

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No. 243/TT/2021

Coram:

**Shri I. S. Jha, Member
Shri Arun Goyal, Member
Shri P. K. Singh, Member**

Date of Order: 24.11.2022

In the matter of:

Approval under Regulation 86 of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999 and determination of transmission tariff of 2019-24 tariff period under the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 in respect of **Asset-1**: Pugalur HVDC station-Edayarpalayam (TANTRANSCO) 400 kV (Quad) D/C transmission line along with associated bays at Pugalur HVDC Station and Edayarpalayam (TANTRANSCO)-Udumalpet 400 kV (Quad) D/C transmission line along with associated bays at Udumalpet Sub-station (Pugalur HVDC-Edayarpalayam line and Edayarpalayam-Udumalpet line are bypassed at Edayarpalayam Sub-station to make Pugalur HVDC-Udumalpet line as an interim arrangement) and **Asset-2**: Pugalur (HVDC Station)-Thiruvalam 400 kV (Quad) D/C Transmission line along with associated bays and equipment at both ends and 2 numbers 80 MVAR line Reactors at Pugalur (HVDC Station) and 2 numbers 63 MVAR line reactors at Thiruvalam (existing 63 MVAR Bus reactor at Thiruvalam shall be utilized as line reactor in one circuit and second circuit shall have new 63 MVAR Line Reactor) under "HVDC Bipole link between Western Region (Raigarh, Chattisgarh) and Southern Region (Pugalur, Tamil Nadu)-North Trichur (Kerala)-Scheme-2 AC System strengthening at Pugalur end" in the Southern Regional Grid.

And in the matter of:

Power Grid Corporation of India Limited.
SAUDAMINI, Plot No-2,
Sector-29, Gurgaon-122 001 (Haryana).

.... Petitioner

Versus

1. Tamil Nadu Generation and Distribution Corporation Limited,
(Formerly Tamil Nadu Electricity Board-TNEB),
NPKRR Maaligai, 800, Anna Salai,
Chennai-600002, Tamil Nadu.
2. Transmission Corporation of Andhra Pradesh Limited,
Vidyut Soudha, Near Axis Bank, Eluru Road,



Gunadala, Vijayawada-520004.

3. Kerala State Electricity Board Limited,
Vaidyuthi Bhavanam, Pattom,
Thiruvananthapuram-695004.
4. Electricity Department,
Government of Goa, Vidyuti Bhawan,
Panaji, Goa-403001.
5. Electricity Department,
Government of Pondicherry,
Pondicherry-605001.
6. Eastern Power Distribution Company of Andhra Pradesh Limited (APEPDCL),
P&T Colony, Seethmmadhara,
Vishakhapatnam, Andhra Pradesh.
7. Southern Power Distribution Company of Andhra Pradesh Limited,
D. No.19-13-65/A, Srinivasapuram, Corporate Office,
Tiruchanoor Road, Tirupati-517503,
Chittoor District, Andhra Pradesh.
8. Southern Power Distribution Company of Telangana Limited,
6-1-50, Corporate Office, Mint Compound,
Hyderabad -500063, Telangana.
9. Northern Power Distribution Company of Telangana Limited,
H.No.2-5-3 ½, Vidyut Bhawan, Corporate Office,
Nakkal Gutta, Hanamkonda,
Warangal-506001, Telangana.
10. Bangalore Electricity Supply Company Limited,
Corporate Office, K.R. Circle,
Bangalore-560001, Karnataka.
11. Gulbarga Electricity Supply Company Limited,
Station Main Road,
Gulbarga, Karnataka.
12. Hubli Electricity Supply Company Limited,
Navanagar, PB Road,
Hubli, Karnataka.
13. MESCOM Corporate Office,
Paradigm Plaza, AB Shetty Circle,
Mangalore-575001, Karnataka.



14. Chamundeswari Electricity Supply Corporation Limited,
927, LJ Avenue, Ground Floor,
New Kantharaj URS Road, Saraswatipuram,
Mysore-570009, Karnataka.

15. Transmission Corporation of Telangana Limited,
Vidhyut Sudha, Khairatabad,
Hyderabad-500082, Telangana.

16. Karnataka Power Transmission Corporation Limited,
Kaveri Bhawan, Bangalore-560009.

17. Tamil Nadu Transmission Corporation,
NPKRR Maaligai, 800, Anna Salai,
Chennai-600002.

...Respondent(s)

For Petitioner: Ms. Swapna Seshadri, Advocate, PGCIL
Shri Aditya H. Dubey, Advocate, PGCIL
Shri S.S. Raju, PGCIL
Ms. Anshul Garg, PGCIL
Shri D.K Biswal, PGCIL
Shri V. P. Rastogi, PGCIL

For Respondent: Shri S. Vallinyagam, Advocate, TANGEDCO
Shri Sri Harsha Peechara, Advocate, TSSPDCL & TSNPDCL
Shri Diptiman Acharyya, Advocate, TSSPDCL & TSNPDCL
Shri Prabhas Bajaj, Advocate, KSEB
Dr. R. Kathivaran, TANGEDCO
Shri R. Ramalakshmi, TANGEDCO
Shri R. Srinivasan, TANGEDCO
Shri Anindya Khare, MPPMCL

ORDER

The instant petition has been filed by Power Grid Corporation of India Limited, a deemed transmission licensee, for determination of tariff under the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 (hereinafter referred to as “the 2019 Tariff Regulations”) from the date of commercial operation (COD) to 31.3.2024 in respect of the following assets under “HVDC Bipole link between Western Region (Raigarh, Chattisgarh) and Southern Region (Pugalur, Tamil Nadu)-



North Trichur (Kerala)-Scheme-2: AC System strengthening at Pugalur end” in the Southern Regional Grid (hereinafter referred to as “transmission project”):

Asset-1: Pugalur HVDC station-Edayarpalayam (TANTRANSCO) 400 kV (Quad) D/C transmission line along with associated bays at Pugalur HVDC Station and Edayarpalayam (TANTRANSCO)-Udumalpet 400 kV (Quad) D/C transmission line along with associated bays at Udumalpet Sub-station (Pugalur HVDC-Edayarpalayam line and Edayarpalayam-Udumalpet line are bypassed at Edayarpalayam Sub-station to make Pugalur HVDC-Udumalpet line as an interim arrangement); and

Asset-2: Pugalur (HVDC Station)-Thiruvalem 400 kV (Quad) D/C Transmission line along with associated bays and equipment at both ends and 2 numbers 80 MVAR line Reactors at Pugalur (HVDC Station) and 2 numbers 63 MVAR line reactors at Thiruvalem (existing 63 MVAR Bus reactor at Thiruvalem shall be utilized as line reactor in one circuit and second circuit shall have new 63 MVAR Line Reactor) (hereinafter referred to as “transmission assets”)

2. The Petitioner has made the following prayers in the instant Petition:

“1) Admit the capital cost as claimed in the Petition and approve the Additional Capitalisation incurred / projected to be incurred.

2) Condone the delay in execution of the project due to ROW issues.

3) Approve the Transmission Tariff for the tariff block 2019-24 block for the asset covered under this petition, as per para –9.3 above.

4) Allow the petitioner to submit the Revised Cost estimation for the asset under instant petition.

5) Allow the petitioner to recover the shortfall or refund the excess Annual Fixed Charges, on account of Return on Equity due to change in applicable Minimum Alternate/Corporate Income Tax rate as per the Income Tax Act, 1961 (as amended from time to time) of the respective financial year directly without making any application before the Commission as provided in Tariff Regulation 2019 as per para 8 above for respective block.

6) Approve the reimbursement of expenditure by the beneficiaries towards petition filing fee, and expenditure on publishing of notices in newspapers in terms of Regulation 70 (1) Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019, and other expenditure (if any) in relation to the filing of petition.

7) Allow the petitioner to bill and recover Licensee fee and RLDC fees and charges, separately from the respondents in terms of Regulation 70 (3) and (4) Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019.



8) Allow the petitioner to bill and adjust impact on Interest on Loan due to change in Interest rate on account of floating rate of interest applicable during 2019-24 period, if any, from the beneficiaries.

9) Allow the Petitioner to claim the overall security expenses and consequential IOWC on that security expenses separately.

10) Allow the petitioner to claim the capital spares at the end of tariff block as per actual.

11) Allow the Petitioner to bill and recover GST on Transmission Charges separately from the respondents, if GST on transmission is levied at any rate in future. Further, any taxes including GST and duties including cess etc. imposed by any statutory/Govt./municipal authorities shall be allowed to be recovered from the beneficiaries.

12) Allow interim tariff in accordance with Regulation 10 (3) of Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 for purpose of inclusion in the PoC charges.

and pass such other relief as Hon'ble Commission deems fit and appropriate under the circumstances of the case and in the interest of justice.”

Background

3. The brief facts of the case are as follows:

(a) **Project Background:** Southern Region was facing a huge power deficit which had arisen mainly due to - (i) delay/deferment of anticipated generation projects (for example-Krishnapattam UMPP (4000 MW), Cheyyur UMPP (4000 MW), Udangudi TPS, IPP projects in Nagapattinam/ Cuddalore area (3000 to 4000 MW), Kundankulam APP (2000 MW), Kalpakkam PFBR (500 MW), East coast project in Srikakulam (1320 MW), Gas based projects in Vemagiri (about 3000 MW) etc.) and (ii) non-availability of gas for existing gas projects in Southern Region (SR). The maximum power demand of SR was about 39,000 MW around 2013-15. As per 18th EPS of Central Electricity Authority (CEA), the expected power demand of SR by the end of XIIth and XIIIth plan would be about 57,200 MW and 82,200 MW, respectively. Hence, power transfer requirement to SR was expected to increase. Therefore, to facilitate the import of power into SR and considering the long distance, it was proposed that power be transferred over HVDC system along with the associated AC Transmission system at 400 kV level.



(b) Accordingly, ± 800 kV 6000 MW HVDC link with terminals at Raigarh and Pugalur along with VSC based 2000 MW HVDC link between Pugalur and North Trichur (Kerala) was discussed in 37th Standing Committee on Power system planning of Southern Region (SCPSPSR) held on 31.7.2014. The scheme was again discussed and agreed in the Joint Standing Committee meeting of SR and WR constituents held on 20.4.2015, wherein it was decided that the scheme “ ± 800 kV 6000 MW HVDC link with terminals at Raigarh and Pugalur along with VSC based 2000 MW HVDC link between Pugalur and North Trichur (Kerala) and associated AC Transmission system at 400 kV level” would to be implemented as three separate schemes as follows:

- i. **Scheme-1:** Raigarh-Pugalur 6000 MW HVDC System
- ii. **Scheme-2:** AC System strengthening at Pugalur end
- iii. **Scheme-3:** Pugalur-Trichur 2000 MW VSC Based HVDC System

(c) In the above Joint Standing Committee meeting, it was decided that the schemes may be implemented as three separate schemes, however, it is important that Scheme-2 and Scheme-3 should be in place before execution of 6000 MW Raigarh-Pugalur link. Further, the Raigarh-Pugalur-Trichur HVDC transmission scheme was discussed in the 39th meeting of SCPSRSR held on 28/29.12.2015. In the meeting, it was agreed that schedule of Scheme-3 viz. Pugalur-Trichur 2000 MW VSC Based HVDC System will be kept with Bi-Pole-II (i.e. 3000 MW) of Scheme-1. It was also decided in the 39th SCPSPSR meeting that in case of any mismatch in the execution of these schemes, their usefulness will be discussed with CEA before their execution.

(d) Further, the execution of Scheme-2 was delayed due to severe RoW issues in the areas of Tamil Nadu and Kerala States. Accordingly, a meeting was convened by CEA/ Constituents on 21.8.2020 to discuss the issue of part execution of Raigarh-Pugalur-Trichur HVDC transmission system. After discussion, it was agreed that Scheme-1 (Phase I: ± 800 kV, 1500 MW HVDC terminal at Raigarh and Pugalur of Bipole-I) along with ± 800 kV, 6000 MW Raigarh-Pugalur HVDC transmission link will be executed alongwith Scheme-2 (400 kV D/C Pugalur (HVDC)-Pugalur (existing) transmission line and 400 kV



D/C Pugalur (HVDC)- Arasur Transmission line). Therefore, the Petitioner put the asset: \pm 800 kV 6000 MW Raigarh (HVDC Station)-Pugalur (HVDC Station) HVDC link along with \pm 800 kV 1500 MW (Pole-I) HVDC terminals each at Raigarh (HVDC Station) & Pugalur (HVDC Station) being part of Scheme-1 and 400 kV D/C Pugalur (HVDC)-Pugalur (existing) transmission line and 400 kV D/C Pugalur (HVDC)-Arasur transmission line being part of Scheme-2 together under commercial operation w.e.f. 6.9.2020. The minutes of CEA has already been placed on record *vide* affidavit dated 11.8.2021.

(e) The details and scope of the transmission system as discussed and agreed in various Standing Committees and Regional Power Committee of Southern and Western Region is summarised as follows:

Sl. No.	Dated	Particulars
1	4.1.2013	35 th meeting of Standing Committee on Power system planning in Southern Region
2	29.8.2013	36 th meeting of Standing Committee on Power system planning in Western Region
3	4.9.2013	36 th meeting of Standing Committee on Power system planning in Southern Region
4	9.10.2013	24 th meeting of Western Regional Power committee
5	26.10.2013	23 rd Meeting of Southern Regional Power Committee
6	15.3.2014	24 th Meeting of Southern Regional Power Committee
7	31.7.2014	37 th meeting of Standing Committee on Power system planning in Southern Region
8	26.7.2014	25 th Meeting of Southern Regional Power Committee
9	5.9.2014	37 th meeting of Standing Committee on Power system planning in Western Region
10	30.9.2014	33 rd meeting of Empowered committee on Transmission
11	20.12.2014	26 th Meeting of Southern Regional Power Committee
12	7.3.2015	38 th meeting of Standing Committee on Power system planning in Southern Region
13	13.4.2015	34 th meeting of Empowered committee on Transmission
14	20.4.2015	Joint Meeting of Standing Committee on Power system planning in Southern Region and Western Region
15	12.5.2015	27 th Meeting of Southern Regional Power Committee
16	28.5.2015	Joint Meeting of Standing Committee on Power system planning in Southern Region
17	28.5.2015	Corrigendum-Joint Meeting of Standing Committee on Power system planning in Southern Region and Western Region
18	29.9.2015	Prior Approval Letter of the Government under Section-68(1) of Electricity Act, 2003

(f) The scope of various Schemes of the transmission project is as follows:

(i) Scheme-1: Raigarh-Pugalur 6000 MW HVDC System



1. Establishment of Raigarh HVDC Station ± 800 kV with 6000 MW HVDC terminals. This Raigarh station would be implemented with extended bus of Raigarh (Kotra) existing 400 kV Sub-station. The HVDC Station would have GIS for 400 kV part and AIS for HVDC part.
2. Establishment of Pugalur HVDC Station ± 800 kV with 6000 MW HVDC terminals. The HVDC Station would have GIS for 400 kV part and AIS for HVDC part.
3. ± 800 kV Raigarh (HVDC Station)-Pugalur (HVDC Station) HVDC Bipole link with 6000 MW capacity.

This system would be designed with normal 20% overload for 30 minutes and 10% overload for 2 hours.

(ii) Scheme-2: AC System strengthening at Pugalur end

Transmission Line

1. Pugalur HVDC Station-Pugalur (Existing) 400 kV (quad) D/C line.
2. Pugalur HVDC Station-Arasur 400 kV (quad) D/C line.
3. Pugalur HVDC Station-Thiruvalem 400 kV (quad) D/C line with 2x80 MVAR line reactor at Pugalur HVDC Station end and 2x63 MVAR line reactor at Thiruvalem 400 kV end (existing 1x63 MVAR bus reactor shall be utilized as line reactor in one circuit and the second circuit shall have new 63 MVAR line reactor)
4. Pugalur HVDC Station-Edayarpalayam 400 kV (quad) D/C line.
5. Edayarpalayam-Udumalpet 400 kV (quad) D/C line.

Sub-station

1. Extension of 400 kV Pugalur (existing) Sub-station:
 - 400 kV Line bays-2 numbers.
2. Extension of 400 kV Arasur Sub-station
 - 400 kV Line bays-2 numbers.
3. Extension of 400 kV Thiruvalem Sub-station
 - 400 kV Line bays-2 numbers.
 - 63 MVAR Line Reactors- 2 numbers.



(Existing 1x63 MVAR Bus Reactor shall be utilized as line reactor in one circuit and the second circuit shall have new 63 MVAR line reactor)

4. Extension of 400 kV Edayarpalayam (TANTRANSCO) Sub-station (*)
- 400 kV Line bays-4 numbers.
5. Extension of 400 kV Udumalpet Sub-station
- 400 kV Line bays-2 numbers.
6. Extension of 400 kV Pugalur GIS
- 400 kV Line bays-8 numbers.
- 80 MVAR Line Reactors-2 numbers.

() Bay extension works at Edayarpalayam (TANTRANSCO) Sub-station is envisaged to be implemented by TANTRANSCO on behalf of the Petitioner on deposit work basis.*

(iii) Scheme-3: Pugalur-Trichur 2000 MW VSC Based HVDC System

1. ± 320 kV, 2000 MW VSC based HVDC terminal at Pugalur. The HVDC Station would have GIS for 400 kV part and AIS for HVDC part.
2. ± 320 kV, 2000 MW VSC based HVDC terminal at North Trichur. The HVDC Station would have GIS for 400 kV part and AIS for HVDC part.
3. Establishment of VSC based 2000 MW HVDC link between Pugalur and North Trichur* (Kerala). (*part/parts of this link, in the Kerala portion, may be implemented as underground cable where implementation as overhead transmission line is difficult because of RoW issues).
4. LILO of North-Trichur-Cochin 400 kV (Quad) D/C line at North Trichur HVDC Station.

(g) The Investment Approval (IA) of the transmission project (i.e. Scheme-2 of the project) was accorded by the Board of Directors of the Petitioner's Company vide Memorandum No. C/CP/RP HVDC Scheme-2 dated 30.8.2017 in its 344th meeting held on 16.8.2017 at an estimated cost of ₹193139 lakh including IDC of ₹9910 lakh, based on April, 2017 price level.



(h) Further, Revised Cost Estimate (RCE) of the transmission project (i.e. Scheme-2 of the project) was accorded by the Committee on Investment on Projects of the Petitioner's Company in its 127th meeting held on 29.12.2021 communicated *vide* Memorandum No. C/CP/PA2122-10-0AR-RCE009 dated 13.1.2022 at an estimated cost of ₹263555 lakh including IDC of ₹11160 lakh, based on September, 2021 price level.

(i) As per IA dated 16.8.2017, the Scheduled Commercial Operation Date (SCOD) of the transmission assets is 30 months from the date of IA i.e. by 16.2.2020, against which the transmission assets have been declared under commercial operation (COD) on 13.7.2021 and 25.10.2021 with time over-run ranging from 513 to 617 days.

(j) The status of Scheme/Projects/Assets covered under various petitions are as tabulated as follows:

Sl. No.	Assets	SCOD	Actual COD	Covered under Petition No.
A	Scheme-1: Raigarh-Pugalur 6000 MW HVDC System			
1	±800 kV 6000 MW Raigarh (HVDC Station)-Pugalur (HVDC Station) HVDC Link along with ±800 kV 1500 MW (Pole-I) HVDC terminals each at Raigarh (HVDC Station) & Pugalur (HVDC Station)	5.11.2019	6.9.2020	685/TT/2020
2	±800 kV 1500 MW (Pole-II) HVDC terminals each at Raigarh (HVDC Station) & Pugalur (HVDC Station)	5.11.2019	9.3.2021	173/TT/2021
3	±800 kV 1500 MW (Pole-III) HVDC terminals each at Raigarh (HVDC Station) & Pugalur (HVDC Station)	5.11.2019	13.7.2021	
4	±800 kV 1500 MW (Pole-IV) HVDC terminals each at Raigarh (HVDC Station) & Pugalur (HVDC Station)	5.11.2019	25.10.2021	242/TT/2021
B	Scheme-2: AC System strengthening at Pugalur end			
1	a) 400 kV Pugalur (HVDC Station) - Pugalur (Existing) (Quad) D/C Transmission line along with associated bays at Pugalur (HVDC Station) & Pugalur (Existing) Sub-station and b) 400 kV Pugalur (HVDC Station)-Arasur (Quad) D/C	16.2.2020	6.9.2020	693/TT/2020



Sl. No.	Assets	SCOD	Actual COD	Covered under Petition No.
	Transmission line along with associated bays at Pugalur (HVDC Station) & Arasur station			
2	Pugalur HVDC Station-Edayarpalyam (TANTRANSCO) 400 kV (quad) D/C line along with associated bays at Pugalur HVDC station and Edayarpalyam (TANTRANSCO) Sub-station and 2 numbers 80 MVAR line reactors at Pugalur HVDC station and Edayarpalayam (TANTRANSCO)-Udumalpet 400 kV (quad) D/C line (Pugalur-Edayarpalyam line and Edayarpalyam-Udumalpet line are bypassed at Edayarpalyam Sub-station to make Pugalur-Udumalpet line)	16.2.2020	13.7.2021	243/TT/2021 (Instant Petition)
3	Pugalur HVDC Station-Thiruvalam 400 kV (quad) D/C line along with associated bays at Pugalur HVDC station and Thiruvalam Sub-station and 2 numbers. 63 MVAR line reactors at Thiruvalam Sub-station		25.10.2021	
4	4 numbers of 400 kV line bays at Edayarpalayam (Tamil Nadu station) for terminating Pugalur HVDC Station-Edayarpalayam 400 kV (quad) D/C line and Edayarpalayam-Udumalpet 400 kV (quad) D/C lines.	16.2.2021	Yet to achieve COD*	
<i>*Bay extension works at Edayarpalayam (TANTRANSCO) Sub-station is envisaged to be implemented by TANTRANSCO on behalf of the Petitioner on deposit work basis.</i>				
C	Scheme-3: Pugalur- Trichur 2000 MW VSC Based HVDC System			
1	±320 kV VSC based 2000 MW Pugalur (HVDC)-North Trichur HVDC (Kerala) HVDC link along with ±320 kV 1000 MW (Mono Pole-II) HVDC terminals each at Pugalur (HVDC Station) & North Trichur (HVDC Station, Kerala)	9.4.2020	9.3.2021	172/TT/2021
2	±320 kV 1000 MW (Mono Pole-I) HVDC terminals each at Pugalur (HVDC Station) & North Trichur (HVDC Station, Kerala)	9.4.2020	8.6.2021	



Sl. No.	Assets	SCOD	Actual COD	Covered under Petition No.
3	LILO of North Trichur-Cochin 400 kV (Quad) D/C line at North Trichur HVDC station along with associated bays & equipment's (GIS) at North Trichur HVDC station	9.4.2020	9.3.2021	
4	2 X 315 MVA 400/220/33 kV 3 Ph Auto Transformer along with its associated bays & equipment (GIS) at North Trichur HVDC station	9.4.2020	9.3.2021	
5	2 Numbers. additional 220 kV line bays (GIS) at North Trichur HVDC for implementation of 220 kV feeder of Kerala	9.4.2020	9.3.2021	

4. The Petitioner has submitted that it discussed part execution of Raigarh-Pugalur HVDC transmission along with AC transmission lines. The relevant extracts of the minutes of the CEA meeting held on 21.8.2020 are as follows:

“List of the participants is enclosed at Annex-I

1. Chief Engineer (PSP&A-I), CEA, welcomed the participants and informed that the meeting had been convened to deliberate on the proposal of CTU for part commissioning of Raigarh- Pugalur HVDC transmission system.
2. Director (PSPA-I), CEA, informed that the Raigarh- Pugalur + 800 kV, 600 MW HVDC transmission system had been planned in the year 2014 for import of power to Southern Region was facing huge power deficit. The scheme was discussed in the 37th SCPSPSR meeting held on 31.7.2014. Subsequently, the scheme was discussed and agreed in the Joint Standing Committee meeting of SR & WR constituents held on 20.04.2015. Details of the scheme are as given below:

Scheme # 1: Raigarh-Pugalur 6000 MW HVDC Transmission System:

- i. Establishment of Raigarh HVDC Station + 800 KV 6000 MW HVDC terminals.
- ii. Establishment of Pugalur HVDC Station + 800 KV 6000 MW HVDC terminals.
- iii. + 800 KV Raigarh (HVDC Staion) – Pugalur (HVDC Station) HVDC Bipole link with 6000 MW capacity.

Scheme # 2: AC System strengthening at Pugalur end:

- i. Pugalur HVDC Station – Pugalur (Existing) 400 kV (quad) D/c line
- ii. Pugalur HVDC Staion – Arasur 400 kV with (quad) D/c line.
- iii. Pugalur HVDC Station – Thiruvalem 400 kV (quad) D/c line with 2x80 MVAR line reactor at Pugalur HVDC Station end and 2x63 MVAR line reactors at Thiruvalem 400 kV end.
- iv. Pugalur HVDC Station – Edayaroakayam 400kV D/c line.
- v. Edayarpalayam – Udumulpeta 400 kV (quad) D/c line.

Scheme # 3: Pugalur –Trichur 2000 MW VSC Based HVDC System:



- i. +320 kV, 2000 MW VSC based HVDC terminal at Pugalur. The HVDC Station would have GIS for 400kV part and AIS for HVDC part.
- ii. +320 kV, 2000 MW VSC based HVDC terminal at North Trichur. The HVDC Station would have GIS for 400kV part for AIS for HVDC part.
- iii. Establishment of VSC based 2000 MW HVDC link between Pugalur and North Trichur* (Kerala). (*participants of this link, in the Kerala portion, may be implemented as underground cable where implementation as overhead transmission line is difficult because of RoW issues).
- iv. LILO of North-Trichur – Cochin 400 kV (Quad) D/c line at North Trichur HVDC Station

In the Joint Standing Committee meeting, it was also decided that the schemes may be implemented as separate schemes, however, it is important that the Scheme no. 2 Scheme no. 3 should be in place before commissioning of 6000 MW Raigarh – Pugalur link.

3. Director (PSPA-I), CEA, further informed that subsequently the matter regarding sequence of commissioning of three schemes, in view of uncertainties on account of RoW and land issues, was discussed in the 39th meeting of SCPSPSR held on 28-29 December, 2015. In the meeting it was brought out that even if Scheme-3 commissioned (prior to Scheme-1), it can be utilized for export of power to Kerala which is facing transmission constraints. Similarly, in case part system of Cheme-2 and one pole Raigarh–Pugalur HVDC link and/or VSC based HVDC to Kerala is commissioned, the system would be benefitted by enabling additional transfer of power to Southern Region.

It is decided in the 39th SCPSPSR meeting that in case of nay mismatch in the execution of these schemes, their usefulness shall be discussed with CEA before their commissioning.

4. As per discussion in the 39th SCPSPSR, CTU vide letter dated 10.07.2020, has submitted the proposal for part commissioning of Raigarh – Pugalur HVDC Transmission System (part of Scheme-1 part of Scheme-2) for consideration of CEA as under:

- Raigarh – Pugalur HVDC line and Pole 1 (1500 MW) are ready for commissioning and test are in progress.
- Pugalur (HVDC) – Pugalur (existing) 400 kV D/c line is ready for commissioning.
- Pugalur – Arasur 400 kV D/c line would be ready for Commissioning by 31.08.2020.

Commissioning of above transmission system will facilitate additional import of 1500 MW power in Southern Region. Director (PSPA-I), CEA, informed that the proposal has been examined and technically it has been found to be generally in order for transfer of 1500 MW power of Southern Region. He requested CTU to present the detailed proposal.

5. CGM (CTU-Plg) informed that the Raigarh – Pugalur HVDC transmission system was planned in 2015 for import of power in Southern Region from NEW Grid. Southern Region was facing acute shortage of power due to delay in large number of generation projects in the NEW (North, East & West) Grid, however, due to constraints in inter-regional links, power import was limited and region could not meet the electricity demand. He further stated that the Raigarh – Pugalur – Trichur HVDC transmission system is a large scheme and considering the ROW/ land issues, it is not possible to complete and charge all the elements of the scheme at one go. Further, it will be beneficial from grid security point of view if the scheme is commissioned in stages so



that its impact on grid, if any, can be analysed and appropriate action could be taken. Further, details of elements ready for commissioning as part of Scheme#1 and Scheme#2 are as given below.

Elements ready for commissioning from Scheme #1

- i. +800 kV Raigarh HVDC Station with 1500 MW HVDC terminal (Pole-1)
- ii. +800 kV Pugalur HVDC Station with 1500 MW HVDC terminal (Pole-1)
- iii. +800 kV Raigarh (HVDC Stn) – Pugalur (HVDC Stn) HVDC line.

Elements ready for commissioning from Scheme#2

- i. Pugalur (HVDC) – Pugalur (Existing) 400 kV D/c line
- ii. Pugalur (HVDC) – Arasur 400 kV D/c line

Details of commissioning schedule of other elements are enclosed at Annex-2.

6. CGM (CTU-Plg) further informed that based on the study result it was observed that 1500 MW power can be transferred over this Raigarh – Pugalur HVDC system even under N-1-1 contingency criteria. It was also informed that commissioning of above transmission system will facilitate enhancement in import ATC of Southern Region by 1500 MW and it shall provide additional control flexibility to the grid operator in power flow management and maintaining system parameters.
7. Chief Engineer (PSPA-I), CEA, requested Southern Region constituents to express their views/observations on the part commissioning of the transmission system.
8. Representative of TSTRANSCO congratulated PGCIL for their efforts in implementation and readiness for part commissioning for Raigarh-Pugalur HVDC transmission system and informed that they welcome the part commissioning of the system. It was also stated that as explained by CTU, it will enhance the import capability of the Region – Pugalur HVDC transmission system is of National importance and may be considered as National Component.
9. Chief Engineer, KSEB, stated that they also welcome the part commissioning of the Raigarh – Pugalur HVDC transmission system and are of same opinion as that of TSTRANSCO for declaring the assets as National Component.
10. Chief Engineer (PSPA-1), CEA, informed that the Raigarh – Pugalur HVDC transmission was planned for import of power to Southern Region and subject meeting was regarding part commissioning of the Raigarh – Pugalur HVDC transmission system. The matter regarding considering Raigarh-Pugalur-Trichur HVDC transmission system as National Component has been taken up separately through a VIP reference and the matter has been flagged in Ministry of Power, Government of India. Matter regarding considering the Raigarh – Pugalur –Trichur HVDC transmission system as a National Component is beyond the scope of this forum and is under the purview of CERC.
11. Representatives of TANTRANSCO enquired about the impact on grid in case of outage of 1500 MW Pole-1 of Raigarh – Pugalur HVDC transmission system. DGM(CTU-Plg) informed that transmission system has been planned considering the Transmission Planning Criteria of CEA and existing AC inter-regional links shall facilitate and withstand the contingency of one pole outage.



12. *Member Secretary, SRPC, informed that power flow on HVDC system will relieve loading on AC networks, especially inter-regional links between SR and WR/ER which may cause high voltage situations in SR grid. He also stated that a number of 400 kV & 765 kV transmission line are required to be kept open to keep the voltage within the limits. COO(CTU-Plg) informed that the Raigarh-Pugalur HVDC transmission system would also facilitate in voltage regulation. In addition, a number of bus reactors have been planned for installation in SR grid to keep voltages within permissible limits. He also informed that reactive power planning is a continuous process to review the network condition & system parameters and a committee has been formed by CEA for reactive power planning on all-India basis in order to address the high voltage conditions.*

Member, Secretary, SRPC, further stated that various issue related to software maloperation and issue in DMR had been observed during initial phase of operation of Champa-Kurukshetra HVDC transmission system, which let to tripping of poles on several occasions and enquired about the steps taken-up to avoid such tripping in the Raigarh-Pugalur HVDC system. ED (HVDC), PGCIL informed that Champa-Kurukshetra HVDC transmission system was planned and awarded in phase wise manner i.e. DK-1 (3000MW) and CK-2 (3000MW) and the software was originally designed for operation of Bipole-1 with DMR and not for parallel operation of Bipole-1 and Bipole-2. Software integration was carried out at a later stage, which let to frequent tripping during various combination of operation of Pole-1 and Pole-2 and Pole-3. However, in case of Raigarh – Pugalur HVDC transmission system, the software and control system have been designed in totality and will facilitate multiple combinations of operation without any problem.

13. *Member Secretary, SRPC, further enquired about the status of readiness of reactor at Arasur substation. ED (RPT), PGCIL, informed that Pugalur (HVDC) – Arasur 400kV D/c line has already charged and regarding reactor he would check and inform. Subsequently, PGCIL has informed that no reactor is planned at Arasur substation. 80 MVAR bus reactor has been planned at Thiruvalem S/s which shall be commissioned along with 400kV Pugalur (HVDC) – Thiruvalem D/c line.*
14. *ED (SRLDC), POSOCO, stated that they also welcome the part commissioning of the Raigarh-Pugalur HVDC transmission system, however, under certain operational conditions especially during high RE generation in Southern Region, high loading on Neyveli TS-II – NNTPS 400 kV S/c line to the extent of about 700 MW has been observed and the same may be looked into.*
15. *DGM (CTU-Plg) informed that matter regarding high loadings on Neyveli TS-II NNTPS 400 kV S/s line has already been deliberated in 2nd SRSC and 1st SRPC(TP) meeting held on 10.06.2019 and 16.12.2019 respectively, while panning the transmission system for grant of connectivity to Neyveli TS-II 2nd Expansion (2x600 MW) and to address the growing short circuit level at NEyveli Complex, Wherein it had been agreed to bypass Neyveli TS II – NNTPS 400 kv S/s line and one circuit of Neyveli TS II – Salem 400 kV D/c line at Nayveli TS II to form NNTPS –Salem 400 kV S/c line. This arrangement shall address the high loading issues of Neyveli TS II – NNTPS 400 kV S/c line. CGM (SRLDC0, POSOCO, also stated that the bypassing arrangements may resolve the issue of high loading on the line.*
16. *Sr. GM (NLDC), POSOCO, stated that power flow on the Raigarh – Pugalur HVDC Pole-1 (1500 MW) may not be 1500 MW on continuous basis. It shall depend on prevailing grid conditions and RE generation in Southern Region. The Raigarh-*



Pugalur HVDC transmission system shall also be utilized to control voltage by regulating the power flow on the HVDC link and parallel inter-regional AC links. He also informed that similar operational practices are being followed for other HVDC systems. He also added that part commissioning of Raigarh – Pugalur HVDC transmission system is expected to enhance import ATC of Southern Region from New grid by 1500 MW and shall provide additional flexibility for grid operation and shall enhance the grid security.

He further stated that loading on Kolhapur PG-Kolhapur MS 400 kV D/c line and NNTPS-Neyveli TS-II 400 kV S/C line may be high under certain grid conditions and power flow on the Raigarh-Pugalur HVDC transmission system may be regulated under these conditions to keep the flow on the above AC lines within limits. It was suggested that CTU may plan and suggest alternatives to address high loading on 400 kV Kolhapur PG-Kolhapur MS S/c line.

17. Chief Engineer (PSPA-I), CEA, opined that as the Southern Region constituents and POSOCO are in agreement for part commissioning of the Raigarh – Pugalur HVDC transmission system, PGCIL may commission the part transmission system as per their proposal, subject to the following:

- a) Commissioning of Pugalur (HVDC) – Pugalur (Existing) 400 kV d/c line and Pugalur (HVDC) –Arasur 400 kV D/c line to be ensure before commissioning of Single pole of Raigarh-Pugalur HVDC transmission system.
- b) Technical issue and other constraints observed consequent to commissioning shall be flagged for discussion and review in the next SRPC(TP) Meeting.

18. After detailed deliberations, it was agreed that PGCIL may commission part of Raigarh-Pugalur HVDC transmission system comprising of the following elements:

Part of Scheme#1: Raigarh-Pugalur 6000 MW HVDC System

- i. + 800kV Raigarh HVDC Station with 1500 MW HVDC terminal (Pole-1)
- ii. + 800kV Pugalur HVDC Station with 1500 MW HVDC terminal (Pole-1)
- iii. + 800kV Raigarh (HVDC Stn)-Pugalur (HVDC Stn) HVDC line.

Part of Scheme#2: AC System Strengthening at Pugalur end

- i. Pugalur (HVDC) –Pugalur (Existing) 400 kV D/c line
- ii. Pugalur (HVDC) –Arasur 400 D/c line.”

5. The Respondents are distribution licensees, transmission licensees and power departments, which are procuring transmission service from the Petitioner, mainly beneficiaries of the Southern and Western Region.

6. The Petitioner has served the petition on the Respondents and notice regarding filing of this petition has been published in the newspaper in accordance with Section 64 of the Electricity Act, 2003. No comments or suggestions have been received from the general public in response to the aforesaid notice published in the newspaper by



the Petitioner. Kerala State Electricity Board Limited (KSEB), Respondent No. 3 has filed a reply *vide* affidavit dated 13.12.2021 and has raised issues of increase in capital cost, time over-run, O&M Expenses, security expenses and charges and funding from PSDF/National Clean Energy fund. Tamil Nadu Generation and Distribution Corporation Ltd. (TANGEDCO), Respondent No. 1, has filed a reply *vide* dated 4.12.2021 and has raised the issues of techno-economical aspect of the transmission project and strategic importance of the project, time over-run, O&M Expenses, sharing of transmission charges, reduction of TTC/ ATC of Southern Region and funding from PSDF/ National Clean Energy Fund. TANGEDCO has also requested the Commission to declare the asset of 'Strategic and National Importance. Bangalore Electricity Supply Company Limited (BESCOM), Respondent No. 11, has filed a reply *vide* dated 7.3.2022 and has raised the issues of strategic importance of the project, time over-run, Initial Spares and O&M Expenses, sharing of transmission charges, and funding from PSDF/National Clean Energy Fund. The issues raised by KSEB, TANGEDCO and BESCOM and clarifications given by the Petitioner thereto have been dealt in the relevant portions of this order.

7. The hearings in this matter were held on 11.2.2022 through video conference and the order was reserved.

8. This order is issued considering the submissions made by the Petitioner *vide* affidavits dated 27.10.2021, 7.12.2021, 24.2.2022 and 28.2.2022, KSEB's reply filed *vide* affidavit dated 13.12.2021, TANGEDCO's reply *vide* affidavit dated 4.12.2021, BESCOM's reply *vide* affidavit dated 7.3.2022 and the Petitioner's rejoinders to the replies of KSEB and BESCOM *vide* affidavits dated 17.3.2022 and TANGEDCO's reply *vide* affidavit dated 14.12.2021.



9. We have heard the learned counsels for the Petitioner, KSEB, TANGEDCO and BESCOM and perused the material on record.

DETERMINATION OF ANNUAL FIXED CHARGES FOR 2019-24 TARIFF PERIOD

10. The Petitioner has claimed the following transmission charges *vide* affidavit dated 7.12.2021 for the transmission assets for 2019-24 tariff period:

(₹ in lakh)

Particulars	Asset-1		
	2021-22 (Pro-rata 262 days)	2022-23	2023-24
Depreciation	1881.45	2748.97	2822.70
Interest on Loan	644.89	927.82	926.42
Return on Equity	2008.81	2935.19	3013.98
O&M Expenses	188.09	271.12	280.44
Interest on Working Capital	66.61	97	99.08
Total	4789.85	6980.10	7142.62

(₹ in lakh)

Particulars	Asset-2		
	2021-22 (Pro-rata 158 days)	2022-23	2023-24
Depreciation	2866.24	6896.03	7063.23
Interest on Loan	1001.16	2376.66	2380.37
Return on Equity	3057.82	7357.31	7536.04
O&M Expenses	296.53	708.67	732.88
Interest on Working Capital	102.07	244.99	249.85
Total	7323.82	17583.66	17962.37

11. The Petitioner has claimed the following Interest on Working Capital (IWC) *vide* affidavit dated 7.12.2021 for the transmission assets for 2019-24 tariff period:

(₹ in lakh)

Particulars	Asset-1		
	2021-22 (Pro-rata 262 days)	2022-23	2023-24
O&M Expenses	21.84	22.59	23.37
Maintenance Spares	39.31	40.67	42.07



Particulars	Asset-1		
	2021-22 (Pro-rata 262 days)	2022-23	2023-24
Receivables	822.69	860.57	878.20
Total Working Capital	883.84	923.83	943.64
Rate of Interest (in %)	10.50	10.50	10.50
Interest on Working Capital	66.61	97.00	99.08

(₹ in lakh)

Particulars	Asset-2		
	2021-22 (Pro-rata 158 days)	2022-23	2023-24
O&M Expenses	57.08	59.06	61 .07
Maintenance Spares	102.75	106.30	109.93
Receivables	2085.90	2167.85	2208.49
Total Working Capital	2245.73	2333.21	2379.49
Rate of Interest (in %)	10.50	10.50	10.50
Interest on Working Capital	102.07	244.99	249.85

Date of Commercial Operation (COD)

12. The Petitioner has initially submitted in the petition that the actual COD of Asset-1 was declared as 13.7.2021 and Asset-2 was anticipated to be put into commercial operation on 31.10.2021. However, in response to the Commission's query, the Petitioner *vide* affidavit dated 7.12.2021 has claimed the actual COD of Asset-2 as 25.10.2021.

13. Regulation 5 of the 2019 Tariff Regulations provides as follows:

"5. Date of Commercial Operation: (1) *The date of commercial operation of a generating station or unit thereof or a transmission system or element thereof and associated communication system shall be determined in accordance with the provisions of the Grid Code.*

(2) *In case the transmission system or element thereof executed by a transmission licensee is ready for commercial operation but the interconnected generating station or the transmission system of other transmission licensee as per the agreed project implementation schedule is not ready for commercial operation, the transmission licensee may file petition before the Commission for approval of the date of commercial operation of such transmission system or element thereof:*



Provided that the transmission licensee seeking the approval of the date of commercial operation under this clause shall give prior notice of at least one month, to the generating company or the other transmission licensee and the long term customers of its transmission system, as the case may be, regarding the date of commercial operation:

Provided further that the transmission licensee seeking the approval of the date of commercial operation of the transmission system under this clause shall be required to submit the following documents along with the petition:

- (a) Energisation certificate issued by the Regional Electrical Inspector under Central Electricity Authority;*
- (b) Trial operation certificate issued by the concerned RLDC for charging element with or without electrical load;*
- (c) Implementation Agreement, if any, executed by the parties;*
- (d) Minutes of the coordination meetings or related correspondences regarding the monitoring of the progress of the generating station and transmission systems;*
- (e) Notice issued by the transmission licensee as per the first proviso under this clause and the response;*
- (f) Certificate of the CEO or MD of the company regarding the completion of the transmission system including associated communication system in all respects.*

(3) The date of commercial operation in case of integrated mine(s), shall mean the earliest of —

- a) the first date of the year succeeding the year in which 25% of the Peak Rated Capacity as per the Mining Plan is achieved; or*
- b) the first date of the year succeeding the year in which the value of production estimated in accordance with Regulation 7A of these regulations, exceeds total expenditure in that year; or*
- c) the date of two years from the date of commencement of production:*

Provided that on earliest occurrence of any of the events under subclauses (a) to (c) of Clause (3) of this Regulation, the generating company shall declare the date of commercial operation of the integrated mine(s) under the relevant sub-clause with one week prior intimation to the beneficiaries of the end-use or associated generating station(s);

Provided further that in case the integrated mine(s) is ready for commercial operation but is prevented from declaration of the date of commercial operation for reasons not attributable to the generating company or its suppliers or contractors or the Mine Developer and Operator, the Commission, on an application made by the generating company, may approve such other date as the date of commercial operation as may be considered appropriate after considering the relevant reasons that prevented the declaration of the date of commercial operation under any of the sub-clauses of Clause (3) of this Regulation;

Provided also that the generating company seeking the approval of the date of commercial operation under the preceding proviso shall give prior notice of one month to the beneficiaries of the end-use or associated generating station(s) of the integrated mine(s) regarding the date of commercial operation.”



14. In support of the actual COD of Asset-1, the Petitioner has submitted CEA energisation certificates dated 30.8.2019, 9.12.2019 and 22.6.2021 (2 numbers), RLDC charging certificate dated 15.7.2021 certifying that successful trial operation was completed on 7.7.2021, self-declaration letter dated 19.7.2021 and CMD Certificate.

15. In support of the actual COD of Asset-2, the Petitioner vide affidavit dated 7.12.2021 has submitted CEA energisation certificates dated 31.12.2020, 9.7.2021 and 21.6.2021, RLDC charging certificate dated 8.11.2021 certifying that successful trial operation was completed on 24.10.2021, self-declaration letter dated 25.10.2021 and CMD Certificate.

16. Taking into consideration the CEA energization certificate, RLDC charging certificate and CMD certificate, COD of the Asset-1 and Asset-2 is approved as 13.7.2021 and 25.10.2021, respectively.

Capital Cost

17. Regulation 19 of the 2019 Tariff Regulations provides as follows:

“19. Capital Cost: (1) *The Capital cost of the generating station or the transmission system, as the case may be, as determined by the Commission after prudence check in accordance with these regulations shall form the basis for determination of tariff for existing and new projects.*

(2) *The Capital Cost of a new project shall include the following:*

- (a) *The expenditure incurred or projected to be incurred up to the date of commercial operation of the project;*
- (b) *Interest during construction and financing charges, on the loans (i) being equal to 70% of the funds deployed, in the event of the actual equity in excess of 30% of the funds deployed, by treating the excess equity as normative loan, or (ii) being equal to the actual amount of loan in the event of the actual equity less than 30% of the funds deployed;*
- (c) *Any gain or loss on account of foreign exchange risk variation pertaining to the loan amount availed during the construction period;*
- (d) *Interest during construction and incidental expenditure during construction as computed in accordance with these regulations;*
- (e) *Capitalised initial spares subject to the ceiling rates in accordance with these*



- regulations;
- (f) *Expenditure on account of additional capitalization and de-capitalisation determined in accordance with these regulations;*
 - (g) *Adjustment of revenue due to sale of infirm power in excess of fuel cost prior to the date of commercial operation as specified under Regulation 7 of these regulations;*
 - (h) *Adjustment of revenue earned by the transmission licensee by using the assets before the date of commercial operation;*
 - (i) *Capital expenditure on account of ash disposal and utilization including handling and transportation facility;*
 - (j) *Capital expenditure incurred towards railway infrastructure and its augmentation for transportation of coal upto the receiving end of the generating station but does not include the transportation cost and any other appurtenant cost paid to the railway;*
 - (k) *Capital expenditure on account of biomass handling equipment and facilities, for co-firing;*
 - (l) *Capital expenditure on account of emission control system necessary to meet the revised emission standards and sewage treatment plant;*
 - (m) *Expenditure on account of fulfilment of any conditions for obtaining environment clearance for the project;*
 - (n) *Expenditure on account of change in law and force majeure events; and*
 - (o) *Capital cost incurred or projected to be incurred by a thermal generating station, on account of implementation of the norms under Perform, Achieve and Trade (PAT) scheme of Government of India shall be considered by the Commission subject to sharing of benefits accrued under the PAT scheme with the beneficiaries.*

(3) *The Capital cost of an existing project shall include the following:*

- (a) *Capital cost admitted by the Commission prior to 1.4.2019 duly trued up by excluding liability, if any, as on 1.4.2019;*
- (b) *Additional capitalization and de-capitalization for the respective year of tariff as determined in accordance with these regulations;*
- (c) *Capital expenditure on account of renovation and modernisation as admitted by this Commission in accordance with these regulations;*
- (d) *Capital expenditure on account of ash disposal and utilization including handling and transportation facility;*
- (e) *Capital expenditure incurred towards railway infrastructure and its augmentation for transportation of coal upto the receiving end of generating station but does not include the transportation cost and any other appurtenant cost paid to the railway; and*
- (f) *Capital cost incurred or projected to be incurred by a thermal generating station, on account of implementation of the norms under Perform, Achieve and Trade (PAT) scheme of Government of India shall be considered by the Commission subject to sharing of benefits accrued under the PAT scheme with the beneficiaries.*

(4) *The capital cost in case of existing or new hydro generating station shall also include:*

- (a) *cost of approved rehabilitation and resettlement (R&R) plan of the project in conformity with National R&R Policy and R&R package as approved; and*
- (b) *cost of the developer's 10% contribution towards Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) and Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY) project in the affected area.*



- (5) *The following shall be excluded from the capital cost of the existing and new projects:*
- (a) *The assets forming part of the project, but not in use, as declared in the tariff petition;*
 - (b) *De-capitalised Assets after the date of commercial operation on account of replacement or removal on account of obsolescence or shifting from one project to another project:*

Provided that in case replacement of transmission asset is recommended by Regional Power Committee, such asset shall be de-capitalised only after its redeployment;

Provided further that unless shifting of an asset from one project to another is of permanent nature, there shall be no de-capitalization of the concerned assets.

- (c) *In case of hydro generating stations, any expenditure incurred or committed to be incurred by a project developer for getting the project site allotted by the State Government by following a transparent process;*
- (d) *Proportionate cost of land of the existing project which is being used for generating power from generating station based on renewable energy; and*
- (e) *Any grant received from the Central or State Government or any statutory body or authority for the execution of the project which does not carry any liability of repayment.”*

18. The Petitioner *vide* affidavit dated 7.12.2021 has claimed the following capital cost in respect of the transmission assets and has submitted the Auditor’s Certificates dated 18.11.2021 in support of the same:

(₹ in lakh)

Asset	FR apportioned approved cost	Cost up to COD	Projected ACE			Estimated completion cost
			2021-22	2022-23	2023-24	
Asset-1	32201.75	48447.07	2500.79	2288.80	507.75	53744.41
Asset-2	117529.20	122751.37	5694.38	4418.70	1762.86	134627.31

19. Further, the Petitioner *vide* affidavit dated 24.2.2022 has submitted the RCE.

19. Accordingly, the details of estimated completion cost vis-à-vis FR apportioned approved cost and RCE apportioned approved cost in respect of the transmission assets are as follows:



(₹ in lakh)

Assets	FR Apportioned approved cost	RCE apportioned approved cost	Estimated completion cost	Cost Variation w.r.t. FR	Cost Variation w.r.t. RCE
	(a)	(b)	(c)	(d)=(c)-(a)	(e)=(c)-(b)
Asset-1	32201.75	55387.89	53744.41	21774.17	-1643.47
Asset-2	117529.20	137592.38	134627.31	17098.12	-2965.07

Cost Over-run

20. It is observed that the estimated capital cost of Asset-1 and Asset-2 of ₹53744.41 lakh and ₹134627.31 lakh respectively is beyond the FR apportioned approved cost of ₹32201.75 lakh and ₹117529.20 lakh respectively. Hence, there is a cost over-run of ₹21774.17 lakh and ₹17098.12 lakh in the estimated capital cost of Asset-1 and Asset-2 respectively. However, the completion cost of Asset-1 and Asset-2 is within the RCE apportioned approved cost of ₹55387.89 lakh and ₹137592.38 lakh respectively. The Petitioner has submitted the reasons for item wise cost variation between the FR apportioned approved cost and RCE and estimated completion cost and the same is explained in Form-5. The item wise cost variation with respect to FR and estimated completion cost of the transmission assets are as follows:

Asset-1

(₹ in lakh)

Sl. No.	Description	FR Apportioned Approved Cost	RCE Apportioned Approved Cost	Estimated Completion Cost	Variation as per FR (-decrease, +increase)	Variation as per RCE (-decrease, +increase)
		A	B	c	d = c - a	e = c - b
1	Preliminary works including Compensation	3956.12	16691.09	16659.00	12702.88	-32.09
A	Transmission Lines material					
2	Towers Steel	6120.38	7915.98	7999.70	1879.32	83.72
3	Conductor	8354.87	8897.94	8883.86	528.99	-14.08
4	Erection, Stringing & Civil works including foundation	4131.84	2611.69	2481.89	-1649.95	-129.80
5	Taxes & Duties	317.71	3404.55	3324.46	3006.75	-80.09
6	Miscellaneous Transmission Line	1983.44	1937.66	1651.13	-332.31	-286.53
	Total Transmission Lines (1 to 6)	24864.36	41458.91	41000.04	16135.68	-458.87



Sl. No.	Description	FR AppORTIONED Approved Cost	RCE AppORTIONED Approved Cost	Estimated Completion Cost	Variation as per FR (-decrease, +increase)	Variation as per RCE (-decrease, +increase)
		A	B		c	d = c - a
B	Sub-stations					
1	Civil Works	40.00	346.05	170.91	130.91	-175.14
2	Switchgear (CT, PT, Circuit Breaker, Isolator etc)	1671.78	3257.01	2797.33	1125.55	-459.68
3	Erection, Stringing & Civil works including foundation	765.94	1801.64	1811.40	1045.46	9.76
4	Taxes & Duties	497.36	842.67	764.55	267.19	-78.12
5	Miscellaneous Sub-station	258.80	689.23	543.03	284.23	-146.20
	Total Sub-station (1 to 5)	3233.88	6936.60	6087.22	2853.34	-849.38
C	Over heads	2221.00	3671.47	3659.47	1438.47	-12.00
D	Interest During Construction (IDC)	1651.00	2037.07	1829.12	178.12	-207.95
E	Foreign Exchange Rate Variation (FERV)		1283.83	1168.56	1168.56	-115.27
	Grand Total	31970.24	55387.88	53744.41	21774.17	-1643.47

Asset-2

(₹ in lakh)

Sl. No.	Description	FR AppORTIONED Approved Cost	RCE AppORTIONED Approved Cost	Estimated Completion Cost	Variation w.r.t FR (-decrease, +increase)	Variation w.r.t RCE (-decrease, +increase)
		A	b		c	d = c - a
1	Preliminary works including Compensation	18884.23	23355.49	22159.39	3275.16	-1196.10
A	Transmission Lines material					
2	Towers Steel	23047.51	22766.49	22669.82	-377.69	-96.67
3	Conductor	29295.52	39500.49	39464.14	10168.62	-36.35
4	Erection, Stringing & Civil works including foundation	16566.19	12757.79	12668.00	-3898.19	-89.79
5	Taxes & Duties	1252.79	5851.88	5765.00	4512.21	-86.88
6	Miscellaneous Transmission Line	8436.18	7088.78	6694.99	-1741.19	-393.79
	Total Transmission Lines (1 to 6)	97482.42	111320.92	109421.34	11938.92	-1899.58
B	Sub-stations					
1	Civil Works	40	252.63	229.22	189.22	-23.41
2	Switchgear (CT, PT, Circuit Breaker, Isolator etc)	1966.87	4177.28	4038.93	2072.06	-138.35



3	Erection, Stringing & Civil works including foundation	457.91	1621.63	1452.14	994.23	-169.49
4	Taxes & Duties	877.35	1247.19	1217.39	340.04	-29.80
5	Miscellaneous S/S	2530.65	2233.60	1938.56	-592.09	-295.04
	Total Sub-station (1 to 5)	5872.78	9532.33	8876.24	3003.46	-656.09
C	Over heads	8145.00	8112.78	7983.47	-161.53	-129.31
D	Interest During Construction (IDC)	6029.00	5349.85	5242.56	-786.44	-107.29
E	Foreign Exchange Rate Variation (FERV)	0	3276.51	3103.71	3103.71	-172.80
	Grand Total	117529.20	137592.39	134627.32	17098.12	-2965.07

21. The Petitioner has submitted that being a Government enterprise, the Petitioner is under obligation for indigenous development of manufacturer as well as to adhere to the Government of India guidelines. Accordingly, the Petitioner has been following a well laid down procurement policy which ensures both transparency and competitiveness in the bidding process. Route of International Competitive Bidding (ICB) as well as Domestic Competitive Bidding (DCB) process have been followed to award this special mega project. Through this process, lowest possible market prices for required product/services/as per detailed designing is obtained and contracts are awarded on the basis of lowest evaluated eligible bidder. The best competitive bid prices against tenders may vary as compared to the cost estimate depending upon prevailing market conditions, design and site requirements. Whereas, the estimates are prepared by the Petitioner as per well-defined procedures for cost estimate. The FR cost estimate is broad indicative cost worked out generally on the basis of average unit rates of recently awarded contracts/general practice. The Petitioner has submitted that the cost estimate of the project is on the basis of April, 2017 price level, where the contract date is August, 2017 price level.



22. As per the Petitioner, the variation in cost is mainly due to increase in compensation paid towards crops, trees, PTCC and forest/ NPV, increase in the cost of tower steel and conductors, increase in the cost of sub-station equipment, Taxes and Duties, IDC, IEDC and FERV etc. Major reasons of cost variation with respect to FR submitted by the Petitioner is as follows:

a) There is an increase in cost of about ₹12702 lakh and ₹3275 lakh in case of Asset-1 and Asset-2 respectively with respect to FR on account of compensation against transmission line construction for crop, tree, PTCC and Forest/ NPV. The variation is due to the actual assessment of crops/trees/land and household and forest area encountered in line corridor by concerned Government officials of respective states, forest department, quantity and value of which are much lesser than the notional estimate. Tree compensation has been worked out/ paid based on tree enumeration in the corridor and rates obtained from Horticulture Departments/ DC and forest departments. Similarly, crop compensation has been paid/ estimated based on the rates obtained from Agriculture Departments. Corridor compensation for construction of the line has been estimated based on the individual orders received from respective Deputy Commissioners of the District through which line is passing in line with the Ministry of Power (MoP) guidelines dated 15.10.2015 for tower footing and corridor. The estimate was prepared by considering compensation at ₹15 lakh/ acre (mostly agricultural land in rural setting), compensation at ₹25 lakh/ acre (mostly urban/ semi-urban land near Cities/Towns), compensation at ₹50 lakh/ acre (mostly urban land near big cities/ metro towns). However, due to actual site condition and route alignment, the line length increased. The estimate was



prepared by considering crop and tree compensation at ₹5 lakh/km on normative basis which increased to around ₹79.12 lakh/km on actual average basis.

b) Due to RoW issues encountered during the construction of line in the State of Tamil Nadu, the actual line length and routing changed, which increased the number of angles and extension towers, which resulted in increase of the cost of tower steel by about ₹1879 lakh with respect to FR cost. The transmission line also unavoidably passes through urban areas of Tirupur and Coimbatore districts. Due to severe RoW issues in these areas, ascertaining locations for raising the height of towers was formed. In line with the recommendations and assessment of the committee/ officials, special tower body extensions had to be adopted for towers falls under severe RoW areas. Increase in number of extension and tension/ suspension tower due to actual line routing and line length, these resulted in increase of tower steel.

c) The cost increase of ₹529 lakh and ₹10168 lakh in case of Asset-1 and Asset-2 respectively vis-à-vis FR cost with respect to conductor, insulators, hardware fittings are due to the rate received through competitive biddings. Price variation has been incurred from the time of approval of project till award of various contracts (DPR to Award) based on prices received as per competitive bidding and also price variation has been incurred/ envisaged as per applicable price variation provisions of respective contracts. The contracts for various packages under this project were awarded to the lowest evaluated and responsive bidder, on the basis of Open International/ Domestic Competitive Bidding. The award prices represent the lowest prices available at the time of bidding of various packages, thus capturing the price level at the bidding stage.



d) There is reduction of ₹1649 lakh and ₹3898 lakh in case of Asset-1 and Asset-2 respectively with respect to FR cost on account of erection, stringing and civil works including foundation. The cost variation is due to the actual site condition encountered during execution. In addition, the rate received through competitive biddings also effects the actual variation of the item with respect to estimate. The contracts for various packages under this project were awarded to the lowest evaluated and responsive bidder, on the basis of Open International/ Domestic Competitive Bidding. The award prices represent the lowest prices available at the time of bidding of various packages, thus, capturing the price level at the bidding stage.

e) The increase in cost of about ₹2853 lakh and ₹3003 lakh in case of Asset-1 and Asset-2 respectively with respect to FR cost is on account of sub-station equipment and structure for switchyard due to the rate received through competitive biddings. The contracts for various packages under this project were awarded to the lowest evaluated and responsive bidder, on the basis of Open International/ Domestic Competitive Bidding. The award prices represent the lowest prices available at the time of bidding of various packages, thus capturing the price level at the bidding stage.

f) The FR costs of individual items/ materials are exclusive of taxes and duties which have been indicated under a separate head while the cost of items as per the actual expenditure is inclusive of taxes and duties. Increase of about ₹3273 lakh and ₹4852 lakh in case of Asset-1 and Asset-2, respectively is mainly on accounts of actual taxes & duties, octroi, custom duty, excise duty, GST etc. paid



based on the prevailing rate and charges raised by respective district, state and statutory authorities at the time of execution of project.

g) As per approved cost, IEDC for Asset-1 and Asset-2, respectively, was estimated at ₹2221 lakh and ₹8145 lakh, whereas, based on the actual expenditure incurred, IEDC is ₹3659 lakh and ₹7983 lakh. Thus, IEDC under the project has increased by ₹1438 lakh for Asset-1 and reduced by ₹161 lakh for Asset-2 with respect to FR. The Petitioner has further submitted that during estimation for FR, 3% and 5% of capital cost (excluding IEDC & IDC) has been considered for contingency and IEDC respectively. The actual amount of IEDC, has been considered for claiming the tariff.

h) IDC in respect of the transmission assets as per FR cost for Asset-1 and Asset-2, respectively, was estimated at ₹1651 lakh and ₹6029 lakh against which, IDC works out to ₹1829 lakh and ₹5242 lakh. Thus, there is an increased of ₹178 lakh for Asset-1 and reduction of ₹786 lakh for Asset-2 with respect to FR in IDC. The main reason for the increase in IDC of Asset-1 is due to increase in the cost of asset and time over-run in execution of the transmission line.

i) On account of deployment of foreign loan (ADB/ KFW) in the transmission assets, there is an incidence of increase in FERV liability from FR cost to the tune of ₹1168 lakh and ₹3103 lakh with respect to FR in case of Asset-1 and Asset-2, respectively, due to revaluation of the said loans. The exchange rate at the time of preparation of FR was 1 USD = ₹64.93, EURO = ₹69.31, however, while on actual payment/ deployment the exchange rate is upto the extent of 1 USD =



₹75.10. The variation in exchange rate increased the FERV in overall cost of the asset.

j) Thus, the price variation under the project is attributable to the actual line routine and compensation paid based on the assessment of Government officials of State and also inflationary trend prevailing during execution of project and also market forces prevailing at the time of bidding process of various packages, conductor, IEDC and FERV etc. The reasons for cost variation are beyond the control of the Petitioner. Accordingly, the Petitioner has prayed to allow the estimated completion cost for the transmission assets.

23. KSEB has submitted that on analyzing the capital cost claimed in the petition with the benchmark cost in terms of order dated 18.3.2016 in Petition No. 184/TT/2013, it is observed that the hard cost of 400 kV transmission line work out to be ₹102.93 lakh per km and the cost of 400 kV bays work out to be ₹450 lakh per bay. Thus, the cost claimed in the petition is very high compared to the benchmark cost considered by the Commission. Such an increase in capital cost is not justified and, hence, KSEB has requested to do prudence check of the capital cost and limit to the benchmark capital cost considered by the Commission.

24. In response, the Petitioner has submitted that the objections raised by KSEB are incorrect and without any merit. The present petition needs to be decided in terms of the provisions of the 2019 Tariff Regulations, which do not contain any benchmark cost for the type of HVDC installed by the Petitioner in the present case.

25. The Petitioner has further submitted that the benchmarking can be done only if a database is created of various components by collecting the capital cost of all existing



and new projects as per Annexure 1 of the 2019 Tariff Regulations which are relevant tariff filing forms for determination of tariff. As far as the present transmission assets are concerned, the details as per Annexure 1 (Tariff forms) referred to in Regulation 20(4) of the 2019 Tariff Regulations has already been submitted before the Commission as tariff forms vide affidavit dated 7.12.2021. However, the Petitioner has submitted that benchmarking analysis for determination of prudent costs cannot be on the basis of one order passed by the Commission and needs to be based on a substantially bigger database, which at present is not available for transmission systems. Multiple variables influence capital costs and in the context of transmission assets, the capital cost primarily depends on the following variables:

- (a) Project specific conditions such as terrain, project location, right of way constraints, including urbanization, river/ highway/ railway line crossings, intersection of other transmission lines, forest area etc. Further, weather conditions are also an important factor which differentiate capital cost of similar transmission assets.
- (b) Market forces driven by demand-supply balance i.e. availability of competition among vendors, purchase quantum (onetime order v. repeat orders), input cost variations, economic and environmental factors, etc.
- (c) Technology adopted for implementation of the transmission assets especially the sub-stations and the requirement of the active compensation, etc.

26. The Petitioner has further submitted that all the above factors influence price discovery and the assessment of prudent costs for assets needs to be done on a project specific basis. It is practically impossible for any benchmarking of capital cost for assets



at this stage. The Petitioner has further submitted a table that illustrates the variation in cost per km of transmission lines even if such lines fall under same wind zones, soil conditions and topography. The table shows that cost of 765 kV line varies from ₹166.50 lakh per km to ₹210.79 lakh per km even within similar regions. The table further demonstrates the variation in cost per km of transmission lines falling under different wind zones, soil conditions and topography as follows:

Asset	Region	COD	Line length in km	Completion cost (₹ lakh)	Cost per km (₹ lakh)
765 kV S/C Transmission Lines under same wind zone/Soil condition/Plain area					
Bareilly-Lucknow S/C	NR-III	1.4.2014	251	41704.85	166.15
Gaya-Varanasi S/C	NR-III	21.4.2015	273	57546.81	210.79
Jaipur-Bhiwani S/C	NR-I	7.10.2016	276	49343.72	178.78
765 kV D/C Transmission lines under different wind zone/Soil condition/ plain area					
Champa-Raipur D/C	WR-I	24.5.2014	149	67005.6	449.70
Angul-Srikakulam D/C	SR-I/ ER-II	1.2.2017	276.49	139487.89	504.50
Chittorgarh-Ajmer D/C	NR-I	31.12.2017	211	101482.97	480.96
400 kV Transmission Lines under same wind zone/Soil condition/plain area					
Barh-Gorakhpur D/C	NR-III	7.6.2015	349.17	97166.05	278.28
Sikar-Jaipur D/C	NR-I	16.2.2017	169.00	22820.21	135.03
Lucknow-Kanpur D/C	NR-III	1.6.2017	159.61	25221.01	158.02
400 kV D/C Transmission lines under different wind zone/Soil condition/ plain area					
Ranchi-Chandwa-Gaya D/C	ER-I	12.7.2016	190.00	55996.46	294.72
Betul-Khandwa D/C	WR-I	24.8.2017	168.64	40241.28	238.62
400 kV D/C Transmission lines under different wind zone/Soil condition/ Hilly area					
Balipara-Bongaigaon D/C	NER	7.11.2014	309.00	107030.77	346.38
Silcher-PK Bari D/C	NER	1.8.2015	128.76	40879.20	317.48
Kishenpur-New Wanpoh D/C	NR-II	31.7.2017	135.00	54324.00	402.40

27. The Petitioner has submitted that the results of any benchmarking of such assets will cause severe losses to the transmission licensee if, the benchmarks have no relation to the actual cost incurred. Similarly, benchmarking on the basis of one or two cases on a higher level will affect the consumers and the distribution licensees since the actual capital cost incurred may be much lower. The Petitioner has submitted that it would be better that if an independent prudence check is applied by the Commission on the capital cost incurred and claimed by the Petitioner in the present case.



28. We have considered the submissions of the Petitioner and KSEB. KSEB has submitted that the cost of the transmission assets is high and the cost of the transmission assets has to be allowed as per the bench mark cost or the cost of similar transmission assets. KSEB has further submitted that the cost over-run may not be approved. The Petitioner has submitted reasons of cost variation with respect to FR cost. The Petitioner has submitted that the cost of the transmission assets cannot be approved on the basis of the bench mark cost and the Commission should conduct an independent prudence check of the capital cost incurred and claimed by the Petitioner. It is observed that the cost increase/variation in case of transmission line is due to higher compensation paid for land and corridor compensation and tree/ crop compensation as per the site conditions and rates assessed by the State Government officials. Further, sub-station cost variation is due to the increase in the materials and sub-station equipment cost (including taxes and duties) due to quantity variation as per actual site conditions/ urbanisation and price variation as per actual contract prices received in open bidding. The price variation is beyond the control of the Petitioner. Accordingly, the cost over-run in case of the transmission assets is approved.

29. It is observed that the estimated completion cost of Asset-1 and Asset-2 is ₹53744.41 lakh and ₹134627.32 lakh including ACE is more than the FR cost by ₹21774.16 lakh and ₹17098.12 lakh respectively. The Petitioner has submitted RCE duly approved by the Competent Authority and has also revised the apportionment of the cost in the RCE. The details of FR apportioned cost, RCE apportioned cost and capital cost as on 31.3.2019 of the transmission assets are given in the following table. The estimated completion cost of Asset-1 and Asset-2 is within RCE cost and the same is allowed.



(₹ in lakh)

Sl. No.	Description	FR apportioned approved cost	RCE apportioned approved cost	Estimated completion cost
1	Asset-1	31970.24	55387.88	53744.41
2	Asset-2	117529.20	137592.39	134627.32

Time over-run

30. As per the IA dated 16.8.2017, the transmission project was scheduled to be executed within 30 months from the date of I.A. Accordingly, SCOD of the transmission assets was 16.2.2020 against which Asset-1 and Asset-2 were put under commercial operation with effect from 13.7.2021 and 25.10.2021 respectively. Hence, there is a time over-run of 513 days and 617 days in execution of Asset-1 and Asset-2 respectively.

31. The Petitioner has made the following submissions regarding time over-run:

- a) The delay in execution is mainly because of various factors viz. RoW issues vis-a-vis law and order problem during construction of transmission lines, litigations, statutory clearances in reserved forest and Covid pandemic situations, etc. However, the Petitioner managed to reduce the delay period and put Asset-1 and Asset-2 into commercial operation on 13.7.2021 and 25.10.2021 respectively. The Petitioner has submitted PERT and CPM chart and submitted documentary evidence and has prayed to condone the delay in execution of the transmission assets as the time over-run was beyond the control of the Petitioner.
- b) After obtaining IA, preliminary actions were initiated immediately for taking up survey works of the transmission line.
- c) The Petitioner had completed the task on its end in an efficient and time bound manner, however, the validation and certification of land scheduling could not be obtained from the concerned Land and Revenue Authorities as envisaged.



d) The transmission line is traversing through various districts of Tamil Nadu. Due to increased industrialization and infra projects, an increasing number of severe RoW issues were encountered right from the onset of transmission line works. RoW issues involved demand of exorbitant amount of crop compensation, land compensation, man handling of workers, etc. Many of the land owners had filed suits and writ petitions before the District Courts/High Court to oppose the construction of line through their land.

e) Intervention of the concerned Government Authorities was sought to get the said issues resolved without further delay. Despite active support being rendered by the Central/ State Governments for timely implementation of the project, the Petitioner and TANTRANSCO were facing severe RoW issues, created by the said several groups in Tiruppur, Karur, Erode, Coimbatore, Dharmapuri, Salem and Namakkal Districts.

f) The summary of RoW issues encountered on various locations in respect of elements of Asset-1 as follows:

Pugalur (HVDC Station) - Edayarpalayam (TANTRANSCO) 400 kV D/C (Quad) Line (Coimbatore and Tiruppur districts of Tamil Nadu)

Sl. No.	Description (Location/ Tower Reference)	RoW start date	RoW cleared date
1	Loc. No. 2/1 (Tiruppur)	21.2.2019	13.7.2019
2	Loc. Nos. 29/1, 30/0, 30/1, 30/2, 31/0, 32/0, 32/1 (Tiruppur)	22.8.2019	10.12.2020
3	Loc. Nos. 25/1, 26/0, 26/1, 26/2, 26/3, 26/4, 27/0, 27/1, 27/2, 27/3, 27/4, 28/0, 28/1 (Tiruppur)	22.8.2019	19.4.2021
4	Loc. No. 34/0 (Coimbatore)	9.11.2019	24.2.2020
5	Loc. No. 45/1 (Coimbatore)	11.10.2019	20.5.2020



**Edayarpalayam (TANTRANSCO – Udumalpet 400 kV D/C (Quad) Line
(Coimbatore and Tiruppur districts of Tamil Nadu)**

Sl. No.	Description (Location/ Tower Reference)	RoW start date	RoW cleared date
1	Loc. No. 10/3 (Coimbatore)	10.9.2019	1.10.2020
2	Loc. No. 11/0 (Coimbatore)	10.9.2019	5.10.2020
3	Loc. No. 13/1 (Coimbatore)	10.9.2019	31.8.2020
4	Loc. No. 15/1 (Coimbatore)	1.11.2019	23.11.2020
5	Loc. No. 15/2 (Coimbatore)	1.11.2019	23.11.2020
6	Loc. No. 17/1A & 17/1B (Coimbatore)	28.8.2019	16.3.2021
7	Loc. No. 25/0 (Tiruppur)	27.8.2019	20.11.2020
8	Loc. No. 46/2 to 47/0 (Tiruppur)	30.11.2020	7.1.2021
9	Loc. No. 48/0 (Tiruppur)	27.8.2019	23.11.2020
10	Loc. No. 54/0 (Tiruppur)	27.8.2019	28.11.2020
11	Loc. No. 55/0 (Tiruppur)	27.8.2019	29.11.2020
12	Loc. No. 56/0 (Tiruppur)	27.8.2019	20.11.2020

g) Detailed chronology related to various incidences of hinderance caused during the construction activity has been filed. The issue was also brought in and discussed in the PRAGATI (Pro-Active Governance and Timely Implementation – by PMO) in May, 2018. Before the PRAGATI meeting the issues were reviewed and discussed by the Minister of Electricity & Prohibition, Government of Tamil Nadu and the Chief Secretary to Government of Tamil Nadu with all the respective District Collectors for resolution.

h) Issues involved were regularly pursued with the district authorities through various letters for removal of obstructions caused by the local farmers and villagers and other vested interest groups.

i) The details of RoW issues, forest clearance and court cases encountered at various locations at Tiruppur, Coimbatore, Karur, Namakkal, Trichy, Salem and Kallakurichi Districts in respect of elements of Asset-2 have been submitted. There is delay of about 10 months due to statutory clearances in Ammur Reserve



forest areas encountered in the route of Asset-2 (Pugalur-Thiruvalam). The Petitioner has submitted the chronology of details of forest clearance and submitted documentary evidence in support of delay due to forest clearance.

32. KSEB has submitted that there is delay of 1 year 4 months and 27 days in case of Asset-1 and 1 year 8 months and 15 days till 31.10.2021 in execution of the Asset-2 citing RoW issues. The Petitioner has stated that the work was slow at few locations due to hurdles created by the land owners. KSEB has prayed that the time over-run and cost over-run for such avoidable delays purely attributable to the Petitioner may be disallowed and consequently IDC and IEDC corresponding to the delay attributable to the Petitioner may be disallowed in accordance with the 2019 Tariff Regulations.

33. TANGEDCO has submitted that the time for completing the project was framed duly considering the limitations faced by the Petitioner while executing the transmission assets. The Petitioner's inability in completing the project within the time framed and praying for condoning the delay stating RoW issues, litigation, law etc. is infirm. The reasons stated by the Petitioner are covered under controllable factors as stipulated in Regulation 22(1)(a) of the 2019 Tariff Regulations. Hence, the reasons provided by the Petitioner are unjustifiable and requested not to condone the delay and deduct the IDC and IEDC corresponding to the delayed period.

34. BESCOM has submitted that the cost related to time over-run may not be allowed as the delay is on account of the controllable parameters as per Regulation 22(1)(a) of the 2019 Tariff Regulations. Hence, the capital cost of the transmission project may be reduced to an extent of IDC and IEDC incurred during time over-run.



35. In response, the Petitioner has submitted that TANGEDCO, KSEB and BESCO have generally objected to the time over-run which has occurred in the project due to RoW issues, litigation, law and order problems etc. and contended that these factors are controllable factors whereas Regulation 22(2) of the 2019 Tariff Regulations states as follows:

*“(2) The “uncontrollable factors” shall include but shall not be limited to the following:
a. Force Majeure events;
b. Change in law; and
c. Land acquisition except where the delay is attributable to the generating company or the transmission licensee.”*

36. The Petitioner has further submitted that the details of time over-run in execution due to various factors viz. RoW issues/ Court cases, hindrance due to lock down during COVID pandemic situations have already been placed on record. Delay due to statutory clearances in reserve forest has been submitted vide affidavit dated 7.12.2021. Accordingly, the Petitioner has prayed for condonation of delay in completion of the transmission assets keeping in view the submissions/justifications as regards RoW issues, forest clearance, Covid pandemic situations which were beyond the control of the Petitioner and in line with 2019 Tariff Regulations 22(2)(c) “uncontrollable factors” and accordingly prayed for approval of tariff as claimed.

37. We have considered the submissions made by the Petitioner, KSEB, TANGEDCO and BESCO.

38. The Petitioner has attributed that the time over-run of 513 days and 617 days in execution of Asset-1 and Asset-2 respectively is mainly due to various factors viz. RoW vis-à-vis law-and-order problem during construction of transmission lines, litigations, forest clearance, COVID-19 pandemic situations, etc. The Petitioner has submitted



copies of relevant documents in support of time over-run justification. The reasons of time over-run having major impact in execution of transmission asset are as follows:

Asset-1

RoW issues and Court cases Related issues while executing Pugalur (HVDC) - Edayarpalayam (TANTRANSCO) and Edayarpalayam (TANTRANSCO) - Udumalpet 400 kV D/C (Quad) Transmission lines:

39. It is observed from the chronology of scheduled versus actual project activities, that the Petitioner has placed LoA for survey work in advance and carried out preparatory activities prior to the IA. However, the Petitioner encountered RoW issues between 21.2.2019 to 19.4.2021 of about 788 days in Pugalur-Edayarpalayam line and between 27.8.2019 to 16.3.2021 of about 567 days in Pugalur-Edayarpalayam line at various locations of the transmission lines in the State of Tamil Nadu covering about 13 districts, thus affecting the execution of 400 kV D/C Pugalur (HVDC)-Edayarpalayam (TANTRANSCO) and 400 kV D/C Edayarpalayam (TANTRANSCO)-Udumalpet transmission lines. This delay of 788 days and 567 days in completion of Pugalur-Edayarpalayam and Pugalur-Edayarpalayam lines, respectively was caused by RoW issues and court cases and thus was beyond the control of the Petitioner. Moreover, RoW issue was resolved on 19.4.2021 and 16.3.2021 in the Pugalur-Edayarpalayam and Pugalur-Edayarpalayam lines respectively, which is about 428 days and 394 days, respectively beyond the SCOD. It is stated that Pugalur-Edayarpalayam and Pugalur-Edayarpalayam lines were required to be executed simultaneously to Edayarpalayam Sub-station, since, 4 numbers of 400 kV line bays at Edayarpalayam (Tamil Nadu Station) for terminating Pugalur HVDC Station–Edayarpalayam and Edayarpalayam–Udumalpet 400 kV (quad) D/C lines is yet to be executed. Accordingly, it was decided to directly connect Pugalur-Edayarpalayam and Pugalur-Edayarpalayam lines by way



of by-passing Edayarpalyam (Tamil Nadu Sub-station). Therefore, immediately after the RoW issues were resolved on 19.4.2021 and 16.3.2021 in both the above lines, the Petitioner completed the remaining activities and both the lines were declared under commercial operation on 13.7.2021. This additional time of 788 days and 567 days due to RoW issues and court cases had a cascading effect on the execution of Pugalur-Edayarpalayam and Pugalur-Edayarpalayam lines respectively. Due to efforts made by the Petitioner, the overall delay was reduced to 513 days. Thus, the Petitioner faced serious issues during the construction of the above transmission lines. Considering the reasons enumerated above, we are of the view that hindrance caused due to RoW issues and court cases were beyond the control of the Petitioner and accordingly the time over-run of 513 days in case of Asset-1 is condoned.

Asset-2

RoW issues and Court cases Related issues while executing Pugalur (HVDC) - Thiruvalem (TANTRANSCO) 400 kV D/C (Quad) Transmission line:

40. It is observed from the chronology of scheduled versus actual project activities, that the Petitioner has placed LoA for survey work in advance and carried out preparatory activities prior to the IA. However, the Petitioner encountered RoW issues since December, 2017 (Tiruppur), 24.12.2018 (Kallakurichy), 29.5.2018 (Salem), 25.5.2018 (Trichy), 29.9.2018 (Namakkal), 20.2.2018 (Karur) in various districts. The RoW issues were progressively resolved by 4.6.2019 (Karur), 29.9.2018 (Namakkal), 13.2.2020 (Trichy), 26.10.2020 (Salem), 19.3.2020 (Kallakurichy). Thus, the Petitioner encountered RoW issues/ court cases between 20.2.2018 to 26.10.2020 of about 979 days in Pugalur-Thiruvalem line at various locations of the transmission lines in the State of Tamil Nadu covering about 13 districts. This affected the execution of 400 kV D/C Pugalur (HVDC)- Thiruvalem (TANTRANSCO) line. The delay of 979 days in



completion of Pugalur-Thiruvallam line was caused due to RoW issues and court cases which were beyond the control of Petitioner. RoW issue was resolved on 26.10.2020 in the line, which is about 253 days beyond the SCOD of 16.2.2020. After the RoW issue was resolved on 26.10.2020, the Petitioner completed the remaining activities and the line was declared under commercial operation on 25.10.2021. Considering the reasons enumerated above, we are of the view that hindrance caused in execution of Pugalur (HVDC)-Thiruvallam (TANTRANSCO) 400 kV D/C (Quad) Transmission line was due to RoW issues and court cases which were beyond the control of the Petitioner, and accordingly the time over-run of 979 days in case of the above transmission line is condoned.

Delay due to Forest approval (5.382 Ha) in Ammur Reserve Forest Area in Pugalur (HVDC Station) - Thiruvallam (TANTRANSCO) Line

41. The Petitioner has submitted that survey was carried out in Pugalur-Thiruvallam line of the Petitioner. As per the Petitioner's policy every effort is made to avoid the forest area while finalizing the route alignment of this line. However, out of total line length of 390 km, the crossing of about 1.17 km line involving forest area of about 5.382 Ha of Ammur Reserve Forest (RF) in Arcot Range of Vellore District in Tamil Nadu was unavoidable and bare minimum. Accordingly, the Petitioner had submitted application for diversion of 5.382 Ha forest land in Ammur RF on 9.3.2018. Subsequently, interim forest approval (under Stage-I) was accorded on 3.12.2019 and final approval (under Stage-II) was granted on 21.1.2021. Thereafter, temporary working permission was issued on 22.1.2021 by the DFO, Vellore Forest Division subject to felling of only 2917 trees of spontaneous origin for which permission was obtained from Hon'ble Supreme Court of India. The Petitioner has submitted copies of documents in support of forest approval and work permission given by the Forest Authorities.



42. Asset-2 passes through forest area of 5.382 Ha in Tamil Nadu. The Petitioner has submitted the proposal for forest clearance on 9.3.2018 and obtained Stage-II forest clearance and permission for tree cutting in forest area from Forest Authorities on 22.1.2021. Thus, it took 1050 days in obtaining forest clearance. As per the Forest (Conservation) Amendment Rules, 2004 notified by MoEF on 3.2.2004, the timeline for forest approval after submission of proposal is 210 days by the State Government and 90 days by the Forest Advisory Committee of Central Government. Therefore, the processing time of forest approval is 300 days. In the instant case, the Petitioner applied for forest clearance on 9.3.2018 and obtained the same on 22.1.2021. As against the statutory period of 300 days for processing and obtaining the forest clearance, the Forest Authorities took more about 1050 days for grant of forest clearance. Therefore, the delay due to forest clearance for 1050 days was beyond the control of the Petitioner. We are of the view that time period beyond 300 days is not within the control of the Petitioner. Accordingly, out of the total time over-run of about 1050 days, time over-run of 750 was beyond the control of the Petitioner and the same is condoned.

43. We have observed in the previous para of this order that the delay of about 979 days has occurred due to events of RoW and Court cases and is beyond the control of the Petitioner. Further, we have also observed above that time over-run of 750 due to forest clearance was beyond the control of the Petitioner and the same is condoned. It is seen that the forest clearance was obtained between 9.3.2018 to 22.1.2022, whereas the RoW issues and court case(s)/litigations occurred between 20.2.2018 to 26.10.2020. Therefore, delay due to RoW and Court case is subsumed in the delay due to forest clearance.



44. Accordingly, the additional time of 750 days due to forest clearance had a cascading effect on the execution of Asset-2 and was beyond the control of the Petitioner. However, the Petitioner was able to reduce the execution time, and the Asset-2 has been put under commercial operation w.e.f. 25.10.2021 and accordingly the overall delay is 617 days. Therefore, the time over-run of 617 days in Asset-2 due to forest clearance is beyond the control of the Petitioner and is condoned.

45. The Commission has already condoned the time over-run in case of the transmission assets covered under the Scheme-1 of the instant transmission project vide order dated 29.9.2022 in Petition No. 685/TT/2020 due to RoW issues, court cases, forest clearances, Covid-19 Pandemic, etc.

46. In view of the above, the time over-run of 513 days and 617 days in respect of Asset-1 and Asset-2 respectively under Scheme-2 deserves to be condoned and hence condoned. The details of time over-run condoned/not condoned are as follows:

Assets	Schedule COD as per IA	Actual COD	Time over-run	Time over-run Condoned	Time over-run not condoned
Asset-1	16.2.2020	13.7.2021	513 days	513 days	Nil
Asset-2		25.10.2021	617 days	617 days	Nil

Interest During Construction (“IDC”)

47. The Petitioner vide affidavit dated 7.12.2021 has claimed the following IDC in respect of the transmission assets covered in the instant petition and has submitted the statement showing IDC claim, discharge of IDC liability as on COD and thereafter:

Assets	IDC as per Auditor’s Certificate dated 18.11.2021	IDC Discharged upto COD	(₹ in lakh)	
			IDC discharged during 2021-22	IDC discharged during 2022-23
Asset-1	1829.12	1768.10	61.02	0.00
Asset-2	5242.56	4943.02	136.89	162.66



48. We have considered the submissions of the Petitioner. As discussed above in this order, the time over-run in the execution of the transmission assets has been fully condoned. Accordingly, IDC on cash basis up to the COD has been worked out on the basis of the loan details given in the statement showing discharge of IDC and Form-9C for the transmission assets. IDC claimed and considered as on COD and summary of discharge of IDC liability up to COD and thereafter for the purpose of tariff determination subject to revision at the time of truing up is as follows:

(₹ in lakh)

Assets	IDC as per Auditor's Certificate dated 18.11.2021	IDC disallowed due to computational error	IDC Allowed on accrual basis	Undischarge d IDC liability as on COD	IDC allowed on cash basis as on COD	Discharge of IDC liability allowed as ACE	
						2021-22	2022-23
Asset-1	1829.12	14.19	1814.93	61.07	1753.86	61.07	0.00
Asset-2	5242.56	0.00	5242.56	314.47	4928.09	136.89	177.58

Incidental Expenditure During Construction ("IEDC")

49. The Petitioner has claimed IEDC for the transmission assets *vide* affidavit dated 7.12.2021 as per the Auditor's Certificate. The Petitioner has further submitted that the entire amount of IEDC for the transmission assets has been discharged up to COD. As the time over-run for the transmission assets have been completely condoned, there is no disallowance of IEDC on this account. Accordingly, details of IEDC claimed as per Auditor's Certificate, IEDC disallowed and IEDC allowed is as follows:

(₹ in lakh)

Assets	IEDC as per Auditor's certificate dated 18.11.2021 (A)	IEDC disallowed due to time over-run not condoned (B)	IEDC allowed (A-B)
Asset-1	3659.46	0.00	3659.46
Asset-2	7983.47	0.00	7983.47



Initial Spares

50. Regulation 23(d) of the 2019 Tariff Regulations provides that Initial Spares shall be capitalised as a percentage of plant and machinery cost up to cut-off date, subject to the following ceiling norms:

“(d) Transmission System

- i. Transmission line: 1.00%*
- ii. Transmission sub-station*
 - Green Field: 4.00%*
 - Brown Field: 6.00%*
- iii. Series Compensation devices and HVDC Station: 4.00%*
- iv. Gas Insulated Sub-station (GIS)*
 - Green Field: 5.00%*
 - Brown Field: 7.00%*
- v. Communication System: 3.50%*
- vi. Static Synchronous Compensator: 6.00%*”

51. The Initial Spares as claimed by the Petitioner *vide* affidavit dated 7.12.2021 are as follows:

Assets	Particulars	Plant and machinery cost (₹ in lakh)	Initial Spares claimed (₹ in lakh)	Initial Spares Claimed (in %)	Ceiling limit as mentioned as per Regulation (in %)
		A	B		C
Asset-1	Sub-station (HVDC)	5898.79	48.48	0.82	4.00
	Transmission line	41991.34	21.05	0.05	1.00
Asset-2	Sub-station (HVDC)	8587.76	55.89	0.65	4.00
	Transmission line	111935.92	850.94	0.76	1.00
	PLCC	631.18	3.91	0.62	4.00

52. We have considered the submissions of Petitioner. Based on the information available on record, Initial Spares for the transmission assets are allowed as per respective percentage of the plant and machinery cost as on the cut-off date on individual basis. The Initial Spares allowed in respect of the transmission assets are as follows:



Assets	Particulars	Plant and Machinery cost (excluding IDC/IEDC, Land cost & Cost of Civil Works) (₹ in lakh)	Initial Spares claimed (₹ in lakh)	Ceiling limit (in %)	Initial Spares allowable (₹ in lakh)	Initial Spares dis-allowed (₹ in lakh)	Initial Spares Allowed (₹ in lakh)
		A	B	C	$D=(A-B)*C/(100-C)$	E	F
Asset-1	Sub-station (HVDC)	5898.79	48.48	4.00%	243.76	NIL	48.48
	Transmission line	41991.34	21.05	1.00%	423.94	NIL	21.05
Asset-2	Sub-station (HVDC) and PLCC	9218.94	59.80	4.00%	381.63	NIL	59.80
	Transmission line	111935.92	850.94	1.00%	1122.07	NIL	850.94

53. The details of capital cost approved as on COD in respect of the transmission assets are as follows:

(₹ in lakh)				
Assets	Capital Cost claimed as on COD as per Auditor's Certificate) (A)	Less: IDC disallowed due to time over-run/ computational error (B)	Less: Undischarged IDC (C)	Capital Cost allowed as on COD on cash basis (D)=(A-B-C)
Asset-1	48447.07	14.19	61.07	48371.81
Asset-2	122751.37	0.00	314.47	122436.90

Additional Capital Expenditure ("ACE")

54. Regulation 24 and Regulation 25 of the 2019 Tariff Regulations provide as follows:

"24. Additional Capitalisation within the original scope and upto the cut-off date

(1) The additional capital expenditure in respect of a new project or an existing project incurred or projected to be incurred, on the following counts within the original scope of work, after the date of commercial operation and up to the cut-off date may be admitted by the Commission, subject to prudence check:

- (a) Undischarged liabilities recognized to be payable at a future date;*
- (b) Works deferred for execution;*
- (c) Procurement of initial capital spares within the original scope of work, in accordance with the provisions of Regulation 23 of these regulations;*
- (d) Liabilities to meet award of arbitration or for compliance of the directions or*



- (e) *order of any statutory authority or order or decree of any court of law;*
- (e) *Change in law or compliance of any existing law; and*
- (f) *Force Majeure events:*

Provided that in case of any replacement of the assets, the additional capitalization shall be worked out after adjusting the gross fixed assets and cumulative depreciation of the assets replaced on account of de-capitalization.

(2) The generating company or the transmission licensee, as the case may be shall submit the details of works asset wise/work wise included in the original scope of work along with estimates of expenditure, liabilities recognized to be payable at a future date and the works deferred for execution.

25. Additional Capitalisation within the original scope and after the cut-off date:

(1) The ACE incurred or projected to be incurred in respect of an existing project or a new project on the following counts within the original scope of work and after the cut-off date may be admitted by the Commission, subject to prudence check:

- (a) Liabilities to meet award of arbitration or for compliance of the directions or order of any statutory authority, or order or decree of any court of law;*
- (b) Change in law or compliance of any existing law;*
- (c) Deferred works relating to ash pond or ash handling system in the original scope of work;*
- (d) Liability for works executed prior to the cut-off date;*
- (e) Force Majeure events;*
- (f) Liability for works admitted by the Commission after the cut-off date to the extent of discharge of such liabilities by actual payments; and*
- (g) Raising of ash dyke as a part of ash disposal system.*

(2) In case of replacement of assets deployed under the original scope of the existing project after cut-off date, the additional capitalization may be admitted by the Commission, after making necessary adjustments in the gross fixed assets and the cumulative depreciation, subject to prudence check on the following grounds:

- (a) The useful life of the assets is not commensurate with the useful life of the project and such assets have been fully depreciated in accordance with the provisions of these regulations;*
- (b) The replacement of the asset or equipment is necessary on account of change in law or Force Majeure conditions;*
- (c) The replacement of such asset or equipment is necessary on account of obsolescence of technology; and*
- (d) The replacement of such asset or equipment has otherwise been allowed by the Commission.”*

55. The Petitioner *vide* affidavit dated 7.12.2021 has claimed the following ACE in respect of the transmission assets for 2019-24 period in accordance with the provisions of Regulation 24 of the 2019 Tariff Regulations on account of undischarged liability towards final payment for works executed and for works deferred for execution within cut-off date and un-discharged IDC:



(₹ in lakh)

Assets	ACE claimed (Details as per Form-1A)		
	2021-22	2022-23	2023-24
Asset-1	2561.81	2288.80	507.75
Asset-2	5831.27	4581.36	1762.86

56. Further, the Petitioner *vide* affidavit dated 7.12.2021 has submitted the contractor wise details of ACE (Liabilities flow Statement) claimed including details of balance and retention payments. The Petitioner has confirmed that as on date no ACE is expected beyond 2023-24.

57. We have considered the submissions made by the Petitioner. ACE claimed by the Petitioner has been allowed under Regulation 24(1)(a) and 24(1)(b) of the 2019 Tariff Regulations, on account of balance and retention payments for works already executed. Accordingly, ACE allowed for 2019-24 period is as follows:

Asset-1

(₹ in lakh)

Particulars	2021-22	2022-23	2023-24
ACE claimed as per Auditor's Certificate	2500.79	2288.80	507.75
Add: IDC Discharged	61.07	-	-
Total ACE allowed	2561.86	2288.80	507.75

Asset-2

(₹ in lakh)

ACE 2019-24			
Particulars	2021-22	2022-23	2023-24
ACE claimed as per Auditor's Certificate	5694.38	4418.70	1762.86
Add: IDC Discharged	136.89	177.58	-
Total ACE allowed	5831.27	4596.28	1762.86

Capital cost allowed as on 31.3.2019

58. Capital cost as on 31.3.2019 for Asset-1 and Asset-2 is as follows:



(₹ in lakh)

Assets	Capital cost allowed as on COD					Total Capital cost as on 31.3.2024
		2020-21	2021-22	2022-23	2023-24	
Asset-1	48371.81	0.00	2561.86	2288.80	507.75	53730.22
Asset-2	122436.90	0.00	5831.27	4596.28	1762.86	134627.31

Debt-Equity ratio

59. Regulation 18 of the 2019 Tariff Regulations provides as follows:

“18. Debt-Equity Ratio: (1) For new projects, the debt-equity ratio of 70:30 as on date of commercial operation shall be considered. If the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as normative loan:

Provided that:

- i. where equity actually deployed is less than 30% of the capital cost, actual equity shall be considered for determination of tariff:*
- ii. the equity invested in foreign currency shall be designated in Indian rupees on the date of each investment:*
- iii. any grant obtained for the execution of the project shall not be considered as a part of capital structure for the purpose of debt: equity ratio.*

Explanation-The premium, if any, raised by the generating company or the transmission licensee, as the case may be, while issuing share capital and investment of internal resources created out of its free reserve, for the funding of the project, shall be reckoned as paid up capital for the purpose of computing return on equity, only if such premium amount and internal resources are actually utilised for meeting the capital expenditure of the generating station or the transmission system.

(2) The generating company or the transmission licensee, as the case may be, shall submit the resolution of the Board of the company or approval of the competent authority in other cases regarding infusion of funds from internal resources in support of the utilization made or proposed to be made to meet the capital expenditure of the generating station or the transmission system including communication system, as the case may be.

(3) In case of the generating station and the transmission system including communication system declared under commercial operation prior to 1.4.2019, debt: equity ratio allowed by the Commission for determination of tariff for the period ending 31.3.2019 shall be considered:

Provided that in case of a generating station or a transmission system including communication system which has completed its useful life as on or after 1.4.2019, if the equity actually deployed as on 1.4.2019 is more than 30% of the capital cost, equity in excess of 30% shall not be taken into account for tariff computation;

Provided further that in case of projects owned by Damodar Valley Corporation, the debt: equity ratio shall be governed as per sub-clause (ii) of clause (2) of Regulation 72 of these regulations.

(4) In case of the generating station and the transmission system including communication system declared under commercial operation prior to 1.4.2019, but where debt: equity



ratio has not been determined by the Commission for determination of tariff for the period ending 31.3.2019, the Commission shall approve the debt: equity ratio in accordance with clause (1) of this Regulation.

(5) Any expenditure incurred or projected to be incurred on or after 1.4.2019 as may be admitted by the Commission as additional capital expenditure for determination of tariff, and renovation and modernisation expenditure for life extension shall be serviced in the manner specified in clause (1) of this Regulation.

(6) Any expenditure incurred for the emission control system during the tariff period as may be admitted by the Commission as additional capital expenditure for determination of supplementary tariff, shall be serviced in the manner specified in clause (1) of this Regulation.”

60. Debt-equity ratio considered for the purpose of computation of tariff for 2019-24 tariff period in respect of the transmission assets is as follows:

Asset-1

Particulars	Capital Cost as on COD (₹ in lakh)	(in %)	ACE during 2019-24 (₹ in lakh)	(in %)	Capital Cost as on 31.3.2024 (₹ in lakh)	(in %)
Debt	33860.27	70.00	3750.99	70.00	37611.16	70.00
Equity	14511.54	30.00	1607.52	30.00	16119.07	30.00
Total	48371.81	100.00	5358.41	100.00	53730.22	100.00

Asset-2

Particulars	Capital cost as on COD (₹ in lakh)	(in %)	ACE during 2019-24 (₹ in lakh)	(in %)	Capital cost as on 31.3.2024 (₹ in lakh)	(in %)
Debt	85705.83	70.00	8533.29	70.00	94239.12	70.00
Equity	36731.07	30.00	3657.12	30.00	40388.19	30.00
Total	122436.90	100.00	12190.41	100.00	134627.31	100.00

Depreciation

61. Regulation 33 of the 2019 Tariff Regulations provides as follows:

“33. Depreciation: (1) Depreciation shall be computed from the date of commercial operation of a generating station or unit thereof or a transmission system or element thereof including communication system. In case of the tariff of all the units of a generating station or all elements of a transmission system including communication system for which a single tariff needs to be determined, the depreciation shall be computed from the effective date of commercial operation of the generating station or the transmission system taking into consideration the depreciation of individual units:

Provided that effective date of commercial operation shall be worked out by considering the actual date of commercial operation and installed capacity of all the units of the generating station or capital cost of all elements of the transmission system, for which



single tariff needs to be determined.

(2) The value base for the purpose of depreciation shall be the capital cost of the asset admitted by the Commission. In case of multiple units of a generating station or multiple elements of a transmission system, weighted average life for the generating station of the transmission system shall be applied. Depreciation shall be chargeable from the first year of commercial operation. In case of commercial operation of the asset for part of the year, depreciation shall be charged on pro rata basis.

(3) The salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the capital cost of the asset:

Provided that the salvage value for IT equipment and software shall be considered as NIL and 100% value of the assets shall be considered depreciable;

Provided further that in case of hydro generating stations, the salvage value shall be as provided in the agreement, if any, signed by the developers with the State Government for development of the generating station:

Provided also that the capital cost of the assets of the hydro generating station for the purpose of computation of depreciated value shall correspond to the percentage of sale of electricity under long-term power purchase agreement at regulated tariff:

Provided also that any depreciation disallowed on account of lower availability of the generating station or unit or transmission system as the case may be, shall not be allowed to be recovered at a later stage during the useful life or the extended life.

(4) Land other than the land held under lease and the land for reservoir in case of hydro generating station shall not be a depreciable asset and its cost shall be excluded from the capital cost while computing depreciable value of the asset.

(5) Depreciation shall be calculated annually based on Straight Line Method and at rates specified in **Appendix-I** to these regulations for the assets of the generating station and transmission system:

Provided that the remaining depreciable value as on 31st March of the year closing after a period of 12 years from the effective date of commercial operation of the station shall be spread over the balance useful life of the assets.

(6) In case of the existing projects, the balance depreciable value as on 1.4.2019 shall be worked out by deducting the cumulative depreciation as admitted by the Commission upto 31.3.2019 from the gross depreciable value of the assets.

(7) The generating company or the transmission licensee, as the case may be, shall submit the details of proposed capital expenditure five years before the completion of useful life of the project along with justification and proposed life extension. The Commission based on prudence check of such submissions shall approve the depreciation on capital expenditure.

(8) In case of de-capitalization of assets in respect of generating station or unit thereof or transmission system or element thereof, the cumulative depreciation shall be adjusted by taking into account the depreciation recovered in tariff by the de-capitalized asset during



its useful services.

(9) Where the emission control system is implemented within the original scope of the generating station and the date of commercial operation of the generating station or unit thereof and the date of operation of the emission control system are the same, depreciation of the generating station or unit thereof including the emission control system shall be computed in accordance with Clauses (1) to (8) of this Regulation.

(10) Depreciation of the emission control system of an existing or a new generating station or unit thereof where the date of operation of the emission control system is subsequent to the date of commercial operation of the generating station or unit thereof, shall be computed annually from the date of operation of such emission control system based on straight line method, with salvage value of 10%, over a period of-

a) twenty five years, in case the generating station or unit thereof is in operation for fifteen years or less as on the date of operation of the emission control system; or

b) balance useful life of the generating station or unit thereof plus fifteen years, in case the generating station or unit thereof is in operation for more than fifteen years as on the date of operation of the emission control system; or

c) ten years or a period mutually agreed by the generating company and the beneficiaries, whichever is higher, in case the generating station or unit thereof has completed its useful life.”

62. Depreciation has been worked out considering the admitted capital expenditure as on COD. The weighted average rate of depreciation (WAROD) has been worked as per the rates of depreciation prescribed in the 2019 Tariff Regulations and the WAROD is placed in the Annexures. Depreciation allowed in respect of the transmission assets is as follows:

Asset-1

(₹ in lakh)			
Particulars	2021-22 (Pro-rata 262 days)	2022-23	2023-24
Depreciation			
Opening Gross Block	48371.81	50933.67	53222.47
ACE	2561.86	2288.80	507.75
Closing Gross Block	50933.67	53222.47	53730.22
Average Gross Block	49652.74	52078.07	53476.35
Freehold Land	0.00	0.00	0.00
Weighted average rate of Depreciation (WAROD) (in %)	5.28	5.28	5.28
Balance useful life of the asset (Year)	34	34	33



Particulars	2021-22 (Pro-rata 262 days)	2022-23	2023-24
Lapsed life at the beginning of the year (Year)	0	0	1
Aggregate Depreciable Value	44687.47	46870.26	48128.71
Combined Depreciation during the year	1880.92	2748.23	2821.95
Aggregate Cumulative Depreciation	1880.92	4629.14	7451.09
Remaining Aggregate Depreciable Value	42806.55	42241.12	40677.62

Asset-2

(₹ in lakh)

Particulars	2021-22 (Pro-rata 158 days)	2022-23	2023-24
Depreciation			
Opening Gross Block	122436.90	128268.17	132864.45
ACE	5831.27	4596.28	1762.86
Closing Gross Block	128268.17	132864.45	134627.31
Average Gross Block	125352.53	130566.31	133745.88
Freehold Land	0.00	0.00	0.00
Weighted average rate of Depreciation (WAROD) (in %)	5.28	5.28	5.28
Balance useful life of the asset (Year)	34	34	33
Lapsed life at the beginning of the year (Year)	0	0	1
Aggregate Depreciable Value	112817.28	117509.68	120371.29
Combined Depreciation during the year	2865.89	6895.63	7063.23
Aggregate Cumulative Depreciation	2865.89	9761.53	16824.76
Remaining Aggregate Depreciable Value	109951.38	107748.15	103546.53

Interest on Loan (“IoL”)

63. Regulation 32 of the 2019 Tariff Regulations provides as follows:

“32. Interest on loan capital: (1) The loans arrived at in the manner indicated in Regulation 18 of these regulations shall be considered as gross normative loan for calculation of interest on loan.

(2) The normative loan outstanding as on 1.4.2019 shall be worked out by deducting the cumulative repayment as admitted by the Commission up to 31.3.2019 from the gross normative loan.



(3) The repayment for each of the year of the tariff period 2019-24 shall be deemed to be equal to the depreciation allowed for the corresponding year/period. In case of de-capitalization of assets, the repayment shall be adjusted by taking into account cumulative repayment on a pro rata basis and the adjustment should not exceed cumulative depreciation recovered upto the date of de-capitalisation of such asset.

(4) Notwithstanding any moratorium period availed by the generating company or the transmission licensee, as the case may be, the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the depreciation allowed for the year or part of the year.

(5) The rate of interest shall be the weighted average rate of interest calculated on the basis of the actual loan portfolio after providing appropriate accounting adjustment for interest capitalized:

Provided that if there is no actual loan for a particular year but normative loan is still outstanding, the last available weighted average rate of interest shall be considered;

Provided further that if the generating station or the transmission system, as the case may be, does not have actual loan, then the weighted average rate of interest of the generating company or the transmission licensee as a whole shall be considered.

(5a) The rate of interest on loan for installation of emission control system shall be the weighted average rate of interest of actual loan portfolio of the emission control system or in the absence of actual loan portfolio, the weighted average rate of interest of the generating company as a whole shall be considered.

(6) The interest on loan shall be calculated on the normative average loan of the year by applying the weighted average rate of interest.

(7) The changes to the terms and conditions of the loans shall be reflected from the date of such re-financing.”

64. The Petitioner has claimed the weighted average rate of IoL, based on its actual loan portfolio and rate of interest. Accordingly, IoL has been calculated based on actual interest rate submitted by the Petitioner, in accordance with Regulation 32 of the 2019 Tariff Regulations. IoL allowed in respect of the transmission assets is as follows:

Asset-1

Particulars	(₹ in lakh)		
	2021-22 (Pro-rata 262 days)	2022-23	2023-24
Interest on Loan			
Gross Normative Loan	33860.27	35653.57	37255.73
Cumulative Repayments upto Previous Year	0.00	1880.92	4629.14
Net Loan-Opening	33860.27	33772.65	32626.59



Particulars	2021-22 (Pro-rata 262 days)	2022-23	2023-24
Additions	1793.31	1602.16	355.43
Repayment during the year	1880.92	2748.23	2821.95
Net Loan-Closing	33772.65	32626.59	30160.07
Average Loan	33816.46	33199.62	31393.33
Weighted Average Rate of Interest on Loan (in %)	2.6560	2.7940	2.9504
Interest on Loan	644.72	927.61	926.22

Asset-2

(₹ in lakh)

Particulars	2021-22 (Pro-rata 158 days)	2022-23	2023-24
Interest on Loan			
Gross Normative Loan	85705.83	89787.72	93005.12
Cumulative Repayments upto Previous Year	0.00	2865.89	9761.53
Net Loan-Opening	85705.83	86921.82	83243.59
Additions	4081.89	3217.40	1234.00
Repayment during the year	2865.89	6895.63	7063.23
Net Loan-Closing	86921.82	83243.59	77414.36
Average Loan	86313.82	85082.70	80328.97
Weighted Average Rate of Interest on Loan (in %)	2.6792	2.7932	2.9633
Interest on Loan	1001.05	2376.49	2380.38

Return on Equity (“RoE”)

65. Regulation 30 and Regulation 31 of the 2019 Tariff Regulations provide as follows:

“30. Return on Equity: (1) Return on equity shall be computed in rupee terms, on the equity base determined in accordance with Regulation 18 of these regulations.

(2) Return on equity shall be computed at the base rate of 15.50% for thermal generating station, transmission system including communication system and run-of-river hydro generating station, and at the base rate of 16.50% for the storage type hydro generating stations including pumped storage hydro generating stations and run-of-river generating station with pondage:

Provided that return on equity in respect of additional capitalization after cutoff date beyond the original scope, excluding additional capitalization on 7 account of emission control system, shall be computed at the weighted average rate of interest on actual loan portfolio of the generating station or the transmission system or in the absence of actual loan portfolio of the generating station or the transmission system, the weighted



average rate of interest of the generating company or the transmission licensee, as the case may be, as a whole shall be considered, subject to ceiling of 14%.

Provided further that:

- i. In case of a new project, the rate of return on equity shall be reduced by 1.00% for such period as may be decided by the Commission, if the generating station or transmission system is found to be declared under commercial operation without commissioning of any of the Restricted Governor Mode Operation (RGMO) or Free Governor Mode Operation (FGMO), data telemetry, communication system up to load dispatch centre or protection system based on the report submitted by the respective RLDC;
- ii. in case of existing generating station, as and when any of the requirements under (i) above of this Regulation are found lacking based on the report submitted by the concerned RLDC, rate of return on equity shall be reduced by 1.00% for the period for which the deficiency continues;
- iii. in case of a thermal generating station, with effect from 1.4.2020:
 - a) rate of return on equity shall be reduced by 0.25% in case of failure to achieve the ramp rate of 1% per minute;
 - b) an additional rate of return on equity of 0.25% shall be allowed for every incremental ramp rate of 1% per minute achieved over and above the ramp rate of 1% per minute, subject to ceiling of additional rate of return on equity of 1.00%:

Provided that the detailed guidelines in this regard shall be issued by National Load Dispatch Centre by 30.6.2019.

(3) The return on equity in respect of additional capitalization on account of emission control system shall be computed at the base rate of one year marginal cost of lending rate (MCLR) of the State Bank of India as on 1st April of the year in which the date of operation (ODe) occurs plus 350 basis point, subject to ceiling of 14%;

“31. Tax on Return on Equity. (1) The base rate of return on equity as allowed by the Commission under Regulation 30 of these regulations shall be grossed up with the effective tax rate of the respective financial year. For this purpose, the effective tax rate shall be considered on the basis of actual tax paid in respect of the financial year in line with the provisions of the relevant Finance Acts by the concerned generating company or the transmission licensee, as the case may be. The actual tax paid on income from other businesses including deferred tax liability (i.e. income from business other than business of generation or transmission, as the case may be) shall be excluded for the calculation of effective tax rate.

(2) Rate of return on equity shall be rounded off to three decimal places and shall be computed as per the formula given below:

$$\text{Rate of pre-tax return on equity} = \text{Base rate} / (1-t)$$

Where “t” is the effective tax rate in accordance with clause (1) of this Regulation and shall be calculated at the beginning of every financial year based on the estimated profit and tax to be paid estimated in line with the provisions of the relevant Finance Act applicable for that financial year to the company on pro-rata basis by excluding the income of non-generation or non-transmission business, as the case may be, and the



corresponding tax thereon. In case of generating company or transmission licensee paying Minimum Alternate Tax (MAT), "t" shall be considered as MAT rate including surcharge and cess.

Illustration-

(i) In case of a generating company or a transmission licensee paying Minimum Alternate Tax (MAT) @ 21.55% including surcharge and cess:

$$\text{Rate of return on equity} = 15.50 / (1 - 0.2155) = 19.758\%$$

(ii) In case of a generating company or a transmission licensee paying normal corporate tax including surcharge and cess:

(a) Estimated Gross Income from generation or transmission business for FY 2019-20 is Rs 1,000 crore;

(b) Estimated Advance Tax for the year on above is Rs 240 crore;

(c) Effective Tax Rate for the year 2019-20 = Rs 240 Crore / Rs 1000 Crore = 24%;

(d) Rate of return on equity = $15.50 / (1 - 0.24) = 20.395\%$.

(3) The generating company or the transmission licensee, as the case may be, shall true up the grossed up rate of return on equity at the end of every financial year based on actual tax paid together with any additional tax demand including interest thereon, duly adjusted for any refund of tax including interest received from the income tax authorities pertaining to the tariff period 2019-24 on actual gross income of any financial year. However, penalty, if any, arising on account of delay in deposit or short deposit of tax amount shall not be claimed by the generating company or the transmission licensee, as the case may be. Any under-recovery or over-recovery of grossed up rate on return on equity after truing up, shall be recovered or refunded to beneficiaries or the long term customers, as the case may be, on year to year basis."

66. The Petitioner has submitted that MAT rate is applicable to it. Accordingly, MAT rate applicable in 2019-20 has been considered for the purpose of RoE which shall be trued up with actual tax rate in accordance with Regulation 31(3) of the 2019 Tariff Regulations. RoE in respect of the transmission assets has been worked out and allowed as follows:

Asset-1

(₹ in lakh)			
Particulars	2021-22 (Pro-rata 262 days)	2022-23	2023-24
Return on Equity			
Opening Equity	14511.54	15280.10	15966.74
Additions	768.56	686.64	152.33
Closing Equity	15280.10	15966.74	16119.07



Particulars	2021-22 (Pro-rata 262 days)	2022-23	2023-24
Average Equity	14895.82	15623.42	16042.90
Return on Equity (Base Rate) (in %)	15.500	15.500	15.500
MAT Rate for respective year (in %)	17.472	17.472	17.472
Rate of Return on Equity (in %)	18.782	18.782	18.782
Return on Equity	2008.24	2934.39	3013.18

Asset-2

(₹ in lakh)

Particulars	2021-22 (Pro-rata 158 days)	2022-23	2023-24
Return on Equity			
Opening Equity	36731.07	38480.45	39859.34
Additions	1749.38	1378.89	528.86
Closing Equity	38480.45	39859.34	40388.19
Average Equity	37605.76	39169.89	40123.76
Return on Equity (Base Rate) (in %)	15.500	15.500	15.500
MAT Rate for respective year (in %)	17.472	17.472	17.472
Rate of Return on Equity (in %)	18.782	18.782	18.782
Return on Equity	3057.46	7356.89	7536.05

Operation & Maintenance Expenses (“O&M Expenses”)

67. O&M Expenses claimed by the Petitioner in respect of the transmission assets for 2019-24 period are as follows:

Asset-1

(₹ in lakh)

Particulars	2021-22 (Pro-rata 262 days)	2022-23	2023-24
Transmission Lines			
400 kV D/C (quad) Pugalur HVDC station -Edayarpalayam (TANTRANSCO) transmission line (52.337 km)			
400 kV D/C (quad) Edayarpalayam (TANTRANSCO)- Udumalpet Transmission line (47.018 km)			
Double Circuit (Bundled conductor with four or more sub-conductors) (km)	99.355	99.355	99.355
Norms (₹ lakh/units)	1.416	1.466	1.517
Total O&M Expenses	140.69	145.65	150.72
Bays:			
400 kV GIS: Pugalur HVDC: Udumalpet line 1 and 2 Bays at Pugalur HVDC (2 numbers)			
400 kV: Udumalpet: Pugalur HVDC Line 1 and 2 Bays at Udumalpet Sub-station (2 numbers)			



Particulars	2021-22 (Pro-rata 262 days)	2022-23	2023-24
400 kV GIS (numbers)	2	2	2
Norms (₹ lakh/bay)	24.115	24.962	25.837
Total O&M Expenses	48.23	49.92	51.67
400 kV (numbers)	2	2	2
Norms (₹ lakh/bay)	34.45	35.66	36.91
Total O&M expenses	68.90	71.32	73.82
PLCC			
Original Project cost (₹ lakh)	211 .00 1	211 .00 1	211 .00 1
Total O&M Expenses	3.03	4.22	4.22
Total O&M Expenses	188.09	271.12	280.44

Asset-2

(₹ in lakh)

Particulars	2021-22 (Pro-rata 158 days)	2022-23	2023-24
Transmission Lines			
Pugalur HVDC station-Thiruvalem 400 kV (QUAD) D/C line along with associated bays and equipment (391.237 km)			
Double Circuit (Bundled conductor with four or more sub-conductors) (km)	391.237	391.237	391.237
Norms (₹ lakh/units)	1.416	1.466	1.517
Total O&M Expenses	553.99	573.55	593.51
Bays:			
400 kV GIS: Pugalur HVDC: Thiruvalem line 1 and 2 (2 numbers)			
400 kV: Thiruvalem:Pugalur HVDC Line 1 and 2 Bays (2 numbers)			
400 kV GIS (numbers)	2	2	2
Norms (₹ lakh/bay)	24.115	24.962	25.837
Total O&M Expenses	48.23	49.92	51.67
400 kV (numbers.)	2	2	2
Norms (₹ lakh/bay)	34.45	35.66	36.91
Total O&M Expenses	68.90	71.32	73.82
PLCC			
Original Project cost (₹ lakh)	694.04	694.04	694.04
Total O&M Expenses	6.01	13.88	13.88
Total O&M Expenses	296.53	708.67	732.88

68. The norms specified under Regulation 35(3)(a) of the 2019 Tariff Regulations provide as follows:

“35. Operation and Maintenance Expenses:

...



(3) Transmission system: (a) The following normative operation and maintenance expenses shall be admissible for the transmission system:

Particulars	2019-20	2020-21	2021-22	2022-23	2023-24
Norms for sub-station Bays (₹ Lakh per bay)					
765 kV	45.01	46.60	48.23	49.93	51.68
400 kV	32.15	33.28	34.45	35.66	36.91
220 kV	22.51	23.30	24.12	24.96	25.84
132 kV and below	16.08	16.64	17.23	17.83	18.46
Norms for Transformers (₹ Lakh per MVA)					
765 kV	0.491	0.508	0.526	0.545	0.564
400 kV	0.358	0.371	0.384	0.398	0.411
220 kV	0.245	0.254	0.263	0.272	0.282
132 kV and below	0.245	0.254	0.263	0.272	0.282
Norms for AC and HVDC lines (₹ Lakh per km)					
Single Circuit (Bundled Conductor with six or more sub-conductors)	0.881	0.912	0.944	0.977	1.011
Single Circuit (Bundled conductor with four sub-conductors)	0.755	0.781	0.809	0.837	0.867
Single Circuit (Twin & Triple Conductor)	0.503	0.521	0.539	0.558	0.578
Single Circuit (Single Conductor)	0.252	0.260	0.270	0.279	0.289
Double Circuit (Bundled conductor with four or more sub-conductors)	1.322	1.368	1.416	1.466	1.517
Double Circuit (Twin & Triple Conductor)	0.881	0.912	0.944	0.977	1.011
Double Circuit (Single Conductor)	0.377	0.391	0.404	0.419	0.433
Multi Circuit (Bundled Conductor with four or more sub-conductor)	2.319	2.401	2.485	2.572	2.662
Multi Circuit (Twin & Triple Conductor)	1.544	1.598	1.654	1.713	1.773
Norms for HVDC stations					
HVDC Back-to-Back stations (Rs Lakh per 500 MW) (Except Gazuwaka BTB)	834	864	894	925	958
Gazuwaka HVDC Back-to-Back station (₹ Lakh per 500 MW)	1,666	1,725	1,785	1,848	1,913
500 kV Rihand-Dadri HVDC bipole scheme (Rs Lakh) (1500 MW)	2,252	2,331	2,413	2,498	2,586
±500 kV Talcher- Kolar HVDC bipole scheme (Rs Lakh) (2000 MW)	2,468	2,555	2,645	2,738	2,834
±500 kV Bhiwadi-Balia HVDC bipole scheme (Rs Lakh) (2500 MW)	1,696	1,756	1,817	1,881	1,947



Particulars	2019-20	2020-21	2021-22	2022-23	2023-24
<i>±800 kV, Bishwanath-Agra HVDC bipole scheme (Rs Lakh) (3000 MW)</i>	2,563	2,653	2,746	2,842	2,942

Provided that the O&M expenses for the GIS bays shall be allowed as worked out by multiplying 0.70 of the O&M expenses of the normative O&M expenses for bays;

Provided further that:

- i. the operation and maintenance expenses for new HVDC bi-pole schemes commissioned after 1.4.2019 for a particular year shall be allowed pro-rata on the basis of normative rate of operation and maintenance expenses of similar HVDC bi-pole scheme for the corresponding year of the tariff period;*
- ii. the O&M expenses norms for HVDC bi-pole line shall be considered as Double Circuit quad AC line;*
- iii. the O&M expenses of ±500 kV Mundra-Mohindergarh HVDC bipole scheme (2000 MW) shall be allowed as worked out by multiplying 0.80 of the normative O&M expenses for ±500 kV Talchar-Kolar HVDC bi-pole scheme (2000 MW);*
- iv. the O&M expenses of ±800 kV Champa-Kurukshetra HVDC bi-pole scheme (3000 MW) shall be on the basis of the normative O&M expenses for ±800 kV, Bishwanath-Agra HVDC bi-pole scheme;*
- v. the O&M expenses of ±800 kV, Alipurduar-Agra HVDC bi-pole scheme (3000 MW) shall be allowed as worked out by multiplying 0.80 of the normative O&M expenses for ±800 kV, Bishwanath-Agra HVDC bi-pole scheme; and*
- vi. the O&M expenses of Static Synchronous Compensator and Static Var Compensator shall be worked at 1.5% of original project cost as on commercial operation which shall be escalated at the rate of 3.51% to work out the O&M expenses during the tariff period. The O&M expenses of Static Synchronous Compensator and Static Var Compensator, if required, may be reviewed after three years.*

(b) The total allowable operation and maintenance expenses for the transmission system shall be calculated by multiplying the number of sub-station bays, transformer capacity of the transformer (in MVA) and km of line length with the applicable norms for the operation and maintenance expenses per bay, per MVA and per km respectively.

(c) The Security Expenses and Capital Spares for transmission system shall be allowed separately after prudence check:

Provided that the transmission licensee shall submit the assessment of the security requirement and estimated security expenses, the details of year-wise



actual capital spares consumed at the time of truing up with appropriate justification.

(4) Communication system: The operation and maintenance expenses for the communication system shall be worked out at 2.0% of the original project cost related to such communication system. The transmission licensee shall submit the actual operation and maintenance expenses for truing up.”

69. We have considered the submission of the Petitioner. O&M Expenses for 2019-24 tariff period are as follows:

Asset-1

Particulars	(₹ in lakh)		
	2021-22 (Pro-rata 262 days)	2022-23	2023-24
Transmission Lines			
400 kV D/C (quad) Pugalur HVDC station -Edayarpalayam (TANTRANSCO) Ttransmission line (52.337 km)			
400 kV D/C (quad) Edayarpalayam (TANTRANSCO)- Udumalpet Transmission line (47.018 km)			
Double Circuit (Bundled conductor with four or more sub-conductors) (km)	99.355	99.355	99.355
Norms (₹ lakh/units)	1.416	1.466	1.517
Total O&M Expenses	140.69	145.65	150.72
Bays:			
400 kV GIS: Pugalur HVDC: Udumalpet line 1 and 2 Bays at Pugalur HVDC (2 numbers)			
400 kV: Udumalpet: Pugalur HVDC Line 1 and 2 Bays at Udumalpet Sub-station (2 numbers)			
400 kV GIS (numbers)	2	2	2
Norms (₹ lakh/bay)	24.115	24.962	25.837
Total O&M Expenses	48.23	49.92	51.67
400 kV (numbers)	2	2	2
Norms (₹ lakh/bay)	34.45	35.66	36.91
Total O&M Expenses	68.90	71.32	73.82
Total O&M Expenses	185.06	266.90	276.22

Asset-2

Particulars	(₹ in lakh)		
	2021-22 (Pro-rata 158 days)	2022-23	2023-24
Transmission Lines			
Pugalur HVDC station-Thiruvalam 400 kV (QUAD) D/C line along with associated bays and equipment (391.237 km)			
Double Circuit (Bundled conductor with four or more sub-conductors) (km)	391.237	391.237	391.237
Norms (₹ lakh/units)	1.416	1.466	1.517



Particulars	2021-22 (Pro-rata 158 days)	2022-23	2023-24
Total O&M Expenses	553.99	573.55	593.51
Bays:			
400 kV GIS:Pugalur HVDC: Thiruvallam line 1 and 2 (2 numbers)			
400 kV:Thiruvallam:Pugalur HVDC Line 1 and 2 Bays (2 numbers)			
400 kV GIS (numbers)	2	2	2
Norm (₹ lakh/bay)	24.115	24.962	25.837
Total O&M Expenses	48.23	49.92	51.67
400 kV (numbers)	2	2	2
Norms (₹ lakh/bay)	34.45	35.66	36.91
Total O&M Expenses	68.90	71.32	73.82
PLCC			
Original Project cost (₹ lakh)	694.04	694.04	694.04
Total O&M Expenses	6.01	13.88	13.88
Total O&M Expenses	290.51	694.80	719.00

Interest on Working Capital (“IWC”)

70. Regulation 34(1)(c), Regulation 34(3), Regulation 34(4) and Regulation 3(7) of the 2019 Tariff Regulations specify as follows:

“34. Interest on Working Capital: (1) The working capital shall cover:

...

(c) For Hydro Generating Station (including Pumped Storage Hydro Generating Station) and Transmission System:

- (i) Receivables equivalent to 45 days of annual fixed cost;
- (ii) Maintenance spares @ 15% of operation and maintenance expenses including security expenses; and
- (iii) Operation and maintenance expenses, including security expenses for one month.

(3) Rate of interest on working capital shall be on normative basis and shall be considered as the bank rate as on 1.4.2019 or as on 1st April of the year during the tariff period 2019-24 in which the generating station or a unit thereof or the transmission system including communication system or element thereof, as the case may be, is declared under commercial operation, whichever is later:

Provided that in case of truing-up, the rate of interest on working capital shall be considered at bank rate as on 1st April of each of the financial year during the tariff period 2019-24.

(4) Interest on working capital shall be payable on normative basis notwithstanding that the generating company or the transmission licensee has not taken loan for working capital from any outside agency.”



“3. Definitions. - In these regulations, unless the context otherwise requires:-

(7) **‘Bank Rate’** means the one year marginal cost of lending rate (MCLR) of the State Bank of India issued from time to time plus 350 basis points;”

71. The Petitioner has submitted that it has computed IWC for 2019-24 period considering the SBI Base Rate plus 350 basis points as on 1.4.2019. The Petitioner has considered the rate of IWC as 12.05%.

72. IWC is worked out in accordance with Regulation 34 of the 2019 Tariff Regulations. The Rate of Interest (ROI) considered is 12.05% (SBI 1-year MCLR applicable as on 1.4.2019 of 8.55% plus 350 basis points) for 2019-20, ROI for 2020-21 has been considered as 11.25% (SBI 1-year MCLR applicable as on 1.4.2020 of 7.75% plus 350 basis points) whereas ROI for 2021-22 onwards has been considered as 10.50% (SBI 1-year MCLR applicable as on 1.4.2021 of 7.00% plus 350 basis points). The components of the working capital and interest allowed thereon are as follows:

Asset-1

Particulars	(₹ in lakh)		
	2021-22 (Pro-rata 262 days)	2022-23	2023-24
Interest on Working Capital			
WC for O&M Expenses	21.48	22.24	23.02
WC for Maintenance Spares	38.67	40.03	41.43
WC for Receivables	821.92	859.80	877.43
Total Working Capital	882.08	922.08	941.88
Rate of Interest (in %)	10.50	10.50	10.50
Interest on Working Capital	66.48	96.82	98.90

Asset-2

Particulars	(₹ in lakh)		
	2021-22 (Pro-rata 158 days)	2022-23	2023-24
Interest on Working Capital			
WC for O&M Expenses	55.93	57.90	59.92



Particulars	2021-22 (Pro-rata 158 days)	2022-23	2023-24
WC for Maintenance Spares	100.67	104.22	107.85
WC for Receivables	2083.88	2165.95	2206.72
Total Working Capital	2240.48	2328.07	2374.49
Rate of Interest (in %)	10.50	10.50	10.50
Interest on Working Capital	101.83	244.45	249.32

Annual Fixed Charges for 2019-24 Tariff Period

73. The transmission charges allowed in respect of the transmission assets for 2019-24 tariff period is as follows:

Asset-1

(₹ in lakh)

Particulars	2021-22 (Pro-rata 262 days)	2022-23	2023-24
Annual Transmission Charges			
Depreciation	1880.92	2748.23	2821.95
Interest on Loan	644.72	927.61	926.22
Return on Equity	2008.24	2934.39	3013.18
O&M Expenses	185.06	266.90	276.22
Interest on Working Capital	66.48	96.82	98.90
Total	4785.42	6973.95	7136.47

Asset-2

(₹ in lakh)

Particulars	2021-22 (Pro-rata 158 days)	2022-23	2023-24
Annual Transmission Charges			
Depreciation	2865.89	6895.63	7063.23
Interest on Loan	1001.05	2376.49	2380.38
Return on Equity	3057.46	7356.89	7536.05
O&M Expenses	290.51	694.80	719.00
Interest on Working Capital	101.83	244.45	249.32
Total	7316.74	17568.26	17947.98

Filing Fee and the Publication Expenses

74. The Petitioner has sought reimbursement of fee paid by it for filing the petition and publication expenses. The Petitioner shall be entitled for reimbursement of the filing



fees and publication expenses in connection with the present petition, directly from the beneficiaries on pro-rata basis in accordance with Regulation 70(1) of the 2019 Tariff Regulations.

Licence Fee & RLDC Fees and Charges

75. The Petitioner shall be entitled for reimbursement of licence fee in accordance with Regulation 70(4) of the 2019 Tariff Regulations for 2019-24 tariff period. The Petitioner shall also be entitled for recovery of RLDC fee and charges in accordance with Regulations 70(3) of the 2019 Tariff Regulations for 2019-24 tariff period.

Security Expenses

76. The Petitioner has submitted that security expenses in respect of the transmission assets are not claimed in the instant petition and it would file a separate petition for claiming the overall security expenses and consequential IWC.

77. KSEB has submitted that the Petitioner has claimed recovery of security expenses from the beneficiaries directly on quarterly basis. This claim is against the provisions under Regulation 35(3)(c) of the 20109 Tariff Regulations, which allows the recovery only at the time of truing up.

78. In response the Petitioner has submitted that Regulation 35(3)(c) of the 2019 Tariff Regulations only requires the transmission licensee to submit the assessment of security expenses and the details of year wise actual spare consumption at the time of truing up with appropriate justification. The regulation further provides that the security expenses shall be allowed separately after prudence check. The methodology proposed by the Petitioner, namely recovery on a quarterly basis is not prohibited by the above regulations. In fact, if the recovery is made on quarterly basis, regular cash flow is



ensured to the Petitioner and at the same time, the carrying cost burden on the KSEB will get reduced at the time of truing up. The Petitioner has further submitted that a separate petition (Petition No. 260/MP/2020) was filed before the Commission under Regulation 35(3)(c) of the 2019 Tariff Regulations for approval and recovery of security expenses already incurred or to be incurred in relation to the transmission systems of the Petitioner from 1.4.2019 to 31.3.2024.

79. We have considered the submissions of the Petitioner and KSEB. The Petitioner has claimed consolidated security expenses for all the transmission assets owned by it on projected basis for 2019-24 tariff period on the basis of actual security expenses incurred in 2018-19 in Petition No. 260/MP/2020. The said petition has already been disposed of by the Commission vide order dated 3.8.2021 wherein the Commission has approved security expenses from 1.4.2019 to 31.3.2024. Therefore, security expenses will be shared in terms of the order dated 3.8.2021 in Petition No. 260/MP/2020. Accordingly, the Petitioner's prayer in the instant petition for allowing it to file a separate petition for claiming the overall security expenses and consequential IWC has become infructuous.

Goods and Services Tax

80. The Petitioner has submitted that if GST is levied at any rate and at any point of time in future on charges of transmission of electricity, the same shall be borne and additionally paid by the Respondent(s) to the Petitioner and the same shall be charged and billed separately by the Petitioner. Further additional taxes, if any, are to be paid by the Petitioner on account of demand from Government/ Statutory authorities, the same may be allowed to be recovered from the beneficiaries.



81. We have considered the submissions of the Petitioner. Since GST is not levied on transmission service at present, we are of the view that the Petitioner's prayer is premature.

Capital Spares

82. The Petitioner has sought reimbursement of capital spares at the end of tariff period. The Petitioner's claim, if any, shall be dealt with in accordance with the provisions of the 2019 Tariff Regulations.

Grant from PSDF/ NCEF

83. KSEB has submitted that considering the importance of the transmission assets for renewable energy integration, it is requested that the funding from Power System Development Fund (PSDF)/ National Clean Energy Fund (NCEF) may be used for reducing the cost of the transmission project.

84. BESCO has submitted that the Petitioner may be directed to approach the PSDF or NCEF for financial assistance so as to reduce the burden of the transmission charges on the DICs.

85. TANGEDCO has submitted that the Petitioner being a public sector undertaking should have approached the Central Government for availing the grant under PSDF and NCEF fund. Hence, the Petitioner may be directed to approach MoP to sanction grant from PSDF and NCEF to reduce the financial burden to DISCOMS and tariff shock to the end consumers.

86. In response to KSEB, BESCO and TANGEDCO, the Petitioner has submitted that as on date, the entire capital cost of the transmission assets has been incurred by the Petitioner and tariff must be determined based on full capital cost incurred. In case,



Ministry of Power (MoP) allocates any amount from PSDF/ NCEF, as an when amount is available, the same can be considered and decision on the same can be taken by the Commission at the time of truing up.

87. We have considered the submissions of the Petitioner, KSEB and BESCO. The Commission is aware of the fact that capital investments of the instant transmission scheme/ transmission project is huge. The Commission feels that there is a strong necessity to share the burden of capital cost of transmission project by way of assistance from the PSDF by way of one-time grant. Accordingly, we direct the Petitioner to take up the matter with the Monitoring Committee of the PSDF for assistance in the form of one time grant from the PSDF and with MoP for grant to reduce the burden of transmission charges on the DICs. We, in the facts and circumstances of the present case, are of the considered view that MoP, Government of India may approve funds from PSDF and provide Government grant, considering the benefits that would accrue to the power sector and the economy of the country.

Sharing of Transmission Charges

88. The Petitioner has prayed that the transmission charges for 2019-24 tariff period may be allowed to be recovered on monthly basis in accordance with Regulation 57 of the 2019 Tariff Regulations and will be shared by the beneficiaries and long-term customers in accordance with the 2010 and 2020 Sharing Regulations as amended from time to time .

89. KSEB, TANGEDCO and BESCO have submitted that the transmission project is a high capacity HVDC project, therefore, the same may be treated as a project of strategic importance and funding should be from PSDF/ National Clean Energy Fund (NCEF). Further, the sharing of the subject HVDC project should be in line with sharing



methodology followed for other HVDC schemes (e.g. substantial sharing under National Component (NC)-HVDC as per the 2020 Sharing Regulations). The major portion of the submission made by the Respondents pertains to sharing of charges of the HVDC component of the transmission project and utilisation of Pole-I to Pole-IV of the transmission project vis-à-vis actual load and generation scenario.

90. In response, the Petitioner has submitted that the entire capital cost for the transmission assets has been incurred by the Petitioner and the tariff must be determined based on full capital cost incurred. In case, MoP allocates any amount from the PSDF/ NCEF fund as and when amount is available, the same can be considered and decided by the Commission. Thus, the Commission may take an appropriate decision on the sharing of the transmission charges of the transmission assets. The Petitioner has further submitted that it is only concerned with the recovery of the transmission charges in an expeditious and fair manner since substantial cost has been incurred by the Petitioner in implementing the transmission system.

91. The Commission *vide* RoP dated 11.2.2022 directed the Petitioner to submit Power flow details of Pole-I, Pole-II, Pole-III and Pole-IV of +- 800 kV 6000 MW Raigarh (HVDC Station)-Pugalur (HVDC Station). In response, the Petitioner *vide* affidavit dated 28.2.2022 has submitted the documents showing the power flow.

92. We have considered the submissions of the Petitioner and Respondents. The transmission project consists of HVDC components (Scheme-1 and Scheme-3) as well as AC components (Scheme-2). The Petitioner has filed separate petitions pertaining to HVDC components under Scheme-1 (Petition Nos. 685/TT/2020, 173/TT/2021 and 242/TT/2021) and Scheme-3 (Petition No. 172/TT/2021). Accordingly, the sharing of



charges specific to HVDC portion shall be dealt by the Commission in relevant petitions submitted by the Petitioner.

93. The transmission assets covered in the instant petition pertains to Scheme-2 of the transmission project which is the AC System strengthening at Pugalur end and consists of various AC lines and associated bays. Therefore, the transmission charges of Asset-1 and Asset-2 shall be included in PoC Pool from the COD of the Asset-1 and Asset-2. With effect from 1.11.2020, sharing of transmission charges is governed by the Central Electricity Regulatory Commission (Sharing of Transmission Charges and Losses) Regulations, 2020 (in short “the 2020 Sharing Regulations”). The COD of the Asset-1 and Asset-2 is approved as 13.7.2021 and 25.10.2021. Therefore, the transmission charges of Asset-1 and Asset-2 shall be governed by the 2020 Sharing Regulations. Accordingly, the liabilities of the DICs for arrears of the transmission charges determined through this order shall be computed DIC-wise in accordance with the provisions of respective Sharing Regulations and shall be recovered from the concerned DICs through bill under Regulation 15(2)(b) of the 2020 Sharing Regulations.

94. To summarise, AFC allowed in respect of the transmission assets for 2019-24 tariff period in this order is as follows:

(₹ in lakh)

Assets	2021-22 (Pro-rata 262 days)	2022-23	2023-24
Asset-1	4785.42	6973.95	7136.45

(₹ in lakh)

Assets	2021-22 (Pro-rata 158 days)	2022-23	2023-24
Asset-2	7316.74	17568.26	17947.98



95. The Annexures to this order forms part of the order.

96. This order disposes of Petition No. 243/TT/2021 in terms of the above findings and discussions.

sd/-
(P. K. Singh)
Member

sd/-
(Arun Goyal)
Member

sd/-
(I. S. Jha)
Member



ANNEXURE

Asset-1	Admitted Capital Cost as on COD (₹ in lakh)	Projected ACE (₹ in lakh)				Admitted Capital Cost as on 31.3.2024 (₹ in lakh)	Rate of Depreciation as per Regulations	Annual Depreciation as per Regulations (₹ in lakh)		
		2019-24	2021-22	2022-23	2023-24			Total	2021-22	2022-23
Building Civil Works & Colony	174.27	11.22	11.37	0.00	22.59	196.86	3.34%	6.01	6.39	10.34
Transmission Line	42516.75	2502.14	1396.82	507.75	4406.71	46923.46	5.28%	2310.94	2413.87	2464.45
Sub Station	5474.94	43.99	880.03	0.00	924.02	6398.96	5.28%	290.24	314.63	336.08
PLCC	205.85	4.51	0.58	0.00	5.09	210.94	6.33%	13.17	13.33	11.08
Total	48371.81	2561.86	2288.80	507.75	5358.41	53730.22		2620.36	2748.23	2821.95
						Average Gross Block (₹ in lakh)		49652.74	52078.07	53476.35
						Weighted Average Rate of Depreciation (in %)		5.28%	5.28%	5.28%



ANNEXURE

Asset-2	Admitted Capital Cost as on COD (₹ in lakh)	Projected ACE (₹ in lakh)				Admitted Capital Cost as on 31.3.2024 (₹ in lakh)	Rate of Depreciation as per Regulations	Annual Depreciation as per Regulations (₹ in lakh)		
2019-24		2021-22	2022-23	2023-24	Total			2021-22	2022-23	2023-24
Capital Expenditure										
Building Civil Works & Colony	267.94	2.61	30.57	0.00	33.18	301.12	3.34%	8.99	9.55	15.80
Transmission Line	112617.66	5759.31	3978.35	1762.86	11500.52	124118.18	5.28%	6098.26	6355.33	6511.87
Sub Station	8874.14	54.19	585.64	0.00	639.83	9513.97	5.28%	469.99	486.88	499.15
PLCC	677.16	15.16	1.72	0.00	16.88	694.04	6.33%	43.34	43.88	36.41
Total	122436.90	5831.27	4596.28	1762.86	12190.41	134627.31		6620.58	6895.63	7063.23
						Average Gross Block (₹ in lakh)		125352.53	130566.31	133745.88
						Weighted Average Rate of Depreciation (in %)		5.28%	5.28%	5.28%

