CENTRAL ELECTRICITY REGULATORY COMMISSION

NEW DELHI

Petition No. 693/TT/2020

Coram:

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

Date of Order: 17.10.2022

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 the Asset: (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 Transmission Line along with associated bays at Pugalur (HVDC Station) & Arasur station under "HVDC Bipole link between the 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.

2. Transmission Corporation of Andhra Pradesh Limited,
   Vidyut Soudha, Near Axis Bank, Eluru Road,
   Gunadala, Vijayawada-520004.

3. Kerala State Electricity Board,
   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,
   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-517 503
   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 1/2, Vidyut Bhawan, Corporate Office, Nakkal Gutta,
   Hanamkonda, Warangal – 506 001, 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.

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 Ved Prakash Rastogi, PGCIL
Shri D. K. Biswal, 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, KSEBL
Dr. R. Kathiravan, 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 Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 (hereinafter referred to as "the 2019 Tariff Regulations") for the period from COD to 31.3.2024 in respect of the transmission asset comprising of (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 Transmission Line along with associated bays at Pugalur (HVDC Station) & Arasur station under "HVDC Bipole link between the 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 the "transmission project").

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

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

4) 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.

5) 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.

6) 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.

7) 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.

8) Allow the petitioner to file a separate petition before Hon'ble Commission for claiming the overall security expenses and consequential IOWC on that security expenses as mentioned at para 8.9 above.

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

10) 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.

11) 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 power deficit 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. The maximum power demand of Southern Region (SR) was about 39,000 MW around 2013-15. As per 18th EPS of CEA, the expected power demand of SR by the end of XII and XIII 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 A.C 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 & 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 matching to the execution of 6000 MW Raigarh-Pugalur link. Further, Raigarh-Pugalur-Trichur HVDC transmission scheme was discussed in the 39th meeting of SCPSRSR held on 28-29 December, 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 has been 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 part of Scheme-1 [Phase I: ± 800 kV, 1500 MW HVDC terminal (Pole-1 of Bipole-1) at Raigarh and Pugalur along with ± 800 kV, 6000 MW Raigarh-Pugalur HVDC transmission link] will be executed along with part of 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: ±800 kV 6000 MW Raigarh (HVDC Station)-Pugalur (HVDC Station) HVDC transmission link along with ±800 kV 1500 MW (Pole-I) HVDC terminals each at Raigarh (HVDC Station) & Pugalur (HVDC Station) of Scheme-1 and 400 kV D/C Pugalur (HVDC)-Pugalur (existing) Transmission line and 400 kV D/C Pugalur (HVDC)-Arasur transmission line of Scheme-2 together under commercial operation w.e.f. 6.9.2020. The minutes of the CEA meeting have 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 meetings of Southern and Western region is summarised as follows:

Sl. No.	Dated	Particulars
1	4.1.2013	35th meeting of Standing Committee on Power System Planning in Southern Region
2	29.8.2013	36th meeting of Standing Committee on Power System Planning in Western Region
3	4.9.2013	36th meeting of Standing Committee on Power System Planning in Southern Region
4	9.10.2013	24th meeting of Western Regional Power Committee
5	26.10.2013	23rd Meeting of Southern Regional Power Committee
6	15.3.2014	24th Meeting of Southern Regional Power Committee
7	31.7.2014	37th meeting of Standing Committee on Power System Planning in Southern Region
8	26.7.2014	25th Meeting of Southern Regional Power Committee
9	5.9.2014	37th meeting of Standing Committee on Power System Planning in Western Region
10	30.9.2014	33rd meeting of Empowered committee on Transmission
11	20.12.2014	26th Meeting of Southern Regional Power Committee
12	7.3.2015	38th meeting of Standing Committee on Power System Planning in Southern Region
13	13.4.2015	34th 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	27th 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 detailed 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) DC line.
3. Pugalur HVDC Station-Thiruvalam 400 kV (quad) D/C line with 2x80 MVAR line reactor at Pugalur HVDC Station end and 2x63 MVAR line reactor at Thiruvalam 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 Thiruvalam 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 TANTRASCO 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 in its 344th meeting held on 16.8.2017 communicated *vide* Memorandum No. C/CP/RP HVDC Scheme#2 dated 30.8.2017 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 Date of Commercial Operation (SCOD) of the transmission asset is 30 months from the date of IA i.e. by 16.2.2020, against which the transmission asset has been declared under commercial operation (COD) on 6.9.2020 with delay of 6 months 18 days (i.e. 203 days), the details of which have been given in the subsequent paragraph of this order. The details of COD of the transmission assets covered in the instant petition are also given in the subsequent paragraph.

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

Sl. No.	Asset	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 Transmission line along with associated bays at Pugalur (HVDC Station) & Arasur station	16.2.2020	6.9.2020	693/TT/2020 (instant petition)

Sl. No.	Asset	SCOD	Actual COD	Covered under Petition No.
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
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.	16.2.2020	**Yet to be put into commercial operation***	
	**Bay extension works at Edayarpalayam (TANTRANSCO) Sub-station is envisaged to be implemented by TANTRASCO on behalf of the Petitioner on deposit work basis.*			
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	
3	LILO of North Trichur-Cochin 400 kV (Quad) D/C line at North Trichur HVDC station along with associated bays & equipment (GIS) at North Trichur HVDC station	9.4.2020	9.3.2021	

Sl. No.	Asset	SCOD	Actual COD	Covered under Petition No.
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	

(k) The date of commercial operation (COD) along with the details of time over-run in respect of the transmission asset is as follows:

IA date	SCOD	COD	Time over-run
16.8.2017	16.2.2020	6.9.2020	203 days

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

5. 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 27.4.2021 and has raised issues of variation of cost claimed from benchmark cost, time over-run, high cost of preliminary works, mis-match between tariff claimed and cost as per Auditor's Certificate, recovery of security expenses, sharing of transmission charges and funding from PSDF/ National Clean Energy Fund. Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO), Respondent No. 1, has filed reply *vide* dated 23.11.2021 and has raised

the issues of techno-economical aspect of the transmission project and strategic importance of the project, funding from PSDF/ National Clean Energy Fund, reduction of TTC/ATC of Southern Region, time over-run and restriction of IDC and IEDC due to time over-run, cost variation and imprudent cost estimation and sharing of transmission charges. Telangana State Power Distribution Company Limited (TSSPDCL), Respondent No. 9 and Telangana State Northern Power Distribution Company Limited (TSNPDCL), Respondent No. 10, have filed a combined reply vide affidavit dated 22.2.2022 and has raised the issues of strategic importance of the project, funding from PSDF/ National Energy Clean Fund, reduction of TTC/ATC of Southern Region, time over-run and restriction of IDC and IEDC due to time over-run, cost variation and imprudent cost estimation, and sharing of transmission charges. Bangalore Electricity Supply Company Ltd. (BESCOM), Respondent No. 11, has filed a reply vide dated 7.3.2022 and has raised the issues of strategic importance of the project, funding from PSDF/National Energy Clean Fund, time over-run with regard to disallowance of IDC and IEDC, initial spares and O&M Expenses, and sharing of transmission charges. The issues raised by KSEB, TANGEDCO, TSSPDCL, TSNPDCL and BESCOM and clarifications given by the Petitioner thereto have been dealt in the relevant portions of this order.

6. The hearings in this matter were held on 10.9.2021, 25.11.2021 and 11.2.2022 through video conference and the order was reserved on 11.2.2022.

7. This order is issued considering the submissions made by the Petitioner vide affidavit in the petition dated 25.8.2020 and the Petitioner's affidavits dated11.8.2021, 8.9.2021,14.12.2021, 24.2.2022 and 28.2.2022, KSEB's reply *vide* affidavit dated 27.4.2021, TANGEDCO's reply vide affidavit dated 23.11.2021, TSSPDCL and

TSNPDCL's combined reply vide affidavit dated 22.2.2022, BESCOM's reply *vide* affidavit dated 7.3.2022 and Petitioner's rejoinders to the replies of KSEB, TANGEDCO, TSSPDCL & TSNPDCL and BESCOM *vide* affidavits dated 14.12.2021, 14.12.2021, 15.3.2022 and 17.3.2022 respectively in the matter.

8. We have heard the learned counsels for the Petitioner, KSEB, TANGEDCO, TSSPDCL, TSNPDCL and perused the material on record. The issues raised by KSEB, TANGEDCO, TSSPDCL and TSNPDCL will be dealt in relevant paragraphs in the order.

DETERMINATION OF ANNUAL FIXED CHARGES FOR 2019-24 TARIFF PERIOD

9. The Petitioner has claimed the following transmission charges in respect of the transmission asset for the period from its COD to 31.3.2019:

(₹ in lakh)

Particulars	2020-21 (Pro-rata 207 days)	2021-22	2022-23	2023-24
Depreciation	1578.49	2961.61	3048.82	3048.82
Interest on Loan	565.97	1030.54	1017.28	963.09
Return on Equity	1679.14	3150.36	3242.74	3242.74
O&M Expenses	212.86	388.53	402.18	416.25
Interest on Working Capital	62.44	116.27	119.16	118.67
Total	**4098.90**	**7647.31**	**7830.18**	**7789.57**

10. The Petitioner has claimed the following Interest on Working Capital (IWC) in respect of the transmission asset for the period from its COD to 31.3.2019:

(₹ in lakh)

Particulars	2020-21 (Pro-rata 207 days)	2021-22	2022-23	2023-24
O&M Expenses	31.28	32.38	33.52	34.69
Maintenance Spares	56.30	58.28	60.33	62.44
Receivables	891.07	942.82	965.36	957.74
Total Working Capital	978.65	1033.48	1059.21	1054.87
Rate of Interest (in %)	11.25	11.25	11.25	11.25
Interest on Working Capital	**62.44**	**116.27**	**119.16**	**118.67**

Date of Commercial Operation ("COD")

11. The Petitioner has initially submitted in the petition that the transmission asset is anticipated to be put into commercial operation on 31.8.2020. However, the Petitioner *vide* affidavit dated 11.8.2021 has claimed the actual COD of the transmission asset as 6.9.2020.

12. 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."*

13. The Petitioner *vide* affidavit dated 11.8.2021 has submitted CEA energization certificates dated 24.3.2020 and 14.8.2020, RLDC charging certificates dated 1.6.2020

and 1.9.2020 certifying that trial operation was completed on 15.5.2020 and 20.8.2020 respectively, self-declaration COD letter dated 6.9.2020 and CMD certificate as required under the Grid Code.

14. Taking into consideration the CEA energization certificate, RLDC charging certificate and CMD certificate, COD of the transmission asset is approved as 6.9.2020.

Capital Cost

15. 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."*

16. The Petitioner *vide* affidavit dated 14.12.2021 has claimed the following capital cost in respect of the transmission asset and has submitted the Auditor's Certificates dated 18.11.2021 in support of the same:

(₹ in lakh)

FR Apportioned Approved Cost	Cost up to COD	Projected ACE				Estimated Completion Cost
		2020-21	2021-22	2022-23	2023-24	
40331.20	51077.29	3219.49	3253.70	0.00	0.00	57550.49

17. Further, the Petitioner *vide* affidavit dated 24.2.2022 has submitted RCE with respect to the transmission asset.

18. Accordingly, the details of estimated completion cost vis-à-vis FR apportioned approved cost and RCE apportioned approved cost are as follows:

(₹ in lakh)

FR Apportioned Approved Cost	RCE Apportioned Approved Cost	Estimated Completion Cost	Cost Variation (FR)	Cost Variation (RCE)
(a)	(b)	(c)	(d)=(c)-(a)	(e)=(c)-(b)
40331.20	62131.90	57550.49	17219.29	(-)4581.41

Cost over-run

19. It is observed that the estimated capital cost of ₹57550.49 lakh is beyond the FR apportioned approved cost of ₹40331.20 lakh. Hence, there is a cost over-run of ₹17219.29 lakh vis-à-vis the FR apportioned approved cost. However, the completion cost of the transmission asset of ₹57550.49 lakh is within the RCE apportioned approved cost of ₹62131.90 lakh.

20. The Petitioner *vide* affidavit dated 28.2.2022 has submitted the reasons for item-wise cost variation between apportioned approved cost as per FR and RCE and estimated completion cost is explained in Form-5. The Petitioner has attached Form-5 and Form-5B with respect to the transmission asset. Further, item wise cost variation with respect to FR and estimated completion cost of the line are as follows:

(₹ 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 incl. Compensation	5556.49	14494.07	13268.97	7712.48	-1225.10
A	**Transmission Lines material**					
2	Towers Steel	6929.84	9318.20	9227.74	2297.90	-90.46
3	Conductor	8865.98	11829.60	11642.25	2776.27	-187.35
4	Erection, Stringing & Civil works including foundation	4986.83	3044.44	2924.00	-2062.83	-120.44
5	Taxes & Duties	321.69	2299.21	2037.29	1715.60	-261.92
6	Miscellaneous Transmission Line	1833.72	2095.25	2196.45	362.73	101.20
	Total Transmission Lines	**28494.54**	**43080.77**	**41296.70**	**12802.16**	**-1784.07**
B	**Sub-stations**					
1	Civil Works	40	729.37	584.37	544.37	-145.00
2	Switchgear (CT, PT, Circuit Breaker, Isolator etc)	3472.07	6520.97	5568.11	2096.04	-952.86
3	Erection, Stringing & Civil works including foundation	1774.42	2017.37	1476.17	-298.25	-541.20
4	Taxes & Duties	1119.52	1508.00	1444.28	324.76	-63.72
5	Miscellaneous S/S	599.16	1252.26	1237.05	637.89	-15.21
	Total sub-station	**7005.17**	**12027.97**	**10309.98**	**3304.82**	**-1717.99**
C	Over heads	2762.09	3086.28	2141.27	-620.82	-945.01
D	Interest During Construction (IDC)	2069.41	2573.56	2473.61	404.20	-99.95
E	Foreign Exchange Rate Variation (FERV)	0	1363.32	1328.93	1328.93	-34.39
	Grand Total	**40331.20**	**62131.90**	**57550.49**	**17219.29**	**-4581.41**

21. The Petitioner has submitted that being a Government enterprise, the Petitioner is under obligation for indigenous development of manufacturers as well as to adhere

to 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. 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 transmission 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 crop, tree, PTCC and forest/ NPV, increase in the cost of tower steel and conductor, increase in the cost of sub-station equipment, Taxes & 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 variation (increase) of cost of about ₹7712 lakh w.r.t. 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 & 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 Department/DC and Forest Department. Similarly crop compensation has been paid/estimated based on the rates obtained from Agriculture Department. 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 is approximately 110 km.

b. Due to RoW issues encountered during the construction of line in Tamil Nadu state, the actual line length and routing changed, which increased the number of angle & extension towers, which resulted in increase of the cost of tower steel by about ₹2297 lakh with respect to FR cost. 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 district 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 variation (increase) of ₹2776 lakh with respect to FR for conductors, insulators and hardware fittings is 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 ₹2062 lakh with respect to FR 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 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 ₹2040 lakh 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.

f. IEDC including contingencies, establishment and other overheads for the asset approved in FR was estimated at ₹2762 lakh, whereas, the actual expenditure incurred, IEDC is ₹2141 lakh. Thus, IEDC under the project has decreased by ₹620 lakh with respect to FR. During estimation for FR, 3% and 5% of equipment cost and civil works has been considered for contingency and IEDC respectively. The actual amount of IEDC, establishment and contingency has been considered at the time of claim of tariff.

g. IDC in respect of the transmission asset as per FR cost was estimated at ₹2069 lakh, IDC in respect of the transmission asset works out to ₹2473 lakh. Thus, there is an increase of ₹404 lakh with respect to FR in IDC. The main reason for the increase in IDC is due to actual interest as compared to interest rates considered in FR.

h. On account of deployment of foreign loan (ADB/KFW) in the transmission asset, there is an incidence of increase in FERV liability from FR cost to the tune of ₹1382 lakh 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 extend of 1 USD = ₹75.77, EURO = ₹85.12 (present rate). The variation in exchange rate increases the FERV in overall cost of the transmission asset.

i. Thus, the price variation under the project is attributable to the actual line route and compensation paid based on the assessment of Government officials of state, inflationary trend prevailing during execution of project and 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 Petitioner.

23. TANGEDCO, TSSPDCL and TSNPDCL have submitted that there is cost over-run of ₹17444 lakh (43.25%) with respect to FR cost of the transmission asset. In case of tower steel there is 33.16% increase in price. The Petitioner has stated that due to RoW issues the routing and line length changed which resulted in increase of tower cost. The Petitioner who has expertise in this field, should add sufficient cushion while preparing the estimate. TANGEDCO, TSSPDCL and TSNPDCL have further submitted that in the conductor, insulator and hardware fittings cost there is 31.31% increase as compared to FR cost. The reason submitted by the Petitioner is 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. If the individual component cost is too high when compared to recent orders / benchmark rates, then it is the duty of the Petitioner to negotiate the rates with the lowest bidder. TANGEDCO, TSSPDCL and TSNPDCL have further submitted that there is 42.5% drop in expenditure incurred on erection, stringing and civil works of transmission line. It indicates that the Petitioner has not

followed prudent method in estimation. TANGEDCO, TSSPDCL and TSNPDCL have further submitted that there is 61.24% increase in sub-station equipment, civil works and communication system. This seems quite abnormal and the Petitioner has not submitted the reason for this increase. For taxes and duties, there is an increase of 141.57% and the reason submitted by the Petitioner is 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. The reason submitted by the Petitioner is not acceptable as they have exposure in this field and preparation of estimate. TANGEDCO, TSSPDCL and TSNPDCL have further submitted that the Petitioner has been executing number of projects and they should have benchmark data for each and every component of the project. They should have considered such basic data for FR estimation. Hence, TANGEDCO has prayed to restrict the capital cost to original approved FR cost.

24. BESCOM has submitted that the Petitioner has indicated that ₹17444 lakh additional cost has been incurred due to delay in execution of the transmission asset, which is almost additional cost of 43.25% with respect to original cost of the transmission project.

25. In response to TANGEDCO, TSSPDCL, TSNPDCL and BESCOM, the Petitioner has submitted that there is cost over-run of ₹17129 lakh with respect to FR cost in respect of instant asset. The reasons for item-wise cost variation between approved apportioned costs (FR) and estimated completion cost has already been placed on record. 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 Petitioner. RCE-I has been placed on the record.

26. KSEB has submitted that the cost variation is ₹17444 lakh i.e. around 44% increase. The capital cost of transmission lines as per the petition is ₹46180 lakh and that of sub-station is ₹11283 lakh. On analyzing the transmission line cost and sub-station cost claimed in the petition with the benchmark cost for 400 kV lines considered by the Commission in order dated 18.3.2016 in Petition No. 184/TT/2013, it is observed that the cost claimed in the petition is very high compared to the benchmark cost considered by the Commission for 400 kV transmission lines and bays as follows:

Sl. No.	Item	Benchmark cost (₹ in lakh/km)	Cost claimed in petition (₹ in lakh/km)
1	400 kV Transmission Line	102.93	423.92
2	400 kV bays	450.00	1410.38

27. KSEB has further submitted that such an increase in capital cost is not justified and requested to consider the same after the prudence check of the capital cost and limit to the benchmark capital cost considered by the Commission. The Petitioner has claimed a delay of 6 months for the project citing RoW issues. However, as per the chronological events of RoW issues narrated by the Petitioner, it is seen that the delay of 6 months could have been avoided. In case of RoW issues in Tiruppur District at location 32/2, the Petitioner has stated that foundation works commenced on 14.6.2019, however was going on in a slow manner. Similarly, at locations 34/0 and 38/1 also, it has been stated that the work was going in a slow manner. KSEB, therefore, requested to disallow the cost over-run for such avoidable delays purely attributable to the Petitioner.

28. In response, the Petitioner has submitted that as per the contention of KSEB, in terms of the Commission's order dated 18.3.2016 in Petition No. 186/TT/2013, hard cost of 400 kV transmission line should work out to ₹102.93 lakh per km and the cost of 400 kV bays works out to be ₹450 lakh is much higher per km capital cost in the instant case and should not be allowed. The Petitioner has submitted that the contentions of KSEB are incorrect and without any merit and 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. The Petitioner has further 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 HVDC 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 (one-time order vs. 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.

29. The Petitioner has further submitted that all the above factors influence price discovery and the assessment of prudent costs for HVDC assets needs to be done on a project specific basis. It is practically impossible for any benchmarking of capital cost for HVDC assets at this stage. The Petitioner has submitted that it has evaluated the variation in cost per km of transmission lines even if such lines fall under same wind zones, soil conditions and topography and the result of the study shows that a cost of 765 kV line varies from ₹166.50 lakh per km to ₹210.79 lakh per km even in similar regions. The Petitioner has further submitted that any benchmarking in the case of such HVDC 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 further requested that an independent prudence check may be applied by the Commission on the capital cost incurred and claimed by the Petitioner in the present case.

30. KSEB has further submitted that the Petitioner has claimed huge amount of ₹13708 lakh towards preliminary works and compensation. However, the Petitioner has not provided supporting documents for the compensation paid by the Petitioner. KSEB has submitted that the Petitioner has considered ₹49132 lakh as expenditure upto 31.3.2020 and ₹4678 lakh in 2020-21 and ₹3964 lakh in 2021-22 for tariff computation for these years, whereas the Auditor's Certificate furnished by the Petitioner with approved expenditure of ₹41975 lakh upto 31.3.2020, ₹11836 lakh in 2020-21 and ₹3964 lakh in 2021-22 and prayed that the Commission may look into the above discrepancies.

31. In response, the Petitioner has submitted that all the compensation payments made are as per the directions of various court orders issued by District Court of Kerala, High Court or any other court as received from time to time. Although, the tree compensation has been paid based on tree enumeration in the corridor and rates obtained from Horticulture Department/DC and Forest Department. Similarly crop compensation has been paid/estimated based on the rates obtained from Agriculture Department. The Petitioner has further submitted that 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 MoP guidelines dated 15.10.2015 for tower footing and corridor. The estimate was prepared considering compensation ₹15 lakh/ acre (mostly agricultural land in rural setting), compensation ₹25 lakh/ acre (mostly urban/ semi-urban land near Cities/Towns), compensation ₹50 lakh/ acre (mostly urban land near big cities/ metro towns) for 400 kV D/C Pugalur-Arasur and 400 kV D/C Pugalur-Pugalur Transmission Line. However, compensation paid is as per the actual site condition encountered and route alignment due to sever RoW issues.

32. The Petitioner has further submitted that tariff has been claimed on the capital cost of ₹49132 lakh i.e. from the anticipated COD of 31.8.2020 and Additional Capital Expenditure (ACE) of ₹4678 lakh from 1.9.2020 to 31.3.2021 and ₹3964 lakh from 1.4.2021 to 31.3.2022. Thus, there is no discrepancy in Auditor certificate and claimed tariff. Further, revised tariff forms on actual COD have already been placed on record vide affidavit dated 11.8.2021.

33. We have considered the submissions of the Petitioner and Respondents. It is noted that the estimated completion cost of the transmission asset of ₹57550.49 lakh

including ACE as mentioned in the table above is beyond the FR apportioned approved cost of ₹40331.20 lakh and thus there is a variation of about ₹17219.29 lakh. The Petitioner has submitted RCE approved by the competent authority and revised the apportioned approved cost of the transmission, which are as follows:

(₹ in lakh)

FR Apportioned Approved Cost	RCE Apportioned Approved Cost	Estimated Completion Cost
40331.20	62131.90	57550.49

The major reason for cost variation as submitted by the petitioner is due to higher compensation paid for land, corridor and tree/ crop as per the site conditions and rates assessed by the State Government officials. Further, cost variation is also due to the variation in the route and length of the transmission line leading to increase in quantity of material used, variation in the sub-station equipment cost due to quantity variation as per actual site conditions and higher actual contract prices received in open bidding which is beyond the control of the Petitioner.

34. The estimated completion cost of the transmission asset is within the RCE apportioned approved cost. Accordingly, the cost variation is allowed.

Time over-run

35. As per the IA dated 16.8.2017, the transmission project was scheduled to be put into commercial operation within 30 months from the date of IA i.e. by 16.2.2020. However, the transmission asset was put into commercial operation on 6.9.2020. Thus, there is a time over-run of 203 days. The Petitioner has submitted that the time over-run is mainly because of RoW issues vis-à-vis law and order problems during construction of transmission lines, litigations, etc. as elaborated below. After managing intense RoW problems, Court cases etc. throughout the stretch of transmission line and

other construction challenges like COVID-19 pandemic leading to the delay in completion of the transmission project, the Petitioner has finally compressed the schedule and put the transmission asset into commercial operation on 6.9.2020. In support, the Petitioner has submitted PERT and CPM chart i.e. Planned vs Actual (as per prescribed format Form-12) and has also submitted documentary evidence. Accordingly, the Petitioner has requested to condone the delay in completion of the transmission assets on merit of the same being out of the control of the Petitioner in line with the Regulation 22(2)(c) “uncontrollable factors” of the 2019 Tariff Regulations and approve the tariff as claimed.

36. The Petitioner has submitted that after obtaining IA, preliminary action was initiated immediately for taking up survey works of the transmission line. The Petitioner acted proactively and intimated the concerned district authorities regarding this upcoming project involving construction of transmission line. Further, the authorities were also requested to extend their cooperation and support whenever the Petitioner may encounter hindrances.

37. The Petitioner had completed 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 & Revenue Authorities as envisaged. The Petitioner had pursued the matter through a number of meetings and also brought out issue of cascading effect of this delay on the eventual completion target of the line. After rigorous follow up with district authorities, the survey was completed and route was identified with minimal habitat area.

38. 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. Further, wherever possible, persuasive measures were adopted to pacify the land owners/ villagers agitating against the line construction. However, at certain locations verbal persuasions did not suffice and eventually the help and assistance of District administration and Police Department was sought to mitigate the RoW issues. Many of the land owners had approached the courts to oppose the construction of line through their premises.

39. In this regard, intervention was also sought from the concerned Government Authorities to get the said issues resolved without 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. Only with the support of District Administration and Revenue and Police protection, the construction works were carried out.

40. The Petitioner has submitted the details of RoW issues emerged from the start date till the date they were resolved as follows:

RoW issues and Court cases related issues while executing 400 kV D/C Transmission Lines from Pugalur (HVDC Station)-Pugalur (Existing) and Pugalur (HVDC Station)-Arasur:

Sl. No.	Description (Location/ Tower Reference)	RoW Start Date	RoW Resolved Date
1	Loc. No. 32/2 (TiruppurTi)	11.12.2017 28.6.2019 15.10.2019	28.6.2019 26.8.2019 19.3.2020
2	Loc. No. 34/0 (Tiruppur)	11.12.2017 18.6.2019	14.6.2019 07.2.2020
3	Loc. No. 38/1 (Tiruppur)	11.12.2017	29.11.2019
4	Loc. No. 49/0 (Tiruppur)	11.12.2017	11.3.2020
5	Loc. Nos. 73/0, 74/0 (Coimbatore)	11.12.2017	8.7.2020
6	Loc. No. 75/0 (Coimbatore)	11.12.2017	25.7.2020

41. The Petitioner has submitted detailed chronology related to various incidences of hinderance caused during the construction activity. Initially the works were hampered in Tiruppur and Coimbatore districts due to RoW issues due to 'Dharna' conducted by the association named as "Tamizhaga Vivasayigal Padukappu Sangam" on 11.12.2017 and 24.12.2017. The protesters were demanding underground cabling in place of overhead transmission lines of the Petitioner and TANTRANSCO. Thereafter, the mobsters assaulted manpower and damaged vehicles and construction equipment. The Petitioner was continuously interacting with the authorities during the months of January and February, 2018. As per the chronology, a hunger strike ("Maperum Adayala Unna Viratham") was conducted on 17.3.2018 jointly by groups like "Tamizhaga Vivasayigal Padukappu Sangam/ Tamizhaga Vivasayigal Sangam", "Ermunaillangar Ani" and "Aanathu Vivasayigal Sangam" at Palladam in Kosavampalayam section. Again on 6.5.2018, joint committee of farmers from 12 affected districts convened a meeting ("Vivasayigal Korikkai Maanadu") against overhead transmission tower lines with a single demand of "Providing UG cable in place of overhead transmission line" of the Petitioner and TANTRANSCO projects. However, with continuous follow-up by the Petitioner and TANTRANSCO at all levels of the State Government; the issue was 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.

42. Subsequently, RoW issues prevailing in the State of Tamil Nadu (13 districts) were reviewed by the Minister of Electricity & Prohibition, Government of Tamil Nadu and Chief Secretary to Government of Tamil Nadu with the respective District Collectors (through VC) on 12.11.2018 and further reviewed on 4.6.2019 at Tamil Nadu Government Secretariat, Chennai. However, on 18.9.2019, farmers from Coimbatore, Tiruppur, Erode, Salem, Dharmapuri, Krishnagiri, Vellore, Tiruvannamalai, Karur districts staged protest ("Indiya Thanthi Satta Nagla Euripi Porattam") burning Indian Telegraph Act, 1885 in front of the office of the respective District Collectors for safeguarding farmer's rights and their livelihood. Again on 18.11.2019, the farmers staged protest in 13 districts against erection of transmission towers on agriculture lands.

43. The Petitioner has submitted that they have been regularly requesting the DC, Tiruppur through various letters dated 11.12.2017, 11.1.2018, 28.2.2018, 4.4.2018, 5.10.2018 etc. for removal of obstructions caused by the local farmers and villagers and other vested interest groups deliberated above at various locations falling in Tiruppur District. Similarly, the Petitioner has been regularly requesting the DC, Coimbatore through various letters dated 14.12.2017, 12.1.2018, 6.2.2018, 3.3.2018, 9.3.2018, 25.11.2019 etc. for removal of obstructions caused by the local farmers and villagers and other vested interest groups deliberated above at various locations falling in Coimbatore District. Thus, the work in these districts could not be commenced from

11.12.2017 due to protest by various Sangams. Further, the Petitioner has submitted specific district wise and location wise detailed reasons of delay due to RoW and court case in respect of transmission asset as follows:

Delay due to RoW & Court Cases in 400 kV D/C Pugalur (HVDC Station)-Pugalur (Existing) and Pugalur (HVDC Station)-Arasur transmission lines

(1) Loc. No. 32/2 (Tiruppur):

In addition to the earlier letters, the Petitioner *vide* letter dated 8.7.2019 requested DC, Tiruppur for removal of obstructions on location no. 32/2 in the land with survey no. 118/2, Sithampalam Village, Palladam Taluk under clause 16 (1) and Sec-10 of Indian Telegraph Act, 1885. Thereafter, on 24.7.2019, DC, Tiruppur sent a call letter to the landowner and concerned officials to conduct an enquiry on 31.7.2019. Subsequently, the enquiry was held by DC, Tiruppur and enter upon order issued *vide* letter ref: Mu.M.No. 2586/2019/E1 dated 16.8.2019 to carry out the work at tower location 32/2. Foundation works commenced on 14.6.2019, however, work was going on in a slow manner and stopped by the land owners on 28.6.2019. After resolving RoW issues, foundation works recommenced on 26.8.2019 (delay from 28.6.2019 to 26.8.2019: 59 days) and completed by 3.9.2019. Thereafter, the tower erection was completed by 14.10.2019. However, the stringing could not be carried out due to RoW issues. After resolving the RoW issues, the stringing works commenced on 19.3.2020. (delay from 15.10.2019 to 19.3.2020: 156 days). The work was also hampered due to COVID lockdown and the stringing works was recommenced with less manpower from 15.5.2020 in this stretch and completed by 21.5.2020.

(2) Loc. No. 34/0 (Tiruppur):

The work in Tiruppur districts could not be commenced since 11.12.2017 due to protest by various Sangams. The foundation works commenced on 14.6.2019 (delay from 11.12.2017 to 14.6.2019: 550 days), however, work was going on in a slow manner and stopped by the land owners on 18.6.2019. The Petitioner requested the Tehsildar for Police protection *vide* letter dated 18.11.2019 to execute the works at 34/0. After resolving RoW issues, foundation works

recommenced on 7.2.2020 (delay from 18.6.2019 to 7.2.2020: 234 days) and completed by 15.2.2020. Thereafter, tower erection was completed by 29.2.2020 and stringing was completed by 5.5.2020. Thus, the delay is due to RoW issues is beyond the control of the Petitioner.

(3) <u>Loc. No. 38/1 (Tiruppur):</u>

In addition to the earlier letters, the Petitioner *vide* letter dated 10.7.2019 requested DC, Tiruppur for removal of obstructions on location no. 38/1. Thereafter, on 24.7.2019, DC, Tiruppur sent a call letter to the landowner and concerned officials to conduct an enquiry on 29.7.2019. Subsequently, the enquiry was held by DC, Tiruppur and enter upon order issued *vide* letter ref: Mu.M.No. 2586/2019/E1 dated 19.8.2019 to carry out the work at tower location 38/1. However, the land owner K. I. Theivasigamani *vide* letter dated 26.8.2019 submitted his petition to DC, Tiruppur to avoid the construction of transmission lines. The land owner filed Writ Petition (W.P.No.29454 of 2019 dated 27.9.2019) and the case was registered on 14.10.2019. The Writ Petition was filed under Article 226 of the Constitution of India, praying to issue Writ of Mandamus, directing the DC, Tiruppur to take necessary action on the land owner's representation dated 29.7.2019 & 26.8.2019 and pass orders. The matter was heard on 15.10.2019 and posted on 1.11.2019 for filing status report. Finally, W.P.No.29454 of 2019 was disposed of on 7.11.2019.

Foundation works commenced on 29.11.2019 (delay from 11.12.2017 to 29.11.2019: 718 days) however, work was going on in a slow manner and stopped by the land owners on 4.12.2019. After resolving RoW issues, foundation works recommenced on 17.12.2019 (delay: from 4.12.2019 to 17.12.2019: 13 days) and completed by 19.12.2019. The tower erection was commenced on 30.12.2019 and completed by 3.1.2020. Thereafter, stringing was completed by 5.5.2020. Thus, the delay after the completion schedule is due to RoW issues and is beyond the control of the Petitioner.

(4) Loc. No. 49/0 (Tiruppur):

Detailed survey works was commenced in July, 2017 in Sukkampalayam Village, Palladam Taluk, Tiruppur district where 9 towers were to be constructed as per route alignment and the survey works were to be completed by December, 2017. During survey, there was no building near the survey nos. of this RoW location 49/0. The Petitioner requested for removal of obstructions to DC, Tiruppur on various dates *vide* letter dated 11.12.2017, 11.1.2018, 28.2.2018. It was observed that, construction of one shed was being carried out deliberately by the land owner beneath the identified transmission line corridor in survey no. 335/2D (Patta No. 753) Sukkampalayam Village, Palladam Taluk, Tiruppur district. The Petitioner *vide* letter dated 7.3.2018 to Village Panchayat Officer, Sukkampalayam, copy to RDO/Tiruppur, Tehsildhar/Palladam, RI/Samalapuram, TANGEDCO and the land owner S. K. Murugasamy, objected to the construction of shed. In response, the land owner *vide* letter 28.3.2018 stated that the construction of building is completed and requested to change the alignment. The Petitioner then requested DC, Tiruppur *vide* letter dated 4.4.2018 for removal of obstructions. The Petitioner's officials met Deputy Speaker (Tamil Nadu Assembly) on 18.7.2018, and explained about the transmission line work and compensation payment in Pollachi area and also sought his support to carry out work in his constituency. The Petitioner again requested DC, Tiruppur *vide* letter dated 5.10.2018 for removal of obstructions. In addition to the earlier letters, the Petitioner *vide* letter dated 1.11.2019 requested DC, Tiruppur for removal of obstructions on location no. 49/0. Thereafter, on 21.11.2019, DC, Tiruppur sent a call letter to the landowner and concerned officials to conduct an enquiry on 29.11.2019. Subsequently, the enquiry was held by DC, Tiruppur on 29.11.2019 wherein the land owner requested for repositioning of the tower. Accordingly, DC, Tiruppur has advised the Petitioner to check for feasibility of repositioning of the tower. As advised in the enquiry, a technical feasibility for repositioning the tower position of 49/0 has been carried out on 30.11.2019. The tower is repositioned slightly, avoiding the structure and to the extent possible technically. Thereafter, the Petitioner submitted a written statement to DC, Tiruppur *vide* letter dated 14.12.2019, wherein it was mentioned that two legs of tower no.49/0 falls in

survey no. 334/1B2 and other 2 legs in survey no. 335/2F. A shed was under construction during February, 2018 in the adjacent survey no., and in this regard a letter has also been issued to the concerned land owner to stop the construction work and Village Panchayat Officer *vide* letter dated 7.3.2018. However, construction works were not stopped and competed now. Hence, the tower location has been repositioned within the said survey nos. 334/1B2 and 335/2F. The route alignment from the tower no.48/0 to 50/0 (on either side of 49/0) is very carefully made by maintaining the required statutory clearances to the existing houses, roads and sheds. Any further repositioning of tower 49/0 from SF no. 334/1B2 in Sukkampalayam Village will affect the route alignment towards 48/0 and 50/0 which will invite new survey nos. and fresh RoW issues besides technical violation and it is technically not feasible. The Petitioner *vide* letter dated 7.1.2020 requested DC, Tiruppur to issue enter upon order for location no. 49/0. The Petitioner vide letters dated 21.1.2020 and 27.1.2020 requested for Police protection. Consequently, the foundation works commenced on 31.1.2020. However, the land owner gave a letter dated 3.2.2020 to DC, Tiruppur stating that there is only 10 feet for pathway to his land. Subsequent to this, DC has sent a letter to Surveyor, Samalapuram and VAO to measure the land in front of the land owner and to submit a report and also sent a call letter on 5.2.2020 to the landowner and all concerned to attend an enquiry scheduled on 11.2.2020. The enquiry was held on 11.2.2020 based on which the Petitioner submitted a written statement that the said tower is repositioned slightly, avoiding the structure and to the extent possible technically. The route alignment from the tower 48/0 to 50/0 (on either side of 49/0) is very carefully made by maintaining the required statutory clearances to the existing houses, roads and sheds. Further, foundation works of the succeeding & preceding towers and two legs of 49/0 tower were already completed and hence it is not technically feasible and requested DC, Tiruppur to issue enter upon order. Meanwhile, the foundation works of 2 legs of tower no. 49/0 in survey no. 334/1B2 was completed on 12.2.2020. DC, Tiruppur has issued enter upon order vide letter ref: Na.Ka.No.689/2020/E5 dated 18.2.2020 to carry out the work at tower location 49/0, without affecting the pathway to the land as requested by the land owners

and to conduct a survey by revenue team. The land measurement in survey no 335/2F for tower no 49/0 was carried out in front of the land owner on 29.2.2020 and the Revenue Inspector submitted a report to Tehsildar, Palladam with the sketch depicting the location of the tower and land measurements. Further, the land owner filed a Writ Petition (W.P. No. 5547/2020) on 26.2.2020 for restraining order against construction of towers in survey no. 335/2F. The matter came up for admission on 3.3.2020 wherein the learned counsel appearing on behalf of the Petitioner submitted that the objections were already considered by the District Collector and an order has been passed on 18.2.2020 and also informed that a joint inspection is being conducted along with the owners of the property in order to ensure that free ingress and egress is provided to the property of the objectors. The inspection was again carried out on 4.3.2020 as per DC's enter upon order dated 18.2.2020 and the W.P. No. 5547/2020. It was found that 11 feet wide path is available for free ingress and egress to the land. Tehsildar, Palladam submitted the report of this inspection *vide* letter dated 5.3.2020 to DC, Tiruppur. W.P.No.5547/2020 was taken up for hearing on 9.3.2020 and the case was dismissed on 11.3.2020 (delay from 11.12.2017 to 11.3.2020: 821 days). Foundation works in the balance 2 legs in survey no. 335/2F completed on 15.3.2020. Further, the Petitioner *vide* letters dated 20.5.2020, 23.5.2020 and 31.5.2020 requested for Police protection to execute the construction works. The work was also hampered due to COVID lockdown. The tower erection commenced on 9.6.2020 and completed by 22.6.2020, whereas, the stringing commenced on 13.7.2020 and completed by 17.7.2020 in this stretch. Thus, the delay is due to RoW issues and is beyond the control of the Petitioner.

(5) Loc. No. 73/0 and 74/0 (Coimbatore):

Work could not be commenced in Coimbatore district due to RoW issues from 11.12.2017 due to protest by various Sangams. There are 19 locations and for all locations petition was filed before the District Collector, Coimbatore for removal of objection/obstruction under section 16(1) of Indian Telegraph Act, 1885 and the enter upon received for all locations after due hearing by the District Collector/Magistrate, Coimbatore. During the course of hearing for enter upon

petitions filed by the Petitioner, an objection was filed on 18.10.2019 by A. R. Chennimalai Gounder School (ARC School), Karumathampatti Village, Sulur Taluk, Coimbatore district to change the route alignment. In response, the Petitioner submitted a point wise reply on 13.11.2019. Subsequently, a Writ Petition (W.P. No. 3501/2020) was filed by ARC School, Karumathampatti before the Hon'ble High Court of Madras. The case came up for hearing 13.2.2020 and after arguments put before, the matter was referred to the District Collector/Magistrate, Coimbatore. The Petitioner vide letter dated 19.2.2020 requested DC, Coimbatore for removal of obstruction on location nos. 73/0 & 74/0. Thereafter, on 27.2.2020 and 3.3.2020, DC, Tiruppur sent a call letter to the landowner and concerned officials to attend an enquiry. ARC School submitted petition dated 3.3.2020 to the DC, Coimbatore and the same has been forwarded/directed to the Petitioner for submitting reply. Joint survey at ARC School has been carried out on 13.3.2020 before Tehsildar, Sulur, and Surveyor in presence of School Authorities. Report of joint survey submitted to Tehsildar, Sulur vide the Petitioner's letter dated 13.3.2020. DC, Coimbatore vide letter dated 3.6.2020 directed the Petitioner to submit the reply against the petition submitted by the ARC School. In response, a point wise reply was filed by the Petitioner on 11.6.2020 and requested for removal of obstruction and issuance of enter upon permission for laying the transmission line. After the receipt of court order copy on 22.5.2020 in W.P. No. 3501/2020, the enter upon order has been issued by DC, Coimbatore vide letter ref: Pa.Mu.3893/2020/E2 dated 30.6.2020 to carry out the construction work in section 73/0 & 74/0. The foundation works in section 73/0 & 74/0 taken up with police protection on 8.7.2020. (delay from 11.12.17 to 8.7.2020: 940 days) The foundation work was completed on 14.7.2020, tower erection work was completed by 22.7.2020 and the stringing work was completed by 4.8.2020. Thus, the delay after the completion schedule is due to RoW issues and is beyond the control of the Petitioner.

(6) Loc. No. 75/0 (Coimbatore):

The Petitioner has been regularly requesting the DC, Coimbatore through various letters dated 14.12.2017, 12.1.2018, 6.2.2018, 3.3.2018, 9.3.2018, 25.11.2019 etc. for removal of obstructions caused by the local farmers and villagers and

other vested interest groups as deliberated above at various locations falling in Coimbatore District. Thus, the work in these districts could not be commenced since 11.12.2017 due to protest by various Sangams. In addition to the earlier letters, the Petitioner *vide* letter dated 4.2.2020 requested DC, Tiruppur for removal of obstructions on location no. 75/0. Thereafter, the Petitioner *vide* letter dated 2.7.2020 requested the owner of land (Flourish Dwellers Private Limited) in survey no. 771/1 for allowing the construction activities in loc. no.75/0. However, the land owner vide letter dated 11.7.2020 objected to the proposed installation of the towers and transmission line. After continuous follow up, a meeting was held on 24.7.2020 with the land owner and after understanding the importance of the project the land owner communicated their acceptance on 29.7.2020. Meanwhile, the foundation work commenced on 25.7.2020 (delay: from 11.12.17 to 25.07.20: 957 days) and completed on 28.7.2020 and the tower erection works was completed by 3.8.2020.

44. KSEB has submitted that the Petitioner has claimed time over-run of 6 months for the project citing RoW issues. It has been stated that the work was going in a slow manner. KSEB has prayed to the Commission that the time over-run and cost over-run for such avoidable delays are purely attributable to the Petitioner and the same may be disallowed and that IDC and IEDC corresponding to the delay attributable to the Petitioner may be disallowed in accordance with the applicable regulations.

45. TANGEDCO has submitted that COD of the transmission asset has to be declared matching with COD of Scheme–II i.e. AC System Strengthening at Pugalur end. TANGEDCO has further submitted that execution of transmission lines, RoW issues, Court cases litigation are common and they are not *force majeure* conditions. Hence, the reasons given by the Petitioner are unjustifiable and delay may not be condoned and IDC and IEDC ought to be considered only upto the SCOD and not on the date of actual COD.

46. Similar issues on time over-run have been raised by TSSPDCL, TNSPDCL and BESCOM as were raised by TANGEDCO in its reply. Therefore, the issues as raised by TSSPDCL and TNSPDCL are not being repeated here once again for brevity.

47. In response, the Petitioner has submitted that TANGEDCO, TSSPDCL, TNSPDCL and BESCOM 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, To the contrary, Regulation 22(2) of the 2019 Tariff Regulations 2019 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."*

48. The Petitioner has further submitted that as per IA, the SCOD of the transmission asset was 16.2.2020 while the transmission asset was put under commercial operation with effect from 6.9.2020 with a time over-run of 6 months and 18 days. The time over-run was mainly due to RoW issues, law and order problems during construction of transmission lines, litigations, COVID pandemic etc. The details of time over-run and documentary evidences have already been placed on record for the perusal of the Commission. Further, the details of execution of other assets under the Transmission Scheme 1, Scheme 2 and Scheme 3 have already been submitted alongwith the relevant minutes of meeting with SR constituents and CEA vide affidavit dated 11.8.2021. Accordingly, requested to condone the time over-run in completion of the transmission asset on merit as the same is beyond the control of the Petitioner as provided in Regulation 22(2)(c) of the 2019 Tariff Regulations "uncontrollable factors" and approve the tariff as claimed.

49. The Commission *vide* TV letter dated 7.9.2021 directed the Petitioner to submit detailed justification for time over-run with respect to the transmission asset and submit Form-12. In response, the Petitioner vide affidavit dated 8.9.2021 has submitted that the time over-run in execution is mainly because of various factors viz. RoW issues/ Court cases and hindrance due to lock down during COVID pandemic. After managing intense RoW problems, Court cases throughout the stretch of transmission line and other construction challenges in Southern Region, the Petitioner has finally squeezed the prolonged delay and put the transmission asset into commercial operation. The Petitioner has submitted the CPM and PERT chart indicating scheduled date vs. actual completion date.

50. We have considered the submissions made by the Petitioner, KSEB, TANGEDCO, TSSPDCL, TNSPDCL and BESCOM. We have also gone through the documentary evidence placed on record by the Petitioner regarding time over-run. The transmission asset is scheduled to be put under commercial operation within 30 months from the date of I.A. dated 16.8.2017. Accordingly, SCOD was 16.2.2020. However, the transmission asset was put into commercial operation on 6.9.2020. Therefore, there is a time over-run of 203 days in execution of the transmission asset.

51. The Petitioner has attributed that the time over-run mainly to RoW vis-à-vis law and order problem during construction of transmission lines, litigations, COVID-19 pandemic etc. The Petitioner has submitted the 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 discussed herein below:

RoW issues and Court Cases:

a) 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 11.12.2017 to 25.7.2020 of about 957 days 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)-Pugalur (Existing) and 400 kV D/C Pugalur (HVDC)-Arasur transmission lines. This delay of 957 days was caused by RoW issues and thus was beyond the control of the Petitioner. Moreover, RoW issue was resolved on 25.7.2020 which is about 160 days beyond SCOD. Immediately after RoW issues was resolved on 25.7.2020, the Petitioner completed the remaining activities and the line was declared under commercial operation on 6.9.2020. This additional time of 957 days due to RoW issues had a cascading effect on the execution of line. However, the Petitioner compressed the execution time due to which the overall time over-run has been reduced to 203 days. We are convinced that the time over-run of 203 days is due to hindrance caused by RoW issues and it is beyond the control of the Petitioner and accordingly is condoned.

b) The other issue of delay due to COVID-19 pandemic etc. is either partially or fully subsumed in the delay due to RoW vis-a-vis law and order and court case related issues, therefore the same is not being deliberated.

c) Accordingly, the decision with regard to time over-run in respect of the transmission asset is as follows:

SCOD	COD	Time over-run	Time over-run condoned	Time over-run not condoned
16.2.2020	6.9.2020	203 days	203 days	-

Interest During Construction ("IDC")

52. The Petitioner vide affidavit dated 14.12.2021 has claimed following IDC in respect of the transmission asset covered in the instant petition and has submitted the statement showing IDC claim, discharge of IDC liability as on COD and thereafter:

(₹ in lakh)

IDC as per Auditor's Certificate dated 18.11.2021	IDC Discharged upto COD	IDC discharged during 2020-21	IDC discharged during 2021-22
2473.61	2218.48	229.73	25.41

53. We have considered the submissions of the Petitioner. As discussed above in this order, time over-run with respect to the transmission asset 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 of the transmission asset. 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)

IDC as per Auditor's Certificate dated 18.11.2021	IDC disallowed due to computational error	IDC allowed on accrual basis	Undischarged IDC liability as on COD	IDC allowed on cash basis as on COD	Discharge of IDC liability allowed as ACE	
					2020-21	2021-22
2473.61	89.98	2383.63	250.74	2132.89	229.73	21.01

Incidental Expenditure During Construction ("IEDC")

54. The Petitioner has claimed IEDC in respect of the transmission asset *vide* affidavit dated 14.12.2021 as per the Auditor's Certificate. The Petitioner has further submitted that the entire amount of IEDC with respect to the transmission asset has been discharged up to COD. As the time over-run in respect of the transmission asset

has been completely condoned, there is no disallowance of IEDC on this account. Accordingly, the details of IEDC claimed as per Auditor's Certificate and IEDC allowed is as follows:

(₹ in lakh)

IEDC as per Auditor's Certificate dated 18.11.2021 (A)	IEDC disallowed (B)	IEDC allowed (A-B)
2141.27	0.00	2141.27

Initial Spares

55. 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%"

56. Initial Spares as claimed by the Petitioner vide affidavit dated 14.12.2021 is as follows:

(₹ in lakh)

Particulars	Plant and machinery cost	Initial Spares claimed	Initial Spares Claimed (in %)	Ceiling limit as mentioned as per Regulation (in %)
	A	B		C
Transmission line	42511.11	166.39	0.40	1.00
Sub-station (Greenfield)	10136.28	100.89	0.98	4.00

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

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
Transmission line	42511.11	166.39	1.00%	472.72	NIL	166.39
Sub-station (Greenfield)	10136.28	100.89	4.00%	418.14	NIL	100.89

58. The details of capital cost approved as on COD in respect of the transmission asset is as follows:

(₹ in lakh)

Capital Cost claimed as on COD as per Auditor's Certificate dated 18.11.2021 (A)	Less: IDC disallowed due to computational error (B)	Less: Undischarged IDC (C)	Capital Cost allowed as on COD on cash basis (D)=(A-B-C)
51077.29	89.98	250.74	50736.57

Additional Capital Expenditure ("ACE")

59. 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 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:
(g) 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;
(h) Change in law or compliance of any existing law;
(i) Deferred works relating to ash pond or ash handling system in the original scope of work;
(j) Liability for works executed prior to the cut-off date;
(k) Force Majeure events;
(l) Liability for works admitted by the Commission after the cut-off date to the extent of discharge of such liabilities by actual payments; and
(m) 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."

60. The Petitioner vide affidavit dated 14.12.2021 has claimed the following ACE in respect of the transmission asset 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)

ACE claimed (details as per Form-1A)			
2020-21	**2021-22**	**2022-23**	**2023-24**
3449.23	3279.10	0.00	0.00

61. The Petitioner *vide* affidavit dated 14.12.2021 has submitted the contractor wise details of ACE (Liabilities Flow Statement) claimed including details of balance and retention payments as under. Further, the Petitioner has confirmed that as on date no ACE is anticipated beyond 2023-24.

(₹ in lakh)

Party	**Package**	**Discharged**		**Additional liability recognised**	
		2020-21	**2021-22**	**2020-21**	**2021-22**
KEC	Transmission Line	506.81	641.00	142.41	0.00
KSA	Sub-station	513.89	0.00	0.00	9.13
Compensation	Transmission Line	0.00	0.00	1921.15	2101.50
JV of ABB & BHEL	Sub-station, PLCC and IT	135.23	473.40	0.00	0.00
JV of ABB & BHEL	PLCC	0.00	17.53	0.00	0.00
JV of ABB & BHEL	IT	0.00	11.14	0.00	0.00
Total		**1155.93**	**1143.07**	**2063.56**	**2110.63**

62. We have considered the submissions made by the Petitioner. ACE claimed by the Petitioner is allowed under Regulations 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 tariff period is as follows:

(₹ in lakh)

Particulars	**2020-21**	**2021-22**
ACE claimed as per Auditor's Certificate	3219.49	3253.70
Add: IDC Discharged	229.73	21.01
Total ACE allowed	**3449.22**	**3274.71**

Capital Cost allowed as on 31.3.2024

63. Capital cost as on 31.2.2024 in respect of the transmission asset subject to true-up is as follows:

(₹ in lakh)

Capital Cost allowed as on COD	ACE				Total Capital Cost as on 31.3.2024
	2020-21	2021-22	2022-23	2023-24	
50736.57	3449.22	3274.71	0.00	0.00	57460.50

Debt-Equity ratio

64. 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."

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

Funding	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	35515.60	70.00	4706.75	70.00	40222.35	70.00
Equity	15220.97	30.00	2017.18	30.00	17238.15	30.00
Total	**50736.57**	**100.00**	**6723.93**	**100.00**	**57460.50**	**100.00**

Depreciation

66. 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."

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

(₹ in lakh)

	Particulars	2020-21 (Pro-rata 207 days)	2021-22	2022-23	2023-24
	Depreciation				
A	Opening Gross Block	50736.57	54185.78	57460.50	57460.50
B	ACE	3449.22	3274.71	0.00	0.00
C	Closing Gross Block (A+B)	54185.78	57460.50	57460.50	57460.50
D	Average Gross Block (A+C)/2	52461.17	55823.14	57460.50	57460.50
E	Weighted average rate of Depreciation (WAROD) (in %)	5.30	5.30	5.30	5.30
F	Balance useful life of the asset (Year)	33	33	32	31
G	Lapsed life at the beginning of the year (Year)	0	0	1	2
H	Aggregate Depreciable Value	47221.89	50248.23	51722.41	51722.41
I	**Combined Depreciation during the year**	**1575.92**	**2956.96**	**3044.05**	**3044.05**
J	Aggregate Cumulative Depreciation	1575.92	4532.88	7576.93	10620.97
K	Remaining Aggregate Depreciable Value (H-J)	45645.97	45715.35	44145.48	41101.44

Interest on Loan ("IoL")

68. 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."*

69. 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, subject to true-up is as follows:

(₹ in lakh)

	Particulars	2020-21 (Pro-rata 207 days)	2021-22	2022-23	2023-24
	Interest on Loan				
A	Gross Normative Loan	35515.60	37930.05	40222.35	40222.35
B	Cumulative Repayments upto Previous Year	0.00	1575.92	4532.88	7576.93
C	Net Loan-Opening (A-B)	35515.60	36354.13	35689.47	32645.42
D	Additions	2414.45	2292.30	0.00	0.00
E	Repayment during the year	1575.92	2956.96	3044.05	3044.05
F	Net Loan-Closing (C+D-E)	36354.13	35689.47	32645.42	29601.37
G	Average Loan (C+F)/2	35934.86	36021.80	34167.45	31123.40
H	Weighted Average Rate of Interest on Loan (in %)	2.7726	2.8564	2.9727	3.0896
I	**Interest on Loan (G*H)**	**565.04**	**1028.92**	**1015.70**	**961.58**

Return on Equity ("RoE")

70. 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:

Rate of pre-tax return on equity = 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:

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."*

71. 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 allowed in respect of the transmission asset is as follows:

(₹ in lakh)

	Particulars	**2020-21 (Pro-rata 207 days)**	**2021-22**	**2022-23**	**2023-24**
	Return on Equity				
A	Opening Equity	15220.97	16255.74	17238.15	17238.15
B	Additions	1034.77	982.41	0.00	0.00
C	Closing Equity (A+B)	16255.74	17238.15	17238.15	17238.15
D	Average Equity (A+C)/2	15738.35	16746.94	17238.15	17238.15
E	Return on Equity (Base Rate) (in %)	15.500	15.500	15.500	15.500
F	MAT Rate for respective year (in %)	17.472	17.472	17.472	17.472
G	Rate of Return on Equity (in %)	18.782	18.782	18.782	18.782
H	**Return on Equity (D*G)**	**1676.40**	**3145.41**	**3237.67**	**3237.67**

Operation & Maintenance Expenses ("O&M Expenses")

72. The Petitioner *vide* affidavit dated 14.12.2021 has claimed the following O&M Expenses in respect of the transmission asset for 2020-24 period:

(₹ in lakh)

Particulars	2020-21 (Pro-rata 207 days)	2021-22	2022-23	2023-24
Transmission Lines 400 kV D/C Pugalur HVDC-Pugalur (Existing) Transmission Line (49.930 km) 400 kV D/C Pugalur-Arasur Transmission Line (59.006 km)				
Double Circuit (Bundled conductor with four or more sub-conductors) (km)	108.936	108.936	108.936	108.936
Norms (₹ lakh/km)	1.368	1.416	1.466	1.517
O&M Expenses claimed (transmission line)	**84.52**	**154.25**	**159.70**	**165.25**
Bays: **400 kV GIS** i. Pugalur HVDC: Bays at Pugalur HVDC Terminal for Pugalur-Pugalur D/C Transmission Line (2 numbers) ii. Pugalur HVDC: Bays at Pugalur HVDC Terminal for Pugalur-Arasur D/C Transmission Line at HVDC Terminal (2 numbers) **400 kV** i. Pugalur: Bays at Pugalur Existing for Pugalur-Pugalur D/C Transmission Line (2 numbers) ii. Arasur/Coimbatore: Bays at Arasur for Pugalur-Arasur D/C Transmission Line (2 numbers)				
400 kV GIS (Numbers)	4	4	4	4
Norms (₹ lakh/bay)	23.296	24.115	24.962	25.837
O&M Expenses claimed (400 kV GIS bays)	**52.84**	**96.48**	**99.84**	**103.36**
400 kV (numbers)	4	4	4	4
Norms (₹ lakh/bay)	33.28	34.45	35.66	36.91
O&M Expenses claimed (400 kV bays)	**75.50**	**137.80**	**142.64**	**147.64**
Total O&M Expenses	**212.86**	**388.53**	**402.18**	**416.25**

73. 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	2,252	2,331	2,413	2,498	2,586
±500 kV Talcher- Kolar HVDC bipole scheme (Rs Lakh) (2000	2,468	2,555	2,645	2,738	2,834
±500 kV Bhiwadi-Balia HVDC bipole scheme (Rs Lakh) (2500	1,696	1,756	1,817	1,881	1,947
±800 kV, Bishwanath-Agra HVDC bipole scheme (Rs Lakh) (3000 MW)	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."*

74. We have considered the submission of the Petitioner. O&M Expenses allowed for the transmission asset for the period 2020-24 are as follows:

(₹ in lakh)

Particulars	2020-21 (Pro-rata 207 days)	2021-22	2022-23	2023-24
Transmission Lines 400 kV D/C Pugalur HVDC-Pugalur (Existing) Transmission Line (49.930 km) 400 kV D/C Pugalur-Arasur Transmission Line (59.006 km)				
Double Circuit (Bundled conductor with four or more sub-conductors) (km)	108.936	108.936	108.936	108.936
Norms (₹ lakh/km)	1.368	1.416	1.466	1.517
O&M Expenses claimed (Transmission Line)	**84.52**	**154.25**	**159.70**	**165.25**
Bays: **400 kV GIS** i. Pugalur HVDC: Bays at Pugalur HVDC Terminal for Pugalur-Pugalur D/C Transmission Line (2 numbers) ii. Pugalur HVDC: Bays at Pugalur HVDC Terminal for Pugalur-Arasur D/C Transmission Line at HVDC Terminal (2 numbers) **400 kV** i. Pugalur:Bays at Pugalur Existing for Pugalur-Pugalur D/C Transmission Line (2 numbers) ii. Arasur/Coimbatore:Bays at Arasur for Pugalur-Arasur D/C Transmission Line (2 numbers)				
400 kV GIS (numbers)	4	4	4	4
Norms (₹ lakh/bay)	23.296	24.115	24.962	25.837
O&M Expenses claimed (400 kV GIS bays)	**52.84**	**96.48**	**99.84**	**103.36**
400 kV (numbers)	4	4	4	4
Norms (₹ lakh/bay)	33.28	34.45	35.66	36.91
O&M Expenses claimed (400 kV bays)	**75.50**	**137.80**	**142.64**	**147.64**
Total O&M Expenses	**212.86**	**388.53**	**402.18**	**416.25**

Interest on Working Capital ("IWC")

75. 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;"*

76. 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%.

77. The 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:

(₹ in lakh)

	Particulars	**2020-21 (Pro-rata 207 days)**	**2021-22**	**2022-23**	**2023-24**
	Interest on Working Capital				
A	Working Capital for O&M Expenses (O&M Expenses for one month)	31.28	32.38	33.52	34.69

B	Working Capital for Maintenance Spares (15% of O&M Expenses)	56.30	58.28	60.33	62.44
C	Working Capital for Receivables (Equivalent to 45 days of annual fixed cost/ annual transmission charges)	889.69	940.45	962.95	955.33
D	**Total Working Capital (A+B+C)**	**977.26**	**1031.10**	**1056.79**	**1052.46**
E	Rate of Interest (in %)	11.25	10.50	10.50	10.50
F	**Interest on working capital (D*E)**	**62.35**	**108.27**	**110.96**	**110.51**

Annual Fixed Charges for 2019-24 Tariff Period

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

(₹ in lakh)

	Particulars	2020-21 (Pro-rata 207 days)	2021-22	2022-23	2023-24
	Annual Transmission Charges				
A	Depreciation	1575.92	2956.96	3044.05	3044.05
B	Interest on Loan	565.04	1028.92	1015.70	961.58
C	Return on Equity	1676.40	3145.41	3237.67	3237.67
D	O&M Expenses	212.86	388.51	402.19	416.24
E	Interest on Working Capital	62.35	108.27	110.96	110.51
F	**Total (A+B+C+D+E)**	**4092.57**	**7628.07**	**7810.57**	**7770.05**

Filing Fee and the Publication Expenses

79. 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

80. The Petitioner shall be entitled for reimbursement of licence fee in accordance with Regulation 70(4) of the 2019 Tariff Regulations for the 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

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

82. 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 2019 Tariff Regulations, which allows the recovery only at the time of truing up.

83. 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.

84. We have considered the submissions of 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 the 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. Therefore, 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

85. 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.

86. 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

87. 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

88. KSEB has submitted that considering the importance of the transmission asset 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.

89. BESCOM 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.

90. TANGEDCO, TSSPDCL and TSNPDCL have 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.

91. In response to KSEB, TANGEDCO, TSSPDCL, TSNPDCL and BESCOM, the Petitioner has submitted that as on date, the entire capital cost of the transmission asset has been incurred by the Petitioner and tariff must be determined based on full capital cost incurred. In case, Ministry of Power allocates any amount from PSDF or NCEF, as

and 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.

92. We have considered the submissions of the Petitioner, KSEB, TANGEDCO, TSSPDCL, TSNPDCL and BESCOM. 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 scheme 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 Ministry of Power 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 Ministry of Power, Government of India may approve funds from PSDF and provide Government grants, considering the benefits that would accrue to the power sector and the economy of the country.

Sharing of Transmission Charges

93. The Petitioner has submitted that the Annual Fixed Cost (AFC) for 2019-24 will 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 transmission customers in accordance with 2010 and 2020 Sharing Regulations as amended from time to time.

94. KSEB, TANGEDCO, TSSPDCL, TSNPDCL and BESCOM have submitted that the sharing of the subject HVDC project should be in line with sharing methodology followed for other HVDC schemes (substantial portion under National Component (NC)-

HVDC as per the 2020 Sharing Regulations). The major portion of the submissions made by the Respondents pertain 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.

95. In response, the Petitioner has submitted that the entire capital cost of the transmission asset has been incurred by the Petitioner and the tariff must be determined based on full capital cost incurred. If Ministry of Power allocates any amount from the PSDF/ NCEF, the same can be considered and decided by the Commission. The Petitioner has submitted that the Commission may take an appropriate decision on the sharing of the transmission charges of the instant 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.

96. 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.

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

sharing of transmission charges specific to HVDC portion shall be dealt by the Commission in relevant petitions filed by the Petitioner.

98. The transmission asset 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 transmission lines and associated bays. The Petitioner has submitted that it discussed part execution of Raigarh-Pugalur HVDC transmission system alongwith AC transmission lines. The extract of 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 – Thiruvalam 400 kV (quad) D/c line with 2x80 MVAR line reactor at Pugalur HVDC Station end and 2x63 MVAR line reactors at Thiruvalam 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 Raighar – 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 any 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 Rarigarh (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 Raighar – Pugalur HVDC transmission system. The matter regarding considering Raighar-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 outrage 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 outrage.*

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 Thiruvalam S/s which shall be commissioned along with 400kV Pugalur (HVDC) – Thiruvalam 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 SRSCT 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."*

99. As per the above approval, the Petitioner has put into commercial operation the AC System Strengthening at Pugalur end.

100. With effect from 1.7.2011, sharing of transmission charges for inter-State transmission systems was governed by the provisions of the Central Electricity Regulatory Commission (Sharing of Transmission Charges and Losses) Regulations, 2010 (2010 Sharing Regulations) and 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 (2020 Sharing Regulations"). The COD of the 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 400 kV Pugalur (HVDC Station)-Arasur (Quad) D/C Transmission Line along with associated bays at Pugalur (HVDC Station) & Arasur station is approved as 6.9.2020. Therefore, the transmission charges from 6.9.2020 to 31.10.2020 shall be governed by the 2010 Sharing Regulations and from 1.11.2020 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.

101. To summarise, AFC allowed in respect of the transmission asset for 2019-24 tariff period in the instant order is as follows:

(₹ in lakh)

Particulars	2020-21 (pro-rata 207 days)	2021-22	2022-23	2023-24
AFC	4092.57	7628.07	7810.57	7770.05

102. The Annexure to this order forms part of the order.

103. This order disposes of Petition No. 693/TT/2020 in terms of the above findings and discussions.

sd/-	**sd/-**	**sd/-**
(P. K. Singh)	**(Arun Goyal)**	**(I. S. Jha)**
Member	**Member**	**Member**

ANNEXURE

2019-24	Admitted Capital Cost as on 1.4.2019 (₹ 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)			
Capital Expenditure		**2020-21**	**2021-22**	**2022-23**	**Total**			**2020-21**	**2021-22**	**2022-23**	**2023-24**
Transmission Line	40406.42	2753.32	2759.24	0.00	5512.57	45918.99	5.28%	2206.15	2351.68	2424.52	2432.62
Sub Station	10052.52	694.64	486.68	0.00	1181.32	11233.84	5.28%	549.11	580.30	593.15	595.13
PLCC	209.48	0.95	17.62	0.00	18.57	228.05	6.33%	13.29	13.88	14.44	12.08
IT Equipment (Incl. Software)	68.14	0.31	11.17	0.00	11.48	79.62	15.00%	10.24	11.11	11.94	11.94
Total	**50736.57**	**3449.22**	**3274.71**	**0.00**	**6723.93**	**57460.50**		**2778.79**	**2956.96**	**3044.05**	**3044.05**
						Average Gross Block (₹ in lakh)		**52461.17**	**55823.14**	**57460.50**	**57460.50**
						Weighted Average Rate of Depreciation (in %)		**5.30%**	**5.30%**	**5.30%**	**5.30%**