capped at 408 paise per kWh (“hereinafter UI Cap Rate”) for all generating stations using coal or lignite or gas supplied under Administered Price Mechanism (APM) as the fuel, in case when actual generation is higher or lower than the scheduled generation in the frequency range between 50.3 Hz and up to 49.2 Hz

Note: *The Unscheduled Interchange charges including UI Cap rate shall be reviewed by the Commission on six-monthly basis or earlier, and revised, if necessary, through separate orders from time to time.”*

2. The rationale for the above mentioned charges and the proposed periodic revision of the same as mentioned in Note under regulation 5, were clarified by the Commission in para 5.4 of its order dated 8.6.2009 as under:

5.4. In this context, we also take note of the fact that the share of grid connected diesel based generating stations in the total installed capacity being very miniscule, does not reflect the marginal generation cost in true sense. On the other hand, combined cycle generation capacity in excess of 3000 MW (of central generating stations alone) using naphtha/RLNG as fuel represents significant marginal generation capacity in the system. Accordingly, variable cost of generation of combined cycle plants using naphtha/RLNG as fuel has been taken into account while revising UI ceiling price in April 2007 and subsequently in January 2008. With significant reduction in liquid fuel prices in the recent past, variable cost of generation of such combined cycle generating stations is bound to decline necessitating review and revision in the UI price vector and cap thereof. Accordingly, variable cost of generation based on prevalent fuel prices in case of combined cycle gas turbine stations of central generating stations using naphtha and RLNG as fuel was summarised in the Explanatory Memorandum.

The average prices of RLNG for various CCGT stations has varied from US\$ 13.56/MMBTU (Anta and Faridabad) to US\$ 16.55/MMBTU (Auraiya) whereas average price of naphtha for various CCGT stations has varied from Rs 24,872/MT (Kayamkulam) to Rs 33,794/MT (Auraiya) The variable cost of generation of various CCGT stations have been computed based on the approved norms, fuel price and calorific value for respective CCGT station. Accordingly, the variable cost of generation for such combined cycle generating stations have varied from Rs 4.52/kWh (Kayamkulam-naphtha) to Rs 6.97/kWh (Auraiya-RLNG) and the weighted average variable cost for generation for such stations is around Rs 6.01/kWh. The variable cost of generation may vary due to variation in prices of RLNG or Naphtha, as the case may be. As the highest variable cost for RLNG based generating station amounts to Rs 6.97 per kWh and providing for variation in fuel prices of around 5%, ceiling UI rate as Rs 7.35 per kWh has been arrived at. The Commission recognises that as variation in the liquid fuel prices are subject to market fluctuations, revision in UI price mechanism from time to time is desirable. Accordingly, provision has been made under the Regulations. Needless to add that while undertaking such revision, the Commission shall duly consider impact of variation in fuel prices.”

3. Subsequent to the notification of the UI Charges regulations, the energy charges using Naphtha and HSD in NTPC gas/liquid fuel based stations in the month of July 2009 were as follows:

Sl. No.	Name of the Generating Station	Installed Capacity MW	Energy Charges as in July 2009 Paise/kWh
1	Dadri CCGT	829.78	707.99
2	Faridabad	431.00	665.78
3	Anta CCGT	419.33	745.26
4	Auraiya GPS	663.36	864.27
5	Kayamkulam CCGT	359.58	631.00
6	Kawas GPS	656.20	601.25

4. It may be seen from the above that the energy charges on liquid fuels is in the range of Rs. 6.01 to Rs. 8.64 per kWh for the liquid fuel based stations of NTPC. The energy charges in case of Auraiya GPS on liquid fuel is

of the order of Rs. 8.64 per kWh. Providing for variation in fuel prices to the tune of around 5%, ceiling UI rate works out to Rs 9.07 per kWh.

5. Further, the energy charges of some of the load centre stations of NTPC namely Dadri TPS, Farakka TPS, etc. for the month of July 2009 were as follows:

Sl. No.	Name of the Generating Station	Installed Capacity (MW)	Energy Charges as in July,2009
1	FGUTPP TPS St-I	420.00	163
2	FGUTPP St-II	420.00	162
3	FGUTPP St-III	210.00	163
4	NCTP Dadri	840.00	234
5	Farrakka STPS	1600.00	240
6	Tanda TPS	440.00	258
7	Badarpur TPS	705.00	266
8	Kahalgaon STPS St-I	840.00	193
9	Kahalgaon STPS St-III	1000.00	186
10	Simhadri	1000.00	170

6. It can be seen that as per the existing price vector between 50.3 Hz to 49.5 Hz, the stations like Dadri, Farakka etc. would not like to generate at 50.0 Hz as the UI charges of Rs 1.80/kWh are less than the energy charges. It is only axiomatic that all coal based generation should continue to generate as per the schedule.

7. This consideration mandates the following UI price vector:

The charges for Unscheduled Interchange for all the time-blocks when grid frequency is between 50.3 Hz and 49.2 Hz shall be payable for over-drawal by the buyer or the beneficiary and under-injection by the generating station or the seller and receivable for under-drawal by the buyer or the beneficiary and over-injection by the generating station or the seller and shall be worked out on the average frequency of the time-block at the rates given hereunder:-

Average frequency of time block (Hz)		UI Rate
Below	Not below	(Paise per kWh)
----	50.30	0
50.30	50.28	16.5
50.28	50.26	33.0
-----	-----	-----
-----	-----	-----
50.04	50.02	231.0
50.02	50.00	247.5
50.00	49.98	264.0
-----	-----	-----
-----	-----	-----
49.52	49.50	660.0
49.50	49.48	676.5
49.48	49.46	693.0
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-----	-----	-----
49.24	49.22	891.0
49.22	49.20	907.5
49.20		907.5

(Each 0.02 Hz step is equivalent to 16.5 paise/kWh in the 50.3-49.2 Hz frequency range)

8. Correspondingly, the UI Cap Rate is also revised marginally to 412.5 paise/kWh for all generating stations using coal or lignite or gas supplied under Administered Price Mechanism (APM) as the fuel, in case when actual generation is higher or lower than the scheduled generation in the frequency range between 50.3 Hz and up to 49.2 Hz.

9. The note to regulation 7 (3) of the UI Charges regulations provides that:-

“The Additional Unscheduled Interchange Charge shall be reviewed by the Commission on six-monthly basis or earlier, and revised, if necessary through separate orders.”

10. The Commission, in para 5.3 of its order dated 8.6.2009, has observed as under:

“UI pricing is expected to serve the twin objectives of specifying settlement rate for deviations from schedules in normal operating range and ensuring ‘grid discipline’ on the one hand while ensuring maximisation of generation at optimal cost for grid participants on the other. Further, UI pricing mechanism should discourage grid participants from using UI mechanism as trading instrument.

11. Accordingly, revision of UI charges is required to pay adequate attention to the instances of violation of grid discipline. In this regard, it has come to notice that the frequency of the integrated grid in the months of April, June and August, 2009 was below 49.2 Hz for the 19.63, 19.33 and 25.51 per cent of time respectively. The details of over-drawls by the constituents of the Northern Region under low grid frequency condition i.e. below 49.20 Hz during June to August, 2009 are given as under:

STATES	CHANDI GARH	DELHI	H.P.	HARYA NA	J & K	PUNJA B	RAJAS THAN	U.P.	UTTARA KHAND
June									
Violation in No. of Blocks	457	214	389	363	260	303	148	501	323
Total MWh	4762	5695	6382	16330	3035	13903	1835	86762	6897
Max MW	125	496	267	995	152	631	352	1762	263
Avg.MW	42	106	66	180	47	184	50	693	85
July									
Violation in No. of Blocks	83	47	69	54	28	48	58	87	53
Total MWh	723	1471	1193	2284	438	1548	2324	21263	1138
Max MW	111	342	200	493	191	364	511	1723	412
Avg. MW	35	125	69	169	63	129	160	978	86
August									
Violation in No. of Blocks	683	601	379	543	344	262	473	720	604
Total MWh	12762	102511	4511	102678	19365	108498	74100	263539	25922
Max MW	118	559	464	490	263	395	667	2102	346
Avg. MW	40	175	54	143	63	89	97	891	105

12. It can be seen that there is over-drawal by Uttar Pradesh to the extent of 1762 MW, 1723 MW and 2102 MW during the months of June , July and August 2009 respectively. The average over-drawal during these three months are 693 MW, 978 MW and 891 MW respectively.

13. The situation appears to be no better in the Southern Region. Details of over-drawal by the constituents of Southern Region at frequency below 49.2 Hz. are as given below:

DESCRIPTION	APTRANSCO	KPTCL	KSEB	TNEB	PONDY	GOA
JUNE						
Violation in No. of Blocks	113	51	49	263	152	214
Total MWh	2298	333	420	15178	293	421
Max.MW	512	134	132	1131	26	29
Avg.MW	81	26	34	231	8	8
JULY						
Violation in No..of Blocks	76	63	20	78	85	40
Total MWh	3502	1576	412	4234	589	77
Max.MW	741	209	241	624	62	19
Avg.MW	184	100	82	217	28	8
AUGUST						
Violation in No. of Blocks	132	50	9	219	216	212
Total MWh	2773	403	63	7392	712	622
Max.MW	518	361	70	399	39	36
Avg.MW	84	32	28	135	13	12

15. It is dismaying to notice that over-drawal by Tamil Nadu was as high as 1131 MW in June 2009.

16. Sustained over-drawals at low frequency by Uttar Pradesh as well as Tamil Nadu prompted initiation of suo motu proceedings for violation of grid

discipline vide Petitions No. 105/2009 (Uttar Pradesh) and 106/2009 and 130/2009 (both against Tamil Nadu) and resulted in imposition of penalties for violation of statutory provisions. These are but few of the plethora of instances of over-drawals by the grid constituents at the cost of grid security.

17. That a number of grid constituents resort to reckless and frequent over-drawal at frequency below the mandated frequency of 49.2 Hz needs no emphasis. To make matters worse, there have also been instance of under injections by the generating stations at frequency below 49.2Hz.

18. Analysis of the frequency profile during April to August 2009, reveals that there has been consistent deterioration, especially in the months of April, June and August 2009. This clearly establishes that the 40% additional UI charges for over-drawal at frequency below 49.2Hz has failed to serve the intended result. With the reservoir level reaching below the average of last 10 years, it is apprehended that the power supply position in the ensuing months is unlikely to improve.

19. The persistent over-drawl by a number of State entities such as Uttar Pradesh in the Northern Region and Tamil Nadu in southern region, even with 40% additional charges could be explained as under:-

(a) After integration of NEW grid and due to diversity of NR and WR it is beneficial for a State in Northern Region to draw through UI rather than procuring through other means such as short term contracts or power exchange. It is seen that average cost of power through UI even

after additional charges , is Rs. 4.94/ kWh while the cost of power through Power exchange was Rs. 7.39/ kWh as per data of market monitoring for the month of June 2009.

(b) Arranging power through Exchange has attendant uncertainties both in respect of price as well as availability. The success of transaction at power exchange depends on corridor availability. In April 2009 the price differential between NR and other regions due to congestion and market splitting reached to Rs. 9 per kWh and on 11.8.2009 it went as high as Rs. 16.12 per kWh.

(c) While the transaction of bilateral and day ahead trading face curtailments due to difference in declared value of Available Transmission Capacity (ATC) and Transferable Transmission Capacity (TTC), it was found that on same day sustained UI over draws were more than the value of ATC.

(d) While the recommendation of the Forum of Regulators not to pass the additional charges for over-drawals below 49.2 Hz with effect from 1.8.2009 may be a deterrent, its efficacy is yet to be tested in case of state owned discoms.

(e) The discoms are not required to go through the process of open access in meeting their long term demand and that too without any transmission charges on UI draws while both bilateral and exchange transaction had to pay STOA charges (approximate 16 paisa / kWh).

20. From the above, it is seen that due to multiplicity of factors like adverse climate, low rainfall, congestion and in case of UP, UI billing ambiguity, the imposition of 40% additional charges could not bring desired result in grid discipline. September 2009 also witnessed heavy over draws by some States in Northern Region causing frequency below 49.2 Hz. for 45.77 % of time on some days.

21. We are left with no doubt that the above mentioned facts and circumstances, warrant appropriate enhancement of additional charges for over-drawal at low frequency so as to give a clear message to over-drawing States to desist from over drawing under low frequency condition of 49.2 Hz and below.

22. By applying price cap on short term power for 45 days, the Commission has made its intention clear that consumer interest is at top priority. The upshot of this is the endeavor to enforce grid discipline to have highest order of grid security in the consumer interest. Consequently, the additional UI charge is hereby increased with immediate effect to 100% of the maximum UI charge of 907.5 Paise/kWh at grid frequency below 49.2 Hz.

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Member

[S.Jayaraman]
Member

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Member

[Dr. Pramod Deo]
Chairperson

New Delhi, dated the 7th October, 2009