

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No.191/2011 (Suo-motu)

**Coram:
Shri Pramod Deo, Chairperson
Shri S.Jayaraman, Member
Shri V.S.Verma, Member
Shri M.Deena Dayalan, Member**

**Date of Hearing: 30.10.2012
Date of order: 31.12.2012**

In the matter of

Compliance with the Regulation 5.2 (f) of the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010 regarding restricted governor mode of operation by the generating companies.

**And
In the matter of**

- 1 NTPC Ltd., New Delhi
- 2 NHPC Ltd. Faridabad
- 3 North Eastern Electric Power Corporation Ltd, Shillong
- 4 Neyvelli Lignite Corporation Ltd., Chennai
- 5 Tehri Hydro Development Corporation India Ltd., Rishikesh
- 6 NTPC Sail Power Corporation Ltd., New Delhi
- 7 Satluj Jal Vidyut Nigam Ltd. (SJVNL), Shimla
- 8 Haryana Power Generation Corporation Ltd. (HPGCL)
- 9 Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd.
- 10 Teesta Urja Ltd., New Delhi
- 11 Gujarat State Electricity Generation Company (GSEC)
- 12.Kerala State Electricity Board, Kerala
- 13 Uttarakhand Power Generation Ltd., Dehradun
- 14 Karnataka Power Trading Company Ltd, Karnataka
- 15 Power Development Department, J & K
- 16 Damodar Valley Corporation, Kolkata
- 17 Jharkhand State Electricity Board, Ranchi
- 18 Orissa Power Generation Company Ltd, Bhubaneshwar
- 19 West Bengal Power Development Corporation Ltd., Kolkata
- 20 Central Electricity Supply Company Ltd., Kolkata
- 21 Orissa Hydro Electricity Corporation Ltd., Bhubaneshwar
- 22 Meghalya Electricity Corporation Ltd., Shillong
- 23 Assam State Electricity Board, Guwahati
- 24 M.P. Power Generating Company Ltd. (MPPGCL)
- 25 Chattisgarh State Power Generating Company Ltd.Raipur
- 26 Andhra Pradesh Generation Company Ltd., Hyderabad.
- 27 Maharashtra State Power Generating Co. Ltd. (Mahagenco)

28 Punjab State Power Corporation Ltd., Patiala
29 Rajasthan Rajya Vidyut Utpadan Nigam Ltd. , Jaipur
30 Maha TATA Ltd., Mumbai
31 Maha Rel, Mumbai
32 Jindal Power Ltd., New Delhi
33 LANCO Ltd., Gurgaon
34 Narmada Control Authority, Indore
35 JSW Ltd., Mumbai

...Respondents

Following were present:

Shri S.K.Sonee, POSOCO
Shri S.R.Narasimhan, NLDC
Shri V.K. Agarwal, NRLDC
Shri S.C.Sexana, NLDC
Miss Joyti Prasad, NLDC
Shri Rajiv Porwal, NLDC
Shri M.Pradeep Reddy, NLDC
Shri Mohit Joshi, NLDC
Shri M.A.K.P.Singh, NCA
Shri Rohit Chabra, NTPC
Shri P.P.Francis, NTPC
Shri S.K.Sharma, NTPC
Shri Ajay Dua, NTPC
Miss Silpa Agarwal, NTPC
Shri C.L.Sabrina, NLC
Shri Piyush Kumar, NHPC
Shri Amrik Singh, NHPC
Shri Romesh, SJVNL
Shri Rajiv Agarwal, SJVNL
Shri Ashok Kumar, SJVNL
Shri H.W Vyas, MPGCL
Miss Ranjitha Ramchandran, Advocate, CESC

ORDER

The Commission vide its order dated 9.10.2012 had observed as under:

"8. As all the generating stations are not on the RGMO mode, fluctuation in system frequency is adversely affecting the power system and the generating stations. Considering the seriousness of the situation, Chairman and Managing Directors of the North Eastern Electric Power Corporation Ltd., Satluj Jal Vidyut Nigam Ltd., Haryana Power Generation Corporation Ltd., Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd., Teesta Urja Ltd., Gujarat State Electricity Generation Company, Uttarakhand Power Generation Ltd., PDD, J&K, Damodar Valley Corporation, Jharkhand State Electricity Board, Central Electricity Supply Company Ltd., Assam State Electricity Board, Punjab State Power Corporation Ltd., Rajasthan Rajya Vidyut Utpadan Nigam Ltd, Maha TATA Ltd., Maha Rel, Lanco Ltd., and APCL Ltd. are directed to show cause by 23.10.2012 as to why they will not be held personally liable for the penalty under

Section 142 of the Electricity Act, 2003 for non-compliance with the directions of the Commission and provisions of the Grid Code with regard to implementation of RGMO.

9. It is observed that the reports on RGMO are not being received from NLDC/RLDCs in regular intervals. It may be noted that NLDC/RLDCs are required to monitor the status of implementation of RGMO by the generators and submit a monthly report so that necessary action can be taken against the defaulting generating companies. If NLDC/RLDCs are not getting cooperation from the generating companies to get the necessary information, they should file appropriate application by imploding the concerned generating companies."

2. National Load Despatch Centre (NLDC) vide its reply dated 29.10.2012 has submitted that in the procedure on "Assessment of Frequency Response Characteristics of Control Areas in Indian Power System" already filed in Petition No. 47/MP/2012, it has been suggested that the monitoring of Frequency Response Characteristics (FRC) might be done at the control area level as it is difficult to monitor generating station-wise response. Internationally, a method and associated equipment for performing online frequency response tests for individual generators have been developed. It is a Hardware-in-the-Loop method that combines a real time simulator, data acquisition system and signal generators. Principally, the normal frequency feedback of the governor, i.e. the real frequency, is replaced by a frequency generated by test equipment. This method allows the generating unit to be tested without varying the grid frequency and it has been used in Sweden for the last decade at over 50 generating units. An IEEE paper describing this method for testing of frequency control capability in island operation has already been submitted to the Commission.

3. NLDC has suggested that a similar philosophy for testing frequency response of individual generators should also be adopted in India. Simultaneously, control area

wise FRC monitoring might also continue. NLDC has proposed that a committee comprising of experts from Central Electricity Authority, Central Transmission Utility, National/Regional/State Load Despatch Centers and Central/State/Private generating companies should be formed for proposing the testing protocol and performing field tests. Based on the direction of the Commission, the Committee should would be submit a report in a time bound manner, detailing the frequency response related performance of different generators vis-à-vis standards specified in Grid Code. NLDC is willing to take the lead in the matter, if so desired by the Commission.

4. In response to show cause notice dated 9.10.2012, replies have been filed by the Tata Power Company Ltd., Maha Rel., Mumbai, Madhya Pradesh Power Generating Company Limited, SJVN Limited, CESC Limited, Teesta Urja Ltd, Rajasthan Rajya Vidyut Utpadan Nigam Ltd., Lanco Amarkantak Power Limited, Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd., Gujarat State Electricity Corporation Ltd. and North Eastern Electric Power Corporation Ltd.

5. Tata Power Company Limited and SJVN Limited have filed their replies vide letters dated 30.10.2012 and 23.10.2012, respectively. It is clarified that the parties are required to make their submissions in response to the notice issued by the Commission through affidavits in accordance with Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999.

6. Maha Reliance Mumbai vide its affidavit dated 30.10.2012 has submitted the reasons for delay in implementation of RGMO at Dahanu Thermal Power Station. It

has been submitted that to address the principal issues *inter-alia* including implementation of RGMO in the intra-State generating stations arising out of difference in ABT mechanism at State and Regional level, Maharashtra State Load Despatch Centre has filed a petition before MERC for removal of difficulties in implementation of final balancing and settlement mechanism which is pending before the MERC.

7. Madhya Pradesh Power Generating Company Limited (MPPGCL) in its affidavit dated 27.10.2012 has submitted that orders for supply and work of RGMO operation has been placed on M/s BHEL. MPPGCL is constantly pursuing M/s BHEL to spare time slot of their experts in next available opportunity when units are under shut down. MPPGCL has requested to condone the delay being caused in implementation of RGMO in respect of its units No. 1 to 4 of SGTPS, Birsinghpur and Unit No. 5 of ATPS, Chachai and extend the period of implementation of the same to Annual over Haul (AOH) of Financial Year 2014-15.

8. CESC Limited in its reply dated 19.10.2012 has submitted that Units 1 and 2 of Budge Budge Power Station are of Siemens (earlier persons) make and could not be switched over from FGMO to RGMO as the relevant expertise to change governor software for such units is no longer available. CESC Limited has submitted that it runs three units in FGMO (unit 1 and 2 in FGMO and unit 3 in RGMO). The generating station thus responds to the system frequency and modifies the steam input accordingly. For FGMO, the responses are uniform throughout the frequency range. Eastern Regional Power Committee in its TCC meeting held on 20.4.2012 has checked and recorded the status of RGMO in the Eastern Region. The ERPC

recorded the RGMO/FGMO status of CESC Limited's Budge Budge power station as "Response Satisfactory".

9. Teesta Urja Limited in its reply dated 19.10.2012 has submitted that its 1200 MW Teesta-III HEP is presently under construction and yet to be synchronized with the grid.

10. Rajasthan Rajya Vidyut Utpadan Nigam Limited has submitted the details regarding RGMO and requested to condone delay in submission of requisite details.

11. Lanco Amarkantak Power Limited in its reply dated 17.10.2012 has submitted that RGMO was implemented in both its operational units from 17.3.2012 and 25.4.2012 and information in this regard was sent to WRPC on 26.4.2012.

12. Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd.(UPRVUNL) in its reply dated 15.11.2012 has submitted that it has initiated suitable steps for switching over its four thermal generating stations to RGMO. UPRVUNL has enumerated the reasons for not implementing the RGMO in its generating stations. UPRVUNL has requested not to take any adverse action in form of penalty against it and it will ensure timely compliance of the orders/directions of the Commission.

13. Gujarat State Electricity Corporation Limited (GSECL) in its reply has submitted that the matter was continuously being pursued with the Original Equipment Manufacturer i.e. M/s BHEL with regard to the changes required in the Hydro plants.

BHEL recently has submitted its offers for both Ukai HPS and Kadana HPS regarding changes to be made and time required for the same. The operation of Ukai HPS and Kadana HPS on RGMO is being done with manual intervention. GSECL has further submitted as under:

(a) Ukai and Kadana Hydro machines are being operated at full load during peak/demand hours, and being hydro stations, they will be the last units to set backing down or reserve shut down. As such, these units operate at full load during the improvement of frequency upto 50.2 Hz without any load reduction, thus full filing the criteria of RGMO.

(b) Ukai and Kadana Hydro machines are not capable to achieve 110% of MCR in case of sudden fall of frequency due to GT constraints and obsolete design;

(c) As directed by the Commission by its order dated 12.3.2012, the load reduction in case if frequency rises to 50.2 Hz is being done manually.

14. It has been submitted that the GSECL has implemented RGMO in other machines without giving any chance of complaint to WRLDC/SLDC.

15. North Eastern Electric Power Corporation Ltd. (NEEPCO) in its reply dated 5.12.2012 has submitted that necessary orders for new governor system with the OEM have been placed on M/s BHEL. However, the delivery period being long, the system can only be made operational by March, 2014 in all the generating stations of

NEEPCO, barring Kopili 2nd Stage extension plant which expected date of commissioning is March, 2013.

16. During the course of hearing on 30.10.2012, with regard to Committee for evaluating the frequency response, the representative of the NLDC submitted that Committee would only be required to frame the protocols/modalities and testing can be left to a small team comprising of members decided by the Committee. The team would visit all the generators with the equipment and induce the frequency to test the generator's governor response to such induced frequency.

17. Learned counsel for the CESC Limited submitted that Budge Budge plant of CESC Ltd has three units of 250 MW each. Units 1 and 2 are Siemens make and are equipped with FGMO and unit-3 is BHEL make and is equipped with RGMO. However, the generating station responds to the system frequency, ERPC and ERLDC have recorded the governor response of the units as satisfactory in various OCC and TCC meetings.

18. The representative of the SJVNL submitted that Nathpa Jhakri plant is having pondage capacity up to three hours, therefore, it is exempted from RGMO operation as per the stipulation of proviso of Regulation 5.2 (f) (i) of the Grid Code.

19. The representative of the MPPGCL submitted that orders for supply and work of RGMO operation has been placed on M/s BHEL. In unit No. 4 during AOH the software has been installed by BHEL and its interfacing with the field instrument is

to be done. MPPGCL is constantly pursuing BHEL to spare time slot of their experts in next available opportunity when unit is under shut down.

20. We have considered the submission of the respondents. As per Regulation 5.2 (f) of the Grid Code, all thermal generating units of 200 MW and above and all hydro units of 10 MW and above which are synchronized with the grid, irrespective of their ownership, shall be required to have their governors in operation at all time in accordance with the provisions in sub-clauses (i) to (iii) of the said Regulation.

21. It is noted Rajasthan Rajya Vidyut Utpadan Limited, Lanco Amarkantak Power Ltd, Maha Reliance, Tata Power Limited, UPRVUNL, SJVNL, Teesta Urja Ltd, CESC Limited, Gujarat State Electricity Corporation Ltd. and North Eastern Electric Power Corporation Ltd. have filed their replies and therefore, proceedings initiated under Section 142 of the Act against them are dropped with the directions to comply with Grid Code strictly in future. The respondents, Haryana Power Generation Corporation Ltd, Uttarakhand Power Generation Limited, Power Development Department, Jammu and Kashmir, Jharkhand State Electricity Board, Assam State Electricity Board and Punjab State Power Corporation Ltd. have not filed reply nor have entered appearance in person or through advocate. We depreciate the attitude of the respondents towards the order of the Commission in the matter.

22. In our view, respondents who have not filed any reply have clearly violated the provisions of Regulation 5.2 (f) of the Grid Code. Accordingly, we impose a penalty of ₹ one lakh each on the Haryana Power Generation Corporation Ltd, Uttarakhand Power Generation Limited, Power Development Department, Jammu and Kashmir,

Jharkhand State Electricity Board, Assam State Electricity Board and Punjab State Power Corporation Ltd. The penalties shall be deposited within one month from the date of issue of the order.

23. The NLDC in its submission dated 29.10.2012 has provided the account of frequency response of the generating stations to the following events:

- (i) Jhajjar units tripped on 10.9.2012 at 14.11.40 Hrs
- (ii) Tehri and Koteshwar units tripped on 10.9.2012 at 11.19 Hrs
- (iii) Korba units tripped on 11.9.2012 at 00.40 Hrs
- (iv) Sipat units tripped on 14.9.2012 at 18.58.00 Hrs
- (v) CGPL Mundra 800 MW unit tripped on 18.9.2012 at 14.39.00 Hrs
- (vi) Talcher-Kolar Pole-2 tripping on 5.10.2012 at 12.29.00 Hrs

24. On perusal of the record submitted by the NLDC, it is observed that data pertains to a time gap of around five to eight minutes after the event. As such, the data cannot be said to exhibit the primary response of the generators due to RGMO. The primary response from generators shall come within thirty to sixty seconds of generation loss/load throw off. As such, position after five to eight minutes is controlled by the commercial implications of UI mechanism. In view of the above position, it would not be prudent to categorize the stations as 'low frequency response' or 'adequate response' stations based on the data as submitted by the NLDC. The method and associated equipment for performing online frequency response tests for individual generators, as suggested by NDLC may become handy for ascertaining the primary response of the generators to the major events of generation loss/load throw.

25. It has come to our notice that Task Force under the Chairmanship of Member (Thermal), Central Electricity Authority has been constituted with the following 'Terms of Reference':

"a) Visit Dadri NCTPS & GPS and formulate the 'Term of Reference' for conducting the primary response tests on following generating units by a third party

- i. 500 MW thermal unit at Dadri NCTPS
- ii. 210 MW thermal unit at Dadri NCTPS
- iii. 130 MW gas turbine unit at Dadri GPS
- iv. 216 MW gas turbine unit at Bawana GPS
- v. 180 MW hydro unit at Chamera-I HPS
- vi. 250 MW hydro unit at Tehri HPS

- b) Develop a detailed testing procedure
- c) Conduct testing and tuning on the identified units
- d) Prepare a report of the pilot project by April 2013."

26. We direct the above task force to complete the testing and tuning of identified units in a time bound manner of the date of issue of the order. We also direct NLDC to extend all help to the Task Force and facilitate early completion of the listing of primary responses in a time bound manner and submit copy of the report to the Commission with its comments/suggestions.

27. NLDC shall be the nodal agency for smooth functioning of the Committee. Any expenditure on the testing of frequency response in the above stations shall be borne

by the RLDC and shall be charged as part of RLDC charges under 'System Operation Charges'. However, cost of such testing after the first stage shall have to be borne by the respective generating company. The Committee constituted to finalize the protocols/modalities of testing shall finalize its report within six months from the date of issue of the order. We direct the NLDC to submit to the Commission a report containing test results within two months thereafter.

28. The petition is disposed of with the above directions.

Sd/-
(M. Deena Dayalan)
Member

sd/-
(V.S.Verma)
Member

sd/-
(S.Jayaraman)
Member

sd/-
(Dr. Pramod Deo)
Chairperson