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ODISHA ELECTRICITY REGULATORY COMMISSION
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Present: **Shri G. Mohapatra, Member**
Shri S. K. Ray Mohapatra, Member

Case No. 79/2024

Odisha Power Transmission Corporation Ltd. (OPTCL) …… Petitioner

Vrs.

TPWODL & others …… Respondents

In the matter of: **Application under condition 10 of its Licence Conditions for approval of Investment proposal taken up from FY 2022-23 to FY 2026-27 for construction of 2 Nos. of 132/33 kV Grid Sub-station (GSS), 1 No. of 132 kV UG cable line, 02 Nos. 132 kV S/C to D/C line, 1 No. of 132 kV panther to HTLS conversion work & 1 No. 220/33 kV GSS along with associated lines on availing equity/grant/loan assistance from the suitable funding agency.**

For the Petitioner: Shri B.B. Mehta, Director (Projects), Sri P.K. Pattnaik, Director (Operation), Sri P.K. Mallick, Sr. GM (RT&C) and C.R. Mishra, GM (Elect.), OPTCL.

For the Respondents: Sri Bharat Bhadawat, (Chief Regulatory Affairs), TPCODL, Ms. Malancha Ghose, DGM (RA), TPNODL, Sri Abhisek Mohapatra, Regulatory Cell, TPWODL, Sri Soumitry Dey, Head Regulatory, TPSODL and Ms. Sonali Pattnaik, Manager (Legal), Department of Energy, Government of Odisha.

Date of hearing: 16.01.2025 **Date of Order: 19.04.2025**

ORDER

1. The petitioner, OPTCL being the State Transmission Utility and deemed Transmission Licensee, has submitted an application under Condition 10 of the Licence Conditions seeking approval of investment proposals for the construction of 132/33kV Grid Substations at Raighar & Bijepur, 132kV S/C UG cable link from Narendrapur to Berhampur, stringing of 2nd Circuit of Khariar-Nuapada 132kV line on existing D/C tower, stringing of 2nd Circuit of Khariar-Kantabanji 132kV line on existing D/C tower, 132kV D/C line from Turumunga to Dhenkikote, replacement of ACSR Panther Conductor to HTLS Conductor in existing Pratapsasan-Kesura-Ransinghpur 132kV

D/C Line and 220/33kV Grid Substation at Sarasmal (Rampur) on availing equity/grant/loan assistance from suitable funding agency.

2. As per OPTCL's Licence Conditions 7.1 and provision under Section 40 of the Electricity Act, 2003, it is the duty of OPTCL to make investments to build, maintain & operate an efficient co-ordinated & economic intra-state transmission system. As per OPTCL's Licence Condition 10 read with Condition 23.1, the Petitioner-OPTCL is required to obtain prior approval of the Commission for an investment proposal of Rs.10.00 Cr. and above. Accordingly, OPTCL has submitted this investment proposal for the execution of eight transmission projects totalling Rs.379.50 Cr., as the individual cost of the proposed projects exceeds the limit of Rs.10.00 Cr. As per the Licence Condition, the Commission is to be satisfied with the need for such investment and also to examine the economic, techno-commercial & environmental issues attached to such investment proposals. In compliance with the requirements under Licence Condition 10.4, OPTCL has submitted the Detailed Project Reports (DPRs) of individual investment proposals along with relevant information and justification pertaining to the above projects. The details of the investment proposals based on the load flow study are as follows:

a) OPTCL has proposed for the construction of a new 2X20MVA, 132/33kV Grid Sub-station at Raighar with SAS and associated 132kV LILO Line from the existing 132kV Dabugaon-Umerkote D/C Line (approximate line length: 36.36 kms.) at an estimated cost of Rs.63.31 Cr. with 100% Equity Support from the Government of Odisha under OTSSP (Odisha Transmission System Strengthening Programme) phase-I Scheme. OPTCL has submitted that the existing Raighar PSS is connected to Beheda PSS through a 100 sq. mm. line which is approximately 18km in length and Beheda PSS is availing power from 132/33kV GSS at Umerkote which is 18km away. Accordingly, Raighar PSS is connected to the 132/33kV Umerkote Grid through the 33kV Raighar feeder, which is approximately 36 km long. Further, PSS like Jodinga and Gona are approximately at a distance of 35 kms. to 50 kms. away from GSS at Umerkote. The present voltage level of Jodinga, Gona and Raighar PSS is found to be lower than the permissible limit due to this long distance 33kV line. In order to improve the voltage profile in the aforesaid areas, a 2X20MVA 132/33kV Grid Sub-Station is required at Raighar. Additionally, the new GSS at Raighar will provide an alternative supply to the distribution sub-stations thus making the distribution

system more stable and reliable with supply of quality power. The proposed Grid Sub-station has been approved in the Revised 14th Transmission Plan of OPTCL for the period from FY 2022-23 to 2026-27 (Case No. 08/2024). OPTCL has projected a reduction of average annual technical loss to the extent of 0.48 MW, which is equivalent to a gain of Rs.3.99 Lakh in monetary terms (considering 24 paise/kWh). With 70% utilization of (2x20) MVA transformation capacity at the proposed grid S/S and with 3% transmission loss, the additional energy available would be 1284.78 LU/annum, which will bring additional annual revenue of Rs.308.35 Lakhs to OPTCL at the transmission charge of 24 paise/kWh. Thus, as per Cost Benefit Analysis, OPTCL has projected the total annual revenue to the tune of Rs.312.34 Lakhs with the Average Annual Rate of Return of 4.93%. Further, OPTCL has estimated the Internal Rate of Return (IRR) from this investment as 5.22% with a negative Net Present Value (NPV).

b) OPTCL has proposed for the construction of a new 2X40MVA, 132/33kV Grid Sub-station at Bijepur with SAS and associated 132kV LILO line of 132kV New Bargarh-Ghens line (approximate line length: 5 km.) at an estimated cost of Rs.61.67 Cr. with 100% Equity Support from the Government of Odisha under OTSSP (Odisha Transmission System Strengthening Programme) phase-I Scheme. OPTCL has submitted that the existing Bijepur and Arda PSS are receiving power from the 132/33kV Ghens Grid Sub-Station through a dedicated 33kV Bijepur Feeder with a load of 20 MW and Sohela PSS receives power from the same Ghens Grid Sub-Station through a dedicated 33kV Sohela feeder with a load of 22 MW. As per the system study, the current-voltage levels of the aforementioned PSSs are found to be very low and beyond the permissible limit, which deprives the supply of quality and uninterrupted power to consumers in the Bargarh district. Additionally, two Mega Lift Projects with a load of 6 MVA (approximately) have been proposed by the Water Resource Department, Government of Odisha. The newly proposed Grid Substation will also support the load of 15MVA for the New Lift Irrigation in the Bargarh District. Given this situation, OPTCL has submitted that the 132/33kv Grid Sub-Station at Bijepur is essential for TPWODL to ensure quality power and uninterrupted supply to consumers in the surrounding areas. The proposed Grid Sub-station has been approved in the Revised 14th Transmission Plan of OPTCL for the period from FY 2022-23 to 2026-27 (Case No.08 /2024). OPTCL has projected a reduction of average annual technical loss to the extent of

0.30 MW, which is equivalent to a gain of Rs.2.53 Lakh in monetary terms (considering 24 paise/kWh). With 70% utilization of (2x40) MVA transformation capacity at the proposed Grid S/S and with 3% transmission loss, the additional energy available would be 2569.55 LU/annum, which will bring additional annual revenue of Rs.616.69 Lakhs to OPTCL at the transmission charge of 24 paise/kWh. Thus, as per Cost Benefit Analysis, OPTCL has projected the total annual revenue to the tune of Rs.619.22 Lakhs with the Average Annual Rate of Return of 10.04%. Further, OPTCL has estimated the Internal Rate of Return (IRR) from this investment as 57.63% with a positive Net Present Value (NPV).

c) OPTCL has proposed for the construction of a new 132 kV S/C line through 132kV UG cable from 220/132/33kV GSS at Narendrapur to 132/33kV GSS at Berhampur with one no. of 132 kV bay extension at each end (approx. line length: 16.00 km.) at an estimated cost of Rs.89.14 Cr. Regarding the source of funding OPTCL has submitted that Rs.50.00 Cr. will be funded from the State Disaster Mitigation Fund (SDMF) and the rest amount as a Grant from the Government of Odisha under the Disaster Resilient Power System (DRPS) Phase-II scheme. OPTCL has submitted that presently, the 132/33kV Berhampur Grid is connected with the 220/132/33kV Narendrapur Grid Sub-Station with a 132kV D/C overhead line passing through a dense locality. Further, OPTCL has submitted that Berhampur town is always prone to natural calamity from time to time, which requires a disaster-resilient Power Transmission system. Therefore, to ensure an uninterrupted power supply during emergencies, a 132kV underground cable is proposed from the 132/33kV Berhampur Grid Sub-Station to the 220/132/33kV Narendrapur Grid Sub-Station in addition to the existing connectivity. This proposed transmission line will increase the stability and reliability of the 132 kV network in the southern part of Odisha by improving the voltage profile and providing an uninterrupted power supply during emergency situations. The proposed Transmission line has been approved in the Revised 14th Transmission Plan of OPTCL for the period from FY 2022-23 to 2026-27 (Case No.08 /2024). OPTCL has projected a reduction of average annual technical loss to the extent of 0.31MW, which is equivalent to a gain of Rs.02.57 Lakh in monetary terms (considering 24 paise/kWh). The expectation of an additional 531.75 LU (considering a 3% transmission loss) shall bring additional annual revenue of Rs.127.62 Lakhs to OPTCL at the transmission charge of 24 paise/kWh. Thus, as per Cost Benefit Analysis, OPTCL has projected the total

annual revenue to the tune of Rs.130.19 Lakhs with the Average Annual Rate of Return is 1.46%. Further, OPTCL has not calculated the Internal Rate of Return (IRR) for this investment as the project will be executed through 100% grant from the Government of Odisha.

d) OPTCL has proposed for the construction of 2nd Circuit stringing of 132kV Khariar-Nuapada line on the existing D/C tower with bay extension work both at Khariar and Nuapada Grid Sub-Stations (approx. line length: 72.23 km.) at an estimated cost of Rs.12.09 Cr. with 30% Equity Support from the Government of Odisha under OTSSP (Odisha Transmission System Strengthening Programme) phase-II Scheme and the balance 70% will be met by availing loan from outside funding agency. OPTCL has submitted that the existing 132/33kV GSS at Khariar is connected through a 132kV S/C line (line length: 72.23 kms.) on the D/C tower to 132/33kV GSS at Nuapada. The Khariar GSS serves the Khariar, Boden, and Muribahal command areas, while the 132/33kV GSS at Nuapada caters to the Bisora, Kurumpuri, and Khariar Road command areas at 33kV. The 33kV supply has been extended to both rural and agricultural areas from this substation. Since, this is an existing S/C line on the D/C tower, in order to ensure the reliability of the transmission network and uninterrupted power supply, the 2nd circuit stringing will be highly essential. Once this Project is completed, it will ensure the stability and reliability of the 132kV network in the western part of Odisha by improving the voltage profile and providing an uninterrupted power supply. The proposed Transmission line has been approved in the Revised 14th Transmission Plan of OPTCL for the period from FY 2022-23 to 2026-27 (Case No.08 /2024). OPTCL has projected a reduction of average annual technical loss to the extent of 0.18MW, which is equivalent to a gain of Rs.01.50 Lakh in monetary terms (considering 24 paise/kWh). The expectation of an additional energy of 398.28 LU (considering a 3% transmission loss) shall bring additional annual revenue of Rs.95.59 Lakhs to OPTCL at the transmission charge of 24 paise/kWh. Thus, as per Cost Benefit Analysis, OPTCL has projected the total annual revenue to the tune of Rs.97.09 Lakhs with the Average Annual Rate of Return is 8.03%. Further, OPTCL has estimated the Internal Rate of Return (IRR) from this investment as 04.02% with a negative Net Present Value (NPV).

e) OPTCL has proposed the construction of the 2nd Circuit stringing of 132kV Khariar-Kantabanji line on the existing D/C tower (approx. line length: 33.25 km.)

with 1 No. of 132kV bay extension work at Kantabanji GSS and 2 Nos. of 132kV bay extension along with 132kV Bus extension through 132kV single core 1000 sqmm. XLPE cable at Khariar GSS with bay swapping at an estimated cost of Rs.12.09 Cr. with 30% Equity Support from the Government of Odisha under OTSSP (Odisha Transmission System Strengthening Programme) phase-II Scheme and the balance 70% will be met by availing loan from outside funding agency. OPTCL has submitted that the existing 132/33kV GSS at Khariar is connected through a 132kV S/C line (line length: 33.25 kms.) on D/C tower to 132/33kV Grid S/S Kantabanji. The Khariar Grid Substation is serving the Khariar, Boden, and Muribahal command areas, while the 132/33kV Grid Substation at Kantabanji is serving the Kantabanji, Muribahal, Turekela, and Gudighat command areas at 33kV. The 33kV supply has been extended to both rural and agricultural areas from this substation. Since, the 132kV Khariar-Kantabanji line is an existing S/C line on the D/C tower, in order to ensure the reliability of the transmission network and uninterrupted power supply, the 2nd circuit stringing will be highly essential. Once this Project is completed, it will ensure the stability and reliability of the 132kV network in the western part of Odisha by improving the voltage profile and providing an uninterrupted power supply. The proposed Transmission line has been approved in the Revised 14th Transmission Plan of OPTCL for the period from FY 2022-23 to 2026-27 (Case No.08 /2024). OPTCL has projected a reduction of average annual technical loss to the extent of 0.19MW, which is equivalent to a gain of Rs.01.59 Lakh in monetary terms (considering 24 paise/kWh). The expectation of an additional 412.56 LU (considering a 3% transmission loss) shall bring additional annual revenue of Rs.99.01 Lakhs to OPTCL at the transmission charge of 24 paise/kWh. Thus, as per Cost Benefit Analysis, OPTCL has projected the total annual revenue to the tune of Rs.100.60 Lakhs with the Average Annual Rate of Return is 9.94%. Further, OPTCL has estimated the Internal Rate of Return (IRR) from this investment as 08.06% with a negative Net Present Value (NPV).

f) OPTCL has proposed the construction of 132kV D/C line from 220/132kV GSS at Dhenkikote to 132/33 kV GSS at Turumunga along with 2 Nos. of 132kV feeder bay extension each at Turumunga and Dhenkikote (approx. line length: 45.52 km.) at an estimated cost of Rs.43.89 Cr. with 30% Equity Support from the Government of Odisha under LVMS (Low Voltage Mitigation System) Scheme and the balance 70% will be met by availing loan from outside funding agency.

OPTCL has submitted that the Dhenkikote command area is availing power supply from the existing 132/33kV Grid Sub-Station at Denkikote, which is fed radially from the 132/33kV Grid Sub-station at Karanjia through 132kV D/C line (Line length: 42.50 kms.). As Dhenkikote, Grid Sub-Station is a radial Sub-Station, for any fault in Karanjia- Dhenkikote feeder, the entire Dhenkikote command area remains in darkness. This hampers the aim of providing quality and uninterruptable power supply to the consumers under the Dhenkikote Command area. Therefore, an alternative source of supply is required for the Dhenkikote GSS to make the 132kV level stable and to provide an uninterrupted power supply to the Dhenkikote command area. This problem can be resolved by the construction of a 132kV D/C line from Dhenkikote to Turumunga which will form a ring network. The proposed Transmission line has been approved in the Revised 14th Transmission Plan of OPTCL for the period from FY 2022-23 to 2026-27 (Case No.08 /2024). OPTCL has projected a reduction of average annual technical loss to the extent of 0.43MW, which is equivalent to a gain of Rs.03.58 Lakh in monetary terms (considering 24 paise/kWh). The expectation of an additional 2141.29 LU (considering a 3% transmission loss) shall bring additional annual revenue of Rs.513.91 Lakhs to OPTCL at the transmission charge of 24 paise/kWh. Thus, as per Cost Benefit Analysis, OPTCL has projected the total annual revenue to the tune of Rs.517.49 Lakhs with the Average Annual Rate of Return is 11.79%. Further, OPTCL has 3estimated the Internal Rate of Return (IRR) from this investment as 12.28% with a positive Net Present Value (NPV).

g) OPTCL has proposed the Conversion of ACSR Panther Conductor to HTLS Conductor in the existing 132kV Pratapsasan-Kesura-Ransinghpur D/C line (approx. line length: 35.28 km.) at an estimated cost of Rs.19.81 Cr. with 100% Grant Support from the Government of Odisha under SCRIPS (State Capital Region Improvement of Power System) Scheme. OPTCL has submitted that 132kV Ransinghpur GSS is connected through 132 kV S/C lines from Chandaka. 132kV GSS at Kesura is getting power supply from Grid Sub-Station at Pratapsasan. 132kV Grid Sub-Station at Pratapsasan is getting 132kV supply from GSS at Pandiabili (PGCIL). Presently Ransinghpur GSS (peak load 118 MW) is availing power supply through the Chandaka-Ransinghpur feeder (HTLS). After the integration of the 220kV Pandiabili-Pratapsasan line, the major share of load flow was noticed through the 132kV Pratapsasan–Kesura-Ransinghpur line, which

shoots up beyond permissible limit during peak hours. In case of failure of 132kV Chandaka-Ransinghpur Line, Ransinghpur will be unable to draw full load through 132kV Pratapsasan-Kesura-Ransinghpur line which is of ACSR panther conductor. Considering the above, the OPTCL has proposed to augment the 132kV Pratapsasan–Kesura -Ransinghpur line from ACSR to HTLS conductor. The proposed Transmission line has been approved in the Revised 14th Transmission Plan of OPTCL for the period from FY 2022-23 to 2026-27 (Case No. 08/2024). OPTCL has projected a reduction of average annual technical loss to the extent of 0.35MW, which is equivalent to a gain of Rs.02.87 Lakh in monetary terms (considering 24 paise/kWh). The expectation of an additional 1339.02 LU (considering a 3% transmission loss) shall bring additional annual revenue of Rs.321.37 Lakhs to OPTCL at the transmission charge of 24 paise/kWh. Thus, as per Cost Benefit Analysis, OPTCL has projected the total annual revenue to the tune of Rs.324.24 Lakhs with the Average Annual Rate of Return is 16.36%. Further, OPTCL has not calculated the Internal Rate of Return (IRR) for this investment as the project will be executed through 100% grant from the Government of Odisha.

h) OPTCL has proposed the construction of a new 2X40MVA, 220/33kV Grid Sub-Station at Sarasmal (Rampur) along with the associated 220kV LILO line of 220kV Kiakata-Katapali line (approximate line length: 21.00 km) at an estimated cost of Rs.79.46 Cr. with 100% Equity Support from the Government of Odisha under OTSSP (Odisha Transmission System Strengthening Programme) phase-I Scheme. OPTCL has submitted that the existing Binka PSS is availing power from 132/33kV Sonepur Grid Sub-Station through a dedicated 33kV line having a load of 7MW and areas like Pandikital, Bahatabahal & Balitikra are receiving power from 132/33kV Barpali Grid Sub-Station through 33kV dedicated Pandikital feeder having a load of 12MW. As per the system study the present voltage scenario of some PSS such as Pandikital, Bahatabahal, Ulunda, Ainlachat, Megaproject-2, Binka & Bishalpali are found to be very low and beyond the permissible limit (+6% & -9%) and this hampers the aim of providing quality and uninterrupted power supply to the consumers under Sonepur districts. Further, the aforesaid PSS could not be able to feed the future upcoming load in these areas due to low voltage issues. So, it is very much necessary to establish a 220/33kV Grid Substation at Sarasmal for TPWODL to provide reliable & uninterrupted power supply to the

consumers in the nearby areas. This 220/33kV Grid Sub-Station Sarasmal and associated 220kV LILO line on 220kV Kiakata - Katapali Line (Approx. Line Length-21Kms.) will facilitate the uninterrupted power supply & mitigate the low voltage issue and will cater the anticipated future load of 26MVA for upcoming rice mills & proposed Ethanol plant at Sonepur Districts. The proposed Grid Sub-station has been approved in the Revised 14th Transmission Plan of OPTCL for the period from FY 2022-23 to 2026-27 (Case No.08 /2024). OPTCL has projected a reduction of average annual technical loss to the extent of 0.42 MW, which is equivalent to a gain of Rs.3.49 Lakh in monetary terms (considering 24paise/kWh). With 70% utilization of 2x40 MVA transformation capacity at the proposed Grid Substation and with 3% transmission loss, the additional energy available would be 2569.55 LU/annum, which will bring additional annual revenue of Rs.616.69 Lakhs to OPTCL at the transmission charge of 24 paise/kWh. Thus, as per Cost Benefit Analysis, OPTCL has projected the total annual revenue to the tune of Rs.620.19 Lakhs with the Average Annual Rate of Return is 7.80%. Further, OPTCL has estimated the Internal Rate of Return (IRR) from this investment as 38.20% with a positive Net Present Value (NPV).

3. The total investment against the above 8 Nos. of proposals for the Transmission system of OPTCL has been estimated as Rs.379.50 Cr. The investment proposal in brief, with the source of funding as submitted by OPTCL is given in the Table below:

Sl. No.	DESCRIPTION	CAPITAL EXPENDITURE (Rs. Cr.)	NAME OF THE SCHEME & SOURCE OF FUNDING
1	2X20MVA, 132/33kV Grid Substation at **Raighar** with SAS and associated 132kV LILO Line	63.31	**OTSSP-I** Equity -100% (GoO)
2	2X40MVA, 132/33kV Grid Substation at **Bijepur** along with its associated 132kV LILO line of 132kV New Bargarh-Ghens line	61.67	**OTSSP-I** Equity -100% (GoO)
3	132kV S/C line through **132kV UG cable** from 220/132/33kV Grid S/S, **Narendrapur** to 132/33kV Grid S/S, **Berhampur** with one no. of 132kV bay extension at each end.	89.14	**SDMF DRPS-II** Grant- 100% (GoO)
4	2nd Circuit stringing of 132kV **Khariar-Nuapada** line on existing D/C tower with bay extension work both at Khariar and Nuapada Grid Sub-Stations	12.09	**OTSSP-II** Equity- 30% (GoO) Loan- 70%

5	2nd Circuit stringing of 132kV **Khariar-Kantabanji** line on existing D/C tower with 1 No of 132kV bay extension work both at Kantabanji and 2 Nos. of 132kV bay extension along with 132kV Bus extension through 132kV 1 Core 1000 sqmm. XLPE cable at GSS Khariar with bay swapping	10.12	**OTSSP-II** Equity- 30% (GoO) Loan- 70%
6	132kV D/C line from 2x160MVA, 220/132kV & 2x20MVA, 220/33kV GSS at **Turumunga**, to 2x40MVA, 132/33kV GSS at **Dhenkikote** along with 2 nos. 132kV Feeder Bay extension each at Turumunga and Dhenkikote	43.89	**LVMS** Equity- 30% (GoO) Loan- 70%
7	Conversion of ACSR Panther Conductor to HTLS Conductor in existing 132kV **Pratapsasan-Kesura-Ransinghpur** D/C Line	19.81	**SCRIPS** Grant- 100% (GoO)
8	2X40MVA, 220/33kV Grid Substation at **Sarasmal** (Rampur) along with its associated 220kV LILO of 220kV Kiakata-Katapali line	79.46	**OTSSP-I** Equity -100% (GoO)
TOTAL		**379.50**	

4. OPTCL has submitted that the System Studies have been conducted in line with the planning criteria considering different load generation scenarios under normal steady-state conditions. The implementation of the aforesaid additional proposed Substation and transmission lines would improve the system voltage profile, reduce the loading on certain important sections of the transmission network and also reduce the overall transmission system loss. Further, under a single contingency scenario, the study indicates potential problems related to the overloading of remaining lines and the collapse of system voltages at locations close to the tripped line. Therefore, OPTCL has submitted the above investment proposal for the construction of the above-mentioned Substation and transmission lines for reinforcement of its existing transmission network to meet the system needs in future years. OPTCL envisages the reduction of an average annual loss of a total of 2.66 MW after the execution of the above projects.

5. OPTCL has submitted that the projects have been proposed after a detailed discussion with the concerned DISCOM. Further, as per the Environmental Impact Assessment (EIA) Study submitted by OPTCL, the projects do not have any adverse environmental impact or resettlement issue and the overall impact of the projects is highly positive. OPTCL has also stated that the projects are being executed on a turnkey basis through a Competitive Bidding process.

6. All DISCOMs have agreed with the submission of OPTCL and have requested early execution of these projects as these projects are required to extend reliable power supply, to mitigate low voltage issues and to meet the expected load growth in those areas. Further, these projects will support the implementation of various developmental programmes of the State Government resulting in socio-economic development in remote areas and crucial for enhancing network stability & reliability.

7. Heard the parties at length through hybrid mode and considered their written submissions. It is observed that:

a) The proposed Substation and transmission lines have been approved in the Revised 14th Transmission Plan study of OPTCL for the period from FY 2022-23 to 2026-27 (Case No. 08/2024). OPTCL has now approached the Commission with the DPR along with the cost-benefit analysis for approval of their investment proposals for the proposed projects.

b) The petitioner-OPTCL has justified that the investments would strengthen the power transmission system, reduce loading on certain sections of OPTCL's transmission network, reduce the overall transmission losses, improve voltage profile, ensure better quality of power supply, minimize interruption of power supply, enhance security/reliability of power system for smooth flow of power without any constraint/congestion in the system and would enable OPTCL to receive economic return.

c) The Board of Directors (BoD) of OPTCL has accorded administrative approval for the aforesaid projects.

d) The proposed Substation and transmission lines are being executed by availing funds from the Government of Odisha under the Odisha Transmission System Strengthening Programme (OTSSP) Phase-I scheme (100% Equity), OTSSP Phase-II scheme (30% Equity), State Capital Region Improvement of Power System (SCRIPS) Scheme (100% Grant), Disaster Resilient Power System (DRPS) Phase-II scheme and Low Voltage Mitigation System (LVMS) scheme (30% Equity).

8. The Commission has studied the technical and commercial viability of the projects as submitted by OPTCL which are summarized below:

Sl. No	Name of the Project	Project Cost (Rs. Cr)	Net Cash flow (Rs. Cr)	Period of Benefits (in Years)	Avg. Return estimated by OPTCL (%)	NPV @ 10.91% Dis. Factor (Rs. Cr)	IRR (%)	Viability
1	2X20MVA, 132/33kV Grid Substation at **Raighar** with SAS and associated LILO of one circuit of Dabugaon - Umerkote 132kV D/C line (approximate line length: 36.36 kms.) at Raighar (Scheme: OTSSP Phase-I) (100% Equity)	63.31	23.14	35	4.93	(4.87)	5.52	**Non-viable**
2	2X40MVA, 132/33kV Grid Substation at **Bijepur** along with associated LILO of one circuit of New Bargarh-Ghens 132kV D/C line at Bijepur (approximate line length: 5 km.) (Scheme: OTSSP Phase-I) (100% Equity)	61.67	129.68	35	10.04	16.19	57.63	**viable**
3	132kV S/C UG cable from 220/132/33kV Grid S/S at **Narendrapur** to 132/33kV Grid S/S, **Berhampur** along with one 132kV bay extension at each end. (Scheme: SDMF & DRPS Phase-II) (100% Grant)	89.14	(39.11)	35	100% Government grant (under SDMF & DRPS Phase-II scheme)			
4	2nd Circuit stringing of 132kV **Khariar-Nuapada** line on existing D/C tower with bay extension work both at Khariar and Nuapada Grid Sub-Stations (Scheme: OTSSP Phase-II) (30% Equity and 70% Loan)	12.09	7.23	35	8.03	(2.98)	4.02	**Non-viable**
5	**2nd Circuit** stringing of **132kV Khariar-Kantabanji** line on existing D/C tower with one 132kV bay extension work at Kantabanji and 2 Nos. of 132kV bay extension along with 132kV Bus extension through 132kV 1C X1000 sqmm. XLPE cable at GSS Khariar with bay swapping (Scheme: OTSSP Phase-II) (30% Equity and 70% Loan)	10.12	13.90	35	9.94	(0.94)	8.06	**Non-viable**
6	132kV D/C line from	43.89	87.59	35	11.79	1.61	12.28	**Viable**

Sl. No	Name of the Project	Project Cost (Rs. Cr)	Net Cash flow (Rs. Cr)	Period of Benefits (in Years)	Avg. Return estimated by OPTCL (%)	NPV @ 10.91% Dis. Factor (Rs. Cr)	IRR (%)	Viability
	220/132/33kV GSS at **Turumunga**, to 132/33kV GSS at **Dhenkikote** along with one 132kV Feeder Bay extension each at Turumunga and Dhenkikote (Scheme: LVMS) (30% Equity and 70% Loan)							
7	Replacement of ACSR Panther Conductor by HTLS Conductor in existing 132kV **Pratapsasan-Kesura-Ransinghpur** D/C Line (Scheme: SCRIPS) (100% Grant)	19.81	94.66	35	(under the SCRIPS scheme) 100% Government grant			
8	2X40MVA, 220/33kV Grid Substation at **Sarasmal** (Rampur) along with associated LILO of 220kV Kiakata-Katapali line at Sarasmal. (Scheme: OTSSP Phase-I) (100% Equity)	79.46	108.89	35	7.80	11.04	38.20	**Viable**

a) The above table shows that out of eight (8) projects, two (3) projects i.e. 2X20MVA, 132/33kV Grid Substation at Raighar, 2nd Circuit stringing of 132kV Khariar-Nuapada line on existing D/C tower and 2nd Circuit stringing of 132kV Khariar-Kantabanji line on existing D/C tower are not economically viable, but the proposed lines would result in reduction in the transmission loss to the extent of 0.48 MW, 0.18 MW & 0.19 MW respectively.

b) Presently, Raighar, Jodinga and Gona in Nabarangpur district are getting power supply from 132/33kV GSS at Umerkote through 33kV feeder of the approximate line length of 36 km for which the voltage levels of these areas are very low at present and exceed the permissible limit. The proposed 2X20MVA, 132/33kV GSS at Raighar will provide reliable power to areas like Jodinga, Gona, Raighar, Dumurimunda, Turuni, Chhotabeda and Gurusingha etc. through PSSs at Gona, Raighar, Dumurimunda and others, thereby mitigating the low voltage issues.

c) At present, voltage levels of 33kV system of the PSSs such as Bijepur, Sohela and Arda in the Bargarh District is beyond the permissible limits. Further, two Mega Lift Projects having loads of 6 MVA (approximately) and new Lift Irrigation load of 15 MVA in Raighar in Bargarh District have also been proposed in these areas in addition to 30,000 consumers. The proposed 2X40MVA, 132/33kV GSS at Bijepur will address the future load demand of Bijepur, Sohela, Arda, and part of Barpali with improved voltage profile and reliable power supply.

d) Berhampur town is prone to natural calamities, necessitating a disaster-resilient power transmission system capable of withstanding various cyclonic storms. To ensure an uninterrupted power supply during emergencies, the proposed 132kV S/C underground XLPE cable (16 Kms.) from the 132/33kV Berhampur Grid Sub-Station to the 220/132/33kV Narendrapur Grid Sub-Station (in addition to the existing 132kV overhead connectivity) will not only provide reliable power during emergencies but also enhance the stability and reliability of the 132kV network in the southern part of Odisha by improving the voltage profile.

e) The 2nd Circuit stringing of the Khariar-Nuapada 132kV line (72.23 Kms.) on the existing D/C tower, along with the Khariar-Kantabanji 132kV line (33.25 Kms.) on the existing D/C tower along with associated terminal bays, will ensure the stability and reliability of the 132kV network in the western part of Odisha by improving the voltage profile and providing an uninterrupted power supply.

f) The existing 132/33kV Grid Substation at Dhenkikote is radially connected to the 132/33kV Grid Substation at Karanjia. The proposed 132kV D/C line (45.52 Kms.) from Dhenkikote to Turumunga along with associated bays, will form 132kV ring system (Dhenkikote-Turumunga-Karanjia-Dhenkikote) and will deliver quality & uninterrupted power supply to consumers in the Dhenkikote Command area by enhancing the stability and reliability of the 132kV network in the Keonjhar District.

g) Currently, Ransinghpur GSS (peak load 118 MW) receives power supply through the Chandaka-Ransinghpur feeder (HTLS) and is also connected through Ransinghpur-Kesura-Pratapsasan 132kV line. After integrating the Pandiabili-Pratapsasan 220kV line, a significant portion of the load flow has

been observed through the Pratapsasan-Kesura-Ransinghpur 132kV line, which exceeds permissible limits during peak hours. If the Chandaka-Ransinghpur 132kV line fails, Ransinghpur will not be able to draw the full load through the Pratapsasan-Kesura-Ransinghpur 132kV line, which uses ACSR Panther conductor. This issue will be addressed by upgrading the Pratapsasan-Kesura-Ransinghpur 132kV line from ACSR to HTLS conductor.

h) At present voltage levels of 33kV system of the PSSs, such as Binka, Pandikital, Bahatabahal, Ainlachat, and Balitikra, are beyond the permissible limit and unable to support the anticipated future load of 26MVA for the upcoming rice mills and proposed ethanol plant in Sonepur District. The proposed 220/33KV Grid Substation at Sarasmal will address the low voltage issues and meet the upcoming load demand in these areas.

i) The concerned DISCOMs have also agreed to the implementation of these projects, to improve the reliability, availability and quality of power supply in the areas of operation. Further, DISCOMs have requested the Commission to direct OPTCL for the timely completion of the projects to avoid cost and time overrun.

9. In view of the above-stated factual scenario, the Commission approves the investment proposal of OPTCL(Rs.379.50 Cr.) for the construction of the 132/33kV Grid Substations at Raighar and Bijepur, 132kV S/C UG cable link from Narendrapur to Berhampur, 2nd Circuit stringing of Khariar-Nuapada 132kV line on existing D/C tower, 2nd Circuit stringing of Khariar-Kantabanji 132kV line on existing D/C tower, 132kV D/C line from Turumunga, to Dhenkikote, Replacement of ACSR Panther Conductor by HTLS Conductor in existing Pratapsasan-Kesura-Ransinghpur 132kV D/C Line and 220/33kV Grid Substation at Sarasmal (Rampur). These projects are intended to facilitate the smooth flow of power, improve the voltage profile at PSS levels, reduce transmission system losses, create 132kV network and enhance the reliability and availability of power supply in the western part of Odisha, thereby supporting the ultimate objective of providing 24x7 quality power supply to all.

10. The Commission has the following observations/ directions for necessary action:

a) OPTCL shall ensure the timely completion of projects to avoid cost and time overruns. Additionally, 33kV outlets must be optimally utilized by the DISCOMs

to prevent the creation of stranded assets. Accordingly, DISCOMs shall be communicated to develop the downstream distribution network within a matching timeframe.

b) Accordingly, there shall be a binding agreement between OPTCL and the concerned DISCOM regarding the Schedule date of completion of GSS of OPTCL and downstream network of DISCOM failing which either OPTCL or DISCOM will be liable to pay penalty as per the agreement.

c) It has been observed that work orders for various transmission projects are being issued before land acquisition is finalized, leading to significant delays in many OPTCL projects, resulting in cost overruns. In view of this, the Commission directs OPTCL to complete all necessary prerequisites, including the acquisition of land and preliminary/detailed route survey of proposed lines, before issuing work orders to avoid delay in the execution of work. Further, any cost overruns arising due to delay in the execution of projects will no longer be passed on to consumers in future.

d) Despite repeated directions to OPTCL, projects are being executed by OPTCL without prior approval of the investment proposal from the Commission. Projects at various stages of execution/tendering process are being submitted for the Commission's approval. It is observed that out of eight(8) projects, work order has already been placed for six(6) projects and the other two projects relating to the stringing of the 2nd circuit are in the tendering stage. Such actions violate the provisions of Licence Conditions and will not be entertained in future. The investment requirements for these projects will not be considered in the ARR and tariff determination of OPTCL. OPTCL is again directed to avoid the execution of transmission projects in future without proper system study and prior approval of the investment proposal by the Commission.

e) The replacement of the existing conductor with the HTLS Conductor is not a solution to the overloading of the line, which is caused by some other associated problems in the transmission system. OPTCL is directed to conduct proper system study to explore the use of Phase Shift Transformer (PST) to address issues where lower voltage lines (e.g. 132kV line) are overloaded due to the addition of higher voltage lines (e.g. 220kV line) in the transmission system. Further, OPTCL may also explore the use of AL59 Conductor in the transmission lines.

f) In the present investment proposal, it is observed that 132/33kV GSS at Raighar and Bijepur with 2x20 MVA or 2x40 MVA transformation capacity, as well as 220/33kV GSS at Sarasmal with 2x40 MVA have been proposed very close to the other existing nearby GSSs (each of above GSS are being established within a radius of about 20-25 kms. of existing other two GSS). This is undesirable and indicates lack of proper planning and long-term vision for accommodating load growth over the next 10–15 years. As a result, increasing number of underutilized transmission assets are being created, placing unnecessary financial burden on consumers. Despite repeated advice, OPTCL has not adhered to the national standard practices regarding transformer ratings and the total MVA capacity of GSS. Once again, OPTCL is directed to adopt best practices to optimize the overall cost of the transmission system and reduce the ultimate financial burden on the state's consumers.

g) OPTCL is advised to ensure that the benefit of the embedded fibre optic cable in the EHV cable link is also utilised for hot-spot monitoring of the cable and associated joints.

11. With the above observations and directions, the case is disposed of.

Sd/-
(S. K. Ray Mohapatra)
Member

Sd/-
(G. Mohapatra)
Member