

KERALA STATE ELECTRICITY REGULATORY COMMISSION
THIRUVANANTHAPURAM

Present: **Shri. Preman Dinaraj, Chairman**
 Shri. S. Venugopal, Member
 Shri. K. Vikraman Nair, Member

OP No. 11/2017

In the matter of : Approval of capital investment under Regulation 72 of the KSERC (Terms and Conditions for determination of tariff) Regulations, 2014 for the proposed 110 kV Substation of Thrissur Corporation Electricity Department (TCED)

**Petitioner : Thrissur Corporation Electricity Department (TCED)
 Thrissur**

**Petitioner represented by : Shri. Jomon C.J, Assistant Secretary, TCED
 Shri. Jose T.S, Electrical Engineer, TCED
 Shri. Francis P.X, AE, TCED**

**KSEB Ltd represented by : Shri. James M David, Chief Engineer, Transmission (North), KSEB Ltd
 Shri. Bipin Sankar P, Deputy CE, TRAC, KSEB Ltd
 Shri. Manoj. G, AEE, TRAC, KSEB Ltd
 Shri. Anoop Mathew, S.A, TRAC, KSEB Ltd**

Order dated 01.02.2018

1. Thrissur Corporation Electricity Department (herein after referred to as TCED or the Petitioner) proposed to construct 110 kV substation at Kottappuram, Thrissur, and sought investment approval for the construction of the substation.
2. Summary of the proposal submitted by TCED is extracted below.
 - (i) The area of license of TCED is 12.63 sq.km and consumer strength is about 36000 nos.
 - (ii) At present, there are three substations within the licensed area of TCED, with a total capacity of 65 MVA. The details are given below.

Table-1
Existing substations within the licensed area of TCED

Sl No	Substation, location	Voltage rating	Transformer capacity	Nos	Total capacity
		(kV)	(MVA)		(MVA)
1	110 kV s/s , Paturaikal	110	12.5	2	25
2	66 kV s/s, Paturaikal	66	10	3	30
3	33 kV, s/s, Ekkanda Warriier Rd	33	5	2	10
	Total				65

- (iii) The railway line divides the licensed area of TCED in to two parts. Three feeders out of fifteen feeders of the TCED, serving the electricity demand of the western side of the rail way line of their licensed area.
 - (iv) The electricity demand of the Western side of TCED is about 12 MVA. The expected additional load requirement of this area is about 15 MVA within next two years, i.e., the electricity demand of this area is expected to increase from 12 MVA to 27 MVA with in next two years. The additional load requirement of this area is estimated based on the pending applications for electricity connection. Considering the expected additional load requirement, TCED proposed to have a 110 kV s/s at Kottupuram, which is located at the western side of the licenced area of TCED.
 - (v) Once this substation is commissioned, the AT&C loss can be reduced from 16% to 8%. As per the loss studies conducted on selected feeders of the TCED, the AT&C loss is about 20%.
 - (vi) The estimated cost of the substation is Rs 34.33 crore.
 - (vii) The possibility of expansion of the existing substation at Patturackal is remote due to space constraints.
3. The abstract of the estimate of the proposed 110 kV S/s at Kottappuram by M/s TCED is given below.

Table-2
Abstract of estimate

	PARTICULARS	Amount (Lakh)
1	PART I- Substation	820.00
2	PART II- Cable Laying	2130.00
3	PART III- Reconductoring using AAAC Conductor	40.12
	Total	2990.12
	Consultancy & Establishment Charges @ 15%	442.50
	GRAND TOTAL	3433

4. The cost benefit analysis of the proposed substation submitted by M/s TCED is detailed below.

Table-3
Cost Benefit Analysis of New Proposed 110 kV, Kottapuram Substation

A	Total power sales in the feeder (2016)	Poothole	14114000 kWh
B		Kottapuram	13424000 kWh
C		Aranattukara	17728000 kWh
d=a+b+c	Total power sales in the feeder (2016)		45266000 kWh
E	Present AT&C loss in similar feeders (as per the study conducted by KSPC)		16%
F	Reduction in AT&C loss by the allocation of new substation		8%
g=d*(e-f)	Reduction in power consumption by the allocation of new substation		3621280 kWh
H	Average power purchase cost for TCED during 2016 (Rs./kWh)		6.30 Rs.
i=g*h	Savings in operational cost by the implementation of new Substation		2.28 Cr.
One time investment required			
J	Substation		8.2 Cr.
K	110 kV Cabling (Paturaikal to Proposed Kottapuram substation)		21 Cr.
L	Substation re conducting		0.41 Cr.
M	Consultancy Charge		4.12 Cr.
n=j+k+l+m	Total investment required		34.33 Cr.
o=n/i	Simple payback		15.06 ears

5. In the meanwhile Smt. Adv. Smini Sheejo, former councilor of Thrissur Corporation has raised several allegations against the construction of 110 kV substation by TCED at Kottapuram vide letters dated 26.03.2016, 16.02.2017, 13.03.2017, 17.04.2017, 29.05.2017, 28.06.2017. She alleged that, the present capacity of the substations installed by TCED is about 65 MVA as against the same the recorded maximum demand was only 36 MVA. Hence she requested that, the Commission may entrust an expert committee to study the need for such a substation. She also requested to allow her to participate in the hearing on the matter. The Commission has sent the complaints of Adv. Smini Sheejo to the TCED for their remarks.

6. The Commission has scheduled a hearing on the matter on 09.08.2017. A copy of the details submitted by the TCED was also sent to KSEB Ltd for their comments. A copy of the details was also forwarded to Smt. Smini Sheejo, with the request to attend the hearing. However, she vide the letter dated 07.08.2017 communicated her inability to attend the hearing.
7. Shri. Jose T.S, Electrical Engineer, TCED explained the present distribution system of TCED and stressed the need for the additional 110kV substation at Kottappuram.
8. On behalf of KSEB Ltd, Sri. James M David, Chief Engineer (Transmission) North, and Sri. Bipin Sankar, P, Dy.CE, O/o the Chief Engineer (Commercial Tariff), presented their comments . KSEB Ltd submitted that, the proposal for providing an alternate source of supply to TCED is under consideration and it may requires some modification works in the existing transmission network. KSEB Ltd is open to discuss the issue with TCED and submit a detailed proposal before the Commission, within one month. KSEB Ltd was also asked to look into the possibility providing an additional feeding point for providing supply to the western side of the licensed area of TCED and submit suitable proposals before the Commission.
9. Based on the deliberations during the hearing, the Commission vide the daily order dated 14.08.2017 has observed as follows.

“The Commission examined the submission of TCED and the comments offered by KSEB Ltd. In exercise of the statutory powers conferred on the Commission as per the provisions of the Electricity Act-2003, the Commission is duty bound to examine the prudence of the capital investments made by the distribution licensees of the State, since any investment made by the licensees are ultimately pass on to the consumers of the State through tariff. The Commission has noted that, the average annual increase in electricity demand in the licensed area of TCED is about 8% only. Hence the Commission was not convinced about the argument of the TCED that, the load demand of the western side of the licensed area of TCED will increase from the present demand of 12 MVA to 27 MVA with in next ‘2’ years. As per the audited accounts for the financial year 2015-16, the AT&C loss in the licensed area of TCED is 7.46% as against 16% adopted by the TCED for determining the cost benefit analysis. The Commission cannot deviate from the loss figures audited and certified by statutory auditors without valid reasons. The present distribution cost of TCED is about Rs 1.10/unit. TCED has not submitted the details of the likely increase in O&M cost with the commissioning of the proposed substation. TCED also not submitted the details of the alternate options for providing supply to the western side of their licensed area.

10. Further, the Commission vide the daily order dated 14.08.2017 has directed the TCED to submit the following details by 11.09.2017.

- (i) The year wise details of the category wise consumer strength and category wise consumption of the consumers availing supply and the peak load on the 11kV feeders at western side of the licensed area for the last five years.
 - (ii) the details of the pending applications/ consumers proposed to avail supply at western side of the licensed area in the next two years, including the category wise details of, number of consumers, proposed connected load, and annual consumption.
 - (iii) the likely increase in distribution cost and its details once the project is commissioned..
 - (iv) the reasons for the abnormal increase in AT&C loss adopted for the cost benefit analysis of the proposed investment.
11. The Commission has further directed to M/s TCED and KSEB Ltd that,
- (i) Recommend suitable proposals on providing an alternate source of supply to TCED from KSEB Ltd.
 - (ii) Explore the possibility to get additional supply from KSEB Ltd to provide the western side of the licensed area of TCED and report the matter before the Commission.
12. In compliance of the direction issued by the Commission, TCED vide the letter dated 27.09.2017 has submitted the following details before the Commission for considerations.

Table-4
Details of the total energy consumption at the western side

Year	Number of Consumers	Annual Consumption
	Total (nos)	(MU)
2013-14	13008	27.44
2014-15	13117	30.78
2015-16	13243	33.01
2016-17	13397	33.77
CAGR		7.2%

Table-5
Details of the HT consumers in the western side

Year	Number of consumers	Annual Consumption
	(Nos)	(MU)
2013	16	4.63

2014	20	6.03
2015	20	6.29
2016	20	6.08
CAGR		9.5%

Table-6
Details of LT commercial consumers in the western side

Year	Number of consumers	Annual Consumption
	(Nos)	(MU)
2013	982	25.34
2014	980	25.28
2015	978	25.20
2016	998	25.46
CAGR		0.16%

Table-7
Details of LT-IV Industrial consumers

Year	Number of consumers	Annual Consumption
	(Nos)	(MU)
2013	131	0.059
2014	133	0.059
2015	132	0.058
2016	134	0.059
CAGR		0.35%

Table-8
Peak load in the three feeders Kottapuram, Poothole and Aranattukara feeders in the Western side 04.12.2012 to 31.08.2017

Year	Max peak load met in the feeder in Amps				Total peak load met in MVA	Month
	Kottapuram	Poothole	Aranattukara	Total		
2012	146	222	220	588	11.2	Oct-12
2013	178	208	236	622	11.8	May-13
2014	194	216	174	584	11.1	Apr-14
2015	162	163	184	509	9.7	Apr-15
2016	194	180	198	572	10.9	Apr-16
2017	200	160	190	550	10.5	Apr-17

13. Further, regarding the objections raised by Adv. Smini Sheejo, M/s TCED submitted as follows.

“It is pertinent to note that the complainant is not at all a consumer of TCED. The complainant has raised her objections without going into the technical details pertaining to the necessity of an additional substation. It may also be noted that the complainant was councilor of the ruling front which took the decision for an additional substation. Council resolution is attached herewith. Her dissent note is not seen on it. As the complainant is not a stakeholder of TCED, her motive is really doubtful. She is not getting affected by the power problem of TCED since she is residing at Viyyur. Her intension is just to sabotage the developmental initiatives of TCED and hence may be set aside without giving much importance.”

14. KSEB Ltd vide its letter dated 28.11.2017, has communicated its proposal for making alternate arrangements for providing electricity to M/s TCED and submitted as follows.

- (1) There is sufficient capacity available at the 110 kV s/s at Pullazhy. The spare capacity available at Pullazhi s/s can be utilized for TCED by drawing '3' 11 kV feeders to western side.
- (2) KSEB Ltd can also provide 33 kV feeder from Viyyur to Kottapuram area by OH line or ABC cable. This can be further extended to 33 kV s/s at Sakthan Nagar forming a ring network. Even if the entire length is provided with 33 kV UG cable, it will be economical than constructing a 110 kV substation now.
- (3) By implementing the above two proposal, the additional capacity will be get enhanced by 18 MVA in the western area of TCED.
- (4) In the next stage, the existing old 66kV/11kV transformers at Patturakkal s/s of TCED and 66 kV line can be removed, saving cost on maintaining two systems and space. Additional 12.5 MVA, 110/11kV and another 16 MVA, 110/33kV power transformers along with renovation of Patturakkal s/s and upgradation of Viyyur-Ollur line to 110kV can be taken up subsequently in phased manner based on load growth.
- (5) Subsequently, Viyyur- Ollur line can be upgraded to 110kV in phases as second source of supply from Southern side. By implementing the renovation scheme as proposed by KSEB Ltd, TCED will be getting second source of 110 kV supply at Patturakkal s/s of TCED.
- (6) The existing power transformer capacity as per petition of TCED is 65 MVA and the maximum demand is only 36 MVA. The demand projected to the western side of Thrissur Corporation is on higher side.

The increase in demand projected by Thrissur Corporation on the western side from the present 12 MVA to 27 MVA (additional 15 MVA load) with in next 2 years is not realistic. However, with the above proposal an additional 18 MVA can be made available in the area. The above alternate proposal will be much more cost effective to meet the load in the western side compared to proposal of Thrissur Corporation for construction of 110 kV substation at Kottappuram.

Analysis and Decision

15. The Commission had examined in detail the proposal of M/s TCED to establish the 110 kV s/s at Kottapuram, with the provisions of the Electricity Act, 2003, the KSERC (Terms and Conditions of Tariff) Regulations, 2014 and other rules and regulations in force.
16. As per the provisions of the Tariff Regulations, 2014, all the capital investment schemes having an investment above Rs 10.00 crore requires the approval of the Commission. The licensee has to submit the detailed project report with cost benefit analysis for the approval of the Commission, but M/s TCED yet submit such details.
17. However, the Commission had appraised the details submitted by M/s TCED in compliance of the directions given by the Commission vide the daily order dated 14.08.2017 and noted that,
 - (i) Already there are three substations with a total capacity of 65 MVA within the licensed area of TCED.
 - (ii) The present recorded maximum demand of TCED is only 36 MVA as against the total capacity of 65 MVA.
 - (iii) The total annual energy sale in the licensed area of TCED is about 150 MU, where the total annual consumption of the western side of the licensed area of TCED is only about 32 MU (which is about 22% of the total sale of TCED). The maximum peak demand in the western side is about 11 MVA.
 - (iv) The compounded annual growth rate (CAGR) of the energy demand in the western side is about 7% only. However, there is not much growth in peak demand in this area. TCED has not provided the details of pending applications for electricity connections in western side with supporting documents.

- (v) Based on the details submitted by the TCED, it is reasonably concluded that, there is no plausible reason that an increase in electricity demand from 12 MVA to 27 MVA within a period of '2' years in the western side of the distribution area of TCED will materialize.
18. The Commission has also appraised the alternative proposals submitted by KSEB Ltd, to support the power requirement of the western side of the licensed area of TCED, which are given below.
- (i) There is sufficient capacity available at the 110 kV s/s at Pullazhi. The spare capacity available at Pullazhi s/s can be utilized for TCED by drawing '3' 11 kV feeders to western side. KSEB Ltd can also provide 33 kV feeder from Viyyur to Kottapuram area by OH line or ABC cable. This can be further extended to 33 kV s/s at Sakthan Nagar forming a ring network. Even if the entire length is provided with 33 kV UG cable, it will be economical than constructing a 110 kV substation now. By implementing the above two proposal, the additional capacity will be get enhanced by 18 MVA in the western area of TCED.
- (ii) In the next stage, the existing old 66kV/11kV transformers at Patturakkal s/s of TCED and 66 kV line can be removed, saving cost on maintaining two systems and space. Additional 12.5 MVA, 110/11kV and another 16 MVA, 110/33kV power transformers along with renovation of Patturakkal s/s and upgradation of Viyyur-Ollur line to 110kV can be taken up subsequently in phased manner based on load growth. This work can be executed within three years to resolve all the issues with better connectivity and reliability in 110kV and 33 kV level.
- (iii) Subsequently, Viyyur- Ollur line can be upgraded to 110kV in phases as second source of supply from Southern side. By implementing the renovation scheme as proposed by KSEB Ltd, TCED will be getting second source of 110 kV supply at Patturakkal s/s of TCED.
- (iv) KSEB Ltd further submitted that, the demand growth projected for the western side from the present level of 12 MVA to 27 MVA within next two yeas is not realistic. However, with the above proposal of KSEB Ltd, an additional 18 MVA can be made available in the area and this proposal is much more cost effective to meet the electricity demand of the western side of the TCED as compared to the proposal to construct a 110 kV s/s at Kottappuram.

19. The Commission has also appraised the objections raised by Adv. Smini Sheejo, former councilor, against the construction of the 110 kV s/s at Kottappuram.
20. The Commission, based on the deliberations of the subject matter and also duly considering the materials and other documents placed before it, has decided and ordered as follows.
- (i) There is no immediate requirement for the construction of a second 110 kV s/s within the distribution area of TCED at Kottappuram, extending 110kV supply from the existing substation.
 - (ii) KSEB Ltd as the State Transmission Utility (STU) of the State has the responsibility to provide alternate feeding arrangements to M/s TCED in line with the increase in electricity demand of the distribution area of TCED.
 - (iii) KSEB Ltd and TCED may discuss and finalise the alternate cost effective proposals submitted by KSEB Ltd to cater the additional load requirement up 18 MVA at the western side of the distribution area of TCED.

The proposal to construct a 110 kV s/s at Kottapuram by M/s TCED, within their distribution area, is disposed as above.

Sd/-
K. Vikraman Nair
Member

Sd/-
S. Venugopal
Member

Sd/-
Preman Dinaraj
Chairman

Approved for issue

K B Santhosh Kumar
Secretary