

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Review Petition No. 13/2011

in

Petition No. 9/MP/2011

Coram:

Dr. Pramod Deo, Chairperson

Shri S. Jayaraman, Member

Shri V. S.Verma, Member

Shri M. Deena Dayalan, Member

Date of Hearing: 13.9.2011

Date of Order: 29.4.2013

IN THE MATTER OF

Review of Commission's order dated 28.6.2011 in Petition No. 9/2011 for Exemption from and Extension of time for implementation of Restricted Governor Mode Operation (RGMO) of various Thermal and Hydel generating stations operated by the Andhra Pradesh Power Generation Corporation Ltd (APGENCO)

AND

IN THE MATTER OF

Andhra Pradesh Power Generation Corporation Ltd, Hyderabad ...**Petitioner**

Parties Present

Shri K.Gopal Choudhury, Advocate, APGENCO

Shri B.G.K.Murthy, APGENCO

Shri R.G.Bansal, NLDC

Shri Sri Prakash, APGENCO

ORDER

Miscellaneous Petition No. 9/2011 was filed by the petitioner, Andhra Pradesh Power Generation Corporation Ltd, (APGENCO) for relaxation of the provisions of Clause 5.2 (f) of the Indian Electricity Grid Code (IEGC), 2010 in exercise of power under Clause (4) of Part 7 of the IEGC, 2010 and to grant exemption from, and extension of time, for



implementation of RGMO in the thermal and hydro generating stations of the petitioner, as detailed below:

(a) Exemption from RGMO

SI.No	Thermal/Hydro generating stations
1	Dr. Narla Tata Rao Thermal Power Station (420MW) LMW Units-I and II
2	Donkarayi Power House 1x 25MW
3	Nagarjunasagar Right Canal Power house 3 x 30 MW
4	Nagarjunasagar Left Canal Power house 2 x 30 MW
5	Penna Ahobilam Power house 2 x 10 MW

(b) Extension of time for RGMO

SI.No	Thermal/Hydro generating stations	Extension upto
i.	Dr. NTPPS- 3 X 210 KWU Units 3, 5 & 6	31.12.2011
ii.	Dr. NTPPS- 1 X 2010 KWU Unit 4 and 1 X 500 KWU Unit 7	31.12.2011
iii.	RTPP- 2 X 210 KWU Unit 1	31.12.2011
iv.	RTPP- 2 X 210 KWU Unit 2	31.12.2012
v.	RTPP- 2 X 210 KWU Unit 3 & 4	31.12.2011
vi.	KTPS- Stage- V- 2 X 250 MW KWU Units 9 & 10	31.12.2011
vii.	KTPP- 1 X 200 MW KWU Unit 1	31.12.2011
viii.	Machkund HEP- 3 X 23 MW + 3X 17 MW	31.12.2013
ix.	Upper Sileru PH- 4 X 60 MW	31.12.2012
x.	Lower Sileru PH- 7 X 110 MW	31.12.2012
xi.	Srisaillam RBPH- 7 X 110 MW	30.06.2012
xii.	Srisaillam LBPH- 6 X 150 MW	31.12.2013
xiii.	Nagarjunasagar- 1 X 110 MW + 7 X 100.8 MW	31.12.2013
xiv.	Jurala- 4 X 39 MW	31.12.2012

2. By order dated 28.6.2011 the said petition was disposed of by the Commission and the relevant portion of the order containing the findings of the Commission is as under:

"8. The Commission observed that RGMO has been recommended by CEA in LMW turbines also, which would involve consideration of capital expenditure, during the Renovation and Modernization (R&M) of the units. It was also observed that RGMO is in interest of generators and in case the generators delay the implementation of RGMO, then these units would have to be operated in FGMO mode with appropriate droop setting, so that these units participate in load sharing and contribute to the stability of the grid.

9. As regards the constraints expressed by the learned counsel for the petitioner on discharge of water in canal in case of hydro generating units, the representative of RLDC clarified that the constraints relating to discharge of water in canal were insignificant. He however submitted that these units could operate on FGMO mode as time constant of the governing system was much smaller than the time constant of control of water system. He also submitted that the non-implementation of RGMO resulted in fluctuation in grid frequency and destabilization of the line flow and voltages, thereby threatening grid stability. He however suggested that these units could be put on FGMO without loss of further time,

but prayed that the petitioner should be directed to implement the provisions of the IEGC, 2010 without fail.

10. Considering the submissions of the petitioner and the documents on record, we observe that the steps taken by the petitioner for implementation of the RGMO in its units of the generating station is belated. It is expected that the petitioner would expedite the implementation of RGMO in these units at the earliest. We, however direct the petitioner to ensure that these thermal and hydro generating units shall be put on FGMO with manual intervention with immediate effect, till such time RGMO is implemented."

3. Aggrieved by the said order, the petitioner has filed this review petition seeking review and modification of the order dated 28.6.2011, as under:

- (a) Exempt the petitioner's Dr. Narla Tata Rao Thermal Power Station (420MW) LMW Units-I and II from the requirement of RGMO and allow time till 31.12.2011 for implementation of FGMO with manual intervention to the extent practically feasible in these units, and
- (b) Allow time upto 31.12.2011 for implementation of FGMO in Dr. NTPPS- 3 X 210 KWU Units 5 & 6, Dr. NTPPS- 1 X 500 KWU Unit 7, RTPP- 2 X 210 KWU Units 1&2, KTPP- 1 X 500 MW KWU Unit I and KTPS- Stage- V- 1 X 250 MW KWU Unit 10; and
- (c) Exempt the petitioner's Nagarjunasagar Right Canal Power house 3 x 30 MW, Nagarjunasagar Left Canal Power house 2 x 30 MW, Donkarayi Power House 1x 25MW and Penna Ahabilam Power house 2 x 10 MW from the requirement of RGMO and FGMO ; and
- (d) Pass such order as the Hon'ble Commission to consider fit and expedient in the facts and circumstances of the case.

4. The petition was listed for hearing on 'admission' on 13.9.2011 and the learned counsel for the petitioner reiterated his submissions as stated in the petition. However, as regards irrigation canal based hydro generating units like Nagarjunasagar Right canal and Left canal power stations, the learned counsel for the petitioner submitted that operation of the said units under FGMO and RGMO is not possible. He also submitted that FGMO operation of these units with manual intervention involves consequent variation of and interference with the discharge of canals which is impermissible. He also submitted that the order of the Commission dated 28.6.2011 to operate under FGMO till RGMO is made in respect of all generating stations without considering the facts and circumstances specifically averred in respect of these hydropower stations. Accordingly, the learned



counsel had prayed for review of order dated 28.6.2011 in terms of the prayers made in the petition. Considering the difficulties faced by the petitioner in respect of irrigation canal based hydropower stations, it was suggested by the Commission that the matter may be taken up by the petitioner with the irrigation authorities as regards their willingness to allow the implementation of RGMO in hydropower stations wherein strict control on the discharge is effected by them.

5. Pursuant to the suggestions of the Commission as aforesaid, the petitioner by its affidavit dated 28.8.2012 filed additional submissions indicating the present status with regard to the implementation or otherwise of RGMO in various Thermal and hydropower generating stations and also the update on the outcome of the letter addressed to the irrigation authorities for their willingness to allow RGMO in certain hydropower stations, as per suggestion of the Commission on 13.9.2011, and also considering the amendment of the CERC (Indian Electricity Grid Code) Regulations, 2010 on 5.3.2012.

6. Heard the petitioner and examined the documents available on record. During the pendency of this petition, the Commission had notified the Central Electricity Regulatory Commission (Indian Electricity Grid Code) (First Amendment) Regulations, 2012 on 5.3.2012, which came into force with effect from 2.4.2012. By the said notification, a proviso to Regulation 5.2 (f)(iii) of the principal regulations, was inserted as under:

“Provided that if a generating unit cannot be operated under restricted governor mode operation, then it shall be operated in free governor mode operation with manual intervention to operate in the manner required under restricted governor mode operation.”

7. The petitioner has submitted that the units of the thermal generating stations namely, Units 3, 4, 5 and 7 of Dr. Narla Tata Rao TPS (3 X 210 MW and 1 x 500 MW KWU), Units 3, 4 and 5 of Rayalaseema TPP (3 x 210 MW KWU), Units 9 and 10 of Kothagudem TPS-Stage-V (2 x 250 MW KWU) and Kakatiya TPP (1 x 50 MWW) are

operating under RGMO. The efforts taken by the petitioner to ensure efficient grid operation on this count are highly appreciable.

8. We now examine and consider the submissions of the petitioner as regards the prayer for review of order dated 28.6.2011 along with the updated status in respect of various other generating units (both thermal and hydro) as submitted by the petitioner in the subsequent paragraphs.

(I) Thermal Generating units

Dr. Narla Tata Rao Thermal Power Station (420MW) LMW Units-I and II

9. In paragraph 8 of the order dated 28.6.2011, the Commission had observed as under:

"The Commission observed that RGMO has been recommended by CEA in LMW turbines also, which would involve consideration of capital expenditure, during the Renovation and Modernization (R&M) of the units. It was also observed that RGMO is in interest of generators and in case the generators delay the implementation of RGMO, then these units would have to be operated in FGMO mode with appropriate droop setting, so that these units participate in load sharing and contribute to the stability of the grid"

10. The petitioner in the review petition has submitted that the observations of the Commission in paragraph 8 of the order with regard to the recommendations of the CEA on RGMO in LMW Turbines were not put during the hearing on 9.6.2011 and therefore the petitioner had no opportunity to be heard thereon. Accordingly, it has also submitted that the Commission has proceeded on the basis that RGMO could be implemented in respect of these units and directed operation in FGMO mode with appropriate droop setting in the meantime. The petitioner has also pointed out that in case of TNEB, the Commission in its order dated 21.6.2011 in Misc. Petition No. 237/2010 had recognized and accepted that no scheme was available for implementation of RGMO in LMW turbines and exempted them from implementation of RGMO in those units and directed to put these units on FGMO with manual intervention. The petitioner has thus submitted that

these units can be operated in FGMO mode with manual intervention and the functions of RGMO cannot be performed. It has further submitted that due to reaction and response time feasible under manual intervention, there would be only a substantially coarse simulation of FGMO to the extent practically feasible. The petitioner has also added that immediate implementation of FGMO with manual intervention in these units is not possible as the implementation can be effected only during annual shutdown as and when permitted by SLDC. Thereafter, the petitioner in its additional submissions has informed that the units of the generating station are available for operation in FGMO with manual intervention and operation in RGMO is not possible and exemption from the same has been prayed for.

11. The matter has been examined. In Petition No. 237/2010, the Commission by its order dated 21.6.2011 had observed as under:

"In view of the statement of OEM (BHEL), dated 21.5.2010 that there was no such scheme available at their end for implementation of RGMO in LMW turbines of Units-I to IV of Mettur Thermal Power Stations (MTPS) and the Units-I to III of Tuticorin Thermal Power Station (TTPS), the petitioner is directed to put these units of the generating stations of Free Governor Mode Operation (FGMO) with manual intervention to perform the function of RGMO"

12. The above observations made in order dated 21.6.2011 in respect of TNEB, has admittedly been overlooked by the Commission at the time of passing of the order dated 28.6.2011 in the instant case, thereby depriving the petitioner the benefit of the relief of exemption from RGMO, in respect of this generating station as prayed for by the petitioner. This according to us is an error apparent on the face of the order which is required to be rectified in review. Taking into consideration the submissions of the petitioner and the observations of the Commission's order dated 21.6.2011 in Petition No. 237/2010, the review of order dated 28.6.2011 on this ground is allowed. Accordingly, we

allow the operation of the said units on FGMO with manual intervention, which the petitioner has been able to achieve as per its submissions dated 28.8.2012.

13. The petitioner in its petition has also submitted the details of the steps taken to implement RGMO operation in respect of thermal generating stations and which have been put on FGMO with manual intervention with immediate effect till such time RGMO was implemented. Taking into consideration the prayer of the petitioner and the present status submitted by affidavit dated 28.8.2012, we, in the interest of justice, review and modify the order dated 28.6.2011 in respect of the other generating stations as stated below.

Dr. Narla Tata Rao TPS, Unit –VI (210 MW) and Rayalaseema TPP, 2x210 MW KWU Units I and II

14. The petitioner in its petition has submitted that FGMO cannot be implemented in these units with immediate effect because the implementation of FGMO in these units also requires software/hardware modifications in the present EHG ATRS system and the units will be required to be shut down. It has also submitted that having regard to the power demand and system operation considerations, the implementation of FGMO can be done during the annual overhauls during 2011 and as and when the consent of SLDC is given for shut down. Thereafter, the petitioner vide its affidavit dated 28.8.2012 has submitted that Unit VI of Dr. Narla Tata Rao TPS is under annual overhaul shutdown from 21.7.2012 and RGMO will be implemented during the present shutdown. In respect of Units I and II of Rayalseema TPP, software/hardware modifications were carried out during the shutdown and now the units are operating in FGMO. Unit II was under shut down for capital overhaul from 20.6.2012 and R&M of the C&I system to max DNA was being carried out and consequently, RGMO will be implemented. Moreover, for Unit-I,

RGMO can be implemented only after R&M of C&I system is undertaken during capital overhaul scheduled in 2013, the petitioner has added. Considering the submissions of the petitioner and since these units are operating in FGMO with manual intervention, we allow time for implementation of RGMO after completion of R&M of C&I system undertaken during capital overhaul.

(II) Hydro generating stations

Donkarayi (1 x25MW)

15. The petitioner has submitted that it had sought exemption from implementation of RGMO for this hydrogenating station on the ground that it was not feasible and the Commission in its order had rejected the same without considering the said submissions. Aggrieved, the petitioner in support of its prayer for exemption from implementation of RGMO has submitted as under:

"This power house operates between the discharge of the Upper Sileru Power house and the Fore bay of the Lower Sileru Power house. Its operation is dependent upon and controlled by the discharges from the Upper Sileru Power house. The maintenance of the level in the Fore Bay of the Lower Sileru Power House and the strict requirement to monitor flow without endangering the breach of the Fore Bay is imperative and decisive. There is no scope for controlling the water flow on other considerations under FGMO or otherwise. It is therefore not feasible to implement FGMO in this hydro station"

16. While reiterating the above submissions, the petitioner in its affidavit dated 28.8.2012 has submitted that implementation of FGMO or RGMO is not feasible and it is necessary to grant exemption from the requirement to operate under FGMO and RGMO. It has also been submitted that in such small stations, the maximum of 5% variation of generation that may be required by FGMO/RGMO is of insignificant effect on the frequency of the very large capacity Regional/National Grid and the costs of implementing RGMO is disproportional and not justifiable for any tangible benefits more particularly when considered along with other constraints as detailed.

17. The submissions of the petitioner that variation in generation and the consequent discharge from the generating station has insignificant effect to the frequency of large capacity grid, is not acceptable. The generation and the consequent discharges from the hydro generating stations vary depending upon variation in the inflows during the different seasons. As such, the variation in discharges to accommodate operation in FGMO/RGMO is negligible when compared to seasonal variations. To assume that FGMO/RGMO operation in all small hydro generating stations would not help the large capacity Regional / National Grid, would only result in endangering the safety of the grid. Being a collective effort, these hydro generating stations do play a major role in providing primary response to the fluctuations in grid frequency. Considering the above, the petitioner is directed to implement operation in FGMO with manual intervention in respect of this generating station.

Irrigation Canal based hydro generating stations

- (a) Nagarjunasagar Right Canal Power house 3 x 30 MW
- (b) Nagarjunasagar Left Canal Power house 2 x 30 MW

18. The petitioner has submitted that the flow of water in respect of these irrigation canals based hydro power stations are under the strict and exclusive control and direction of the Irrigation Authorities and no variation or interference whatsoever in the discharge or the flow of water is allowed by the Irrigation Authorities. It has also submitted that no variation and interference by the power house whatsoever with the flow or discharge is permissible. The petitioner has submitted that this is an unexceptionable requirement of the Irrigation Authorities who are beyond the jurisdiction of the Commission in respect of control of irrigation, water resources used incidentally for power generation and involves among other serious issues, the safety of canal system and the interest and ire of ayacut

farmers. The petitioner has further submitted that pursuant to the suggestions of the Commission during the hearing on 13.9.2011 a letter was addressed to the irrigation authorities for their willingness and objections for the implementation of RGMO in these units. In response, the irrigation and CAD Department of Government of Andhra Pradesh by letter dated 23.12.2011 has object to the implementation of RGMO in these units. Accordingly, the petitioner has added that the operation of these units under RGMO and FGMO is not possible. The petitioner has further stated that FGMO operation of these units with a manual intervention involves consequent variation of and interference with the discharge in canals which is impermissible and such a requirement cannot be complied with because of binding constraints as above.

19. The submissions have been examined. Considering the difficulties faced by the petitioner in the implementation of RGMO/FGMO in respect of the above irrigation canal based hydro generation stations of the petitioner and in view of the stand taken by the Irrigation Authority of the Government of Andhra Pradesh, we are of the considered view that these hydro generating stations could be exempted from implementation operation in RGMO/FGMO. We order accordingly.

Penna Ahobilam (2x10MW)

20. The petitioner has submitted that the water discharged from Penna Ahobilam reservoir (ca 10 MC capacity) go to one mid Pennar Dam Reservoir (ca 3 TMC capacity) and from there through right and left canal (without any generation) water goes to meet the irrigation requirement. The petitioner has also submitted that discharges of water are therefore dependent upon instructions of Irrigation Authorities depending upon the reservoir levels and discharges required for irrigation. The petitioner has further submitted that the cost of implementing FGMO in such circumstances is disproportional and not

justifiable. The petitioner has added that the discharges cannot be varied due to power system requirements and the compliance with instructions of Irrigation Authorities is mandatory. It has also submitted that the power house has practically not generated more than 7.2 MW with single unit due to insufficient water accumulation in the reservoir since its commissioning. Accordingly, the petitioner has prayed that this generating station may be exempted from operating under FGMO/RGMO.

21. Considering the submission of the petitioner and the difficulties faced by it in the implementation of RGMO/FGMO due to instructions of the Irrigation Authorities on water discharges, we are of the considered view that the hydro generating stations should be exempted from RGMO/FGMO for mode of operation. We order accordingly.

Machkund Hydro Electric Project (3x23 + 3x17 MW)

22. The petitioner has submitted that this hydro electric project with a total installed capacity of 120 MWs runs as a base load station as per the water available in the Jalaput Reservoir and the discharge from this power house maintains the water level in the Balimela Reservoir from which the States of Orissa and Andhra Pradesh share water equally. It has also submitted that the governors do not have facilities required for RGMO/FGMO and proposals are under consideration between the petitioner and OHPC for R&M of the generating stations by joint participation and the arrangement is expected to be concluded soon. The petitioner has further submitted that under the R&M scheme it has proposed to replace the existing units themselves along with the governor with new ones and thereafter the RGMO operation can be met after the conclusion of the arrangements for the R&M scheme. The petitioner has added that the delivery period for the equipment is about 18 months and hence time upto 31.12.2013 for implementation of RGMO in this generating station be allowed. Further, the petitioner has submitted that the

finalization of R&M scheme clearance and concurrence of both the State Governments and therefore, the implementation is likely to be delayed upto December, 2015.

23. The matter has been examined. Considering the submissions of the petitioner and the steps taken by the petitioner for the implementation of RGMO in this generating station we allow extension of time upto 31.12.2013 for operating the units on RGMO. In the meanwhile, we direct the petitioner to operate the units under FGMO with manual intervention.

Upper Sileru Hydro Electric project (4x60 MW).

24. The petitioner has submitted that the first stage governors or of mechanical fly ball type and have become old and obsolete and these units are operated in FGMO with manual intervention. It has also submitted that the second stage machines are also operated in FGMO with manual intervention. The petitioner has further submitted that there is no provision to operate these governors in RGMO mode without replacing the governors entirely and the replacement of governors for RGMO will be considered during future R&M works.

Lower Sileru Hydro Electric project (4x115 MW)

25. The petitioner has submitted that these units were commissioned with magnetic amplifier based hydraulic operated governor of LMW make and these governors are operated in FGMO with manual intervention. The petitioner has further submitted that there is no provision to operate these governors in RGMO mode without replacing the governors entirely and the replacement of governors for RGMO will be considered during future R&M works.

Srisaillam Left bank Power House (6x150 MW)

26. The petitioner has submitted that the hydro generating station is equipped with analogue based Hitachi governors and is being operated in FGMO with manual intervention. The petitioner has further submitted that there is no provision to operate these governors in RGMO mode without replacing the governors entirely and the replacement of governors for RGMO will be considered during future R&M works.

Nagarjuna Sagar (7x100.8 MW)

27. The petitioner has submitted that the first unit of this generating station is of M/s. BHEL make, non-reversible turbine type and is being operated in FGMO with manual intervention with new micro-processor based governor and incorporation of RGMO facility will be completed by the end of October, 2012. The petitioner has further submitted that there is no provision to operate these governors in RGMO mode without replacing the governors entirely and the replacement of governors for RGMO will be considered during future R&M works.

28. The submissions of the petitioner in paragraphs 24 to 27 above have been examined. It is noticed that these projects have been put under FGMO with manual intervention. Though, the petitioner has submitted that there is no provision for operation under RGMO without replacing the governors entirely which is to be considered under future R&M works, no timeframe has been furnished by the petitioner for implementation of RGMO in respect of these hydro generating stations under future R&M works. It is also noticed that the petitioner in its original petition had sought extension of time upto 31.12.2012 for implementation of RGMO in respect of the above said generating stations. In our view, the implementation of RGMO in respect of these hydro generating stations cannot be left open ended. In view of this, the petitioner is directed to take immediate

steps for replacement of the governors in order to put these hydro generating stations on RGMO mode of operation at the earliest. However, considering the submissions of the petitioner, extension of time upto 31.12.2013 is allowed in respect of the above said hydro generating stations for RGMO mode of operation.

Jurala (6x39 MW)

29. The petitioner has submitted that the governing equipment of this hydro electric project which has been commissioned during the period 2008-11 is from PR China. It has also submitted that this hydro generating station is a run of the river system and surplus water is utilized for generation and all the six units are being operated in FGMO with manual intervention. It is noticed that the petitioner has not furnished the details as to why the units could not be operated under RGMO. It is observed that the petitioner in its original petition has sought time to extension upto 31.12.2012 for implementation of RGMO in respect of this generating station. Considering the submissions, we direct the petitioner to put these units under RGMO without further delay.

30. Based on the above discussion, the order dated 28.6.2011 in Petition No. 9 of 2011 stands modified/reviewed to the extent indicated above.

31. Review Petition No. 13 of 2011 is disposed of in terms of the above.

Sd/-
[M.Deena Dayalan]
Member

Sd/-
[V.S.Verma]
Member

Sd/-
[S.Jayaraman]
Member

Sd/-
[Dr. Pramod Deo]
Chairperson

