

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Coram

1. **Shri Ashok Basu, Chairman**
2. **Shri K.N.Sinha, Member**
3. **Shri Bhanu Bhushan, Member**
4. **Shri H. L. Bajaj, Member (EO)**

Petition No.66/2003

In the matter of

Free Governor mode of operation on all generating units installed at Ramagundam Super Thermal Power Station (Ramagundam STPS) of NTPC

And in the matter of

Southern Regional Load Despatch Centre	... Petitioner
Vs	
National Thermal Power Corporation Ltd (NTPC)	...Respondent

Petition No.4/2004

In the matter of

Exemption from participating in Free Governor mode of operation for the machines of different power stations of OHPC

And in the matter of

Orissa Hydro Power Corporation, Bhubaneshwar Petitioner
Vs	
Eastern Regional Load Despatch Centre, Kolkata Respondent

Petition No.12/2004

In the matter of

Exemption from participating in Free Governor mode of operation for NLC power stations

And in the matter of

Neyveli Lignite Corporation Ltd, Chennai

Petitioner

Vs

1. Southern Regional Load Despatch Centre, Bangalore
2. Tamilnadu Electricity Board, Chennai
3. Transmission Corporation of Andhra Pradesh, Hyderabad
4. Karnataka Power Transmission Corporation Ltd, Bangalore
5. Kerala State Electricity Board, Thiruvanthapuram
6. Pondichery Electricity Department, Poindichery
7. National Thermal Power Corporation Ltd, New Delhi

Respondents

The following were present

S/Shri

1. S.K. Soonee, GM, SRLDC Powergrid
2. R.G.Yadav, Powergrid
3. S.Mehrotra, PGCIL
4. Umesh Chandra, Powergrid
5. P.C. Pankaj, Powergrid
6. U.K.Tyagi, Powergrid
7. Alok Roy NRLDC, Powergrid
8. V.V. Sharma, Powergrid
9. V. Mittal, Powergrid
10. D.D. Dhayaseelan, Powergrid
11. V.K. Agarwal, NRLDC
12. S.R. Narsimmhan, NRLDC
13. Vivek Pandey, NRLDC
14. S.S. Barpanda, Chief Manager, ERLDC, Powergrid
15. Anjan Roy, GM, WRLDC
16. P. Pentayya, DGM, WRLDC
17. S.K. Banerjee, ERLDC, Powergrid
18. Chandan Roy, NTPC
19. R.S. Sharma, NTPC
20. V.B.K. Jain, NTPC
21. M.S. Chawla, NTPC
22. Shankar Saran, NTPC
23. Anil Chawla, NTPC
24. Lallji Agarwal, NTPC
25. S.K. Das, NTPC
26. A.K. Ahuja, NTPC
27. Arun Dua, Sr. Manager, NTPC
28. R. Singhal, NTPC VVN
29. Vijay Gupta, NTPC VVN

30.V.K. Singhal, NTPC
31.G.M.Sahoo, OHPC
32.S.K.Sarang, OHPC
33.R.Suresh, Dy.GM, NLC

ORDER
(DATE OF HEARING 13.4.2004)

Petition No 66/2003

The petitioner, Southern Regional Load Despatch Centre, has brought out that the respondent has failed to comply with the provisions of IEGC, in particular, Clauses 1.6, 4.8 (c) and 4.8(d), 6.2(e) and 6.2(f) as also the Commission's order dated 30.10.1999 in Petition No.1/1999, so far as the operation of the generating units at Ramagundam STPS in Free Governor Mode is concerned. Accordingly, it has made the following prayers in the petition:

- "(a) To direct the respondent to faithfully follow the provisions of IEGC (Clause 1.6, 4.8(c), 4.8(d), 6.2(e) & 6.2(f) and relevant CERC Orders.
- (b) To direct the respondent to put the Generating Units at Ramagundam Super Thermal Power Station in Free Governor Mode of Operation.
- (c) To disallow a component of fixed charges as a deterrent for not participating in Free Governor Mode of Operation.
- (d) To pass such further order or orders as may be deemed proper in the circumstances of the case."

2. Free Governor Mode of Operation, (For short 'FGMO') is a defense mechanism against grid disturbances and is a standard practice worldwide. Though the manual control through resetting of speed set point is also important but in actual practice a very fast response is impossible to achieve the desired result through human intervention. SRLDC during its presentation has clearly brought out that FGMO has smoothed the frequency curve and sharp frequency fluctuations are mitigated to a large extent under

FGMO. As critical mass is vital to the successful implementation of FGMO, it is required that all major generating units should be on FGMO. Partial response and blocked governors in some of the units increase undue strain on the units, which are put on FGMO, because only the latter absorb the load fluctuations. If more number of generating units are on FGMO, then the load variations are shared by all the units proportionally and the units are not stressed. It has also been shown that under FGMO, time required for restoring the grid operating conditions gets substantially reduced. These are the few advantages of putting the generating machines on FGMO.

3. The Commission in its order dated 30.10.1999 in Petition No.1/1999 had directed as under:

".....we direct that to begin with the stipulation regarding free governor shall apply to thermal units with a capacity of 200 MW and above, with immediate effect. This condition will also apply to all reservoir based hydro stations. For N.E. region, this condition will apply to units of 10 MW capacity and above. Keeping in view the time required to activate free governors, CTU may separately announce the time limit by which all other units should put free governors in action. We also grant liberty to any particular unit to approach the Commission to get exempted from the provisions regarding free governor for valid reasons. As regards the plea of Nuclear Power Corporation to provide a separate dispensation in view of safety considerations and special characteristics of Nuclear Plants, we have considered the matter and it is appropriate that Nuclear Units be permitted to continue operating in 'turbine follow reactor' mode. Since nuclear capacity is small compared to regional capacity, such special dispensation will not make any significant difference. CTU is directed to accordingly modify clause 4.8.c so that (a) thermal generating units of 200 MW and above (10 MW and above for N.E. region) and reservoir based hydro stations need only to be covered by this clause immediately; (b) for all other units CTU may separately announce time limits for putting free governor in action." (Emphasis added).

4. As laid down in Clause 1.6 of IEGC, the date of implementation of FGMO on all thermal generating units of installed capacity of 200 MW and above and reservoir based hydro units of installed capacity of 50 MW and above in all regions except North-Eastern Region, was linked with the implementation of commercial mechanism in the respective region. So far as North-eastern Region is concerned, clause 1.6 provides that all thermal and reservoir based hydro generating stations of installed capacity of 10 MW and above in the Region were to be brought under FGMO from the date of implementation of commercial mechanism in that region. The commercial mechanism, which is also described as Availability Based Tariff (ABT), has been implemented in all the five regions from the dates indicated below:

- | | | | |
|-----|----------------------|---|-----------|
| (a) | Western Region | - | 1.7.2002 |
| (b) | Northern Region | - | 1.12.2002 |
| (c) | Southern Region | - | 1.1.2003 |
| (d) | Eastern Region | - | 1.4.2003 |
| (e) | North-Eastern Region | - | 1.11.2003 |

5. Accordingly, in accordance with Clause 1.6 of IEGC, by now FGMO ought to have been implemented in all the regions.

6. According to the petitioner, in a meeting of Southern Regional Electricity Board held on 5.7.2003, all concerned had agreed to put their machines on FGMO with effect from 00:00 hrs of 1.8.2003. It is alleged that the respondent failed to implement the decision, unanimously arrived at, as it did not put all its machines at Ramagundam STPS on FGMO. The petitioner made efforts to persuade the respondent to implement the

decision taken at SRE Board, but to no avail. In this regard the petitioner has placed on record the correspondence exchanged with the respondent on the subject. Accordingly, the petitioner has sought the directions reproduced in para 1 above.

7. On consideration of the allegations made in the petition, while issuing notice to the respondent, the Commission had considered it appropriate to issue notice to the Central Transmission Utility (CTU) as well to file an appropriate affidavit apprising the Commission of the status regarding operation of the generating units in all the regions within the country on Free Governor Mode.

8. The petition was initially heard on 4.12.2003, when it was stated on behalf of the respondent that the generating units 1, 2, 3 and 5 at Ramagundam STPS were put on FGMO one by one by 19.9.2003 and Unit 6 on 11.11.2003. So far as the unit 4 is concerned, it was informed that it was under forced outage and had been restored two days before the hearing. A fresh affidavit has been filed by the respondent to the effect that unit 4 had also been put on FGMO. The correctness of the statement made on affidavit has been confirmed on behalf of the petitioner. With this the main grievance of the petitioner does not survive.

9. When we heard the matter on 13.4.2004, Shri Chandan Roy, Director (Operations), NTPC gave an undertaking on behalf of NTPC that the directions of the Commission and the provisions of IEGC would be strictly complied with and that in future all its machines would be kept on FGMO. The respondent shall be bound by the undertaking given. In view of this undertaking, no further directions on prayers extracted

at para 1 (a) and (b) are called for. On the question of levy of penalty for the past non-compliance of the provisions of IEGC, we note that the Commission will be observing for some more time the conduct of the respondent in view of the undertaking given on its behalf in the matter. A serious view will be taken in case of any default in compliance of the undertaking given.

10. The respondent has, however, stated that on account of operating of its machines on Free Governor Mode, it stands to lose. It has been stated, based on data for the period from 10.11.2003 to 23.11.2003, Ramagundam STPS had incurred negative UI of the order of Rs.7.33 lakh and has lost another Rs.17 lakh towards fuel cost, not recoverable from the constituents of Southern Region, when the generating units were put on FGMO. It also pointed out certain technical difficulties that were coming in the way of putting generating units on FGMO. At the hearing the respondent submitted that there had been wide variation and excursions above design limits in the operational parameters like main stream temperature and pressure, HRH temperature, SH and RH metal temperature, throttle pressure, drum pressure, control valve hunting having life cycle implications. There were documented reports of failure of rotors under fluctuating loading conditions. FGMO under load following mode requires sliding pressure operation for which boiler is not designed. The respondent prayed for a reconsideration with a view to resolving the commercial and technical difficulties.

11. As noted above, the petition was filed for directions to the respondent. However, considering the vital significance of the issue raised, the scope of the proceedings was widened as the Commission thought it proper to review the situation on all-India basis.

Accordingly, vide order dated 10.12.2003, the Commission had directed the CTU to file an affidavit, covering the following aspects:

- (a) Statement giving break-up of all the units identified for putting under FGMO, in the first instance, along with their ownership and status of implementation, that is, partial or full.
- (b) Statement, unit-wise and ownership-wise of units which were brought on FGMO but were withdrawn subsequently by the generator, and
- (c) A scheme for watching and monitoring of continuity on FGMO on regular basis.

12. The affidavit filed on behalf of the CTU is revealing as it documents the status of implementation of FGMO. The CTU indicated the status of FGMO in different regions as follows:

SI.No	Region	Date of Implementation of FGMO	Total Capacity on FGMO	Response	Partial	Non-response	Data-not available	Withdrawn from FGMO	Total
			MW	MW	MW	MW	MW	MW	MW
1	N.R	07.10.2003	15338	4341	2890	2440	5667	420	15758
2	W.R	02.1.2004	17580	0	6000	11580	0	600	18180
3	S.R	01.8.2003	17974	5399	11805	770	0	0	17974
4	E.R	02.1.2004	9860	5350	2520	1990	0	0	9860
5	N.E.R	07.1.2004	1113.2	685	294.7	133.5	0	0	1113.2

13. In regard to the generating stations which were initially brought on FGMO but were withdrawn subsequently by the generator, the CTU furnished the following information:

Region	Station	Date of Withdrawal
Northern Region	Unit 4 & 5 (210 MMW each) of Badarpur TPS	22.1.2004
Western Region	Koyna stage-I & II (Total 600 MW)	04.1.2004
Southern & Eastern Region	None of the units has been withdrawn	

14. The CTU in its affidavit has highlighted the following issues to be resolved for implementation of FMGO:

- (a) Central Sector Generating stations have pointed out that there are commercial implication in the implementation of FMGO. For example, if the generation picks up on account of FGMO above the declared capability, the UI charges are not paid for the extra generation. This conflict of interest is one of the roadblocks. The state owned generating stations would face similar conflict of interest as and when intra-state ABT is implemented.
- (b) The generating units, which are covered under clause 1.6 (iii) of IEGC, can be taken on FGMO only after the stabilization of FGMO on the thermal and hydro units, which are identified and covered under clause 1.6 (i) and (ii) of IEGC.
- (c) Since over the past many years, the generating units have been operating with locked governors, more time (4-6 months) would be required for stabilization of FGMO on the identified units, before the other units can be put on FGMO.

(d) In the case of NER, there are a number of strategically located units, whose MW variation can cause overloading of some of the transmission corridors and may lead to grid instability.

15. In view of above, CTU has recommended as follows:

- (i) The Commission may review the status of implementation of FGMO in the different regions after 3 months.
- (ii) CTU and each of the Generating utilities/SEBs should file affidavits of their experience, problems and further course of action/targets before the next hearing.
- (iii) RLDCs should conduct monthly meetings to review the status/response of the units under FGMO.
- (iv) During the intervening period, the generating stations may file petitions for exemptions, if required, before the Commission. Exemptions, if any, may be provided expeditiously to enable focussed efforts to be made for FGMO.

16. The CTU also submitted the detailed account of the status of FGMO in the five regions of the country at the hearing on 13.4.2004. The status of FGMO as in April 2004 indicated by the CTU is as follows:

	Total Capacity on FGMO		Adequate	Partial	No-response
	(units)	MW	(units)	(units)	(units)
			MW	MW	MW
NER	(34)	1403.16	(19) 808.50	---	(15) 594.66
WR	(77)	18180.00	(3) 1500.00	(15) 3780.00	(59) 12900.00
SR	(125)	19025.00	(68) 10004.00	(50) 8250.00	(7) 770.00
ER	(57)	11010.00	(30) 7190.00	(6) 1260.00	(21) 2560.00
NR	(87)	16180.00	(10) 3020.00	(33) 5605.00	(44) 7555.00
Total	(380)	65797.16	(130) 22522.50	(104) 18895.00	(146) 24379.00

17. The CTU also stated that a capacity of 65797 MW out of a total capacity of 110000 MW in the country, was identified to be put on FGMO in the first phase which includes thermal sets of 200 MW and above and Hydro sets of 50 MW. It could be seen that out of 65797 MW only 22522 MW is responding adequately. A capacity of 18895 MW is responding partially. There is improvement in the response in all regions except the Western Region. In the Western Region most of the units are not giving adequate response. In the North-eastern Region, in which ABT has been implemented recently more than 50%, units are giving adequate response. The CTU informed that FGMO had smoothed the wide frequency fluctuations and with the implementation of FGMO the frequency band had narrowed down.

18. The main commercial concerns of the generators with regard to FGMO have been adequately addressed in the terms and conditions of tariff notified by the Commission on 26.3.2004, applicable from 1.4.2004. Now only a few technical problems need to be taken care of. We consider the technical aspects of the problems projected by the respondent need to be studied by CEA, as a technical expert. The respondent is, therefore, directed to approach CEA with all the necessary technical details and the problems faced and render all necessary assistance to CEA for an indepth study. CEA may submit its report to the Commission latest by 15.8.2004. However, in the meantime, the existing system of FGMO shall continue to be followed and the respondent shall implement the scheme envisaged in the IEGC in view of the undertaking given on its behalf at the hearing.

19. The respondent in this petition has filed an application for impleadment of certain state/central power utilities as also the private ones. At this stage, we do not consider it

necessary to specifically implead them as prayed for by the respondent. The progress of implementation of FGMO will be monitored through the CTU and if on consideration of report(s) of the CTU, it becomes necessary to call any one defaulting in the process of implementation of FGMO, the Commission will in no way be handicapped to take appropriate steps, including coercive ones, if necessary. Therefore, the application filed by the respondent is dismissed.

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20. The petitioner (Orissa Hydro Power Corporation) has submitted that it too had technical problems in running the units on FGMO under particular operating conditions at around 70% loading. It is submitted that it is unsafe to operate the units in this critical zone and has sought exemption of its units from FGMO in this critical zone. We do not propose to go into the merits of the issue raised by the petitioner in view of our decision to refer the study of all technical aspects of the problem to CEA. Accordingly, the petitioner may also approach CEA with its technical problems, for study by CEA who will advise the Commission on the issues raised by the petitioner.

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21. NLC, the petitioner submitted that all the units of the stations were put on FGMO. However, these units being very old, operation beyond 215 MW was not possible. It is submitted that it is unsafe to operate the machines beyond this under FGMO. The petitioner in this case also seeks exemption from FGMO. We direct that the petitioner may bring its difficulties and problems to the notice of CEA, along with complete details for latter's study and report as aforesaid. However, in the meanwhile no exemption from

FGMO could be considered and the petitioner shall be liable to implement the provisions made in IEGC.

General

22. The present order is made based on the petitions filed before the Commission. Maybe, other generators also face similar kinds of technical difficulties in regard to putting their machines on FGMO. Thereofre, Member Secretary, REBs are directed to bring the contents of this order to the notice of the constituents of the respective REB so that if any one of them has any technical difficulties, it may also approach CEA for study of its problems and difficulties in the light of aforesaid directions.
23. List these petitions on 27.7.2004 for further directions.

**Sd/-
(H.L. BAJAJ)
MEMBER**

**Sd/-
(BHANU BHUSHAN)
MEMBER**

**Sd/-
(K.N. SINHA)
MEMBER**

**Sd/-
(ASHOK BASU)
CHAIRMAN**

New Delhi dated the 21st May, 2004