KERALA STATE ELECTRICITY REGULATORY COMMISSION
THIRUVANANTHAPURAM

Present : Sri. T. M. Manoharan, Chairman

Sri. K. Vikraman Nair, Member

Petition No. O.P. 19 of 2014

In the matter of Approval of the enhancement of the contract demand on the 11 kV feeder to M/s. UST Global IT Parks Pvt. Ltd in the Technopark campus upto 5 MVA

The Chief Executive Officer : Petitioner
Technopark
Thiruvananthapuram

Kerala State Electricity Board Limited : Respondent
Vydyuthi Bhavanam
Thiruvananthapuram.

Order dated 17-06-2015

Government of Kerala had issued electricity distribution licence to Electronics Technology Parks – Kerala (Technopark), as per G.O (P) No.19/99/PD dt: 12-07-1999 for distribution of power to various establishments within the Technopark campus. Technopark is a deemed distribution licensee under the first proviso of Section 14 of the Electricity Act, 2003. Subsequently, the licensee status was extended to Technopark Phase II & III, Technocity and Technopark Kollam campuses. 36 Acres of land is leased out to M/s UST Global IT Parks Pvt. Ltd in the Technopark Phase-II campus and they are constructing a modern Internet Protocol enabled building, which wasdueto be completed by December-2014. The total built-up area of the building would be 7.42 lakhs sq. ft and the expected power demand when the building becomes fully operational would be 4.8 MVA.

2. Power connection with a contract demand of 800kVAhas been provided by Technopark to the IT building of M/s UST Global IT parksthrough 11kV underground cablesfrom the 110kV substation of the licensee, M/s. Technopark. The total connected load of the installation is estimated at 5463 kW and the maximum demand when the building becomes fully functional would be around 4623 kW i.e. 5137 kVA.

3. The Chief Executive Officer, Technopark has filed a petition for approving the proposal to give connection M/s. UST Global IT Parks Pvt. Ltd in the Technopark Phase-II campus at 11 kV level for the enhanced contract demand upto 5 MVA. The petition has been filed as per KSERC (Conduct of Business) Regulations, 2003 on 23-10-2014 and petition fee of Rs.10,000/-has been remitted.The petition was admitted as O.P. No. 19 of 2014 and posted for hearing.

4. A hearing was conducted in the court room of the Commission on 31-12-2014. Sri. Einstein A.V. Assistant Manager, Technopark presented the arguments of the petitioner and Sri. B.Pradeep, Executive Engineer, K.S.E.B.Ltd. represented K.S.E.B.Ltd.

Arguments of the Petitioner:

5. Regulation 8 of the Kerala Electricity Supply Code, 2014 stipulates that the maximum contract demand of a consumer availing connection on a single 11kV feeder shall be limited to 3000 kVA. The first proviso of this regulation stipulates that "*this limit may be exceeded upto a maximum of 20%, if supply at appropriate higher voltage level is not feasible due to non-availability of distribution line at such higher voltage."* As per the 2nd proviso to Regulation 8,*"the limits specified for different supply voltage levels may be exceeded in exceptional cases with the approval of the Commission.*Regulation 52 specifies that "*supply shall be given only at one point for same purpose at the same voltage level in a single premises".* Hence more than one connection at 11 kV voltage level cannot be provided to them.

6. M/s UST Global has obtained sanction for a connected load of 1440.26 kW from the Electrical Inspectorate and energised the electrical installation. The contract demand as per the agreement executed with Technopark, for the supply at 11kV voltage level at present, is 800 kVA, which would be increased gradually.Pursuant to the Regulation 8 of the Kerala Electricity Supply Code, 2014, the maximum contract demand which could be provided at a voltage level of 11kV is 3 MVA. Hence approval of the Commission is sought for by the petitioner licensee for giving connection at 11 kV to the consumer namely, M/s. UST Global IT Parks Pvt. Ltd., enhancing the limit of 3 MVA fixed for giving connection at 11kV to 5 MVA.

7. Since 22kV voltage level is not available at Thiruvananthapuram, Technopark has to construct additionally, a 110/33kV substation of at least 8 MVA capacity. M/s UST Global also has to set up a 33/11kV substation in their premises for feeding their

load for supplying power to the consumer above 3 MVA. As per the latest P.A.R (Plinth Area Rates – 2012) issued by CPWD for specialized E&M works, an amount of Rs. 6 Crore has to be incurred by Technopark for the 8 MVA 110/33 kV substation and Rs. 4.5 Crore by M/s UST Global for their 6 MVA 33/11 kV substation. In addition to this, there will be high recurring expenditure for the maintenance of these sub stations.

8. M/s UST Global IT parks have already set up a 11/0.433 kV substation with three 2000 kVA transformers and allied equipment.The major component in transferring power from 110kV substation Technopark Phase III to the 11kV substation located at the campus of M/s UST Global SEZ is the feeder with a single run of 3core x 300sqmm XLPE Aluminium 11kV cable. The detailed calculations of fault level and voltage drop have been submitted and are reported to be within the permissible limits. It is further submitted that,-

(i) The maximum load current for the maximum demand of 5.137MVA would be 270A and the rated current carrying capacity of the cable of 3x300mm^2 XLPE Aluminium cable is 345 A. Hence cable can carry the load current at maximum demand conditions.

(ii) (ii) Percentage voltage drop of the cable at maximum demand condition is 0.61% and that at rated current carrying capacity is 0.79%, which are within the acceptable limits.

9. During short circuit conditions, heavy current flows through all the sections of the systems which are in the path between the power source and the equipment. The short circuit current is limited only by the impedance of the system. This heavy current could damage the cables, switchgear etc., if they are not properly rated. The rating of the cable laid is capable of withstanding the fault (the short circuit condition) in the consumer's premises. It is submitted by the Petitioner that the Commission may consider these technical calculations justifying the use of the cable to cater the proposed load at 11 kV.

10. It was also submitted that if the approval for enhanced contract demand is accorded, the consumer and the licensee would be fully relieved of the burden in constructing the substation and thereby, the expensive land can be spared and utilised effectively for other infrastructure development activities.

Arguments of the K.S.E.B.Ltd.

11. K.S.E.B.Ltd. has submitted that the petitioner has considered only the steady state load condition for voltage drop calculation. As the major loads are motor loads, of

the order of 1826 kW used for air conditioning equipment, the impact of motor starting and acceleration on system voltage profile has to be looked into, through system studies for ascertaining its impact on the grid. For fault level assessment, worst case scenario has to be looked into by considering the parallel operation of transformers and the limiting impedance at 11 kV side is to be reviewed accordingly. Here the petitioner has assumed 2193 MVA as the fault level at 110kV bus at Technopark substation.

12. K.S.E.B.Ltd. submitted that they do not have any objection to the proposal and intimated that the additional load of about 5 MVA can be catered only after making proper modifications in the existing connectivity of the licensee with the state grid. Presently, the petitioner is availing supply at 110 kV in Phase II and III of the Technopark by establishing a 110/11 kV substation at Technopark, from TP-TL2 110 kV feeder.(Technopark – TERLS 2nd feeder). The Petitioner has been provided connectivity for 5 MVA on a temporary basis for catering the load at Phase II & III of Technopark.

13. At present K.S.E.B.Ltd. has provided connectivity for 5MVA at 110 kV for catering to their load at Phase – II & III of Technopark by establishing a 110/11kV substation at Technopark from TP- TL2 110 kV feeder on a temporary basis. The maximum demand recorded in Nov. 2014 is 2514 MVA.As requested by the petitioner, K.S.E.B.Ltd. has provided in-principle approval for additional 3 MVA at 'Phase-I'. For providing modified connectivity to cater the additional requirement, enhancement of capacity of 110kV substation at Kazhakkuttom is a necessity, as the existing 110 kV feeder is not satisfying (n-1) condition.

Para wise counter arguments of the Petitioner:

14. It is admitted that in the proposed enhancement of contract demand of 5MVA, HVAC (Heating, Ventilation and Air Conditioning) load constitute 1826 kW. The main individual loads are chiller units and their assisted motor loads. Of the 5 chiller units, one will remain as standby. For calculation, these equipment with maximum acceleration ratio is considered. The following factors have also been considered,-

(i) not more than one chiller is switched on at a time and

(ii) only primary condenser and cooling tower motors are operated along with the chiller units, which will be put 'on' in a sequential order.

Voltage drop calculation and fault level calculation have been furnished. The maximum load current at 11 kV side was calculated as 270 A earlier and after considering the loads with starting current, the same is worked out as 344A with the rated current carrying capacity of the cable is 345 A. Hence the cable would withstand the load

current under the maximum demand conditions. Fault level calculation is also revised (based on the fault level at 110kV bus at Technopark substation as 2570 MVA as per 2012 system condition). Considering the worst fault condition, when the two transformers in the substation are operated in parallel, the cable would withstand the fault in the premises.

Analysis and Decisions of the Commission:

15. As per Regulation 8 of the Kerala Electricity Supply Code, 2014, the maximum contract demand that can be allowed on a single 11kV feeder is 3000 kVA. Whereas the first proviso of this regulation permits that this limit may be exceeded upto a maximum of 20%, if supply at appropriate higher voltage level is not feasible due to non availability of distribution line at such higher voltage. The second proviso to Regulation 8 stipulates that the limits specified for different supply voltage levels may be exceeded in exceptional cases with the approval of the Commission. The 22 kV supply system is not available in the system except at Palakkad area. The Commission has examined the technical feasibility of connecting the load with contract demand of 5MVAto M/s UST Global IT Parks Pvt. Ltd through the existing 3 x 300 mm^2 11 kV U.G.cable from the 110 kV substation of the licensee, M/s. Technopark and found that all parameters are within the permissible limits. In order to avoid unnecessary financial expenditure for setting up a new 110/33 kV substation by the petitioner licensee and another 33/11 kV substation by the consumer, M/s UST Global IT Parks Pvt. Ltd, the Commission has decided to approve the proposal to give connection at 11 kV level for a contract demand of 5 MVA as a special case, as the supply is extended through 3 x 300 mm^2 XLPE underground cable satisfying all technical parameters.

Orders:

21. Considering the above facts and circumstances and the relevant provisions in the Electricity Act, 2003, and Kerala Electricity Supply Code, 2014, the Kerala State Electricity Regulatory Commission in exercise of the powers conferred on it by the 2nd proviso to Regulation 8 of the Kerala Electricity Supply Code, 2014 hereby orders as follows,

(i) The Commission approves as an exceptional case, the proposal to give connection exceeding the limit ofcontract demand specified for 11 kV supply voltage in Regulation 8 to M/s UST Global IT Parks Pvt. Ltd by the licensee M/s. Technopark.

(ii) M/s. Technopark is allowed to enhance the contract demand up to 5 MVA to M/s UST Global IT Parks Pvt. Ltd for their electric connection at 11 kV level through 3 x 300 mm^2 U.G. cable from the 110 kV substation of the licensee, Technopark.

(iii) KSEBL may undertake studies on the aspects explained in their remarks, the resume of which is given in para 11 of this order and report results to the Commission for its consideration and appropriate decision.

Sd/-
K. Vikraman Nair
Member

Sd/-
T.M.Manoharan
Chairman

Approved for issue

Secretary