

**CENTRAL ELECTRICITY REGULATORY COMMISSION  
NEW DELHI**

**Petition No. 218/MP/2012**

**Coram:**

**Shri V.S. Verma, Member**

**Shri M. Deena Dayalan, Member**

**Date of Hearing: 16.7.2013**

**Date of Order : 10.9.2013**

**In the matter of:**

Miscellaneous petition under Regulations 24,111 and 113 of the CERC (Conduct of Business) Regulations, 1999 for regulatory approval of implementation of OPGW based communication system for Central Sector sub-stations and generating stations in North-Eastern region and direction for payment by the respondents till it is funded by DONER.

**And**

**in the matter of:**

Power Grid Corporation of India Ltd., Gurgaon.

**....Petitioner**

Vs

1. Assam State Electricity Board, Guwahati
2. Meghalaya Energy Corporation Limited, Shillong
3. Power and Electricity Department., Aizawal
4. Electricity Department., Imphal
5. Department of Power, Arunachal Pradesh, Itanagar
6. Department of Power, Govt. of Nagaland, Kohima
7. Department of Power, Govt. of Tripura, Agartala
8. DONER, North Eastern Council Secretariat, Shillong,

**.....Respondents**

**Following were present:**

1. Shri S. Raju, PGCIL
2. Shri M.M. Mondal, PGCIL
3. Shri A.S. Khushwaha, PGCIL
4. Shri A. Kharpan, MeECL

**ORDER**

The petitioner, Power Grid Corporation of India Limited has filed this petition under Regulations 24,111 and 113 of the Central Electricity Regulatory Commission



(Conduct of Business) Regulations, 1999 seeking regulatory approval for implementation of Fibre Optic (OPGW) Based Communication System for Central Sector sub-stations and generating stations in North Eastern Region.

2. The petitioner has made following prayers:

"(a) Approve regulatory approval for implementation of Fibre Optic based communication system in the North Eastern Region.

(b) Direction for payment by all the NER respondent through tariff as per CERC Regulations to be framed as indicated at para 9 above. The same shall be adjusted by the petitioner to the respondents if the funds are received from the DONER for this scheme.

(c) Pass such other relief as Hon`ble Commission deems fit and appropriate under the circumstances of the case and in the interest of justice."

3. The petitioner has submitted that the planning and operation of power system has been carried out on regional basis. Considering the complexity and growth of power system, need of effective management of power system was felt essential. Accordingly, Unified Load Dispatch and Communication (ULDC) Schemes were established by Power Grid in close coordination with the constituents on regional basis for providing advance EMS/SCADA and Communication System for management of Regional Power Grids. The ULDC projects were commissioned progressively from July 2002 to February 2006 in Southern, Northern, North-Eastern, Eastern and Western regions. Subsequent to commissioning of ULDC Schemes in all the regions and formation of NEW Grid with the synchronization of Northern, North-Eastern, Eastern and Western grids and increase of inter-regional Power Exchange to about 20,800 MW as of now, National Load Despatch Centre (NLDC) at apex level has been established

to coordinate inter-regional and inter-national power exchanges and monitoring the power situation at national level for ensuring security to National Power grid.

4. The petitioner has submitted that Fiber Optic Communication Network comprising of OPGW, Microwave and PLCC network were established under North Eastern Region ULDC project to support data and voice requirements of SCADA/EMS projects. These links are under commercial operation since May 2003. Further, under North Eastern Region ULDC project, approximately twenty five (25) no. of wide band nodes were established, which includes fourteen (14) no. of Central Sector sub-stations. Subsequently, several developments in the power sector have taken place which necessitates the establishment of robust, reliable high capacity wide band network.

5. The petitioner has submitted that power system communication requirements are reliability, availability and security of the highest order. As per previous experience, fiber optics installed on overhead power lines is the most reliable form of communication medium due to least amount of down time. Thus, an expansion of fiber optic system has been considered essential to meet the power system communication requirements. After commissioning of NER-ULDC, several sub-stations have been added to the power system. However, hardly any new node has been added to the wide band network. The new sub-stations integrated to the SCADA system of NER-ULDC project are communicating to the control centers on PLCC. The PLCC based communication system has limitations in regard to data communication as the performance of this system deteriorates after two hops. Further, due to frequency congestion only limited

number of channels can be provided. Therefore, it is essential that in order to provide reliable and efficient communication network to the fast growing power system network, existing Fiber Optic Communication Network is expanded to cater to additional wideband nodes in the communication network of NER-ULDC project. In addition to SCADA system, functions are being added which require reliable and robust communication system. The petitioner has highlighted the requirement of communication system in the present circumstances as under:

(a) As per the provisions of the Grid Code, CTU is required to establish communication for RLDCs, which is to be used by all agencies connecting to grid under control area of RLDCs. This ultimately results in more number of sub-stations and power plants using the communication network of power sector.

(b) Number of IPPs, UMPPs, high capacity transmission system, etc., are increasing very fast which means that number of sub-stations and power plants are required to transfer real time data of their generating stations to NERLDC.

(c) The utility of SCADA system has been realized by system operators and users expect a very reliable system which could be ensured with reliable communication system.

(d) It is not possible to meet the communication requirement such as speech, data and protection with PLCC as the transmission lines are being LILLOed (Loop-In Loop-Out) frequently due to open access which disrupts the communication system based upon PLCC as LILO increases the number of PLCC hops and more number of PLCC hops deteriorates the performance of PLCC communication.

(e) With increasing complexities in the power system and in order to ensure effective grid operation in case of contingencies, the need of Special Protection Schemes (SPS) as one of the measures is being felt by the grid operators. These SPS requires the transfer of signals from one node to many nodes simultaneously. Since these are contingency provisions and their effectiveness is of paramount importance, SPS can work effectively when reliable wide band network is available.

(f) Wide Area Measurement System (WAMS) is the emerging technology for grid operators. Phasor Measurement Unit (PMU) is the basic building block for WAMS which is to be installed at the sub-stations and power plants. The PMUs generate large volume of data and if the data of all the feeders is to be accommodated, each sub-station would require up to 2 Mbps band width for PMU data alone. WAMS based systems can be implemented with wideband communication system such as Fiber Optic based Communication System.

(g) Presently PLCC communication is being used for remote operation which is not very reliable. The expansion of wide band network shall ensure effective remote operation of the existing as well as new sub-stations. Availability of wide band communication can also facilitate remote operation of hydro power plants.

6. The petitioner has submitted that considering the fact that very few central stations are presently at wideband nodes and in view of requirement of deployment of emerging technologies in near future, constituents of North Eastern Region deliberated the need of expansion of wideband communication network in various meetings for developing communication network to cater these requirements as per the details given below:

(a) In the various Technical Coordination Committee (TCC)/RPC meetings of North Eastern Region held during February 2009 to May 2011, the necessity of up-gradation/ new State Control Centers and communication network of Central and State was discussed as the PLCC links are getting more difficult to operate due to frequency congestion, LILO of existing transmission lines and increasing of number of hops and it was agreed that Power Grid would formulate the network and take up for approval at NERPC forum.

(b) The constituents of North Eastern Region in the 11<sup>th</sup> TCC/RPC meeting held on 5.5.2011 and 6.5.2011 at Kolkata discussed the proposal for 1523 kms of OPGW based Fibre network at an estimated cost of ₹ 34.79 crore and it was agreed that the petitioner would prepare a scheme in consultation with NER States incorporating their suggestions. Accordingly, the scheme was circulated among the constituents for their suggestions. Based on the feedback from the constituents, the network was modified. The petitioner has submitted that OPGW length in the revised network comes to 1901 Kms with estimated cost of ₹ 56.36 crore, the basis of cost estimate being the latest L1 bid prices (October 2010) received by Power Grid for a similar project with exchange rate of 15.9.2010. The combined finalized network is 1901 Kms which includes 1349 km of Central Sector links and 552 km of State Sector links.

(c) In the special TCC meeting held on 5.8.2011, constituents of NER present were agreed to the proposal, irrespective of funding from DONER or through tariff of ULDC. ASEB had informed that he is agreed to the proposal if the funding was from North Eastern Council (DONER). The scheme was further discussed in the 12<sup>th</sup> NERPC meeting held on 15.11.2011 in the presence of representatives of Arunachal Pradesh and Nagaland and NERPC agreed for the scheme with funding from DONER.

(d) Mizoram requested to include 58.5 km additional Fiber Optic for connecting its sub-stations with the main grid. Considering the additional

requirement of Mizoram the final network has re-sized to 1960 km at an estimated cost of ` 58.24 crore.

7. The petitioner has submitted that Fibre Optic based reliable communication is essential to ensure uninterrupted real time data to NERLDC. The petitioner has prayed for approval of the implementation of Fibre Optic based reliable communication in North Eastern Region and direct the respondents to pay the charges of the scheme through tariff as determined by CERC. In case of receipt of the funding from the DONER, the same shall be adjusted accordingly.

8. No reply has been filed by the respondents.

9. During the hearing on 22.1.2013, the representative of petitioner reiterated submissions made in the petition and submitted that NERLDC has already filed petition before the Commission seeking direction to all the constituents to ensure availability of real time data. In response to representative of Meghalaya's query regarding method of sharing of expenditure, the representative of the petitioner submitted that the Commission has, vide its order dated 8.12.2012 in Petition No. 68/2010 outlined the principles for determination of tariff for payment of ULDC Scheme. The representative of the petitioner further submitted that the time-lines for the OPGW projects for existing lines and for new lines are required to be prescribed separately which will be considered at the time of framing regulations for new communication assets. The regulations shall be applicable to all constituents accordingly.



10. We have considered the submissions of petitioner and respondents. Under the Regulation 4.6.2 of the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010, CTU is responsible to provide telemetry and communication system from Data Collection Point (DCP) to RLDC and responsibility for providing telemetry and communication system up to DCP rests with the users and STUs. Regulation 4.6.2 of Grid Code is extracted as under:

**"Data and Communication Facilities**

4.6.2. Reliable and efficient speech and data communication systems shall be provided to facilitate necessary communication and data exchange, and supervision/control of the grid by the RLDC, under normal and abnormal conditions. All Users, STUs and CTU shall provide Systems to telemeter power system parameters such as flow, voltage and status of switches/ transformer taps etc. in line with interface requirements and other guideline made available by RLDC. The associated communication system to facilitate data flow up to appropriate data collection point on CTU's system shall also be established by the concerned User or STU as specified by CTU in the Connection Agreement. All Users/STUs in coordination with CTU shall provide the required facilities at their respective ends as specified in the Connection Agreement."

11. Further, clause 1.1 (c) of the "General Conditions for Connectivity" of the Procedures of Central Transmission Utility approved under Central Electricity Regulatory Commission (Grant of Connectivity, Long-Term Access and Medium-Term Open Access in inter-State Transmission and related matters) Regulations, 2009 provides as under:

"The applicant or inter-State transmission licensee shall provide facilities for voice and data communication for transfer of real time operational data such as voltage, frequency, real and reactive power flow, energy, status of circuit breaker & isolator positions, transformer taps and other parameters from their station to Data Collection Point (DCP) of CTU as per IEGC. CTU shall provide

access to applicant's data transfer through communication Network in case spare channels are available on mutually agreed terms. The location of DCP of CTU shall be the nearest station connected electrically where wideband communication capacity of POWERGRID is available. Additional communication system from the DCP to the concerned RLDC shall be the responsibility of CTU, however its cost shall be borne by the applicant. The responsibility of data transfer shall be that of the applicant."

12. Initially the scheme for additional requirement of OPGW based communication system for Central Sector Sub-Stations and other large generating stations in NER comprising 1523 km of OPGW based fiber optic network at an initial cost of ₹ 34.79 crore was discussed and agreed in principle at RPC level. However, based on the requests of constituent States of North East the scheme was re-sized to 1960 km at an estimated cost of ₹ 58.24 crore. Some of the constituents had also proposed that funding of the scheme should be done by NEC/Department of NER (DONER).

13. Since the execution of scheme has not commenced so far, the petitioner has approached the Commission for regulatory approval for scheme for Central Sector sub-stations and generating stations in NER and direction for payment by respondents till it is funded by DONER.

14. The constituents of NER have also agreed that the scheme should be executed by the petitioner through funding from DONER or through tariff of ULDC. Accordingly, we accord in-principle approval to the Central Sector Scheme. The Central Sector Scheme includes OPGW based communication system for Central Sector sub-stations

and other generating stations and other large generating stations in NER comprising of 1523 km of OPGW based Fiber Optic Network at an initial cost of ₹ 34.79 crore. The scheme shall be funded through DONER. However, till the time funds are received from DONER, the petitioner is at liberty to recover charges through tariff, for which the petitioner is directed to file petition, after execution of the scheme, in accordance with law .

15. Regarding State sector and additional requirement of different States of NER, the petitioner is at liberty to implement the scheme in consultation with individual State on mutually agreed terms.

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

Sd/-  
**(M. Deena Dayalan)**  
**Member**

sd/-  
**(V.S.Verma)**  
**Member**