ODISHA ELECTRICITY REGULATORY COMMISSION
BIDYUT NIYAMAK BHAWAN
PLOT NO. 4, CHUNUKOLI, SHAILESHREE VIHAR,
BHUBANESWAR-751021
****

Present: Shri G. Mohapatra, Officiating Chairperson
Shri S. K Ray Mohapatra, Member

Case No. 08/2024

Odisha Power Transmission Corporation Ltd. …… Petitioner
Vrs.
DoE, GoO & Others …… Respondents

In the matter of: Application under Chapter 3 of Odisha Grid Code (OGC) Regulations, 2015 read with Clause 16 of the Licence Conditions of OPTCL seeking approval of the revised 14th Intra State Transmission Plan for Odisha (FY 2022-23 to 2026-27).

For Petitioner: Shri B.B. Mehta, Director (Operation) & Shri P. K. Mallick, Sr. GM (RT&C) on behalf of the Petitioner-OPTCL & SLDC.

For Respondent: Ms Sonali Pattnaik, Manager (Legal), Department of Energy, Government of Odisha, Shri Amiya Kumar Mohanty, Sr. GM, Shri Akshya Kumar Das, AGM (Electrical) & Shri Susil Kumar Khuntia, AGM on behalf of M/s. OHPC Ltd., Shri Bharat Bhadawat (Chief Regulatory), TPCODL, Shri K.C. Nanda, G.M (RA & Strategy), TPWODL, Shri Sanjit Moharana, DGM, GRIDCO, Ms. Malancha Ghose, DGM (RA), TPNODL and the Representatives of TPSODL.
None appears on behalf of CEA, ERPC, M/s. OPGC Ltd. and M/s. PGCIL.

ORDER

Date of Hearing: 18.06.2024 **Date of Order: 02.08.2024**

The Petitioner OPTCL (State Transmission Utility) is entrusted with the responsibility of preparing a long-term Transmission System expansion plan and submitting the same before the Commission for approval under various applicable provisions under the Electricity Act, 2003, Odisha Grid Code (OGC) 2015 and Licence Conditions. The Intra-State transmission planning for expansion and system strengthening need to be based on long-term load flow studies and as per the mandate under Section 39(2) of the Electricity Act, 2003. It should be finalised in consultation with CTU, State Government, Generating Companies, Regional Power Committee, Central Electricity Authority etc. The extract of the Electricity Act, 2003, Licence Conditions and the Odisha Grid Code, 2015 depicting the relevant provisions are given below:

Extracts of Electricity Act, 2003

As per the Section 39(2) of the Electricity Act, 2003:

The functions of the State Transmission Utility shall be -

(a) to undertake transmission of electricity through intra-State transmission system;

(b) to discharge all functions of planning and co-ordination relating to intra-State transmission system with –

(i) Central Transmission Utility;

(ii) State Governments;

(iii) generating companies;

(iv) Regional Power Committees;

(v) Authority;

(vi) licensees;

(vii) any other person notified by the State Government in this behalf;

(c) to ensure development of an efficient, co-ordinated and economical system of intra-State transmission lines for smooth flow of electricity from a generating station to the load centres;

(d) XXX

Extract of Orissa Grid Code Regulations, 2015

*3.8 **PERSPECTIVE PLAN***

(1) The STU is charged with the responsibility to prepare and submit a long-term (10 years) plan to the Commission for Transmission System expansion to meet the future demand in accordance with the Licence Conditions and the practice direction of the Commission.

(2) For fulfilment of the above requirement the STU shall:

(a) Forecast the demand for power within the State in each of the succeeding five years and provide to the Commission details of the demand forecasts, data, methodology and assumptions on which the forecasts are based.

(b) GRIDCO shall prepare a least cost generation plan for the State to meet the ten years load demand as per the forecast, after examining the economic, technical and environmental aspects of all available alternatives taking into account the existing contracted generation resources and effects of demand side management.

(c) Discharge all functions of planning and co-ordination relating to the State Transmission System compatible with the above load forecast and generation plan a long-term (10 years) plan for the Transmission System in accordance with Section-39 (2) (b) of the Act, compatible with the above load forecast and generation plan in consultation with CEA. Central Transmission Utility (CTU) shall have to be consulted in connection with systems to evacuate power from inter-State Transmission System.

(3) The STU shall prepare and submit to the Commission on an annual basis, a statement showing in respect of each of the 5 succeeding financial years forecasts of circuit capacity, power flows and loading on the Transmission System under Transmission Licence General Conditions Clause-15.5 of Appendix 4B to OERC (Conduct of Business) Regulations, 2004.

Extracts of Transmission Licence Conditions

CONDITION 16.1

The Licensee shall plan and operate the Transmission System, so as to ensure that Transmission System built, operated and maintained to provide an efficient, economical and co-ordinated system of Transmission, in accordance with the Orissa Grid Code and the Overall Performance Standards.

2. OPTCL, in obedience to the provisions under Section 39 (2) of the Electricity Act, 2003 read with Regulation 3.8 (1) of Odisha Grid Code, 2015 and Conditions 16 of the Licence Condition had filed the 14th Intra State Transmission Plan (ISTP) report of Odisha for the period from FY 2022-23 to 2026-27. Accordingly, the Commission, vide order dated 12.01.2022 in Case No. 49/2021, had granted in-principle approval to the feasible projects (13 nos. of Sub-stations, 8 nos. of transmission lines and up-gradation of Transformer capacity in 38 nos. of existing sub-stations) for implementation during the 14th plan period (FY 2022-23 to 2026-27) under the Intra-State Transmission Plan. The Status of Substations with associated lines approved in the 14th Transmission Plan are as follows:

Table-1

Sl.	Substations	Voltage Level	Scheme	Remark
1	Begunia (Khurda)	765 kV	OTPCL commissioning deferred	Not considered in Revised TP as OTPCL commissioning deferred
2	Khuntuni (Cuttack)	400 kV	400 kV	Not considered at Khuntuni in rev TP as proposed Industrial loads differed their schedule of commissioning
3	Balichandrpur (Jajpur)	220/33 kV	30% equity of GoO	Commissioning in April-24
4	M Rampur (Kalahandi)	220/33 kV	LVMS (100% equity)	Tender floated
5	Nuapada (Nuapada)	220/132 kV	CAPEX	Considered in rev TP
6	Nayapalli (Khurda)	132/33 kV	SCRIPS	Commissioning in April-24
7	Hinjilicut (Ganjam)	132/33 kV	30% equity of GoO.	Commissioned
8	Lamtaput (Koraput)	132/33 kV	30% equity of GoO.	Commissioning in Dec-24
9	Nabrangpur (Nabrangpur)	132/33 kV	30% equity of GoO.	Commissioned
10	Brundbahal (Kalahandi)	132/33 kV	100% Grant	Commissioning in April-24

11	Tarabha (Sonepur)	132/33 kV	100% Grant	Commissioning in Dec-24
12	Athamallik (Angul)	132/33 kV	LVMS (100% equity)	Commissioning in March-25
13	Mahanga (Cuttack)	132/33 kV		Not considered in rev TP as Balichandrapur Sub-station will meet the requirement

Note: Out of 13 approved substations, 10 nos. of Substations have been considered in the revised 14th Transmission Plan.

3. The 14th Intra-state Transmission Plan has been revisited due to the expected load growth in areas like Paradeep (1400 MW), Gopalpur (1000 MW), Duburi (1400 MW), Joda (482 MW) and Neulapoi (660 MW) for which transmission system study is required for integration of these bulk loads with the existing network of OPTCL to design and develop of an efficient and effective Electrical Transmission System. In addition to these loads, several other expected load growths like Paradeep Plastic Park (80 MW), Angul Aluminium Park (90 MW) and Bhadrak Textile Park (60 MW) have been taken into consideration in FY 2026-27. The study also provides a plan for the evacuation of 1320 MW of power from TTPS and 400 MW of power from NLCIL. OPTCL has also considered some of the new Grid Substations as proposed by DISCOMs in the Revised 14th Intra-state Transmission Plan to meet the upcoming load growth and to address low voltage issues, ensuring no stranded assets.
4. Accordingly, OPTCL has filed the Revised 14th Intra State Transmission Plan for Odisha for the period from FY 2022-23 to 2026-27 on 15.02.2024 for approval of 20 nos. of new Sub-stations along with 33 nos. of associated Transmission lines, conversion of 20 nos. of transmission lines from S/C to D/C, 3 nos. of transmission lines for conductor upgradation and 12 nos. of existing sub-stations for up-gradation of Transformation capacity for implementation during this period.
5. Subsequently, OPTCL made an additional submission to the petition on the Revised 14th Intra-State Transmission Plan for Odisha from FY 2022-23 to FY 2026-27 on 16.03.2024. OPTCL has submitted that some industrial and commercial developments in the different pockets of the State require additional strengthening for unrestricted power supply. OPTCL as STU therefore have the responsibility to develop the Intrastate transmission system having adequate capacity to meet the power demand of all the stakeholders without fail in the overall interest of the State. The above development necessitates some additional Transmission system strengthening proposals. Accordingly, OPTCL has proposed the Revised 14th Intra-State Transmission Plan to include some additional system-strengthening proposals along with the modified connectivity in the original proposals.

6. As in the subsequent petition dated 16.03.2024, OPTCL has proposed some system-strengthening proposals along with the modified connectivity without any system study, the Commission during the hearing on 02.04.2024 directed OPTCL to file its consolidated amended Petition by 23.04.2024 incorporating revised details of projects and to submit the revised study report. Further, the OPTCL was directed to comply with the queries raised by the Commission during the hearing regarding conductor configuration for the 765 kV line, standardisation of MVA rating of transformers at 220/132 kV and 132/33 kV Grid Substations and inclusion of new lines and Substations in the revised study.

7. During the hearing on 30.04.2024, OPTCL prayed for two weeks' time to file their consolidated amended Petition with details of its projects, the required transmission system study report and reply to the queries of the Commission made during the hearing of the case on 02.04.2024 which could not be filed due to paucity of time. Accordingly. the Commission allowed OPTCL to file the consolidated amended Petition by 13.05.2024.

8. In compliance with the directions of OERC in the interim order dated 30.04.2024, OPTCL has filed its consolidated amended petition on the Revised 14th Intra-state Transmission Plan of Odisha for the period FY 2022-23 to FY 2026-27 on 10.05.2024 with details of its projects along with the required study report. Subsequently, OPTCL filed a corrigendum on 30.05.2024 to the aforesaid petition filed on 10.05.2024 wherein, it has submitted that some inadvertent errors have been made in the petition filed on 10.05.2024 for which few corrections were proposed for consideration and requested for condonation of these inadvertent errors.

9. The present Application has been filed by OPTCL in fulfilment of requirements as mandated under various provisions of the Act, OGC and Licence Conditions of OPTCL. The Revised 14th Intra-State Transmission planning study report covers load flow analysis, contingency analysis, short circuit study and Transient stability analysis which has been prepared through the Consultant M/s. Power Research & Development Consultants Pvt. Ltd. (PRDC). The submissions of OPTCL are as stated hereafter:

   a) FY 2022-23 has been considered as the base year and case study has been carried out for the following scenarios:

Table-2

Planning study in different Scenarios				
Sl. No	**Scenarios**	**Peak demand (MW)**	**Date**	**Time of**
1	Summer peak	5809*	13th June 2022	11.00 PM
2	Winter Lean	3009	12th January 2022	2.00 AM
3	Solar Peak	4195	21st October 2022	11.45 AM

4	Low Hydro	4442	15th June 2022	4.00 PM
5	High Hydro	5116	8th September 2022	8.00 PM

* 5809 MW= 5278 + 531(Open access)

The Transmission planning study includes a feasibility study for 33 nos. of new Grid Substations proposed by all four DISCOMS (TPCODL, TPNODL, TPSODL& TPWODL).

b) The following important points have been considered in the revised planning study.

- Peak demand as per SLDC for the financial year 2022-23 is considered for the base case.
- DISCOM-wise Demand forecasting data.
- Industrial load growth in different areas as proposed by Govt. of Odisha.
- 765/400kV and 400/220kV substations proposed due to upcoming industrial hubs by the year 2026-27.
- 400kV Ring network is developed across the state for a stable power supply.
- Evacuation of powers of NLCIL (2x800MW) and TTPS Expansion (2x660MW).
- Plastic Park at Paradeep, Textile Park at Bhadrak, Aluminum Park at Angul.
- Industrial Park at Mundamba.
- Green hydrogen and Green Ammonia plant(s) at Gopalpur and Paradeep.
- Tata steel expansion at Duburi, upcoming industries in the Joda area.
- Solar Manufacturing Plant at Neulapoi.
- Loads Considered in Summer Peak Study for the FY 2022-23 to 2026-27.

Table-3

Sl. No	Particulars	2022-23	2023-24	2024-25	2025-26	2026-27
1	TPCODL	1327	1418	1484	1536	1589
2	TPNODL	588.9	623	627	646	710
3	TPSODL	494	513	541	556	571
4	TPWODL	894	935	987	1032	1096
Total DISCOM load		**3303**	**3490**	**3638**	**3770**	**3966**
Sectoral Loads						
1	Loads considered at 33kV and 11kV level	**3303**	**3490**	**3638**	**3770**	**3966**
2	Industrial loads considered	2098	2383	2440	2440	6936
3	Traction loads considered	408	418	418	418	418
4	Total Peak System Demand	5809	6291	6497	6628	11320
	Open Access (Less)	531	531	531	531	531
	ISTS Load (Less)					-2000
Total peak load		**5278**	**5760**	**5966**	**6097**	**8789**

c) Year-wise Load Generation Balance Report (LGBR) in summer peak:

Table-4

Sl. No.	Particulars	Generation (MW)				
		2022-23	**2023-24**	**2024-25**	**2025-26**	**2026-27**
1	State sector	3513	3513	3513	3513	3913
2	Central Sector	1941	1941	1941	1941	2469
3	IPP/CGP	893	893	893	893	893
Available power in Odisha		**6347**	**6347**	**6347**	**6347**	**7275**
1	Total Load	5278	5760	5966	6097	8789
2	Total losses	163	172	172	175	247
Power Consumed in Odisha		5441	5932	6138	6272	9036
Import (-)/ Export (+)		906	415	209	75	-1761

d) The Intra-State Transmission Planning study report covers the load flow & short circuit study for the following 05 different scenarios & Transient Stability Analysis.

- Load flow and short circuit study (**Summer Peak**)
- Load flow and short circuit study (**Winter Lean**)
- Load flow and short circuit study (**Solar Peak**)
- Load flow and short circuit study (**Low Hydro**)
- Load flow and short circuit study (**High Hydro**)

e) Observations of Load Flow Analysis from FY: 2022-23 to 2026-27

- Line loadings are within the acceptable limits for FY 2022-23 to 2026-27.
- During normal operating conditions loading of all 765 kV, 400 kV, 220 kV & 132 kV lines and transformers are within 80% of thermal loading limit.
- 275 MVAr capacitor banks are found to be adequate to maintain the voltage profile within the grid code limits up to FY 2026-27. Further, with the network augmentation plans in subsequent years, the voltage profiles at all proposed substations for the years 2022-23 to 2026-27 are within the grid code limits except Chandikhol 132/33 kV S/S.

f) N-1 Contingency Observations from FY: 2022-23 to 2026-27:

- Line loadings and bus voltages are well within the acceptable limits during the normal operating conditions for FY 2022-23 to 2026-27.
- During normal operating conditions, loading of all 765 kV, 400 kV, 220 kV & 132 kV lines and transformers are within 80% of the thermal loading limit. Further, loading may vary based on various load generation scenarios.

- During N-1 batch mode contingency analysis, a few lines get overloaded. Augmentation of these lines is proposed considering various methods to maintain optimum loading during contingency conditions. Accordingly, augmentation proposals for transmission lines are given:
  - Conversion of line from S/C to D/C
  - Replacement of existing conductors by HTLS conductors
  - Construction of new lines

g) Observations on Short Circuit Study:

- Year-wise fault current (in kA) of 400 kV and 220 kV Substations (Three phase to ground and single line to ground) are exceeding 80% (but within 100%) except for 3 Nos. of Sub stations i.e. Lapanga, Budhipadar and Meramundali-A where fault current exceeding 100% of breaking capacity of respective circuit breakers.
- On the basis of the short circuit study OPTCL has proposed the following:
  - Meramundali-A, and Budhipadar 220 kV substations having 40 kA breakers are presently in high fault level zones. It is recommended to upgrade the breaker of Meramunduli-A to 63 kA, and upgrade the Budhipadar 220/132 kV AIS to 400/220 kV GIS to accommodate upcoming generations, and CGPs.
  - Budhipadar 220 kV substation having 40 kA breaker is in high fault level zones up to year 2025-26. The fault level will reduce in 2026-27, as Bhusana Steel and Aditya Alumina are shifted to Lapanga 400kV. It is recommended to upgrade the breaker to 63 kA until the shifting.
  - After generation shifting, the Lapanga 400 kV bus is recommended to be modified using a split bus arrangement to accommodate the existing breaker capacity.

h) Observations on Transient stability studies for FY 2026-27:

Based on the transient stability studies simulated for the disturbances created on 765 kV, 400 kV & 220 kV lines, 400/220 kV interconnecting transformers, generator outages and load disturbances of the OPTCL system, it is observed that the system is stable and the frequency & rotor angle swing damp with time.

i) Transmission Loss:

OPTCL has submitted that it is also observed from the study that the system losses

(transmission and transformation) are within the acceptable limit as per the grid code mentioned in the Table below.

Table-5

FY	System Losses (%)
2022-23	2.8%
2023-24	2.7%
2024-25	2.6%
2025-26	2.6%
2026-27	2.38%

j) Based on the Transmission Planning study report OPTCL has proposed 24 nos. new Substations (Including two ISTS Substations) in the Odisha network from FY 2024-25 to 2026-27.

Table-6

Year-wise proposed Substations					
Voltage Level (kV)	**FY 2022-23**	**FY 2023-24**	**FY 2024-25**	**FY 2025-26**	**FY 2026-27**
765/400	-	-	-	-	3*
400/220	-	-	-	-	4
220/132	-	-	-	-	2
220/132/33	-	-	1	1	-
220/33	-	-	5	-	4
132/33	-	-	4	-	1
Total	-	-	**10**	**1**	**14**

k) Proposals of new Substations and associated lines for FY 2024-25:

Table-7

Sl. No.	Substation	Voltage level	PTR in MVA	Scheme	Connectivity
1	Nua Betanda Dist: Cuttack	220/33	2x40	OTSSP-1	LILO of 220 kV D/c line from Erasama (400 kV S/S) to Pratapsasan (220 kV S/S) at Nuabetanda S/S
2	Sarasmal Dist: Sonepur	220/33	2x40	OTSSP-1	LILO of 220 kV S/c line from Katapali to Kiakata S/S at Sarasmal S/S.
3	Parjang Dist: Dhenkanal	220/33	2x20	OTSSP-1	LILO of 220 kV S/c line from Meramunduli-B (400/220 kV S/S) to Duburi Old (220/132 kV S/S) at Parjang S/S
4	Hatabasta Dist: Nayagarh	220/33	2x40	OTSSP-1	LILO of 220 kV S/c line from Mendhasal (220 kV S/S) to Bhanjanagar (220 kV S/S) at Hatabasta S/S.

Sl. No.	Substation	Voltage level	PTR in MVA	Scheme	Connectivity
5	Bhandaripokhari Dist: Bhadrak	220/33	2x40	OTSSP-2	LILO of 220 kV S/c line from Bhadrak (220/132 kV S/S) to Duburi New (220/132 kV S/S) at Bhandaripokhari 220/33kV S/S
					LILO of 220 kV S/C line from Balasore (220/132 kV S/S) to Duburi New (220/132 kV S/S) at Bhandaripokhari 220/33 kV S/S
6	Khalikote Dist: Ganjam	220/33	2x40	OTSSP-1	LILO of 220 kV S/c line from Atri to Narendrapur S/S at Khalikote S/S.
7	Bijepur Dist: Bargarh	132/33	2x20	OTSSP-1	LILO of 132 kV S/c line from Bargarh New (220/132/33 kV S/S) to Ghens (132/33 kV S/S) at Bijepur S/S
8	Raighar Dist: Nabarangapur	132/33	2x20	OTSSP-1	LILO of 132 kV S/c line from Umarkote (132/33 kV S/S) to Dabugaon (132/33 kV S/S) at Raighar S/S.
9	Jarabandha Dist: Baragarh	132/33	2x20	OTSSP-1	LILO of 132 kV S/C line from Nuapada S/S to Padampur S/S at Jarabandha S/S.
10	SCB Medical Dist: Cuttack	132/33	2x63	SCRIPS	132 kV S/c UG cable from Brajabiharipur to SCB Medical (132 kV S/S).
					132 kV S/c UG cable from Bidanasi to SCB Medical S/S.

l) Proposals of new Substations and associated lines for **FY 2025-26:**

Table-8

Sl. No.	Substation	Voltage level	PTR in MVA	Scheme	Connectivity
1	Komna Dist: Nuapada	220/132	2x100	CAPEX	220 kV D/c line from Komna to Kesinga S/S.
		132/33	2x40		132 kV S/c line from Komna to Kantabanjhi S/S.
					132 kV S/c line from Komna 220 kV to Khariar S/S.
					132 kV S/c line from Komna to Nuapada S/S

m) Proposals of new Substations and associated lines for **FY 2026-27:**

Table-9

Sl. No.	Substation	Voltage level	PTR in MVA	Scheme	Connectivity
1	Paradeep PG (ISTS) Dist: Jagatsinghpur	765/400	2x1500	ISTS	765 kV D/c line from Duburi to Paradeep PG 765/400 kV S/S.
					400 kV D/c line from Paradeep PG (765/400 kV S/S) to Erasama (400/220 kV S/S)
2	Gopalpur PG (ISTS) Dist: Ganjam	765/400	2x1500	ISTS	765 kV D/c line from Anugul PG (765/400 kV S/S) to Gopalpur PG (765/400 kV S/S)
					400kV D/c line from Gopalpur PG (765/400 kV S/S) to Gopalpur (400/220 kV S/S)
3	Duburi-765 kV Dist: Kendujhar	765/400	2x1500	CAPEX	LILO of 765 kV D/c line from Angul PG (765/400 kV S/S) to Paradeep PG (765/400 kV S/S) at Duburi (LILO part only)
					400 kV D/c line from Duburi (765/400 kV S/S) to Duburi (400/220 kV S/S)
4	Remuli (Joda) Dist: Kendujhar	400/220/33	3x500 (3rd ICT to be installed progressively with demand growth)	TBCB	LILO of 400 kV D/c line from Bishra S/S to NTPC Kaniha S/S at Remuli S/S
					LILO of 220 kV S/c Line from Joda to TTPS at Remuli S/S
					LILO of 220 kV S/c Line from Joda to Kendujhar S/S at Remuli S/S
5	Barbil Dist: Kendujhar	220/132/33 (upgradation of existing 132/33 kV S/S)	2x160	TBCB	220 kV D/c line (HTLS) from Remuli (Joda) S/s to Barbil S/S
6	Neulapoi Dist: Dhenkanal	400/220	2x500	OTSSP-2	LILO of 400 kV D/c line from Meramunduli-B to Duburi S/S at Neulapoi S/S
					LILO of 400 kV D/c line from Meramunduli-A to Mendhasal at Neulapoi S/S

7	Khuntuni Dist: Dhenkana	220/132	2x160	OTSSP-2	220 kV D/c line from Neulapoi to Khuntuni S/S
8	Bhandaripokhari Dist: Bhadrak	400/220	2x500	OTSSP-2	LILO of 400 kV S/c line from Duburi to Kuchei PG S/S at Bhandaripokhari S/S
					LILO of 400 kV S/c line from Pandiabil PG S/S to Kuchei PG S/S at Bhandaripokhari S/S
9	Theruvali Dist: Rayadada	400/220	2x500	CAPEX	LILO of 400 kV D/c line from Gopalpur (400/220 kV S/S) to Jayanagar PG (400/220 kV S/S) at Theruvali (400/220 kV S/S)
					400 kV D/c line from Indravati (400/220 kV S/S) to Theruvali (400/220 kV S/S)
10	Angul Alluminium Dist: Angul	220/33	2x40	OTSSP-2	LILO of 220kV S/c line from Meramunduli-A to Bhanjanagar S/S at Angul new S/S
11	Paradeep Plastic Dist: Jagatsinghpur	220/33	2x40	OTSSP-2	LILO of 220 kV D/c line from IOCL to Paradeep old at Paradeep Plastic S/S
12	Mundamba Industrial Park Dist: Khurdha	220/33	2x40	OTSSP-2	LILO of 220 kV S/c from Atri to Narendrapur S/S at Mundamba S/S
13	Chitalo Dist: Jajpur	220/33	2x40	LVMS	LILO of 220 kV S/c from Paradeep to Duburi New S/S at Chitalo S/S
14	Manmunda Dist: Boudh	132/33	2x40	GEETC	LILO of 132 kV S/c from Sonepur to Boudh S/S at Manmunda S/S

n) Further, based on the Transmission Planning study report, OPTCL has proposed some new Transmission lines, conversion of the existing S/c line to D/c lines, Conversion of the existing ACSR Panther conductor to HTLS Conductor and laying of new 132 kV UG Cable lines in the Odisha network from FY 2024-25 to 2026-27.

Table-10

ABSTRACT OF NEW PROPOSALS OF TRANSMISSION LINES					
Sl.	**Transmission**	**765 kV**	**400 kV**	**220 kV**	**132 kV**

No.	Lines	Km	No of lines	Km	No of lines	Km	No of lines	Km	No of lines
1	Construction of New D/c Transmission Lines	20	1	1514	9	752	5	158	2
2	Construction of New S/c Transmission Lines	-	-	220	2	998	13	714	12
3	Conversion of existing S/c line to D/c line	-	-	-	-	-	-	293.59	8
4	Conversion of existing ACSR Panther conductor to HTLS Conductor	-	-	-	-	-	-	191.9	7
5	132 kV UG Cable lines	-	-	-	-	-	-	170.2	10
	Total:	**20**	**1**	**1734**	**11**	**1750**	**18**	**1527.69**	**39**

o) List of New Transmission Lines Considered in Revised 14th Transmission Plan:

Table-11

Sl. No	Name of Line	Root Length	Distance in Total Ckt. Km	Year of Com.
765kV				
1	LILO of 765 kV D/c line from Anugul (765/400 kV S/S) to Paradeep PG (765/400kV S/S) at Duburi 765/400kV S/S (LILO part only)	5	20	2026-27
400kV				
1	400 kV D/c line from Paradeep PG (765/400 kV S/S) to Ersama 400 kV S/S	30	60	2026-27
2	400 kV D/c line from Gopalpur PG (765/400 kV S/S) to Gopalpur (400/220 kV S/S)	15	30	2026-27
3	400 kV D/c line from Duburi (765/400 kV S/S) to Duburi (400/220 kV S/S)	110	220	2026-27
4	LILO of 400 kV D/c line from Bishra (400/220/33 kV S/S) to STPS Kaniha at Joda (400/220 kV S/S)	60	240	2026-27
5	400 kV D/c line from Gopalpur (400/220 kV S/S) to Pandiabil (400/220 kV S/S)	132	264	2026-27
6	400 kV D/c line from Indravati (400/220 kV S/S) to Theruvali (400/220 kV S/S)	100	200	2026-27
7	LILO of 400 kV D/c line from Meramunduli-B to Duburi New S/S at Neulapoi S/S	60	240	2026-27
8	LILO of 400 kV D/c line from Meramunduli-A to Mendhashal S/S at Neulapoi S/S	50	200	2026-27

Sl. No	Name of Line	Root Length	Distance in Total Ckt. Km	Year of Com.
9	LILO of 400 kV S/c line from Duburi to Kuchei at Bhandaripokhari 400/220/33 kV S/S	60	120	2026-27
10	LILO of 400 kV S/c line from Pandiabil PG to Kuchei PG S/S at Bhandaripokhari 400/220/33 kV S/S	50	100	2026-27
11	400 kV D/c line from TTPS to Meramundali-B S/S	30	60	2026-27
220kV				
1	LILO of 220 kV S/c line from Erasama 220 kV S/S to Pratapsasan 220 kV S/S at Nuabetanda S/S	40	80	2024-25
2	LILO of 220 kV S/c line from Katapali S/S to Kiakata S/S at Sarasmal S/S	50	100	2024-25
3	LILO of 220 kV S/c line from Meramunduli-B (400/220kV S/S) to Old Duburi (220/132kV S/S) at Parajanga S/S	30	60	2024-25
4	LILO of 220 kV S/c line from Mendhasal S/S to Bhanjanagar S/S at Hatabasta S/S.	60	120	2024-25
5	LILO of 220 kV S/c line from 220 kV Atri to Narendrapur S/S at Khalikote S/S	55	110	2024-25
6	LILO of 220 kV S/c line from Bhadrak (220/132kV S/S) to Duburi New (220/132kV S/S) at Bhandaripokhari 220/33kV S/S	32	64	2024-25
7	LILO of 220 kV S/c line from Balasore (220/132kV S/S) to Duburi (220/132 kV S/S) at Bhandaripokhari 220/33 kV S/S	35	70	2024-25
8	220 kV S/c line from Komna to Kesinga S/S	80	80	2025-26
9	LILO of 220 kV D/c Line from Balimela to Jayanagar S/S at Gobindpalli S/S	98	392	2025-26
10	220 kV D/c Line from Theruvali to Kesinga S/S	120	240	2025-26
11	LILO of 220 kV D/c Line from Joda to TTPS S/S at Joda New S/S	5	20	2026-27
12	LILO of 220 kV S/c Line from Narendrapur (220/132 kV S/S) to Aska New (220/33 kV S/S) at Gopalpur 400/220 kV S/S	34	68	2026-27
13	LILO of 220 kV S/c Line from Narendrapur (220/132kV S/S) to Gunupur (220/132/33 kV S/S) at Gopalpur 400/220 kV S/S	35	70	2026-27
14	220 kV D/c line from Neulapoi to Khuntuni S/S	40	80	2026-27
15	LILO of 220 kV S/c line from Meramunduli-A to Narsinghpur S/S at Angul Aluminium Park S/S	38	76	2026-27

Sl. No	Name of Line	Root Length	Distance in Total Ckt. Km	Year of Com.
16	LILO of 220 kV D/c line from Paradeep (220/132/33 kV S/S) to IOCL S/S at Paradeep Plastic Park S/S	5	20	2026-27
17	LILO of S/c from Atri to Narendrapur S/S at Mundaamba S/S	20	40	2026-27
18	LILO of S/c from Paradeep (220/132/33 kV S/S) to Duburi New (220/132/33 kV S/S) at Chitalo S/S	30	60	2026-27
132 kV				
1	LILO (S/c) of 132 kV D/c line from Potangi to Podagada S/S at Lamtaput S/S	39	78	2025-26
2	LILO of 132 kV S/c line from Baragarh New (220/132/33 kV S/S) to Ghens (132/33 kV S/S) at Bijepur 132/33 kV S/S	46	92	2024-25
3	LILO of 132 kV S/c line from Umarkote (132/33kV S/S) to Dabugaon (132/33 kV S/S) at Raighar S/S.	46	92	2024-25
4	LILO of 132 kV S/c line from Nuapara to Padampur S/S at Jarabandha S/S	36	72	2024-25
5	132 kV S/c UG cable from Brajabiharipur S/S to SCB Medical S/S.	11	11	2024-25
6	132 kV S/c UG cable from Bidanasi S/S to SCB Medical S/S.	13	13	2024-25
7	132 kV S/c line from Komna to Kantabanjhi S/S	50	50	2025-26
8	132 kV S/c line from Komna to Khariar S/S	23	23	2025-26
9	132 kV S/c line from Komna to Nuapada S/S	35	35	2025-26
10	132 kV S/c line from Kantabanji S/S to Patnagarh S/S on DC tower	35	35	2025-26
11	LILO of 132 kV S/c Line from Budhipadar to Sundergarh S/S at Bamra S/S	42	84	2025-26
12	132 kV S/c line from Ghens to Padampur S/S on DC Tower	30	30	2025-26
13	LILO of 132 kV D/c line from Chhend to Nuagaon S/S at Kuarmunda S/S	35	140	2025-26
14	132 kV S/c line from Dhenkikote to Turmunga S/S	35	35	2025-26
15	132 kV D/c line from Jayapatna to Junagarh S/S	40	80	2025-26
16	LILO 132 kV S/c from Sonepur to Boudh S/S at Manmunda S/S	44	88	2026-27

p) List of New Transmission Lines considered for Conversion from S/c to D/c line in the 14th Transmission Plan:

Table-12

Sl. No.	List of Transmission Lines	Distance (Ckt. KM)	Year Considered
1	132 kV D/c line from Burla to Sambalpur	15	2024-25
2	132 kV D/c line from Paralakhemundi to Akhusing	76.9	2025-26
3	132 kV D/c line from Kendrapada to Pattamundai	19.5	2025-26
4	132 kV D/c line from Atri to Banki	29.73	2025-26
5	132 kV D/c line from Banki to Nuapatna	30	2025-26
6	132 kV D/c line from Khariar to Nuapada	72.23	2025-26
7	132 kV D/c line from Khariar to Kantabanji	30	2025-26
8	132 kV D/c line from Nimapada to Konark	20.23	2025-26

q) List of New Transmission Lines considered for Conversion of ACSR Panther to HTLS conductor in the Revised 14th intra-state Transmission Plan:

Table-13

Sl. No.	List of Transmission Lines	Distance (Ckt. KM)	Year Considered
1	132 kV S/c HTLS from Cuttack to Jagtsingpur	40	2025-26
2	132 kV S/c Kesura – Pratapsasana – Ransingpur	35	2025-26
3	132 kV S/c Chaipal to Angul	14.9	2025-26
4	132 kV S/c Angul – TTPS S/C line	16	2025-26
5	132 kV S/c Katapali to Bargarh	56	2025-26
6	132 kV S/c Joda – Barbil 2nd ckt	15	2025-26
7	132 kV S/c Bidanasi – Choudwar	15	2025-26

r) List of new 132 kV UG cable lines in the Revised 14th Transmission Plan:

Table-14

Sl. No.	List of Transmission Lines	Distance (Ckt. KM)	Year Considered
1	132 kV UG Cabling from Mendhasal S/S to Chandaka S/S	23	2025-26
2	132 kV UG Cabling from Argul S/S to Ransinghpur S/S	25	2025-26
3	132 kV UG Cabling from Chandaka S/S to Mancheswar-A S/S (D/c: 2x8 kms)	16	2025-26
4	132 kV UG Cabling from Samangara S/S to Puri S/S	6.2	2025-26
5	132 kV UG Cabling from Narendrapur S/S to Berhampur S/S	27	2025-26
6	132 kV UG Cabling from Autonagar to Narendrapur S/S and Autonagar to Berhampur S/S (24 km) (two circuits)	24	2026-27
7	132 kV UG Cabling from Samuka S/S to Puri S/S	10	2025-26
8	132 kV UG Cabling from Balasore S/S to Chandipur S/S	15	2025-26

s) List of Line Reactors & Bus Reactors in the Revised 14th Transmission Plan:

Table-15

Station Name	765 kV		400 kV	
	Line reactor	Bus reactor	Line reactor	Bus reactor
Gopalpur	-	2x330	-	2x125
New Duburi	-	2x330	-	2x125
Paradeep New	-	2x330	-	2x125
Joda	-	-	-	2x125
Narendrapur	-	-	2x50	2x125
Theruvali	-	-	2x50	2x125
Neulapoi	-	-	-	2x125
Bhandari Pokhari	-	-	-	2x125

t) OPTCL has proposed some augmentation of Transformer capacity in the Revised 14th Intra-State Transmission Plan for Odisha from FY 2022-23 to 2026-27:

Table-16

Sl. No.	Substation Name	Substation capacity before augmentation (MVA)	No. Units x Unit capacity after augmentation (MVA)
2024-25			
1	Cuttack	3x40	1x40+2x80
2	Soro	2x20+1x40	1x40+1x80
3	Unit-8	2x40	1x40+1x80
4	Baragarh Old	3x40	2x40+1x80
5	Baragarh New	2x12.5	2x40
6	Atri	2x20	2x40
7	Satasankha	2x20	2x40
8	New Bolangir	1x20+1x40	2x40
2025-26			
1	Balasore	3x63	1x63+2x80
2	Somnathpur	2x12.5	2x20
3	Phulnakhara	2x20+1x40	1x40+2x80
4	Lapanga	2x315	2x315+1x500
5	Nayaghar	2x40+1x20	2x40+1x80
6	Jagatsinghpur	1x40+2x20	1x40+2x80
7	Chhend	3x40	1x40+2x80
8	Khariar	3x40	2x40+1x80
9	New Duburi	2x315	2x315+1x500
10	Betanati	1x20+1x40	1x40+1x80

u) OPTCL prays that the Commission may accord approval of the Revised 14th Intra-State Transmission Plan for Odisha from FY 2022-23 to 2026-27 prepared and submitted by OPTCL.

The views of the Respondents on the Application and the Rejoinder of OPTCL are as stated hereafter:

10. The Respondent- TPWODL has made the following submissions:

(a) TPWODL in its earlier occasion has requested for the inclusion of 10 Nos. of GSS at strategic locations, out of which only 4 Nos. GSS are considered and the remaining 6 Nos. GSS has not been considered in the Revised 14th Intra State Transmission Planning even though the TPWODL is repeatedly requesting before OPTCL with justification for consideration with priority to address low voltage issues and proper load management. Therefore, TPWODL has again proposed 6 Nos. GSS i.e. Koida, Subdega, Titlagarh, Basantpur, Bagdihi and Sason with detailed justifications for inclusion in OPTCL's Revised 14th Intra State Transmission Planning. Since this plan extends until FY 2026-27, it is crucial to address these GSS to accommodate future load growth and avoid issues with loading and voltage profiles.

(b) Similarly. OPTCL has proposed 7 Nos. of New Transmission Lines for Conversion from S/c to D/c line in the Revised 14th Intra State Transmission Planning out of which 3 Nos. are under the TPWODL area. However, earlier in the instant case, the OPTCL has proposed 7 Nos. of Transmission Lines under the TPWODL area which are not considered in the present filing. Hence, the TPWODL has requested OPTCL to consider the earlier proposals along with a new one for a total of 10 Transmission Lines under the TPWODL area.

(c) OPTCL has proposed 46 Nos. of new Transmission Lines to be created, of which 12 Nos. are under the TPWODL area. TPWODL has supported the proposal by stating that these 12 new lines will provide N-1 reliability and will also mitigate N-1 contingency overloading caused due to outage of some lines.

(d) TPWODL has submitted that out of the proposed 7 Nos. of Transmission Lines for conversion of ACSR Panther to HTLS Conductor by OPTCL, 1 No. Transmission Lines i.e. 132 kV S/C Katapali to Bargarh is under the TPWODL area. The TPWODL has supported the proposal as HTLS will enhance security reserves and transmission capacity without impacting the existing tower thus eliminating right-of-way issues. Additionally, by using HTLS conductors, more clearance to the ground is gained. Similarly, OPTCL has also proposed 18 Nos. of Sub-stations for capacity augmentation out of which 6 Nos. are under TPWODL jurisdiction serving key industrial loads round the clock.

(e) OPTCL has proposed the Jharbandh Substation at the capacity of 2x20 MVA. However, TPWODL has requested OPTCL to consider a capacity of 2x40 MVA for

the upgradation instead of 2x20 MVA with the sanctioned amount for meeting heavy loads in future.

11. The OPTCL in their Rejoinder to the issues raised by TPWODL, has submitted that:

(a) Regarding non-consideration of the Grid substation as proposed by TPWODL, OPTCL has submitted that out of the 09 nos. of Grid Substation as proposed by TPWODL, 04 nos. of Grid Substation i.e. Sarasmal, Bijepur, Jharbandh & Komna have already been considered in the Revised 14th Intra-state Transmission Plan. However, Grid Substations i.e. Koida, Subdega, Titlagarh, Baantpur, Bagdihi and Sason as proposed by TPWODL have not been considered in the said transmission plan as some projects i.e. Baantpur, Bagdihi and Sason have not been intimated earlier to OPTCL and with respect to the balance proposed Substations OPTCL has suggested some alternative arrangements. However, new proposals received at a later stage will be deliberated in detail along with a joint study in the upcoming Transmission, Distribution Planning & Coordination meeting to be convened under the chairmanship of CMD, OPTCL. Accordingly, proposals will be taken up to the Commission for approval.

(b) Regarding Transmission Lines for Conversion of S/c to D/c line, OPTCL has submitted that the proposals that have not been considered in the Revised 14th Transmission Plan may be considered in the subsequent Transmission Plan as per the load demand.

(c) The upcoming perspective load details with the tentative date of commissioning have not been mentioned by the respondent TPWODL. As far as the viability of a proposed Substation is concerned, the Firm capacity of GSS has been considered by DISCOMs which is not in uniformity with CEA planning criteria.

12. The Respondent- TPNODL has made the following submissions:

TPNODL has proposed a total peak load of 49.74 MVA (existing 20.5 MVA and proposed 29.24 MVA) for the Chandipur Grid Sub-station which exceeds the firm capacity of Chandipur Grid Substation (2x20 MVA) i.e. 40 MVA. Further additional load growth of approximately 10.78 % per year has also been considered. Therefore, for the reliability of power supply during peak loading conditions, TPNODL has requested OPTCL to consider the required upgradation of PTR capacity at Chandipur Grid Sub-station from existing 2x20 MVA capacity to either (1x20 MVA + 1x40 MVA) or (1x20 MVA + 1x63 MVA) in the Revised 14th Intra-State Transmission plan

13. The OPTCL in their Rejoinder to the issues raised by TPNODL, has submitted that:

In the Revised 14th Transmission Planning study, 2X20 MVA capacity has been considered

for 132/33kV Chandipur Grid Sub-station as the load of the S/S was 7.8 MW during FY 2022-23 (being considered as the base year) based on data received from SLDC. However, in August 2023 (FY: 23-24) the maximum demand for Chandipur GSS touched 20.5MW. Hence, OPTCL will upgrade the 20MVA transformer to 40MVA in future, looking at the growing demand.

14. The Respondent- TPSODL has made the following submissions:

(a) For the augmentation of PTR at the existing Grid Substation or for the proposed new GSS, the planning of the PTR capacity should consider the N-1 arrangement or firm capacity.

(b) TPSODL has requested OPTCL to consider a new Grid Substation at the Autonagar industrial area in Berhampur City vide its earlier submission made on 21st March 2024. Further, TPSODL has requested to consider the same in the Revised 14th Intra-state Transmission planning for improvement of reliability of supply in the area under consideration as well as for Berhampur City.

(c) Peak loading of PTR (during N-1 condition) is observed to be above 80% at Umerkote, Sonepur, Chhatrapur, Ganjam, Rayagada, Muniguda and Sunabeda GSS. Planning of Augmentation or addition of PTR needs to be considered under the revised transmission plan.

(d) Grid Substations at Nabrangpur, Kasipur, Chikiti, Boriguma, Muniguda and Pottangi have only one PTR and do not comply with the N-1 provision. The planning of additional PTR needs to be considered under the revised transmission plan.

(e) TPSODL has requested for Augmentation of overloaded PTR at Berhampur Grid Substation under the revised transmission plan.

(f) To improve the voltage in the TPSODL area, installation of Capacitor banks, and adjustment of Tap changers are to be ensured at all Grid Substations supplying power to the TPSODL area.

(g) TPSODL has further requested for earlier commissioning of already approved schemes for Lamtaput, Baliguda, and R.Udaygiri to improve the quality of power supply in the areas.

(h) The loading of the PTR / Grid Substations as mentioned in section- Transformer loading during summer peak-Annexure iii page no 39-47 (like Umerkote, Muniguda, Nabarangapur, etc.) needs to be reviewed and planned as per the correct loading.

(i) As per the study report, the year-wise peak demand projection of TPSODL during the

summer peak (in MW) is mentioned as 571 MW till FY 2026-27 which seems to be very low. TPSODL has submitted the peak demand projection as follows:

Table-17

FY	Projection submitted by TPSODL	As per the study report submitted by OPTCL
2022-23	686	494
2023-24	729	513
2024-25	820	541
2025-26	873	556
2026-27	904.4	571

(j) Loads due to green hydrogen projects at Gopalpur are mentioned but plans/proposals for the same have not been mentioned.

15. The OPTCL in their Rejoinder to the issues raised by TPSODL, has submitted that:

(a) As far as augmentation of PTR at existing GSS or proposed new GSS is concerned, the N-1 arrangement has already been considered in the Revised 14th Intra-state Transmission Plan study.

(b) In the Revised 14th Intra-state Transmission Plan study, both the concurrent load data and non-concurrent load data have been provided by SLDC for all the Grid Substations for FY-2022-23. The capacity of PTR has been taken into account by considering the concurrent load, the percentage of loading and also satisfying the N-1 Contingency study.

(c) The augmentation of PTR has not been considered for GSS at Berhampur & Narendrapur in the Revised 14th Intra-state Transmission Plan as Autonagar GSS has already been approved in the 13th Intra-state Transmission Plan and will share the load of Berhampur GSS along with Narendrapur GSS.

(d) As per Transmission planning criteria, the Revised 14th Intra-state Transmission Plan study has been conducted considering the normal tap position wherein low voltage issue has not been found in any pockets of the TPSODL area. As far as the installation of Capacitor Bank for improvement of voltage is concerned, installation of Capacitor banks on the 11 kV side is more effective than at 132/33 kV level of the GSS. So, it may be advisable to install capacitor banks on the 11 kV side of the PSSs to improve the voltage profile and decrease the load current.

(e) Regarding early commissioning of already approved projects, OPTCL has submitted that the Grid Substations at Lamtaput & Baliguda GSS are under progress and the Grid Substation at R. Udayagiri has been back charged from the 33 kV end.

16. The Respondent- OHPC has made the following submissions:

(a) It is observed that the following proposals earlier submitted in the 14th Intra State Transmission Planning of Odisha for the period FY 2022-23 to FY 2026-27 by OHPC have not been considered in the 14th Revised Transmission Plan.

i. The proposal of conversion of 132 kV S/c to D/c line from Burla to Sambalpur.

ii. Revival of 2nd Circuit of MHEP i.e. 132 kV Machkund-Traction line with LILO arrangement at Lamtaput GSS.

iii. Upgradation of the existing 132 kV conductor of the Machkund - Jaynager circuit.

(b) Conversion of 132 kV S/c to D/c line from Burla to Sambalpur S/S:

It is observed that the generation at HHEP, Burla could not be optimized due to power evacuation constraints. OHPC proposes to construct one 132 kV new line from HHEP, Burla to Sambalpur to provide N-1 reliability/ N-1 contingency overloading caused due to outage of some lines. But, in the recently revised 14th Intra State Transmission plan of OPTCL for the period FY2022-23 to FY2026-27, the proposal has not been considered in the petition. However, the same is reflected in the Single Line Diagram provided in the Annexures of the present petition. Hence, OHPC has prayed before the Commission to include the same in the final approval.

(c) Revival of 2nd Circuit of MHEP i.e. 132 kV Machkund-Traction line & LILO arrangement at Lamtaput GSS:

The Commission, in the order dated 12.01.2022 in Case No. 49 of 2021, had approved 132/33 kV GSS at Lamtaput and a connectivity plan for LILO arrangement of 132 kV Machkund-Traction line at 132 kV Lamtaput GSS. The same has also been reflected in the Single Line diagram provided in the Annexures of the present petition of OPTCL. But, at present, the revival of the 132 kV Machkund-Traction line has not been proposed along with the LILO arrangement at 132/33 kV Lamtaput GSS. Hence, OHPC has prayed before the Commission to direct OPTCL for the revival of the said 2nd 132 kV Circuit of Machkund i.e. MHEP-traction line with LILO arrangement at 132/33 kV Lamtaput GSS to provide N-1 reliability / N-1 contingency plan to address the persistent evacuation constraints for Odisha drawl from MHEP (Jt.) Scheme.

(d) Upgradation of the existing 132 kV conductor of the Machkund - Javnager circuit:

OHPC, in Case No. 49 of 2021, had requested to approve the upgradation of the

existing 132 kV line between Machhakund Power Station and Jayanagar Grid as the existing line is old and is not capable of transmitting power beyond 70 MW continuously. Hence, OHPC has prayed before the OERC to direct OPTCL to upgrade the existing 132 kV conductor of the Machkund-Jaynager circuit to improve the reliability of evacuation of Odisha's share of power from MHEP (Jt.) Scheme.

17. The OPTCL in their Rejoinder to the issues raised by OHPC, has submitted that:

(a) To improve the reliability of evacuation of Odisha share power from Machhkund generation, LILO of 132kV S/C line from Podagada to Pottangi at Lamtaput GSS has been proposed in the revised 14th Intra-state transmission plan.

(b) Regarding power evacuation constraints at HHEP, Burla, conversion of 132kV S/c to D/c line from Burla to Sambalpur has been considered in the Revised 14th Intra-State Transmission Plan study (SLD) and it has been listed under line augmentation proposal.

18. Heard the Petitioner and Respondents through hybrid mode on 18.06.2024. The Commission has considered their arguments and written submissions to the extent those are relevant to the matter. OPTCL was directed to submit their rejoinder in compliance to the observations of the Commission raised in its interim order dated 18.06.2024. The OPTCL has submitted as following:

i. Hexa Zebra ACSR conductor has been proposed for all 765 kV lines and the associated technical parameters are mentioned in the final report. Thermal capacity ratings of high-performance conductors are taken from the document titled “Guidelines for Rationalized Use of High-Performance Conductors” published by CEA in February 2019. The thermal rating of the ACSR conductor has been considered w.r.t to the highest operating temperature of 85°C.

ii. Spare transformers can be reutilized/reconciled in the following ways:
- All transformers with an effective life >= 30 years will be scrapped.
- Transformers rated 40 MVA and above with effective life < 30 years can be reshuffled in the year-wise capacity augmentation process subject to engineering feasibility.
- Transformers rated 20 MVA and below with an effective life of < 30 years can be taken in the stores for emergency restoration purposes.

iii. OPTCL has already considered Line and Bus Reactors in the 765 kV and 400 kV Grid Substations & Transmission Lines in their systems study. They have submitted the list of proposed Line and Bus Reactors.

19. Now the Commission proceeds to examine the proposed Substations in line with the

transmission planning criteria of CEA. The system study reports of PRDC submitted by OPTCL have been taken into consideration. Load flow studies and short-circuit studies for the Substations have been gone through. The load flow studies submitted by OPTCL justify the need for the proposed new Substations and transmission lines at the Intra-State level to meet future load growth and address operational issues. The loss level (transmission and transformations) is found to be within the limit up to FY 2026-27. As per Clause 5.1.5 of CEA's Transmission Planning Criteria 2023, the maximum short-circuit level at any new Substation bus should not exceed 80% of the rated short circuit capacity of the Substation. The 20% margin is intended to take care of the increase in short-circuit level as the system grows. From the short-circuit studies of Sub-stations, it is observed that the fault level (in kA) exceeds the short-circuit breaking capacity of circuit breakers at Budhipadar, Meramundali-A & Lapanga Substations from FY 2022-23 to 2026-27.

20. During the pendency of this case i.e. when the finalisation of Intra-State Transmission Planning (ISTP) was under active consideration of the Commission, OPTCL also submitted investment proposals for setting up of 132/33 kV Grid Sub-station (GSS) at Jharbandh and 3 Nos. Transmission lines i.e. 132 kV S/c line from Ghens to Padampur on D/c Tower, 132 kV S/c line on D/c tower from 132/33 kV GSS at Kantabanji to 132/33 kV GSS at Patnagarh and LILO of Budhipadar-Sundargarh (CKT-II) 132 kV line at 220/132/33 kV GSS at Bamra. The Commission, in its order dated 13.05.2024 in case No.05 of 2024 had accorded in-principle approval of the said projects subject to the inclusion of the above transmission lines and Sub-station in the present Transmission system studies.

21. In view of the above, we have examined the proposed projects of OPTCL in line with the Transmission Planning Criteria of the Central Electricity Authority (CEA) and our observations are as stated hereafter:

a) **Projects at 765 kV level**: -

Three 765/400 kV Substation projects have been proposed by OPTCL, out of which Substations i.e. Paradeep PG (ISTS) & Gopalpur PG (ISTS) are covered under ISTS for which no approval is required from the Commission. The petitioner has proposed one 765/400 kV S/S at Duburi with 2x1500 MVA, 765/400 kV transformation capacity to meet the upcoming Phase-I Industrial loads and the same was approved in the 17th Consultation Metting for Evolving Transmission Schemes in Eastern Region (CMETS-ER) held on 29.03.2023. As per the Minutes of the Meeting of 17th CMETS-ER, for connectivity with Duburi Substation both circuits of the Angul-Paradeep 765 kV D/c line will be LILO at Duburi. Therefore, the Commission accords in-principal approval for 765/400 kV Substation at Duburi

along with the associated transmission lines in accordance with the approval of the 17th CMETS-ER.

b) **Projects at 400 kV level**: -

Four 400/220 kV Substation projects have been proposed by OPTCL at Bhandaripokhari (Bhadrak), Remuli (Joda), Neulapoi & Theruvali. 400/220 kV Substation at Bhadrak was approved by CEA in the 19th Standing Committee Meeting on power systems and subsequently approved by the OERC in Case No. 18/2017 relating to the Intra-State Transmission Plan for Odisha for the balance period of the 13th Plan (2019-20 to 2021-22). Now, the 400/220 kV Substation has been relocated to Bhandaripokhari in the Bhadrak district with the additional connectivity proposal. Further, 400/220 kV, 3x500 MVA Remuli (Joda) Substation was approved in the 6th Consultation Metting for Evolving Transmission Schemes in Eastern Region (CMETS-ER) held on 29.04.2022 and 400/220 kV Substation at Neulapoi was approved in the 30th CMETS-ER held on 26.04.2024. Switching Substation at Theruvali with LILO of 400 kV D/c line from Gopalpur 400/220 kV to Jayanagar PG 400/220 kV at Theruvali was approved in the 1st meeting of the Eastern Region Standing Committee on Transmission (ERSCT) held on 16.07.2018. However, OPTCL has now proposed 400/220 kV Substation at Theruvali instead of Switching Station along with additional 400 kV D/c line from Indravati 400/220 kV to Theruvali S/S, which needs approval of CMETS-ER.

Further, as submitted by OPTCL, the Government of Odisha through the Odisha Transmission System Strengthening Programme (OTSSP) phase-I under the Chief Minister's Power Development Programme (CMPDP) will support Equity (30%) to OPTCL for implementation of Substations at Bhandaripokhari (Bhadrak) and Neulapoi. The Substation at Remuli (Joda) with associated transmission lines will be executed under TBCB mode. In view of the above consideration, the Commission accords in-principle approval for the above four projects.

c) **Projects at 220 kV & 132 kV level**: -

We have examined the loading expected by OPTCL, petitioner at existing 220 kV and 132 kV Substations in FY 2026-27. Further, OPTCL has submitted the source of funding for the proposed 220 kV and 132 kV Substations as follows:

Table-18

Sl. No.	Substation	Scheme
1	Nua Betanda, Sarasmal, Parjang, Hatabasta, Khalikote, Bijepur, Raighar & Jarabandha	Odisha Transmission System Strengthening Programme (OTSSP) phase-I **(100 % Equity support)**
2	Khuntuni, Angul Alluminium Park, Paradeep Plastic Park, Mundamba Industrial Park.	Odisha Transmission System Strengthening Programme (OTSSP) phase-II **(30 % Equity support)**
3	Chitalo	Low Voltage Mitigation System (LVMS) **(30 % Equity support)**
4	Manmunda.	GEETC **(100% budgetary support)**
5	SCB Medical	SCRIPS **(100% Grant)**
6	Barbil (upgradation of existing 132/33 kV S/S to 220/132/33 kV S/S)	TBCB

d) Considering the above, the Commission approves the following Substations and associated transmission lines.

Table-19

Sl. No.	Substation	Voltage level	PTR in MVA	Connectivity
FY 2024-25				
1	Nua Betanda Dist: Cuttack	220/33	2x40	LILO of 220 kV D/c line from Erasama (400 kV S/S) to Pratapsasan (220 kV S/S) at Nuabetanda S/S
2	Sarasmal Dist: Sonepur	220/33	2x40	LILO of 220 kV S/c line from Katapali S/S to Kiakata S/S at Sarasmal S/S
3	Parjang Dist: Dhenkanal	220/33	2x20	LILO of 220 kV S/c line from Meramunduli-B (400/220 kV S/S) to Duburi Old (220/132 kV S/S) at Parjang S/S
4	Hatabasta Dist: Nayagarh	220/33	2x40	220 kV S/c line from Mendhasal kV S/S to Bhanjanagar S/S at Hatabasta S/S
5	Bhandaripokhari Dist: Bhadrak	220/33	2x40	LILO of 220 kV S/c line from Bhadrak (220/132 kV S/S) to Duburi New (220/132 kV S/S) at Bhandaripokhari (220/33 kV S/S) LILO of 220 kV S/c line from Balasore (220/132 kV S/S) to Duburi New (220/132 kV S/S) at Bhandaripokhari (220/33 kV S/S)
6	Khalikote Dist: Ganjam	220/33	2x40	LILO of 220 kV S/c line from Atri to Narendrapur S/S at Khalikote S/S
7	Bijepur Dist: Bargarh	132/33	2x20	LILO of 132 kV S/c line from Bargarh New (220/132/33 kV S/S) to Ghens (132/33 kV S/S) S/S at Bijepur S/S

Sl. No.	Substation	Voltage level	PTR in MVA	Connectivity
8	Raighar Dist: Nabarangapur	132/33	2x20	LILO of 132 kV S/c line from Umarkote (132/33 kV S/S) to Dabugaon (132/33 kV S/S) at Raighar S/S
9	Jarabandha Dist: Baragarh	132/33	2x20	LILO of 132 kV S/c line from Nuapada to Padampur S/S at Jarabandha S/S
10	SCB Medical Dist: Cuttack	132/33	2x63	132 kV S/c UG cable from Brajabiharipur to SCB Medical S/S.
				132 kV S/c UG cable from Bidanasi to SCB Medical S/S.
FY 2025-26				
11	Komna Dist: Nuapada	220/132	2x100	220 kV D/c line from Komna to Kesinga S/S.
		132/33	2x40	132 kV S/c line from Komna to Kantabanjhi S/S.
				132 kV S/c line from Komna S/S to Khariar S/S.
				132 kV S/c line from Komna to Nuapada S/S.
FY 2026-27				
12	Duburi Dist: Kendujhar	765/400	2x1500	LILO of 765 kV D/c line from Anugul PG (765/400 kV S/S) to Paradeep PG (765/400 kV S/S) at Duburi S/S (LILO part only)
				400 kV D/c line from Duburi (765/400 kV S/S) to Duburi 400/220 kV S/S
13	Remuli (Joda) Dist: Kendujhar (TBCB)	400/220/33	3x500 (3rd ICT to be installed progressively with demand growth)	LILO of 400 kV D/c line from Bishra S/S to NTPC Kaniha S/S at Remuli S/S
				LILO of 220 kV S/c Line from Joda to TTPS at Remuli S/S
				LILO of 220 kV S/c Line from Joda to Kendujhar S/S at Remuli S/S
14	Barbil Dist: Kendujhar (TBCB)	220/132/33 (upgradation of existing 132/33 kV S/S)	2x200	220 kV D/c line (HTLS) from Remuli (Joda) S/s to Barbil S/S
15	Neulapoi Dist: Dhenkanal	400/220	2x500	LILO of 400 kV D/c line from Meramunduli-B to Duburi S/S at Neulapoi S/S
				LILO of 400 kV D/c line from Meramunduli-A to Mendhasal S/S at Neulapoi S/S
16	Khuntuni Dist: Dhenkana	220/132	2x160	220 kV D/c line from Neulapoi (400/220 kV S/S) to Khuntuni S/S
17	Bhandaripokhari Dist: Bhadrak	400/220	2x500	LILO of 400 kV S/c line from Duburi S/S to Kuchei S/S at Bhandaripokhari S/S

Sl. No.	Substation	Voltage level	PTR in MVA	Connectivity
				LILO of 400 kV S/c line from Pandiabil to Kuchei S/S at Bhandaripokhari 400/220/33 kV S/S
18	Theruvali Dist: Rayadada	400/220	2x500	LILO of 400 kV D/c line from Gopalpur (400/220 kV S/S) to Jayanagar PG (400/220 kV S/S) at Theruvali 400/220 kV S/S
				400 kV D/c line from Indravati (400/220 kV S/S) to Theruvali 400/220 kV S/S
19	Angul Alluminium Dist: Angul	220/33	2x40	LILO of 220 kV S/c line from Meramunduli-A to Bhanjanagar S/S at Angul new S/S
20	Paradeep Plastic Dist: Jagatsinghpur	220/33	2x40	LILO of 220 kV D/c line from IOCL to Paradeep old S/S at Paradeep Plastic S/S
21	Mundamba Industrial Park Dist: Khurdha	220/33	2x40	LILO of 220kV S/c from Atri to Narendrapur S/S at Mundamba S/S
22	Chitalo Dist: Jajpur	220/33	2x40	LILO of 220 kV S/c from Paradeep to Duburi New S/S at Chitalo S/S
23	Manmunda Dist: Boudh	132/33	2x40	LILO of 132 kV S/c from Sonepur to Boudh S/S at Manmunda S/S

22. In addition to the above Transmission links, OPTCL has proposed some additional transmission lines for power evacuation, Radial to Ring conversion, to mitigate low-voltage pockets of the Distribution system and to meet the demand for Green Hydrogen and green Ammonia. The (N-1) contingency studies have been carried out to ensure system stability. Transient stability study reports are taken on record. It is found that the voltage, frequency and rotor angle of machines in the vicinity of the cases of interest are within acceptable limits after incorporation of these lines. Most of such Transmission Lines are funded by the Government of Odisha with 30 % Equity support under various schemes such as Radial to Ring Conversion Projects (RRCP) Phase-II, Low Voltage Mitigation Scheme (LVMS) and Green Energy Evacuation Transmission Corridor (GEETC). In view of the above considerations, the Commission approves the plan for the construction of the following Transmission Lines during the 14th Transmission Plan period.

Table-20

Sl. No	Name of Line	Year of Com.
	400kV	
1	400 kV D/c line from Gopalpur (400/220 kV S/S) to Pandiabil 400/220 kV S/S	2026-27
2	400 kV D/c line from TTPS to Meramundali-B S/S	2026-27
	220kV	
3	LILO of 220 kV D/c Line from Balimela to Jayanagar S/S at Gobindpalli S/S	2025-26
4	220 kV D/c Line from Theruvali to Kesinga S/S	2025-26
5	LILO of 220 kV S/c Line from Narendrapur (220/132 kV S/S) to Aska New (220/33 kV S/S) at Gopalpur 400/220 kV S/S	2026-27
6	LILO of 220 kV S/c Line from Narendrapur (220/132 kV S/S) to Gunupur (220/132/33 kV S/S) at Gopalpur 400/220 kV S/S	2026-27
	132kV	
7	LILO (S/c) of 132 kV D/c line from Potangi to Podagada S/S at Lamtaput S/S	2025-26
8	132 kV S/c line from Kantabanji to Patnagarh S/S on D/c tower	2025-26
9	LILO of 132 kV S/c Line from Budhipadar to Sundergarh S/S at Bamra S/S	2025-26
10	132 kV S/c line from Ghens to Padampur S/S on D/c Tower	2025-26
11	LILO of 132 kV D/c line from Chhend to Nuagaon S/S at Kuarmunda S/S	2025-26
12	132 kV S/c line from Dhenkikote to Turmunga S/S	2025-26
13	132 kV D/c line from Jayapatna to Junagarh S/S	2025-26

23. In addition to the above, OPTCL has proposed new 132 kV UG cable links in the Revised 14th Transmission Plan under the Disaster Resilient Power System (DRPS) Phase-II Scheme. The following UG cable links are proposed to meet the exigency condition in case of failure of Overhead Transmission lines during disaster. As the investment requirement for these UG cable links would be substantial, ultimately this will burden the consumers on account of high capital investment, RoE, loan, O&M expenses, manpower cost etc. In order to make the transmission system disaster resilient, the Commission approves the following proposals contingent upon receiving Government funding as a grant.

Table-21

Sl. No.	List of Transmission Lines	Year Considered
1	132 kV UG Cabling from Mendhasal S/S to Chandaka S/S	2025-26
2	132 kV UG Cabling from Argul S/S to Ransinghpur S/S	2025-26
3	132 kV UG Cabling from Chandaka S/S to Mancheswar-A S/S (D/c:2x8Kms)	2025-26
4	132 kV UG Cabling from Samangara S/S to Puri S/S	2025-26
5	132 kV UG Cabling from Narendrapur S/S to Berhampur S/S	2025-26

6	132kV UG Cabling from Autonagar to Narendrapur S/S and Autonagar to Berhampur S/S (24km) (two circuits)	2026-27
7	132 kV UG Cabling from Samuka S/S to Puri S/S	2025-26
8	132 kV UG Cabling from Balasore S/S to Chandipur S/S	2025-26

24. OPTCL has proposed the conversion of the existing 132 kV S/c transmission lines to D/c lines and the upgradation of ACSR panther conductors to HTLS conductors of existing lines under the Odisha Transmission System Strengthening Programme (OTSSP) phase-II with 30 % Equity support from Govt. of Odisha. Considering the load growth and to meet N-1 criteria, the Commission approves the following proposals as submitted by OPTCL.

Table-22

Approved Transmission Lines for Conversion from S/c to D/c		
Sl. No.	**List of Transmission Lines**	**Year Considered**
1	132 kV D/c line from Burla to Sambalpur S/S	2024-25
2	132 kV D/c line from Paralakhemundi to Akhusing S/S	2025-26
3	132 kV D/c line from Kendrapada to Pattamundai S/S	2025-26
4	132 kV D/c line from Atri to Banki S/S	2025-26
5	132 kV D/c line from Banki to Nuapatna S/S	2025-26
6	132 kV D/c line from Khariar to Nuapada S/S	2025-26
7	132 kV D/c line from Khariar to Kantabanji S/S	2025-26
8	132 kV D/c line from Nimapada to Konark S/S	2025-26

Table-23

Approved Transmission Lines for Conversion of ACSR Panther to HTLS conductor		
Sl. No.	**List of Transmission Lines**	**Year Considered**
1	132 kV S/c Cuttack to Jagtsingpur S/S	2025-26
2	132 kV S/c Kesura – Pratapsasana – Ransingpur S/S	2025-26
3	132 kV S/c Chaipal to Angul S/S	2025-26
4	132 kV S/c Angul – TTPS S/S	2025-26
5	132 kV S/c Katapali to Bargarh S/S	2025-26
6	132 kV S/c Joda – Barbil S/S	2025-26
7	132 kV S/c Bidanasi – Choudwar S/S	2025-26

25. OPTCL has proposed transformer capacity upgradation in 18 nos. of Substations from FY 2022-23 to 2026-27. We perused the transformer loading of different Sub-stations of the State and found that the transformation capacity of the existing Grid Substations at Unit-8 and Satasankha do not require augmentation in view of the projected load up to FY 2026-27

and similarly, the transformation capacity in Nayagarh & Khariar Substations do not require augmentation due to establishment of new proposed Substations at Hatabasta & Komna respectively. Further, the capacity augmentation of Somnathpur can be met from the spare transformers.

Further, in view of the above observations of the Commission, OPTCL has submitted the reutilization /reconciliation of the Spare transformers available due to the upgradation of the Substation. It is advised that the old transformers should not be scraped based on their service life rather Residual Life Assessment (RLA) study should be undertaken before taking such a decision.

In view of the above considerations and the loading of transformers as per the load flow studies, the Commission approves the augmentation of transformer capacity in the following Grid Substations:

Table-24

Sl. No.	Substation Name	Substation capacity before augmentation (MVA)	No. Units x Unit capacity after augmentation (MVA)
2024-25			
1	Cuttack	3x40	1x40+2x80
2	Soro	2x20+1x40	2x40+1x20
3	Baragarh Old	3x40	2x40+1x80
4	Baragarh New	2x12.5	2x40
5	Atri	2x20	2x40
6	New Bolangir	1x20+1x40	2x40
2025-26			
7	Balasore	3x63	1x63+2x80
8	Somnathpur	2x12.5	2x20 (From spare Transformers)
9	Phulnakhara	2x20+1x40	3x40
10	Lapanga	2x315	2x315+1x500
11	Jagatsinghpur	1x40+2x20	2x40+1x20
12	Chhend	3x40	1x40+2x80
13	New Duburi	2x315	2x315+1x500
14	Betanati	1x20+1x40	2x40

26. In principle approval of the proposed plan is accorded for (a) the establishment of 22 nos. of new Sub-stations with associated transmission lines, 13 nos. of new transmission lines & 8 nos. 132 kV UG cable (b) Conversion of 8 nos. existing transmission lines from S/c to D/c (c) Conversion of ACSR panther to HTLS conductors for 7 nos. of existing transmission lines (d) Upgradation of transformer capacity in 14 nos. of existing Sub-

stations based on the projected load and generation scheduled as per the system study report.

27. As per the Regulations, OPTCL shall approach the Commission for approval of the investment proposal of each project along with DPR incorporating cost-benefit analysis, and system studies under various generation & load scenarios during peak and off-peak hours and in different seasons considering appropriate renewable capacity additions. OPTCL shall follow all statutory requirements and obtain approval of the Commission for executing all the projects and avoid time and cost overrun. Planning of the Transmission system is an ongoing process, peak demand and energy requirement projection need to be reviewed by OPTCL regularly based on the input from DISCOMs and operational feedback to provide reliable power supply to ultimate consumers as the transmission system is the backbone of the power system and establishes the link with distribution systems. The study shall be conducted on a rolling basis each year based on the implementation schedule of approved projects and any rescheduling shall be intimated to OERC.
28. In the past, the Commission, while approving the Investment Proposals, Business Plans, Transmission Planning & Tariffs of the OPTCL, had repeatedly directed OPTCL not to execute any projects in absence of approval of the Investment Proposal by the Commission. The same has been reiterated in many orders of the Commission. In spite of such observations, OPTCL recedes in the matter of following the directions of the Commission and is repeatedly executing the projects without the approval of the Investment Proposal which is mandatory under the provisions of the Licence Conditions of OPTCL. OPTCL should avoid such practices in future.
29. OPTCL should regularly coordinate with CTU and DISCOMs for the execution of the above projects so that upstream and downstream infrastructures are developed in matching time frames for smooth flow of power and to avoid stranding & underutilization of assets created by OPTCL. In no case, the transmission assets should remain idle because of no matching development of the downstream network by DISCOMs. A committee may be constituted comprising of the representative/concerned officials of OPTCL and DISCOMs to monitor matching development and optimum utilization of assets created by OPTCL.
30. The delay in the commissioning of transmission projects by OPTCL has become a matter of concern. As observed, most of the projects are delayed due to ROW problems, Court Cases, delays in getting statutory clearances from Railways, Forest & NHAI, and non-availability of clear corridors for construction of lines etc. These issues need to be resolved on priority basis with the help of concerned Department of the Government of Odisha / Government of India, if required and sincere effort should be made for timely completion of projects to

avoid cost and time overrun.

31. It is observed that some Grid Substations such as Kashipur, Muniguda, Chikiti, etc. are provided with a single transformer without meeting N-1 contingency. To provide an uninterrupted power supply, OPTCL should ensure N-1 contingency for transmission lines and transformation capacity in every Grid Substation.
32. OPTCL has responded to the concerns of the DISCOMs regarding (a) augmentation of transformation capacity at GSS (b) early commissioning of some GSS (c) installation of the Capacitor Bank (d) conversion of ACSR to HTLS conductor to enhance power transmission capacity (e) commissioning of new Grid Substations. Similarly, OPTCL has also responded to the concerns of the OHPC regarding improved reliability of evacuation of power from Machhkund (Odisha share). However, stakeholders such as TPNODL, TPSODL, TPWODL, OHPC etc. have raised concerns that some of their proposals have not been addressed in the revised 14th Transmission Planning. Therefore, OPTCL should consider in subsequent transmission planning studies, if their issues are not properly addressed. If any proposal is not feasible based on the system study, OPTCL should provide alternative arrangements to address their issues. Further, OPTCL should consult stakeholders in advance and prepare Transmission Planning based upon their input/feedback.
33. As far as the installation of Capacitor Bank is concerned, the installation of Capacitor Banks at the HT level is more effective than at the EHT (132 kV/ 220 kV) level for improvement of voltage at the HT level. So, it is advisable to install Capacitor Banks by DISCOMs in PSSs to improve the voltage profile and decrease the load current.
34. In principle approval has been accorded by the Commission for some projects to meet the demand of the upcoming Green Hydrogen, Green Ammonia plants and other power-intensive industries. Considering the above, OPTCL is directed to execute agreements with the industries or DISCOMs or agencies developing Green Hydrogen & Green Ammonia plants in consultation with the Energy Department/Industry Department of Odisha before the execution of any such transmission projects to avoid the creation of stranded assets, which shall burden the consumers on account of high capital investment, RoE, loan, O&M expenses, manpower cost etc.
35. OPTCL need to ensure voltage variation within the tolerable limit at 33 kV level, feeding the distribution network, by operation of OLTC as and when required to address the low voltage issues to some extent. OPTCL may plan to implement automatic OLTC operation of power transformers in GSS in stages to maintain the voltage profile for smooth operation of the Grid without human intervention.
36. OPTCL should plan and take the necessary steps for swapping of transformers while

augmenting the transformation capacity in the existing Substations for optimum utilization of assets.

37. There is need for transmission system study group, as the planning of the transmission network is an ongoing process to strengthen and expand the transmission systems based on load growth and operational feedback, in order to improve the availability and reliability of transmission systems & downstream distribution network and to address low voltage issue of the distribution system. OPTCL is directed to strengthen their system study group.
38. Considering future load growth due to rapid industrialization, there is need to move to a higher voltage transmission system in order to improve transmission loss and enhance power transmission capacity. OPTCL needs to ensure the use of the right conductor configuration for the transmission line at 400 kV and 765 kV levels to address the RoW issues, which are likely to be the major concerns in future and also needs to consider adequate Reactive compensation at 400 kV and 765 kV levels to avoid over-voltage problem under light load condition.
39. With the aforesaid observations, the case stands disposed of.

Sd/-

(S. K. Ray Mohapatra)
Member

Sd/-

(G. Mohapatra)
Officiating Chairperson