

**BEFORE THE ODISHA ELECTRICITY REGULATORY COMMISSION
PLOT NO. 4, SHAILASHREE VIHAR, CHANDRASEKHARPUR
BHUBANESWAR-751023**

**CASE NO.
FILING NO. 1**

IN THE MATTER OF: An application under condition 10 of License Conditions of Odisha Power Transmission Corporation Limited (OPTCL) approved by Odisha Electricity Regulatory Commission vide order dated 27.10.2006 passed in Case No.22 of 2006.

**AND
IN THE MATTER OF:** Investment proposal of OPTCL taken up from FY 2026-27 to FY 2028-29 for 01 no. 765/400/220kV GSS, 01 no. 220/33kV GSS, 01 conversion of 132kV Switching station to 132/33kV GSS, 01 no. 400kV D/C line, 02 nos. 132kV UG cable, 01 no. HTLS conversion work, Substation Isolator & Mechanism Boxes up gradation and 01 no. Telecom project availing equity/grant/loan assistance from suitable funding agency.

**AND
IN THE MATTER OF:** Odisha Power Transmission Corporation Ltd.
Janpath, Bhubaneswar-751 007

--- **Applicant/ Petitioner**

Vs.

- 1. The Chief Executive Officer**
TP Western Odisha Distribution Ltd.
At/PO: Burla, Dist: Sambalpur-768017
- 2. The Chief Executive Officer**
TP Southern Odisha Distribution Ltd.
Kamapalli, Courtpetta, Berhampur, Ganjam, Odisha-760004
- 3. The Chief Executive Officer**
TP Northern Odisha Distribution Ltd.
At/PO: Januganj, Remuna Golei, Dist. Balasore-756019
- 4. The Chief Executive Officer**
TP Central Odisha Distribution Ltd
IDCO Tower, 2nd Floor, Janpath, Bhubaneswar-751022
- 5. The Managing Director, GRIDCO Limited,**
Regd. Offic: Janpath, Bhubaneswar-751022



6. **The Chairman-cum-Managing Director, OHPC Ltd.,**
OHPC Corporate Office, Bhoinagar, Janpath ,
Bhubaneswar, India, Odisha - 751022

7. **The Additional Chief Secretary to Government**
Department of Energy, Government of Odisha,
2nd floor, Kharavel Bhawan,
Gopabandhu Marg, Keshari Nagar, Bhubaneswar-
751001

--- Respondents

**The above named applicant, Odisha Power
Transmission Corporation Ltd.**

MOST RESPECTFULLY SHOWETH:

1. That Odisha Power Transmission Corporation Ltd. (hereinafter referred to as "OPTCL") is a deemed Transmission Licensee under fifth proviso of section 14 of the Electricity Act, 2003 (hereinafter referred to as the "Act") and as notified by the Government of Odisha in the Transfer Scheme vide Notification No. 6892 dated 09.06.2005.
2. That Odisha Electricity Regulatory Commission (hereinafter referred to as the "Commission") vide order dated 27.10.2006 passed in Case No.22 of 2006 approved the License Conditions of OPTCL, the deemed Transmission Licensee, which came into force from 1st November 2006.
3. That in terms of licence condition 10.1 of the aforesaid licensee conditions, unless otherwise directed by the Commission, the licensee shall obtain prior approval of the Commission for making investment in the licensed business, if such investment is above the limits laid down at licence condition 23.1.

As per license condition 23.1, the Hon'ble Commission has specified the term "Major Investment" as any planned investment in or acquisition of transmission facilities, the cost of which, when aggregated with all other investments or acquisitions (if any) forming part of the same overall transaction, equals or exceeds Rs.10 Crore.

4. That as mentioned under aforesaid licence condition 7.1 and as per provisions contained in section 40 of the Electricity Act, 2003, OPTCL, as a Transmission Licensee, is duty bound to make investment to build, maintain and operate an efficient, co-ordinated and economical intra-state transmission system.



5. That in the above backdrop and in compliance of the requirement under licence condition 10, OPTCL is filing this investment proposal before the Hon'ble Commission for approval towards following projects on availing equity/loan assistance from suitable funding agency.
6. The highlights of the proposal are given as under:

Grid Substations

1. 3x1500MVA 765/400kV ICT + 3x500MVA 400/220kV ICT + 2x240 MVAR 765kV Bus Reactor + 1x125 MVAR 400kV Bus Reactor, 765/400/220kV GIS at **Khuntuni (At Betakholi)**, Athagarh with associated lines
2. 2x100 MVA, 220/33kV GIS at **Pahala**, Khordha with associated lines
3. Conversion of 132kV Kutra Switching Station to 2X50MVA 132/33kV Grid Substation, **Kutra**

Transmission lines

4. 400kV **Indravati PSP-Therubali** D/C line
5. 132kV **Balasore-Chandipur** S/C UG cable with associated bays
6. 132kV **Narendrapur-Chhatrapur** S/C UG cable with associated bays
7. 132 kV **Burla PH-Katapali Ckt-I & II** HTLS conversion

Upgradation work

8. Substation Isolator and Mechanism Box Upgradation
9. Upgradation of OPTCL OPGW network to 48F OPGW to facilitate IP-MPLS project of Govt. of Odisha

Total investment of the above said projects **Rs. 3,793.29 Cr.** and the details of estimated cost, source of funding and OERC approvals in Transmission/ Business Plan are as under

SUMMARY OF INVESTMENT, COST AND SOURCE OF FUNDING

Sl. No.	NAME OF TRANSMISSION REINFORCEMENT WORKS	ESTIMATED COST (Rs. Cr.)	SOURCE OF FUNDING / SCHEME	Approved by OERC in Trans. Plan
1	3x1500MVA 765/400kV ICT + 3x500MVA 400/220kV ICT + 2x240	2678.97	30:70 Equity:Debt	Will be incorporated in upcoming 15 th TP. But



	MVAR 765kV Bus Reactor + 1x125 MVAR 400kV Bus Reactor, 765/400/220kV GIS at Khuntuni (At Betakholi) , Athagarh with associated lines			approved in 30 th CMETS-ER meeting held on dtd. 26.04.2024
2	2x100 MVA, 220/33kV GIS at Pahala , Khordha with associated line	360.75	100% Grant (SDMF)	New project will be taken in 15 th TP
3	Conversion of 132kV Kutra Switching Station to 2X50MVA 132/33kV Grid Substation, Kutra	34.30	30:70 Equity:Debt	New project will be taken in 15 th TP
4	400kV Indravati PSP-Therubali D/C line	367.41	100% Equity (GEETC)	14 th Transmission plan in case no. 08/2024
5	132kV Balasore-Chandipur S/C UG cable with associated bays	165.66	100% Grant (SDMF)	14 th Transmission plan in case no. 08/2024
6	132kV Narendrapur-Chhatrapur S/C UG cable with associated bays	114.67	100% Grant (SDMF)	New project will be taken in 15 th TP
7	132 kV Burla PH-Katapali Ckt-I & II HTLS conversion	13.90	30:70 Equity:Debt (OTSSP-II)	New project will be taken in 15 th TP
8	Substation Isolator and Mechanism Box Upgradation	30.41	30:70 Equity:Debt (own capital)	Not applicable
9	Upgradation of OPTCL OPGW network to 48F OPGW to facilitate IP-MPLS project of Govt. of Odisha	27.22	100% Grant	Not applicable
	TOTAL	3,793.29		

- Sl. No. 1 will be funded through 30% Equity from Govt. under the scheme MMSBY-Construction of 765kV GSS & Lines and 70% by availing loan from suitable funding agency.
- Sl. No. 3 will be funded through 30% Equity from Govt. as per the resolution dated 26.11.2025 and 70% by availing loan from suitable funding agency.



- Sl. No. 4 has been funded through 100% Equity support from Govt. of Odisha under the scheme "Green Energy Evacuation Transmission Corridor (GEETC)".
 - Sl. No. 2, 5 & 6 have been funded through 100% Grant from Govt. under SDM Fund.
 - Sl. No. 7 has been funded through 30% Equity support from Govt. of Odisha and 70% loan under scheme OTSSP-II.
 - Sl. No. 8 has been funded through 30% own Equity and 70% loan from suitable funding agency.
 - Sl. No. 9 has been funded through 100% Grant from Govt. of Odisha.
7. That the information on the above proposed investment with regard to the following:
- a) Executive Summary
 - b) Technical Considerations
 - c) Techno-Economic justification
 - d) Implementation
 - e) Prior consultation with DISCOMs
 - f) Environmental Considerations
 - g) NPV & IRR

are filed along with this application as **ANNEXURE- 1 & 2** for kind perusal and approval of the Hon'ble Commission.

8. That in compliance of the requirements under aforesaid license condition 10.4, the Detailed Project Report (DPRs) containing the relevant information related to the above mentioned projects are filed along with this application **ANNEXURE- 2**.
9. That, OPTCL hereby submits the justification for creation of each of the proposed **09 nos.** projects in the respective DPRs and in the information document filed along with this application.

PRAYER

The applicant, Odisha Power Transmission Corporation Ltd., Bhubaneswar most respectfully requests the Hon'ble Commission to approve the investment proposal amounting to Rs. **3,793.29** Crore filed herein for implementation of the projects.

Bhubaneswar
Date: 16 06.2026



By the applicant
Through

Maheswar Behara
GM, RT&C

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10. The Additional Chief Secretary to Government
Department of Energy, Government of Odisha,
2nd floor, Kharavel Bhawan,
Gopabandhu Marg, Keshari Nagar, Bhubaneswar-
751001

--- RESPONDENTS

AFFIDAVIT VERIFYING THE APPLICATION

Sri Maheswar Behera, Late Babaji Behera, aged about 51 years, residing at
Bhubaneswar, do solemnly affirm and say as follows:

1. I am the General Manager, Regulation, Tariff and Commercial, OPTCL,
duly authorized by the said applicant to make this affidavit on its behalf.
2. The Statements made in Paragraphs 1 to 9 herein above are based on
official information and I believe them to be true.

Bhubaneswar
Date: 16.06.2026

Maheswar Behera
DEPONENT

SWORN BEFORE ME



N. Mohanty
N. MOHANTY
NOTARY
Regd. No. ON 20194
382, Bhoi Nagar,
Bhubaneswar-751022

16.06.2026

1. EXECUTIVE SUMMARY

OPTCL has technically and economically justified requirements for the immediate implementation of additional system reinforcement of its transmission network to meet the system needs for the years immediately beyond 2026. The proposed projects to be implemented by OPTCL on availing assistance from the State Govt. and loans from suitable funding agency is the immediate priority and long-term system reinforcement required for the State. The proposed addition will improve the security and supply standards of the OPTCL transmission network and reduce transmission loss. The requirement for OPTCL to undertake such investment to provide an efficient, coordinated and economical system of transmission is called for in condition 7.1 of license conditions of OPTCL (effective from 1st November 2006) approved by the Hon'ble Commission vide order dated 27.10.2006 passed in Case No.22 of 2006 and as per provisions contained in section 40 of the Electricity Act, 2003. The technical, economic and environmental aspects of the investment have been considered in compliance with condition 10 for major investments of aforesaid license conditions.

The proposed investment has been taken into account as regards the fundamental requirements to:

- Ensure that the quality of supply to consumers is maintained / improved.
- Enable OPTCL to receive an economic return.

In the light of the above requirements, the proposed investment has been developed and justified based upon:

- Comparative load flow studies using application of planning criteria to meet various combinations of load and generation patterns currently available and anticipated beyond 2026.
- Comparative loss evaluation and also comparison with the capital expenditure of the scheme proposed after capitalization.

A total investment of **Rs. 3,793.29 Cr.** for the transmission schemes is proposed as follows:

Grid Substations

1. 3x1500MVA 765/400kV ICT + 3x500MVA 400/220kV ICT + 2x240 MVAR 765kV Bus Reactor + 1x125 MVAR 400kV Bus Reactor, 765/400/220kV GIS at **Khuntuni (At Betakholi)**, Athagarh with associated lines

2. 2x100 MVA, 220/33kV GIS at **Pahala**, Khordha with associated lines
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	TOTAL	3,793.29		

2. TECHNICAL CONSIDERATIONS

2.1 Planning Criteria

Maintenance of quality power supply to consumers and reduction of technical losses are achieved by application of appropriate planning criteria.

The following criteria have been considered when investigating the proposed new sub-stations as well as transmission lines with respect to the acceptable range of voltages permitted at different points of the system under both normal and contingency situation:

- At all loads under normal steady state operating conditions, the voltages at all points on the main nodal points of the interconnected system should be maintained within a tolerance of + 5% to -5% of the nominal voltage. At other locations and outgoing line circuits a higher voltage tolerance of +10% to - 10% can be accepted.
- The loading of all elements should not exceed their rated values for steady state conditions.
- Under a single contingency outage i.e. under outage of any one of power element of the transmission system, the system voltage at any point should

not fall below 90% of the nominal value without any immediate corrective action.

- After system re-adjustment, following any single element outage, without considering any load shedding at important load centers, the voltages and loading of all elements should return to normal acceptable levels.
- Under any low load or loss of load situation, the 400kV system voltage should not be allowed to exceed +5% of the nominal value, whereas the 220kV & 132kV system voltage can be permitted to rise to a maximum of +10%.

2.2 Overall conclusions of the studies performed with proposed schemes

The System Studies concluded that under the normal steady state conditions, the immediate implementation of the additional proposed sub-stations as well as transmission lines would:

- Improve the system voltage profile at all points of the transmission system.
- Reduce the loading on certain important line sections of the transmission network thereby avoiding overloading of lines or avoiding the line sections being loaded close to their respective capacities.
- Reduce the overall transmission system losses.

The single contingency outage scenario studies indicated certain line outage situations that could lead to potential problems related to overloading of remaining system lines and collapse of system voltages at locations close to the tripped line in the proposed case.

2.3 Review of scheme proposed

2.3.1 765/400/220 KV GIS Sub-Station at Khuntuni (At Betakholi), Athagarh with installation of 3x1500MVA, 765/400KV ICT, 2x240MVAR, 765KV Bus reactor, 3 x 500MVA, 400/220KV ICT and 1x125MVAR, 400KV Bus reactor along with construction of equipping bay & associated System along with its associated transmission lines

EXISTING SUPPLY SYSTEM

At present, Bhubaneswar's electricity supply is heavily dependent on a single major transmission source—the 400/220 kV substation at Mendhasal. Although a second major substation was established at Pandiabil by Power Grid Corporation of India Limited (PGCIL) with the intention of strengthening the city's power infrastructure and providing redundancy, the arrangement did not achieve true

source diversification. This is because the Pandiabil substation itself receives its bulk power through transmission links originating from Mendhasal. As a result, both substations are effectively dependent on the same upstream source. Consequently, any major disturbance, outage, maintenance activity, or transmission constraint at Mendhasal can still impact power supply to Bhubaneswar, limiting the reliability benefits that would normally arise from having multiple independent substations. A genuinely resilient system would require Pandiabil to be fed from an alternative transmission corridor or generating source, thereby creating an independent supply path and reducing the city's reliance on Mendhasal as a single point of failure.

Bhubaneswar's power supply is presently dependent on the 220 kV network fed from Mendhasal, whose transfer capacity is limited to about 940 MVA. The substation has already recorded a peak loading of around 924 MVA this year, leaving very little spare capacity to accommodate future demand growth. With rapid urbanization and increasing industrial, commercial, and residential loads, the existing system is nearing saturation. Therefore, any significant increase in power demand cannot be reliably met through the current 220 kV infrastructure. Establishment of a 765 kV supply source is essential to ensure adequate capacity, reliability, and long-term power security for the capital region.

The line loading of 400KV Meramundali-Mendhasal during peak summer reaches 570MW/ckt with 400KV Mendhasal-Pandiabilli loaded up to 140 MW/ckt. Now, some of the power intensive industries including Waree Ltd., JSW & POSCO JV, Kalyani Steel etc. are going to be setup in the area. The total requirement for the new industrial establishments would be around **1203MW**. Hence, it is proposed to construct 765/400KV GIS Substation at Khuntuni with associated system covering major scope like construction of (i) 765KV DC line (Hexa Zebra Conductor) from PGCIL Angul substation to proposed GIS, Khuntuni, (ii) 400KV DC line (Quad Moose Conductor) from proposed GIS, Khuntuni to 400/220KV Grid S/S, Neulapoi, (iii) 400KV DC line (Twin Moose Conductor) from proposed GIS, Khuntuni to 400/220/132KV Grid S/S, Mendhasal, so as to meet the additional power requirement in the area.

Details of Load:

- Present demand of Bhubaneswar (1160MW + 333MVAR) is supplied from Mendhasal
- To meet the future load growth (Capital region load enhancement around 500 MW) of Twin city Cuttack & Bhubaneswar.

- To meet the upcoming load demand of 1203 MW of industries,
 - M/s Waree Energies Ltd. - 650 MW
 - M/s JSW Group - 350 MW
 - M/s Kalyani Steel - 203 MW
- The total load demand on the Sub-Station is around **1703 MW** and will increase to **2500MW** in 3/5 years.
- Provide an alternate and robust power supply path to Bhubaneswar through 220kV Khuntuni to Pahala to Mancheswar(upgraded to 220kV) connectivity, establishing N-1 transmission planning criteria.
- Reduce the load on Meramundali and Lapanga Grid Sub-Stations increasing reliability of the system.
- Further 220kV DC line from and Khuntuni (Betakholi) to Choudwar will act as a ring among 220kV Khuntuni-Choudwar-Bidanasi.

Odisha's 765 kV transmission network is evolving into a robust corridor that anchors the state's industrial and infrastructural growth. The Angul 765 kV substation is the oldest and most critical node, serving as a gateway for interstate power transfer between the Eastern and Southern regions. It stabilizes the grid and supports Odisha's heavy industries, while also enabling surplus evacuation to the national network.

Building on this backbone, the Gopalpur 765 kV GIS project has been awarded to Tata Power under the Eastern Region Expansion Scheme. It includes two 1500 MVA transformers and a 190 km 765 kV double-circuit line from Angul to Gopalpur. Scheduled for commissioning by 2027, it is designed to support coastal industries, renewable integration, and emerging green hydrogen projects, thereby diversifying Odisha's industrial base.

The third major development is the Paradeep 765 kV project, awarded under the Tariff-Based Competitive Bidding (TBCB) framework. With an investment of over ₹2,500 crore, it will establish a 765 kV double-circuit line from Angul to Paradeep, along with advanced reactive compensation. This project is critical for Paradeep's port-led industrial cluster, including petrochemicals, fertilisers, and steel.

NEED OF THE PROJECT

The proposed 765 kV GIS Sub-station at Khuntuni (Betakholi), Athagarh is essential to meet the rising industrial and regional load demand in

Cuttack district. Athagarh has emerged as a hub for ferroalloy, cement, and ancillary industries, all of which require uninterrupted high-voltage supply. By creating a D/C from the 765 kV double-circuit transmission line from Angul, Betakholi will act as a critical node to absorb heavy industrial loads and stabilize the transmission system. This sub-station will not only ensure reliable power for upcoming projects in Athagarh but also complement the existing 765 kV grid at Angul and the upcoming substations at Gopalpur and Paradeep. Together, these high-capacity nodes will form a robust transmission corridor, enabling Odisha to handle industrial expansion, renewable integration, and interstate power exchange. Betakholi's GIS facility will thus play a pivotal role in balanced regional development and strengthening Odisha's grid backbone. Further, this project will support the rapid urbanization and load growth in Bhubaneswar, Bidanasi, Choudwar, Pahala & Khuntuni region.

In addition to the above, the following lines are proposed to be connected to the 765 kV GIS Substation at Khuntuni, Betakholi:

1. 765kV Hexa Zebra D/C from upcoming 765/400kV GIS, Duburi.
2. 765kV Hexa Zebra D/C from 765/400kV GSS, Phulpada, Angul.
3. 400 kV Quad Moose D/C line from Neulapoi to 765/400 kV Khuntuni, Betakholi.
4. 400 kV Twin Moose D/C line from Mendhasal to 765/400 kV Khuntuni, Betakholi.
5. 220 kV D/C line from existing 220/132kV GSS at Bidanasi.
6. 220kV D/C line from upgraded 220/132kV GSS at Choudwar.
7. 220kV D/C line from upcoming 220/33kV GIS at Pahala.
8. 220kV D/C line from upgraded 220/132kV GSS at Khuntuni

The 3x1500 + 3x500MVA, 765/400/220KV Khuntuni, Betakholi GIS substation will also cater to the existing and upcoming industries for evacuation of power to load centers.

Also, since during off peak load hours voltage shoots up 02 nos. 240 MVAR, 765KV Bus reactor and 1x125MVAR, 400KV bus reactor is required at Khuntuni, Betakholi GIS for absorbing reactive power thereby decreasing voltage shoot up at the substation.

SCOPE OF NEW PROPOSAL:

There is proposal to install 3x1500MVA, 765/400KV ICT, 2x240 MVAR, 765KV Bus reactor, 3 x 500MVA, 400/220KV ICT and 1x125MVAR, 400KV Bus reactor at Khuntuni, Betakholi. The total scope of works as envisaged in the proposed project is detailed below.

I.	765 kV Lines By	: As mentioned above. Transmission towers.
II.	400 kV Lines By	: As mentioned above. Transmission towers.
III.	Installation of 1500 MVA, 765/400/220 KV	: 3 Nos.
IV.	Installation of 500 MVA, 400/220 KV ICT Transformer	: 3 Nos.
V.	Installation of 240 MVA, 765 KV Bus Reactor	: 2 Nos.
VI.	Installation of 125 MVA, 400 KV Bus Reactor	: 1 Nos.
VII.	765 kV Bays (Feeder, ICT & bus reactor)	: 12 Nos.
VIII.	765 kV Tie Bays	: 6 Nos.
IX.	400 kV Bays (Feeder, ICT & bus reactor)	: 13 Nos.
X.	400 kV Tie Bays	: 8 Nos.
XI.	220 KV feeder bays	: 8 No.
XII.	220 KV Transformer bays	: 3 No.
XIII.	220 kV bus-Coupler bays	: 1 Nos.
XIV.	1000 kVA, 33 / 0.4 KV station transformer with its auxiliaries	: 2 Set
XV.	Sub-station auxiliaries i.e., battery and battery charger, firefighting equipment etc.	: 1 Set
XVI.	OPGW	: As required
XVII.	Land, Control room and other civil Works	: As required.

The said project is a new project and will be incorporate in upcoming 15th Transmission Plan of OPTCL. The working capital would be made available from 30% Equity support from Govt. of Odisha MMSBY-Construction of 765kV GSS &

Lines scheme and remaining 70% will be met by availing loan from suitable funding agencies.

2.3.2 2x100 MVA, 220/33KV GIS at Pahala with SAS along with 220 KV D/C line (UG cabling length approx 8.805 Km & Over Head length approx 1.135 Km. Total Line Length=9.94 RKms approximately) from existing 220/132/33KV GIS at Baliana & 220 KV D/C line (Over Head length approx 13 Km & UG cabling length approx 1.135 Km. Total Line Length=14.135 RKms approximately) from existing 220/132/33KV GIS at Bidanasi along with 02 nos. of Bay extension at Baliana GIS & Bidanasi

EXISTING SCENARIO

At present, the Pahala area is primarily receiving supply through the 33kV and 11kV distribution network routed from nearby 33/11kV Nakhara & Naharakanta PSS. The 33kV feeders originate from the 132/33kV GSS at Phulnakhra and 132/33kV GSS at Mancheswar, which are already heavily loaded due to rising demand in Bhubaneswar's industrial and residential clusters. These feeders extend supply to Pahala and adjoining areas, but because of their long route lengths, consumers often face voltage drops and reliability issues.

NEED OF THE PROJECT

The Government of Odisha has prioritized strengthening the transmission backbone in the Bhubaneswar command area to cater to the rising demand from industries, IT hubs, and residential clusters. The **Pahala region**, located strategically between Baliana and Mancheswar, is witnessing rapid development with upcoming logistics parks, IT establishments, and large housing projects. The existing 132/33kV substations at Baliana, Bidanasi and Mancheswar are already heavily loaded, and the feeders supplying Pahala are long and stressed, leading to voltage drops and reliability issues. With demand projected to cross **1000 MW in the Bhubaneswar belt**, the current system cannot sustain future growth.

In order to meet this requirement, the Government has advised construction of a **2x100 MVA, 220/33kV GIS Grid Sub-station at Pahala**. This sub-station will be connected through **220kV D/C underground cabling from Baliana, 220kV D/C underground cabling from Bidanasi, and future 220kV S/C underground cabling from Mancheswar (after upgraded to 220kV GIS)**. These multiple corridors will ensure redundancy, reliability, and compliance with **N-1**

contingency standards, meaning uninterrupted supply even if one line or transformer is out of service.

The proposed Pahala GIS will provide **dedicated and quality power** to upcoming industries in the area, including IT parks, logistics hubs, and manufacturing units, while also supporting residential colonies and commercial establishments. It will improve voltage profile, minimize interruptions, and reduce transmission congestion, thereby strengthening OPTCL's transmission corridor in the capital region.

Thus, the **220/33kV GIS Sub-station at Pahala** is very much necessary to provide uninterrupted power supply with a stable voltage profile to industries and consumers in the Bhubaneswar command area. It will ultimately feed DISCOM consumers with better quality supply, support socio-economic development, and ensure the transmission system is future-ready to meet the growing load demand.

SCOPE OF THE PROPOSAL:

For the proposed 2x100 MVA, 220/33KV GIS at Pahala with SAS along with 220 KV D/C line (UG cabling length approx 8.805 Km & Over Head length approx 1.135 Km. Total Line Length=9.94 RKms approximately) from existing 220/132/33KV GIS at Baliana & 220 KV D/C line (Over Head length approx 13 Km & UG cabling length approx 1.135 Km. Total Line Length=14.135 RKms approximately) from existing 220/132/33KV GIS at Bidanasi along with 02 nos. of Bay extension at Baliana GIS & Bidanasi, there is proposal to install 2 nos. of 100 MVA, 220/33 kV transformers at Pahala. The total scope of works as envisaged in the proposed project is detailed below.

- | | |
|--|--------------------|
| a) 220kV D/C line from existing 220/132/33kV GIS at Baliana though UG Cabling | : 8.805 Kms. |
| b) 220kV D/C line from existing 220/132/33kV GIS at Baliana though Overhead T/L | : 1.135 kms. |
| c) 220kV D/C line from existing 220/132/33kV GIS at Bidanasi though UG Cabling | : 1.135 Kms. |
| d) 220kV D/C line from existing 220/132/33kV GIS at Bidanasi though Overhead T/L | : 13 kms. |
| e) 220kV GIS Feeder bay module | : 5 Nos. + 1 spare |
| f) 220kV GIS Power Transformer bay | : 2 Nos. |

g) 220 kV GIS bus-Coupler bay module with Bus PT	: 1 Nos.
h) 33 kV GIS transformer bay module	: 2 Nos
i) 33 kV GIS bus coupler bay module	: 1 No.
j) 33 kV GIS feeder bay module	: 5 Nos.
k) 33 kV Station transformer bay	: 1 No.
l) 250 KVA, 33 / 0.4 kV station transformer with its auxiliaries	: 2 Set
m) Sub-station auxiliaries i.e., Battery and Battery charger, firefighting equipment etc.	: 2 Set
n) OPGW for 220kV line	: 10 + 15 Kms
o) Land, control room and other civil works	: as required

The said project is a new project and will be incorporate in upcoming 15th Transmission Plan of OPTCL. The working capital for the said project will be met by availing **100% Grant** from Govt. of Odisha under State Disaster Mitigation (SDM) Funding.

2.3.3 Conversion of 132kV Kutra Switching Station to 2X50MVA 132/33kV Grid Substation, Kutra

EXISTING SUPPLY SYSTEM

The existing 132 kV Kutra Switching Station in Sundargarh district is presently operating only as a switching point without any transformation facility. However, the region is experiencing significant growth in industrial activity, with major consumers such as M/s Scan Steels Ltd., M/s Shiva Cement Limited, M/s Uni Profiles Private Limited, M/s M R Engineers Private Limited, along with several emerging MSME units establishing operations in the area.

In addition to growing industrial demand, the station is expected to cater to the increasing agricultural and domestic load within the nearby TPWODL command areas. At present, power supply to these loads is being managed through long 33 kV feeders originating from distant substations, resulting in considerable voltage drops, reduced reliability, and frequent interruptions.

To address these issues and ensure quality power supply, it is proposed to upgrade the existing 132 kV Kutra Switching Station into a full-fledged 132/33 kV

Grid Sub-Station by installing 2×50 MVA, 132/33 kV power transformers along with associated bays, switchgear, protection, control, and communication systems. This augmentation will enhance system reliability, reduce loading on existing substations, minimize technical losses, and ensure stable and quality power supply to industrial, agricultural, and domestic consumers in the region.

NEED OF THE PROJECT

1. The proposal shall help to cater power supply to M/s. Scan Steels Ltd., M/s Sita Cement Limited, Uni Profiles Private Limited, M/s M R Engineers Private Limited and several other MSME enterprises in and around Kutra tahasil.
2. Moreover, the implementation of this project will strengthen power availability for TPWODL consumers in nearby villages and towns. This would also encourage the establishment of additional small and medium-scale industries in the region, thereby fostering industrial growth and ultimately contributing to the overall economic development of the State of Odisha.

JUSTIFICATION OF THE PROJECT

The current infrastructure is inadequate to support the rising industrial, agricultural, and domestic demand, leading to persistent power quality issues and underscoring the need for establishing a dedicated 132/33 kV Grid Sub-Station at Kutra. In order to address these issues and ensure quality power supply, upgradation of the existing 132 kV Kutra Switching Station into a full-fledged 132/33 kV Grid Sub-Station by installing 2×50 MVA, 132/33 kV power transformers along with associated 33kV bays, switchgear, protection, control, and communication systems, shall be pertinent. This augmentation will enhance system reliability, reduce loading on existing substations, minimize technical losses, and ensure stable and quality power supply to industrial, agricultural, and domestic consumers in the region.

SCOPE OF NEW PROPOSAL

Proposed “Conversion of 132kV Kutra Switching Station to 2X50MVA 132/33kV Grid Substation, Kutra” in the district of Sundargarh.

The total scope of works as envisaged in the proposed project is detailed below.

- | | |
|---|----------|
| I] Installation of 50MVA, 132/33KV Transformers | : 2 Nos. |
| II] 132KV Transformer bay | : 2 Nos. |

III] 33KV Transformer bays	: 2 Nos.
IV] 33KV Bus coupler bay	: 1 No.
V] 33KV Line feeder bays	: 5 Nos.
VI] 250 KVA, 33 / 0.4KV station transformer with its auxiliaries	: 1 Set
VII] Sub-station auxiliaries i.e., battery and battery charger, firefighting equipment etc.	: 1 Set
VIII] Land, Control room and other civil	: As required.

The said project will be incorporated in upcoming 15th Intra-State Transmission plan. The working capital would be made available through 30% equity support from Govt. of Odisha and 70% debt from suitable financial institutions as per the Govt. resolution dated 26.11.2025.

2.3.4 Infrastructure development for evacuation of 600MW power from PSP project at Mukhiguda (Indravati) by construction of 400 KV Indravati-Therubali D/C LINE from proposed 600MW PSP Sub-Station at Mukhiguda to proposed 400/220 KV GSS Therubali in the state of Odisha (Approx.- 93.25 KMs)

INTRODUCTION

Odisha Power Transmission Corporation Limited (OPTCL) received communication from GoO, Odisha Energy Dept. and subsequently Renewable Energy Agency (RENA), GRIDCO intimated for infrastructure development for the evacuation of approximately 600 MW of PSP (Pumped Storage Power station) at the Indravati Mukhiguda. To ensure seamless power evacuation, following infrastructure developments, and as per CEA guidelines, Construction of 400 KV Indravati-Therubali D/C LINE, have been proposed.

The proposed 400 kV Indravati–Therubali Double Circuit Transmission Line is a project of strategic importance for the State of Odisha, being the dedicated evacuation system for the upcoming 600 MW Upper Indravati Pumped Storage Project (UIPSP) at Mukhiguda, Kalahandi. The UIPSP, developed by utilizing the existing Upper Indravati Hydro Electric Project reservoir infrastructure, has been conceived as a peaking power station with an installed capacity of 600 MW (4 x 150 MW) and annual design energy generation of about **1040 MU** and it will take around

1283 MU energy for pumping. The DPR highlights that pumped storage projects are essential for meeting peak demand, enhancing grid reliability, providing large-scale energy storage, and facilitating integration of renewable energy sources such as solar and wind power. The project is therefore critical for strengthening Odisha's energy security and supporting the State's long-term clean energy transition.

NEED OF THE PROJECT

This project establishes a benchmark for PSP plant development in India, demonstrating the technical feasibility and economic viability of large-scale water-based renewable energy installations. The comprehensive power evacuation strategy ensures reliable delivery of clean energy to the grid while preserving environmental resources and supporting sustainable development objectives. The integration of advanced monitoring, protection, and control systems ensures optimal performance while supporting the broader goals of renewable energy integration and grid modernization. This infrastructure development shall ensure future load growth demands in Kalahandi as well as Koraput Districts of Odisha.

SCOPE OF NEW PROPOSAL

The proposed Supply, Erection and Commissioning of 400KV D/C line from PSP at Mukhiguda to 400/220KV GSS at Theruivali with an estimated cost of **₹367.41 Cr**, which includes: the total scope of works as envisaged in the proposed project is as detailed below.

1. Construction of 400 KV D/C Transmission Line

01 no. of D/C transmission line from proposed 600MW at Mukhiguda (Indravati) to Proposed AIS 400/220KV (Grid Sub-station) at Theruivali (Approx. 93.25 KMs with Twin Moose Conductor).

The said project is approved in revised 14th Intra-State Transmission plan of OPTCL in case no. 08/2024. The working capital for the said project will be met by availing **100% Equity** from Govt. of Odisha under Green Energy Evacuation Transmission Corridor (**GEETC**) Scheme.

2.3.5 Engineering, Supply, Erection and Commissioning of (i) 132 kV Underground Cable Connectivity from 220/132/33 kV GSS, Balasore to 132/33 kV GSS, Chandipur (Approximate UG Cable Route Length: 27.00

km) and (ii) 01 No. of 132 kV AIS Bay Extension Work each at 220/132/33 kV GSS, Balasore & 132/33 kV GSS, Chandipur

EXISTING SUPPLY SYSTEM

Presently, the 132/33 kV GSS at Chandipur draws power at 132 kV from the 220/132/33 kV GSS, Balasore through a **132 kV Single Circuit (S/C) overhead line**. The existing 132 kV load at Balasore GSS is approximately **80 MW**, being shared across several 132 kV feeders, including Soro, Basta, Somnathpur, Udala, Chandipur, and direct EHV consumers such as Dhamra Port (22 MW) and Fecor Power (5 MW).

The existing 132 kV overhead line to Chandipur is entirely exposed to the cyclonic, saline, and humid atmosphere of the Odisha coast. The line has suffered repeated damage during past cyclonic events (Cyclone Fani 2019, Amphan 2020, Yaas 2021), resulting in extended outages ranging from several days to multiple weeks, each time disrupting the power supply to the critical DRDO Integrated Test Range (ITR) at Chandipur and the surrounding civilian and industrial consumers.

The existing system suffers from the following deficiencies:

- **No Network Redundancy (N-0):** The Chandipur GSS presently has only one source of power – the single-circuit overhead line from Balasore. Any fault on this line results in complete supply failure at Chandipur.
- **Saline Corrosion:** Continuous exposure to coastal saline atmosphere causes accelerated corrosion of towers, insulators, hardware fittings, and conductors, reducing asset life and reliability.
- **High Cyclone Vulnerability:** The overhead line lies within the Very High Damage Risk Zone (VHDRZ). Cyclone-related outages require extended restoration time due to the volume of damage to multiple tower/conductor spans.
- **Strategic Risk:** The DRDO/ITR at Chandipur is a nationally important defence installation. Power supply interruptions to this facility have serious national security and operational implications.
- **High Maintenance Cost:** Repeated cyclone damage necessitates large annual maintenance and emergency restoration expenditure on this corridor.

NEED OF THE PROJECT

The necessity for the proposed 132 kV Underground Cable Connectivity from 220/132/33 kV GSS, Balasore to 132/33 kV GSS, Chandipur arises from the following key considerations:

(i) Cyclone Vulnerability of the Existing Overhead Corridor:

Balasore district falls within the Very High Damage Risk Zone (VHDRZ) for cyclonic storms in the Bay of Bengal. Tropical cyclones of Severe, Very Severe, Extremely Severe, and Super Cyclonic categories make landfall along the Odisha coast with increasing frequency and intensity. The existing 132 kV S/C overhead line from Balasore GSS to Chandipur GSS runs entirely through this high-risk coastal zone. Repeated cyclone-related damage to this line and the long restoration time thereafter renders it unreliable for serving critical loads. Underground cabling will permanently eliminate cyclone-induced outage risk on this corridor.

(ii) Strategic Importance of Chandipur Load Centre:

The DRDO Integrated Test Range (ITR) at Chandipur is a nationally critical strategic defence establishment used for testing of missiles, rockets, and other defence systems. Any power disruption at this facility has direct implications for national defence preparedness. The Government of Odisha and Government of India require a reliable, weather-independent power supply to this establishment on a priority basis. The proposed underground cable is the most suitable solution for meeting this strategic requirement.

(iii) DPRS Mandate – Disaster Resilience of Coastal Power Infrastructure:

The Government of Odisha has specifically sanctioned this project under the Disaster Preparedness and Resilience Scheme (DPRS) through the State Disaster Mitigation Fund (SDMF). The DPRS scheme mandates the development of weather-resilient power infrastructure in cyclone-prone coastal districts of Odisha, of which Balasore is a priority area. Implementation of 132 kV underground cabling for the Balasore–Chandipur corridor is thus both mandated and funded under this state-level disaster resilience initiative.

(iv) N-1 Security and System Reliability:

The current system provides only N-0 (no redundancy) supply to Chandipur GSS. The proposed underground cable, when implemented with the AIS Bay Extensions at both Balasore and Chandipur, will enable N-1 security arrangements to be developed in future, significantly improving the reliability of supply to Chandipur and surrounding areas.

(v) Growing Load Demand at Chandipur:

In addition to the DRDO/ITR complex, the Chandipur area is witnessing growing civilian, industrial, and tourism-related load development. A reliable 132 kV supply

through underground cable is essential to support this load growth and attract future industrial investment in the coastal belt.

NEED OF UG CABLE:

The alternative of constructing a conventional 132 kV overhead line between Balasore GSS and Chandipur GSS is technically feasible but operationally and strategically inadequate for the following reasons:

- The entire ~27 km route passes through the Very High Cyclone Damage Risk Zone (VHDRZ) of Balasore district's coastal belt. An overhead line would remain fully exposed to annual cyclone risk.
- The route traverses developed urban/semi-urban areas of Balasore town and coastal zone, creating Right of Way (RoW) challenges for erection of conventional overhead towers.
- Underground cabling eliminates weather-related outage risk, requires no overhead RoW width acquisition, has zero visual and environmental impact on the coastal landscape, and provides a long-term, reliable power supply solution.
- The DPRS Scheme specifically mandates underground cabling as the preferred and approved solution for disaster-resilient power infrastructure in cyclone-prone coastal corridors of Odisha.
- The adoption of 132 kV UG cable is technically in line with best practices for EHV power transmission in densely populated coastal zones with high cyclone risk, as followed in comparable international and domestic projects.

SCOPE OF NEW PROPOSAL

The total scope of works as envisaged in the proposed project is as detailed below.

I.	Description of Scope	Qty.
1	Construction of 132 kV S/C line through UG Cabling from 220/132/33 kV GSS, Balasore to 132/33 kV GSS, Chandipur, Balasore	27 km
2	One (1) No. 132 kV AIS Bay Extension at 132/33 kV GSS, Chandipur	1 No.

3	One (1) No. 132 kV AIS Bay Extension at 220/132/33 kV GSS, Balasore	1 No.
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The said project is approved in revised 14th Intra-State Transmission plan in case no. 08/2024. The working capital for the said project will be met by availing **100% Grant** from Govt. of Odisha under State Disaster Mitigation (SDM) Funding.

2.3.6 Construction of 132kV s/c line through UG cabling from 220/132/33kV GSS Narendrapur to 132/33kV GSS Chhatrapur with one number of 132kV bay extension at both ends, Narendrapur & Chhatrapur.

EXISTING SUPPLY SYSTEM

Presently GSS Narendrapur is connected to GSS Chhatrapur through 132KV double circuit line. Normally GSS Chhatrapur avail power supply from GSS Narendrapur, GSS Aska New and GSS Purusottampur (Aska-Purusottampur-Chhatrapur).132KV power supply extend to GSS Ganjam. IRE avail power supply through 132KV IRE double circuit line. Rambha Traction avail power supply from GSS Chhatrapur.132KV Power supply also extend to GSS Balugaon. M/s Grasim Industries Limited avail power supply from GSS Ganjam. Solari traction avail power supply from GSS Balugaon.33KV feeders of Chhatrapur Command area avail power supply from GSS Chhatrapur.

NEED OF THE PROJECT

The project is required to establish a **high-capacity power network** to ensure uninterrupted and reliable power supply, sustaining long-term growth in the Chhatrapur command area. Chhatrapur is District Headquarter of Ganjam. The existing transmission connectivity is presently depends upon overhead transmission lines which are placed in coastal and cyclone prone area of Odisha and may unavailable/trip during cyclone. Odisha coastal belt including Ganjam is frequently affected by severe cyclonic storm / cyclonic storm. Continuous exposure to saline moisture accelerates corrosion of towers, insulators, hardware fitting etc leads to reduce asset life and reliability.Underground cable is therefore essential to ensure resilient, safe and uninterrupted power supply.

Benefits after Commissioning of 132KV S/C Line through UG Cabling from 220/132/33KV GSS Narendrapur to 132/33KV GSS Chhatrapur with one number of 132KV Bay extension at both ends, Narendrapur & Chhatrapur:

- Resolution of low voltage issues at Chhatrapur.
- Mitigation of overloading of 132KV feeders connected to Narendrapur while outage of other feeder.
- Ability to cater an additional 80MW load.
- Provision of N-1 connectivity at GSS Chhatrapur.
- Strengthening of the 132 kV system network in the Chhatrapur region.
- Enhancement of overall grid reliability and load handling capability with the addition of 132KV source.
- Alternative and reliable source of power supply during natural calamity.
- Outage chance of 132KV underground cabling is lesser than that of 132KV overhead transmission line.
- Uninterrupted power supply to District Headquarter, Chhatrapur.

SCOPE OF THE PROPOSAL:

- 132 kV Single Circuit line through UG Cabling from 220/132/33KV GSS Narendrapur to 132/33KV GSS Chhatrapur- Route length 18.5 Kms approx.
- One No. 132KV bay extension at 220/132/33KV GSS Narendrapur.
- One No. 132KV bay extension at 132/33KV GSS Chhatrapur.

The said project will be incorporated in upcoming 15th Intra-State Transmission Plan of OPTCL. The working capital for the said project will be met by availing **100% Grant** from Govt. of Odisha under State Disaster Mitigation (SDM) Funding.

2.3.7 Dismantling of ACSR Panther Conductor and Stringing of AAAC HTLS Conductor (ACSR Panther Equivalent) in 132KV Burla PH-Katapali Ckt-I & II, under EHT (O&M) Division, Burla

EXISTING SUPPLY SYSTEM

The 132 kV Burla PH–Katapali Ckt-I & II form an important part of the Burla Power House evacuation network. The original 132 kV Burla PH–Boinda SC line was commissioned in the year 1963, and subsequently the 132 kV LILO portion to Katapali Ckt-I was commissioned in the year 2010.

Similarly, the 132 kV Burla PH–Chiplima PH line was commissioned in the year 1979, and the 132 kV LILO portion to Katapali Ckt-II was commissioned in the year 2016.

At present, the 132 kV Burla PH–Katapali Ckt-I & II are being used as major evacuation corridors for Burla Power House. These circuits are presently strung with ACSR Panther conductor. Since the original line sections have been in operation for a considerably long period, strengthening of the existing evacuation system has become essential for ensuring reliable and secure evacuation of hydro generation from Burla PH.

NEED OF THE PROJECT

Burla Power House is an important hydro generating station in the OPTCL network, and the 132 kV Burla PH–Katapali Ckt-I & II lines play a vital role in evacuation of power from the generating station. In the present network condition, SLDC is compelled to restrict hydro generation under certain operating conditions due to limitations in the existing evacuation network. Such restriction of hydro generation results in loss of generation opportunity and consequent revenue loss.

The existing 132 kV Burla PH–Katapali Ckt-I & II are strung with ACSR Panther conductor. Considering the long operating period of the associated line sections and the importance of these circuits in the Burla PH evacuation system, the existing conductor capacity is required to be enhanced for improving system reliability and contingency support.

Hence, in order to strengthen the Burla PH evacuation network and enhance the current carrying capacity of the existing line without construction of a new transmission corridor, it is proposed to upgrade the existing ACSR Panther conductor to suitable AAAC HTLS conductor equivalent to ACSR Panther conductor. The HTLS conductor can carry substantially higher current than the existing Panther conductor and can help in improving evacuation capacity.

The proposed up gradation will improve the reliability of the 132 kV network, reduce evacuation constraints, avoid restriction of hydro generation, minimize revenue loss, and strengthen the contingency performance of the Burla PH evacuation system.

SCOPE OF NEW PROPOSAL

Proposed “Dismantling of ACSR Panther Conductor and Stringing of AAAC HTLS Conductor (ACSR Panther Equivalent) in 132KV Burla PH-Katapali Ckt-I & II, under EHT (O&M) Division, Burla”. The total scope of works as envisaged in the proposed project is detailed below.

- 132KV Burla PH-Katapali Ckt-I from Loc. No. 1 to Loc. No.9 including LILO-01 to LILO-36- 10.995 RKM
- 132KV Burla PH-Katapali Ckt-II from Loc. No. 1A to Loc. No.20A including LILO-01 to LILO-09- 6.831 RKM

- Supply of HTLS conductor with suitable hardware fittings : As required
- Stringing of 132 kV line with AAAC HTLS conductor for : 10.995 Kms
- 132 kV Burla PH–Katapali Ckt-I
- Stringing of 132 kV line with AAAC HTLS conductor for : 6.831 Kms
- 132 kV Burla PH–Katapali Ckt-II
- Dismantling of existing ACSR Panther conductor from : 10.995 Kms
- 132 kV Burla PH–Katapali Ckt-I
- Dismantling of existing ACSR Panther conductor from : 6.831 Kms
- 132 kV Burla PH–Katapali Ckt-II

The said project has been approved by Hon'ble Commission in case no. 86/2025 for replacement of old panther conductor with new panther conductor. However, due to increased loading, the line upgraded with HTLS conductor for reliable operation and will be incorporated in upcoming 15th Intra-State Transmission Plan of OPTCL. The working capital for the said project will be met by availing 30% Equity from Govt. of Odisha under OTSSP-II Scheme and remaining 70% by availing loan from suitable funding agencies.

2.3.8 Substation Isolator and Mechanism Box Upgradation Scheme

At present, the OPTCL transmission network comprises 207 Grid Substations and switching stations, along with 17,251.48 circuit kilometres of transmission lines. Considering the scale and geographical spread of the network, there is a critical need for centralized monitoring and control under the Substation Automation and Monitoring System (STAMS) framework, in place of the existing distributed mode of

operation, to enable faster decision-making, improved asset performance management, and expedited restoration during contingency conditions.

Effective implementation of STAMS necessitates that substations are:

- **Compliant with Substation Automation System (SAS) architecture, and**
- **Equipped with modern, reliable, and automation-compatible primary switching equipment.**

OPTCL has already converted 70 conventional Grid Substations into SAS-enabled substations. These substations are equipped with network and gateway panels installed in the SAS control room for acquisition of real-time power system data and transmission to remote control centers using standardized IEC 60870-5-104 communication protocol for selected signals. The adoption of SAS technology has enabled enhanced monitoring and control through local Human-Machine Interface (HMI) systems.

However, a substantial number of substations continue to operate in conventional mode, utilizing aged and failure-prone equipment such as isolators that are not compatible with remote operation and automation. These isolators are operated manually, resulting in increased operation time, delayed restoration during faults & Shutdowns, and reduced system reliability and availability.

In order to fully leverage the benefits of the STAMS framework and to strengthen system reliability and availability, it is imperative to replace and upgrade the existing aged and underperforming isolators and associated mechanism boxes across OPTCL Grid Substations. Accordingly, an upgradation scheme has been proposed covering the replacement of obsolete, under-rated, and deteriorated Isolators in 99 Grid Substations, including installation and commissioning.

Subsequently, as a cost optimization measure, it has been decided to limit the scope of replacement to Motorized Operating Mechanism (MOM) boxes of isolators instead of complete isolator replacement. However, considering the possibility of deterioration of critical isolator components, approximately 5% of the total isolator requirement shall be procured as complete isolator units, while the remaining requirement shall be addressed through retrofitting with MOM boxes.

EXISTING SCENARIO

At present, only 70 numbers of SAS-enabled Grid Substations (GSSs) under OPTCL have been integrated with the STAMS platform, while a significant number of substations continue to operate in conventional, non-automated mode. O&M

activities in these substations are largely decentralized and dependent on manual intervention, with no provision for centralized supervisory control or remote operation. System coordination is primarily carried out through telephonic communication, resulting in operational delays and reduced efficiency.

Many of these substations are equipped with aged and deteriorated isolators and manual mechanism boxes, leading to higher failure rates, increased maintenance requirements, and prolonged switching and restoration time. This adversely impacts system reliability and availability. Further, the absence of SAS-compliant infrastructure limits integration with SCADA/STAMS, thereby restricting real-time monitoring, control, and data acquisition.

With increasing renewable energy penetration and growing load demand, the need for a responsive and automated transmission system has become critical, which the existing conventional setup is unable to adequately support. Additionally, constraints in O&M manpower further necessitate the adoption of automation and centralized monitoring for efficient asset management and system operation.

NEED OF THE PROJECT

A significant number of Grid Substations (GSSs) under OPTCL are presently operating with aging isolators and associated mechanism boxes, leading to the following concerns:

- Frequent failures and operational issues in isolators and their mechanism boxes due to wear and obsolescence.
- Increased Operational delays as well as Outage duration.
- Increased maintenance requirements, including frequent adjustments, repairs, and replacement of mechanical components
- Operational constraints affecting safe and reliable switching operations
- Limited scope for integration with automation systems due to non-motorized/manual operating mechanisms
- Reduced system reliability and operational efficiency

Further, Phase-I of the STAMS project is under execution, wherein 70 GSSs are being integrated into the system. Additionally, IT and telecom infrastructure such as communication panels, Video Management Systems (VMS), and Remote Access Systems (RAS) have already been deployed across 187 GSSs.

However, a large number of substations are still equipped with conventional, non-motorized isolators and outdated mechanism boxes, making them non-SAS compliant. This restricts seamless integration with STAMS and limits capabilities such as remote operation, status monitoring, and interlocking.

In view of the above, replacement/retrofitting of isolators with motorized operating mechanisms and upgraded mechanism boxes is essential for enabling SAS compatibility and achieving a fully automated, reliable, and integrated

SCOPE OF THE PROPOSAL:

i) Supply, Dismantling, and Replacement of Existing Isolators:

Supply, dismantling of existing units, and erection & commissioning of new isolators for approximately 5% of the total assessed isolator population (that require repair/ Replacement) across 99 Grid Sub-Stations. The replacement shall be undertaken for isolators identified as critically aged, electrically/ mechanically deteriorated, or under-rated with respect to present system parameters. The new isolators shall be of requisite voltage and current ratings, with enhanced short-time withstand capacity, improved contact performance to ensure operational safety, reliability, and longevity.

ii) Supply, Installation, and Retrofitting of Motorized Isolator & Earth Switch Mechanism Boxes:

Supply and retrofitting of motorized operating mechanism boxes for isolators and earth switches. The scope includes retrofitting in place of existing manually operated, mechanically degraded mechanism boxes. The motorized mechanisms shall be suitable for both local and remote operation, equipped with necessary control circuits, interlocks, limit switches, position indication, space heaters, and provision for integration with Substation Automation System (SAS). The equipment shall conform to the latest OPTCL-approved technical specifications and applicable standards, ensuring improved operational reliability, safety interlocking, and seamless compatibility with centralized monitoring and control systems.

The said project will be incorporated in upcoming Business Plan of OPTCL. The above Project will be funded through OPTCL's internal resources with 30% equity by OPTCL and 70% by availing loan from outside funding agencies.

2.3.9 UPGRADATION OF OPTCL OPGW NETWORK BY PROCUREMENT & ERECTION OF 48F OPGW, 48F APPROACH CABLE AND 48F FODP TO FACILITATE IP-MPLS PROJECT OF GOVERNMENT OF ODISHA

INTRODUCTION

OPTCL operates an extensive OPGW-based communication network over its EHV transmission lines, which forms the backbone for SCADA, protection signalling, tele-protection, PMU data transfer, voice, video, and leased communication services. Many sections of the existing OPGW network are presently operating near full fiber utilization due to leasing commitments and internal system requirements.

In some critical sections of the network, **no spare fibers are presently available**, due to which it is becoming increasingly difficult to roll out the IP-MPLS project of Government of Odisha. The lack of spare fiber capacity is emerging as a major constraint for timely implementation of MPLS-based communication, OSWAN expansion, and integration of government data services.

Considering this bottleneck, the competent authority in the E & IT Department, Government of Odisha, has **directed OPTCL to upgrade the existing OPGW network at the earliest** so as to ensure availability of adequate fiber resources for the IP-MPLS project and other mission-critical communication requirements.

Considering the strategic importance of uninterrupted and scalable communication infrastructure, and in compliance with the direction of the E & IT Department, Govt. of Odisha, it has become necessary to augment the fiber capacity by upgrading selected OPGW routes with 48F OPGW and associated terminal infrastructure.

NEED OF THE PROJECT

- To comply with the directive of E & IT Department, Govt. of Odisha for IP-MPLS-based communication requirements.
- To enhance fiber availability for SCADA, protection, and future smart grid applications.
- To provide redundancy and improve reliability of the OPTCL communication network.
- To enhance passive revenue generation by leasing dark fibers to ISPs.

SCOPE OF THIS PROPOSAL

The scope of work under this proposal includes:

- Procurement and erection of 48F OPGW on identified transmission line sections as per the approved chart.
- Supply and laying of 48F approach cable at substations/locations wherever required.
- Supply and installation of 48F Fiber Optic Distribution Panels (FODPs).
- Supply of all associated hardware fittings, accessories, joint enclosures, clamps, vibration dampers, and down leads.
- Testing, splicing, commissioning, and integration of the upgraded OPGW network with the existing communication system.

JUSTIFICATION

- **Increasing Bandwidth Requirement:** Existing fiber capacity is insufficient to cater to IP-MPLS, OSWAN, SCADA, and leasing demands.
- **Government Priority Project:** The work is being undertaken on high priority as per E & IT Department's instruction.
- **Future Readiness:** 48F OPGW provides sufficient headroom for future expansion and new applications.
- **Revenue Potential:** Additional fiber capacity can be utilized for leasing, generating non-tariff revenue for OPTCL.

The said project will be incorporated in upcoming Business Plan of OPTCL. The above Project will be funded through 100% Grant from Govt. of Odisha.

3. TECHNO-ECONOMIC JUSTIFICATION

3.1 Overall assessment of economic benefit

The financial analysis concludes that the immediate implementation of the proposed transmission schemes will involve additional capital expenditure (CAPEX) to the tune of **Rs. 3,793.29 Cr.** and generate/save **Rs. 325.16 Cr.** annually. However, some projects provide intangible benefits.

Sl. No.	Name of Project	Total Project cost (Cr.)	Revenue earned or saved/year (Cr.)	Remark
1	3x1500MVA 765/400kV ICT + 3x500MVA 400/220kV ICT + 2x240 MVAR 765kV Bus Reactor + 1x125 MVAR 400kV Bus Reactor, 765/400/220kV GIS at Khuntuni (At Betakholi) , Athagarh with associated lines	2678.97	297.83	Tangible benefits
2	2x100 MVA, 220/33kV GIS at Pahala , Khordha with associated line	360.75	9.96	Tangible benefits
3	Conversion of 132kV Kutra Switching Station to 2X50MVA 132/33kV Grid Substation, Kutra	34.30	4.74	Tangible benefits
4	400kV Indravati PSP-Therubali D/C line	367.41		The project is envisioned to help the State by lowering the cost of power procurement during peak demand.
5	132kV Balasore-Chandipur S/C UG cable with associated bays	165.66	5.52	Tangible benefits
6	132kV Narendrapur-Chhatrapur S/C UG cable with associated bays	114.67	1.99	Tangible benefits
7	132 kV Burla PH–Katapali Ckt-I & II HTLS conversion	13.90	1.70	Tangible benefits
8	Substation Isolator and Mechanism Box Upgradation	30.41		Intangible benefits
9	Upgradation of OPTCL OPGW network to 48F OPGW to facilitate IP-MPLS project of Govt. of Odisha	27.22	3.42	Tangible benefits
	TOTAL	3,793.29	325.16	

3.2 Capital Expenditure for the transmission scheme

The capital expenditure for the schemes has been estimated as **Rs. 3,793.29 Cr.** and indicated in the Table below.

SUMMARY OF EVALUATION OF THE TOTAL OVERALL CAPITAL EXPENDITURE RELATED TO THE PROPOSED NEW TRANSMISSION SCHEMES

SUMMARY OF INVESTMENT, COST AND SOURCE OF FUNDING

Sl. No.	NAME OF TRANSMISSION REINFORCEMENT WORKS	ESTIMATED COST (Rs. Cr.)	SOURCE OF FUNDING / SCHEME	Approved by OERC in Trans. Plan
1	3x1500MVA 765/400kV ICT + 3x500MVA 400/220kV ICT + 2x240 MVAR 765kV Bus Reactor + 1x125 MVAR 400kV Bus Reactor, 765/400/220kV GIS at Khuntuni (At Betakholi) , Athagarh with associated lines	2678.97	30:70 Equity:Debt	Will be incorporated in upcoming 15 th TP. But approved in 30 th CMETS-ER meeting held on dtd. 26.04.2024
2	2x100 MVA, 220/33kV GIS at Pahala , Khordha with associated line	360.75	100% Grant (SDMF)	New project will be taken in 15 th TP
3	Conversion of 132kV Kutra Switching Station to 2X50MVA 132/33kV Grid Substation, Kutra	34.30	30:70 Equity:Debt	New project will be taken in 15 th TP
4	400kV Indravati PSP-Therubali D/C line	367.41	100% Equity (GEETC)	14 th Transmission plan in case no. 08/2024
5	132kV Balasore-Chandipur S/C UG cable with associated bays	165.66	100% Grant (SDMF)	14 th Transmission plan in case no. 08/2024
6	132kV Narendrapur-Chhatrapur S/C UG cable with associated bays	114.67	100% Grant (SDMF)	New project will be taken in 15 th TP
7	132 kV Burla PH-Katapali Ckt-I & II HTLS conversion	13.90	30:70 Equity:Debt (OTSSP-II)	New project will be taken in 15 th TP

8	Substation Isolator and Mechanism Box Upgradation	30.41	30:70 Equity:Debt (own capital)	Not applicable
9	Upgradation of OPTCL OPGW network to 48F OPGW to facilitate IP-MPLS project of Govt. of Odisha	27.22	100% Grant	Not applicable
	TOTAL	3,793.29		

3.3 Transmission loss reduction

The loss reduction realizable by implementing the schemes is given in the table below.

SUMMARY OF SYSTEM LOSSES ON THE TRANSMISSION SYSTEM

Sl. No.	DESCRIPTION OF LOAD FLOW CASES	PEAK LOSSES IN MW
1	3x1500MVA 765/400kV ICT + 3x500MVA 400/220kV ICT + 2x240 MVAR 765kV Bus Reactor + 1x125 MVAR 400kV Bus Reactor, 765/400/220kV GIS at Khuntuni (At Betakholi) , Athagarh with associated lines	12.34
2	2x100 MVA, 220/33kV GIS at Pahala , Khordha with associated line	0.72
3	Conversion of 132kV Kutra Switching Station to 2X50MVA 132/33kV Grid Substation, Kutra	1.36
4	132kV Balasore-Chandipur S/C UG cable with associated bays	0.89
5	132kV Narendrapur-Chhatrapur S/C UG cable with associated bays	1.85
6	132 kV Burla PH–Katapali Ckt-I & II HTLS conversion	-0.12
	TOTAL	17.04

4. IMPLEMENTATION

The proposal for availing loan assistance towards execution of these proposed transmission schemes is being posed before a suitable funding agency.

5. PRIOR CONSULTATION WITH DISCOMS

The Hon'ble Commission invariably in each and every ARR order of OPTCL has directed that OPTCL should have prior discussion and coordination with the DISCOMs before submission of transmission project for approval of OERC in order to avoid idle investments. Accordingly, OPTCL has made prior discussions with DISCOMs.

6. ENVIRONMENTAL CONSIDERATIONS

Sl. No.	DESCRIPTION OF LOAD FLOW CASES	FOREST AREA AFFECTED IN HECTORS
1	3x1500MVA 765/400kV ICT + 3x500MVA 400/220kV ICT + 2x240 MVAR 765kV Bus Reactor + 1x125 MVAR 400kV Bus Reactor, 765/400/220kV GIS at Khuntuni (At Betakholi) , Athagarh with associated lines	100
2	400kV Indravati PSP-Therubali D/C line	65
	TOTAL	165

165 Hectors of forest land will be affected during construction of aforesaid Grid Substations. The forest diversion proposal is under progress.

No major environmental or resettlement issues are envisaged for these additional transmission schemes.

OPTCL's policy is to generally avoid social and environmental impacts. Where this is not possible, mitigation measures are designed and implemented. A detailed mechanism for suitable and adequate environmental mitigation by compensatory afforestation is well established and generally implemented.

The Environmental Impact Assessment Study has been made and annexed with the Detailed Project Reports.

7. NET PRESENT VALUE & INTERNAL RATE OF RETURN

The Net Present Value as well as the Internal Rate of Return of individual projects have been calculated and annexed with the respective Detailed Project Reports.

ANNEXURE-2

09 nos. of DPRs of the following Investment proposals are detailed below.

Grid Substations

1. 3x1500MVA 765/400kV ICT + 3x500MVA 400/220kV ICT + 2x240 MVAR 765kV Bus Reactor + 1x125 MVAR 400kV Bus Reactor, 765/400/220kV GIS at **Khuntuni (At Betakholi)**, Athagarh with associated lines
2. 2x100 MVA, 220/33kV GIS at **Pahala**, Khordha with associated lines
3. Conversion of 132kV Kutra Switching Station to 2X50MVA 132/33kV Grid Substation, **Kutra**

Transmission lines

4. 400kV **Indravati PSP-Therubali** D/C line
5. 132kV **Balasore-Chandipur** S/C UG cable with associated bays
6. 132kV **Narendrapur-Chhatrapur** S/C UG cable with associated bays
7. 132 kV **Burla PH–Katapali Ckt-I & II** HTLS conversion

Upgradation work

8. Substation Isolator and Mechanism Box Upgradation
9. Upgradation of OPTCL OPGW network to 48F OPGW to facilitate IP-MPLS project of Govt. of Odisha