

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No.192/2010

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

DATE OF HEARING: 7.12.2010

DATE OF ORDER: 31.1.2012

In the matter of

Miscellaneous petition under Regulation 24 read with Regulation 111 and Regulation 44 "Power to Relax" of the CERC (Terms and Conditions of Tariff) Regulations, 2009 to include time lines for 765 kV D/C EHVAC Transmission lines and \pm 800 kV HVDC Transmission Systems.

And in the matter of

Power Grid Corporation of India Ltd., Gurgaon

.... Petitioner

Vs

1. Himachal Pradesh State Electricity Board, Shimla
2. Rajasthan Rajya Vidyut Prasaran Nigam Limited, Jaipur
3. Ajmer Vidyut Vitaran Nigam Ltd., Ajmer
4. Jaipur Vidyut Vitaran Nigam Ltd, Jaipur
5. Jodhpur Vidyut Vitaran Nigam Ltd, Jodhpur
6. Punjab State Electricity Board, Patiala
7. Haryana Power Purchase Centre, Panchkula
8. Power Development Department, Jammu (Tawi)
9. Uttar Pradesh Power Corporation Ltd., Lucknow
10. Delhi Transco Ltd, New Delhi
11. BSES Yamuna Power Ltd., New Delhi
12. BSES Rajdhani Power Ltd., New Delhi
13. North Delhi Power Ltd., New Delhi
14. Chandigarh Administration, Chandigarh
15. Uttarakhand Power Corporation Ltd, Dehradun
16. Northern Central Railway, Allahabad
17. New Delhi Municipal Council, New Delhi
18. Assam State Electricity Board, Guwahati
19. Meghalaya State Electricity Board, Shillong
20. Government of Arunachal Pradesh, Arunachal Pradesh
21. Power & Electricity Deptt., Aizwal, Mizoram
22. Electricity Department, Manipur
23. Department of Power, Gov. Of Nagaland, Kohima, Nagaland
24. Tripura State Electricity Corporation Limited, Agartala
25. Bihar State Electricity Board, Patna
26. West Bengal State Electricity Board, Kolkata
27. Grid Corporation of Orissa, Bhubaneswar
28. Damodar Valley Corporation, Calcutta
29. Power Department, Govt of Sikkim, Gangtok
30. Jharkhand State Electricity Board, Ranchi

31. Madhya Pradesh Power Trading Co. Ltd., Jabalpur
32. Maharashtra State Electricity Distribution Co. Ltd., Mumbai
33. Gujarat Urja Vikas Nigam Ltd., Vadodara
34. Electricity Department, Govt. Of Goa, Panaji, Goa
35. Electricity Department, Daman
36. Electricity Department, Silvassa
37. Chhatisgarh State Electricity Board, Raipur, Chhatisgarh
38. Madhya Pradesh Audyogik Kendra Vikas Nigam (Indore) Ltd., Indore
39. Kerala State Electricity Board (KSEB), Thiruvananthapuram
40. Tamilnadu Electricity Board (TNEB), Anna Salai, Chennai
41. Electricity Department, Govt. Of Pondicherry, Pondicherry
42. Transmission Corporation of Andhra Pradesh Ltd. (APTRANSCO), Hyderabad
43. Northern Power Distribution Company of Andhra Pradesh Limited (APNPDCL), Kazipet, Warangal, Andhra Pradesh
44. Eastern Power Distribution Company of Andhra Pradesh Limited (APEPDCL), Vishakhapatnam, Andhra Pradesh
45. Southern Power Distribution Company of Andhra Pradesh Limited (APSPDCL), Chittoor District, Andhra Pradesh
46. Central Power Distribution Company of Andhra Pradesh Limited (APCPDCL), Hyderabad, Andhra Pradesh
47. Karnataka Power Transmission Corporation Ltd. (KPTCL), Bangalore
48. Bangalore Electricity Supply Company Ltd., (BESCOM), Karnataka
49. Gulbarga Electricity Supply Company Ltd., (GESCOM), Karnataka
50. Hubli Electricity Supply Company Ltd., (HESCOM), Karnataka
51. MESCOM Corporate Office, Mangalore, Karnataka
52. Chamundeswari Electricity Supply Corporation Ltd., (CESCO), Mysore, Karnataka

The following were present:

1. Shri M. M. Mondal, PGCIL
2. Shri B. Vamsi, PGCIL
3. Shri Rajeev Gupta, PGCIL
4. Shri S. S. Rao, PGCIL
5. Shri Prashant Sharma, PGCIL
6. Shri Anish Anand, PGCIL
7. Shri Manoj Dubey, MP Tradeco
8. Shri Rakesh Kumar, PGCIL
9. Shri B. B. Mukherjee, PGCIL

ORDER

The petitioner, Power Grid Corporation of India Limited (PGCIL), has filed the present petition under Regulations 24 and 111 of Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999 and Regulation 44 "Power to Relax" of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2009 (herein after

referred to as "2009 regulations") for relaxation of Regulation 15 of 2009 regulations:

- (a) to allow time lines for ± 800 kV, 3000 MW HVDC for Alipurduar-Agra (Bi-pole terminal) and ± 800 kV, 3000 MW HVDC for Biswanath Chariyali-Agra (Bi-pole terminal) and associated ± 800 kV Transmission lines, to the extent as stated at para 4.1.3. of the petition and allow additional return on equity of 0.5%; and
- (b) to include 765 kV D/C EHVAC Transmission line in Appendix-II to the 2009 regulations to the extent as stated at para 4.2.2. of the petition and allow additional for return on equity of 0.5%.

2. The petitioner has submitted that in order to meet the requirement of increased power transfer and to address the Right of Way problems, 765 kV D/C EHVAC Transmission lines and ± 800 kV HVDC Transmission Systems are being planned in the country. As per Regulation 15 of the 2009 regulations, for projects commissioned on or after 1st April, 2009, an additional return of 0.5% shall be allowed if such projects are completed within timeline specified in Appendix-II to the 2009 regulations. However, the timelines for 765 kV D/C Transmission lines and ± 800 kV HVDC Transmission lines have not been specified.

Timeline for ± 800 kV HVDC Transmission lines

3. The petitioner has submitted that ± 800 kV HVDC Transmission lines are not only envisaged for the first time in the world, but also are unique in nature owing to multi-terminal HVDC concept at ± 800 kV level. Further, the two bi-poles of ± 800 kV, 3000 MW each (± 800 kV, 6000 MW multi terminal HVDC

system having a provision for further up-gradation) with rectifiers positioned at different locations (Alipurduar and Biswanath Chariyali) shall be connected to common HVDC line. A major portion of the project time would be towards engineering, manufacturing, testing transporting, installation and commission a massive number of Converter Transformers totaling to 60 units. In addition, the eight units of 12- Pulse Converters alongwith the sub-station civil works to house indoor DC yard at Agra at ± 800 kV DC level, complex control and protection and ± 800 kV DC switchgear equipment warrants substantial project time apart from activities associated to achieve integrated operation of the two Bi-poles. The petitioner has proposed a timeline of 60 months for each of the aforementioned ± 800 kV, 3000 MW HVDC Bi-poles.

4. The petitioner has submitted that ± 800 kV HVDC transmission lines are front end technologies which the petitioner would be deploying for the first time in the country. These technologies are not commonly used around the world and involve development of fresh designs and testing of towers and line materials. The petitioner has submitted that these transmission lines require development time for these activities unlike routinely used technologies. It has been further submitted that the ± 800 kV HVDC transmission lines would involve hexagonal bundle conductor configuration in comparison to quadruple bundle conductor used in 765 kV S/C and ± 500 kV HVDC transmission lines. Weight of the towers and foundation volumes for ± 800 kV HVDC transmission lines would be more than two times that of 765 kV S/C and ± 500 kV HVDC transmission lines. Height of towers in case of ± 800 kV HVDC is also more owing to configuration and additional clearance requirements. For the

hexagonal conductor bundle, the stringing process is more complex requiring special procedures and techniques (including deployment and parallel operation of two Tension Stringing Equipments). Due to these factors and complexities, time required for construction of ± 800 kV HVDC transmission lines is much more as compared to the other transmission lines. Accordingly, the petitioner has proposed a timeline of 42 months in hilly terrain and 46 months in snowbound/very difficult terrain for ± 800 kV HVDC Transmission Line and 36 months in plain area. The petitioner has further requested to specify a time line of 60 months since each of the total scheme involves Bi-pole and transmission line. The salient features of the existing + 500 kV vis-a-vis ± 800 kV HVDC transmission lines as submitted by the petitioner are as under:-

Item description	± 500 kV HVDC	± 800 kV HVDC	Comparison between ± 500 kV and ± 800 kV HVDC
Approx Tower tonnage. MT/km*	45	87	2 times
Approx. Foundation excavation volume in cum/km*	583	1197	2 times
Approx. Foundation concerting volume in cum/km*	94	211	2.3 times
Stringing – Total number of conductors	8	12	1.5 times
Timeline for plain area in months as per CERC guidelines	24	36 (proposed in the petition)	

*Comparative quantities for Wind Zone-4 Transmission Line as per Barh Project FR data (for \pm 500 kV HVDC) & North East-North/West Interconnector Project FR data (for \pm 800 kV HVDC)

Timeline for 765 kV EHVAC transmission line

5. The petitioner has submitted that Double Circuit configuration for Transmission lines at 765 kV EHVAC level are deploying front end technologies and the same would be deployed for the first time in the country. These technologies are not commonly used around the world and would involve development of fresh designs and testing of towers and line materials and would therefore require development time for these activities unlike routinely used technologies by the petitioner. It has been further submitted that 765 kV D/C Transmission Lines would involve hexagonal bundle conductor configuration in comparison to quadruple bundle conductor used in 765 kV S/C and \pm 500 kV HVDC transmission lines. Weight of the towers & foundation volumes for 765 kV D/C transmission lines would be more than two times that of 765 kV S/C or \pm 500 kV HVDC transmission lines. Height of towers in case of 765 kV D/C is also more owing to configuration and additional clearance requirements. For the hexagonal conductor bundle, the stringing process is more complex requiring special procedures and techniques (including deployment & parallel operation of two Tension Stringing Equipments). Due to these factors and complexities, time required for construction of 765 kV D/C transmission lines is much more as compared to the other transmission lines. Accordingly, the petitioner has proposed a timeline of 36 months in plain area, 42 months in hilly terrain and 46 months in snowbound/ very difficult terrain for 765 kV DC Transmission Line.

6. The petitioner, vide its affidavit dated 6.10.2010 has submitted that the 765 kV D/C EHVAC transmission line technology is being used for the first time in the country and has not been commonly used around the world. The transmission line has many unique features and requires special techniques, equipments and procedures for commissioning of the lines. The salient features of 765 kV S/C vis-avis 765 kV D/C transmission lines are given below:-

Item description	765 kV S/C	765 kV D/C	Comparison
Approx Tower tonnage. MT/km*	78	158	2 times
Approx. Foundation excavation volume in cum/km*	705	1774	2.5 times
Approx. Foundation concreting volume in cum/km*	117	308	2.6 times
Stringing – Total No of conductors	12	36	3 times
Timeline for plain area in months as per CERC guidelines	30	36	

*Comparative quantities for Wind Zone-4 Transmission Line as per Orissa (Part-C) FR data.

7. The petitioner has requested to invoke the provision of Regulation 44 “Power to Relax” of 2009 regulations, to relax Regulation 15(2) of 2009 regulations in order to include time lines as proposed herein above for 765 kV D/C EHVAC Transmission lines and ± 800 kV HVDC Transmission Systems

and allow additional return on equity of 0.5% for completing the projects within the timeline.

8. Replies to the petitioner have been filed by Uttar Pradesh Power Corporation Limited (Respondent No.9), Bihar State Electricity Board (Respondent No.25) Madhya Pradesh Power Trading Company Limited (Respondent No.31) and Maharashtra State Electricity Distribution Company Limited (Respondent No.32). The petitioner has filed rejoinder only to the replies filed by Uttar Pradesh Power Corporation Limited (UPPCL), Bihar State Electricity Board (BSEB) and Madhya Pradesh Power Trading Company Limited (MPPTCL).

9. UPPCL has submitted in its reply, vide its affidavit dated 4.12.2010 has submitted that in case of \pm 800 HVDC bi-pole, a time line of 60 months is high because other works which are even more difficult from the point of view of procurement, transportation, civil works, arrangement of fuel linkages, arrangement for ash disposal and cooling system and transport of fuel take remarkably short time to complete the project. The petitioner's claim of 21 months for designing, which is 35% of the proposed 60 months for the whole project, should not be included in the timeline since conventionally DPR does not include the time taken of designing. If the petitioner wants to qualify for 0.5% for additional return on equity, it should make effort to complete the project within the timeline of 40 months. The timeline of 40 months for 765 kV D/C may also be allowed as provided in case of 765 kV S/C Transmission Line in snow bound area / difficult terrain. UPPCL has further submitted that for the sake of maintaining concurrence of date of commercial operation of terminal bi-

pole and the corresponding line, the timeline for the Bi-pole should also be 40 months and not 60 months as prayed by the petitioner. UPPCL has further submitted that Appendix-II of 2009 regulations read with Regulation 15 provides for additional incentive of 0.5% on return on equity irrespective of the length of line. As such, an incentive of additional 0.5% return on equity for the whole life of the line is to be given if the construction work of the line, irrespective of its length is completed within the timeline by applying special techniques of erection, strict supervision and proper management. Therefore, it will be wrong to change the percept of special efforts on the part of the petitioner to complete the work even under the worst conditions and on the contrary increase the timeline to accommodate the petitioner to get incentive of 0.5% of additional return on equity for the whole life of the project, to the detriment of the interest of the consumer and nation as a whole.

10. UPPCL has further submitted that if \pm 800 kV HVDC Transmission line for Biswanath Chariyali-Agra and between Alipurduar and Biswanath Chariyali Transmission line are considered to be very difficult nature, then maximum timeline of 40 months may be allowed as provided in the case of 765 kV S/C transmission line in snow bound area/difficult terrain. It has also been submitted that the incentive of additional 0.5% of return on equity for total period of 35 years of the life of the equipment will be 5.25% of the capital cost on the date of commercial operation and it would be a burden on the ultimate consumer and in violation of Section 61 (d) of Electricity Act, 2003.

11. In response to UPPCL's reply, the petitioner in its rejoinder, vide affidavit dated 18.1.2011, has submitted that the subject transmission systems are much more complex in nature and cannot be compared to any other type of line or the generation projects. It has been submitted that design is an integral part of the project and the same cannot be carried out before the project is awarded owing to complexity, uniqueness and technicalities. The petitioner has submitted that the ± 800 kV HVDC and ± 765 kV D/C EHVAC transmission lines are custom-built depending upon geotechnical, geographical, climatological and ecological parameters obtainable along the line route and stand on a different footing as of now and may remain so far a long time owing to their unique application in the Indian power system. These projects deserve to be suitably incentivized as they entail lot of benefits to transmission system users viz (a) economies of scale (b) high capacity corridor conserving Right of Way (c) active components contributing to improvement in quality of power supply, etc. The detailed time lines for the projects including the sub-tasks were arrived at after a considerable diligence at the petitioner's end.

12. BSEB in its reply, vide affidavit dated 29.10.2010 has submitted that this is a case for amendment of regulations and not a case for relaxation under Regulation 44 of 2009 Regulations. BSEB has further submitted that the transmission project considered as front end technologies are deployed for the first time in the country and the same cannot be considered for defining the time line as no basis for such projects exist in the country. It has been further submitted that the relaxation in the regulations would result in unreasonable benefit to the petitioner and hence it must be rejected.

13. BSEB has also submitted that the petitioner's request for relaxation to allow the extended timeline for transmission projects is solely guided by the commercial consideration with the sole aim of profit. The Commission has rightly not included such development projects in the Appendix-II of the 2009 regulations as no timeline for such projects can be specified and incorporated in the 2009 regulations. It has also been submitted that the base rate of return on equity has already been increased to 15.5% in the tariff period 2009-14 from 14% applicable in the tariff period 2004-09. It has also been submitted that besides safeguarding the interest of consumers, recovery of the cost of electricity in a reasonable manner is an important consideration while framing the terms and conditions for the determination of tariff through regulations as per Section 61(d) of the Electricity Act, 2003. Seeking relaxation of the regulations on simple counts would disturb the delicate balance which the Commission has tried to maintain through the 2009 regulations.

14. PGCIL, in its rejoinder, vide affidavit dated 4.12.2010, has submitted that the subject petition is to enable the Commission to specify a time line for the \pm 800 kV HVDC and 765 kV D/C EHVAC Transmission System in order to qualify for additional 0.5% return on equity as has been done for other transmission systems. As such, the extant provisions in the 2009 regulations and Conduct of Business Regulations have been invoked to specify a timeline which is not provided in the 2009 regulations and it is not about making corrections in the timeline.

15. MPPTCL in its reply has submitted that the petitioner's case is not based on reliable data, time line study or from information gathered from similar other projects. The petitioner has failed to bring on record a duly approved proper plan for the project accompanied with elaborate engineering studies. The respondent has submitted that if the 2009 regulations are relaxed in the present case, then it would become precedence in all similar cases resulting in grave prejudice to the respondents. The relaxation sought through the present petition tends to amend the 2009 regulations and hence it should be done as per the procedure for amending the regulations. The present petition lacks reliable foundation and legal merit and should be dismissed.

16. The petitioner in its rejoinder, vide affidavit dated 18.1.2011, has submitted that the subject transmission systems are front end technologies and are being undertaken first time in the country to meet the demanding requirements of the evolving power systems and also has little precedence around the world. It has also been mentioned that these projects are to be custom-built and such large, complex and high risk projects implying front end technologies would have inherent difficulties that are and shall be faced at every stage of implementation. Such projects deserve to be suitably incentivized as it entails lot of benefits to the transmission system users, viz. (a) economies of scale (b) high capacity corridor conserving right of way (c) active components contributing to improvement in quality of power supply etc. It has been submitted that the detailed timelines proposed are arrived at after a considerable diligence. It has also been submitted that Regulation 44, "Power to Relax" of 2009 regulations read with Regulation 111 of Conduct of Business

Regulations provides the Commission with inherent power to issue such orders for ends of justice.

17. MSEDCL vide its affidavit dated 29.10.2010, has submitted that PGCIL has requested for additional time to file the information sought by the Commission. The delay in filing of information by PGCIL should not affect the evacuation of power from the power plant associated with the transmission system and the consumers should not be burdened by the increased cost due to delay. The petitioner has not filed any rejoinder to MSEDCL's reply.

18. We have heard the petitioner and the respondents and have gone through the material on record. As highlighted by the petitioner and pointed out by the respondents, the \pm 800 kV HVDC and 765 kV D/C EHVAC transmission lines are deployed for the first time in the country and as such there is no precedence. It has also been submitted by the petitioner that these technologies are not commonly used around the world. We understand Yunnan-Guangdong + 800 kV HVDC Transmission Line of 1418 km. length with transmission capacity of 5000 MW has been commissioned in China in June, 2010. The work was awarded to Siemens around June 2007, and it took about 36 months for completion of the project. As the petitioner has submitted that the \pm 800 kV HVDC and 765 kV D/C EHVAC transmission lines are custom-built depending upon geotechnical, geographical, climatological and ecological parameters obtainable along the line route, Chinese experience and timelines may not be applicable to the Indian conditions. In the absence of any precedence and proper work study it would be unreasonable for specifying a

timeline as prayed by the petitioner. Therefore, the request of the petitioner regarding specifying time line for these transmission systems in the absence of reliable data cannot be acceded to.

19. The petitioner's request to relax Regulation 15 of the 2009 regulations to specify timeline for \pm 800 kV HVDC and 765 kV D/C EHVAC transmission lines for allowing additional return on equity of 0.5% cannot be met by relaxing Regulations 15 of the 2009 regulations and it can be met only by making certain amendments to the 2009 regulations. The petitioner is granted liberty to approach the Commission with reliable data based on international experience in respect of these lines for making suitable provisions in the regulations during the present or next control period.

20. Accordingly, Petition No. 192/2010 is disposed of in terms of the above.

Sd/-	Sd/-	Sd/-	Sd/-
(M. DEENA DAYALAN) MEMBER	(V.S. VERMA) MEMBER	(S. JAYARAMAN) MEMBER	(DR.PRAMOD DEO) CHAIRPERSON