ODISHA POWER TRANSMISSION CORPORATION LIMITED

BHUBANESWAR

DETAILED PROJECT REPORT (DPR)

FOR CONSTRUCTION OF CONVERSION OF 220KV SWITCHING SUBSTATION AT LANDEIHILL INTO A 2X 100MVA 220/33KV GRID SUBSTATION WITH 220KV 100 MVA TRF BAYS-02 NOS., 220 KV SPARE BAY-01 NO., 33KV FDR. BAYS- 5 NOS, I/C TFR.BAYS-2 NOS, B/C BAY-01 NO. AND 33 KV SPARE BAY-01 NO. SCOPE OF WORK IN ODISHA STATE OF INDIA ON TURNKEY.

PROPOSAL FOR FINANCIAL ASSISTANCE

FY 2026-27 ,FY 2027-28, FY 2028-29 AND FY 2029-30.

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SYNOPSIS

The State of Odisha, with a geographical area of approximately **1.56 lakh Sq.km**, is the **10th largest State in India in terms of area** and the **11th most populous**, having a population of about **4.83 Crore**. The State has a coastline of about **482 km** along the Bay of Bengal. Nearly **83% of the population resides in rural areas**, posing significant challenges for equitable and reliable power supply across remote and tail-end regions.

The power system of the State has some Sub-stations in certain remote zones served through single source, causing system unreliable. Therefore, it has been proposed to bring out improvement in the system by way of providing multi source connectivity through construction of new transmission line in the transmission sector of the State.

Therefore, through this scheme, by **Conversion of 220KV Switching substation at Landeihill into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No., 33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey basis"** shall ensure system reliability power supply to existing industries and upcoming industries. This will improve the socio-economic condition of the inhabitants and create many new opportunities for overall development. The implementation of the project is required for provision of uninterrupted power supply, eradication of transmission loss and low voltage profile. This will also improve the stability of the 220 KV network of the system.

Accordingly, this Transmission Project Report has been prepared for , 220/33kV Substation at Kadua (Conversion of Kadua landeihill Switching station to 220/33kV GSS) as per 15th Intrastate Transmission Plan of Odisha.

The project includes:

Conversion of 220KV Switching substation at Landeihill into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No., 33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey.

The project aims to enhance system stability, ensure quality**,** reliable power supply, uninterrupted power supply and meet the increasing load demand and low voltage issues of 33KV Sub station Viz. Banka, JN Prasad, BD Pur, Gallary, Gayaganda, Tilisingi and Buguda are suffering from low voltage problem due to long distance 33KV line from the source.

The main objectives of the proposed scheme are as follows:
A) Improvement of voltage profile.
B) Minimization of interruption to power supply.
C) Enhancement of system security and reliability.
D) Strengthening of the transmission network.

INTRODUCTION

With regard to the Electricity sector, Odisha has been a **pioneer in implementing power sector reforms and restructuring**. The State has played a leading role nationally, with several other States following its reform model. As part of this restructuring, the **distribution sector was unbundled and reorganized into four distribution zones**, while the **generation sector was separated and operates as State-owned generating companies**.

The erstwhile **Grid Corporation of Odisha Limited (GRIDCO)** was initially entrusted with both **transmission and bulk power trading** functions. Subsequently, these responsibilities were bifurcated. While **GRIDCO** continues to manage **bulk power trading**, the **transmission and wheeling of power** are presently handled by the **Odisha Power Transmission Corporation Limited (OPTCL)**.

The proposed scheme comprises:

Conversion of 220KV Switching substation at Landeihill into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No.,33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey basis.

The proposed scheme will ensure stable, reliable, and quality power supply to the command area and will significantly contribute towards minimizing power interruptions**,** improving voltage profile**,** meeting future load growth, and reducing technical losses in the existing system.. This will improve the socio-economic condition of the inhabitants and create many new opportunities for overall development. The implementation of the project is required for provision of uninterrupted power supply, eradication of transmission loss and low voltage profile.

Justification of the Project:

Seven 33KV Sub stations Viz. Banka, JN Prasad, BD Pur, Gallary, Gayaganda, Tilisingi and Buguda are suffering from low voltage problem due to long distance 33KV line from the source Grid Sub station. The cumulative demand of these PSSs are around 21MW, which has overstressed the existing system and impacted supply quality.

At present NHPC is constructing a 40 MW, 220KV Pooling (Switching) Station at Landeihill. By construction of 220/33KV GSS at Landeihill by converting the under construction 220KV Switching station with 220KV LILO from 220KV Bhanjanagar – Nayagarh line will significantly improve the 33KV voltage profile and enhancing reliability of supply.

It will also relieve 11MW of load from Bhanjanagar GSS and 10MW from Aska New GSS, decongesting the upstream grid.

Load Growth and System Requirement:

In recent years, power demand of Bhanjanagar,Buguda, Belaguntha and Jagannath prasad Block of district Ganjam has increased substantially, driven by infrastructure development. This escalating demand necessitates the development of a high-capacity transmission network with uninterrupted and reliable power supply, which is critical for sustaining long-term economic growth in the region.

In view of the above, it is proposed for **Conversion of 220KV Switching substation at Landeihill into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No., 33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey basis w**ith total project cost amounting to **₹ 63,32,25,371.00** (Rupees Sixty Three Crores Thirty Two Lakhs Twenty Five Thousands Three Hundreds Seventy One only).including GST tentative, which includes the following components:

a. Supply of 2X100MVA Power transformer.
b. Construction of 220KV Power transformer bay 2 numbers.
c. Construction of 220KV Spare (unequipped) bay 1 number.
d. Construction of 33KV power transformer (Incomer) bay 2 numbers.
e. Construction of 33KV feeder bay 5 numbers.
f. Construction of 33KV Bus Coupler bay 1 number.
g. 33KV Spare (unequipped) bay 1 number.

Proposed Scope of Works:

Conversion of 220KV Switching substation at Landeihill into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No., 33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey basis.

Key System Benefits:

1. Reliable and alternative power supply near to load centre.
2. Strengthening of regional power evacuation and redundancy.
3. Enabling connectivity to future renewable and industrial loads.
4. Reduction of loading on existing 33KV feeders.
5. Strengthen 33KV connectivity to PSSs and resolve low voltage issues.

This transmission project report broadly contains the following parameters.

- Details of works.
- Need of the Project.
- Cost estimate.
- Least cost analysis.
- Status of works.
- Constraints.
- Costs benefit analysis.
- Phasing of outlay required.

- Drawings.
- System study analysis.

The works covered in this project have been programmed for completion during FY **2029-30** and accordingly, the implementation program has been drawn up. The total Project Cost comes to **Rs. 6332.25 Lakhs** which will be funded by GoO. The Annual Revenue Return (ARR) works out to **12.02 %** considering the anticipated benefits, which accrue due to implementation of the scheme.

EXISTING SUPPLY SYSTEM

220/33KV Switching station, Landeihill (U/c):

1. 220/33KV 40MVA, Power transformer.
2. 220KV LILO from exsiting 220KV Bhanjanagar- Nayagarh line.

NEED OF THE PROJECT

220 KV switching station is being developed at Landei hills, Ganjam for the evacuation of power from 40MW Solar PV plant with OPTCL Transmission system through LILO provision in the existing 220KV Bhanjanagar- Nayagarh line. This Project is being executed by M/s NHPC. The location of the proposed switching substations at Landei Hills is situated approx. 5 KMs from the Kadua area, as originally proposed by TPSODL for the establishment of the Grid Sub-station. Consequently as per the request of OPTCL, M/s. NHPC has allocated space within the current design to accommodate the future Conversion of the switching sub-station into a full-fledged GSS. Hence by considering the above scenario scope of Works are as follows. 1. 220KV Bays- Power Tfr-2 Nos, 1 spare bay (Unequipped Bay) 2. 33KV Bays- Feeder-5 Nos, Tfr-2 Nos, B/C-1 no, 1 spare bay 3. 2 X 100MVA 220/33KV Power transformer. 4. Considering the orientation of proposed GSS, 33KV UG cable laying from LV side of power transformer to 33 KV Bus.

The project is required to establish a high-capacity power network to ensure uninterrupted and reliable power supply, sustaining long-term growth in the Bhanjanagar, Belaguntha, Buguda and Jagannathprasad Block.

Seven 33KV Sub stations Viz. Banka, JN Prasad, BD Pur, Gallary, Gayaganda, Tilisingi and Buguda are suffering from low voltage problem due to long distance 33KV line from the source. The cumulative demand of these PSSs is around is around 21MW, which has overstressed the existing system and impacted supply quality.

At present NHPC is constructing a 40 MW, 220KV Pooling (Switching) Station at Landeihill. By upgrading Landeihill to 220/33KV GSS with 220KV LILO from 220KV Bhanjanagar – Nayagarh line will significantly improve the 33KV voltage profile enhancing reliability of supply. It will also relieve 11MW of load from Bhanjanagar GSS and 10MW from Aska New GSS, decongesting the upstream grid.

Benefits after **Conversion of 220KV Switching substation at Landeihill into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No., 33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey basis.**

- Resolution of low voltage issues **.**

- Strengthening of the 220 kV system network.
- Enhancement of overall grid reliability and load handling capability with the addition of 220KV source.
- Reduction of interruption due fault, as 33KV line length will be reduced.
- Reduction of load in the existing 33KV line from GSSs to PSSs.

SCOPE OF NEW PROPOSAL

Conversion of 220KV Switching substation at Landeihill into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No.,33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey basis.

The total scope of works includes:

Conversion of 220KV Switching substation at Landeihill into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No.,33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State on turnkey basis.

220KV System:

a. Supply of 2X100MVA Power transformer.
b. Construction of 220KV Power transformer bay 2 numbers.
c. Construction of 220KV Spare (unequipped) bay 1 number.

33KV System:

a. Construction of 33KV power transformer (Incomer) bay 2 numbers.
b. Construction of 33KV feeder bay 5 numbers.
c. Construction of 33KV Bus Coupler bay 1 number.
d. 33KV Spare (unequipped) bay 1 number.

PROJECT IMPLEMENTATION PLAN

The project implementation plan for the works covered is given in the Bar Chart enclosed. The activity wise implementation schedule indicates that the project is programmed for completion by **November- 2029.** The Chief General Manager (Project), OPTCL is the nodal authority for implementation of the project.

PROCUREMENT PROCEDURE

In accordance with the approved norms of OPTCL, the procurement of materials and services would be taken up by way of National Competitive Bidding. The entire work for the proposed project is treated as a single package and is awarded on turnkey basis to a single party.

STATUS OF CLEARANCES

1] TECHNO – ECONOMIC CLEARANCE:

Not required as voltage level is less than 400 KV.

2] ENVIRONMENT & FOREST CLEARANCE:

The project does not involve forest land, so, environment & forest clearance is not required.

3] STATE POLLUTION CONTROL BOARD:

Not required.

4] INVESTMENT APPROVAL FROM OERC: 2

As per the license condition 10 read with condition 23.1 of OPTCL approval of OERC is required for cost beyond 10 Cr. The proposed Project for Upgradation of 220/33KV MRSS of TATA Steel SEZ, Gopalpur has been considered essential to undertake the construction of transmission infrastructure, for development of a robust and reliable electrical network in the Industial Hub.

5] POWER & TELECOMMUNICATION CO-ORDINATION COMMITTEE (PTCC)

The clearance in respect of PTCC is not required.

SOURCE OF FUNDING.

The proposed project will funded through **MMSBY- Upgradation/Augmentation of existing Sub-stations/Transmission Lines** scheme, where **30% Equity** support will be provided by GoO and remaining 70% will be met by availing loan from suitable financial institutions.

COST OF IMPLEMENTATION

The implementation of the Project will incur an expenditure of **Rs. 6332.25 lakhs**, the details of which are indicated separately.

CERTIFICATE

Certified, that the Project report has been prepared by adopting the prevailing approved cost data of OPTCL.

PHASING OF EXPENDITURE:

Financial Year	Rs. In Lakhs
2026-27	633.2
2027-28	2849.4
2028-29	2216.2
2029-30	633.2

BENEFITS:

Physical Benefits:

1. Reliable 33KV backbone source for Seven numbers of 33KV Sub stations of TPSODL.
2. Strengthening of regional power evacuation and redundancy.
3. Reduction of loading on existing 33KV feeder.
4. Resolution of low voltage issues.
5. Reduction of interruption due fault, as 33KV line length will be reduced.
6. Facilitating future downstream connectivity at 220KV levels for industrial demand centers.
7. Improving the economic condition of the rural habitats.
8. Alternative and reliable source of power supply .

Financial Benefit:

The Project will yield gross return (ARR) of 12.02**%.**

ESTIMATED COST

SL. NO.	**DESCRIPTION**	**UNIT**	**QTY.**	**AMOUNT IN LAKHS**
1	**Construction of Conversion of 220KV Switching substation at Landeihill into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No.,33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey basis.**			6332.25
TOTAL COST OF THE PROJECT				**Rs.6332.25 Lakhs.**

The following percentages have been considered while framing the cost estimate.

Stock, storage & Insurance @ 3%
Contingency @ 3%
T&P Cost @ 2%
Transportation @ 5%

LEAST COST ANALYSIS

The proposal is based on field studies conducted by OPTCL to arrive at the least cost option of attaining the objectives aimed in the Project. In order to achieve the system reliability, stability and to minimize interruption to the consumers, alternatives were examined at various stages of planning to arrive at the optimal solution based on technical as well as financial considerations.

CONSTRAINTS

No such constaints.

ANNEXURES LIST: DOCUMENTS & DRAWINGS

The following drawings are appended to this Project Report.

Annexure-I

1] The detailed estimate.

Annexure-II

1] Project Implementation Schedule.

Annexure-III

1] Environmental Impact Assessment Study: Line & Sub-Station.

Annexure-IV

1] In principle approval.

2] Single Line Diagram.

3] Connectivity arrangement.

4] Indicative Maps

5] Power Map of Odisha.

6] EHT network & transmission map of OPTCL in the state of Odisha.

7] Load Flow Study

8] IRR

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|:::::        LOAD FLOW ANALYSIS    :::::|
|-----CASE NO :  1     CONTINGENCY  : 0  SCHEDULE NO : 0-----|
|-----CONTINGENCY NAME : Without 220/33kV Landeihill
 RATING CONSIDERED : NOMINAL -----|
--------------------------------------------------------------------------------

|***** SUMMARY OF RESULTS *****|

TOTAL REAL POWER GENERATION                    :    17320.06 MW
TOTAL REACT. POWER GENERATION                  :   -2692.667 MVAr
TOTAL INDUCTION MACHINE GEN.                   :        0.000 MW
TOTAL INDUCTION MACHINE GEN.                   :        0.000 MVAr
TOTAL INDUCTION MACHINE MOTOR LOAD             :        0.000 MW
TOTAL INDUCTION MACHINE MOTOR LOAD             :        0.000 MVAr
TOTAL REAL POWER LOAD                          :    16415.44 MW
TOTAL REACTIVE POWER LOAD                      :     2676.773 MVAr
TOTAL SHUNT INJECTION                          :        0.000 MW
TOTAL LINE SHUNT                               :    9200.312 MVAr
TOTAL CHARGING                                 :        0.000 MW
TOTAL CHARGING                                 :    19834.93 MVAr
TOTAL LOSSES (AC)                              :      297.4011 MW
TOTAL LOSSES (AC)                              :    3669.363 MVAr
TOTAL TIE LINE FLOW                            :     608.0514 MW
TOTAL TIE LINE FLOW                            :      1245.579 MVAr
TOTAL TIES AND LOAD                            :     1352.084 MW
TOTAL TIES AND LOAD                            :     1471.409 MVAr
DESIRED INTERCHANGE                            :        0.000 MW
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|:::::        LOAD FLOW ANALYSIS    :::::|
|-----CASE NO :  1     CONTINGENCY  : 0  SCHEDULE NO : 0-----|
|-----CONTINGENCY NAME : with 220/33kV Landeihill
RATING CONSIDERED : NOMINAL -----|
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|***** SUMMARY OF RESULTS *****|

TOTAL REAL POWER GENERATION	:	17320.06 MW
TOTAL REACT. POWER GENERATION	:	-2707.233 MVAr
TOTAL INDUCTION MACHINE GEN.	:	0.000 MW
TOTAL INDUCTION MACHINE GEN.	:	0.000 MVAr
TOTAL INDUCTION MACHINE MOTOR LOAD	:	0.000 MW
TOTAL INDUCTION MACHINE MOTOR LOAD	:	0.000 MVAr
TOTAL REAL POWER LOAD	:	16413.57 MW
TOTAL REACTIVE POWER LOAD	:	2675.802 MVAr
TOTAL SHUNT INJECTION	:	0.000 MW
TOTAL LINE SHUNT	:	9200.651 MVAr
TOTAL CHARGING	:	0.000 MW
TOTAL CHARGING	:	19817.09 MVAr
TOTAL LOSSES (AC)	:	298.4766 MW
TOTAL LOSSES (AC)	:	3664.33 MVAr
TOTAL TIE LINE FLOW	:	608.0514 MW
TOTAL TIE LINE FLOW	:	1245.579 MVAr
TOTAL TIES AND LOAD	:	1353.475 MW
TOTAL TIES AND LOAD	:	1472.051 MVAr
DESIRED INTERCHANGE	:	0.000 MW

COST BENEFIT ANALYSIS		
A. BENEFITS DUE TO ADDITIONAL SALE OF ENERGY ON ACCOUNT OF CONVERSION OF SWITCHING STATION AT LANDEIHIL TO GRID SUBSTATION		
1	Transformation Capacity considered for revenue calculation with N-1 contigency.	100.00
2	Power factor (PF)	0.90
3	Diversity factor	1.43
4	Load factor	0.60
5	Additional Avg. power available for sale on account of construction of conversion of switching station at Landeihill to grid sub station.	37.76
6	Additional energy available for sale in LU	3307.97
7	With 3% transmission losses in the Grid, the energy available for sale per annum in LU	3208.73
8	Anticipated revenue at a cost of Rs.0.24/ Unit in Lakhs	770.10
B. BENEFITS OF THE SCHEME DUE TO REDUCTION IN LOSSES		-
1	Total losses before implementation of the scheme in MW	297.40
2	Total losses after implementation of the scheme in MW	298.48
3	Total reduction in losses in MW	-1.08
4	Load factor	0.60
5	Loss load factor (0.8 LF^2 **+ 0.2 LF)**	0.41
6	The energy available for sale per year in LU	-38.44
7	With 3% transmission losses in the Grid, the energy available for sale per annum in LU	-37.29
8	Anticipated revenue due to reduction in losses in lakhs @ Rs. 0.24/Unit	-8.95
C. CALCULATION OF REVENUE RETURN		
1	Anticipated revenue due to reduction in losses [Rs. Lakhs]	-8.95
2	Anticipated revenue due to sale of additional energy [Rs. Lakhs]	770.10
3	Total anticipated annual revenue [Rs. Cr.]	7.61
4	Estimated Cost [Rs. Cr.]	63.32
5	**Average Annual Rate of Return in %**	**12.02**
6	**IRR**	**14.51%**

LIST OF FORMATS

SL. NO.	DESCRIPTION	FORMAT NO.
1.	CLEARANCE FROM CEA AND INVESTMENT AUTHORISATION	FORMAT - I
2.	SURVEY	FORMAT - II
3.	ACQUISITION OF LAND FOR SUB-STATION	FORMAT - III
4.	FOREST AND ENVIRONMENT CLEARANCE	FORMAT - IV
5.	FINANCIAL BENEFITS	FORMAT – V
6.	ANNUAL PLAN PROVISION	FORMAT – VI
7.	EXPENDITURE INCURRED	FORMAT – VII
8.	PROCUREMENT OF MATERIALS FOR SUB-STATION	FORMAT - VIII
9.	PROCUREMENT OF MATERIALS FOR LINE	FORMAT - IX

FORMAT - I

SANCTION AND CLEARANCES

SL. NO.	NAME OF THE SCHEME	NAME OF FIVE-YEAR PLAN IN WHICH INCLUDED	TECHNO-ECONOMIC CLEARANCE BY CEA	INVESTMENT APPROVAL	REMARKS
1	2	3	4	5	6
1.	Construction of Conversion of 220KV Switching substation at Landeihill into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No.,33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey basis.	15th Intra-state Transmission plan in case no. 71/2026.	Not required	Would be obtained from OERC.	

FORMAT - II

SURVEY

SL. NO.	EHT LINE	DATE OF TAKING UP SURVEY WORKS ORIGINAL DATE / REVISED DATE	COMPLETION OF SURVEY/ ORIGINAL DATE / REVISED DATE	WHETHER PTCC CLEARANCE RECEIVED	REMARKS
1	2	3	4	5	6
1.	N.A				

FORMAT - III

ACQUISITION OF LAND FOR SUB-STATION

SL. NO.	NAME OF THE SUB-STATION	WHETHER APPLICATION FOR ACQUISITION OF LAND FORWARDED TO COMPETENT AUTHORITY	WHETHER ORDERS ISSUED BY THE STATE GOVERNMENT	FINALLY, WHETHER LAND HAS BEEN ACQUIRED	SPECIFY IF LAND IS AVAILABLE
1	2	3	4	5	6
1.	Construction of Conversion of 220KV Switching substation at Landeihill into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No.,33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey basis.	Land available within the vicinity of under construction 220KV switching station of NHPC at Landeihill.			

FORMAT - IV

FOREST AND ENVIRONMENT CLEARANCE

SL. NO.	DETAILS OF SCHEME	WHETHER SURVEY COMPLETED	WHETHER APPLICATION FOR CLEARANCE FORWARDED TO STATE GOVT.	WHETHER APPLICATION FORWARDED TO CENTRAL GOVT.	RECEIPT OF FOREST AND ENVIRONMENTAL CLEARANCE
1	2	3	4	5	6
1.	Construction of Conversion of 220KV Switching substation at Landeihill into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No.,33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey basis	N.A (Order placed)	NO (Order not placed)	NO (Order not placed)	NO (Order not placed)

FORMAT - V

FINANCIAL BENEFITS

SL. NO.	NAME OF SCHEME	TOTAL LOSSES BEFORE IMPLEMENTATION OF THE SCHEME (MW)	TOTAL LOSSES AFTER IMPLEMENTATION OF THE SCHEME (MW)	REDUCTION IN TRANSMISSION LOSSES (MW)	ADDITIONAL UNITS TO BE SUPPLIED TO THE SYSTEM (LU)	1] REVENUE DUE TO SUPPLY OF ADDITIONAL UNITS 2] REVENUE DUE TO REDUCTION OF LOSSES [Rs. IN LAKHS]	REMARKS
1	2	3	4	5	6	7	8
1.	Construction of Conversion of 220KV Switching substation at Landeihill into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No.,33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey basis	**297.40**	**298.48**	**-1.08**	**3208.73-37.29 = 3171.45**	**1) 770.10** 2) -8.95	**Total Revenue: 761** **Rs. Lakhs**

FORMAT - VI

ANNUAL PLAN PROVISION

SL. NO.	NAME OF SCHEME	WHETHER NECESSARY PROVISIONS HAS BEEN MADE IN CURRENT FINANCIAL YEAR	IF NOT WHETHER PROVISION IS BEING MADE IN THE NEXT YEAR	REMARKS (ANNUAL PLAN PROVISION)
1	2	3	4	5
1.	Construction of Conversion of 220KV Switching substation at Landeihill into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No.,33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey basis.	Provision made for: FY 2026-27 ,FY 2027-28 ,FY 2028-29 and FY 2029-30		

FORMAT - VII

EXPENDITURE STATEMENT

SL. NO.	NAME OF THE SCHEME	ANTICIPATED EXPENDITURE TO BE INCURRED DURING THE FINANCIAL YEARS (Rs. IN LAKHS)				
		FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	Total
1	2	3	4	5	6	7
1.	Construction of Conversion of 220KV Switching substation at Landeihill into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No.,33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey basis	633.2	2849.4	2216.2	633.2	6332.25

FORMAT – VIII

PROCUREMENT OF MATERIAL FOR SUB-STATION

SL. NO.	NAME OF MATERIAL	TOTAL QUANTITY	DETAILS OF ORDER	SUPPLY SCHEDULE FOR BALANCE QUANTITY
		220kV Bay to be equipped.	**220kV**	**220kV**
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12.	• Circuit Breaker • L.A • C.T • IVT • Panels • Relays • Cables • Structures • Isolators • Clamps and connectors. • Insulators and Hardware fittings • Conductors and other materials	As per estimate	The contract shall be awarded to a single party on turn-key basis.	

FORMAT - IX

PROCUREMENT OF MATERIALS FOR LINE.

SL. NO.	NAME OF MATERIAL	TOTAL QUANTITY	DETAILS OF ORDER	POSITION OF RECEIPT OF MATERIALS	SUPPLY SCHEDULE FOR BALANCE QUANTITY
N.A	N.A	N.A	N.A		

ANNEXURE-I

ODISHA POWER TRANSMISSION CORPORATION LIMITED

Name of the work:- Estimate for construction of Conversion of 220KV Switching substation at Landeihills into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No.,33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey basis.

SUMMARY

Sl. No.	Description	Amount(in Rs.)
1	**Total Cost of Materials (a+b below)**	**47,28,30,610.78**
a	Substation Cost	46,91,43,352.81
b	Mandatory Spares	36,87,257.97
2	Stock, storage & Insurance(3% on Sl. No.-01)	1,41,84,918.00
3	**Sub-Total(1+2)**	**48,70,15,528.78**
4	Contigency @ 3% on sl. No.03	1,46,10,466.00
5	T&P Cost @ 2% on Sl. No.03	97,40,311.00
6	Transportation @ 5% on Sl. NO. 03	2,43,50,776.00
7	**Sub - Total Cost of Materials**	**53,57,17,081.78**
8	**Total Cost towards Erection**	**1,69,54,949.04**
a	Substation Erection	1,69,54,949.04
9	**Total Cost towards Civil**	**8,05,53,340.32**
a	Substation Civil Work	8,05,53,340.32
10	**Cost of Supply, Erection and Civil (Sl. No.7 + Sl. No.8 + Sl.no-9)**	**63,32,25,371.14**
12	**TOTAL COST OF SUPPLY, ERECTION AND CIVIL**	**63,32,25,371.14**
	Rounded off	**63,32,25,371.00**

ODISHA POWER TRANSMISSION CORPORATION LIMITED

(SUPPLY SUB-STATION)

Name of the work:- Construction of 2x100 MVA, 220/33 KV Sub-Station at Landei Hill in Odisha State of India.
220/33KV GSS Landei Hill
220KV Bays- Power Tfr-2 Nos, 1 spare bay (Unequipped bay)
33KV Bays- Feeder-5 Nos, Tfr-2 Nos, B/C-1 no, 1 spare bay(Unequipped bay)

Sl. No.	SUBSTATION EQUIPMENTS / MATERIALS DESCRIPTION OF ITEMS(SCHEDULE-VIIA-SS) SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)	UNITS	Qty	IN INR				
				BASIC PRICE PER UNIT (Taxable Value)	GST		TOTAL PRICE PER UNIT	TOTAL PRICE FOR THE QUANTITY
					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	5	6=5X9%	7=5X9%	8=(5+6+7)	9=4X8
1	245 KV, 1200-600-300 A, 50 KA, 5 core Single Phase Current Transformer (4 Nos PX Class & 1 No. 0.2s Class)	Nos	6	₹ 4,50,654.03	₹ 40,558.86	₹ 40,558.86	₹ 5,31,771.75	₹ 31,90,630.50
2	**245 KV, 2000A, 50KA, ISOLATORS**							
2.1	245KV Single Isolator without Earth switch	Nos	6	₹ 7,16,000.00	₹ 64,440.00	₹ 64,440.00	₹ 8,44,880.00	₹ 50,69,280.00
2.2	245KV Single Isolator with Earth switch	Nos	2	₹ 9,74,000.00	₹ 87,660.00	₹ 87,660.00	₹ 11,49,320.00	₹ 22,98,640.00
2.3	245KV Beam mounted Single Isolator without Earth Switch	Nos	2	₹ 7,16,000.00	₹ 64,440.00	₹ 64,440.00	₹ 8,44,880.00	₹ 16,89,760.00
3	Metal oxide polymer housed surge arrrestor for 220 kV system. Station Class Medium Duty (SM) type In, Ur, Uc, Wth & Qrs as per technical specification/Latest IEC complete with insulating base and Surge monitor (AIS). - As per TS	Nos	6	₹ 1,05,000.00	₹ 9,450.00	₹ 9,450.00	₹ 1,23,900.00	₹ 7,43,400.00
4	245KV, 1 phase solid core Bus Post Insulator (8 kN) (AIS) as per Technical Specification.	Nos	90	₹ 45,000.00	₹ 4,050.00	₹ 4,050.00	₹ 53,100.00	₹ 47,79,000.00
5	245KV, 3150A, 50KA, SF6 Circuit Braker with supporting Structure. Facilities for integration with SAS as per the site requirement.	Nos	2	₹ 28,20,000.00	₹ 2,53,800.00	₹ 2,53,800.00	₹ 33,27,600.00	₹ 66,55,200.00
6	36 KV,800-400-200, 31.5KA,3CORE SINGLE PHASE CURRENT TRANSFORMER (2nos PX Class & 1 no 0.2s Class) - Feeder and Bus Coupler Bays	Nos	18	₹ 62,012.84	₹ 5,581.16	₹ 5,581.16	₹ 73,175.16	₹ 13,17,152.88
7	36 KV,2000-1000-500, 31.5 KA,4CORE SINGLE PHASE CURRENT TRANSFORMER(3 nos PX Class & 1 no 0.2s Class) - Transformer Bays	Nos	6	₹ 62,012.84	₹ 5,581.16	₹ 5,581.16	₹ 73,175.16	₹ 4,39,050.96
8	**33KV Single core 300 sq.mm, XLPE Insulated, Copper Conductor Armoured Cable**							
8.1	1000Sq.mm 33KV XLPE insulated Single core Copper cable	Kms	1.6	1,67,00,000.00	₹ 15,03,000.00	₹ 15,03,000.00	₹ 1,97,06,000.00	₹ 3,15,29,600.00
8.2	Outdoor Termination kit for 33KV, 1000 sq.mm cable	Nos	24	11,401.29	₹ 1,026.12	₹ 1,026.12	₹ 13,453.53	₹ 3,22,884.72
9	**36 KV, 31.5KA for 1 sec, AIS Isolators with post insulators as per TS.**							
9.1	1250A Single Isolator without ES	Nos	10	₹ 2,94,000.00	₹ 26,460.00	₹ 26,460.00	₹ 3,46,920.00	₹ 34,69,200.00
9.2	1250A Single Isolator with ES	Nos	5	₹ 3,62,000.00	₹ 32,580.00	₹ 32,580.00	₹ 4,27,160.00	₹ 21,35,800.00
9.3	2000A Single Isolator without ES	Nos	8	₹ 3,14,000.00	₹ 28,260.00	₹ 28,260.00	₹ 3,70,520.00	₹ 29,64,160.00
9.4	2000A Beam mounted Single Isolator without ES	Nos	2	₹ 3,29,000.00	₹ 29,610.00	₹ 29,610.00	₹ 3,88,220.00	₹ 7,76,440.00

Sl. No.	SUBSTATION EQUIPMENTS / MATERIALS DESCRIPTION OF ITEMS(SCHEDULE-VIIA-SS) SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)	UNITS	Qty	IN INR				
				BASIC PRICE PER UNIT (Taxable Value)	GST		TOTAL PRICE PER UNIT	TOTAL PRICE FOR THE QUANTITY
					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	5	6=5X9%	7=5X9%	8=(5+6+7)	9=4X8
9.5	800A Beam mounted Single Isolator without ES	Nos	2	₹ 2,94,000.00	₹ 26,460.00	₹ 26,460.00	₹ 3,46,920.00	₹ 6,93,840.00
10	Metal oxide polymer housed surge arrrestor for 33 kV system. Station Class Low Duty (SL) type In, Ur, Uc, Wth & Qrs as per technical specification/Latest IEC complete with insulating base and Surge monitor - As per TS	Nos	27	19,500.00	₹ 1,755.00	₹ 1,755.00	₹ 23,010.00	₹ 6,21,270.00
11	36 KV, 2 Core Single Phase IVT (1 core 3P & 1 core 0.2)	Nos	3	3,00,000.00	₹ 27,000.00	₹ 27,000.00	₹ 3,54,000.00	₹ 10,62,000.00
12	36 KV, 2500A, 31.5 kA Vacuum Circuit Breaker with supporting Structure as per TS. Facilities for integration with SAS as per the site requirement.	SET	8	₹ 2,22,305.73	₹ 20,007.52	₹ 20,007.52	₹ 2,62,320.77	₹ 20,98,566.16
13	33 KV Solid Core Bus Post Insulator as per TS	Nos	40	₹ 1,722.98	₹ 155.07	₹ 155.07	₹ 2,033.12	₹ 81,324.80
14	**BUS BAR & CIRCUIT MATERIAL:** **The 220KV Main Bus –II & II shall be with Twin ACSR Moose & the jumpers shall be with 4" Aluminium Pipe, Twin/single ACSR Moose.** **The 33KV Main Bus & Reserve Bus shall be with Twin ACSR Bersimis, Jumpers of 33KV Transformer & Bus Coupler shall be with Twin ACSR Bersimis and for feeders single ACSR Bersimis.** **The interconnection between 33KV side of power transformer and 33KV switchyard shall be with 33KV Cable.**							
14.1	**220KV TENSION & SUSPENSION Disc Type Antifog Insulators as per TS**							
14.1.1	160 KN Disc Insulator for 220 KV Tension purpose With appropriate arrangement as per IS.	Nos	720	807.90	₹ 72.71	₹ 72.71	₹ 953.32	₹ 6,86,390.40
14.1.2	90 KN Disc Insulator for 220 KV Suspension purpose With appropriate arrangement as per IS.	Nos	324	800.00	₹ 72.00	₹ 72.00	₹ 944.00	₹ 3,05,856.00
14.2	**33KV TENSION & SUSPENSION Silicon Composite Insulators Complete String as per TS**							
14.2.1	120 KN Disc Insulator for 33 KV Tension purpose With appropriate arrangement as per IS.	Nos	540	1,100.00	₹ 99.00	₹ 99.00	₹ 1,298.00	₹ 7,00,920.00
14.2.2	90 KN Disc Insulator for 33 KV Suspension purpose With appropriate arrangement as per IS.	Nos	135	800.00	₹ 72.00	₹ 72.00	₹ 944.00	₹ 1,27,440.00
14.3	**ACSR CONDUCTORS/IPS Tube**							
14.3.1	ACSR Moose Conductor	KM	2.0	₹ 6,63,000.00	₹ 59,670.00	₹ 59,670.00	₹ 7,82,340.00	₹ 15,64,680.00
14.3.2	ACSR Bersimis Conductor	KM	2.0	₹ 7,45,706.30	₹ 67,113.57	₹ 67,113.57	₹ 8,79,933.44	₹ 17,59,866.88
14.3.3	IPS 4" Aluminium Tubes (114.2 mm OD & 8.51 mm thick)	MTRS	450	₹ 1,200.00	₹ 108.00	₹ 108.00	₹ 1,416.00	₹ 6,37,200.00
14.4	**HARDWARES FITTINGS**							

Sl. No.	SUBSTATION EQUIPMENTS / MATERIALS DESCRIPTION OF ITEMS(SCHEDULE-VIIA-SS) SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)	UNITS	Qty	IN INR				
				BASIC PRICE PER UNIT (Taxable Value)	GST		TOTAL PRICE PER UNIT	TOTAL PRICE FOR THE QUANTITY
					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	5	6=5X9%	7=5X9%	8=(5+6+7)	9=4X8
14.4.1	220KV SINGLE TENSION H/W SUITABLE FOR TWIN MOOSE ACSR WITH 300mm. SUB-CONDUCTOR SPACING WITHOUT TURN BUCKLE.	Nos	24	₹ 6,012.95	₹ 541.17	₹ 541.17	₹ 7,095.29	₹ 1,70,286.96
14.4.2	220KV SINGLE TENSION H/W SUITABLE FOR SINGLE MOOSE ACSR WITHOUT TURN BUCKLE	Nos	24	₹ 3,876.77	₹ 348.91	₹ 348.91	₹ 4,574.59	₹ 1,09,790.16
14.4.3	220KV SINGLE SUSPENSION H/W SUITABLE FOR SINGLE ACSR MOOSE	Nos	12	₹ 5,170.58	₹ 465.35	₹ 465.35	₹ 6,101.28	₹ 73,215.36
14.4.4	220KV SINGLE SUSPENSION H/W SUITABLE FOR TWIN ACSR MOOSE	Nos	12	₹ 3,867.77	₹ 348.10	₹ 348.10	₹ 4,563.97	₹ 54,767.64
14.4.5	33 KV Single Anchoring Double Tension H/W fitting (without Turn buckle) suitable for twin ACSR Bersimis (250mm spacing)	Nos	36	₹ 4,070.00	₹ 366.30	₹ 366.30	₹ 4,802.60	₹ 1,72,893.60
14.4.6	33 KV Single Suspension H/W fitting suitable for single ACSR Bersimis	Nos	15	₹ 2,885.00	₹ 259.65	₹ 259.65	₹ 3,404.30	₹ 51,064.50
14.5	**"CLAMPS & CONNECTORS for the 220KV & 33KV system complete in all respect.**	LOT	1	₹ 20,00,000.00	₹ 1,80,000.00	₹ 1,80,000.00	₹ 23,60,000.00	₹ 23,60,000.00
15	**SUBSTATION EARTHING SYSTEMS**							
15.1	EARTHING CONDUCTOR FOR BURRIAL: 75X10 mm GI Flat for laying (spacing maximum 5m both way)	MT	30	86,500	₹ 7,785.00	₹ 7,785.00	₹ 1,02,070.00	₹ 30,62,100.00
15.2	EARTHING CONDUCTOR; 50X6 mm Gl Flat for Riser from the burial earth mat to equipment, structure, CR Panels, LT Panels, etc)	MT	10	86,500	₹ 7,785.00	₹ 7,785.00	₹ 1,02,070.00	₹ 10,20,700.00
15.3	EARTHING DEVICE & ASSOCIATED ACCESSORIES (50 mm heavy duty Gl PERFORATED PIPE 3 mtrs long for treated earth pit)	Nos	200	₹ 2,280.98	₹ 205.29	₹ 205.29	₹ 2,691.56	₹ 5,38,312.00
15.4	Supply of UPVC Pipes (2", 1.5", 1" & 1/2" etc), Joints, bends, Valves and all accessories for spreading the water network to each treated earth pit as per approved drawing.	LOT	1	₹ 3,00,000.00	₹ 27,000.00	₹ 27,000.00	₹ 3,54,000.00	₹ 3,54,000.00
16	**G.I Cable Trays including support GI angle suitable for different sections along with its accessories as per TS. Details of No. of tiers are indicated in the TS-Civil Section accordingly the requirement can be ascertained & High Quality ISI mark PVC-U selfit Pipe, PVC elbow bend, PVC Tee etc suitable for under ground burrial (HARD CONDUIT INCLUDING of adequate tensile strength minimum 7kg/sqmm or better) as per TS.**							
16.1	G.I Cable Trays(size: 450x75x2500mm)	Mtrs	1000	₹ 638.14	₹ 57.43	₹ 57.43	₹ 753.00	₹ 7,53,000.00
16.2	G.I Cable Trays(size: 300x75x2500mm)	Mtrs	500	₹ 478.61	₹ 43.07	₹ 43.07	₹ 564.75	₹ 2,82,375.00
16.3	G.I Cable Trays(size: 150x75x2500mm)	Mtrs	500	₹ 319.07	₹ 28.72	₹ 28.72	₹ 376.51	₹ 1,88,255.00
16.4	Support G. I angle 50x50x6 mm for cable tray	MT	2.5	86,500	₹ 7,785.00	₹ 7,785.00	₹ 1,02,070.00	₹ 2,55,175.00
16.5	250mm dia PVC Pipe	Mtrs	100	₹ 408.41	₹ 36.76	₹ 36.76	₹ 481.93	₹ 48,193.00
16.6	110mm dia PVCPipe	Mtrs	100	₹ 214.42	₹ 19.30	₹ 19.30	₹ 253.02	₹ 25,302.00
16.7	50mm dia PVC Pipe	Mtrs	100	₹ 114.87	₹ 10.34	₹ 10.34	₹ 135.55	₹ 13,555.00
16.8	PVC pipe bends & other PVC accessories required for 250mm,110mm & 50mm dia as above	Mtrs	100	₹ 28,205.82	₹ 2,538.52	₹ 2,538.52	₹ 33,282.86	₹ 33,28,286.00

Sl. No.	SUBSTATION EQUIPMENTS / MATERIALS DESCRIPTION OF ITEMS(SCHEDULE-VIIA-SS) SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)	UNITS	Qty	IN INR				
				BASIC PRICE PER UNIT (Taxable Value)	GST		TOTAL PRICE PER UNIT	TOTAL PRICE FOR THE QUANTITY
					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	5	6=5X9%	7=5X9%	8=(5+6+7)	9=4X8
17	**SWITCH YARD STRUCTURES STEEL HDG - LATTICE TYPE FOR TOWER COLUMN, BEAMS & PIPE TYPE FOR ALL EQUIPMENT STRUCTURE (INCLUDING FOUNDATION BOLTS - ITS NUTS, ITS WASHERS, ITS PLATE ETC) FOR 220/33 KV CLASS (Weight in brackets are only indicative - Actual weight shall be as per approved BOM. Measurement shall be done accordingly.)**							
17.1	**DIFFERENT TYPE OF LATICE TYPE COLUMNS WITH DETAILS (including top earthing spike)**							
17.1.1	P1S-Column 220 KV (NOMINAL UNIT WT- 4.5MT) =20 Sets(Including Earth Spike)	MT	90.00					
17.1.2	T8S - 33KV (NOMINAL UNIT WT- 0.83 MT)) = 10 Sets(Including Earth Spike)	MT	8.30					
17.1.3	T9S - 33KV(Nominal unit wt- 0.6 MT)=12 Sets(Including Earth Spike)	MT	7.20					
17.2	**DIFFERENT TYPE OF BEAMS WITH DETAILS**							
17.2.1	Q1-Beam 220 KV (NOMINAL UNIT WT- 1.598 MT) = 12 Sets	MT	19.18					
17.2.2	Q3 - 220 KV(NOMINAL UNIT WT- 2.5 MT) =6 Sets	MT	15.00					
17.2.3	G6 - 33KV (NOMINAL UNIT WT- 0.53 MT) = 4 Sets	MT	2.12					
17.2.4	G4 - 33KV(NOMINAL UNIT WT- 0.4 MT) =8 Sets	MT	3.20					
17.2.5	G4X - 33KV (NOMINAL UNIT WT- 0.4 MT) =4 Sets	MT	2.08					
17.3	**TOTAL WEIGHT OF COLUMN & BEAM INCLUDING FOUNDATION BOLTS, - ITS NUTS, WASHERS PLATE ETC**	MT	147.08	₹ 86,500.00	₹ 7,785.00	₹ 7,785.00	₹ 1,02,070.00	₹ 1,50,12,047.32
17.4	**DIFFERENT TYPE OF TUBULAR SUPPORT STRUCTURES HDG TYPE FOR ALL 220KV & 33KV EQUIPMENT INCLUDING FOUNDATION BOLT - ITS NUTS, ITS WASHERS, ITS PLATE ETC)**							
17.4.1	Structure for 220KV SA =6 Nos	MT	2.1					
17.4.2	Structure for 220KV CT =6Nos	MT	6.30					
17.4.3	Structure for 220KV IVTs =0Nos	MT	0.00					
17.4.4	220 KV Single Isolator without Earth Switch = 6 Nos	MT	9.00					
17.4.5	220 KV Single Isolator with Earth Switch = 2 Nos	MT	3.30					
17.4.6	Structure for 220KV BPI =90 Nos	MT	27.90					
17.4.7	Structure for 33kv outer termination kit =12 Nos	MT	1.78					
17.4.8	Structure for 33KV CT =18 Nos	MT	3.55					
17.4.9	Structure for 33KV IVTS =3 Nos	MT	0.37					
17.4.10	Structure for 33KV LAs =6 Nos	MT	0.89					
17.4.11	33 KV Single Isolator without Earth Switch = 18 Nos	MT	5.31					
17.4.12	33 KV Single Isolator with Earth Switch = 5 Nos	MT	1.63					
17.4.13	Structure for 33KV BPI =40 Nos	MT	5.96					
17.4.14	Structure for 33KV HG Fuse =2 Nos	MT	0.49					
17.5	**TOTAL WEIGHT OF TUBULAR SUPPORT STRUCTURE FOR ABOVE EQUIPMENT INCLUDING GI FOUNDATION BOLTS, ITS NUTS, WASHERS PLATE ETC**	MT	**68.57**	₹ 86,500.00	₹ 7,785.00	₹ 7,785.00	₹ 1,02,070.00	₹ 69,99,246.11
17.6	**GI bolts ,Nuts, washers - plain & spring etc for the above LATTICE/PIPE COLUMN, BEAM & EQUIPMENT structures**	MT	10.78	₹ 1,10,000.00	₹ 9,900.00	₹ 9,900.00	₹ 1,29,800.00	₹ 13,99,562.01
18	**GENERAL EQUIPMENT & SUBSTATION ACCESSORIES**							

Sl. No.	SUBSTATION EQUIPMENTS / MATERIALS DESCRIPTION OF ITEMS(SCHEDULE-VIIA-SS) SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)	UNITS	Qty	IN INR				
				BASIC PRICE PER UNIT (Taxable Value)	GST		TOTAL PRICE PER UNIT	TOTAL PRICE FOR THE QUANTITY
					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	5	6=5X9%	7=5X9%	8=(5+6+7)	9=4X8
18.1	**POWER CABLES, 1.1KV, XLPE & PVC, ARMOURED, FRLSH, ALUMINIUM CONDUCTOR (As per Specification) including Power cable termination, all accessories & other materials - (Below quanity is only indicative, actual quantity shall be as per approved cable schedule, based on which material shall be supplied and measurement will be done.)**							
18.1.1	3.5 CX300 mm² XLPE	Mtrs	200	₹ 1,027.10	₹ 92.44	₹ 92.44	₹ 1,211.98	₹ 2,42,395.00
18.1.2	3.5 CX185 mm² XLPE	Mtrs	200	₹ 1,039.63	₹ 93.57	₹ 93.57	₹ 1,226.77	₹ 2,45,354.00
18.1.3	3.5CX120 mm² XLPE	Mtrs	200	749.923	₹ 67.49	₹ 67.49	₹ 884.90	₹ 1,76,980.60
18.1.4	3.5 CX70 mm² PVC	Mtrs	300	474.412	₹ 42.70	₹ 42.70	₹ 559.81	₹ 1,67,943.60
18.1.5	3.5 CX35 mm² PVC	Mtrs	2000	227	₹ 20.43	₹ 20.43	₹ 267.86	₹ 5,35,720.00
18.1.6	4 CX 16 mm² PVC	Mtrs	1000	143	₹ 12.87	₹ 12.87	₹ 168.74	₹ 1,68,740.00
18.1.7	4 CX 6 mm^2 PVC	Mtrs	2000	₹ 93.00	₹ 8.37	₹ 8.37	₹ 109.74	₹ 2,19,480.00
18.1.8	2CX 6 mm^2 PVC	Mtrs	2000	₹ 69.00	₹ 6.21	₹ 6.21	₹ 81.42	₹ 1,62,840.00
18.2	**CONTROL CABLES,1.1 KV, PVC ARMOURED, FRLSH, Stranded Copper (As per specification) including control cable termination & other materials. - (Below quanity is only indicative, actual quantity shall be as per approved cable schedule)**							
18.2.1	2 CX 2.5 mm^2	Mtrs	2000	₹ 78.41	₹ 7.06	₹ 7.06	₹ 92.53	₹ 1,85,060.00
18.2.2	4 CX 2.5 mm^2	Mtrs	8000	₹ 313.77	₹ 28.24	₹ 28.24	₹ 370.25	₹ 29,62,000.00
18.2.3	5CX 2.5 mm²	Mtrs	3000	₹ 313.77	₹ 28.24	₹ 28.24	₹ 370.25	₹ 11,10,750.00
18.2.4	7CX 2.5 mm²	Mtrs	5000	₹ 491.78	₹ 44.26	₹ 44.26	₹ 580.30	₹ 29,01,500.00
18.2.5	10 CX 2.5 mm^2	Mtrs	5000	₹ 639.06	₹ 57.52	₹ 57.52	₹ 754.10	₹ 37,70,500.00
18.2.6	12 CX 2.5 mm^2	Mtrs	4000	₹ 751.76	₹ 67.66	₹ 67.66	₹ 887.08	₹ 35,48,320.00
18.2.7	16 CX 2.5 mm^2	Mtrs	500	₹ 972.04	₹ 87.48	₹ 87.48	₹ 1,147.00	₹ 5,73,500.00
18.2.8	19 CX 2.5 mm^2	Mtrs	200	₹ 1,137.25	₹ 102.35	₹ 102.35	₹ 1,341.95	₹ 2,68,390.00

Sl. No.	SUBSTATION EQUIPMENTS / MATERIALS DESCRIPTION OF ITEMS(SCHEDULE-VIIA-SS) SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)	UNITS	Qty	IN INR				
				BASIC PRICE PER UNIT (Taxable Value)	GST		TOTAL PRICE PER UNIT	TOTAL PRICE FOR THE QUANTITY
					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	5	6=5X9%	7=5X9%	8=(5+6+7)	9=4X8
18.3	**Supply of screened / Shielded Twisted pair copper cable for Analog Communication for showing winding temp, Oil temp,lighting, fire fighting, DG etc, LT current & LT voltage signals of sub-station auxiliary system in HMI**							
18.3.1	8PX1.5 mm2 screened copper cable	Mtrs	500	₹ 1,173.94	₹ 105.65	₹ 105.65	₹ 1,385.24	₹ 6,92,620.00
18.3.2	2PX1.5 mm2 screened copper cable	Mtrs	200	₹ 415.00	₹ 37.35	₹ 37.35	₹ 489.70	₹ 97,940.00
19	**Supply of Power Transformer with spares as per technical specification & conducting the type tests as per the TS. (Including NCT as per TS for High Impedance REF protection)**							
19.1	220/33 KV, **100** MVA **Yn Yn Power Transformer including all accessories and NCTs as per TS**	Nos	2	₹ 11,00,00,000.00	₹ 99,00,000.00	₹ 99,00,000.00	₹ 12,98,00,000.00	₹ 25,96,00,000.00
19.2	**One set of spares as per TS for Two nos Power Transformers**	Lot	1	₹ 25,00,000.00	₹ 2,25,000.00	₹ 2,25,000.00	₹ 29,50,000.00	₹ 29,50,000.00
19.3	The following type tests shall be carried out in presence of Purchaser's representative on one unit out of the lot at the discretion of the purchaser. (a) Temperature Rise Test. (b) Measurement of Zero Sequence Impedance. (c) Auxiliary Power Consumption.. (d) Vacuum Test (e) Pressure Test (f) IP-55 Test (on one unit of MB)	Lot	1	₹ 5,00,000.00	₹ 45,000.00	₹ 45,000.00	₹ 5,90,000.00	₹ 5,90,000.00
19.4	**Other requirement of 100MVA 220/33KV Power Transformer as indicated below and as per technical specification.**							
19.4.1	**FIRE FIGHTING** (Nitrogen Injection Type Fire Prevention & Extinguishing System): Suitable for **100 MVA, 220/33 KV Power Transformer** as per Technical Specification & latest standard.	Lot	2	₹ 1,17,11,115.00	₹ 10,54,000.35	₹ 10,54,000.35	₹ 1,38,19,115.70	₹ 2,76,38,231.40
19.4.2	**Digital RTCC panel with 2 nos of Digital RTCC relays for the Auto Transformers and 2 more cutouts for future.**							
19.4.3	**Online drying out system for Power transformers as per specification**							
20	**SUBSTATION AUTOMATION SYSTEM FOR 220/33 KV SUBSTATION ON PRP MODE:-** The SAS for 02nos 220KV bays & 07nos 33Kv bays are to be intigrated with the existing systm(IEC 61850) for (Complete 220 kV and 33 kV system). Interconnecting cables like FO patch cord,CAT6 RJ45 communication cable,Ethernet Switches,LIU's etc incomplete shape for proper integration with existing SAS. Note: Necessary modification/augumentation to be taken care by the bidder to integrate with the above bay extension SAS. NOTE: All protective relays & BCU shall be numerical type.	Lots	1	**₹ 79,47,105.00**	₹ 7,15,239.45	₹ 7,15,239.45	₹ 93,77,583.90	₹ 93,77,583.90
21	**Design, engineering, drawing & supply of Substation Automation system.**							

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				BASIC PRICE PER UNIT (Taxable Value)	GST		TOTAL PRICE PER UNIT	TOTAL PRICE FOR THE QUANTITY
					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	5	6=5X9%	7=5X9%	8=(5+6+7)	9=4X8
21.1	**RCC Communication Panel comprising of: (i) Substation Ethernet Switches (Layer-3 type)- 2 nos (ii) Ethernet Switches (with 20% spares Port) for bay & station level (iii) Firewall cum Router-2 set (iv) Station Data Concentrator (SDC)- 2 nos (v) LIUs (vi) Multimode glass fibre Doublle jacket armoured optical cables (vii) Red boxes etc. (viii) Provision for mounting the VMS switch etc including all type of devices & accessories & special cables like F.O patch cord & armoured FO cables of adequate length etc required for the system for completeness in all respect for remote communication & as per technical specification**	Lot	1.00	**₹ 38,59,805.40**	₹ 3,47,382.49	₹ 3,47,382.49	₹ 45,54,570.38	₹ 45,54,570.38
21.2	**Workstation for RAS (Remote Access System)**	Nos	1.00					
21.3	**Furniture (Operator desk 2 Nos (for RAS, VMS) & Chair-4Nos) etc.**	SET	1.00					
21.4	**220 KV TRANSFORMER PROTECTION PANEL: Numerical Differential protection Relay, Numerical REF Relay, Back up protection relay, BCU for 220 KV side of 220/33 KV, 100 MVA Two winding transformer with all other relays & components required for complete protection, control etc as per TS compliant to IEC 61850-ED-2 protocol with PRP on FO. Power Supply 220V DC.**	Nos	2	₹ 35,76,298.55	₹ 3,21,866.87	₹ 3,21,866.87	₹ 42,20,032.29	₹ 84,40,064.58
21.5	**Integration, Testing & commissioning of Busbar protection system for the 2 Nos of Bay extensions including supply of any accessories required for successful operation and integration with the SAS.**	Lot	1	₹ 38,09,977.15	₹ 3,42,897.94	₹ 3,42,897.94	₹ 44,95,773.03	₹ 44,95,773.03

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				BASIC PRICE PER UNIT (Taxable Value)	GST		TOTAL PRICE PER UNIT	TOTAL PRICE FOR THE QUANTITY
					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	5	6=5X9%	7=5X9%	8=(5+6+7)	9=4X8
21.6	**33KV Level Protection Panel**							
21.6.1	**33 KV FEEDER PROTECTION Panel:** BCU, Back up protection relay & with other Auxiliary relays & components required for complete protection, control etc as per TS compliant to IEC 61850 - ED-2 protocol with PRP on FO. Power Supply 220V DC. **33 KV TRANSFORMER PROTECTION Panel:** BCU, Back up protection relay, LV REF Relay & with other Auxiliary relays & components required for complete protection, control etc as per TS compliant to IEC 61850 - ED-2 protocol with PRP on FO. Power Supply 220V DC. **33 KV BUS COUPLER PROTECTION Panel:** BCU, Back up protection relay & with other Auxiliary relays & components required for complete protection, control etc as per TS compliant to IEC 61850 - ED-2 protocol with PRP on FO. Power Supply 220V DC. Note: 5 Nos. of Line Feeder Bays, 2 Nos. of Transformer bays and 1 Nos Bus Coupler Bays to be considered in 4 Panels. The sequence shall be as per the approved SLD.	Nos	4	₹ 30,47,981.72	₹ 2,74,318.35	₹ 2,74,318.35	₹ 35,96,618.42	₹ 1,43,86,473.68
22	**AC & DC SYSTEM**							
22.1	**AC SYSTEM**							
22.1.2	**Outdoor Type, Sub Station Swithyard Console Boxes, HDG type (86 micron), 3 mm thick CRCA, (BMK,AC CONSOLE & OTHER MB) as per TS.**							
22.1.2.1	**Bay Marshalling Kiosk**	SET	4	₹ 1,50,362.04	₹ 13,532.58	₹ 13,532.58	₹ 1,77,427.20	₹ 7,09,708.80
22.1.2.1	Console box for switchyard lighting	Nos	2	₹ 54,087.06	₹ 4,867.84	₹ 4,867.84	₹ 63,822.74	₹ 1,27,645.48
22.1.2.2	Console Box for Street Lighting (Outdoor type)	Nos	1	₹ 54,087.06	₹ 4,867.84	₹ 4,867.84	₹ 63,822.74	₹ 63,822.74
22.1.2.3	**Switchyard Receptacle Board for** Transformer Oil Filteration	Nos	1	₹ 54,087.06	₹ 4,867.84	₹ 4,867.84	₹ 63,822.74	₹ 63,822.74
22.1.2.4	Switchyard Receptacle Board for welding and other emergency	Nos	2	₹ 54,087.06	₹ 4,867.84	₹ 4,867.84	₹ 63,822.74	₹ 1,27,645.48
22.1.2.5	CT Out Door Console Boxes (Outdoor type)	Nos	10	₹ 45,108.48	₹ 4,059.76	₹ 4,059.76	₹ 53,228.00	₹ 5,32,280.00
23	**SUB STATION LIGHTING (AS PER SPECIFICATION AND APPROVED DRAWINGS) (includes switchyard, colony street and other street area). The below mentioned quantity is only indicative. Actual quantity shall be as per the lighting calculation. Lux levels as per OPTCL TS/National Lighting Code/IS 6665 shall be maintained. (Supply of cables required are covered in the cable items indicated above)**							
23.1	**SUB-STATION SWITCH YARD LIGHTING :** IT INCLUDES SUPPLY OF FIXTURES & LAMPS (LED - 150 watt each) of reputed make (Phillips/Crompton/Bajaj/Havells/Wipro) with switch gear, GI Conduit etc. (Lighting fixtures are to be fixed rigidly on the Column at a suitable height so that the required lux can be achieved).	Set	35	₹ 15,000.00	₹ 1,350.00	₹ 1,350.00	₹ 17,700.00	₹ 6,19,500.00

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				BASIC PRICE PER UNIT (Taxable Value)	GST		TOTAL PRICE PER UNIT	TOTAL PRICE FOR THE QUANTITY
					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	5	6=5X9%	7=5X9%	8=(5+6+7)	9=4X8
24	**STREET LIGHTING**: HDG Octagonal street lighting poles 7 m height (Crompton/Bajaj/Skipper/Transrail Make) with arm bracket for holding light, foundation nuts & bolts and LED light fittings etc. The pole shall be manufactured in a single section with weight of galvanization 610 g/sqm or thickness of galvanization 86 micron. The pole shall be meant for installation in Wind Zone V. Poles should be suitable for installation on a RCC concrete foundation with 4nos x 20 mm dia foundation bolts with 225 mm PCD . (Poles shall have variable PCD (200-250 mm dia) type base plate with diagonal slotted holes) It includes supply of LED lighting fixtures with lamps of 100 Watts of reputed make (Phillips/Crompton/Bajaj/Havells/Wipro), with switch gear, GI Conduit etc. & as per technical specification. The pole shall have separate or inbuilt GI junction box with suitable cover with (water/dust) ingress protection for housing electrical accessories. The JB shall have provision of fuses/MCB, buses, TBs as required for cable in and out.	SET	30	₹ 21,750.00	₹ 1,957.50	₹ 1,957.50	₹ 25,665.00	₹ 7,69,950.00
25	**AIRCONDITIONING:** Supply of 2T capacity Split Air Conditioning Units (Dual Inverter, five star latest model - LG/Samsung/Hitachi/Carrier/Mitsubishi/Voltas/Daikin Make) with copper condensor having remote temperature & operation control facility with voltage stabilizer.							
25.1	AC for Switchyard Kiosk as per T.S. (The ACs shall run in tandem i.e 1 of the ACs at a time for 4 hours each. Accordingly, the controller shall be supplied.)	Set	4	₹ 65,000.00	₹ 5,850.00	₹ 5,850.00	₹ 76,700.00	₹ 3,06,800.00
26	**FIRE FIGHTING SYSTEM(PORTABLE /TROLLEY/ WHEEL MOUNTED FIRE EXTINGUSHERS SETS FOR CONTROL ROOM, EQUIPMENT LIKE TRANSFORMER AND OTHER AREAS AS PER TECH SPEC**							
26.1	FOAM TYPE-9 LTRS	Nos	4	₹ 2,000.00	₹ 180.00	₹ 180.00	₹ 2,360.00	₹ 9,440.00
26.2	DRY CHEMICAL POWDER(TROLLEY MOUNTED)- 22 5 KGS	Nos	4	₹ 13,000.00	₹ 1,170.00	₹ 1,170.00	₹ 15,340.00	₹ 61,360.00
26.3	DRY POWDER TYPE - 5 KGS	Nos	4	₹ 2,500.00	₹ 225.00	₹ 225.00	₹ 2,950.00	₹ 11,800.00
26.4	Co_2- 4.5 KGS	Nos	10	₹ 5,500.00	₹ 495.00	₹ 495.00	₹ 6,490.00	₹ 64,900.00
26.5	CO_2 - 9 KGS	Nos	10	₹ 12,000.00	₹ 1,080.00	₹ 1,080.00	₹ 14,160.00	₹ 1,41,600.00
26.6	CO_2 (TROLLY MOUNTED)- 22.5 KGS	Nos	4	₹ 25,000.00	₹ 2,250.00	₹ 2,250.00	₹ 29,500.00	₹ 1,18,000.00
26.7	9 litre water type	Nos	4	₹ 2,000.00	₹ 180.00	₹ 180.00	₹ 2,360.00	₹ 9,440.00
26.8	4.5 kg DCP type	Nos	4	₹ 3,000.00	₹ 270.00	₹ 270.00	₹ 3,540.00	₹ 14,160.00
26.9	50 Litres Mechanical Foam type	Set	4	₹ 10,000.00	₹ 900.00	₹ 900.00	₹ 11,800.00	₹ 47,200.00
26.10	FIRE BUCKET (6 NOS IN EACH STAND) WITH STAND & ITS CANOPY	Set	6	₹ 5,000.00	₹ 450.00	₹ 450.00	₹ 5,900.00	₹ 35,400.00
27	Storage Water Cooler (Voltas/ Bluestar only) storage/cooling with at least 15/15ltr with two faucets	Nos	1	₹ 27,000.00	₹ 2,430.00	₹ 2,430.00	₹ 31,860.00	₹ 31,860.00
27.1	**Water Purifier** (RO+UV+UF type) suitable for connecting to the above water storage cooler (Kent/Aquaguard/Livpure/Pureit/Bluestar/LG)only	Nos	1	₹ 20,000.00	₹ 1,800.00	₹ 1,800.00	₹ 23,600.00	₹ 23,600.00

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				BASIC PRICE PER UNIT (Taxable Value)	GST		TOTAL PRICE PER UNIT	TOTAL PRICE FOR THE QUANTITY
					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	5	6=5X9%	7=5X9%	8=(5+6+7)	9=4X8
28	**Insulating Mat:** Best Quality & approved make (Confirming to IS:15652:2006) to be kept infront of all panels, boards etc.(2000X1000X3mm	Nos	35	₹ 2,500.00	₹ 225.00	₹ 225.00	₹ 2,950.00	₹ 1,03,250.00
29	**Visual Monitering System (VMS) with Connection to OPTCL Remote Control Center:** **Note:** Any other requirement besides above to be explored & can be finalised during detail Engg.	Lot	1	₹ 9,28,608.00	83,574.72	83,574.72	10,95,757.44	10,95,757.44
29.1	Design and Supply for IP Based VMS (Server Based with VMS software), which shall include ONVIF Compliant Colour Cameras with Night Vision(Bullet/Done/PTZ), PTZ Controller, Server (Rack mounted/Tower type) Based NVR with VMS Software, NAS Storage, Mounting arrangement for cameras, cables (Armoured/Un armoured FO/Ethernet/AC/DC/HDMI etc.), HDPE Pipes, Ethernet Switches, UPS, Battery, LIU,POE Injectors, Media Converters, Surge Protection Device (SPD), Ethernet Surge Protectors (ESP), Outdoor/Indoor Junction Boxes/Panels, Main display unit (32 inch Full HD), Keyboard, Mouse, Routers, Networking Rack etc. including any other hardware or software to complete the system as per TS.							
29.2	An additional display unit (32 inch Full HD) shall also be provided in the security shed for monitoring purpose as per TS.							
29.3	Any other materials (Hardware & Software) required at the substation for connection of VMS system with remote control center of OPTCL including configuration of the same are also included in the scope of supply. (Configuration at Remote Control Center not the scope of the Contractor.)							
29.4	Network Topology: Ring							
29.5	No. of such cameras (different type viz. PTZ, bullet or dome) are to be calculated as per standard practice & its installations at the strategic locations so as to avoid blind spots.							
29.6	The following areas are to be covered without any blind spots:							
29.7	1. Entry and exits of Store and Equipment storage Platforms/Open stockyard - Bullet cameras							
29.8	2. All entry and exits of Control room building- Bullet cameras							
29.9	3. All gates of switchyard - Bullet cameras							
29.10	4. Control Room Building (Inside Areas) - Panel Room, HMI Room, LT(AC/DC) Panel Room, Battery Room- Dome cameras							
29.11	5. Entry and Exit of Security Shed cum main gate complex - Bullet cameras							
29.12	6. Switchyard areas - PTZ Cameras							
29.13	7. Transformers - Bullet/PTZ cameras							
29.14	Note: Any other requirement besides above to be explored & can be finalised during detail Engg.							
	TOTAL PRICE FOR SUPPLY COMPONENT OF EQUIPEMENTS / MATERIALS_SCHEDULE VIIA(SUB-STATION)							**₹ 46,91,43,352.81**

Sl. No.	SUBSTATION EQUIPMENTS / MATERIALS DESCRIPTION OF ITEMS(SCHEDULE-VIIA-SS) SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)	UNITS	Qty	IN INR				
				BASIC PRICE PER UNIT (Taxable Value)	GST		TOTAL PRICE PER UNIT	TOTAL PRICE FOR THE QUANTITY
					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	5	6=5X9%	7=5X9%	8=(5+6+7)	9=4X8

SUPPLY OF MANDATORY SPARES	Name of the work:- Construction of 2x 100 MVA, 220/33 KV Sub-Station at Landei Hilll in Odisha State of India. 220/33KV GSS Landei Hill: 220KV Bays- Power Tfr-2 Nos, 1 spare bay (Unequipped bay) 33KV Bays- Feeder-5 Nos, Tfr-2 Nos, B/C-1 no, 1 spare bay

SR. No.	DESCRIPTION OF ITEMS SUPPLY OF MANDATORY SPARES FOR THE FOLLOWING	Unit	Quantity	BASIC PRICE PER UNIT (Taxable	CGST @ 9% PER UNIT	OGST @ 9% PER UNIT	TOTAL PRICE PER UNIT (In Rs)	TOTAL PRICE FOR THE QUANTITY
1	245 KV, 1200-600-300 A, 50 KA, 5 core Single Phase Current Transformer (4 Nos PX Class & 1 No. 0.2s Class)	Nos	2	₹ 4,50,654.03	₹ 40,558.86	₹ 40,558.86	₹ 5,31,771.75	₹ 10,63,543.50
2	245 KV, 2000A, 50KA, ISOLATORS							
2.1	Fixed & Moving Contact Assembly set for One complete Isolator	Set	1	₹ 21,157.50	₹ 1,904.18	₹ 1,904.18	₹ 24,965.86	₹ 24,965.86
3	Metal oxide polymer housed surge arrrestor for 220 kV system. Station Class Medium Duty (SM) type In, Ur, Uc, Wth & Qrs as per technical specification/Latest IEC complete with insulating base and Surge monitor (AIS). - As per TS	Nos	2	₹ 71,489.05	₹ 6,434.01	₹ 6,434.01	₹ 84,357.07	₹ 1,68,714.14
4	245KV, 1 phase solid core Bus Post Insulator (8 kN) (AIS) as per Technical Specification.	Nos	2	₹ 20,931.02	₹ 1,883.79	₹ 1,883.79	₹ 24,698.60	₹ 49,397.20
5	**245KV, 3150A, 50KA, SF6 Circuit Braker with supporting Structure. Facilities for integration with SAS as per the site requirement.**							
5.1	Density Monitoring System	Set	1	₹ 6,780.00	₹ 610.20	₹ 610.20	₹ 8,000.40	₹ 8,000.40
5.2	Closing Coil	Nos	4	₹ 3,105.00	₹ 279.45	₹ 279.45	₹ 3,663.90	₹ 14,655.60
5.3	Tripping Coil	Nos	4	₹ 3,105.00	₹ 279.45	₹ 279.45	₹ 3,663.90	₹ 14,655.60
5.4	SF6 Gas Filling Device	Nos	1	₹ 10,351.00	₹ 931.59	₹ 931.59	₹ 12,214.18	₹ 12,214.18
6	**33KV Current Transformer**							
6.1	36 KV,800-400-200, 31.5KA,3CORE SINGLE PHASE CURRENT TRANSFORMER (2nos PX Class & 1 no 0.2s Class) - Feeder Bays	Nos	3	₹ 62,012.84	₹ 5,581.16	₹ 5,581.16	₹ 73,175.16	₹ 2,19,525.48
6.2	36 KV,2000-1000-500, 31.5 KA,4CORE SINGLE PHASE CURRENT TRANSFORMER(3 nos PX Class & 1 no 0.2s Class) - Transformer Bays	Nos	3	₹ 62,012.84	₹ 5,581.16	₹ 5,581.16	₹ 73,175.16	₹ 2,19,525.48
7	**36 KV, 31.5KA for 1 sec, AIS Isolators with post insulators as per TS.**							
7.1	Fixed & Moving Contact Assembly set for One complete Isolator	Set	1	₹ 10,578.75	₹ 952.09	₹ 952.09	₹ 12,482.93	₹ 12,482.93
8	Metal oxide polymer housed surge arrrestor for 33 kV system. Station Class Low Duty (SL) type In, Ur, Uc, Wth & Qrs as per technical specification/Latest IEC complete with insulating base and Surge monitor - As per TS	Nos	3	₹ 9,416.38	₹ 847.47	₹ 847.47	₹ 11,111.32	₹ 33,333.96
9	36 KV, 2 Core Single Phase IVT (1 core 3P & 1 core 0.2)	Nos	1	₹ 31,316.46	₹ 2,818.48	₹ 2,818.48	₹ 36,953.42	₹ 36,953.42
10	36 KV, 1600A, 31.5 kA Vacuum Circuit Breaker with supporting Structure as per TS. Facilities for integration with SAS as per the site requirement.							
10.1	One complete Pole Assembly of Circuit Breaker in dust proof and safe packing.	Nos	3	₹ 59,322.00	₹ 5,338.98	₹ 5,338.98	₹ 69,999.96	₹ 2,09,999.88
10.2	Closing Coil	Nos	4	₹ 1,865.00	₹ 167.85	₹ 167.85	₹ 2,200.70	₹ 8,802.80
10.3	Tripping Coil	Nos	4	₹ 1,865.00	₹ 167.85	₹ 167.85	₹ 2,200.70	₹ 8,802.80

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					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	5	6=5X9%	7=5X9%	8=(5+6+7)	9=4X8
11	33 KV Solid Core Bus Post Insulator as per TS	Nos	3	₹ 3,503.00	₹ 315.27	₹ 315.27	₹ 4,133.54	₹ 12,400.62
12	BUS BAR & CIRCUIT MATERIALS							
12.1	**220KV TENSION & SUSPENSION Disc Type Antifog Insulators as per TS**							
12.1.1	160 KN Disc Insulator for 220 KV Tension purpose With appropriate arrangement as per IS.	Nos	20	₹ 807.90	₹ 72.71	₹ 72.71	₹ 953.32	₹ 19,066.40
12.1.2	90 KN Disc Insulator for 220 KV Suspension purpose With appropriate arrangement as per IS.	Nos	20	₹ 800.00	₹ 72.00	₹ 72.00	₹ 944.00	₹ 18,880.00

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				BASIC PRICE PER UNIT (Taxable Value)	GST		TOTAL PRICE PER UNIT	TOTAL PRICE FOR THE QUANTITY
					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	5	6=5X9%	7=5X9%	8=(5+6+7)	9=4X8
13	ACSR CONDUCTOR							
13.1	ACSR Moose Conductor	Mtrs	250	₹ 663.00	₹ 59.67	₹ 59.67	₹ 782.34	₹ 1,95,585.00
13.2	ACSR Bersimis Conductor	Mtrs	100	₹ 745.71	₹ 67.11	₹ 67.11	₹ 879.93	₹ 87,993.00
14	Clamps & Connectors for 220 KV & 33 KV (Each type Three Nos) The exact qty of each item under this shall be mentioned by the agency and shall be incorporated in the P.O.	Set	1	₹ 50,000.00	₹ 4,500.00	₹ 4,500.00	₹ 59,000.00	₹ 59,000.00
15	Spares for Protection relay Panels (As installed in C/R Panels)							
15.1	**220KV**							
15.1.1	Differential Protection Relay (Main-I) (Power Transformer)	Nos	1	₹ 2,25,750.42	₹ 20,317.54	₹ 20,317.54	₹ 2,66,385.50	₹ 2,66,385.50
15.1.2	HV REF Relay	Nos	2	₹ 11,281.79	₹ 1,015.36	₹ 1,015.36	₹ 13,312.51	₹ 26,625.02
15.1.3	Bus VT Selection Relay	Nos	1	₹ 11,281.79	₹ 1,015.36	₹ 1,015.36	₹ 13,312.51	₹ 13,312.51
15.1.4	Master Trip Relay	Nos	1	₹ 11,281.79	₹ 1,015.36	₹ 1,015.36	₹ 13,312.51	₹ 13,312.51
15.1.5	Busbar Trip Relay	Nos	1	₹ 11,281.79	₹ 1,015.36	₹ 1,015.36	₹ 13,312.51	₹ 13,312.51
15.1.6	DC Supervision Relay	Nos	1	₹ 11,281.79	₹ 1,015.36	₹ 1,015.36	₹ 13,312.51	₹ 13,312.51
15.1.7	TC Supervision Relay	Nos	1	₹ 11,281.79	₹ 1,015.36	₹ 1,015.36	₹ 13,312.51	₹ 13,312.51
15.1.8	Back up Relay	Nos	1	₹ 47,221.41	₹ 4,249.93	₹ 4,249.93	₹ 55,721.27	₹ 55,721.27
15.1.9	LV REF Relay	Nos	1	₹ 11,345.57	₹ 1,021.10	₹ 1,021.10	₹ 13,387.77	₹ 13,387.77
15.1.10	DC Changeover Contactor	Nos	2	₹ 24,000.00	₹ 2,160.00	₹ 2,160.00	₹ 28,320.00	₹ 56,640.00
15.2	**33KV**							
15.2.1	BCU	Nos	1	₹ 4,67,785.00	₹ 42,100.65	₹ 42,100.65	₹ 5,51,986.30	₹ 5,51,986.30
15.2.2	Master Trip Relay	Nos	1	₹ 11,281.79	₹ 1,015.36	₹ 1,015.36	₹ 13,312.51	₹ 13,312.51
15.2.3	LBB Trip Relay	Nos	1	₹ 11,281.79	₹ 1,015.36	₹ 1,015.36	₹ 13,312.51	₹ 13,312.51
15.2.4	DC Supervision Relay	Nos	1	₹ 11,281.79	₹ 1,015.36	₹ 1,015.36	₹ 13,312.51	₹ 13,312.51
15.2.5	TC Supervision Relay	Nos	1	₹ 11,281.79	₹ 1,015.36	₹ 1,015.36	₹ 13,312.51	₹ 13,312.51
15.2.6	Back up Relay	Nos	1	₹ 47,221.41	₹ 4,249.93	₹ 4,249.93	₹ 55,721.27	₹ 55,721.27
15.2.7	DC Changeover Contactor	Nos	2	₹ 18,000.00	₹ 1,620.00	₹ 1,620.00	₹ 21,240.00	₹ 42,480.00
	TOTAL SUPPLY OF MANDATORY SPARES FOR SUB-STATION							**₹ 36,87,257.97**

ODISHA POWER TRANSMISSION CORPORATION LTD

(ERECTION SUB-STATION)

Name of the work:- Construction of 2x100 MVA, 220/33 KV Sub-Station at Landeihill in Odisha State of India.
220/33KV GSS Landei Hill:
220KV Bays- Power Tfr-2 Nos, 1 spare bay (Unequipped bay)
33KV Bays- Feeder-5 Nos, Tfr-2 Nos, B/C-1 no, 1 spare bay(Unequipped bay)

Sl. No.	ERECTION, INSTALLATION, TESTING & COMMISSIONING _SUBSTATION DESCRIPTION OF ITEMS(SCHEDULE-VIIB-SS) ERECTION, INSTALLATION, TESTING & COMMISSIONING OF FOLLOWING EQUIPMENTS (As per Technical Specification)	UNITS	Qty	IN INR				
				BASIC PRICE PER UNIT (Taxable Value) In Rs	GST		TOTAL PRICE PER UNIT (In Rs)	TOTAL PRICE FOR THE QUANTITY
					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	₹ 5.00	6= {5*9%}	7= {5*9%}	8= {5+6+7}	9= {8*4}
A	**ELECTRICAL WORKS**							
	SUB-STATION							
1	245 KV, 1200-600-300 A, 50 KA, 5 core Single Phase Current Transformer (4 Nos PX Class & 1 No. 0.2s Class)	Nos	6	₹ 15,695.55	₹ 1,412.60	₹ 1,412.60	₹ 18,520.75	₹ 1,11,124.50
2	**245 KV, 2000A, 40KA, ISOLATORS**							
2.1	245KV Single Isolator without Earth switch	Nos	6	₹ 29,880.28	₹ 2,689.23	₹ 2,689.23	₹ 35,258.74	₹ 2,11,552.44
2.2	245KV Single Isolator with Earth switch	Nos	2	₹ 33,153.68	₹ 2,983.83	₹ 2,983.83	₹ 39,121.34	₹ 78,242.68
2.3	245KV Beam mounted Single Isolator without Earth Switch	Nos	2	₹ 23,501.34	₹ 2,115.12	₹ 2,115.12	₹ 27,731.58	₹ 55,463.16
3	Metal oxide polymer housed surge arrrestor for 220 kV system. Station Class Medium Duty (SM) type In, Ur, Uc, Wth & Qrs as per technical specification/Latest IEC complete with insulating base and Surge monitor (AIS). - As per TS	Nos	6	₹ 5,203.87	₹ 468.35	₹ 468.35	₹ 6,140.57	₹ 36,843.42
4	245KV, 1 phase solid core Bus Post Insulator (8 kN) (AIS) as per Technical Specification.	Nos	90	₹ 2,853.73	₹ 256.84	₹ 256.84	₹ 3,367.41	₹ 3,03,066.90
5	245KV, 3150A, 50KA, SF6 Circuit Braker with supporting Structure. Facilities for integration with SAS as per the site requirement.	Nos	2	₹ 97,698.43	₹ 8,792.86	₹ 8,792.86	₹ 1,15,284.15	₹ 2,30,568.30
6	36 KV,800-400-200, 31.5KA,3CORE SINGLE PHASE CURRENT TRANSFORMER (2nos PX Class & 1 no 0.2s Class) - Feeder Bays	Nos	18	₹ 2,601.94	₹ 234.17	₹ 234.17	₹ 3,070.28	₹ 55,265.04
7	36 KV,2000-1000-500, 31.5 KA,4CORE SINGLE PHASE CURRENT TRANSFORMER(3 nos PX Class & 1 no 0.2s Class) - Transformer Bays	Nos	6	₹ 2,601.94	₹ 234.17	₹ 234.17	₹ 3,070.28	₹ 18,421.68
8	**33KV Single core 300 sq.mm, XLPE Insulated, Copper Conductor Armoured Cable**							
8.1	1000Sq.mm 33KV XLPE insulated Single core Copper cable	Kms	1.6	₹ 5,72,355.00	₹ 51,511.95	₹ 51,511.95	₹ 6,75,378.90	₹ 10,80,606.24
8.2	Outdoor Termination kit for 33KV, 1000 sq.mm cable	Nos	24	₹ 47,696.25	₹ 4,292.66	₹ 4,292.66	₹ 56,281.57	₹ 13,50,757.67
9	**36 KV, 31.5KA for 1 sec, AIS Isolators with post insulators as per TS.**							
9.1	1250A Single Isolator without ES	Nos	10	₹ 6,714.67	₹ 604.32	₹ 604.32	₹ 7,923.31	₹ 79,233.10
9.2	1250A Single Isolator with ES	Nos	5	₹ 6,714.67	₹ 604.32	₹ 604.32	₹ 7,923.31	₹ 39,616.55
9.3	2000A Single Isolator without ES	Nos	8	₹ 6,714.67	₹ 604.32	₹ 604.32	₹ 7,923.31	₹ 63,386.48
9.4	2000A Beam mounted Single Isolator without ES	Nos	2	₹ 5,539.60	₹ 498.56	₹ 498.56	₹ 6,536.72	₹ 13,073.44

Sl. No.	ERECTION, INSTALLATION, TESTING & COMMISSIONING _SUBSTATION DESCRIPTION OF ITEMS(SCHEDULE-VIIB-SS) ERECTION, INSTALLATION, TESTING & COMMISSIONING OF FOLLOWING EQUIPMENTS (As per Technical Specification)	UNITS	Qty	IN INR				
				BASIC PRICE PER UNIT (Taxable Value) In Rs	GST		TOTAL PRICE PER UNIT (In Rs)	TOTAL PRICE FOR THE QUANTITY
					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	₹ 5.00	6= {5*9%}	7= {5*9%}	8= {5+6+7}	9= {8*4}
9.5	800A Beam mounted Single Isolator without ES	Nos	2	₹ 5,539.60	₹ 498.56	₹ 498.56	₹ 6,536.72	₹ 13,073.44
10	Metal oxide polymer housed surge arrrestor for 33 kV system. Station Class Low Duty (SL) type In, Ur, Uc, Wth & Qrs as per technical specification/Latest IEC complete with insulating base and Surge monitor - As per TS	Nos	27	₹ 1,300.96	₹ 117.09	₹ 117.09	₹ 1,535.14	₹ 41,448.78
11	36 KV, 2 Core Single Phase IVT (1 core 3P & 1 core 0.2)	Nos	3	₹ 2,350.13	₹ 211.51	₹ 211.51	₹ 2,773.15	₹ 8,319.45
12	36 KV, 2500A, 31.5 kA Vacuum Circuit Breaker with supporting Structure as per TS. Facilities for integration with SAS as per the site requirement.	Nos	8	₹ 24,172.81	₹ 2,175.55	₹ 2,175.55	₹ 28,523.91	₹ 2,28,191.28
13	33 KV Solid Core Bus Post Insulator as per TS	Nos	40	₹ 654.68	₹ 58.92	₹ 58.92	₹ 772.52	₹ 30,900.80
14	**BUS BAR & CIRCUIT MATERIAL:** **The 220KV Main Bus –II & II shall be with Twin ACSR Moose & the jumpers shall be with 4" Aluminium Pipe, Twin/single ACSR Moose.** **The 33KV Main Bus & Reserve Bus shall be with Twin ACSR Bersimis, Jumpers of 33KV Transformer & Bus Coupler shall be with Twin ACSR Bersimis and for feeders single ACSR Bersimis.** **The interconnection between 33KV side of power transformer and 33KV switchyard shall be with 33KV Cable**							
14.1	Single conductor/Phase (Bersimis)	Mtr	700	₹ 184.65	₹ 16.62	₹ 16.62	₹ 217.89	₹ 1,52,523.00
14.2	Twin Conductor /Phase (Bersimis)	Mtr	500	₹ 252.05	₹ 22.68	₹ 22.68	₹ 297.41	₹ 1,48,705.00
14.3	Single conductor/Phase (Moose)	Mtr	1000	₹ 184.65	₹ 16.62	₹ 16.62	₹ 217.89	₹ 2,17,890.00
14.4	Twin Conductor /Phase (Moose)	Mtr	900	₹ 252.05	₹ 22.68	₹ 22.68	₹ 297.41	₹ 2,67,669.00
14.5	IPS 4" Aluminium Tubes (114.2 mm OD & 8.51 mm thick)	Mtr	450	₹ 500.00	₹ 45.00	₹ 45.00	₹ 590.00	₹ 2,65,500.00
15	**SUB-STATION EARTH-MAT**							

Sl. No.	ERECTION, INSTALLATION, TESTING & COMMISSIONING _SUBSTATION DESCRIPTION OF ITEMS(SCHEDULE-VIIB-SS) ERECTION, INSTALLATION, TESTING & COMMISSIONING OF FOLLOWING EQUIPMENTS (As per Technical Specification)	UNITS	Qty	IN INR				
				BASIC PRICE PER UNIT (Taxable Value) In Rs	GST		TOTAL PRICE PER UNIT (In Rs)	TOTAL PRICE FOR THE QUANTITY
					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	₹ 5.00	6= {5*9%}	7= {5*9%}	8= {5+6+7}	9= {8*4}
15.1	Substation earth-mat: (a) The Soil resistivity for the substation area is to be measured and approved by OPTCL. (b) The Earth Mat design and layout is to prepared based on the soil resistivity and approved by OPTCL. (c) Laying of earth-mat conductors of Hot dip galvanized flats of size 75X10mm, excavation of earth for laying of earth flat as per approved design & drawing, welding/jointing, application of two coats of bituminous Paint, wrapping of HT Tape etc of ground conductors & etc with back filling and good compaction. The spacing between the earth conductor not more than 5 Mtrs (both way) and to be buried at depth of 700mm from the finished ground level. (d) 40 mm MS solid rod: Provision of grounding driven 40 mm MS Solid rod, along the periphery of the switchyard i.e near the fencing. (e) 50 mm,3 mtr long Heavy duty perforated GI pipes: for treated earth pits (with details of treatment as per IS). (f) Provision of water taps inside the switch yard areas and peripheral for treated earth pit for watering the treated earth pits. Note: The no. of treated and un treated earth pits are to be done as per the practice and as indicated in the drawing for different equipment. (g) The erection of risers of size 50 x 6 mm / 75 x 10 mm GI flats including welding/jointing, application of two coats of bituminous Paint, wrapping of HT Tape etc as per requirement. This is as per approved drawing and specification.							
15.1.1	75x10 MM GI FLAT: The flat is also to be laid from the earth mat up to the foundation level.	Mtrs	5085	₹ 110.27	₹ 9.92	₹ 9.92	₹ 130.11	₹ 6,61,576.82
15.1.2	50x6 MM GI FLAT: for Raiser from the foundation level to equipment, structure, columns and up to the bottom of spikes etc.). Each equipment strructure & Columns shall be connected to earth at two separate points.	Mtrs	4167	₹ 86.64	₹ 7.80	₹ 7.80	₹ 102.24	₹ 4,26,000.34
15.1.3	50MM GI Pipe for Treated Earth Pit including excavation of Earth,tratment of betonate compound, back filling with borrowed earth, termination of earth mat riser by nut bolting,apply of paints(two coats minimum) with supply of all labour and T & P as per ISS 3043: Electrode with chamber & openable hinge type cast iron cover with frame, shall be connected to the main earth mat. The resistance of each earth pit shall be recorded in presence of the Engineer In charge.	Nos	200	₹ 2,993.00	₹ 269.37	₹ 269.37	₹ 3,531.74	₹ 7,06,348.00
16	**G.I Cable Trays including support GI angle suitable for different sections along with its accessories as per TS. Details of No. of tiers are indicated in the TS-Civil Section accordingly the requirement can be ascertained & High Quality ISI mark PVC-U selfit Pipe, PVC elbow bend,PVC Tee etc suitable for under ground burrial (HARD CONDUIT INCLUDING of adequate tensile strength**							
16.1	G.I Cable Trays(size: 450x75x2500mm)	Mtrs	1000	₹ 80.00	₹ 7.20	₹ 7.20	₹ 94.40	₹ 94,400.00
16.2	G.I Cable Trays(size: 300x75x2500mm)	Mtrs	500	₹ 80.00	₹ 7.20	₹ 7.20	₹ 94.40	₹ 47,200.00
16.3	G.I Cable Trays(size: 150x75x2500mm)	Mtrs	500	₹ 80.00	₹ 7.20	₹ 7.20	₹ 94.40	₹ 47,200.00
16.4	Support G. I angle 50x50x6 mm for cable tray	MT	2.5	₹ 10,000.00	₹ 900.00	₹ 900.00	₹ 11,800.00	₹ 29,500.00
17	**SWITCH YARD STRUCTURES STEEL HDG - LATTICE TYPE FOR TOWER COLUMN, BEAMS & PIPE TYPE FOR ALL EQUIPMENT STRUCTURE (INCLUDING FOUNDATION BOLTS - ITS NUTS, ITS WASHERS, ITS PLATE ETC) FOR 220/33 KV CLASS (Weight in brackets are only indicative - Actual weight shall be as per approved BOM. Measurement shall be done accordingly.)**							
17.1	**DIFFERENT TYPE OF LATICE TYPE COLUMNS WITH DETAILS (including top earthing spike)**							

Sl. No.	ERECTION, INSTALLATION, TESTING & COMMISSIONING _SUBSTATION DESCRIPTION OF ITEMS(SCHEDULE-VIIB-SS) ERECTION, INSTALLATION, TESTING & COMMISSIONING OF FOLLOWING EQUIPMENTS (As per Technical Specification)	UNITS	Qty	IN INR				
				BASIC PRICE PER UNIT (Taxable Value) In Rs	GST		TOTAL PRICE PER UNIT (In Rs)	TOTAL PRICE FOR THE QUANTITY
					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	₹ 5.00	6= {5*9%}	7= {5*9%}	8= {5+6+7}	9= {8*4}
17.1.1	P1S-Column 220 KV (NOMINAL UNIT WT- 4.5 MT) =20 Sets(Including Earth Spike)	MT	90.00					
17.1.2	T8S - 33KV (NOMINAL UNIT WT- 0.8 MT)) = 10 Sets(Including Earth Spike)	MT	8.30					
17.1.3	T9S - 33KV(Nominal unit wt- 0.6 MT)=12 Sets(Including Earth Spike)	MT	7.20					
17.2	**DIFFERENT TYPE OF BEAMS WITH DETAILS**							
17.2.1	Q1-Beam 220 KV (NOMINAL UNIT WT- 1.598 MT) = 12 Sets	MT	19.18					
17.2.2	Q3 - 220 KV(NOMINAL UNIT WT- 2.5 MT) =6 Sets	MT	15.00					
17.2.3	G6 - 33KV (NOMINAL UNIT WT- 0.53 MT) = 4 Sets	MT	2.12					
17.2.4	G4 - 33KV(NOMINAL UNIT WT- 0.4 MT) =8 Sets	MT	3.20					
17.2.5	G4X - 33KV (NOMINAL UNIT WT- 0.4 MT) =4 Sets	MT	2.08					
17.3	**TOTAL WEIGHT OF COLUMN & BEAM INCLUDING FOUNDATION BOLTS, - ITS NUTS, WASHERS PLATE ETC**	MT	147.08	₹ 9,831.35	₹ 884.82	₹ 884.82	₹ 11,600.99	₹ 17,06,227.21
17.4	**DIFFERENT TYPE OF TUBULAR SUPPORT STRUCTURES HDG TYPE FOR ALL 220KV & 33KV EQUIPMENT INCLUDING FOUNDATION BOLT - ITS NUTS, ITS WASHERS, ITS PLATE ETC)**							
17.4.1	Structure for 220KV SA =06 Nos	MT	2.10					
17.4.2	Structure for 220KV CT =06 Nos	MT	6.30					
17.4.3	Structure for 220KV IVTs =00 Nos	MT	0.00					
17.4.4	220 KV Single Isolator without Earth Switch = 06 Nos	MT	9.00					
17.4.5	220 KV Single Isolator with Earth Switch = 02 Nos	MT	3.30					
17.4.6	Structure for 220KV BPI =90 Nos	MT	27.90					
17.4.7	Structure for 33kv outer termination kit =12 Nos	MT	1.78					
17.4.8	Structure for 33KV CT =18 Nos	MT	3.55					
17.4.9	Structure for 33KV IVTS =3 Nos	MT	0.37					
17.4.10	Structure for 33KV LAs =6 Nos	MT	0.89					
17.4.11	33 KV Single Isolator without Earth Switch = 18 Nos	MT	5.31					
17.4.12	33 KV Single Isolator with Earth Switch = 5 Nos	MT	1.63					
17.4.13	Structure for 33KV BPI =40 Nos	MT	5.96					
17.4.14	Structure for 33KV HG Fuse =2 Nos	MT	0.49					
17.5	**TOTAL WEIGHT OF TUBULAR SUPPORT STRUCTURE FOR ABOVE EQUIPMENT INCLUDING GI FOUNDATION BOLTS, ITS NUTS, WASHERS PLATE ETC**	MT	68.57	₹ 9,831.35	₹ 884.82	₹ 884.82	₹ 11,600.99	₹ 7,95,514.69
17.6	**Gl bolts ,Nuts, washers - plain & spring etc for the above LATTICE/PIPE COLUMN, BEAM & EQUIPMENT structures**	MT	10.78	₹ 9,831.35	₹ 884.82	₹ 884.82	₹ 11,600.99	₹ 1,25,087.09
18	**Laying of POWER & CONTROL CABLES including Power cable termination & other materials** Laying of Power Cable including fixing of cable with terminal connections both at equipments and panels with supply of and fixing of lugs, Ferrules, clamps, connectors, glands, fixing of cable trays, including supply of N&B, Link plates, Cable Markers, Plaster of Paris, M-Seal compounds etc for sealing purpose and all necessary arrangements, laying of Earthing Flats, earthing ,laying of Cable trench slabs and chequered plate etc for the cable trench,Cable scheduled and cable diagram to be prepared by the contractor. Note: Supply & fixing of Modular Multi-diameter flexible Cable sealing system consisting of frames, blocks and accessories to be installed wherever the electrical / control / communication cables over-ground enter or leave from control room building. Cable sealing to be done with Multi-diameter type flexible modular based sealing blocks of different sizes (refer the Vol-II Scope).							
18.1	POWER CABLES, 1.1KV, XLPE & PVC, ARMOURED, FRLSH, ALUMINIUM CONDUCTOR (As per Specification) including Power cable termination, all accessories & other materials - (Below quanity is only indicative, actual quantity shall be as per approved cable schedule, based on which material shall be supplied and measurement will be done.)							
18.1.1	XLPE 3.5 CX300 mm^2	Mtrs	200	₹ 2,284.14	₹ 205.57	₹ 205.57	₹ 2,695.28	₹ 5,39,056.00
18.1.2	XLPE 3.5 CX185 mm^2	Mtrs	200	₹ 1,732.79	₹ 155.95	₹ 155.95	₹ 2,044.69	₹ 4,08,938.00

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				BASIC PRICE PER UNIT (Taxable Value) In Rs	GST		TOTAL PRICE PER UNIT (In Rs)	TOTAL PRICE FOR THE QUANTITY
					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	₹ 5.00	6= {5*9%}	7= {5*9%}	8= {5+6+7}	9= {8*4}
18.1.3	XLPE 3.5 CX120 mm^2	Mtrs	200	₹ 1,023.94	₹ 92.15	₹ 92.15	₹ 1,208.24	₹ 2,41,648.00
18.1.4	PVC 3.5 CX70 mm^2	Mtrs	300	₹ 685.24	₹ 61.67	₹ 61.67	₹ 808.58	₹ 2,42,574.00
18.1.5	PVC 3.5 CX35 mm^2	Mtrs	2000	₹ 519.83	₹ 46.78	₹ 46.78	₹ 613.39	₹ 12,26,780.00
18.1.6	PVC 4 CX 16 mm^2	Mtrs	1000	₹ 275.67	₹ 24.81	₹ 24.81	₹ 325.29	₹ 3,25,290.00
18.1.7	PVC 4 CX 6 mm^2	Mtrs	2000	₹ 157.53	₹ 14.18	₹ 14.18	₹ 185.89	₹ 3,71,780.00
18.1.8	PVC 2 CX 6 mm^2	Mtrs	2000	₹ 123.97	₹ 11.16	₹ 11.16	₹ 146.29	₹ 2,92,580.00
18.2	CONTROL CABLES,1.1 KV, PVC ARMOURED, FRLSH, Stranded Copper (As per specification) including control cable termination & other materials. - (Below quanity is only indicative, actual quantity shall be as per approved cable schedule)							
18.2.1	2 CX 2.5 mm2	Mtrs	2000	₹ 55.14	₹ 4.96	₹ 4.96	₹ 65.06	₹ 1,30,120.00
18.2.2	4 CX 2.5 mm^2	Mtrs	8000	₹ 55.14	₹ 4.96	₹ 4.96	₹ 65.06	₹ 5,20,480.00
18.2.3	5 CX 2.5 mm^2	Mtrs	3000	₹ 55.14	₹ 4.96	₹ 4.96	₹ 65.06	₹ 1,95,180.00
18.2.4	7CX 2.5 mm^2	Mtrs	5000	₹ 55.14	₹ 4.96	₹ 4.96	₹ 65.06	₹ 3,25,300.00
18.2.5	10 CX 2.5 mm^2	Mtrs	5000	₹ 63.00	₹ 5.67	₹ 5.67	₹ 74.34	₹ 3,71,700.00
18.2.6	12 CX 2.5 mm^2	Mtrs	4000	₹ 63.00	₹ 5.67	₹ 5.67	₹ 74.34	₹ 2,97,360.00
18.2.7	16 CX 2.5 mm^2	Mtrs	500	₹ 63.00	₹ 5.67	₹ 5.67	₹ 74.34	₹ 37,170.00
18.2.8	19 CX 2.5 mm^2	Mtrs	200	₹ 78.77	₹ 7.09	₹ 7.09	₹ 92.95	₹ 18,590.00
19	220/33 KV, 100 mva Transformer: Installing on the plinth and placing in position, Erection of accessories of the Transformers, Earthing as per Standard (Including Supply of Materials), Vacuum Treatment of the tank and winding, Oil Filtration (Including Supply of Vacuum cum Oil Filter Machine), Supply & Laying of all types of Control & Power Cables Pertaining to Transformers, Testing and Commissioning including all tests of the Oil as per stipulation in the Standard Approved Testing Laboratory and as per the instruction of the Engineer in Charge. This include all related works for Erection, Testing and Commissioning of the Power Transformers/Auto Transformers. (Contractor to arrange Power Supply for Filtration And Vacuum Treatment works). (including the NIFPES, Online insulating drying out system, oil storage tank etc) in complete shape as per Technical spec:								
20	220/33 KV, 100 mva Transformer: Installing on the plinth and placing in position, Erection of accessories of the Transformers, Earthing as per Standard (Including Supply of Materials), Vacuum Treatment of the tank and winding, Oil Filtration (Including Supply of Vacuum cum Oil Filter Machine), Supply & Laying of all types of Control & Power Cables Pertaining to Transformers, Testing and Commissioning including all tests of the Oil as per stipulation in the Standard Approved Testing Laboratory and as per the instruction of the Engineer in Charge. This include all related works for Erection, Testing and Commissioning of the Power Transformers/Auto Transformers. (Contractor to arrange Power Supply for Filtration And Vacuum Treatment works). (including the NIFPES, Online insulating drying out system, oil storage tank etc as below) in complete shape as per Technical spec:	Lot	2	₹ 3,18,865.16	₹ 28,697.86	₹ 28,697.86	₹ 3,76,260.88	₹ 7,52,521.75
20.1	FIRE FIGHTING: Erection, Testing and commissioning of the NIFPES system complete with all accessories for successful operation including demonstaration of the NIFPES operational procedures for the 100 mva, 220/33 KV Power Transformer as per the Technical Specification & latest standard.							
20.2	**Digital RTCC panel with 2 nos of Digital RTCC relays for the Auto Transformers and 2 more cutouts for future.**							
20.3	**Online drying out system for Power transformers as per specification**							

Sl. No.	ERECTION, INSTALLATION, TESTING & COMMISSIONING _SUBSTATION DESCRIPTION OF ITEMS(SCHEDULE-VIIB-SS) ERECTION, INSTALLATION, TESTING & COMMISSIONING OF FOLLOWING EQUIPMENTS (As per Technical Specification)	UNITS	Qty	IN INR				
				BASIC PRICE PER UNIT (Taxable Value) In Rs	GST		TOTAL PRICE PER UNIT (In Rs)	TOTAL PRICE FOR THE QUANTITY
					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	₹ 5.00	6= {5*9%}	7= {5*9%}	8= {5+6+7}	9= {8*4}
21	SUBSTATION AUTOMATION SYSTEM: Supervision, installation, testing & commissioning of Substation Automation system alongwith integration with integration with the existing SAS and with the Remote control centers. The work related to connectivity of the substation SAS with OPTCL Main Control Center (remote) shall also be considered.							
21.1	**RCC Communication Panel comprising of:** **(i) Substation Ethernet Switches (Layer-3 type)- 2 nos** **(ii) Ethernet Switches (with 20% spares Port) for bay & station level** **(iii) Firewall cum Router-2 set** **(iv) Station Data Concentrator (SDC)- 2 nos** **(v) LIUs** **(vi) Multimode glass fibre Doublle jacket armoured optical cables** **(vii) Red boxes etc.** **(viii) Provision for mounting the VMS switch etc including all type of devices & accessories & special cables like F.O patch cord & armoured FO cables of adequate length etc required for the system for completeness in all respect for remote communication & as per technical specification**	Lot	1	₹ 1,00,000.00	₹ 9,000.00	₹ 9,000.00	₹ 1,18,000.00	₹ 1,18,000.00
21.2	**Workstation for RAS (Remote Access System)**	Nos	1.00		₹ 0.00	₹ 0.00	₹ 0.00	₹ 0.00
21.3	**Furniture (Operator desk 2 Nos (for RAS, VMS) & Chair-4Nos) etc.**	SET	1.00		₹ 0.00	₹ 0.00	₹ 0.00	₹ 0.00
21.4	GPS System with IRIG-B/SNTP/PTP with VDU (Clock)	Nos	1	₹ 20,000.00	₹ 1,800.00	₹ 1,800.00	₹ 23,600.00	₹ 23,600.00
22	**220KV Level Protection Panel- Single Panel (1 Bay in One Panel) with IEC 61850-ED-2 PRP on FO**							
22.1	220 KV TRANSFORMER PROTECTION PANEL: Numerical Differential protection Relay, Separate Numerical REF Relay, BACK-UP PROTECTION & BCU for 220 KV side) CONSIDERING HV side of 220/33 KV, 100 mva Two winding transformer with all other relays & components required for complete protection, control etc as per TS compliant to IEC 61850-ED-2 protocol with PRP on FO. Power Supply 220V DC	Nos	2	₹ 25,180.01	₹ 2,266.20	₹ 2,266.20	₹ 29,712.41	₹ 59,424.82
22.2	BUS BAR PROTECTION SYSTEM: Installation (including integration of the same with the existing bus bar protection system, testing and commissioning. The bus bar system shall also be integrated with SAS.	Lot	1	₹ 25,180.01	₹ 2,266.20	₹ 2,266.20	₹ 29,712.41	₹ 29,712.41
23	**33 KV SIDE PROTECTION PANELS**							

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					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	₹ 5.00	6= {5*9%}	7= {5*9%}	8= {5+6+7}	9= {8*4}
23.1	**33 KV FEEDER PROTECTION Panel:** BCU, Back up protection relay & with other Auxiliary relays & components required for complete protection, control etc as per TS compliant to IEC 61850 - ED-2 protocol with PRP on FO. Power Supply 220V DC. **33 KV TRANSFORMER PROTECTION Panel:** BCU, Back up protection relay, LV REF Relay & with other Auxiliary relays & components required for complete protection, control etc as per TS compliant to IEC 61850 - ED-2 protocol with PRP on FO. Power Supply 220V DC. **33 KV BUS COUPLER PROTECTION Panel:** BCU, Back up protection relay & with other Auxiliary relays & components required for complete protection, control etc as per TS compliant to IEC 61850 - ED-2 protocol with PRP on FO. Power Supply 220V DC. Note: 5 Nos. of Line Feeder Bays, 2 Nos. of Transformer bays and 1 Nos Bus Coupler Bays to be considered in 4 Panels. The sequence shall be as per the approved SLD	Nos	4	₹ 19,052.88	₹ 1,714.76	₹ 1,714.76	₹ 22,482.40	₹ 89,929.60
24	**AC & DC SYSTEM (Suitable for Sub- station Automation System)**							
24.1	**AC SYSTEM**							
24.1.1	**Bay Marshalling Kiosk**	Nos	4	₹ 6,601.00	₹ 594.09	₹ 594.09	₹ 7,789.18	₹ 31,156.72
24.1.2	Console Box for Switchyard Lighting (Outdoor type)	Nos	2	₹ 5,900.00	₹ 531.00	₹ 531.00	₹ 6,962.00	₹ 13,924.00
24.1.3	Console Box for Street Lighting (Outdoor type)	Nos	1	₹ 5,900.00	₹ 531.00	₹ 531.00	₹ 6,962.00	₹ 6,962.00
24.1.4	Switchyard Receptacle Board for Transformer Oil Filtration (Outdoor type)	Nos	1	₹ 2,037.00	₹ 183.33	₹ 183.33	₹ 2,403.66	₹ 2,403.66
24.1.5	Switchyard Receptacle Board for Welding & Other Emergency (Outdoor type)	Nos	2	₹ 2,037.00	₹ 183.33	₹ 183.33	₹ 2,403.66	₹ 4,807.32
24.1.6	CT Out Door Console Boxes (Outdoor type)	Nos	10	₹ 3,005.27	₹ 270.47	₹ 270.47	₹ 3,546.21	₹ 35,462.10
25	**SUB STATION LIGHTING (AS PER SPECIFICATION AND APPROVED DRAWINGS) (includes switchyard, colony street and other street area). The below mentioned quantity is only indicative. Actual quantity shall be as per the lighting calculation. Lux levels as per OPTCL TS/National Lighting Code/IS 6665 shall be maintained. (Supply of cables required are covered in the cable items indicated above)**							
25.1	**SUB-STATION SWITCH YARD LIGHTING :** IT INCLUDES SUPPLY OF FIXTURES & LAMPS (LED - 150 watt each) of reputed make (Phillips/Crompton/Bajaj/Havells/Wipro) with switch gear, GI Conduit etc. (Lighting fixtures are to be fixed rigidly on the Column at a suitable height so that the required lux can be achieved).	Set	35	₹ 2,219.60	₹ 199.76	₹ 199.76	₹ 2,619.12	₹ 91,669.20
25.2	**STREET LIGHTING**: HDG Octagonal street lighting poles 7 m height (Crompton/Bajaj/Skipper/Transrail Make) with arm bracket for holding light, foundation nuts & bolts and LED light fittings etc. The pole shall be manufactured in a single section with weight of galvanization 610 g/sqm or thickness of galvanization 86 micron. The pole shall be meant for installation in Wind Zone V. Poles should be suitable for installation on a RCC concrete foundation with 4nos x 20 mm dia foundation bolts with 225 mm PCD . (Poles shall have variable PCD (200-250 mm dia) type base plate with diagonal slotted holes) It includes supply of LED lighting fixtures with lamps of 100 Watts of reputed make (Phillips/Crompton/Bajaj/Havells/Wipro), with switch gear, GI Conduit etc. & as per technical specification. The pole shall have separate or inbuilt GI junction box with suitable cover with (water/dust) ingress protection for housing electrical accessories. The JB shall have provision of fuses/MCB, buses, TBs as required for cable in and out.	Set	30	₹ 2,219.60	₹ 199.76	₹ 199.76	₹ 2,619.12	₹ 78,573.60

Sl. No.	ERECTION, INSTALLATION, TESTING & COMMISSIONING _SUBSTATION DESCRIPTION OF ITEMS(SCHEDULE-VIIB-SS) ERECTION, INSTALLATION, TESTING & COMMISSIONING OF FOLLOWING EQUIPMENTS (As per Technical Specification)	UNITS	Qty	IN INR				
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					CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)		
1	2	3	4	₹ 5.00	6= {5*9%}	7= {5*9%}	8= {5+6+7}	9= {8*4}
26	**AIRCONDITIONING:** Supply of 2T capacity Split Air Conditioning Units (Dual Inverter, five star latest model - LG/Samsung/Hitachi/Carrier/Mitsubishi/Voltas/Daikin Make) with copper condensor having remote temperature & operation control facility with voltage stabilizer. Following item description also includes AC Control Panel made of 2mm CR sheet, having suitable outgoing (one outgoing for one AC & with overload control gear) & wiring materials with 15 amp socket & plug for each unit of AC etc to complete (As per specification) for CRB cum GIS (Control/SAS Room, AC DC Room, Communication room, office room & Conference room), Switchyard Kisok, Transit House. Supply of Logic controller for Auto Switch ON & OFF of AC units depending on requirement. Also includes supply of all other additional accessories such as copper tubes, copper cable, steel brackets for holding outdoor units and other accessories necessary for completion of the AC system. As per approved drawing and direction of engineer-in-charge.							
26.1	AC for Switchyard Kiosk as per T.S. (The ACs shall run in tandem i.e 1 of the ACs at a time for 4 hours each.)	Set	4	₹ 5,000.00	₹ 450.00	₹ 450.00	₹ 5,900.00	₹ 23,600.00
27	**Placement of Supplied Fire Exitinguishers at various locations of the substations as per instruction of Site Engineer.**							
27.1	FOAM TYPE-9 LTRS	Nos	4	₹ 146.00	₹ 13.14	₹ 13.14	₹ 172.28	₹ 689.12
27.2	DRY CHEMICAL POWDER(TROLLEY MOUNTED)- 22 5 KGS	Nos	4	₹ 336.00	₹ 30.24	₹ 30.24	₹ 396.48	₹ 1,585.92
27.3	DRY POWDER TYPE - 5 KGS	Nos	4	₹ 135.00	₹ 12.15	₹ 12.15	₹ 159.30	₹ 637.20
27.4	Co_2- 4.5 KGS	Nos	10	₹ 146.00	₹ 13.14	₹ 13.14	₹ 172.28	₹ 1,722.80
27.5	CO_2 - 9 KGS	Nos	10	₹ 146.00	₹ 13.14	₹ 13.14	₹ 172.28	₹ 1,722.80
27.6	CO_2 (TROLLY MOUNTED)- 22.5 KGS	Nos	4	₹ 146.00	₹ 13.14	₹ 13.14	₹ 172.28	₹ 689.12
27.7	9 litre water type	Nos	4	₹ 336.00	₹ 30.24	₹ 30.24	₹ 396.48	₹ 1,585.92
27.8	4.5 kg DCP type	Nos	4	₹ 224.00	₹ 20.16	₹ 20.16	₹ 264.32	₹ 1,057.28
27.9	50 Litres Mechanical Foam type	Set	4	₹ 224.00	₹ 20.16	₹ 20.16	₹ 264.32	₹ 1,057.28
27.10	FIRE BUCKET (6 NOS IN EACH STAND) WITH STAND & ITS CANOPY	Set	6	₹ 224.00	₹ 20.16	₹ 20.16	₹ 264.32	₹ 1,585.92
28	**Insulating Mat:** Best Quality & approved make (Confirming to IS:15652:2006) to be placed infront & backside of all panels, boards etc.(2000X1000X3mm Size)	Nos	35	₹ 20.00	₹ 1.80	₹ 1.80	₹ 23.60	₹ 826.00
29	**COLOUR CODING, BAY MARKING of Entire Sub-Station**:Design, engineering, procurement of labour, material including all associated works for the followings. This should be as per direction of site In charge. a)Color coding (red,Yellow & Blue) for equipments, Bus gantry & column of entire switch yard. Good quality weather proof sticker may be used for identification. b) Each bay should be identified with the help of bay marker sign board, suitably grouted. MS sign board with stand to be installed. Proper painting and lettering to be done of the entire switch yard area.	LOT	1	₹ 2,00,000.00	₹ 18,000.00	₹ 18,000.00	₹ 2,36,000.00	₹ 2,36,000.00
30	**Visual Monitering System (VMS) with Connection to OPTCL Remote Control Center:** **:** Installation, Testing & Commissioning of the VMS system in the substation. The VMS of the subsation shall also be integrated with the remote control center including the supply of any other material required. (The integration work required at the remote control center along with the supply of any material are not in the scope.)	Lot	1	₹ 50,000.00	₹ 4,500.00	₹ 4,500.00	₹ 59,000.00	₹ 59,000.00

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1	2	3	4	₹ 5.00	6= {5*9%}	7= {5*9%}	8= {5+6+7}	9= {8*4}
	TOTAL PRICE FOR ERECTION COMPONENT OF THE WORKS CONTRACT FOR SUBSTATION							₹ 1,69,54,949.04

ODISHA POWER TRANSMISSION CORPORATION LIMITED

CIVIL WORKS

Name of the work:- Construction of 2x100 MVA, 220/33 KV Sub-Station at Landeihill in Odisha State of India.
220/33KV GSS Landei Hill:
220KV Bays- Power Tfr-2 Nos, 1 spare bay (Unequipped bay)
33KV Bays- Feeder-5 Nos, Tfr-2 Nos, B/C-1 no, 1 spare bay(Unequipped bay).

Sl. No.	CIVIL WORKS _SUBSTATION DESCRIPTION OF ITEMS(SCHEDULE-VIIC-SS) CIVIL WORK COMPONENT OF THE WORKS CONTRACT OF FOLLOWING EQUIPMENTS (As per Technical Specification)	UNITS	Qty	IN INR BASIC PRICE PER UNIT (Taxable Value) In Rs	CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)	TOTAL PRICE PER UNIT (In Rs)	TOTAL PRICE FOR THE QUANTITY
1	2	3	4	5	6=5*9%	7=5*9%	8= {5+6+7}	9= {8*4}
1	**CONTOUR SURVEY AND LEVELING, BACK FILLING**							
1.1	**Contour survey** and furnishing contour map including supply of all materials, Labour and T&P	SQ.MTRS.	27000	₹ 5.87	₹ 0.53	₹ 0.53	₹ 6.93	₹ 1,87,110.00
1.2	**Soil investigation** : Supply of labour,T&Pand other necessary arrangements for Soil investigation/testing of the Switchyard,control Room, Quarters area etc.as per the site requirement,Technical specification & instruction of Engineer-in-Charge.	PER POINT	4	₹ 22,195.96	₹ 1,997.64	₹ 1,997.64	₹ 26,191.24	₹ 1,04,764.96
2	**Excavation for OPEN CAST foundation and back filling of columns,Equipments foundations,including supply of all labours,T&P,and materials and as per the direction of the Engineer-in-Charge.**		6122.14					
2.1	**Normal Soil(SOFT/LOOSE)**	Cum	1224.43	₹ 187.16	₹ 16.84	₹ 16.84	₹ 220.84	₹ 2,70,402.74
2.2	**Hard Soil**	Cum	3673.28	₹ 296.35	₹ 26.67	₹ 26.67	₹ 349.69	₹ 12,84,510.96
2.3	**Soft Rock**	Cum	918.32	₹ 608.29	₹ 54.75	₹ 54.75	₹ 717.79	₹ 6,59,161.77
2.4	**Hard Rock(Requiring Blasting/Using breaker machinery)**	Cum	306.11	₹ 1,154.19	₹ 103.88	₹ 103.88	₹ 1,361.95	₹ 4,16,902.52
3	**OPEN CAST/SHALLOW FOUNDATION CONCRETE WORKS**							
3.1	OPEN CAST/SHALLOW FOUNDATION CONCRETE WORKS Foundations: Design, engineering, supply of all labour, material and construction(open cast foundation) of PCC, RCC footings of any depth, pedestal including the cost of soil investigation, concreting, cement, reinforcement steel, fine and coarse aggregated, shoring & shuttering, grouting, underpinning and back filling of foundations etc complete for the switchyard gantry/ portal /column structures and equipment support as per the technical specification and approved drawings & disposal of excess earth as per direction of Engineer In charge. (a) For Switch yard gantry/portal structure foundations (b) For 400KV, 220KV, 33 KV Equipment foundations. (c) For other equipment foundations.							
3.1.1	**Plain cement concrete (PCC 1:3:6) of grade M10** with approved quality coarse aggregates (Nominal size 12mm to 20mm), fine aggregates, cement in for the above column/ equipment/marshalling box foundations for column and equipment foundation as blind layer inclusive of labour charges for concrete mixing & curing. This includes supply of all required materials, labourers, T&P and dewatering wherever required as per Technical specification and instruction of Engineer In charge.	Cum	177	6,058.56	₹ 545.27	₹ 545.27	₹ 7,149.10	₹ 12,68,246.41
3.1.2	Open cast foundation for the above column/equipment/marshalling box foundations with **RCC: 1:1.5:3 (Grade M-20)** ,including supply of Labour all materials like cement, coarse and fine aggregates,shuttering,proper curing of the foundations/concrete and T&P in line with the Techinical Specification and as per direction of Engineer in Charge. (without cost of steel)	Cum	1483	8,751.26	₹ 787.61	₹ 787.61	₹ 10,326.48	₹ 1,53,15,050.23
3.1.3	Supply of steel different sizes(TATA/RINL/SAIL make only). No other make of steel shall be allowed. As per the design with cutting, bending, binding and placing in position of steel rods for foundation concreting including cost of binding wire.	MT	89	63,984.42	₹ 5,758.60	₹ 5,758.60	₹ 75,501.62	₹ 67,50,634.73
4	**Cutting, Filling and Leveling** of Sub-station area including supply of labour and T&P							

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1	2	3	4	5	6=5*9%	7=5*9%	8= {5+6+7}	9= {8*4}
4.1	**LEVELLING OF S/S AREA**:Providing, neatly dressing up and levelling of substation area including switchyard area to a required level as decided by the Engineer in Charge, the work includes removal, clearing of the entire area from vegetation, trees, bushes, uprooting of plants and disposal of surplus earth and unusable material from the site by means of any mechanical transport, if required as per direction of the Project In charge, with all labours, tools, tackles and plants complete as per approved drawing and specification. This also includes excavation in all type of soils or rocks, back filling and disposal of excess earth or rocks to make the area to a level for construction as per scope and as per approved drawing and specification.							
4.1.1	**CUTTING** of substation area and utilising the usable soil for filling and compaction and disposing the unsuable soil from site							
4.1.1.1	Soft/loose soil	Cum	1000	187.16	₹ 16.84	₹ 16.84	₹ 220.84	₹ 2,20,840.00
4.1.1.2	Dense/ Compact soil	Cum	3500	296.35	₹ 26.67	₹ 26.67	₹ 349.69	₹ 12,23,915.00
4.1.1.3	Soft/Disintegrated rock[not requiring blasting]	Cum	500	608.29	₹ 54.75	₹ 54.75	₹ 717.79	₹ 3,58,895.00
4.1.1.4	Hard rock[requiring blasting or by using concrete breaker machinery]	Cum	100	₹ 1,154.19	₹ 103.88	₹ 103.88	₹ 1,361.95	₹ 1,36,195.00
4.1.2	**FILLING** of substation area with borrowed earth with supply of all labour,T & P.							
4.1.2.1	Up to 30 mtr lead	Cum	100	424.46	₹ 38.20	₹ 38.20	₹ 500.86	₹ 50,086.00
4.1.2.2	Beyond 30 mtr & up to 100mtr lead	Cum	1000	658.65	₹ 59.28	₹ 59.28	₹ 777.21	₹ 7,77,210.00
4.1.2.3	Beyond 100mtr lead	Cum	6000	1,170.92	₹ 105.38	₹ 105.38	₹ 1,381.68	₹ 82,90,080.00
5	**Cable Trenches:** Design, engineering, and construction of RCC cable trenches and all associated works for cable trench and cable trench crossings as per technical specifications and approved drawings and as per direction of the Engineer in Charge. (1) This also includes excavation in all types of soil or rocks,back filling and disposal of excess earth as per the direction of Engineer In charge. (2) Design, Engineering, Providing and laying of plain cement concrete (PCC 1:3:6) of grade M10 with approved quality coarse aggregates (Nominal size 12mm to 20mm) , fine aggregates, cement in cable trench as blind layer inclusive of labour charges for concrete mixing & curing. This includes supply of all labourers, T&P and dewatering wherever required as per Technical specification and instruction of Engineer In charge. (3) Open cast foundation for the cable trench with RCC: 1:1.5:3 (Grade M-20 Nominal mixing), including supply of Labour all materials like MS Rod, Cement, coarse and fine aggregates, shuttering, cutting, bending, binding of M.S.Rod including supply of binding wire proper curing of the foundations/concrete and T&P in line with the Specification and as per direction of Engineer in Charge. (4) Fly ash Brickwork with fly ash Brick, plastering (1:6 Ratio) & curing, wherever required including the supply of labour, material, cement, etc. **(5) The outdoor cable trench wall top surface shall be "L" shaped and the cover slabs shall be placed with in the"L shaped" surface of both the walls. The top surface of the trench shall be smooth finished.** (6)Supply,fabrication & Fixing of **GI Angle** for cable tray support (as per specification). The cable tray support frame shall be pre fabricated GI angle as per requirement and to be welded with the GI insert plate fixed on the trench wall for better rigidity. The Insert plate (6mm) fixed on the wall are also to be welded with the MS rods provided for the trench wall before concreting. (7) Precast of **RCC covers (1:1.5:3) with MS sheet(2mm)** frame and its fixing on the cable trench as per spec and instruction of Engg. In Charge. **(8) All the RCC cover slabs shall have the lifting hooks. The slabs without the MS sheet frame and Lifting hooks shall not be accepted.**							

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1	2	3	4	5	6=5*9%	7=5*9%	8= {5+6+7}	9= {8*4}
	(9) Cable Trenches Inside The Control Room Shall Be Covered With M.S Chequered Plate(Duly Painted As Per Instruction Of Engg In Charge) Including Standard Support Stand {Hd Galvanised (M.S Joist , Channel, Angle). Stoppers shall be fixed at the underneath so that the chequered shall not be falling into the cable trench in any case							
5.1	Section 1-1	**Mtrs**	**100**	₹ 17,788.46	₹ 1,600.96	₹ 1,600.96	₹ 20,990.38	₹ 20,99,038.00
5.2	Section 2-2	**Mtrs**	**200**	₹ 17,788.46	₹ 1,600.96	₹ 1,600.96	₹ 20,990.38	₹ 41,98,076.00
5.3	Section 3-3	**Mtrs**	**300**	₹ 12,019.23	₹ 1,081.73	₹ 1,081.73	₹ 14,182.69	₹ 42,54,807.00
5.4	Section 4-4 **(inside dimensions- width- 400mm, height- 400mm), wall- 75mm, bottom concrete-75mm, two 150mm trays shall be laid side by side in one layer.**	**Mtrs**	**200**	₹ 7,211.54	₹ 649.04	₹ 649.04	₹ 8,509.62	₹ 17,01,924.00
6	**CIVIL Works with supply of all materials like Cement, MS tor rod, Brick, Coarse & Fine Agregrates & Labour,T&P etc For RCC Slabs & Others [33KV 630SQ.MM UG CABLE LAYING] Type-B Trench:** **Open trench (direct burried) for laying of 33kV cables** **Width : 1400mm** **Depth : 1850mm** **Length: 200Mtr**							
6.1	Earth work excavation of Hard Soil Trench Dimension : (1.4mtr w x 1.85mtr d)	Cum	518	₹ 296.35	₹ 26.67	₹ 26.67	₹ 349.69	₹ 1,81,139.42
6.2	Filling with fine river sand after laying of Cable inside the trench	Cum	79.8	₹ 921.19	₹ 82.91	₹ 82.91	₹ 1,087.01	₹ 86,743.40
6.3	Supply and erection of prefabricated RCC partition slab 1200x450x100mm (M-20 grade)	Cum	22.8	8,751.26	₹ 787.61	₹ 787.61	₹ 10,326.48	₹ 2,35,443.74
6.4	Supply of rod, bending ,cutting and binding for prefabricated RCC slabs (0.687 Qint/Cum)	MT	1.56636	63,984.42	₹ 5,758.60	₹ 5,758.60	₹ 75,501.62	₹ 1,18,262.72
7	**Cable trench crossing**:Design,engineering,construction including supply of labour,materials,cement,reinforcement steel,formwork etc,and all associated works for construction of trench crossing as per technical specification and approved drawing.(Road crossing)							
7.1	**Section 2-2**	**Nos**	**1**	₹ 5,00,000.00	₹ 45,000.00	₹ 45,000.00	₹ 5,90,000.00	₹ 5,90,000.00
7.2	**Section 3-3**	**Nos**	**1**	₹ 6,50,000.00	₹ 58,500.00	₹ 58,500.00	₹ 7,67,000.00	₹ 7,67,000.00
8	**Outdoor bay kiosks (1 no for 220KV and 33 kV Switchyard) : Design, engineering and construction of switch yard buildings including the piling where required, the cost of material, supply of labour, cement, reinforcement- steel, form work and excavation as per the approved drawing and technical specification (The RCC structure frame should be in the ratio 1:1.5:3). This also includes excavation in all types of soil or rocks, back filling and disposal of excess earth as per the direction of Engineer In charge. The indicative drawing provided in the TS may be referred to. As per approved drawings and specification.** **The inside area for the Bay kiosk are 35 sq. mtrs each (7mx5m) approx. Doors shall be heat insulated and hinge type. The area given is for reference only and may vary according to requirement of the equipment to be installed inside. The contractor shall finalize the dimensions according to the equipment offered by them providing enough space & access for**							
8.1.1	RCC volume including MS rods (FE-500-TATA/ RINL/ Sail/JINDAL) as per BIS-1786 (including, column ,Beams and roofs etc) as per technical spec & approved drawings. (including for Pile foundation if required with cost of boring, Column ,Beams and	Lot	**1**	1,25,217.66	₹ 11,269.59	₹ 11,269.59	₹ 1,47,756.84	₹ 1,47,756.84
8.1.2	Fly Ash Brick masonry work in cement sand mortar 1: 5 with bricks of class designation 75kg/mm2 as per technical spec & approved drawings.	Lot	**1**	75,130.60	₹ 6,761.75	₹ 6,761.75	₹ 88,654.10	₹ 88,654.10
8.1.3	Flooring shall be with vitrified digital double charged tiles (Kajaria/Johnson/ Somany/Varmora/Cera) with dado as per technical spec & approved drawings.	Lot	**1**	25,043.53	₹ 2,253.92	₹ 2,253.92	₹ 29,551.37	₹ 29,551.37
8.1.4	External and internal wall (External (18mm thk) and internal (12 mm thk) wall and ceiling plastering as per technical spec mentioned in the civil section) & approved	Lot	**1**	12,521.77	₹ 1,126.96	₹ 1,126.96	₹ 14,775.69	₹ 14,775.69

Sl. No.	CIVIL WORKS _SUBSTATION DESCRIPTION OF ITEMS(SCHEDULE-VIIC-SS) CIVIL WORK COMPONENT OF THE WORKS CONTRACT OF FOLLOWING EQUIPMENTS (As per Technical Specification)	UNITS	Qty	IN INR BASIC PRICE PER UNIT (Taxable Value) In Rs	CGST @ 9% PER UNIT (INTRA-STATE)	OGST @ 9% PER UNIT (INTRA-STATE)	TOTAL PRICE PER UNIT (In Rs)	TOTAL PRICE FOR THE QUANTITY
1	2	3	4	5	6=5*9%	7=5*9%	8= {5+6+7}	9= {8*4}
8.1.5	Doors shall be of hinge operated openable and window shall be sliding type with adequate locking facility. The door window frame shall be of UPVC (Fenesta make) heavy sections with double layer toughened glaze of 6mm (min.) & windows shall have anodised aluminium grills. As per technical spec & approved drawing.	Lot	1	25,043.53	₹ 2,253.92	₹ 2,253.92	₹ 29,551.37	₹ 29,551.37
8.1.6	Internal concealed wiring (including supply of flexible copper FRLSH 1.1 KV PVC wire,conduits & its accessories,modular type switches having ISI mark & switch board, Junction boxes with required MCB & Earth leakage detector switcghear etc. of Legrand make) ,ceiling fans of 1400 sweep and regulators (including supply), exhaust fan (including supply). No. of LED Lighting fixtures are to be calculated based on the illumination design considering the required lux level indicated in the technical spec/National Lighting Code/IS 6665 & fixing of the same rigidly on the suitable height either ceiling & wall as required. It includes supply of fixtures and lamps (LED) including D.C emergency lighting of reputed make (Phillips/Crompton/Bajaj/Havells/Wipro) with switch gear for succesful illumination of the area/rooms. As per approved drawing and direction of Engineer In charge. This includes Supply of all electrical items and its erection to complete the work as per spec & approved drawing.	Lot	1	50,087.06	₹ 4,507.84	₹ 4,507.84	₹ 59,102.74	₹ 59,102.74
8.1.7	Provision of smoke and fire detection & Alarm system of the kiosks - to be integrated with the system in the main CRB. Provision of conventional fire fighting equipment(including supply of FFE) at strategic locatiosn suitable for wall hanging. At the entrance of the cable trench to the control room building to prevent fire, sand barrier of effective size to be provided as per relevant safety codes and direction of engineer in charge.	Lot	1	56,868.78	₹ 5,118.19	₹ 5,118.19	₹ 67,105.16	₹ 67,105.16
9	**Roads:** Design, construction of roads and walkways/ shoulders within sub-station(Switch yard area,colony area,approach road,control room building area, main gate to the switch yard gate etc) as per specification, layout and approved drawings complete. This also includes excavation in all types of soil or rocks,back filling,and disposal of excess earth as per the direction of Engineer In charge. Provision of drains on both the side of the roads for easy discharge of rain water.							
9.1	**7 mtrs concrete road** with shoulder at both the side as per technical specification indicated in the civil section(from the switch yard main gate to power transformer & infront of GIS cum control room building.	**Mtrs**	**200**	₹ 10,000.00	₹ 900.00	₹ 900.00	₹ 11,800.00	₹ 23,60,000.00
9.2	**Approach Road:** 7 mtrs concrete road with shoulder at both the side as per technical specification indicated in the civil section(from the switch yard main gate to the govt road.	**Mtrs**	**50**	₹ 10,000.00	₹ 900.00	₹ 900.00	₹ 11,800.00	₹ 5,90,000.00
9.3	**3.75 mtrs concrete road** with shoulder at both the side as per technical specification indicated in the civil section(Periphery roads outside switch yard fencing and colony roads)	**Mtrs**	**250**	₹ 7,000.00	₹ 630.00	₹ 630.00	₹ 8,260.00	₹ 20,65,000.00
10	**Drainage system:**Collection of rainfall data, Design, construction of storm water drainage scheme (RCC type), road-culverts,Shall have drain on both side of the road and drains crossing cable trenches etc. as per specification and approved drawing. This also includes excavation in all types of soil or rocks,back filling,and disposal of excess earth as per the direction of Engineer In charge. All the switch yard bays , roads water drainage shall be connected to the main surface drain. As per approved drawing and specification. All the drainage system shall be RCC type with M20 grade							
10.1	**Storm water drain (RCC type) as per design above and subsequent approval**	**Mtrs.**	**200**	₹ 2,500.00	₹ 225.00	₹ 225.00	₹ 2,950.00	₹ 5,90,000.00
10.2	**Road side drains(RCC type)-on each side of the 3.75 mtr and 7 mtr concrete roads as per design above & subsequent apporval**	**Mtrs**	**500**	₹ 1,000.00	₹ 90.00	₹ 90.00	₹ 1,180.00	₹ 5,90,000.00
10.3	**Road-culverts, drain crossings (RCC type)**	**Lots**	**1**	₹ 3,12,294.43	₹ 28,106.50	₹ 28,106.50	₹ 3,68,507.43	₹ 3,68,507.43

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1	2	3	4	5	6=5*9%	7=5*9%	8= {5+6+7}	9= {8*4}
11	**Foundations for transformers** :Design, engineering, supply of labour, material, equipments and construction of Auto-transformer/Transformer foundation including piling if any, all associated works, rail tracks, jacking pads,anchor block RCC and PCC, miscellaneous structural steel including oil collection pits below the transformer (for 30% of the tfr oil capacity), MS grating(if required), gravel filling, and other items etc. not mentioned herein, but specifically required for the completion of the work as per technical specification and approved drawing. (Rate shall be inclusive of cement, reinforcement steel, angles,flats and form work etc.)(all cement concrete shall have RCC ratio 1:1.5:3). Transformer RCC foundation and Rail Track should be extended upto the approaching road (However,the height of RCC foundation beyond transformer main plinth area should be same as height of concrete road). This also includes excavation in all types of soil or rocks,back filling,and disposal of excess earth.							
11.1	**100 MVA 220/33KV Power Transformer and other accessories as per supply**	**Nos**	**2**	₹ 12,00,000.00	₹ 1,08,000.00	₹ 1,08,000.00	₹ 14,16,000.00	₹ 28,32,000.00
11.2	**OIL SUMP PIT (150% of tfr oil capacity of one transformer of each capacity):** Design, engineering, supply of labour, material, equipments and construction of oil sump pit (RCC with ratio 1:1.5:3) including piling if any, all associated works & suitable connectivity oil collector pit provisioned near the transformer to the main oil sump pit and with provision of pump (suitable for handling transformer oil having capacity of 5 HP, with auto level control , including cabling, fixing of control gear & **provision of a pump shed (of sufficient size to allow person to install, dismantle, make cable connection & maintain etc) over the oil sump pit**). **This oil sump pit shall be as per CIGRE standard for the oil collection pit inorder to separate oil from the water.** Other piping with necessary valves arrangement shall also be provided to remove water from the oil sump pit. As per spec and approved drawing.							
11.3	Oil capacity of each Transformer 220/33 KV: 54000 ltrs. (approx)	**Lot**	**1**	₹ 76,414.78	₹ 6,877.33	₹ 6,877.33	₹ 90,169.44	₹ 90,169.44
12	Providing and Laying of non-woven Geo-synthetic fabric of minimum 200gsm as separation layer between switchyard soil and metal spreading as per direction of Engineer in charge. This also includes anchoring the fabric to existing soil, with all necessary fixtures, labour, T&P etc. complete in all respect There shall be an overlap of 250mm of the geo synthetic fabric at the end to end.	**SQM**	**5500**	₹ 100.00	₹ 9.00	₹ 9.00	₹ 118.00	₹ 6,49,000.00
13	**METAL SPREADING IN THE SWITCH-YARD**: Providing supplying and laying two layers of machine crushed metals (gravel) fill, the first layer after compaction shall make minimum 50 mm thickness coarse/ layer of 20 mm nominal size consolidated/ compacted and (by using roller as specified in the specification).A final layer of 50 mm thickness of machine crushed 20 mm nominal size of metals(gravel) above the first layer of 50 mm thickness and as per the technical specification and instruction of Engineer in charge above the PCC(1:4:8). The total compacted thickness of the metals(20 mm Nominal) 100mm above the PCC.	**CUM**	**700**	₹ 3,316.26	₹ 298.46	₹ 298.46	₹ 3,913.18	₹ 27,39,226.00

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1	2	3	4	5	6=5*9%	7=5*9%	8= {5+6+7}	9= {8*4}
14	**STONE PITCHING & TOE WALL**:Stone pitching including making of toe walls both at top and bottom, including surface drain both at top and bottom and partition wall in every 10 mtrs by using boulders and RR masonry walls respectively. This also includes excavation in all types of soil or rocks,back filling,and disposal of excess earth and supply of materials and labour as per the direction of Engineer In charge and as per approved drawing and specification.							
14.1	**Excavation of Soil**	Cum	**1,000**	296.35	₹ 26.67	₹ 26.67	₹ 349.69	₹ 3,49,690.00
14.2	**P.C.C (1:3:6): Lean Concrete Grade M-10**	Cum	**30**	6,058.56	₹ 545.27	₹ 545.27	₹ 7,149.10	₹ 2,14,473.00
14.3	**RR Masonry (1:5)**	Cum	**400**	3,000.48	₹ 270.04	₹ 270.04	₹ 3,540.56	₹ 14,16,224.00
14.4	**P.C.C (1:2:4): Lean Concrete Grade M-15**	Cum	**5**	7,369.48	₹ 663.25	₹ 663.25	₹ 8,695.98	₹ 43,479.90
14.5	**Brick masonary in ratio 1:5 with supply of first class K.B bricks,good quality river sand, cement, labour & T&P etc. as required.**	Cum	**200**	5,415.48	₹ 487.39	₹ 487.39	₹ 6,390.26	₹ 12,78,052.00
15	**RETAINING WALL:** Construction of RCC retaining wall below the FGL and from NSL as per the site condition to sustain the earth pressure. The depth and length of RCC wall shall be designed as per site requirement. This includes excavation in all type of soil, RCC (1:1.5:3) with supply of steel(Fe-500), cement ,sand etc. including cutting, bending, binding, backfilling in layers after concreting for soil compaction and also supply of other required materials and labour . The work shall be executed as per the approved design , drawing as per direction of Engineer In charge							
15.1	**Exacavation all type of soil**	Cum	**1200**	296.35	₹ 26.67	₹ 26.67	₹ 349.69	₹ 4,19,628.00
15.2	**PCC (1:3:6)**	Cum	**50**	6,058.56	₹ 545.27	₹ 545.27	₹ 7,149.10	₹ 3,57,455.00
15.3	**RCC volume (M20)**	Cum	**200**	8,751.26	₹ 787.61	₹ 787.61	₹ 10,326.48	₹ 20,65,296.00
16	**Switch yard fencing:** Providing and fixing of G.I Goat mesh (2.5 mm dia) fencing (the posts and links shall be of HD Galvanized) in switch yard and other areas of the substation with a total fence height complete as per specification and approved drawings, and as required under the safety regulation of local, State and Central Government bodies and as per instruction of the Engineer-in-Charge.(The PCC work for grouting the post shall be 1:2:4 and a continuous Brick Masonry work with ratio mortar (cement and sand)1:5 and cement pointing of the joints, for the fencing upto a height of 350 mm from the finished ground level) .This also includes excavation in all types of soil or rocks, back filling and disposal of excess earth as per the direction of Engineer In charge. The earthing of the fencing shall be as per specification. **The fencing shall be continuous i.e. a GI flat of 50 x 6mm shall run continuous at top & at bottom all along the fence. The fencing shall be connected to**	**Mtr**	**600**	₹ 7,500.00	₹ 675.00	₹ 675.00	**₹ 8,850.00**	**₹ 53,10,000.00**
17	**Fire wall:** Design, engineering, procurement of labour, material including all associated works for construction of fire-walls as per technical specification and approved drawings(column shall be RCC ratio 1:1.5:3 and the walls are of fire resistant bricks).This also includes excavation in all types of soil or rocks,backfilling,and disposal of excess earth as per the direction of Enginer In charge. As per approved drawing and specification. The MS Rod FE-500 as per BIS-1786 to be used .Painting of the walls as per direction of the Engineer in charge.	**NO.**	**1**	₹ 2,00,000.00	₹ 18,000.00	₹ 18,000.00	**₹ 2,36,000.00**	**₹ 2,36,000.00**

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1	2	3	4	5	6=5*9%	7=5*9%	8= {5+6+7}	9= {8*4}
18	**SWITCHYARD GATE:** Design, engineering, procurement of labour, material including all associated works for construction and fixing of switch yard gates and switchyard wicket gates as per specification and approved drawing. Switchyard gates shall have RCC pillars on both sides having open or pile founfdation and the gate shall be of stainless steel square pipes of 304 grade. The main entrance gate to switchyard shall have a wicket gate made of the same material. This also includes excavation in all types of soil or rocks, back filling and disposal of excess earth, PCC/RCC concreting, supply of cement aggregates, rebar rod etc as per the direction of Engineer In charge. It includes supply of all materials and all other associated works required to complete works as per specification and approved drawings and instruction of engineer in charge.							
18.1	Switchyard gate (On both sides of 7 m. road of switchyard)	NOS	1	5,50,908.54	₹ 49,581.77	₹ 49,581.77	6,50,072.08	6,50,072.08
18.2	Wicket gate	NOS	1	50,908.54	₹ 4,581.77	₹ 4,581.77	60,072.08	60,072.08
19	**STORE SHED+OPEN STOCKYARD:** Design, engineering, procurement of labour, material including all associated works for construction of store shed & open stockyard as per specification and approved drawing. This also includes excavation in all types of soil or rocks,back filling,and disposal of excess earth as per the specification,approved drawing and direction of Engineer In charge. One no store shed of floor size 10X10 mtr having Fly ash Brick walls and plastering with RCC roof. The flooring shall be of 75 mm thickness PCC (mix ratio1:2:4) over RR masonry works (as per standard practice of flooring). Provision of adequate nos of MS racks (proper paintings also to be done as per the direction of site in charge) for keeping the spare materials. The height of the shed shall be 4mtrs above the plinth. Internal concealed wiring (including supply of flexible copper FRP 1.1 KV PVC wire,conduits & its accessories,modular type switches & switch board,Junction boxes with required MCB & Earth leakage detector switcghear etc),fixing of lighting fixtures (Phillips/Crompton/Bajaj/Havells/Wipro), ceiling fans of 1400 sweep and regulators(including supply) and provision of incoming AC supply from the main ACDB/outdoor kiosks installed for street light or colony quarters. Foundation shall be as per actual soil condition as per soil test, including pilings where required Also includes painting of the building (in side and out side) as per recommended for colony building in the specification.Store shed door shall have access control system which is sensor operated with key card for entry. Log of all the persons accessing the store shed with date and time stamp shall be kept in the system. There shall be provision for manual override of the system for exigencies as per direction of engineer in charge. Installation of smoke and fire detection & Alarm system of the building. Provision of conventional fire fighting equipment (including supply of FFE) at strategic location suitable for wall hanging as per direction of engineer in charge. The MS Rod (FE-500 as per BIS-1786) to be used in the building. (* REMARKS : FOR SUPPLY OF ALL THE CABLES AS INDICATED ARE COVERED IN THE supply)}	Lot	1	₹ 11,00,000.00	₹ 99,000.00	₹ 99,000.00	₹ 12,98,000.00	₹ 12,98,000.00

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1	2	3	4	5	6=5*9%	7=5*9%	8= {5+6+7}	9= {8*4}
20	**VEHICLE PARKING SHED:** Design, engineering, construction of parking area shall be 15mtrs X 15 mtrs, out of the entire area there shall be provision of shed for 5 mtrs X 15 mtrs and rest of the area shall be without shed (1:2:4 flooring) with the cost of all required material, procurement of labour, all T&P etc. This includes supply of all materials and all associated works for construction of vehicle parking shed, complete in all respect as per technical specification and enclosed drawing. This also includes, excavation in all type soil and rocks, backfilling and disposal of excavated soil, (cement, reinforcement steel, form work for) PCC, RCC (1:1.5:3), M.S. rods, HYSD steel or Tor Steel (SAIL, RINL, TATA, Jindal), Fly ash Brick work with mortar 1:5, Plastering, Flooring, External and Internal Painting, all electrical works (Including but not limited to wires, conduits, GI boxes, switches, luminaires (Phillips/Crompton/Bajaj/Havells/Wipro), electrical fixtures and all other switchgear etc.)etc. and any other works required for completion of the work in all respect. Foundation shall be as per actual soil condition as per soil test, including piling where required.	**Lot**	**1**	₹ 5,00,000.00	₹ 45,000.00	₹ 45,000.00	₹ 5,90,000.00	₹ 5,90,000.00
21	**FIRE FIGHTING** (Nitrogen Injection Type Fire Prevention & Extinguishing System) SYSTEM WITH DETAILED DESIGN SUITABLE FOR 100 MVA, **220/33** KV POWER TRANSFORMER etc AS PER THE TECHNICAL SPEC. & LATEST STANDARD. All civil works related to NIFPES as per approved drawing including excavation in all type of soil, PCC, RCC, Steel , backfilling, compaction etc complete in all respect as per instruction of site in-charge.							
21.1	**For 100 MVA, 220/33KV Power Transformer**	**Lot**	**2**	₹ 1,00,000.00	₹ 9,000.00	₹ 9,000.00	₹ 1,18,000.00	₹ 2,36,000.00
22	**STATION TRANSFORMER**:Design, engineering, procurement of labour, material including all associated works for construction of foundation(RCC) for the station transformers 2X 33/0.415 KV,250 KVA (plinth mounted) and foundation for 4P structure including piling if any as per approved drawing and specification. It includes other accessories & materials as required need to be supplied for complete installation of transformer as per the instruction of Engineer In charge and as per the specification and approved drawing.	**Nos**	**2**	₹ 2,79,707.00	₹ 25,173.63	₹ 25,173.63	₹ 3,30,054.26	₹ 6,60,108.52
23	**Anti-Weed Treatment :**Supply of labour,T&P,Chemicals and other necessary arrangements for anti-weed treat of the switch-yard areas,controlroom etc. as per the instruction of Engineer-in-Charge.The chemical to be sprayed as per the standard practice adopted for antiweed treatment of sub-station area & as per the technical specification	**Sq Mtrs**	**7500**	₹ 17.84	₹ 1.61	₹ 1.61	₹ 21.06	₹ 1,57,950.00
24	**RCC Foundations for Octagonal Lighting Poles:** Design, engineering, procurement of labour, material including piling if any, all associated works for construction of foundations for octagonal lighting poles as per approved drawings (RCC ratio 1:1.5:3).This also includes excavation in all types of soil or rocks,back filling,and disposal of excess earth as per the direction of Engineer In charge. As per approved drawing and specification. Pcc padding ratio (1:4:8). The MS Rod (FE-500-TATA/ RINL/ Sail/JINDAL) as per BIS-1786 to be used.	Nos	30	₹ 10,000.00	₹ 900.00	₹ 900.00	₹ 11,800.00	₹ 3,54,000.00
	TOTAL CIVIL_SUBSTATION (PART-A)							**₹ 8,05,53,340.32**

ANNEXURE-II

Bar Chart for construction of proposed Conversion of 220KV Switching substation at Landeihills into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No., 33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey basis at an estimated cost of ₹ 6332.25 Lakhs.

YEAR	2026												2027												2028												2029											
MONTH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
SANCTION OF LOAN BY THE FINANCING INSTITUTION																																															
PREPARATION OF TENDER DOCUMENTS, TENDERING & AWARD OF CONTRACT																																															
CHECK SURVEY AND MOBILISATION																																															
SUPPLY OF MATERIALS																																															
ERECTION																																															
TESTING & COMMISSIONING																																															
FUNDS REQUIREMENT [RS.IN LAKHS]												6.332												28.494												22.162											6.332

ANNEXURE-III

TRANSMISSION LINE: ENVIRONMENTAL IMPACT ASSESSMENT STUDY

Sl. No.	Project	Voltage
1	**Construction of Conversion of 220KV Switching substation at Landeihill into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No., 33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey basis.**	220KV

Description of Project:

- **Construction of Conversion of 220KV Switching substation at Landeihill into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No., 33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey basis.**

Sl. No.	Overall Length	Forestry	Urban Areas	Rural Areas	Voltage
N.A	N.A	N.A	N.A	N.A	N.A

Impact on Forestry

Under the Forest (Conservation) Act, 1980 and the Forest (Conservation) Rules, 1981, proposals for routing transmission lines through forest areas are subject to a detailed and complex system of review and approval. The route for the line is surveyed by staff from OPTCL.

Approval is conditional on the route having a minimum of forest land involved, following consideration of alternatives, and the undertaking of compensatory afforestation.

Width of right-of-way	N.A
Area of forest land affected	N.A.
Use of agreed method for forestry approval	N.A

All the trees would be cut from root level in the 5m corridor below each line conductor. In the balance corridor, tree branches are only to be lopped to attain the specified clearance. Manual clearing techniques rather than chemical herbicides will be used for clearance of the right-of-way and up-keep of the maintenance access strip.

Impact on Remote Areas and Wild lands

Any impact on remote areas does not arise.

The construction will not affect a national park, wildlife sanctuary, natural reserve, biosphere reserve etc.

Impact on Landscape

The route selection has been so decided that that there is no impact on existing landscape.

Soil Erosion

OPTCL will monitor construction activities to ensure that adequate soil erosion control measures are incorporated where necessary and particularly in steeply sloping terrain.

Land Use Impacts

Under Section 10, Part III of the Indian Telegraph Act, 1885, transmission towers can be erected on private land. Ownership of land will not be required. In accordance with the powers conferred under Section 164 of the Electricity Act, 2003, OPTCL can exercise all powers vested in the Indian Telegraph Act, 1885 provided the matter is published in the official Gazette and local newspapers and two months' time is provided for other persons interested to make representation on such scheme.

There will be no loss of access to communities' common resources and facilities.

Towns in route alignment	N.A.

Number of houses within right-of-way	N.A.
Resettlement and rehabilitation needed	N.A
Compensation for loss of crops	N.A
Basis for compensation	N.A

Public Safety

The scheme will comply fully with the public safety requirements specified in the Indian Electricity Rules.

The Rules cover the clearances required between power lines and roads, safety with regard to transporting materials near overhead lines, accessibility of bare conductors, and precautions to be adopted by Electrical contractors and workmen as per I.E. Rule.

In addition, the Rules address safety and protective devices, such as distance protection relays, over-current relays, and Earth fault relays.

Electromagnetic Field

The standards used by OPTCL in respect of phase-to-phase as well as circuit-to-circuit clearances are consistent with practices used for line clearances worldwide. Statutory clearances is within the limits and meets the requirements of the National Electrical Safety Code.

The scheme will comply fully with the vertical and horizontal clearances specified in the Indian Electricity Rules.

Historic and Cultural Sites

The project does not involve interference with any known historic or cultural sites.

Proximity to Airports

Not applicable.

Comment

The basis for selection of the route was -

No National Park, wildlife sanctuary, natural reserve etc. affected.
No house within right-of-way.
No impact on the environment.

This project does not have any adverse environmental impact and the Environmental Impact Assessment study concluded that the overall impact of the project was highly positive.

SUB-STATION: ENVIRONMENTAL IMPACT ASSESSMENT STUDY

Project	Type
Construction of Conversion of 220KV Switching substation at Landeihill into a 2X 100MVA 220/33KV Grid substation with 220KV 100 MVA Trf bays-02 Nos., 220 KV Spare bay-01 No.,33KV Fdr. Bays- 5 Nos, I/C Tfr.Bays-2 Nos, B/C bay-01 No. and 33 KV spare bay-01 No. scope of work in Odisha State of India on turnkey basis.	220KV switchyard at Sub-station.

Description of Scheme

a. Supply of 2X100MVA Power transformer.
b. Construction of 220KV Power transformer bay 2 numbers.
c. Construction of 220KV Spare (unequipped) bay 1 number.
d. Construction of 33KV power transformer (Incomer) bay 2 numbers.
e. Construction of 33KV feeder bay 5 numbers.
f. Construction of 33KV Bus Coupler bay 1 number.
g. 33KV Spare (unequipped) bay 1 number.

Number and type of transformers : 220/33KV, 2X100MVA Power Transformer.
Type of breakers : SF_6

Existing Environment

Site location : Not located in forest area.
Any special features about the site: No

Land Acquisition

Total area of site N.A.
Area of government land N.A.
Mauza: N.A
Tehsil: N.A
Area of private land N.A

Land Use

Land in agricultural use Nil
Uncultivated or wasteland Nil.

Social Effects

Number of families whose part holding acquired: Nil
Number of families whose total holding acquired: Nil
Number of families whose homestead acquired: Nil
Basis for compensation: N.A

- The scale of resettlement required is Nil and therefore, the issue of impact on host communities does not arise.
- There will be no loss of access to communities' common resources and facilities.

Public Safety

The sub-station will be surrounded by a wall and it will be manned at all times, thereby reducing the risk and danger to the public from unauthorized trespass. The scheme will comply fully with the public safety requirements specified in the Indian Electricity Rules. The Rules cover the clearances required between power lines and roads, safety with regard to transporting materials near overhead lines, accessibility of bare conductors, precautions to be adopted by Electrical contractors and workmen.

In addition, the Rules address safety and protective devices, such as distance relays and ground fault protection.

Hazardous Substances

The project will not involve the use of hazardous substances.

Electromagnetic Field

Phase-to-phase and circuit-to-circuit clearances are consistent with practices used for line clearances worldwide. The conductor-to-ground clearances are within the limits and meet the requirements of the National Electrical Safety Code.

The Project will comply fully with the vertical and horizontal clearances specified in the Indian Electricity Rules.

Noise

Because of the location of equipment within the site, any audible hum from transformers or noise from cooling fans will not be discernible at the substation perimeter.

Historic and Cultural Sites

Construction of the sub-station does not involve interference with any known historic or cultural sites.

Proximity to Airports

Not applicable.

Comment

The chosen site was selected following a comparative examination of two alternatives.

The chosen site was selected due to the reason that its overall impact on the environment is Nil.

This project does not have any adverse environmental impacts and the Project Environmental Assessment concluded that the overall impact of the project was highly positive.

ANNEXURE-IV

EXTRACTS OF THE MINUTES OF ADJOURNED 161ST MEETING OF THE BOARD OF DIRECTORS OF ODISHA POWER TRANSMISSION CORPORATION LTD. HELD ON 09.07.2026 AT 06.00 PM AT THE REGD. OFFICE OF THE CORPORATION AT OPTCL TECH TOWER, JANPATH, BHUBANESWAR.

Item-15: In principle approval for the project "Construction 2X100 MVA 220/33 KV Grid Substation at Landeihill by converting the under construction 220 KV Switching Station of NHPC".

The Board perused the memorandum and noted the followings

- At present, seven 33 kV Substations viz. Banka, JN Prasad, BD Pur, Gallary, Gayaganda, Tilisingi and Buguda are suffering from low voltage problems due to their distance of 40 km from their source GSSs at Bhanjanagar and Aska New. The cumulative demand of these PSSs is around 21 MW, which has overstressed the existing system and impacted supply quality.

- At present NHPC is constructing a 40MW, 220KV Pooling (Switching) Station at Landeihill. By up grading Landeihill to 220/33 kV GSS with 220kV LILO from Bhanjanagar to Nayagarh 220kV line will significantly improve the 33 kV voltage profile enhancing reliability of supply.

- It will also relieve 11 MW of load from Bhanjanagar GSS and 10 MW from Aska New GSS, decongesting the upstream grid.

The Board further noted that an estimate of Rs.54.26 crore has been prepared for Construction of 220/33 KV Grid Substation at Landeihill by converting the under construction 220 KV Switching Station of NHPC.

Considering all above aspects, the Board reviewed the scope of work and Statement of Cost Benefit Analysis as attached to the memorandum and after detailed discussion accorded in-principle approval to the proposal for Construction of 2X100 MVA 220/33 KV Grid Substation at Landeihill by converting the under construction 220 KV Switching Station of NHPC at an estimated cost of Rs.54.26 crore.

CERTIFIED TRUE COPY

COMPANY SECRETARY

Vishnu/Tapan
Chandramani
n/a
11 Cmms
22.05

1862

21 SEP 2026

GOVERNMENT OF ODISHA
ENERGY DEPARTMENT
****

RESOLUTION

No. 11436 **/ En, Bhubaneswar Dated the** 21 SEP 2026
ENG-TDER-RR-0008-2025

Odisha is witnessing unprecedented growth in electricity demand driven by rapid industrialization, urban expansion, development of large manufacturing clusters, increasing penetration of data centres and integration of renewable energy. In order to meet the growing power demand and ensure a secure, reliable and resilient transmission network, the Cabinet, after careful consideration of the proposal submitted by OPTCL, has approved a comprehensive long term transmission scheme aimed at strengthening of the Extra High Voltage (EHV) transmission system through development of new 765 kV, 400 kV and 220 kV transmission corridors, upgradation and augmentation of existing Grid Sub-Stations and transmission lines, and automation/ digitisation of transmission infrastructure.

The comprehensive scheme will be executed under the umbrella scheme Mukhya Mantri Shakti Bikash Yojana (MMSBY). The components under the scheme are indicated below.

2/19
DIR (Comj)
DIR (Op)
DIR (Fin)

A. **Construction of 765 kV GSSs & associated lines**
- Establishment of 765/400/220 kV GSS at Khuntuni (Betakholi) with associated transmission lines.
- Establishment of 765/400 kV GSS at Duburi with associated transmission lines.
- Establishment of 765/400 kV GSS at Kolabira with associated transmission lines.

B. **Construction of 400 kV GSSs & associated lines**
- 400/220/33 kV GSS at Titlagarh with upgradation of Nuapada GSS and associated lines.
- 400/220/132 kV GSS at Kansbahal and associated lines.

C. **Construction of 220 kV GSSs & associated lines**
- 220 kV GSSs at Koida, Indravati, Choudwar Industrial, Panikoili and Khandapada, along with associated transmission lines.
- Construction of new 220 kV transmission lines, including Sarasmal–Bargarh and Bhanjanagar–Balugada corridors.

D. **Upgradation/Augmentation of existing Sub-Stations and transmission lines**
- Upgradation/augmentation of identified existing GSSs and transmission corridors.
- Revamping of old GSS through replacement/modernisation of obsolete switchgear, protection and control systems along with installation of capacitor banks.
- Augmentation/replacement of transformer capacity at critical GSS to meet the increasing load.
- Conversion of identified existing ACSR transmission lines to HTLS conductors.
- Installation of modern relays, BCUs and communication systems.

E. **AI-based Inspection and Maintenance of Transmission Lines**

- Deployment of AI, drones, digital twins and predictive analytics for transmission-line inspection, condition monitoring, predictive maintenance and early identification of faults.

F. **State Assets Management System Phase-II (STAMS-II)**

- Expansion and integration of 116 additional Grid Sub-Stations under State Assets Management System Phase-II (STAMS-II) for strengthening automation, reliability, monitoring and centralized grid operation across OPTCL's network.

The detailed scope of work along with individual project cost is enclosed at **Annexure-I.**

These composite transmission infrastructure and modernisation interventions under MMSBY will substantially augment Odisha's transmission capacity, improve system stability, maintain N-1 redundancy, eliminate transmission bottlenecks, and ensure uninterrupted, high-quality, and reliable power supply to major industrial hubs, manufacturing clusters, urban load centres, and domestic consumers alike, thereby accelerating the socio-economic and industrial growth of the State. The detailed list of projects is enclosed at **Annexure-I.**

The total estimated cost of the composite project is Rs. 15,948.70 Crore, out of which 30% (Rs. 4,784.63 Crore) will be provided as equity support from the State Government and the rest 70% (Rs. 11,164.07 Crore) will be arranged by OPTCL. The scheme will be implemented over a period of four years, i.e., from FY 2026-27 to FY 2029-30. The component-wise financial requirement is indicated in the table below:

(Rs. in Crore)

Sl no	Component/Scope of Work	Estimated Cost	30% Equity by State Government	70% to be arranged by OPTCL
1.	Construction of 765 kV GSS & associated lines	8156.00	2446.80	5709.20
2.	Construction of 400 kV GSS & associated lines	2230.00	669.00	1561.00
3.	Construction of 220 kV GSS & associated lines	1442.95	432.89	1010.06
4.	Upgradation/Augmentation of existing sub-stations & Lines	3815.51	1144.65	2670.86
5.	AI based Inspection & Maintenance of Transmission Lines	96.05	28.82	67.23
6.	State Assets Management System Phase-II(STAMS-II)	208.19	62.46	145.73
	Total	**15948.70**	**4784.63**	**11,164.07**

OPTCL will be the implementing agency for the above projects and the assets created under the scheme will be owned by OPTCL. The projects shall be implemented through Engineering, Procurement and Construction (EPC) mode. The annual O&M expenditure will be reflected in the Annual Revenue Requirement (ARR) of OPTCL for consideration by OERC.

By Order of the Governor,

(Vishal Kumar Dev)
Additional Chief Secretary to Government.

Memo No. 11437 /En. Dated. 21 SEP 2026

Copy forwarded to the Director, Printing Stationery and Publication, Odisha, Cuttack with a request to publish this resolution in the next issue of Extra Ordinary Gazette and send 50 copies thereof to this Department.

21.09.2026
Special Secretary to Govt.

Memo No. 11438 /En. Dated. 21 SEP 2026

Copy forwarded to P.S to Hon'ble Chief Minister, Odisha /P.S to Hon'ble Deputy Chief Minister, A&FE and Energy, Odisha/ OSD to Chief Secretary, Odisha/ Pr. PS to DC-cum-ACS, Odisha / Sr. PS to Additional Chief Secretary to Govt., Energy Department for kind information of Hon'ble Chief Minister /Hon'ble Deputy Chief Minister, A&FE and Energy/ Chief Secretary / DC-cum-ACS/ Additional Chief Secretary to Govt., Energy Department.

21.09.2026
Special Secretary to Govt.

Memo No. 11439 /En. Dated. 21 SEP 2026

Copy forwarded to all Departments of Government of Odisha for information.

21.09.2026
Special Secretary to Govt.

Memo No. 11440 /En. Dated. 21 SEP 2026

Copy forwarded to all Officers/all sections, Energy Department for information.

21.09.2026
Special Secretary to Govt.

Memo No. 11441 /En. Dated. 21 SEP 2026

Copy forwarded to the Chairman and Managing Director, OHPC, Bhubaneswar / CMD, OPTCL, Bhubaneswar/ Secretary, OERC, Bhubaneswar/ MD, GRIDCO, Bhubaneswar/ MD, OPGC, Bhubaneswar / EIC (El.)-cum-PCEI, Odisha, Bhubaneswar / CEO, OREDA, Bhubaneswar / CEO, TPCODL, Bhubaneswar/ TPWODL, Burla, Sambalpur, TPNODL, Balasore/ TPSODL, Berhampur/ GEDCOL, Bhubaneswar / OCPL, Bhubaneswar for information.

21.09.2026.
Special Secretary to Govt.

Memo No. 11442 /En. Dated. 21 SEP 2026

Copy forwarded the Head, Portal Group, IT Centre, Lok Seva Bhawan, Bhubaneswar for information and necessary action. It is requested to take necessary steps for hosting this resolution in the website of Energy Department Urgently.

21.09.2026
Special Secretary to Govt.

Annexure-I

Project Details

1. **MMSBY-Construction of 765kV GSS & Lines**

1.1 765 kV GSS at Khuntuni (Betakholi):-

Sl. No.	Scope of the Project	Approx. Line length in Kms	Estimated Cost (In Cr.)
1	Establishment of 2x1500 MVA, 765/400/220 kV GIS substation at **Khuntuni (Betakholi)**.	-	1,633.00
2	765kV DC Line from proposed 765/400kV Grid S/S, Betakholi to PGCIL, Angul Grid Sub-Station.	76	592.00
3	400kV D/C line from proposed 765/400kV Grid S/S, Betakholi to 400/220 kV GSS Neulapoi.	32	174.00
4	400kV Quad Moose D/C line on M/C tower from proposed 765/400kV Grid S/S, Betakholi to 400/220 kV GSS Mendhasal	34	280.00
	Total		**2679.00**

1.2 765 kV GSS at Duburi:-

Sl. No.	Scope of the Project	Approx. Line length in Kms	Estimated Cost (In Cr.)
1	Establishment of 2x1500 MVA, 765/400 kV GIS Substation at **Duburi**.		1250.00
2	LILO of both circuits of Angul – Paradeep 765kV D/c line at Duburi 765/400kV substation	30	375.00
3	400kV D/C line from Duburi 765kV to Duburi-400kV	44	60.00
	Total		**1685.00**

1.3 765 kV GSS at Kolabira.

Sl. No.	Scope of the Project	Approx. Line length in Kms	Estimated Cost (In Cr.)
1	Establishment of 2x1500 MVA, 765/400 kV Substation at **Kolabira.**		802.00
2	765kV D/C line from Sundargarh-B to Kolabira	60	420.00

3	765kV D/C line from Duburi to Kolabira	290	2030.00
4	400kV D/C line from OPGC to Kolabira	60	270.00
	400kV D/C line from Hirakud floating solar to Kolabira	60	270.00
	Total		**3792.00**

The total cost of "MMSBY-Construction of 765kV GSS & Lines" is ₹8156.00 Crore.

2. **MMSBY-Construction of 400 kV GSS & Lines**

2.1 <u>400 kV GSS at Titlagarh with up gradation of Nuapada</u>.

Sl. No.	Scope of the Project	Approx. Line length in Kms	Estimated Cost (In Cr.)
1	400/220 /33kV Grid Sub-Station at **Titlagarh**	-	210.00
2	400kV D/C line from 765kV Kolabira GSS to 400kV Titlagarh GSS (245.00 Route Kms.)	245	1102.50
3	220KV D/C line from Titlagarh to 220kV GSS at Kesinga. (25.00 Route Kms.)	25	42.50
4	220/132kV GSS at Nuapada (upgradation)	-	105.00
5	220kV D/C line Titlagarh-Nuapada (114.00 Route Kms.)	114	210.00
	Total		**1670.00**

2.2 <u>400 kV GSS at Kansbahal:-</u>

Sl. No.	Scope of the Project	Approx. Line length in Kms	Estimated Cost (In Cr.)
1	Construction of 2x500 MVA + 2x200 MVA , 400/220/132 kV Grid S/S, **Kansbahal**	-	370.00
2	400 kV DC LILO of Sundargarh (PG) – Bisra (PG) line	20	110.00
3	220kV DC line from Kansbahal Grid S/S to 220/132/33kV Grid S/S Kuanrmunda	25	50.00
	132 kV DC line from Kansbahal Grid S/S to 132/33kV Grid S/S Kalunga	20	30.00
	Total		**560.00**

The total cost of "MMSBY-Construction of 400kV GSS & Lines" is ₹2230.00 Crore.

3. MMSBY-Construction of 220 kV GSS & Lines

3.1 220 kV GSS at Koida :-

Sl No	Projects	Line length in Kms.	Estimated cost (in Cr)
1	Construction of 220/132/33kV Grid S/S, **Koida** with 2X160MVA Auto trf and 2X80MVA Power Trf.	-	110.00
2	220kV DC line from Koida to Barbil GSS in Multi Circuit Tower	30	200.00
3	220kV SC line from Koida to Bonai via Taldihi	20	120.00
	Total		**430.00**

3.2 220 kV Indravati Pooling Station :-

Sl No	Projects	Line length in Kms.	Estimated cost (in Cr)
1	220/33kV Substation at Indravati with associated line for evacuation of 300MW floating solar.	-	163.49
2	220kV HTLS D/C line on M/C tower from pooling station to Indravati Power House (PH)	13	40.66
	Total		**204.15**

3.3 220kV GSS at Choudwar Industrial:-

Sl No	Projects	Line length in Kms.	Estimated cost (in Cr)
1	Establishment of 220/132/33kV Substation at Choudwar Industrial with associated lines (Upcoming Industrial load at OTM and system strengthening).	-	110.00
2	220kV D/C line Bidanasi -Choudwar Industrial	24	40.80
3	132kV LILO of Bidanasi-Choudwar line	8	8.00
4	132kV LILO of Bahugram-ICCL line	7	7.00
	Total		**165.80**

3.4 220kV GSS at Panikoili :-

Sl No	Projects	Line length in Kms.	Estimated cost (in Cr)
1	Construction of 220/132/33 kV AIS Substation at Panikoili		165.00
2	Construction of 220 KV Double Circuit LILO from 220 KV Duburi-Paradeep Line (Approx 20 Kms)	20	62.00
3	Construction of 132 KV Double Circuit LILO from 132 kV Jajpur Road-Kendrapada Line (Approx. 15 Kms)	15	17.00
	Total		**244.00**

3.5 220kV GSS at Khandapada:-

Sl No	Projects	Line length in Kms.	Estimated cost (in Cr)
1	220/132/33kV Substation at Khandapada		80.00
2	Associated 220kV & 132kV line (Bhanjanar)	25	25.00
	Total		**105.00**

3.6 220 kV Sarasmal–Bargarh New Line:-

Sl No	Projects	Line length in Kms.	Estimated cost (in Cr)
1	220kV D/C line from Sarasmal to Bargarh new with bay extension at both end	50	85.00

3.7 220 kV Bhanjanagar–Baliguda Line:-

Sl No	Projects	Line length in Kms.	Estimated cost (in Cr)
1	220kV D/C line from Bhanjanagar to Baliguda with bay extension at both end	110	209.00

The total cost of "MMSBY-Construction of 220kV GSS & Lines" is ₹ 1442.95 Crore.

4. MMSBY-Upgradation/Augmentation of Existing Sub-Stations/Lines

Sl No	Projects	Line length in Kms.	Estimated cost (in Cr)
1	Upgradation of existing 132kV Substation at **Chainpal**	-	65.00
	LILO of 220kV D/C line from Meramundali to TTPS	5	10.00
	Total		**75.00**
2	Up gradation of existing 132kV Substation at **Phulbani**		65.00
	220kV D/C line from Baliguda to Phulbani	80	156.00
	Total		**221.00**
3	Construction 2X100 MVA 220/33 KV Grid Substation at **Landeihill**by converting the under construction 220 KV Switching Station.	-	**54.26**
	Total		**54.26**
4	Upgrading the existing 132/33 kV **Rairangpur**GSS to 220/132/33 kV GSS	-	65.00
	220 kV DC line connectivity from Turumunga GSS.	35	133.00
	Total		**198.00**
5	Up gradation of 220/33 kV MRSS at **TATA Steel SEZ**, Gopalpur	-	**102.00**
6	Revamping of old GSSs through replacement of obsolete switchgear, protection, and control systems	-	**925.00**

	along with installation of Capacitor Banks at 50 GSSs (700MVAr total capacity).		
7	Conversion of existing ACSR transmission lines to HTLS conductors for higher power transfer capability (9nos.)	-	**855.23**
8	Augmentation and replacement of transformer capacity at key GSSs to meet growing demand.	-	**1150.86**
9	Installation of modern relays, BCUs, and communication systems for improved automation and reliability(47 GSSs)	-	**234.16**

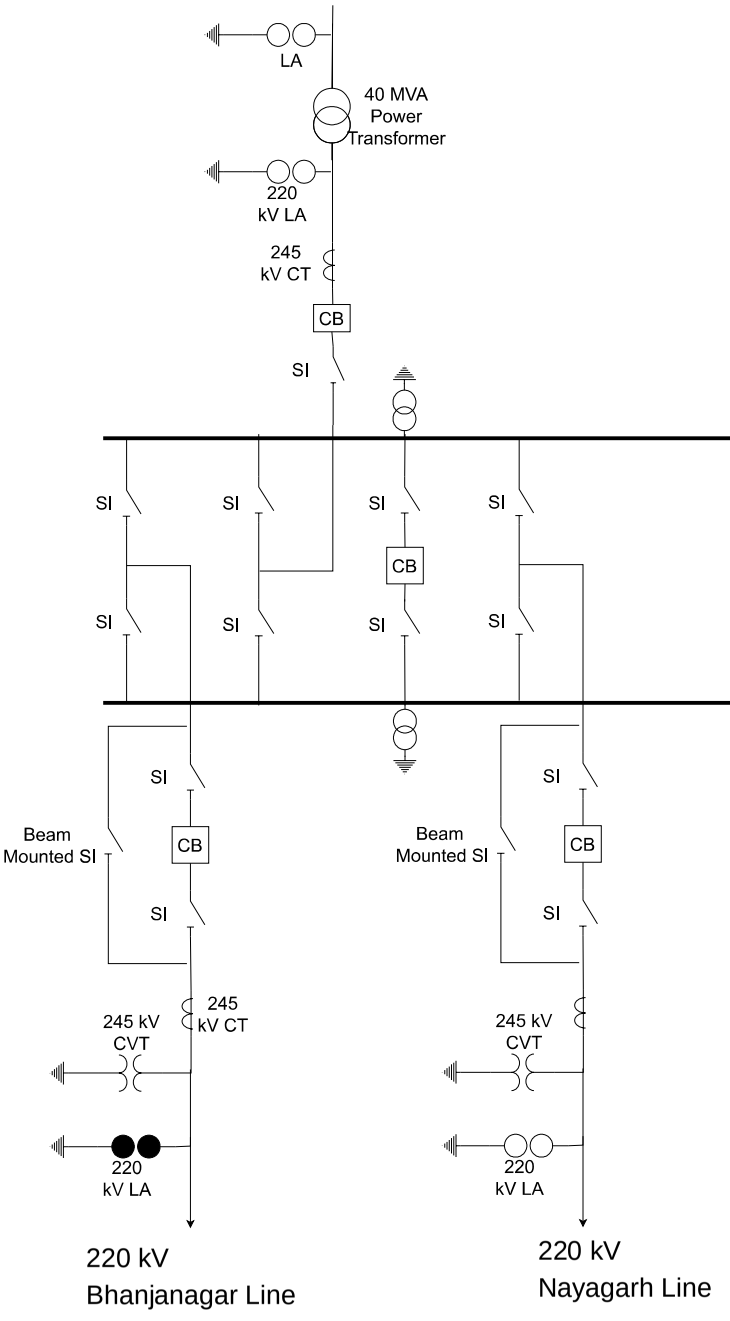
Total Cost of "MMSBY-Upgradation/Augmentation of Existing Sub-Stations/Lines" is ₹ 3815.51Crore

5. **MMSBY -Al-Based Inspection and Maintenance of Transmission Lines**

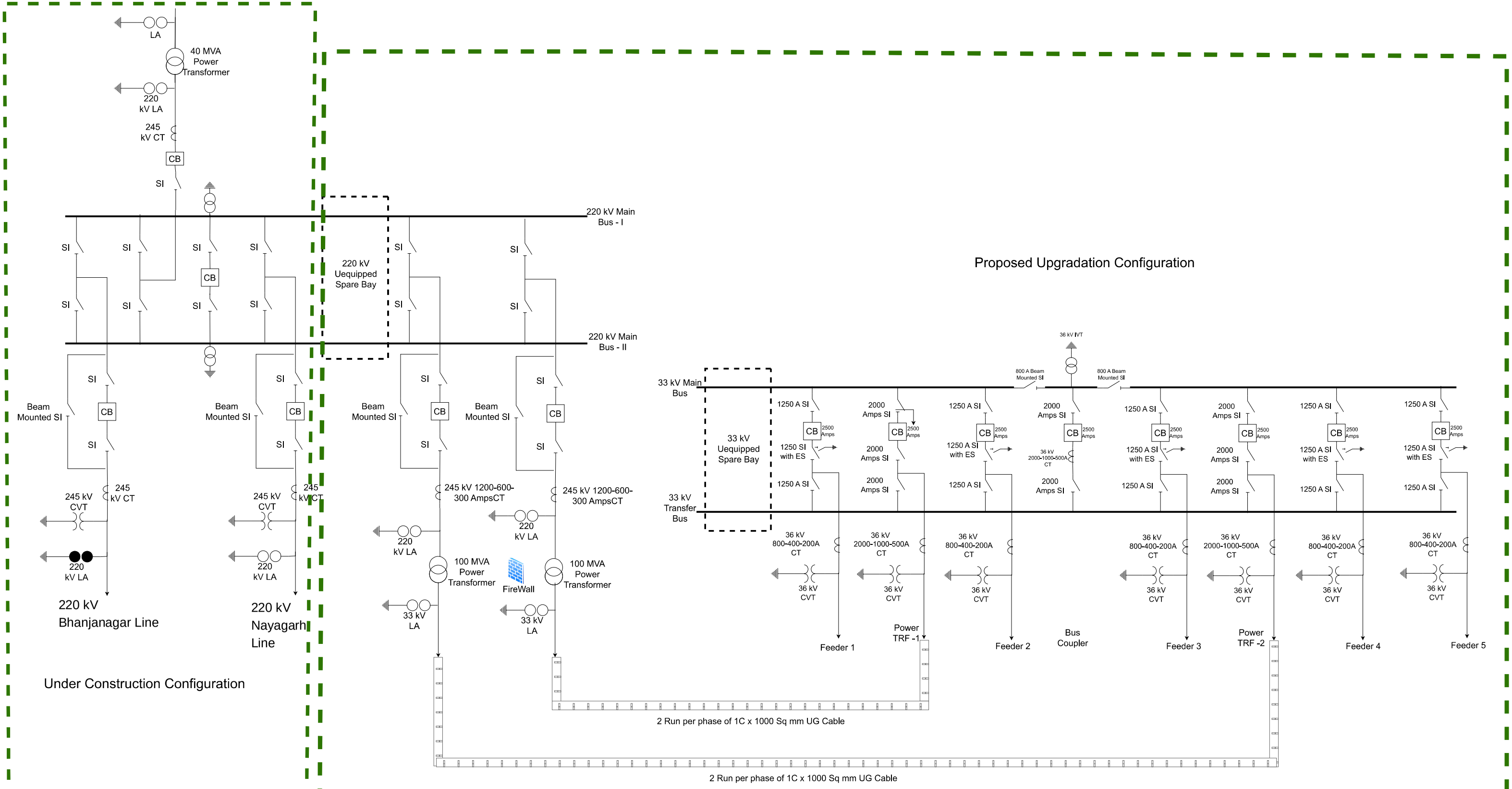
Sl No	Projects	Estimated cost (in Cr)
1	Al-Based Inspection and Maintenance of Transmission Lines	96.05

6. **MMSBY- State Assets Management System Phase-II(STAMS-II)**

Sl No	Projects	Estimated cost (in Cr)
1	State Assets Management System Phase-II(STAMS-II)	208.19

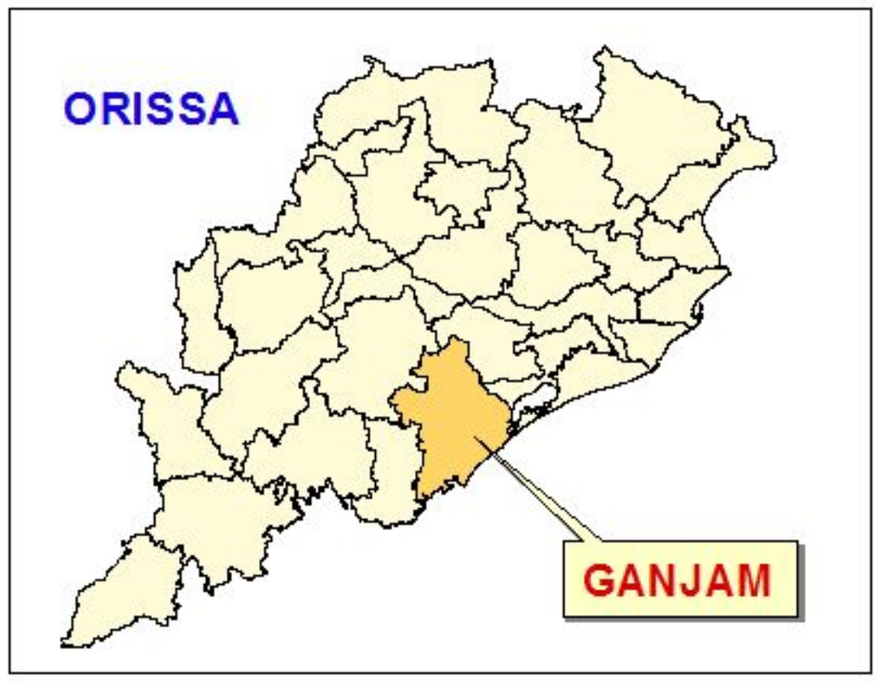


Under Construction Configuration


LA
40 MVA Power Transformer
220 kV LA
245 kV CT
CB
SI
220 kV Main Bus - I
220 kV Main Bus - II
220 kV Uequipped Spare Bay
Beam Mounted SI
245 kV CVT
220 kV LA
220 kV Bhanjanagar Line
220 kV Nayagarh Line
Under Construction Configuration
245 kV 1200-600-300 AmpsCT
100 MVA Power Transformer
FireWall
33 kV LA
2 Run per phase of 1C x 1000 Sq mm UG Cable
Proposed Upgradation Configuration
36 kV IVT
800 A Beam Mounted SI
33 kV Main Bus
33 kV Uequipped Spare Bay
33 kV Transfer Bus
1250 A SI
2000 Amps SI
1250 SI with ES
2500 Amps
36 kV 2000-1000-500A CT
36 kV 800-400-200A CT
36 kV CVT
Feeder 1
Feeder 2
Feeder 3
Feeder 4
Feeder 5
Power TRF -1
Power TRF -2
Bus Coupler

BASE MAP
GANJAM DISTRICT

7 0 7 14 Kilometers



JAGANNATHPRASAD
NH217
BHANJANAGAR
BADA N.
Jagannathprasad
Bhanjanagar
LOHARKHANDI R.
Bellaguntha
BUGUDA
BELLAGUNTHA
Buguda
Surada
POLASARA
BAGHUA R.
Polsara
SURADA
KHALLIKOTE
Asika
BEGUNIAPADA
Beguniapada
Asika
Dharakote
KAVISURYANAGAR
NH 5
Khalikote
CHILIKA LAKE
DHARAKOTE
Kavisuryanagar
PURUSOTTAMPUR
SARAGARH
Purusottampur
Seragad
RUSHIKULYA R.
SANAKHEMUNDI
Hinjilicut
GANJAM
HINJILICUT
Sanakhemundi
GHODAHADA N.
Ganjam
Kukudakhandi
CHHATRAPUR
KUKUDAHANDI
Digapahandi
CHHATRAPUR
Chhatrapur
Rangeilunda
DIGAPAHANDI
BAY OF BENGAL
Chikiti
RANGEILUNDA
BAHUDA R.
CHIKITI
Patrapur
PATRAPUR

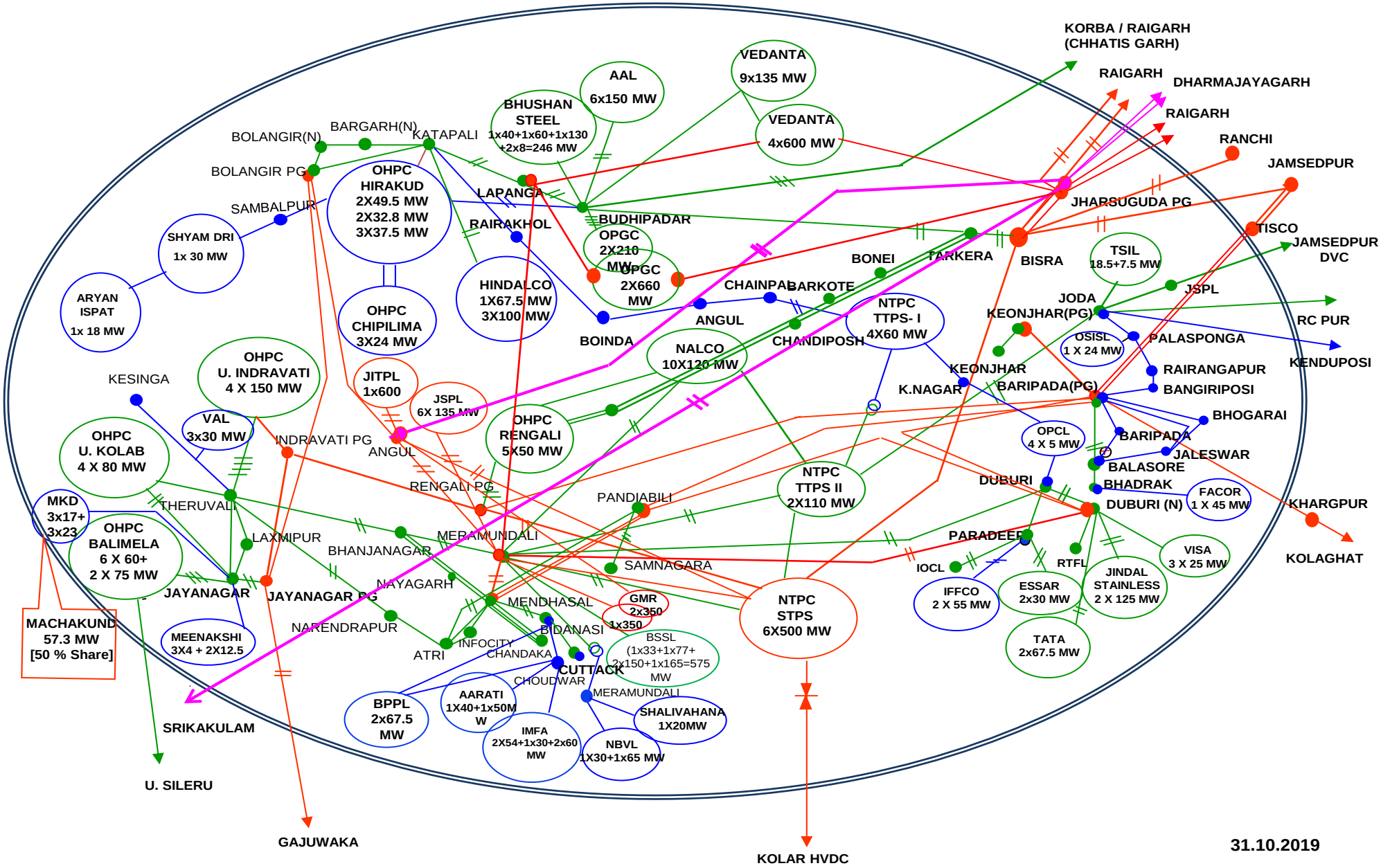
LEGEND

- District Headquarter
- Block Headquarter
- District Boundary
- Railway
- National Highway
- River/Waterbody

Prepared By

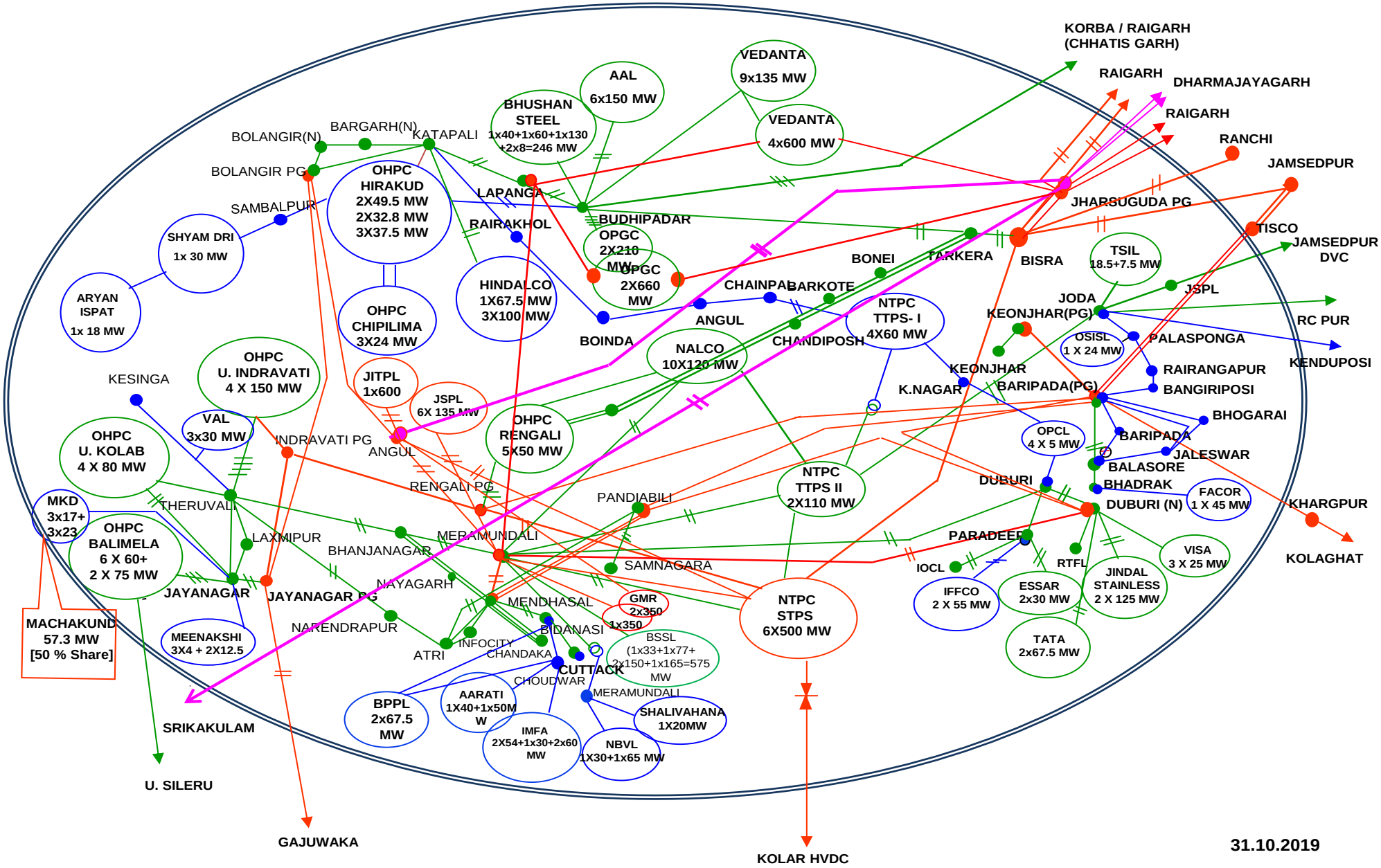
GIS DIVISION
NIC, BHUBANESWAR

OPTCL INTER-CONNECTED SYSTEM



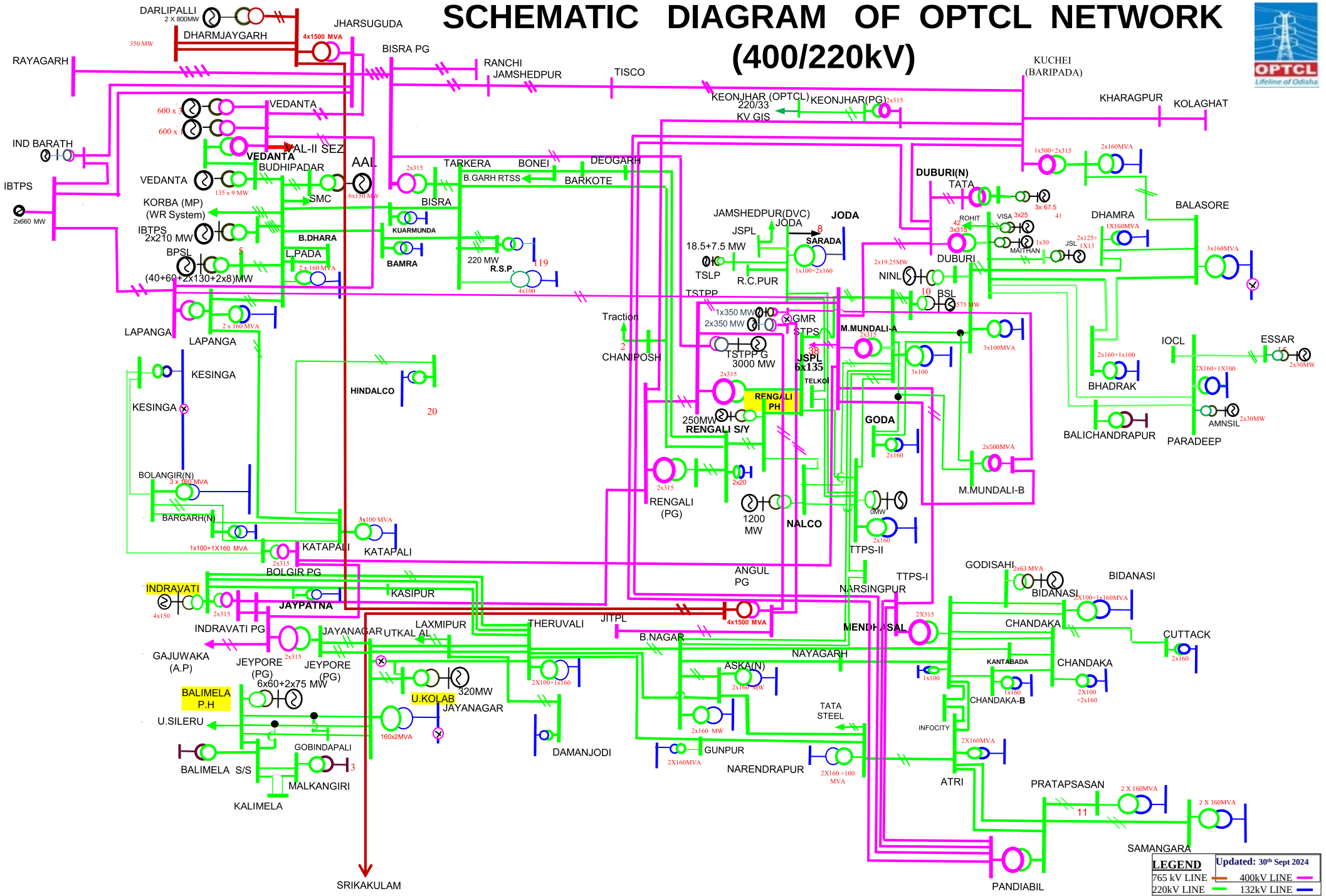
31.10.2019

OPTCL INTER-CONNECTED SYSTEM



31.10.2019

SCHEMATIC DIAGRAM OF OPTCL NETWORK (400/220kV)

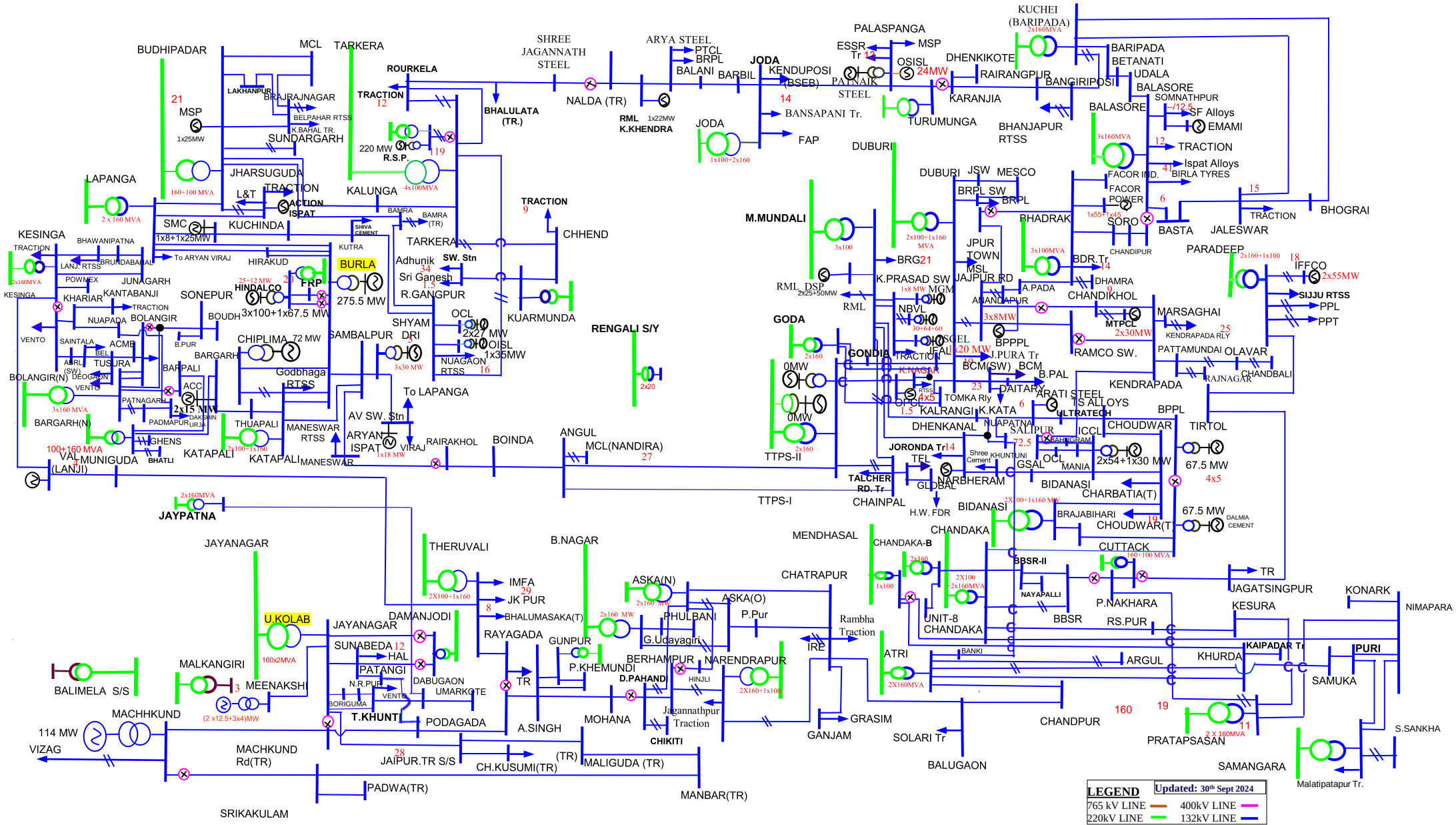


LEGEND — Updated: 30th Sept 2024

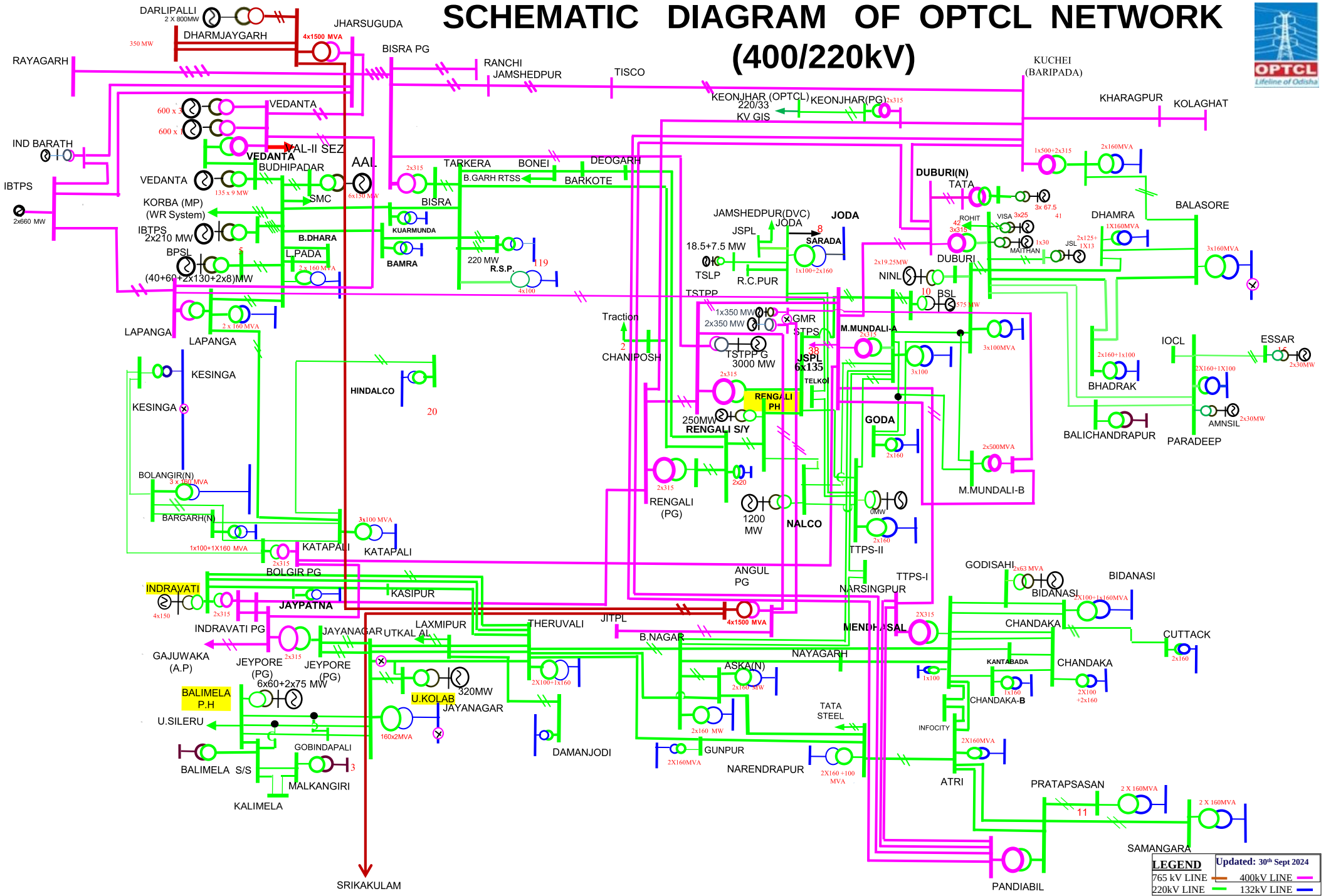
765 kV LINE — 400kV LINE

220kV LINE — 132kV LINE

SCHEMATIC DIAGRAM OF OPTCL NETWORK (132kV)



SCHEMATIC DIAGRAM OF OPTCL NETWORK (400/220kV)

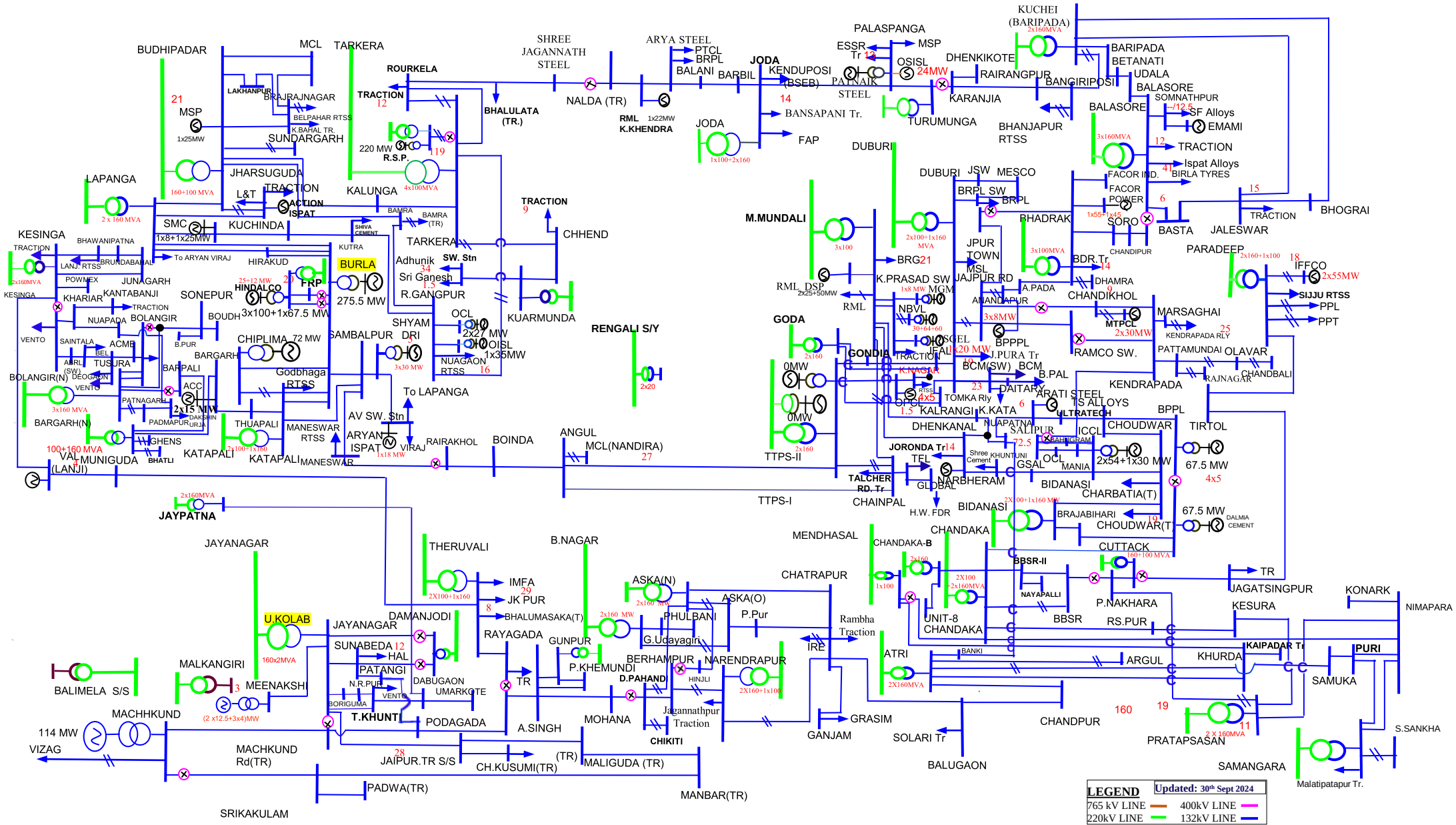


LEGEND — Updated: 30th Sept 2024

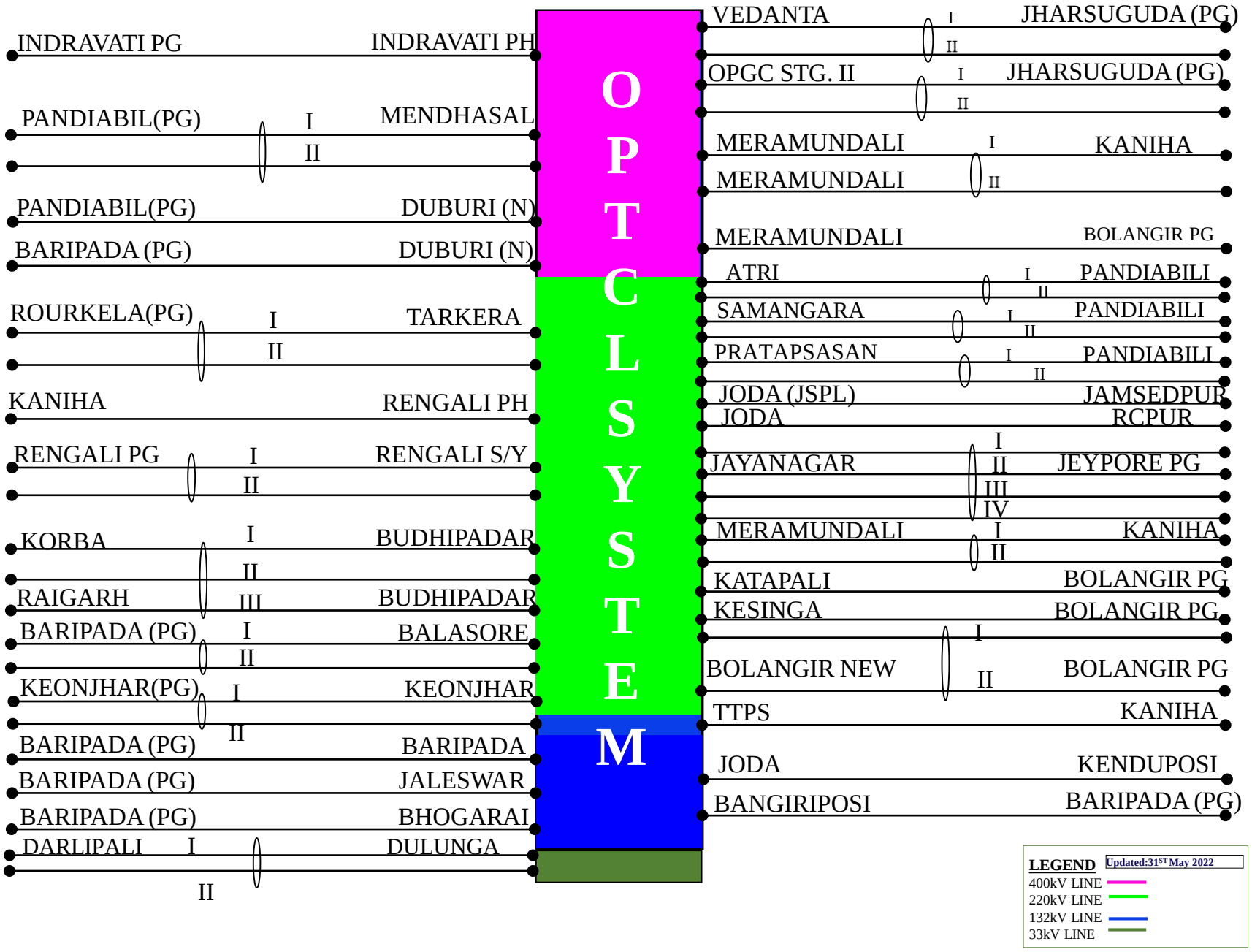
765 kV LINE — 400kV LINE

220kV LINE — 132kV LINE

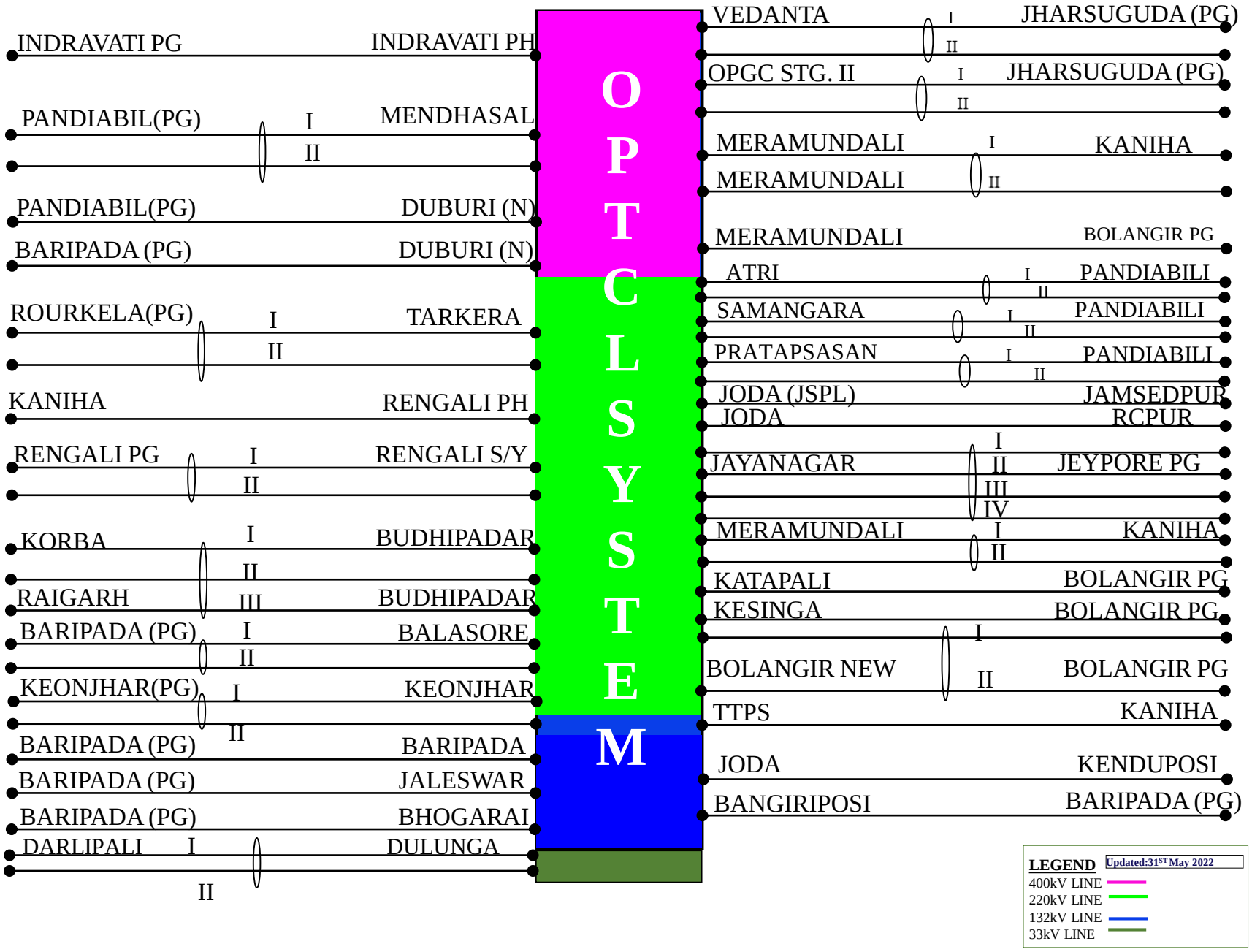
SCHEMATIC DIAGRAM OF OPTCL NETWORK (132kV)

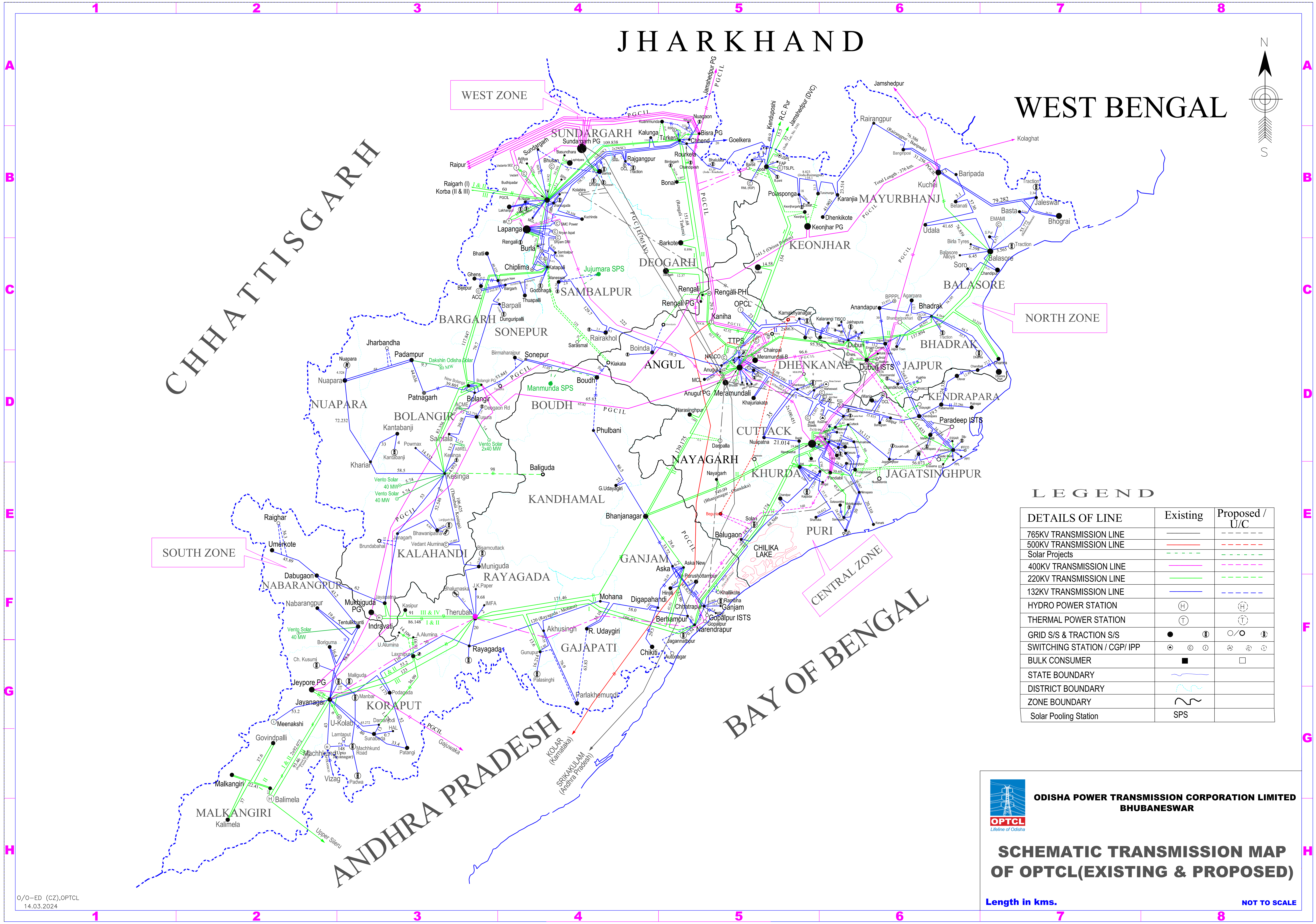


POWER EXCHANGE POINTS OF OPTCL SYSTEM



POWER EXCHANGE POINTS OF OPTCL SYSTEM





L E G E N D

DETAILS OF LINE	Existing	Proposed / U/C
765KV TRANSMISSION LINE		
500KV TRANSMISSION LINE		
Solar Projects		
400KV TRANSMISSION LINE		
220KV TRANSMISSION LINE		
132KV TRANSMISSION LINE		
HYDRO POWER STATION	H	H
THERMAL POWER STATION	T	T
GRID S/S & TRACTION S/S		
SWITCHING STATION / CGP/ IPP	C I	C I
BULK CONSUMER		
STATE BOUNDARY		
DISTRICT BOUNDARY		
ZONE BOUNDARY		
Solar Pooling Station	SPS	

ODISHA POWER TRANSMISSION CORPORATION LIMITED
BHUBANESWAR

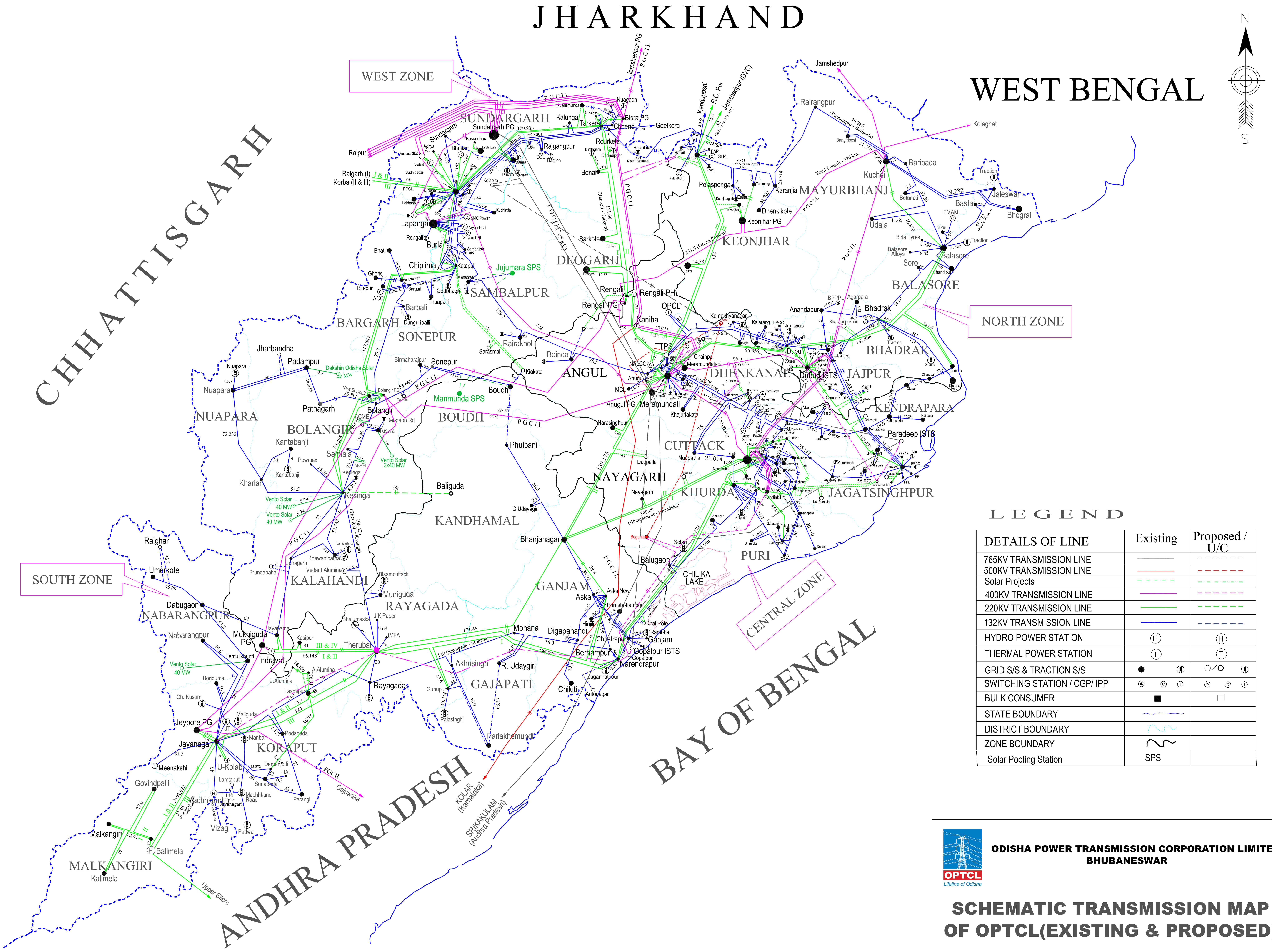
OPTCL
Lifeline of Odisha

SCHEMATIC TRANSMISSION MAP OF OPTCL(EXISTING & PROPOSED)

Length in kms.

NOT TO SCALE

BW



LEGEND

DETAILS OF LINE	Existing	Proposed / U/C
765KV TRANSMISSION LINE		
500KV TRANSMISSION LINE		
Solar Projects		
400KV TRANSMISSION LINE		
220KV TRANSMISSION LINE		
132KV TRANSMISSION LINE		
HYDRO POWER STATION	H	H
THERMAL POWER STATION	T	T
GRID S/S & TRACTION S/S		
SWITCHING STATION / CGP/ IPP	C I	C I
BULK CONSUMER	■	□
STATE BOUNDARY		
DISTRICT BOUNDARY		
ZONE BOUNDARY		
Solar Pooling Station	SPS	

ODISHA POWER TRANSMISSION CORPORATION LIMITED
BHUBANESWAR

OPTCL
Lifeline of Odisha

SCHEMATIC TRANSMISSION MAP OF OPTCL(EXISTING & PROPOSED)

Length in kms.

NOT TO SCALE

O/O-ED (CZ),OPTCL
14.03.2024

BW

Calculation of NPV and IRR : For 2X100 MVA, 220/33KV Sub-Station at Landeihill

CoC (%) =	70%	x	8.03	+	30%	x	15.50	Average	6.580		RoI on Loan P.a		=	7.75		IRR =	14.51%																										(Rs. in Crores)
Particulars	**Constuction Period**			**Benefits Period**																																								**Total**
Financial Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	
Cash Inflow (CI)																																											
Equity	3.80	8.55	6.65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19.00
Loan(Principal)	8.86	19.95	15.51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44.32
Loan (Interest)	0.71	2.31	3.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.58
Revenue	-	-	-	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	7.61	266.40
Salvage Value	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.99	6.99
Total (CI) - (A)	**13.37**	**30.81**	**25.72**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**7.61**	**14.60**	**343.29**
Cash Outflow (CO)																																											
CWIP	12.66	28.50	22.16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	63.32
IDC	0.71	2.31	3.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.58
Loan Repayment	-	-	-	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	4.24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.90
Interest on Loan	-	-	-	3.92	3.58	3.24	2.90	2.55	2.21	1.87	1.53	1.19	0.85	0.51	0.17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.52
R&M exp. @ 3 % PC	-	-	-	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	73.50
Total (CO) - (B)	**13.37**	**30.81**	**25.72**	**10.26**	**9.92**	**9.58**	**9.24**	**8.89**	**8.55**	**8.21**	**7.87**	**7.53**	**7.19**	**6.85**	**6.51**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**2.10**	**218.82**
Net Cash Inflow (A-B)	**-**	**-**	**-**	**(2.65)**	**(2.31)**	**(1.97)**	**(1.63)**	**(1.28)**	**(0.94)**	**(0.60)**	**(0.26)**	**0.08**	**0.42**	**0.76**	**1.10**	**5.51**	**5.51**	**5.51**	**5.51**	**5.51**	**5.51**	**5.51**	**5.51**	**5.51**	**5.51**	**5.51**	**5.51**	**5.51**	**5.51**	**5.51**	**5.51**	**5.51**	**5.51**	**5.51**	**5.51**	**5.51**	**5.51**	**12.50**	**124.47**
DF @ CoC	*1.000*	*0.938*	*0.880*	*0.826*	*0.775*	*0.727*	*0.682*	*0.640*	*0.601*	*0.564*	*0.529*	*0.496*	*0.465*	*0.437*	*0.410*	*0.384*	*0.361*	*0.338*	*0.318*	*0.298*	*0.280*	*0.262*	*0.246*	*0.231*	*0.217*	*0.203*	*0.191*	*0.179*	*0.168*	*0.158*	*0.148*	*0.139*	*0.130*	*0.122*	*0.115*	*0.107*	*0.101*	*0.095*	
Net Present value(NPV)	**-**	**-**	**-**	**(2.19)**	**(1.79)**	**(1.43)**	**(1.11)**	**(0.82)**	**(0.57)**	**(0.34)**	**(0.14)**	**0.04**	**0.20**	**0.33**	**0.45**	**2.12**	**1.99**	**1.86**	**1.75**	**1.64**	**1.54**	**1.44**	**1.36**	**1.27**	**1.20**	**1.12**	**1.05**	**0.99**	**0.93**	**0.87**	**0.82**	**0.77**	**0.72**	**0.67**	**0.63**	**0.59**	**0.56**	**1.19**	**19.71**

**

CoC - Cost of Capital
IDC- Interest During Construction
CWIP- Capital Work in Progress
DF- Discounting Factor
IRR- Internal Rate of Return
ARR- Average Annual Rate of Return