

ARR, ERC, Tariff Proposal, Capital Investment Plan for control period 2018-22

(Comments from KSEB Engineers' Association)

KSEBEA:

- I am representing KSEB Engineers' Association,
- A professional association of electrical engineers in KSEBL
- We are without any political affiliation.
- Engineers' Association would have preferred to present many of these points directly before the KSEBL management first, if there was an opportunity.

KSERC (Terms and Conditions for Determination of Tariff) Regulations, 2018.

- Congratulating KSERC for the notification of the regulation.
- We may point out the many norms adopted for bench marking the performance including auxiliary consumptions, NAPAF etc of Generation are not realistic and shall have large deviations with respect to the actuals.
- It is observed that the nature of the stressed assets, the extended life of the lines, plants & machinery, transformers etc. are not considered while deciding the norms.
- Hence, we request Honourable commission to show adequate flexibility to accommodate the changes in the base line provided consequent to the installation of the appropriate metering infrastructure and on presentation of actual data during truing up

The Petition:

- Congratulating the management for the effort to present the petition within the specified statutory frame work and with limited time (KSERC regulation for tariff determination was notified only by 10/2018).
- We appreciate the efforts in filing the petition in tune with the frame work specified by Electricity Act, the Tariff policies and the KSERC regulation for tariff determination.
- We may point out that these efforts would have been more meaningful if the management would have taken appropriate steps in time for collecting the field data with proper metering infrastructure and asset mapping. Many points are presented in view of future consideration, if not possible for a correction now.

- We request the Honourable KSERC may consider the time limitation and make up the omissions and corrections in the petition with adequate leniency

General Consideration:

- KSERC as a “Quasi-Judicial Body” is supposed to make the tariff determination within the frame work specified by EA, the National Electricity Policy, the Tariff Policy and the KSERC regulation for tariff determination.
- KSERC may leave the other issues to the state government to take care of; in tune with Section 65 of the Act and as specified in National Electric Policy and Tariff Policy.
- Transparency and professionalism in investment decisions shall deliver the desired the results and rhetoric have no place in delivering the performance. Transgrid-2.0 for 10,000 Cr.; Dyuthi -2021 for 4036.30 Cr.; 1000MW Soura Project found mention in the petition. But it is observed that appropriate DPR of these projects are yet to get approved from the Commission. As such, we have apprehension the lack of open discussion and transparency in many investment decisions and about the expenditure on these projects beyond the approved levels.
- The project like Soura & Filament free Kerala are supposed to be government projects and the involvement of KSEBL on such joint venture business may be done with appropriate clarity in business function.
- The accounts of JV ventures like Hydrel Tourism & KFON have not presented in the petition. May be required to ensure that their activities are not encumbered with the envisaged goals of KSEBL

The Summary of ARR & Proposal

Summary of ARR, ERC & Revenue Gap					
No		2018-19	2019-20	2020-21	2021-22
1	ARR	14247.34	15512.45	16348.70	17240.93
2	ERC (@ ruling tariff? (2017-18)	13146.64	14113.20	14283.48	14722.01
3	Gap	1100.70	1399.05	2065.28	2518.92
		1100.70	1399.25	2065.22	2518.92
Tariff Revision proposal (Rs. Cr.)					
1	Revenue @ ruling tariff	12430.59		15114.25	
2	Proposed	13532.30		15814.69	
3	Increase	1101.72		700.44	

Some mismatch observed in the values and it is felt that the proposal is not enough to fill the revenue gap fully.

Pre-requisite for Tariff Determination: Acquiring Correct Data

- The mandatory requirement of SBU wise accounts are meant for ensuring functional efficiencies in operation and maintenance of the functions with viability.
- The identification of the inefficiencies in the functional area can be fixed only through correct accounting of the assets and energy transaction based on the functional classification
- The Interfacing points between Transmission and distribution need to be decided with clarity to ensure correct classification of assets between Generation, Transmission and Distribution functions.
- Correct mapping of Assets with its actual life. & Integration of the data is required for transparency and clarity
- Metering infrastructure to ensure correct accounting of generation, auxiliary consumption, energy handled by transmission at various voltage levels, transmission loss at each voltage level, energy sold and distribution loss.
- There after Power Station wise/ Substation wise / ARU wise integration of the data is required for transparency and clarity of the data and ensuring correctness.
- But it is observed that the verification of the data presented in the petition with the field realities is not an easy task.
- Hence Adequate flexibility to accommodate changes in norms and baseline data may be provided consequent to the installation of the appropriate metering infrastructure.

Generation:

- Project wise financial data not available and hence no clarity on assets with its life and O&M cost requested.
 - As such, no cross checking possible on the correctness of the proposal and its authenticity.
 - Asset value with remaining depreciation period and useful life may be furnished for every plant.
 - Plant wise per unit cost of energy may be calculated to ensure the viability of each plant and to locate the inefficiencies for further necessary action
 - No steps proposed for Proper energy accounting and energy audit of the plants with time synchronized metering between

transmission and distribution interfacing points and for auxiliary consumption. The correct evaluation of auxiliary consumption, inefficiencies in the internal loads, the excess loss in the transformers, excitation systems and other auxiliary consumption need to be measured correctly.

SHEP Issues:

- **SHEP- Cost not approved:** O&M cost of Poozhi-thode (2011), Ranni-Perunad (20120 & Peechi (2013) which were commission earlier than 2014 were not allowed by the commission during the last order. How shall we manage the project without allowing the O&M cost in the ARR.
- **SHEP-Normative cost allowed:** O&M cost allowed but much less than the actual project cost. How the remaining expenditure accounted.?
 - Vilangad (7.5MW)
 - Project cost:75.83 Cr. Cost allowed: $5.92 \times 7.5 = 44.4$ Cr.
 - Chimmany(2.5 MW)
 - Project Cost:14.58 Cr. Cost allowed: $6.46 \times 2.5 = 16.15$ Cr.
 - Adyanpara (3.5 MW)
 - Project Cost: 34.38 Cr. Cost allowed: $6.46 \times 3.5 = 22.61$ Cr.
 - Barapole (15 MW)
 - Project Cost: 127.5 Cr. Cost allowed: $5.92 \times 15 = 88.8$ Cr.
- **Approval Requested:**8 SHEP projects & 4 solar projects: are stated as ongoing projects with specific project costs.
 - Need to clarify whether the capital investment approval of the project has received from the commission.

Table 2. 2 New Hydel Projects for the control period					As per KSERC Renewable Amd., 2017 @ Rs.6.5 Cr. /MW (Cr.)
Name of Scheme	Gen Capacity (MW)	Design Energy (MU)	Expected year of Completion	Project cost (Cr.)	
Pazhassi Sagar	7.5	25.16	2020-21	87.99	48.75
Peruvanamuzhi	6	24.70	2021-22	87.23	39
Chinnar	24	76.45	2022-23	283	158.4
Anakkayam	7.5	22.83	2022-23	77.51	48.75

And Generic Tariff Rs.5.54/unit for 35 years.is specified in the regulation used on with normative project cost.

An evaluation of the actual annual generation against the design energy may be done to make future investment decisions.

Solar Investment Issues: Aggressive solar penetration is not advisable

- The historic low tariff for **Solar (Rs.2.44/unit)** and for **Wind (Rs.2.64/unit)** achieved through the introduction of transparent reverse

bidding during 2017. In the recent reverse auctions conducted by various state utilities, the derived value of solar energy was around **Rs.3/- per unit**.

- Generic Tariff issued by KSERC (RE-Amd), reg,2017 is **Rs. 5.68/unit** for 25 years.
- Issues with grid integration: due to unpredictability and intermittency.
- Do not have proper state regulation to take care of the scheduling and unpredictability and variability in the generation resources.
- Consumption pattern in the Kerala grid do not help us to augment the aggressive growth of renewable energy due to the fact that nearly 65% of the energy is consumed by 95% domestic plus LT commercial consumers and their demand dominate the time slot beyond solar energy availability, that is 06.00 AM to 06.00 PM and peaks during 6.30 PM to 10.30 PM.
- Though the capacity utilisation factor (CUF) of the solar has been specified as 19% by CERC, due to the highest rain fall for 3-4 months, it is observed that the CUF in Kerala is practically 16% only.
- the O&M cost for maintaining the solar panel in Kerala is practically at higher side due to the highest rainfall and humid condition along with higher labour cost prevailing in the state.
- Extra investment Cost involved in Harnessing Solar (*Ref- CEA-Gen. Planning Criteria*)
 - Grid infrastructure cost & System operation Cost.

As such, we are of the opinion that the implementation of smart grid technologies needs to go hand in hand with large scale integration of RES to the grid to ensure grid security and efficient harvesting of renewable energy. The large-scale integration of RES without in-depth studies in demand forecast and without timely implementation of smart grid technologies shall end up in adverse consequences in grid security aspects as well as to the per unit cost of electricity sold to the consumers.

Renovation and Modernisation

- In case of Renovation & modernisation, unit wise or machine wise COD and capitalisation may be considered as the O&M requirement shall starts from COD of each unit.

Investments Not Included

- The capital works with respect to following not included?
- PSDF works
- Flood related capital investments
- Modernisation with respect to SCADA at various Power stations

- Moozhiyar Unit transformer replacement. (14 Cr.)
- Panniar Unit Transformer replacement. (10 Cr.)

Utilisation of KDPP & BDPP: Zero gen. is projected during the control period.

- The asset need to be utilised appropriately for the following reasons
 - The variable cost energy produced from the plant is much less than the cost of electricity in power exchanges during many peaks in every month.
 - There are shortage of power availability during peak hours even during the normal conditions and in the eventualities like transmission constraints and coal shortage, the plant shall be very much useful and viable
 - The plant will increase the stability of the grid in the region and can supply enough reactive power to the grid which is absolutely necessary for a better voltage profile in the locality.
 - Can be utilised as a source for ancillary service, if required by SLDC
 - In spite of the fact that there are better rates for electricity, the unit is not utilised.
 - Need to be treated in par with NTPC thermal stations and make enough fuel available for operation under favourable tariff condition and lack of resources

Hydel Tourism:

- The accounts of the Hydel tourism utilising the KSEBL assets not furnished in the proposal.
 - The establishment cost of the employees deputed
 - Income from leasing the assets to hydel tourism
 - Basis of the leasing rate on the assets to hydel tourism.

Transmission

- Do not have correct interfacing point with distribution and consequently
 - There are issues with respect to correct mapping of transmission assets, the asset value with useful life and depreciation along with O&M cost based on normative standards
 - There are issues in measuring the correct quantum of electricity handled at different voltage levels and correct measurement of losses and operational efficiency.
- Though STU is responsible for installation of metering infrastructure for energy accounting and audit at various voltage levels. But it is not available now and no proposal is included in the control period.

Transgrid-2: The project components needs to be evaluated and prioritised.

- Apprehension on the status of the approval of the various DPRs in the project.
- Apprehension on spending in the project beyond approved cost.

Name of Scheme	Estimated Cost (Cr)	Estimated Cost Accepted (Cr)	Status	Grant Approved (Cr)	Work awarded
Construction of 400/220kV Multicircuit / Multivoltage Transmission line from madakkathara to Areekode. (Transgrid North-1)	371.03	371.03	MOP sanction dated. 16.05.2017.	333.93 (90% grant- para 6.3 (ii) of guidelines.)	Rs. 460.27 Cr (24.05% above the estimate cost on 30.10.2017) (Work in progress)

- Apprehension over extensive use of HTLS in the transmission system
 - As per CEA recommendations, the use of HTLS conductors need to be considered on case to case basis based on technoeconomic analysis over the life cycle.
 - The terminal equipment rating at substations needs to be examined for enhancement of power flow in a line. However, for new lines, proper system studies need to be carried out to identify the corridors for use of such conductor.
 - The consequences on the effect of increase in transmission loss due to the extensive use of HTLS need to be evaluated.

Distribution

Rationalisation of Tariff:

- We have 33 tariff classifications.
 - 17 LT tariff classification,
 - 8 HT tariff classification,
 - 5 EHT tariff classification,
 - 2 traction and
 - Licensee bulk sale.

As such, no initiative in the proposal for rationalisation of Tariff.

T&D Loss Reduction

- The claim needs to be supported with appropriate data from the field or with appropriate study reports. We may point out that the technical evaluation of the data presented with the petition do not provide a supporting picture.
- Normally, the LT level loss is projected as around 6% (as per the table 4.20 of the projected losses, the LT loss during 2018-19 itself is projected as 5.99%). With 2% loss is estimated even for a three-star distribution transformer in India, the only genuine method to reduce the distribution

loss is to ensure maximum sale at HT level by resorting to HVDS. But it is observed that the % of the LT energy sale is on rise and hence the claim cannot be admitted in toto.

Category	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	
Domestic	7705.86	8313.36	8739.52	9367.26	9943.48	10280.74	10574.84	
Commercial	2141.22	2224.06	2229.34	2418.28	2735.36	2957.95	3063.48	
Industrial	1097.04	1101.96	1096.56	1096.93	1103.23	1131.91	1112.33	
Agricultural	286.18	306.08	310.24	291.41	279.48	321.98	346.03	
Streetlight	294.26	313.2	319.06	346.43	366.62	375.77	373.48	
Sub Total (LT)	11524.56	12258.66	12694.72	13520.31	14428.16	15068.35	15470.15	
HT category	2586.27	2687.56	2791.64	2988.14	3130.94	3301.83	3494.04	
EHT Category	1243.12	1217.59	1243.85	1158.45	975.06	826.38	1041.94	
Railways	154.49	173.67	200.69	205.31	212.83	229.59	265.8	
Bulk Supply	472.09	500.76	523.15	554.06	578.08	612.1	608.77	
Total Sales	15980.53	16838.24	17454.05	18426.27	19325.07	20038.25	20880.7	
LT Sale	%	72.12%	72.80%	72.73%	73.38%	74.66%	75.20%	74.09%

- More over as per the data provided in the petition, the LT/HT ratio for the entire state during 2017-18 is **4.7:1** which is far below the CEA recommended ration of **1:1**.

Investment in Transmission & Distribution.

- We support all type of genuine investment in transmission and distribution in tune with the planning Criteria specified by CEA to ensure reliable supply of electricity with quality at reasonable cost.
- The investments decisions need to be transparent complying standards, guidelines and procedures specified by various statutory authorities including CEA, CERC & KSERC and should be open for discussions at various levels before finalising decisions.
- Viability of investment in Transmission & distribution. (Eg-100kVA Tr.)

As per CEA guidelines: spec. for out door energy efficient Transformer								
Rating (kVA)	3 Star				Energy handled for a day at 100% loading for 25 years in units	Loss in kWh @ 2%	Loss in kWh @ 0.58%	Saving in kWh
	Max. Losses at 50% loading (Watts)	%	Max. Losses at 100% loading (Watts)	%				
100	520	0.58%	1800	2.00%	1,97,10,000	3,94,200	1,14,318	2,79,882

- This is applicable for distribution lines and even transmission lines

As such, reliable supply of electricity to the consumer with quality need large scale investments. But the investments decisions need to be done with transparency complying all the relevant standards and procedures specified by the statutory authorities and through open discussions at various levels.

The Pension Fund:

- Clarity account of the Pension Liability
 - The estimated number of employees to be retired during the control period, their terminal benefits and the total amount to be disbursed as pension liability during the control period has not furnished.
- As per the petition, the assessed the unfunded pension liability, gratuity liability and leave surrender liability at Rs.16147.70 Cr.
- Rs.3728.98 Cr increase in liability for the period from 01.11.2013 to 31.03.2017.
- The data on “Interest on the Trust Bond” is provided in the petition is shown below.

Total Interest on the total		Liability to Master Trust			
SBU	Emp. ratio	2018-19	2019-20	2020-21	2021-22
G	5.13	58.79	56.7	54.72	52.53
T	11.32	129.76	125.15	120.54	115.93
D	83.56	958.03	924.01	889.98	855.96
Total	100.00	1146.58	1105.86	1065.14	1024.42

Not clear whether this amount is enough to meet the entire pension liability for the control period.

O&M expense and Employee Cost

As per the petition “the O&M expenses as per norms for the control period are below the actual expense projection. This will lead to under recovery of genuine O&M costs. However, KSEBL is taking earnest efforts to control the O&M expenses to the extent possible. If any variation is found beyond its control, then it is humbly requested that the same may be allowed at actual during true up”.

We are of the opinion that the excess O&M expense along with employee cost is mainly due to the extensive use of the old assets beyond useful life specified to it and lack of automation in its envisaged level. The operation of the assets beyond useful life demand extra care and maintenance to ensure reliability. Hence, we request that the O&M Cost and employee cost may be reduced through a specified road map along with automation, modernisation and mechanisation.

- RLA study or condition assessment may be conducted on such expensive assets in generation & transmission and may be replaced if found unreliable. If the study provides extended life with reliability, same may be utilised with a relaxed O&M norm based on the study reports.
- The assets in the distribution and other normal assets in the generation and transmission may be replaced after useful life unless found fully reliable.

- The structural classification of capital works may be carried out by appropriate organisational structure and it is ensured that the salary of the employee engaged in the capital work is capitalised.
- Salary of the employee engaged in other functions and JV business beyond the scope of ARR may be accounted from the relevant other function.
- The modernisation, automation & mechanisation need to be done in totality for ensuring effective utilisation of the HR.

C.P. George
Vice President,
KSEB Engineers' Association,
Thiruvananthapuram.