

# CENTRAL ELECTRICITY REGULATORY COMMISSION

NEW DELHI

Petition No. 242/TT/2021

**Coram:**

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

**Date of Order: 16.02.2023**

**In the matter of:**

Approval under Regulation 86 of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999 and determination of Transmission Tariff for the 2019-24 tariff period under the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2019 in respect of Asset:  $\pm 800$  kV 1500 MW (Pole-IV) HVDC terminals each at Raigarh (HVDC Station) & Pugalur (HVDC Station) under "HVDC Bipole link between Western Region (Raigarh, Chattisgarh) and Southern Region (Pugalur, Tamil Nadu) – North Trichur (Kerala)-Scheme-1: Raigarh-Pugalur 6000 MW HVDC System" 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,  
NPKRR Maaligai, 800, Anna Salai,  
Chennai-600002.
2. Transmission Corporation of Andhra Pradesh Limited,  
Vidyut Soudha, Near Axis Bank, Eluru Road,  
Gunadala, Vijaywada-520004.
3. Kerala State Electricity Board,  
Vaidyuthi Bhavanam  
Pattom, Thiruvananthapuram-695004.
4. Tamil Nadu Electricity Board,  
NPKRR Maaligai, 800, Anna Salai,  
Chennai-600002



5. Electricity Department,  
Government of Goa,  
Vidyuti Bhawan, Panaji,  
Goa-403001.
6. Electricity Department,  
Government of Pondicherry,  
Pondicherry-605001.
7. Eastern Power Distribution Company of Andhra Pradesh Limited,  
P&T Colony, Seethmmadhara, Vishakhapatnam,  
Andhra Pradesh.
8. 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.
9. Southern Power Distribution Company of Telangana Limited,  
6-1-50, Corporate Office, Mint Compound,  
HYDERABAD – 500 063, Telangana.
10. 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.
11. Bangalore Electricity Supply Company Limited,  
Corporate Office, K.R. Circle,  
Bangalore-560001.
12. Gulbarga Electricity Supply Company Limited,  
Station Main Road, Gulbarga,  
Karnataka.
13. Hubli Electricity Supply Company Limited,  
Navanagar, PB Road,  
Hubli, Karnataka.
14. MESCOM Corporate Office,  
Paradigm Plaza, AB Shetty Circle,  
Mangalore-575001 (Karnataka).
15. Chamundeswari Electricity Supply Corporation Limited,  
927, LJ Avenue, Ground Floor, New Kantharaj URS Road  
Saraswatipuram, Mysore-570009 (Karnataka).
16. Transmission Corporation of Telangana Limited,  
Vidhyut Sudha, Khairatabad,



Hyderabad-500082

17. Karnataka Power Transmission Corporation Limited,  
Kaveri Bhawan, Bangalore-560009
18. Tamil Nadu Transmission Corporation,  
NPKRR Maaligai, 800, Anna Salai,  
Chennai-600002
19. Madhya Pradesh Power Management Company Limited,  
Shakti Bhawan, Rampur  
Jabalpur - 482 008
20. Maharashtra State Electricity Distribution Company Limited,  
Prakashgad, 4th Floor  
Andheri (East), Mumbai - 400 052
21. Gujarat Urja Vikas Nigam Limited,  
Sardar Patel Vidyut Bhawan,  
Race Course Road, Vadodara - 390 007
22. Union territory of Dadra & Nagar Haveli and Daman & Diu,  
Secretariat, Fort Area, Moti Daman-396220
23. Chhattisgarh State Electricity Board  
P.O. Sunder Nagar, Dangania, Raipur  
Chhatisgaarh-492013.
24. Madhya Pradesh Audyogik Kendra Vikas Nigam (Indore) Limited,  
3/54, Press Complex, Agra-Bombay Road,  
Indore-452 008.

...Respondent(s)

**For Petitioner:** Ms. Swapna Seshadri, Advocate, PGCIL  
Shri Aditya H. Dubey, Advocate, PGCIL  
Shri S.S. Raju, PGCIL  
Shri D.K Biswal, PGCIL  
Shri V.P. Rastogi, PGCIL  
Ms. Anshul Garg, 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. Kathivaran, TANGEDCO  
Shri R. Ramalakshmi, TANGEDCO  
Shri R. Srinivasan, TANGEDCO  
Shri Anindya Khare, MPPMCL



## ORDER

The instant petition has been filed by Power Grid Corporation of India Limited, a deemed transmission licensee, for determination of transmission tariff under the 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 Asset: ±800 kV 1500 MW (Pole-IV) HVDC terminals each at Raigarh (HVDC Station) & Pugalur (HVDC Station) (hereinafter referred to as “the transmission asset”) under “HVDC Bipole link between Western Region (Raigarh, Chattisgarh) and Southern Region (Pugalur, Tamil Nadu)-North Trichur (Kerala)-Scheme 1: Raigarh-Pugalur 6000 MW HVDC System” (hereinafter referred to as the “transmission scheme”) in the Southern Regional Grid.

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 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.*

*4) 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.*

*5) 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.*

*6) 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.*



7) *Prayed to Condone the time overrun in completion of subject assets on merit of the same being out of the control of Petitioner in line with CERC Regulations'2019 22(2) (c) "uncontrollable factors" and approve the tariff as claimed.*

8) *Allow the petitioner to claim the overall security expenses and consequential IOWC on that security expenses separately.*

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) Southern Region was facing a huge power deficit 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 MW 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 was about 39,000 MW around 2013-15. As per 18<sup>th</sup> EPS of CEA, the expected power demand of Southern Region by the end of XII<sup>th</sup> and XIII<sup>th</sup> plan would be about 57,200 MW and 82,200 MW, respectively. Hence, power transfer requirement to Southern Region was expected to increase in coming years. Therefore, to facilitate the import of power into Southern Region and considering the long distance, it was proposed that power be transferred over HVDC System along with the associated AC Transmission System at 400 kV level.



(b) Accordingly,  $\pm 800$  kV 6000 MW HVDC link with terminals at Raigarh & Pugalur along with VSC based 2000 MW HVDC link between Pugalur and North Trichur (Kerala) was discussed in the 37<sup>th</sup> Standing Committee on Power System Planning of Southern Region (SCPSPSR) held on 31.7.2014. The transmission scheme was again discussed and agreed to in the Joint Standing Committee meeting of SR & WR constituents held on 20.4.2015, wherein it was decided that the transmission scheme “ $\pm 800$  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 be implemented as three separate transmission 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 had been decided that the transmission schemes may be implemented as separate transmission schemes, however, it is important that the Scheme-2 and Scheme-3 should be in place before commissioning of 6000 MW Raigarh-Pugalur link. Further, the Raigarh-Pugalur-Trichur HVDC transmission scheme was discussed in the 39<sup>th</sup> meeting of Standing Committee on Power System Planning for Southern Region (SCPSPSR) 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 been decided in the 39<sup>th</sup> SCPSPSR meeting that in case of any mis-match in the execution of these schemes, their usefulness will be discussed with CEA before their execution.

(d) Further, the execution of Scheme-2 (AC System Strengthening at Pugalur-end) and Scheme-3 (Pugalur-Trichur 2000 MW VSC Based HVDC link) was delayed due to severe Right of Way (RoW) issues in Tamil Nadu and Kerala States. Accordingly, a meeting was convened by CEA/Constituents on 21.8.2020 to discuss the issue of part commissioning of Raigarh-Pugalur-Trichur HVDC Transmission System. After discussion it was agreed that the Scheme-1 (Phase I:  $\pm 800$  kV, 1500 MW HVDC terminal at Raigarh and Pugalur of Bipole-I) along



with  $\pm 800$  kV, 6000 MW Raigarh-Pugalur HVDC Transmission link will be commissioned along with Scheme-2 (400 kV D/C Pugalur (HVDC)-Pugalur (existing) Transmission Line and 400 kV D/C Pugalur (HVDC)-Arasur Transmission Line). Therefore, the Petitioner put the asset:  $\pm 800$  kV 6000 MW Raigarh (HVDC Station)-Pugalur (HVDC Station) HVDC Link along with  $\pm 800$  kV 1500 MW (Pole-I) HVDC terminals each at Raigarh (HVDC Station) & Pugalur (HVDC Station) being part of Scheme-1 and 400 kV D/C Pugalur (HVDC)-Pugalur (existing) Transmission Line and 400 kV D/C Pugalur (HVDC)-Arasur Transmission Line being part of Scheme-2 together under commercial operation w.e.f. 6.9.2020.

(e) Further, a meeting was convened by CEA/Constituents on 30.12.2020 to discuss the issue of part commissioning of Raigarh-Pugalur-Trichur HVDC Transmission System. After discussion it was agreed that the Scheme-1 (Phase II:  $\pm 800$  kV, 1500 MW HVDC terminal at Raigarh and Pugalur of Bipole-I) will be commissioned along with part of Scheme-3 ( $\pm 320$  kV 2000 MW Pugalur (HVDC Station) – North Trichur (HVDC Station) HVDC Link along with Pugalur- Trichur 1000 MW VSC Based HVDC System after commissioning of 400 kV D/C North-Trichur-Kochi line and 220 kV lines from North Trichur Sub-station). Therefore, the Petitioner put the asset:  $\pm 800$  kV 1500 MW (Pole-II) HVDC terminals each at Raigarh (HVDC Station) & Pugalur (HVDC Station) being part of Scheme-1 and  $\pm 320$  kV 2000 MW Pugalur (HVDC Station)-North Trichur (HVDC Station) HVDC Link along with  $\pm 320$  kV 1000 MW (Mono Pole-II) HVDC terminals each at Pugalur (HVDC Station) & North Trichur (HVDC Station, Kerala) and 400 kV D/C North Trichur-Kochi line and 220 kV lines of KSEBL from North Trichur Sub-station being part of Scheme-3 together under commercial operation w.e.f. 9.3.2021.

(f) In another meeting convened by CEA/Constituents on 5.7.2021, the issue of commissioning of remaining part of Raigarh-Pugalur-Trichur HVDC Transmission System was discussed. After discussion it was agreed that as the trial operation of Mono Pole-I (1000 MW) of Pugalur-North Trichur VSC based HVDC System was already completed, therefore, the same may be commissioned. Therefore, the Petitioner put the asset:  $\pm 320$  kV 1000 MW (Mono



Pole-I) HVDC terminals each at Pugalur (HVDC Station) & North Trichur (HVDC Station, Kerala) being part of Scheme-3 together under commercial operation w.e.f. 8.6.2021.

(g) It was agreed during above meeting dated 5.7.2021 of CEA/Constituents that the part Scheme-1 (Phase I:  $\pm 800$  kV, 1500 MW HVDC terminal at Raigarh and Pugalur of Bipole-II) will be commissioned alongwith part of Scheme-2 (400 kV D/C Pugalur (HVDC) - Edarpalayam Transmission line and 400 kV D/C Edarpalayam - Udumalpet Transmission line). Therefore, the Petitioner put the asset:  $\pm 800$  kV 1500 MW (Pole-III) HVDC terminals each at Raigarh (HVDC Station) & Pugalur (HVDC Station) being part of Scheme-1 and 400 kV D/C Pugalur (HVDC)-Edarpalayam Transmission Line and 400 kV D/C Edarpalayam-Udumalpet Transmission Line being part of Scheme-2 together under commercial operation w.e.f. 13.7.2021.

(h) It was also agreed during above meeting dated 5.7.2021 that part Scheme-1 (Phase II:  $\pm 800$  kV, 1500 MW HVDC terminal at Raigarh and Pugalur of Bipole-II) will be commissioned alongwith part of Scheme-2 (400 kV D/C Pugalur (HVDC) – Thiruvalem Transmission line). Therefore, the Petitioner put the asset:  $\pm 800$  kV 1500 MW (Pole-IV) HVDC terminals each at Raigarh (HVDC Station) & Pugalur (HVDC Station) being part of Scheme-1 and 400 kV D/C Pugalur (HVDC)-Thiruvalem Transmission Line being part of Scheme-2 together under commercial operation w.e.f. 25.10.2021.

(i) The minutes of CEA/Constituents meeting held on 21.8.2020, 31.12.2020 and 5.7.2021 is placed on record *vide* affidavit dated 6.12.2021 submitted by the Petitioner in the matter.

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

Sl. No.	Dated	Particulars
1	4.1.2013	35 <sup>th</sup> meeting of Standing Committee on Power System Planning in Southern Region





Sl. No.	Dated	Particulars
2	29.8.2013	36 <sup>th</sup> meeting of Standing Committee on Power System Planning in Western Region
3	4.9.2013	36 <sup>th</sup> meeting of Standing Committee on Power System Planning in Southern Region
4	9.10.2013	24 <sup>th</sup> meeting of Western Regional power committee
5	26.10.2013	23 <sup>rd</sup> Meeting of Southern Regional Power Committee
6	15.3.2014	24 <sup>th</sup> Meeting of Southern Regional Power Committee
7	31.7.2014	37 <sup>th</sup> meeting of Standing Committee on Power System Planning in Southern Region
8	26.7.2014	25 <sup>th</sup> Meeting of Southern Regional Power Committee
9	5.9.2014	37 <sup>th</sup> meeting of Standing Committee on Power System Planning in Western Region
10	30.9.2014	33 <sup>rd</sup> meeting of Empowered committee on Transmission
11	20.12.2014	26 <sup>th</sup> Meeting of Southern Regional Power Committee
12	7.3.2015	38 <sup>th</sup> meeting of Standing Committee on Power System Planning in Southern Region
13	13.4.2015	34 <sup>th</sup> meeting of Empowered committee on Transmission
14	20.4.2015	Joint Meeting of Standing Committee on Power System Planning in Southern Region and Western Region
15	12.5.2015	27 <sup>th</sup> 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 EA, 2003

(k) The scope of transmission scheme is as follows:

**a. Scheme-1: Raigarh-Pugalur 6000 MW HVDC System**

1. Establishment of Raigarh HVDC Station  $\pm 800$  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  $\pm 800$  kV with 6000 MW HVDC terminals. The HVDC Station would have GIS for 400 kV part and AIS for HVDC part.
3.  $\pm 800$  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.



**b. Scheme-2: AC System Strengthening at Pugalur-end**

**Transmission Line**

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

**Sub-station**

1. Extension of 400 kV Pugalur (existing) Sub-station:
  - 400 kV Line bays – 2 numbers
2. Extension of 400 kV Arasur Sub-station
  - 400 kV Line bays – 2 numbers
3. Extension of 400 kV Thiruvalem Sub-station
  - 400 kV Line bays – 2 numbers
  - 63 MVAR Line Reactors – 2 numbers
  - (Existing 1x63 MVAR Bus Reactor shall be utilized as line reactor in one circuit and the second circuit shall have new 63 MVAR line reactor)*
4. Extension of 400 kV Edayarpalayam (TANTRANSCO) Sub-station (\*)
  - 400 kV Line bays – 4 numbers
5. Extension of 400 kV Udumalpet Sub-station
  - 400 kV Line bays – 2 numbers
6. Extension of 400 kV Pugalur GIS
  - 400 kV Line bays – 8 numbers
  - 80 MVAR Line Reactors – 2 numbers

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



**c. Scheme-3: Pugalur- Trichur 2000 MW VSC Based HVDC System**

1.  $\pm 320$  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.  $\pm 320$  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

(l) The Investment Approval (IA) of the transmission scheme (i.e. Scheme-1 of the transmission scheme) was accorded by the Board of Directors of the Petitioner's Company in its 328<sup>th</sup> meeting held on 5.5.2016 *vide* Memorandum No. C/CP/IA/HVDC RP dated 9.5.2016 with an estimated cost of ₹1473337 lakh including IDC of ₹99528 lakh, based on December, 2015 price level.

(m) As per Investment Approval (IA) dated 5.5.2016, the Scheduled Commercial Operation Date (SCOD) of the transmission assets is 42 months from the date of IA i.e. by 5.11.2019, against which the transmission asset has been declared under commercial operation (COD) on 25.10.2021 with a time over-run of 720 days.

(n) The Petitioner vide affidavit dated 6.12.2021 has submitted the status of transmission asset/transmission scheme covered under various petitions as follows:

Sl. No	Name of Assets	Schedule COD as per IA	Actual COD	Covered under Petition No.
<b>A</b>	<b>Scheme-1: Raigarh-Pugalur 6000 MW HVDC System</b>			
1	$\pm 800$ kV 6000 MW Raigarh (HVDC Station) – Pugalur (HVDC Station) HVDC Link alongwith $\pm 800$ kV 1500 MW (Pole-I) HVDC terminals each at Raigarh (HVDC Station) & Pugalur (HVDC Station)	5.11.2019	6.9.2020	685/TT/2020



Sl. No	Name of Assets	Schedule COD as per IA	Actual COD	Covered under Petition No.
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>(Instant Petition)</b>
<b>B Scheme-2: AC System Strengthening at Pugalur-end</b>				
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
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 Edayarpalyam (TANTRANSCO) – Udumulpet 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	16.2.2020	25.10.2021	
4	4 numbers of 400 kV line bays at Edayarpalayam (TN Sub-station) for terminating Pugalur HVDC Station–Edayarpalayam 400 kV (quad) D/C line and Edayarpalayam–Udumulpet 400 kV (quad) D/C lines.	16.2.2021	<b>Yet to be commissioned*</b>	
<i>*Bay extension works at Edayarpalayam (TANTRANSCO) Sub-station is envisaged to be implemented by TANTRANSCO on behalf of POWERGRID on deposit work basis.</i>				
<b>C Scheme-3: Pugalur- Trichur 2000 MW VSC Based HVDC System</b>				
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



Sl. No	Name of Assets	Schedule COD as per IA	Actual COD	Covered under Petition No.
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	
4	2 X 315 MVA 400/220/33 kV 3 Ph Auto Transformer along with its associated bays & equipment (GIS) at North Trichur HVDC station	9.4.2020	9.3.2021	
5	2 numbers additional 220 kV line bays (GIS) at North Trichur HVDC for implementation of 220 kV feeder of Kerala	9.4.2020	9.3.2021	

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

5. The Petitioner has served the petition on the Respondents and notice regarding filing of this petition has also been published in the newspapers in accordance with Section 64 of the Electricity Act, 2003. No comments/objections have been received from the general public in response to the aforesaid notice published in the newspapers by the Petitioner. Kerala State Electricity Board Limited (KSEB), Respondent No. 3 has filed a reply vide affidavit dated 13.12.2021. KSEB has raised issues such as time over-run, O&M expenses, security expenses, sharing of transmission charges and funding from PSDF/National Clean Energy fund. Tamil Nadu Generation and Distribution Corporation Ltd. (TANGEDCO), Respondent No. 4, has filed a reply vide affidavit dated 2.12.2021 and has raised the issues of time over-run, O&M Expenses, sharing of transmission charges, and funding from PSDF/National Energy Clean Fund. TANGEDCO has also requested the Commission to declare the assets as asset of 'Strategic and National Importance'. Madhya Pradesh Power Management Company



Ltd. (MPPMCL), Respondent No. 19, has filed a reply vide affidavit dated 7.12.2021 and has raised the issues of time over-run, additional capital expenditure (ACE), O&M Expenses, security expenses and GST. The issues raised by KSEBL, TANGEDCO and MPPMCL and clarifications thereto given by the Petitioner have been dealt in the relevant portions of this order.

6. It has been observed that the Respondent(s) have raised some specific issues related to the instant petition such as additional capital expenditure (ACE), time over-run, O&M Expenses, whereas most of the Respondents have raised the issues related to sharing of transmission charges, funding from PSDF/National Energy Clean Fund including request to the Commission to declare the subject HVDC project as project of 'Strategic and National Importance'.

7. We have already deliberated the issues related to sharing of transmission charges, funding from PSDF/National Energy Clean Fund including declaring the subject HVDC project asset of 'Strategic and National Importance' in detail in order dated 29.9.2022 in Petition No. 685/TT/2020 in respect of the subject HVDC project consisting of HVDC line and Pole-I and our views have been crystallised therein. Therefore, we are not inclined to deliberate these issues once again in the instant petition since the transmission asset covered in the instant petition i.e. Pole-IV is an integral part of the subject HVDC project, and the directions contained in the order dated 29.9.2022 regarding PSDF/NCEF funding & strategic transmission system of national importance etc. is equally applicable to transmission asset herein. The relevant portion of the order dated 29.9.2022 is extracted hereunder:

*"117. We have considered the submissions of the Petitioner, KSEB and BESCO. The Commission is aware of the fact that capital investments of the instant transmission scheme/transmission project is huge. The Commission feels that there is a strong*



*necessity to share the burden of capital cost of transmission 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 to arrange for funds from PSDF as well as Government grant, considering the benefits that would accrue to the power sector and the economy of the country.”*

8. However, the specific issues related to the instant petition such as additional capital expenditure (ACE), time over-run, O&M expenses etc. raised by the Respondent(s) and clarifications thereto given by the Petitioner have been dealt in the relevant portions of this order.

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

10. This order is issued considering the submissions made by the Petitioner in the petition vide affidavit dated 26.10.2021 and the Petitioner's affidavits dated 6.12.2021 and 28.2.2022, KSEB's reply filed vide affidavit dated 13.12.2021, TANGEDCO's reply vide affidavit dated 2.12.2021, MPPMCL's reply affidavit dated 7.12.2021, and Petitioner's rejoinders vide affidavits dated 15.3.2022, 14.12.2021, 13.12.2021 and 17.3.2022 respectively.

11. Having heard the learned counsels for the Petitioner and the Respondents TANGEDCO, TSSPDCL & TSNPDCL, KSEBL and MPPMCL and perused the material on record, we proceed to dispose of the petition.

### **DETERMINATION OF ANNUAL FIXED CHARGES FOR THE 2019-24 TARIFF PERIOD**

12. The Petitioner has claimed the following transmission charges for the transmission asset for the 2019-24 tariff period:



(₹ in lakh)

Particulars	2021-22 (Pro-rata 158 days)	2022-23	2023-24
Depreciation	2577.72	6315.45	6563.28
Interest on Loan	1122.05	2641.36	2578.11
Return on Equity	2893.08	7087.44	7365.52
O&M Expenses	593.34	1421.00	1471.00
Interest on Working Capital	109.01	264.33	271.64
<b>Total</b>	<b>7296.20</b>	<b>17729.58</b>	<b>18249.55</b>

13. The Petitioner has claimed the following Interest on Working Capital (IWC) in respect of the transmission asset for the 2019-24 tariff period:

(₹ in lakh)

Particulars	2021-22 (Pro-rata 158 days)	2022-23	2023-24
O&M Expenses	114.42	118.42	122.58
Maintenance Spares	205.95	213.15	220.65
Receivables	2078.03	2185.84	2243.80
Total Working Capital	2398.40	2517.41	2587.03
Rate of Interest (in %)	10.50	10.50	10.50
<b>Interest on Working Capital</b>	<b>109.01</b>	<b>264.33</b>	<b>271.64</b>

#### **Data of Commercial Operation (COD)**

14. The Petitioner has initially submitted in the petition that the transmission asset is anticipated to be put into commercial operation on 30.10.2021. However, the Petitioner vide affidavit dated 6.12.2021 has claimed the actual COD of the transmission asset as 25.10.2021.

15. 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.”*

16. The Petitioner has submitted that it was decided in the Joint Standing Committee meeting of SR and WR constituents held on 20.4.2015, that the transmission 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 transmission schemes as follows:

- iv. Scheme-1: Raigarh-Pugalur 6000 MW HVDC System
- v. Scheme-2: AC System Strengthening at Pugalur-end
- vi. Scheme-3: Pugalur-Trichur 2000 MW VSC Based HVDC System

17. In the above Joint Standing Committee meeting, it had been decided that the transmission schemes may be implemented as separate transmission schemes, however, it is important that the Scheme-2 and Scheme-3 should be in place before commissioning of 6000 MW Raigarh-Pugalur link. Further, the Raigarh-Pugalur-Trichur HVDC transmission system was discussed in the 39<sup>th</sup> meeting of SCPSRSR held on



28-29 December, 2015. In the meeting, it had been 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 had also been decided in the above meeting that in case of any mismatch in the execution of these transmission schemes, their usefulness will be discussed with CEA before their commissioning.

18. However, the execution of Scheme-2 (AC System Strengthening at Pugalur-end) and Scheme-3 (Pugalur-Trichur 2000 MW VSC Based HVDC link) was delayed due to severe RoW issues in Tamil Nadu and Kerala States. Accordingly, a meeting has been convened by CEA/Constituents on 21.8.2020 to discuss the issue of part commissioning of Raigarh-Pugalur-Trichur HVDC Transmission System. Thereafter, two more meetings of CEA/Constituents were held on 31.12.2020 and 5.7.2021 to discuss the commissioning of remaining part of the Raigarh-Pugalur-Trichur HVDC Transmission System. The Petitioner vide affidavit dated 8.11.2021 has submitted copies of the CEA meetings dated 21.8.2020, 31.12.2020 and 5.7.2021 in response to the Commission's technical validation letter dated 21.10.2021 in the matter. Accordingly, as agreed in the above meetings dated 21.8.2020, 31.12.2020 and 5.7.2021, the Petitioner has carried out part commissioning of various transmission assets covered under Scheme-1, Scheme-2 and Scheme-3 of the transmission scheme in the following sequence:

- (a) Part of Scheme-1 consisting of Raigarh-Pugalur HVDC Transmission link along with Pole-I i.e., 1500 MW HVDC terminals each at Raigarh and Pugalur HVDC Sub-stations along with part of Scheme-2 consisting of 400 kV D/C Pugalur (HVDC)-Pugalur (existing) transmission line and 400 kV D/C Pugalur (HVDC)-Arasur transmission line were together put under commercial operation w.e.f. 6.9.2020.



- (b) Part of Scheme-1 consisting of Pole-II, i.e. 1500 MW HVDC terminals each at Raigarh and Pugalur HVDC Sub-stations alongwith part of Scheme-3 consisting of  $\pm 320$  kV 2000 MW Pugalur (HVDC Station)-North Trichur (HVDC Station) HVDC Link along with  $\pm 320$  kV 1000 MW (Mono Pole-II) HVDC terminals each at Pugalur (HVDC Station) & North Trichur (HVDC Station, Kerala) and LILO of 400 kV D/C North Trichur- Kochi line and 220 kV lines of KSEBL from North Trichur Sub-station were together put under commercial operation w.e.f. 9.3.2021.
- (c) Part of Scheme-3 consisting of  $\pm 320$  kV 1000 MW (Mono Pole-I) HVDC terminals each at Pugalur (HVDC Station) and North Trichur (HVDC Station, Kerala) was put under commercial operation w.e.f. 8.6.2021.
- (d) Part of Scheme-1 consisting of Pole-III i.e. 1500 MW HVDC terminals each at Raigarh and Pugalur HVDC Sub-stations alongwith part of Scheme-2 consisting of 400 kV D/C Pugalur (HVDC)-Edarpalayam transmission line and 400 kV D/C Edarpalayam-Udumalpet transmission line were together put under commercial operation w.e.f. 13.7.2021.
- (e) Part of Scheme-1 consisting of Pole-IV i.e. 1500 MW HVDC terminals each at Raigarh and Pugalur HVDC Sub-stations alongwith part of Scheme-2 consisting of 400 kV D/C Pugalur (HVDC)-Thiruvallam transmission line were together put under commercial operation w.e.f. 25.10.2021.

19. The Commission vide order dated 29.9.2022 in Petition No. 685/TT/2020 has already approved the part execution of Raigarh-Pugalur HVDC transmission system along with COD of 6.9.2020 in respect of Raigarh-Pugalur HVDC transmission link along with Pole-I i.e. 1500 MW HVDC terminals each at Raigarh and Pugalur HVDC Sub-stations (part of Scheme-1) and 400 kV D/C Pugalur (HVDC)-Pugalur (existing) transmission line and 400 kV D/C Pugalur (HVDC)-Arasur transmission line (part of Scheme-2) after taking into consideration the discussions of meeting dated 21.8.2020 of CEA/Constituents.



20. The Petitioner has commissioned the Pole-IV i.e. 1500 MW HVDC terminals each at Raigarh and Pugalur HVDC Sub-stations alongwith part of Scheme-2 consisting of 400 kV D/C Pugalur (HVDC) -Thiruvalem transmission line were together put under commercial operation w.e.f. 25.10.2021. Accordingly, we approve the part execution of Raigarh-Pugalur HVDC transmission system in respect of Pole-IV i.e.  $\pm 800$  kV 1500 MW HVDC terminals each at Raigarh (HVDC Station) and Pugalur (HVDC Station) covered under Scheme-1.

21. Further, the Commission vide RoP of hearing dated 11.2.2022 directed the Petitioner to submit the power flow details of Pole-I, Pole-II, Pole-III and Pole-IV of  $\pm 800$  kV 6000 MW Raigarh (HVDC Station)-Pugalur (HVDC Station). In response, the Petitioner vide affidavit dated 28.2.2022 has submitted that power flow has been achieved from the date of commercial operation for Pole-I along with HVDC Raigarh-Pugalur link, Pole-II, Pole-III and Pole-IV of  $\pm 800$  kV 6000 MW Raigarh (HVDC Station)-Pugalur (HVDC Station). In support of the same the Petitioner has submitted copies of power flow chart in respect of the above transmission assets.

22. The approval for energization of electrical installations for  $\pm 800$  kV 1500 MW, Pole-IV HVDC terminals each at Raigarh (HVDC Station) & Pugalur (HVDC Station) under Regulation 43 of Central Electricity Authority (Measures relating to Safety and Electric Supply), Regulations, 2010 (as amended till date) are as follows:

Sl. No.	Particulars	CEA Clearance date
1	HVDC Pole-4 Converter Transformer, Thyristor valves, 12 Pulse Bridge Convertors (PLC) including PLC area and other value equipment of Pole-4 of Bi pole-2 at Pugalur HVDC Station and Bipole-2 of HVDC Raigarh	1.1.2021
2	800 kV Pugalur HVDC Station	22.1.2021



23. The Petitioner has submitted RLDC Charging Certificate dated 12.11.2021 certifying that trial operation was successfully completed on 24.10.2021 and CMD Certificate as required under the Grid Code.

24. Taking into consideration the CEA Energization Certificate, RLDC Charging Certificate and the Petitioner's CMD Certificate, COD of the transmission asset is approved as 25.10.2021.

### **Capital Cost**

25. 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.”*

26. The Petitioner vide affidavit dated 6.12.2021 has claimed the following capital cost incurred as on COD and Additional Capital Expenditure (ACE) projected to be incurred in respect of the transmission asset and has submitted the Auditor’s Certificate dated 18.11.2021 in support of the same:

FR approved cost	Capital cost up to COD	Projected ACE				Capital cost as on 31.3.2024
		2020-21	2021-22	2022-23	2023-24	
148282.27	117162.46	0.00	3973.01	9584.13	0.00	130719.60

### **Cost variation**

27. The Petitioner has submitted that the estimated completion cost of the transmission asset is within the apportioned approved cost (FR). However, the reasons for item-wise cost variation between approved cost and estimated completion cost is explained in Form-5 submitted in the Petition. Further, being a Government Enterprise, the Petitioner has the obligation for indigenous development of manufacturer as well as to adhere to Government of India guidelines in vogue. Accordingly, the Petitioner has been following a well laid down procurement policy which ensures both transparency and competitiveness in the bidding process. Route of International Competitive Bidding (ICB) as well as Domestic Competitive Bidding (DCB) process have been followed to award this special mega project. Through this process, lowest possible market prices for required product/services/as per detailed designing is obtained and contracts are awarded on the basis of lowest evaluated eligible bidder. The best competitive bid prices



against tenders may vary as compared to the cost estimate depending upon prevailing market conditions, design and site requirements. Whereas the estimates are prepared by the Petitioner as per well-defined procedures for cost estimate. The FR cost estimate is broad indicative cost worked out generally on the basis of average unit rates of recently awarded contracts/general practice. It is submitted that the cost estimate of the project is on the basis of December, 2015 price level, whereas the contract date is May, 2016 price level.

28. The Petitioner vide affidavit dated 6.12.2021 has submitted major item/head wise variation as follows:

(₹ in lakh)				
Sl. No.	Description	Cost as per FR	Estimated capital cost	Variation (-decrease, +increase)
		a	b	c = b - a
A	<b>Transmission Lines material</b>	0.00	0.00	0.00
B	<b>Sub-stations</b>			
1	Civil Works	25562.27	12963.28	-12598.99
2	HVDC Packages	99345.00	85484.29	-13860.71
3	Spares	28.00	28.00	0
C	Taxes & Duties	0.00	16545.00	16545.00
D	Over heads	11747.00	3135.65	-8611.35
E	Interest During Construction (IDC)	11600.00	8097.07	-3502.93
F	FERV		4466.31	4466.31
	<b>Grand Total</b>	<b>148282.27</b>	<b>130719.60</b>	<b>-17562.67</b>

29. The Petitioner has submitted the following reasons for cost variation with respect to FR cost:

- a) There is reduction of ₹26459 lakh w.r.t FR on account of HVDC Package, Erection, Stringing & 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 affects the actual variation of the item w.r.t. 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.

- b) The FR costs of individual items/materials are exclusive of taxes and duties, only EDEC and deemed export benefit is considered and only CST @ 2% has been considered during FR and the same 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 ₹16545 lakh is mainly on account of actual Taxes & Duties, Octroi, Custom Duty, Excise Duty, GST etc. paid based on the prevailing rate and charges raised by the respective district, state and statutory authorities at the time of execution of the project. The difference in taxes is mainly due to implementation of GST from 1.7.2017 as during the bid, the agency has considered deemed export & Excise Duty Exemption Certificate. However, after implementation of GST, IGST @ 18% is to be paid on all the import items as well as for on-shore supply/services.
- c) As per approved cost, IEDC for the transmission asset was estimated at ₹11747 lakh, whereas, based on the actual expenditure incurred, IEDC works out to ₹3135 lakh. Thus, IEDC under the transmission asset has decreased by ₹8611 lakh w.r.t. to FR in case of the transmission asset. The Petitioner has submitted that during estimation of FR, 5% of capital cost (excluding IEDC & IDC) has been considered for IEDC. The actual amount of IEDC, has been considered for claiming the Tariff. The project timeline was 42 months as per FR against which the transmission asset has been commissioned in around 65 months due to various uncontrollable factors and thus on account of the delay of almost 23 months and 20 days in commissioning of the transmission asset, IEDC may be considered proportionately as against 5% as per FR considering the actual completion period of 65 months in case of transmission asset. However, the actual IEDC claimed is ₹3135 lakh for transmission asset which comes out to 2.96% of the hard cost and thus within the percentages envisaged in FR.
- d) Interest during Construction (IDC) for the transmission asset as per FR cost was estimated at ₹11600 lakh while the IDC for the transmission asset works out to ₹8097 lakh. Thus, there is a decrease of ₹3502 lakh w.r.t. FR in IDC in case of



the transmission asset. The main reason for the reduction in IDC is due to deployment of loan of lower interest rate as compared to interest rates considered in FR.

- e) 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 ₹4466 lakh w.r.t. FR case of the transmission due to revaluation of the said loans. The exchange rate at the time of preparation of FR was 1 USD = ₹67.57, EURO = ₹74.66, however, while on actual payment/deployment the exchange rate is up to the extent of 1 USD = ₹75.56, EURO = ₹87.17 (present rate). The variation in exchange rate increases the FERV in overall cost of the transmission asset.

30. The variation in cost is mainly due to increase/decrease in tower steel, HVDC packages, IDC, IEDC and FERV etc. Further, the overall cost of the transmission asset is within the apportioned FR cost.

31. The Commission vide technical validation letter dated 23.11.2021 directed to compare the actual cost with the benchmark cost as specified by the Commission and any variation in capital cost, to be explained. In response, the Petitioner vide affidavit dated 6.12.2021 has made its submissions including a tabular comparison of various types of transmission lines such as 765 kV and 400 kV single circuit and double circuit lines under different wind zone, soil type and terrain (plain/hilly) etc. The Petitioner has submitted that multiple variables such as terrain, location, RoW constraints (urban/rural/river/highway/railway crossings/ forest area etc.), weather conditions, market forces (demand-supply balance, input cost variations, economic and environmental factors etc.), technology adopted (AC/HVDC/Voltage level/active compensation etc.) influence the price discovery and the assessment of prudent costs for the transmission asset needs to be done on a project specific basis. It is practically impossible for any benchmarking of capital cost of the transmission asset at this stage.



The Petitioner has further submitted that the table submitted in this regard illustrates that there is wide variation in cost per km of transmission lines even if such lines fall under same wind zones, soil conditions and topography. Therefore, results of any benchmarking in the case of such HVDC transmission asset may cause severe losses to the transmission licensee if the benchmarks have no relation to the actual cost incurred. Similarly, benchmarking on the basis of one or two cases on a higher level will affect the consumers and the distribution licensees since the actual capital cost incurred may be much lower. The Petitioner has submitted that it would be better that if an independent prudence check is applied by the Commission on the capital cost incurred and claimed by the Petitioner in the present case.

32. We have already perused the submission of the Petitioner with regard to benchmarking and expressed our views in recent orders dated 29.9.2022, 17.10.2022 and 24.11.2022 in Petition No. 685/TT/2020, Petition No. 693/TT/2020 and Petition No. 243/TT/2021, respectively related to the subject HVDC project.

33. We have considered the submissions of the Petitioner and the Respondent(s). The Petitioner has submitted reasons of cost variation with respect to FR cost. As per Auditor's Certificate dated 18.11.2021 submitted vide affidavit dated 6.12.2021 there is a reduction of ₹17562.67 lakh in the estimated completion cost as compared to FR cost in respect of transmission asset. It is observed that the cost increase/variation in case of sub-station is due to the increase/decrease in the materials and sub-station equipment cost (including taxes and duties) due to quantity variation as per actual site condition encountered during execution and price variation as per actual contract prices received in open bidding. The price variation is beyond the control of the Petitioner. The



estimated completion cost of transmission asset is within the FR cost and the same is allowed.

34. The Petitioner has submitted the Petition No. 685/TT/2020 for Pole-I, Petition No. 173/TT/2021 for Pole-II and Pole-III and Petition No. 242/TT/2021 (i.e. instant petition) for transmission charges of Pole-IV. It is observed from the submissions of the Petitioner in various petitions as indicated above that there is unequal distribution of FR cost amongst Pole-I, Pole-II, Pole-III and Pole-IV. Accordingly, the Petitioner is directed to submit the reasons for unequal distribution of FR cost amongst Pole-I, Pole-II, Pole-III and Pole-IV at the time of truing up.

**Time over-run**

35. As per the IA dated 5.5.2016, the transmission project was scheduled to be put into commercial operation within 42 months from the date of IA i.e. by 5.11.2019. However, there is time over-run in case of the transmission asset as follows:

<b>SCOD</b>	<b>Actual COD</b>	<b>Time over-run</b>
5.11.2019	25.10.2021	720 days

36. The Petitioner vide petition and vide affidavit dated 6.12.2021 has submitted that the delay in execution of transmission asset (Pole-IV), herein can be bifurcated into following two parts:

- (1) Delay up to 6.9.2020, i.e. delay in execution of Pole-I which have been enumerated in detail in Petition No. 685/TT/2020 and the delay reasons already submitted in Petition No. 685/TT/2020 along with documentary evidence. The detailed reasons along with chronology for time over-run up to 6.9.2020, i.e. execution of Pole-I have been reproduced in the instant petition along with documentary evidence.



(2) Delay beyond 6.9.2020, i.e. delay in execution of Pole-IV is attributable to severe RoW problems during execution of Scheme-2: AC System Strengthening at Pugalur-end and Scheme-3: Pugalur-Trichur 2000 MW VSC Based HVDC System.

37. The Petitioner has submitted that the time over-run up to 6.9.2020 is mainly because of delay in grant of forest clearance in Gadchiroli-Chandrapur, Bellampalli, Ramgiri, Vellore and Dharampuri for HVDC transmission line, court case during award of HVDC terminal order, RoW vis-à-vis law-and-order problems during construction of transmission lines, litigations and Covid-19 Pandemic. The Petitioner has submitted that after managing intense statutory clearances, difficult terrain conditions, court cases throughout the stretch of the transmission line, RoW problems and other construction challenges in the Western and Southern Regions, the Petitioner has squeezed the prolonged delay and put the transmission asset, i.e. main HVDC line and Pole-I into commercial operation on 6.9.2020.

38. With regard to time over-run beyond 6.9.2020, the Petitioner has submitted that it was decided in the Joint Standing Committee meeting of SR and WR constituents held on 20.4.2015, that the transmission 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 be implemented as three separate transmission 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



39. In the above Joint Standing Committee meeting, it was decided that the transmission schemes may be implemented as separate transmission schemes, however, it is important that the Scheme-2 and Scheme-3 should be in place before commissioning of 6000 MW Raigarh-Pugalur link. Further, the Raigarh-Pugalur-Trichur HVDC transmission scheme was discussed in the 39<sup>th</sup> meeting of SCPSRSR held on 28-29 December, 2015. In the meeting, it had been agreed that schedule of Scheme-3, viz., Pugalur-Trichur 2000 MW VSC Based HVDC System shall be kept with Bi-Pole-II (i.e. 3000 MW) of Scheme-1. It was also decided in the above meeting that in case of any mismatch in the execution of these transmission schemes, their usefulness shall be discussed with CEA before their commissioning. Since there was delay in execution of Scheme-2 and 3 due to severe RoW issues in the areas of Tamil Nadu and Kerala, the matter was discussed in CEA meetings dated 21.8.2020, 30.12.2020 and 5.7.2021 in order to mitigate the issue of mismatch and to ensure the usefulness of the commissioned transmission asset.

40. Accordingly, as agreed in the above meetings dated 21.8.2020, 30.12.2020 and 5.7.2021, the Petitioner has carried out part commissioning of various transmission assets covered under Scheme-1, 2 and 3 of the subject project in the following sequence:

- (a) Raigarh-Pugalur HVDC Transmission link along with Pole-I and 400 kV D/C Pugalur (HVDC)-Pugalur (existing) and Pugalur (HVDC)-Arasur Transmission Lines were put under commercial operation w.e.f. 6.9.2020 and claimed under Petition No. 685/TT/2020 (HVDC system) and Petition No. 693/TT/2020 (AC system).
- (b) Pole-II and  $\pm$  320 kV 2000 MW Pugalur-North Trichur HVDC link along with Mono Pole-II and AC system i.e. LILO of 400 kV D/C North Trichur line, 2x315



MVA 400/220 kV ICTs and 2 numbers 220 kV line bays at North Trichur (HVDC) were put under commercial operation w.e.f. 9.3.2021. Pole-II has been covered in Petition No. 173/TT/2021 and remaining transmission assets are covered under Petition No. 172/TT/2021.

- (c) Mono Pole-I i.e.  $\pm$  320 kV 1000 MW HVDC terminals each at Pugalur (HVDC Station) and North Trichur (HVDC Station, Kerala) was put under commercial operation w.e.f. 8.6.2021 and covered under Petition No. 172/TT/2021.
- (d) Pole-III i.e. 1500 MW HVDC terminals each at Raigarh and Pugalur HVDC Sub-stations along with part of AC System of Scheme-2 consisting of 400 kV D/C Pugalur (HVDC)-Edarpalayam transmission line and 400 kV D/C Edarpalayam-Udumalpet transmission line were put under commercial operation w.e.f. 13.7.2021. Pole-III has been covered in the Petition No. 173/TT/2021 and AC System is covered in Petition No. 243/TT/2021.
- (e) Pole-IV i.e. 1500 MW HVDC terminals each at Raigarh and Pugalur HVDC Sub-stations along with part of AC System of Scheme-2 consisting of 400 kV D/C Pugalur (HVDC)-Thiruvalem transmission line was put under commercial operation w.e.f. 25.10.2021. Pole-IV has been covered in Petition No. 242/TT/2021 and AC System is covered in Petition No. 243/TT/2021.

41. The Petitioner has submitted copy of minutes of CEA/Constituents meetings dated 21.8.2020, 30.12.2020 and 5.7.2021 and has submitted PERT and CPM Chart, i.e. Planned vs Actual execution time in support of condonation of time over-run claim. Further, the Petitioner has requested the Commission to condone the delay in completion of transmission asset covered in the instant petition on merit of the same being out of the control of the Petitioner in line with the Regulation 22(2)(c) of the 2019 Tariff Regulations “uncontrollable factors” and approve the tariff as claimed under the 2019 Tariff Regulations.



42. MPPMCL has submitted that the delay is due to various factors like court cases, forest clearance, RoW etc. MPPMCL has further submitted that the Petitioner has resolved the issues of RoW with the help of Central/State/District/local Administration. While commissioning of transmission lines, RoW issues, litigation, law and order problem are common, and they are not under *force majeure* condition. Further, it is the sole responsibility of the Petitioner to obtain all the required consents/ clearances, including forest clearance for timely completion of the project. The Covid-19 pandemic lockdown started after scheduled completion period, therefore, had the Petitioner resolved all issues in time, the work would have been completed well before lockdown commenced. MPPCL has submitted that delay in getting clearance from forest department and revenue authorities are purely attributable to the Petitioner and, therefore, prayed that the delay due to these reasons may be disallowed.

43. KSEBL has submitted that the Petitioner has claimed delay due to RoW issues, forest clearance, wildlife clearance and livelihood rehabilitation from forest department and the delay in getting clearance from forest department and revenue authorities could have been avoided and controlled with better coordination.

44. TANGEDCO has submitted that execution of transmission lines, RoW issues, Court cases litigation are common, and they are not *force majeure* conditions. TANGEDCO has further submitted that except for the lockdown period imposed from 24.3.2020, other delays are attributable to the Petitioner. Hence, the reasons given by the Petitioner are unjustifiable and delay may not be condoned.

45. In response to the above submissions of MPPMCL, KSEBL and TANGEDCO, the Petitioner has reiterated and relied on the facts as set out by it in the petition. The





Petitioner has submitted that details of time over-run and supporting documents including PERT and CPM Chart i.e. planned vs actual, have already been submitted along with the petition. Further, the details of execution of other transmission assets under the Transmission Scheme 1, Scheme 2 and Scheme 3 have also been submitted along with the relevant minutes of the meeting with SR constituents and CEA vide affidavit dated 6.12.2021. The Petitioner has further referred to the provisions of Regulation 22(2) of the 2019 Tariff Regulations to submit that delay was on account of uncontrollable factors which were beyond the control of the Petitioner.

46. We have considered the submissions of the Petitioner and the Respondents MPPMCL, KSEB and TANGEDCO and have gone through the documentary evidence produced on record to justify the time over-run. The transmission asset was scheduled to be put into commercial operation within 42 months from the date of investment approval dated 5.5.2016. Accordingly, the scheduled COD works out to 5.11.2019. However, the transmission asset (Pole-IV) was put into commercial operation on 25.10.2021. Therefore, there is a time over-run of 720 days in execution of the transmission asset. The Petitioner has submitted that the time over-run may be analyzed in two parts (i) delay up to 6.9.2020 of about 306 days in execution of Raigarh-Pugalur HVDC transmission link and Pole-I and (ii) delay beyond 6.9.2020 of about 414 days upto execution of the transmission asset (i.e. Pole-IV).

47. It is observed that the 1<sup>st</sup> element of the subject HVDC transmission scheme i.e. Raigarh-Pugalur HVDC transmission link and Pole-I together with matching AC System, namely, 400 kV D/C Pugalur (HVDC)-Pugalur (existing) and Pugalur (HVDC)-Arasur transmission lines were put under commercial operation w.e.f. 6.9.2020 and claimed under Petition No. 685/TT/2020 (HVDC System) and Petition No. 693/TT/2020 (AC



System). The Petitioner has submitted that the time over-run up to 6.9.2020 is mainly because of delay in grant of forest clearance in Gadchiroli-Chandrapur, Bellampalli, Ramgiri, Vellore and Dharampuri for HVDC transmission line, court case during award of HVDC terminal, RoW vis-à-vis law-and-order problems during construction of transmission lines, litigations and Covid-19 Pandemic situations. Taking into consideration the submission of the Petitioner, the Commission vide order dated 29.9.2022 in Petition No. 685/TT/2020 condoned the time over-run upto their COD on 6.9.2020. The relevant portions of the order dated 29.9.2022 are as follows:

*“54. As stated above, the transmission asset was scheduled to be put into commercial operation on 5.11.2019 and it was put into commercial operation on 6.9.2020. Thus, there is a time over-run of 306 days. It is evident from the above discussion that the implementation of the transmission asset was affected by various court cases initially at the time of issue of NOA and latter while construction of the transmission line. Apart from this, there was delay in grant of forest clearance. It is observed that the first Court case was filed by one of the bidders before the Delhi Court High Court on 13.5.2016 that was disposed on 6.1.2017. Further, numerous Court cases were filed by the land owners seeking more compensation before various forums starting from 16.6.2017 and the Petitioner could resolve them only by 30.1.2020. Besides this, as stated above there was considerable delay in grant of forest clearance and the last Stage-I clearance was granted on 24.9.2019. However, the time taken for grant of forest clearance is subsumed by the time taken for resolving the RoW issues. Thus, the Petitioner faced serious issues from 13.5.2016 to 30.1.2020, i.e. more than three years and thereafter the Petitioner could complete the stringing finally on 16.3.2020. We are of the view that the issues faced by the Petitioner from 13.5.2016 to 24.9.2019, as enumerated above, are beyond the control of the Petitioner and accordingly the time over-run from 6.11.2019 upto 16.3.2020 (completion of stringing), i.e. 133 days is condoned.”*

*“57. Taking into consideration the OM dated 13.5.2020 on force majeure and the fact that Government unlocked the Covid-19 restrictions on 31.8.2020 and thereafter the Petitioner declared COD of the transmission asset on 6.9.2020. In view of the facts and circumstances of the case, we condone the time over-run of 173 days from 17.3.2020 to 5.9.2020 on account of Covid-19 pandemic as the same falls under Regulation 22(2) of the 2019 Tariff Regulations and is beyond the control of the Petitioner. Accordingly, we condone the total time over-run of 306 days in case of the instant transmission asset.”*

48. The Petitioner in the instant petition has submitted the same set of justification and documents that were placed before the Commission in Petition No. 685/TT/2020. The Commission has already perused the time over-run up to 6.9.2020 and after detailed analysis condoned the time over-run up to 6.9.2020. The transmission asset



i.e. Pole-IV is an integral part of the subject HVDC System. Hence, technically the transmission asset could not have been put into commercial operation prior to 6.9.2020 i.e. before the COD of Raigarh-Pugalur HVDC line and Pole-I covered under Petition No. 685/TT/2020. Thus, the decision in the above order dated 29.9.2022 in respect of Raigarh-Pugalur HVDC line and Pole-I covered in Petition No. 685/TT/2020 regarding condonation of time over-run up to 6.9.2020 is applicable in the transmission assets also. Therefore, for the sake of brevity, we are not deliberating on RoW and Covid related hinderances once again in this order since the transmission asset covered in the instant petition i.e. Pole-IV is an integral part of the subject HVDC project, and the directions contained in the above order dated 29.9.2022 regarding condonation of delay up to 6.9.2020 of 306 days is equally applicable to the transmission asset herein. Accordingly, the time over-run up to 6.9.2020 of 306 days in respect of the transmission asset (i.e., Pole-IV) is condoned.

49. With regard to the time over-run beyond 6.9.2020, the Petitioner has submitted that it was decided in the Joint Standing Committee meeting of SR and WR constituents held on 20.4.2015, that the subject HVDC transmission system shall be implemented in three transmission schemes i.e., Scheme-1: Raigarh-Pugalur 6000 MW HVDC System, Scheme-2: AC System Strengthening at Pugalur-end and Scheme-3: Pugalur-Trichur 2000 MW VSC Based HVDC System. It was further decided that that Scheme-2 and Scheme-3 should be in place before commissioning of Scheme-1. The Raigarh-Pugalur-Trichur HVDC transmission system had been further discussed in the 39<sup>th</sup> meeting of SCPSPSR held on 28-29 December, 2015. In the meeting, it was also agreed that schedule of Scheme-3, viz- Pugalur-Trichur 2000 MW VSC Based HVDC System, shall be alongwith Bi-Pole-II (i.e. 3000 MW) of Scheme-1. It was also decided



that in case any mismatch in the execution of these transmission schemes, their usefulness shall be discussed with CEA before their commissioning. The execution of Scheme-3 i.e. Pugalur-Trichur 2000 MW VSC Based HVDC link was delayed due to severe RoW problem in the stretches falling in Tamil Nadu and Kerala. Accordingly, a series of meetings were convened by CEA/constituents on 21.8.2020, 30.12.2020 and 5.7.2021 to discuss the issue of part commissioning of Raigarh-Pugalur-Trichur HVDC transmission system.

50. The relevant extracts of the Minutes of the meeting held on 5.7.2021 pertaining to transmission asset are as follows:

- “1. Member (Power System), CEA, welcomed the participants. Chief Engineer (PSPA-I), CEA, stated that the meeting had been convened to discuss part commissioning of Raigarh-Pugalur-Trichur HVDC transmission system.*
- 2. It was informed that the Raigarh-Pugalur-Trichur HVDC transmission system was discussed and agreed in the Joint Standing Committee meeting of SR & WR constituents held on 20.04.2015. Scheme details are as follows:*
  - i. Scheme 1: Raigarh-Pugalur 6000 MW HVDC Transmission System*
  - ii. Scheme 2: AC System Strengthening at Pugalur end*
  - iii. Scheme 3: Pugalur – Trichur 2000 MW VSC Based HVDC System**Details of Scheme 1,2, and 3 are given below:*

*Scheme 1: Raigarh-Pugalur 6000 MW HVDC System*

- i. Establishment of Raigarh HVDC Station  $\pm 800$  kV with 6000 MW HVDC terminals.*
- ii. Establishment of Pugalur HVDC Station  $\pm 800$  kV with 6000 MW HVDC terminals.*
- iii.  $\pm 800$  kV Raigarh (HVDC Station) – 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 Station – Arasur 400 kV (quad) D/c line.*
- iii. Pugalur HVDC Station – Thiruvalem 400 kV (quad) D/c line with 2x80 MVAR line reactor at Pugalur HVDC Station end and 2x63 MVAR line reactor at Thiruvalem 400 kV end.*
- iv. Pugalur HVDC Station – Edayarpalayam 400 kV (quad) D/c line.*
- v. Edayarpalayam – Udumulpet 400 kV (quad) D/c line.*

*(Establishment of 400/220 kV Sub-station at Edayarpalayam with 2x500 MVA transformers and 2x125 MVAR bus reactors would be under the scope of TANTRASCO. The bay for ISTS transmission lines at Edayarpalayam would be implemented as ISTS.)*

**Scheme 3: Pugalur- Trichur 2000 MW VSC Based HVDC System:**



- i.  $\pm 320$  kV, 2000 MW VSC based HVDC terminal at Pugalur. The HVDC Station would have GIS for 400 kV part and AIS for HVDC part.
  - ii.  $\pm 320$  kV, 2000 MW VSC based HVDC terminal at North Trichur. The HVDC Station would have GIS for 400kV part and AIS for HVDC part.
  - iii. 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).
  - iv. LILO of North-Trichur – Cochin 400 kV (Quad) D/c line at North Trichur HVDC Station.
3. In the Joint Standing Committee meeting held on 20.4.2015, it had been decided that the schemes may be implemented as separate schemes, however, it is important that the Scheme# 2 Scheme# 3 should be in place before commissioning of 6000 MW Raigarh – Pugalur link.
  4. It was also informed that the Raigarh-Pugalur-Trichur HVDC transmission system had been further discussed in the 39th meeting of SCPSPSR held on 28-29 December, 2015. In the meeting, it was deliberated that schedule of scheme # 3 shall be kept as Pole-2 (3000 MW) of Scheme-1. It had been decided in the 39<sup>th</sup> SCPSPSR meeting that in case of any mismatch in the execution of these schemes, their usefulness shall be discussed with CEA before their commissioning.
  5. Accordingly, as per the discussions in the meeting held on 21.08.2020 and 30.12.2020 regarding part commissioning of Raigarh-Pugalur-Trichur HVDC transmission system, the following elements of Raigarh-Pugalur-Trichur HVDC transmission system have already been commissioned.
    - i. Bipole-I (3000 MW) of Raigarh-Pugalur HVDC transmission system (part of scheme 1)
    - ii. Pugalur (HVDC) – Pugalur (Existing) 400 kV (quad) line & Pugalur (HVDC) – Arasur 400 kV (quad) line (part of scheme 2)
    - iii. Monopole-II (1000 MW) of Pugalur – North Trichur VSC HVDC system transmission (part of Scheme-3)

Element wise status of the complete scheme is given at **Annex-II**

6. POWERGRID informed that the trial operation for Monopole-I (1000 MW) of Pugalur – North Trichur VSC HVDC system has been successfully completed.
7. CTUIL informed that POWERGRID has proposed following elements of the Raigarh-Pugalur-Trichur HVDC system for commissioning in phased manner:

**Elements ready for commissioning at present:**

- i. Pole-I (1500 MW) of Bipole-II (3000 MW) of Raigarh – Pugalur HVDC system (part Scheme # 1)
- ii. Pugalur (HVDC) – Edayarpalayam 400 kV (quad) D/c line (part Scheme # 2)
- iii. Edayarpalayam – Udumulpet 400 kV (quad) D/c line (part Scheme # 2)

**Elements to be ready for commissioning by July, 2021:**

- i. Pole-II (1500 MW) of Bipole-II (3000 MW) of Raigarh – Pugalur HVDC system (part Scheme # 1)



- ii. *Pugalur (HVDC) – Thiruvalem 400 kV (quad) D/c line (part Scheme # 2)*

*It was also informed that Edarpalayam S/s is still under implementation by TATRANSCO. Hence, Edarpalayam S/s has been bypassed as an interim measure to form Pugalur (HVDC) – Udumalpet 400 kV (quad) D/c line by connecting Pugalur (HVDC) – Edarpalayam 400 kV (quad) line and Edarpalayam – Udumalpet 400 kV (quad) line.*

xxxxx

xxxxx

18. *After deliberations, following was agreed:*

- i. *As trial operation of Monopole-I (1000 MW) of Pugalur – North Trichur VSC based HVDC system has already been completed, therefore the same may be commissioned.*

- ii. *Following transmission elements may be commissioned on completion.*

- *Pole-I (1500 MW) of Bipole-II (3000 MW) of Raigarh-Pugalur HVDC system.*
- *Pugalur (HVDC) Station – Edayarpalayam 400 kV (quad) D/c line.*
- *Edayarpalayam – Udumalpet 400 kV (quad) D/c line*

*Pole-I (1500 MW) of Bipole-II (3000 MW) would be commissioned only after commissioning of Pugalur (HVDC) – Edarpalayam – Udumalpet 400 kV (quad) D/c line. As Edarpalayam S/s is still under construction, the Pugalur (HVDC) – Edarpalayam 400 kV (quad) D/c line and Edarpalayam – Udumalpet 400 kV (quad) D/c line would be by-passed at Edarpalayam to form Pugalur (HVDC) – Udumalpet 400 kV (quad) D/c line as an interim arrangement.*

- iii. *POWERGRID to expedite the commissioning of Pugalur (HVDC) – Udumalpet 400 kV (quad) D/c line.”*

51. As per the above minutes of meeting dated 5.7.2021 of CEA/Constituents, it has been proposed that the following elements of the Raigarh-Pugalur-Trichur HVDC System may be commissioned in phased manner:

- (a) Elements ready for commissioning at present consisting of Pole-I (1500 MW) of Bipole-II (3000 MW) of Raigarh – Pugalur HVDC system (part Scheme # 1), i.e., Pole-III along with Pugalur (HVDC) – Thiruvalem & Edayarpalayam – Udumalpet 400 kV (quad) D/C lines (part Scheme # 2).

- (b) Elements to be ready for commissioning by July, 2021 consisting of Pole-II (1500 MW) of Bipole-II (3000 MW) of Raigarh – Pugalur HVDC system (part Scheme # 1), i.e., Pole-IV along with Pugalur (HVDC) – Thiruvalem 400 kV (quad) D/c line (part Scheme # 2).



52. Accordingly, Pole-IV i.e. 1500 MW HVDC terminals each at Raigarh and Pugalur HVDC Sub-stations alongwith part of AC System of Scheme-2 consisting of 400 kV D/C Pugalur (HVDC)-Thiruvalem transmission line was put under commercial operation w.e.f. 25.10.2021. Pole-IV has been covered in the instant Petition No. 242/TT/2021 and AC System is covered in Petition No. 243/TT/2021.

53. We have considered the submission of the Petitioner and the Respondents and perused the documents available on record including minutes of CEA meetings dated 21.8.2020, 30.12.2020 and 5.7.2021 and PERT and CPM Chart regarding Planned vs Actual execution time submitted by the Petitioner in support of condonation of time over-run in respect of the transmission asset. The Petitioner has submitted that the time over-run up to 6.9.2020 of about 306 days was due to delay in commissioning of Raigarh-Pugalur HVDC transmission link and Pole-I and additional delay beyond 6.9.2020 of about 414 days in the transmission asset, respectively was due to delay in commissioning of matching AC System of 400 kV D/C Pugalur (HVDC)-Thiruvalem transmission line covered under Scheme-2 on account of severe RoW issues in certain stretches of Tamil Nadu and Kerala States.

54. The Petitioner has submitted that the transmission asset consisting of HVDC Pole-IV Convertor Transformer, Thyristor valves including PLC area and other valve equipment at Raigarh HVDC an Pole-IV Pugalur HVDC Station was completed and was ready for charging on 1.1.2021 and 22.1.2021, respectively. In support of the same, the Petitioner has submitted copies of CEA Charging Certificates dated 1.1.2021 and 22.1.2021. However, as decided in the CEA meeting dated 5.7.2021 the transmission asset, i.e. Pole-IV of part Scheme-1 was commissioned and put under commercial operation w.e.f. 25.10.2021 together with associated AC System of part Scheme-2



consisting of 400 kV D/C Pugalur (HVDC)-Thiruvalam transmission line.

55. The Petitioner has submitted that 400 kV D/C Pugalur (HVDC)-Thiruvalam transmission line was delayed due to RoW issues, forest clearance, Covid pandemic situations which were beyond the control of the Petitioner. It is observed that the Petitioner has claimed tariff for 400 kV D/C Pugalur (HVDC)-Thiruvalam transmission line in Petition No. 243/TT/2021. The Commission vide order dated 24.11.2022 in Petition No. 243/TT/2021 has already dealt with the issue of time over-run and held as follows:

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

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

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





*and court case(s)/litigations occurred between 20.2.2018 to 26.10.2020. Therefore, delay due to RoW and Court case is subsumed in the delay due to forest clearance.*

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

56. The delay up to 25.10.2021 has already been condoned vide order dated 24.11.2022 in Petition No. 243/TT/2021. The Commission has perused the time over-run up to 25.10.2021 and after detailed analysis condoned the time over-run upto 25.10.2021 in respect of Pugalur-Thiruvalem 400 kV D/C line. Therefore, for the sake of brevity, we are not deliberating the RoW issues and court cases once again in the instant order. It is observed that the transmission asset (Pole-IV) was ready for charging on 22.1.2021 as per CEA Charging Certificates in this regard. Thus, Pole-IV was ready much before the COD dated 25.10.2021 of Pugalur-Thiruvalem Line. However, the same was put under commercial operation w.e.f. 25.10.2021 along with Pugalur-Thiruvalem Line as per directive of CEA meeting dated 5.7.2021. Therefore, the time over-run from 6.9.2020 to 25.10.2021 of about 414 days was beyond the control of Petitioner so far as the transmission asset (Pole-IV) is concerned. We have already condoned the delay of 306 days from SCOD to 6.9.2020 in execution of the transmission asset in the preceding paragraphs of this order. Accordingly, the total time over-run of 720 days (306+414) in respect of the transmission asset is condoned.

57. In view of the above, the time over-run of 720 days in respect of the transmission asset under Scheme-1 deserves to be condoned and, hence, condoned. The details of time over-run condoned/not condoned are as follows:



Schedule COD as per IA	Actual COD	Time Over-run	Time Over-run condoned	Time Over- run not condoned
5.11.2019	25.10.2021	720 days	720 days	Nil

### **Interest During Construction (IDC)**

58. The Petitioner vide affidavit dated 6.12.2021 has claimed following IDC in respect of the transmission asset and has submitted the statement showing IDC claimed, discharge of IDC liability as on COD and thereafter:

(₹ in lakh)			
IDC as per Auditor Certificate dt 18.11.2021	IDC Discharged up to COD	IDC discharged during 2021-22	IDC discharged during 2022-23
8097.07	7312.63	497.78	286.65

59. We have considered the submissions of the Petitioner. As discussed above in this order, the time over-run in case of the transmission asset has been fully condoned. Accordingly, the IDC on cash basis up to the COD has been worked out on the basis of the loan details given in the statement showing discharge of IDC and Form-9C for the transmission asset. It has been observed that IDC claimed and allowed includes interest and financial charges on foreign loan from ADB. In the IDC computation statement in respect of ADB, the Petitioner has shown financial charges as a part of IDC, however no document has been provided for claims in respect of financial charges. The Petitioner is directed to provide relevant document to substantiate the claim for financial charges and rate of interest claimed for the ADB loan. In case, amount of loan and financial charges claimed for computation of IDC are an apportionment of gross amount, then the Petitioner is directed to submit petition-wise and asset-wise reconciliation of the ADB loan applied to this project along with computation of IDC at the time of truing-up. 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 in respect of the transmission asset is as follows:



IDC as per Auditor 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	(₹ in lakh)	
					Discharge of IDC liability allowed as ACE	
					2021-22	2022-23
8097.07	159.52	7937.55	1085.46	6852.09	497.78	587.68

### **Incidental Expenditure During Construction (IEDC)**

60. The Petitioner has claimed IEDC for the transmission asset vide affidavit dated 6.12.2021 as per the Auditor's Certificate dated 18.11.2021. The Petitioner has further submitted that the entire amount of IEDC for the transmission asset has been discharged up to COD. As the time over-run for the instant transmission asset has been condoned, there is no disallowance of IEDC. Accordingly, 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 due to time over-run not condoned (B)	IEDC allowed (A-B)
3135.65	0.00	3135.65

### **Initial Spares**

61. 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%*”

62. The Initial Spares claimed by the Petitioner are as follows:



Particulars	Plant and machinery cost (₹ in lakh)	Initial Spares claimed (₹ in lakh)	Initial Spares Claimed (in %)	Ceiling limit as mentioned as per Regulation (in %)
	A	B		C
Sub-station (HVDC)	10375.80	28.00	0.03	4.00

63. The Initial Spares discharge as per Form-13 submitted by the Petitioner vide affidavit dated 6.12.2021 is as follows:

Particulars	Initial spares claimed	Initial spares discharge (₹ in lakh)			
		As on COD	2021-22	2022-23	Total
Sub-station (HVDC)	28.00	28.00	0.00	0.00	28.00

64. We have considered the submissions of the Petitioner. Based on the information available on record, the Initial Spares for the transmission asset are allowed as per respective percentage of the Plant and Machinery Cost as on the cut-off date on individual basis. The Initial Spares allowed for the transmission asset are as follows:

Particulars	Plant and Machinery cost (excluding IDC/IEDC, Land cost & Cost of Civil Works) (₹ in lakh)	Initial Spares claimed (₹ in lakh)	Norms as per 2019 Tariff Regulations (in %)	Initial Spares allowable (₹ in lakh)	Initial Spares disallowed (₹ in lakh)	Initial Spares Allowed (₹ in lakh)
	A	B	C	$D=(A-B) *C/(100-C)$	$E=B-D$	
Sub-station (HVDC)	103750.80	28.00	4.00%	4321.78	0.00	28.00

65. The capital cost allowed as on COD in respect of the transmission asset after adjusting disallowed/undischarged IDC is as follows:

Capital cost claimed as on COD (Auditor's Certificate) (A)	IDC disallowed due to computational error (B)	Undischarged IDC (C)	Capital cost as on COD (A-B-C)
117162.46	159.52	1085.46	115917.48



## **Additional Capital Expenditure**

66. 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:*

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

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

- (a) The useful life of the assets is not commensurate with the useful life of the project and such assets have been fully depreciated in accordance with the*



- provisions of these regulations;*
- (b) *The replacement of the asset or equipment is necessary on account of change in law or Force Majeure conditions;*
- (c) *The replacement of such asset or equipment is necessary on account of obsolescence of technology; and*
- (d) *The replacement of such asset or equipment has otherwise been allowed by the Commission.”*

67. The Petitioner has claimed that the ACE incurred/projected to be incurred is mainly on account of balance/retention payments and, hence, the same is claimed under Regulations 24(1)(a) and 24(1)(b) of the 2019 Tariff Regulations. The Petitioner has claimed capital cost as on 31.3.2024 as follows:

(₹ in lakh)

FR approved cost	Capital cost up to COD	Projected ACE				Capital cost as on 31.3.2024
		2020-21	2021-22	2022-23	2023-24	
148282.27	112244.89	0.00	4436.01	9584.13	0.00	126265.03

68. The Petitioner vide affidavit dated 6.12.2021 has updated the claimed capital cost as on 31.3.2024 as follows:

(₹ in lakh)

FR approved cost	Capital cost up to COD	Projected ACE				Capital cost as on 31.3.2024
		2020-21	2021-22	2022-23	2023-24	
148282.27	117162.46	0.00	3973.01	9584.13	0.00	130719.60

69. MPPMCL has submitted that the Petitioner has claimed ACE under Regulation 14(1) of the 2019 Tariff Regulations with the reasoning of the Balance/Retention payment only, without providing proper details and justification. MPPMCL has submitted that the claims of the Petitioner may only be allowed in true-up on the basis of the actuals. The Petitioner in response has submitted that the ACE claimed is on account of Balance and Retention payments as well as Balance Work under Regulation 24(1)(a) and 24(1)(b) of the 2019 Tariff Regulations. Accordingly, contractor-wise details of the ACE (liabilities flow statement) claimed including details of balance and retention payments has already been submitted vide affidavit dated 6.12.2021.



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

(₹ in lakh)

ACE 2019-24				
Particulars	2020-21	2021-22	2022-23	2023-24
ACE claimed as per Auditor's Certificate	-	3973.01	9584.13	-
Add: IDC Discharged	-	497.78	587.68	-
<b>ACE allowed</b>	-	<b>4470.79</b>	<b>10171.81</b>	-

71. The capital cost considered for the transmission asset for the 2019-24 tariff period is as follows:

(₹ in lakh)

Capital cost as on COD	ACE 2019-24				Capital cost as on 31.3.2024
	2020-21	2021-22	2022-23	2023-24	
115917.48	0.00	4470.79	10171.81	0.00	130560.08

### **Debt-Equity Ratio**

72. 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.”

73. The debt-equity considered for the purpose of computation of tariff for 2019-24 tariff period for 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	81142.24	70.00	10249.82	70.00	91392.05	70.00
Equity	34775.24	30.00	4392.78	30.00	39168.02	30.00
<b>Total</b>	<b>115917.48</b>	<b>100.00</b>	<b>14642.60</b>	<b>100.00</b>	<b>13560.07</b>	<b>100.00</b>





## Depreciation

74. 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 31<sup>st</sup> 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.”*

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



(₹ in lakh)

Particulars	2021-22 (Pro-rata 158 days)	2022-23	2023-24
<b>Depreciation</b>			
Opening Gross Block	115917.48	120388.27	130560.08
ACE	4470.79	10171.81	0.00
Closing Gross Block	120388.27	130560.08	130560.08
Average Gross Block	118152.87	125474.17	130560.08
Freehold Land	0.00	0.00	0.00
Weighted average rate of Depreciation (WAROD) (in %)	5.02	5.02	5.02
Balance useful life of the asset (Year)	25	25	24
Elapsed life at the beginning of the year (Year)	0	0	1
Aggregate Depreciable Value	106337.59	112926.76	117504.07
<b>Combined Depreciation during the year</b>	<b>2567.72</b>	<b>6299.89</b>	<b>6555.27</b>
Aggregate Cumulative Depreciation	2567.72	8867.61	15422.88
Remaining Aggregate Depreciable Value	103769.87	104059.15	102081.18

### **Interest on Loan (IoL)**

76. 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.”*

77. 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. The IoL allowed for the transmission asset is as follows:

Particulars	(₹ in lakh)		
	2021-22 (Pro-rata 158 days)	2022-23	2023-24
<b>Interest on Loan</b>			
Gross Normative Loan	81142.24	84271.79	91392.05
Cumulative Repayments upto Previous Year	0.00	2567.72	8867.61
Net Loan-Opening	81142.24	81704.07	82524.44
Additions	3129.55	7120.27	0.00
Repayment during the year	2567.72	6299.89	6555.27
Net Loan-Closing	81704.07	82524.44	75969.17
Average Loan	81423.15	82114.26	79246.81
Weighted Average Rate of Interest on Loan (in %)	3.1711	3.2089	3.2499
<b>Interest on Loan</b>	<b>1117.71</b>	<b>2635.00</b>	<b>2575.48</b>

### **Return on Equity (RoE)**

78. 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 account of emission control system, shall be computed at the weighted average rate of interest on actual loan portfolio of the generating station or the transmission system or in the absence of actual loan portfolio of the generating station or the transmission system, the weighted average rate of interest of the generating company or the transmission licensee, as the case may be, as a whole shall be considered, subject to ceiling of 14%.*

*Provided further that:*

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

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

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

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



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

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

Where “t” is the effective tax rate in accordance with clause (1) of this Regulation and shall be calculated at the beginning of every financial year based on the estimated profit and tax to be paid estimated in line with the provisions of the relevant Finance Act applicable for that financial year to the company on pro-rata basis by excluding the income of non-generation or non-transmission business, as the case may be, and the corresponding tax thereon. In case of generating company or transmission licensee paying Minimum Alternate Tax (MAT), “t” shall be considered as MAT rate including surcharge and cess.

**Illustration-**

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

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

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

- (a) Estimated Gross Income from generation or transmission business for FY 2019-20 is Rs 1,000 crore;
- (b) Estimated Advance Tax for the year on above is Rs 240 crore;
- (c) Effective Tax Rate for the year 2019-20 = Rs 240 Crore / Rs 1000 Crore = 24%;
- (d) Rate of return on equity =  $15.50 / (1 - 0.24) = 20.395\%$ .

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

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

(₹ in lakh)

Page 54 of 70



Particulars	2021-22 (Pro-rata 158 days)	2022-23	2023-24
<b>Return on Equity</b>			
Opening Equity	34775.24	36116.48	39168.02
Additions	1341.24	3051.54	0.00
Closing Equity	36116.48	39168.02	39168.02
Average Equity	35445.86	37642.25	39168.02
Return on Equity (Base Rate) (in %)	15.500	15.500	15.500
MAT Rate for respective year (in %)	17.472	17.472	17.472
Rate of Return on Equity (in %)	18.782	18.782	18.782
<b>Return on Equity</b>	<b>2881.85</b>	<b>7069.97</b>	<b>7356.54</b>

### **Operation & Maintenance Expenses (O&M Expenses)**

80. The Petitioner has submitted that the O&M Expenses for 800 kV HVDC line and HVDC terminal has been calculated as per Regulation 35(3)(a)(i) and 35(3)(a)(ii) of the 2019 Tariff Regulations 2019. The O&M Expenses claimed by the Petitioner for the transmission asset for the 2019-24 period are as follows:

Particulars	2021-22 (Pro-rata 158 days)	2022-23	2023-24
<b>HVDC Terminal: Pole-IV (1500 MW) HVDC terminals each at Raigarh and Pugalur HVDC Sub-stations</b>			
Units (numbers)	1	1	1
Norms (₹ lakh/units)	1373.00	1421.00	1471.00
<b>Total O&amp;M expenses</b>	<b>594.34</b>	<b>1421.00</b>	<b>1471.00</b>

81. 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
<i>Norms for sub-station Bays (₹ Lakh per bay)</i>					
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
<i>Norms for Transformers (₹ Lakh per MVA)</i>					
765 kV	0.491	0.508	0.526	0.545	0.564



<b>Particulars</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>
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
<b>Norms for AC and HVDC lines (₹ Lakh per km)</b>					
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
<b>Norms for HVDC stations</b>					
HVDC Back-to-Back stations (Rs Lakh per 500 MW) (Except Gazuwaka BTB)	834	864	894	925	958
Gazuwaka HVDC Back-to-Back station (₹ Lakh per 500 MW)	1,666	1,725	1,785	1,848	1,913
500 kV Rihand-Dadri HVDC bipole scheme (Rs Lakh) (1500 MW)	2,252	2,331	2,413	2,498	2,586
±500 kV Talcher- Kolar HVDC bipole scheme (Rs Lakh) (2000 MW)	2,468	2,555	2,645	2,738	2,834
±500 kV Bhiwadi-Balia HVDC bipole scheme (Rs Lakh) (2500 MW)	1,696	1,756	1,817	1,881	1,947
±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  $\pm 500$  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  $\pm 500$  kV Talchar-Kolar HVDC bi-pole scheme (2000 MW);*
- iv. *the O&M expenses of  $\pm 800$  kV Champa-Kurukshetra HVDC bi-pole scheme (3000 MW) shall be on the basis of the normative O&M expenses for  $\pm 800$  kV, Bishwanath-Agra HVDC bi-pole scheme;*
- v. *the O&M expenses of  $\pm 800$  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  $\pm 800$  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.”*

82. MPPMCL and KSEB has submitted that the Petitioner has claimed O&M Expenses for HVDC Terminal calculated considering the pro-rata O&M Expenses allowed for  $\pm 800$  kV Biswanath-Agra HVDC bipole transmission scheme (₹ lakh) (3000 MW). MPPMCL has requested that the O&M Expenses may be fixed separately for this transmission scheme as per the regulations in force. In response, the Petitioner has submitted that the O&M Expenses for 800 kV HVDC terminal has been calculated considering the pro-rata of O&M Expenses allowed for similar HVDC i.e.  $\pm 800$  kV



Biswanath-Agra HVDC bipole transmission scheme (Rs. lakh) (3000 MW) as per Regulation 35 (3)(a) (i) and 35(3)(a)(ii) of the 2019 Tariff Regulations.

83. TANGEDCO has submitted that the Petitioner has calculated O&M Expenses for HVDC terminal considering the pro-rata O&M Expenses allowed for similar HVDC i.e.  $\pm 800$  kV Biswanath-Agra HVDC bipole (3000 MW). Further, the Petitioner has claimed exorbitant O&M Expenses for the HVDC terminal of the  $\pm 800$  kV Raigarh-Pugalur HVDC bipole transmission scheme of 6000 MW capacity which works out to be double the rate of  $\pm 800$  kV Biswanath-Agra HVDC bipole transmission scheme (3000 MW). The calculation is erroneous and unacceptable. TANGEDCO has submitted that normative rate of O&M Expenses for a similar bi-pole transmission scheme of  $\pm 800$  kV HVDC bi-pole of 6000 MW capacity is not available in the regulation. Hence, prayed the Commission to disallow the imprudent claim of the Petitioner and to determine the O&M Expenses for the new HVDC  $\pm 800$  kV Raigarh-Pugalur HVDC bipole transmission scheme of 6000 MW capacity.

84. In response, the Petitioner has submitted that the O&M Expenses for 800 kV HVDC terminal has been calculated as per proviso (i) and (ii) of Regulation 35(3)(a) and 35(3)(a) of the 2019 Tariff Regulations. Accordingly, the O&M Expenses for HVDC terminal calculated considering the pro-rata of O&M Expenses allowed for similar HVDC i.e.  $\pm 800$  kV Biswanath-Agra HVDC bipole transmission scheme (₹ lakh) (3000 MW).

85. We have considered the submissions of the Petitioner and MPPMCL, KSEB and TANGEDCO. The O&M Expenses are allowed under proviso (i) and (ii) of Regulation 35(3)(a) of the 2019 Tariff Regulations as claimed by the Petitioner but the Petitioner is directed to submit the detailed actual computation of the O&M Expenses for the HVDC



terminal at the time of true-up. The O&M Expenses allowed for the 2019-24 tariff period are as follows:

Particulars	2021-22 (Pro-rata 158 days)	2022-23	2023-24
<b>HVDC Terminal: Pole-IV (1500 MW) HVDC terminals each at Raigarh and Pugalur HVDC Sub-stations</b>			
Units (numbers)	1	1	1
Norms (₹ lakh/units)	1373.00	1421.00	1471.00
<b>Total O&amp;M expenses</b>	<b>594.34</b>	<b>1421.00</b>	<b>1471.00</b>

**Interest on Working Capital (IWC)**

86. 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 1<sup>st</sup> 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 true-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;”*



87. The Petitioner has submitted that it has computed IWC for the 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%.

88. 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), 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), whereas ROI for 2022-23 onwards has been considered as 10.50% (SBI 1-year MCLR applicable as on 1.4.2022 of 7.00% plus 350 basis points). The components of the working capital and interest thereon allowed are as follows:

Particulars	(₹ in lakh)		
	2021-22 (Pro-rata 158 days)	2022-23	2023-24
<b>Interest on Working Capital</b>			
Working Capital for O&M Expenses (O&M expenses for 1 month)	114.42	118.42	122.58
Working Capital for Maintenance Spares (15% of O&M Expenses)	205.95	213.15	220.65
Working Capital for Receivables (Equivalent to 45 days of annual transmission charges)	2070.65	2180.92	2241.35
Total Working Capital	2391.02	2512.49	2584.59
Rate of Interest (in %)	10.50	10.50	10.50
<b>Interest on Working Capital</b>	<b>108.68</b>	<b>263.81</b>	<b>271.38</b>

**Annual Fixed Charges for the 2019-24 Tariff Period**

89. The transmission charges allowed for the transmission asset for the 2019-24 tariff period is as follows:

Particulars	(₹ in lakh)		
	2021-22 (Pro-rata 158 days)	2022-23	2023-24



<b>Annual Transmission Charges</b>			
Depreciation	2567.72	6299.89	6555.27
Interest on Loan	1117.71	2635.00	2575.48
Return on Equity	2881.85	7069.97	7356.54
O & M Expenses	594.34	1421.00	1471.00
Interest on Working Capital	108.68	263.81	271.38
<b>Total</b>	<b>7270.29</b>	<b>17689.67</b>	<b>18229.67</b>

### **Filing Fee and the Publication Expenses**

90. 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**

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

### **Security Expenses**

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

93. MPPMCL 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. In response the Petitioner has submitted that a separate petition 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.

94. KSEB has submitted that the Petitioner has claimed recovery of security expenses from the beneficiaries directly on a quarterly basis which is against the Regulation 35(3)(c) of the 2019 Tariff Regulations. 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. 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.

95. The Petitioner has further submitted that 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.

96. We have considered the submissions of the Petitioner and MPPMCL and KSEB. The Petitioner has claimed consolidated security expenses for all the transmission assets owned by it on projected basis for the 2019-24 tariff period on the basis of actual security expenses incurred in 2018-19 in Petition No. 260/MP/2020. The Commission vide order dated 3.8.2021 in Petition No. 260/MP/2020 approved security expenses



from 1.4.2019 to 31.3.2024. Therefore, security expenses will be shared in terms of the order dated 3.8.2021 in Petition No. 260/MP/2020. Accordingly, the Petitioner's prayer in the instant petition for allowing it to file a separate petition for claiming the overall security expenses and consequential IWC has become infructuous.

### **Goods and Services Tax**

97. MPPMCL has submitted that the Petitioner has claimed the implementation of GST. MPPMCL prayed to the Commission that GST has not been applicable on electricity transmission services so the demand of GST may be disallowed.

98. The Petitioner, in response, has submitted that under CGST Act, 2017 implemented w.e.f. 1.7.2017, the Government of India has exempted the charges of transmission of electricity vide Notification No. 12/2017 – Central Tax (Rate) dated 28.6.2017 at Serial No. 25 under the heading 9969 “Transmission or distribution of electricity by an electric transmission or distribution utility” by giving applicable GST rate as NIL. Hence, the Transmission Charges claimed in the instant petition is exclusive of GST. Further, 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 may be borne and additionally paid by the Respondent(s) to the Petitioner and the same may 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, and the same may be allowed to be recovered from the beneficiaries.

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



## **Capital Spares**

100. 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**

101. The Respondents have submitted that the funding from Power System Development Fund (PSDF)/ National Clean Energy Fund (NCEF) Clean Energy Fund may be used for reducing the cost of the transmission project. In response, 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, MoP allocates any amount from PSDF/ 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.

102. We have already deliberated the submissions of the Petitioner and Respondents in order dated 29.9.2022 in Petition No. 685/TT/2020 and held that there is a need to share the burden of capital cost of transmission scheme by way of assistance from the PSDF and directed the Petitioner to take up the matter with the Monitoring Committee of the PSDF/ Ministry of Power. The relevant portion of the order dated 29.9.2022 is as follows:

*"117. We have considered the submissions of the Petitioner, KSEB and BESCO. The Commission is aware of the fact that capital investments of the instant transmission scheme/transmission project is huge. The Commission feels that there is a strong necessity to share the burden of capital cost of transmission 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 to*





*arrange for funds from PSDF as well as Government grant, considering the benefits that would accrue to the power sector and the economy of the country.”*

### **Sharing of Transmission Charges**

103. The Petitioner has prayed that the transmission charges for 2019-24 tariff period may be allowed to be recovered on monthly basis in accordance with Regulation 57 of the 2019 Tariff Regulations and may be shared by the Respondents in accordance with the 2020 Sharing Regulations.

104. KSEB and TANGEDCO have submitted that the sharing of the subject HVDC project should be in line with sharing methodology followed for other HVDC transmission 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. Thus, the main contention of the Respondents is that Raigarh-Pugalur-Trissur HVDC System is one of the important elements of the National Grid which will provide flexibility, stability and RE integration, therefore, Raigarh-Pugalur-Trissur HVDC System may be treated as a national and strategic transmission system of national importance and 100% yearly transmission charges may be considered under National Component.

105. 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 MoP 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 transmission asset. 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.

106. 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.

107. 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 is dealt by the Commission in relevant petitions filed by the Petitioner. The Commission vide order dated 29.9.2020 in Petition No. 685/TT/2022 has already dealt with the sharing of charges of  $\pm 800$  kV (6000 MW) Raigarh-Pugalur HVDC link and Pole-I (1500 MW) covered under Scheme-1 of the transmission project.

108. The transmission asset covered in the instant petition pertain to Scheme-1 of the transmission project, which is  $\pm 800$  kV 1500 MW (Pole-IV) HVDC terminals each at Raigarh (HVDC Station) & Pugalur (HVDC Station).

109. The Commission vide order dated 29.9.2022 in Petition No.685/TT/2020 has held as follows:



*“131. We are of the view that the Commission is not the appropriate forum for declaring any transmission asset to be of national and strategic importance. It is further observed that transmission system being of national importance and a transmission system considered as a National Component are two different aspects. Therefore, we are not inclined to approve the 100% yearly transmission charges of Raigarh-Pugalur-Thrissur HVDC system under National Component.*

*132. KSEB, TANGEDCO, BESCO, TSSPDCL and TSNPDCL have contended that the transmission asset will serve the purpose of evacuation of RE power from Southern Region to the rest of the country. We are of the view that if need be to consider the sharing based on bi-directional flow of Raigarh-Pugalur-Thrissur HVDC transmission system due to change in load-generation mix, the same shall be dealt with by the Commission at the appropriate stage.”*

110. In view of the above, if the sharing in respect of the transmission asset covered in the instant petition is required to be considered based on bi-directional flow of Raigarh-Pugalur-Thrissur HVDC transmission system due to change in load-generation mix, the same shall be dealt with by the Commission at the appropriate stage. However, with effect from 1.11.2020, the sharing of transmission charges is governed by the provisions of the 2020 Sharing Regulations. As per minutes of SCM/RPC, the instant HVDC System i.e. Raigarh (HVDC Station)-Pugalur (HVDC Station) HVDC link is developed as System Strengthening Scheme. Therefore, transmission charges for the transmission asset i.e.,  $\pm 800$  kV 1500 MW (Pole-IV) HVDC terminals each at Raigarh (HVDC Station) and Pugalur (HVDC Station) shall be shared as per Regulation 5 and Regulation 6 of the 2020 Sharing Regulations.

111. Regulation 5 and Regulation 6 of the 2020 Sharing Regulations provide as follows:

*“5. Components and sharing of National Components (NC) (1) National Component shall be sum of the following components:*

*(a) -----” and*  
*(b) National Component-HVDC (NC-HVDC).*

*(2)-----.*

*(3) National Component-HVDC shall comprise of the following:*

*(a) 100% of Yearly Transmission Charges for “back-to-back HVDC” transmission system;*



(b) 100% of Yearly Transmission Charges for Biswanath-Chariali/ Alipurdwar to Agra HVDC transmission system;

(c) Yearly Transmission Charges of Mundra–Mohindergarh 2500 MW HVDC transmission system corresponding to 1005 MW capacity Provided that Yearly Transmission Charges corresponding to 1495 MW for the said transmission system shall be borne by M/s Adani Power (Mundra) Limited or its successor company; and

(d) 30% of Yearly Transmission Charges for all other HVDC transmission systems except those covered under sub-clauses (a), (b) and (c) of this clause of this Regulation.

(4) The Yearly Transmission Charges for the National Component shall be shared by all drawee DICs and injecting DICs with untied LTA in proportion to their quantum of LongTerm Access plus Medium-Term Open Access and untied LTA respectively.”

“6. Components and sharing of Regional Component (RC) (1) Regional Component shall be sum of the following components:

(a) Regional Component of HVDC (RC-HVDC) comprising of 70% of Yearly Transmission Charges of HVDC transmission systems planned to supply power to the concerned region, except HVDC transmission systems covered under sub clauses (a),(b) and (c) of Clause (3) of Regulation 5; and -----

(3) Yearly Transmission Charges covered under sub-clause (b) of Clause (1) of this Regulation shall be shared by drawee DICs of the region and injecting DICs (with untied LTA) of the same region, in proportion to their quantum of Long-Term Access plus Medium Term Open Access and untied LTA, respectively.”

112. In view of the above, as per Regulation 5(3)(d) and Regulation 6(1)(a) of the 2020 Sharing Regulations, 30% of the Yearly Transmission Charges (YTC) with effect from COD of the transmission asset shall be part of National Component and 70% of Yearly transmission charges for Raigarh-Pugalur-Thrissur System is under Regional Component.

113. To summarise, the AFC allowed for the transmission asset for the 2019-24 tariff period in this order are as follows:

Particulars	(₹ in lakh)		
	2021-22 (Pro-rata 158 days)	2022-23	2023-24
AFC	7270.29	17689.67	18229.67

114. The Annexure given hereinafter form part of the order.



115. This order disposes of Petition No. 242/TT/2021 in terms of the above findings and discussions.

**sd/-**  
**(P.K. Singh)**  
**Member**

**sd/-**  
**(Arun Goyal)**  
**Member**

**sd/-**  
**(I.S. Jha)**  
**Member**



**ANNEXURE**

2019-24  Capital Expenditure	Admitted Capital Cost as on 1.4.2019/COD (₹ in lakh)	Projected ACE (₹ in lakh)			Admitted Capital Cost as on 31.3.2024 (₹ in lakh)	Rate of Depreciation as per Regulations	Annual Depreciation as per Regulations (₹ in lakh)		
		2021-22	2022-23	Total			2021-22	2022-23	2023-24
Building Civil Works & Colony	15541.84	543.17	1356.43	1899.60	17441.44	3.34%	528.17	559.89	875.72
Sub Station	100369.89	3927.59	8814.86	12742.46	113112.35	5.28%	5403.22	5739.62	5679.24
PLCC	5.75	0.02	0.51	0.53	6.28	6.33%	0.36	0.38	0.32
<b>Total</b>	<b>115917.48</b>	<b>4470.79</b>	<b>10171.81</b>	<b>14642.60</b>	<b>130560.08</b>		<b>5931.75</b>	<b>6299.89</b>	<b>6555.27</b>
<b>Average Gross Block (₹ in lakh)</b>							<b>118152.87</b>	<b>125474.17</b>	<b>130560.08</b>
<b>Weighted Average Rate of Depreciation</b>							<b>5.02%</b>	<b>5.02%</b>	<b>5.02%</b>

