

**BEFORE THE ODISHA ELECTRICITY REGULATORY COMMISSION,
BIDYUT NIYAMAK BHAWAN.
PLOT No-4, CHUNOKOLI, SHAILASHREE VIHAR, BHUBANESWAR-751021**

Case No: 98 /2022

IN THE MATTER OF: Application for approval of Capital Investment Plan for the FY 2023-24 in the Licensed Area of TP Central Odisha Distribution Ltd:-**Supplementary Submission**

And

IN THE MATTER OF: TP Central Odisha Distribution Ltd. (Formerly CESU), Corporate Office, Power House, Unit 8, Bhubaneswar- 751 012 represented by its Chief – Regulatory & Government Affairs.

.... Petitioner

IN THE MATTER OF: M/s GRIDCO, OPTCL, SLDC , Department of Energy, Govt. of Odisha and All Concerned Stakeholders.


.... Respondents

Affidavit

I, Puneet Munjal, aged about 59 son of late Jagdish Lal Munjal residing at Bhubaneswar do hereby solemnly affirm and say as follows:

1. I am the Chief-Regulatory & Government Affairs of TP Central Odisha Distribution Ltd., the Petitioner in the above matter and I am duly authorized to swear this affidavit on its behalf.
2. The statements made in the submission herein shown to me are based on information provided to me and I believe them to be true.

Bhubaneswar.
Dated: 04.05.2023


NILAMANI BHATTACHARYA
NOTARY PUBLIC
GOVT. OF ODISHA (INDIA)
REGD. NO. DM-36/2019


Chief-Regulatory & Government Affairs



File No TPCODL/Regulatory /2023/ 100
4th May, 2023

Secretary,
Odisha Electricity Regulatory Commission,
Bidyut Niyamak Bhawan
Plot No-4, Chunokoli,
Shailashree Vihar, Bhubaneswar-751021

Subject: Case 98 /2022 :- Supplementary Submission for Approval of the Capital Investment Plan for FY 2023-24

Dear Sir,

TPCODL has submitted its Capital Investment Plan of Rs. 512.37 Cr (excluding capitalization of Interest, Employee Cost and GRIDCO's contribution in kind) for FY 2023-24 vide its filing dated 22nd Dec 2022.

Pursuant to our Board approval of Capital Investment of Rs. 300 Cr (excluding capitalization of Interest, Employee Cost and GRIDCO's contribution in kind) for FY 2023-24, TPCODL made additional submission for approval of Capital Investment Plan of the Board approved amount i.e. Rs. 300 Cr. (excluding capitalization of Interest, Employee Cost and GRIDCO's contribution in kind) for FY 2023-24 vide filing dated 29th April 2023.

In our above filing dated 29th April 2023, we have prayed before the Hon'ble Commission to consider our original petition dated 22nd Dec 2022 for activities where there is no change in scope and amount.

For the sake of convenience and ease of reference, we have compiled relevant aspects of both submissions for the Board Approved amount of Rs. 300 Cr. into a single document, which we are submitting through this filing.

We trust our submission is in order.

Yours faithfully

For **TP Central Odisha Distribution Limited**

(Puneet Munjal)

Chief (Regulatory & Government Affairs)



Cc:

1. The Managing Director, GRIDCO, Janpath, Bhubaneswar-751022.
2. The Managing Director, OPTCL, Janpath, Bhubaneswar-751022.
3. The Principal Secretary to Government
Department of Energy,
Government of Odisha, 2nd Floor, Kharavel Bhawan,
Gopabandhu Marg, Kesharinagar, Bhubaneswar-751001.
4. The Chief Load Despatcher,
SLDC, SLDC Building, Mancheswar, Bhubaneswar-751077.

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Case No:98 /2022

IN THE MATTER OF: Application for approval of Capital Investment Plan for the FY 2023-24 in the Licensed Area of TP Central Odisha Distribution Ltd. – Supplementary Submission

And

IN THE MATTER OF: TP Central Odisha Distribution Ltd ,Corporate Office, Power House, Unit 8, Bhubaneswar- 751 012 represented by its Chief –Regulatory & Government Affairs.

.... Petitioner

IN THE MATTER OF: M/s GRIDCO, OPTCL, SLDC ,Department of Energy, Govt. of Odisha and All Concerned Stake Holders.

.... Respondents

1. Background for Submission of the Petition

In compliance with the directives stipulated in the Vesting Order dated 26.05.2020 as well as the applicable Odisha Electricity Regulatory Commission (Terms and Conditions for Determination of Wheeling Tariff and Retail Supply Tariff) Regulations ,TPCODL has submitted its Capital Investment Plan of Rs. 512.37 Cr. for FY 2023-24 vide its submission TPCODL/Regulatory/2022/204/9260 dated 22nd December 2022.

The Board of Directors in the meeting of 17th January 2023 have however approved Capital expenditure of Rs. 300 Cr (excluding IDC, Employee cost and GRIDCO's Contribution in kind) for FY 2023-24.

In view of the above, TPCODL made a further submission vide filing dated 29th April 2023 for approval of capital investment plan of the Board approved amount i.e. Rs. 300 Cr against the earlier submitted capex plan of Rs. 512.37 Cr for FY 2023-24 . The Table below depicts the revised capex being sought against the earlier submission dated 22.12.2022.

In our above filing dated 29th April 2023, we have prayed before the Hon'ble Commission to consider our original petition dated 22nd Dec 2022 for activities where there is no change in scope and amount.

For the sake of convenience and ease of reference, we have compiled relevant aspects of both submissions for the Board Approved amount of Rs. 300 Cr. into a single document, which is provided in the **Appendix**.

Table: Revised Capital Investment Plan for FY 2023-24

Main Budget head	Activity planned	As submitted in Filing dated 22.12.2022	Revised capex as per Board approval
Safety & Statutory	Safety & Security arrangement at Critical locations	₹ 0.25	0.25
	Testing Equipment for STS	₹ 5.00	3
	Interposing Pole	₹ 4.00	3.25
	Fencing / Boundary Wall / DT plinth	₹ 8.00	5
	Unsafe to Safe	₹ 5.00	4.5
	Safety & Statutory	22.25	16
Loss reduction	Defective Cable Replacement	₹ 9.46	5
	33KV & 11kv Feeder Metering for Energy Accounting	₹ 13.44	10
	Conversion of LT Bare to LT AB Cable	₹ 40.00	20
	Loss reduction	62.90	35
Reliability	SCADA Enablement of 60 Nos. of 33/11 kV Primary Substations	₹ 8.95	8
	FRTUs and Communication for RMU	₹ 1.62	1
	GSAS Implementation	₹ 25.00	13.75
	Weather stations installation and central integration with data accumulation and analytics	₹ 0.25	0.25
	Replacement of Sick Equipment	₹ 10.00	5
	Installation of Micro Grid (5 Nos)	₹ 5.00	3
	LVRT (10 Nos)	₹ 3.50	4
	Capacitor Bank Installation for Reactive Power compensation	₹ 1.00	1
	33KV Network Infrastructure	₹ 113.51	45
	11KV Network Infrastructure	₹ 50.00	22
	AR/FPI/MCCB/RMU	₹ 23.00	13
	33KV Feeder Refurbishment	₹ 24.00	7
	Earthling	₹ 1.00	1
	Reliability	266.83	124
Load Growth	New Connection Release	₹ 20.00	10
	Power Transformer Augmentation	₹ 35.48	30
	DT Augmentation	₹ 20.00	10
	Load Growth	75.48	50.00

Main Budget head	Activity planned	As submitted in Filing dated 22.12.2022	Revised capex as per Board approval
Infrastructure	Call Management System for PSCC	₹ 1.00	1
	:- APSCC Modernization work for 23 APSCC at all Divisions	₹ 1.50	1
	IT - Software, User & Storage Devices, Back up system, Applications	₹ 12.11	11
	Server Room PAC & BMS	₹ 29.84	25
	Civil Works at various stores	₹ 23.99	21
	RMU / DT Workshop	₹ 1.63	1.2
	GIS Implementation	₹ 13.00	13
	Ready to Use Admin Asset	₹ 1.84	1.84
	Infrastructure	84.91	75.04
	Grand Total	512.37	300.04

The above capex is hard cost only i.e. excluding Interest During Construction (IDC), Capitalization of Employee Cost and GRIDCO's contribution in kind which is in addition to the above.

Prayers

TPCODL prays that the Hon'ble Commission may kindly be pleased to:

1. For the sake of convenience and ease of reference, the single document (prepared by compiling relevant aspects of both our earlier submission dated 22.12.2022 and 29.04.2023) submitted in this filing may kindly be referred to for approval of Capital Investment Plan of Rs. 300 Cr (Hard Cost Only) for FY 2023-24.
2. Allow Employee Cost and Interest during Construction based on actuals to be capitalised over and above the Capex (Hard Cost) for FY 2023-24.
3. Permit Carrying forward of the unspent Capital Expenditure approved for the previous years.
4. Permit making additional submission required in this matter.
5. Grant any other relief as deemed fit and proper in the facts and circumstances of the case.
6. Any other direction as the Hon'ble Commission may think appropriate.
7. Condone any delay in submission.

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1.1. Need for Capital Expenditure

TPCODL receives electrical power at 33KV level from 58 numbers of 220/33KV and 132/33KV transmission substations located within and in the vicinity of TPCODL operational area. TPCODL distributes the power at 33KV / 11KV / 440V / 230V depending on the demand of the consumers.

Capital investment is required to improve Power supply reliability, reduce the AT&C losses, ensure the safety and security of network, make the network adequate enough to cater the load growth and implementation of the technology to bring process efficiency in the operations. Further, other infrastructure inherited by the Company viz. Office, Stores, Customer Care/Service Centres etc. require significant refurbishment.

In view of achieving the above objectives, the TPCODL has been framing its Capex Investment plan, which is based upon the following need/requirements:

1. **Statutory & Safety** – Investment required for addressing unsafe conditions and making the network statutory compliant. This covers Refurbishment jobs, set up of safety culture through PPEs and testing equipment.
2. **Loss Reduction** – Investment required for taking initiatives to improve Billing or collection efficiency or reducing the technical Losses in the network. This includes Energy auditing, LT Bare to AB Cable and Defective cable replacement.
3. **Reliability** – Investment required to improve the Reliability and Quality of Power Supply by taking various initiatives like Feeder addition / augmentation, Transformer addition / augmentation and N-1 redundancy etc.
4. **Load Growth** – Investment is required to meet the Load Growth in the network and making the network future ready. This includes Augmentation / Addition of Feeder, Transformers etc.
5. **Technology and Infrastructure** – Investment related to technology adoption and strengthening of various infrastructure to improve internal as well as external customer satisfaction. This includes IT infrastructure, GIS implementation, Civil infrastructure, Transformer Workshop and Admin assets.

As explained in our earlier petitions, TPCODL has identified a number of other challenges related to Metering infrastructure, Customer Services, and Technology usage. These challenges are planned to be addressed through a systematic investment plan prepared by TPCODL, a part of which was proposed by TPCODL for FY 2020-21 in the petition filed in Case



No 32 of 2020, Case 05 of 2021 for FY 2021-22 and also in the petition filed in Case 14 of 2022 and Case 51 of 2022 for FY 2022-23.

Tata Power has been an early implementer of latest technology in India and has perhaps most number of standalone and integrated technology platforms in use. These technologies have been instrumental in improving the overall performance of the company and been able to deliver benefit in terms of lowering losses and improving reliability and better management of business and consumers.

TPCODL considers customers as its most important stakeholders. Hence, it has prepared its strategy to create value for the customers by improving the reliability of supply for better customer experience. So, Capex intervention is required to reinforce the network to enhance the useful life of assets and bring in new technology.

The proposed Capex plan represents a justified and efficient level of total capital investment estimated by TPCODL to meet its service obligation ensuring safe and reliable network, maintaining high level of service standards and to provide customer services at benchmark level through process improvement, capacity building and technology adoption.

1.2. Status of Capex and Capitalization against Capex approved by the Hon'ble Commission for FY 2020-21 , FY 2021-22 and FY 2022-23

The Hon'ble Commission has approved Capex of Rs.280.63 Cr for FY 2020-21 in its order dated 08.09.2020. For FY 2021-22, the Hon'ble Commission has approved a Capex of Rs.298.73 Cr in its order dated 18.09.2021. For FY 2022-23, the Hon'ble Commission has approved a Capex of Rs. 243.31 Cr vide order dated 19.07.2022. Further a supplementary capex of Rs. 137.25 Cr was approved vide order dated 16.12.2022 . The status of project progress against the Capex approved for FY 2020-21 , FY 2021-22 and FY 2022-23 as on 30.09.2022 and total estimated till 31.03.2023 is as provided in table below.

Table: Actual Status as on 30.09.2022 against Capex approved for FY -21 , FY-22 & FY-23 (Rs Cr)

Sr No	Major Category	Capex approved for FY 2020-21	Capex approved for FY 2021-22	Capex approved for FY 2022-23	Total Cumulative Approved till FY-2022-23	Total Actual Capex till H-1 FY-23	Estimated Capex in H-2 FY-23	Total estimated Capex till 31.03.2023
1	Statutory and Safety	68.17	17.59	17.66	103.42	82.77	20.91	103.69
2	Loss Reduction	39.63	67.36	52.85	159.84	46.93	102.56	149.49
3	Reliability	72.48	114.42	131.63	318.53	161.78	95.69	257.47
4	Load Growth	9.00	30.52	118.26	157.78	29.52	30.00	59.52
5	Technology & Infrastructure	91.35	68.84	60.16	220.35	111.36	93.48	204.84
	Total	280.63	298.73	380.56	959.92	432.36	342.64	775.00

As mentioned above, TPCODL estimates cumulative Capital Expenditure of Rs. 775 Cr. by end of FY 23 against the Capex approval of Rs.959.92 Cr. in various Capex Approval Orders upto FY 23, leaving a gap of Rs. 185 Cr. However, it is worthwhile to point out that TPCODL has also incurred substantial capex under various Government Schemes Fani, Elephant corridor etc.

It is submitted that TPCODL is working towards bridging this gap of Rs. 185 Cr. (Rs. 960 Cr. (Approved) – Rs. 775 Cr. (Estimated) We wish to bring to the notice of the Hon'ble Commission that part of the lag is due to the prevalence of COVID in the initial year together with approval for Capex being received towards the latter part of the year, together with spill- over of Projects to subsequent year.



1.3. Summary of the Capital Expenditure for FY 2023-24

TPCODL in line with the philosophy adopted for FY 2020-21, FY 2021-22 and FY 2022-23 has considered Capital Expenditure under five different heads:

- a) Statutory and Safety
- b) Loss Reduction
- c) Reliability
- d) Load Growth and
- e) Development of Infrastructure.

The summary of the Capex planned for FY 2023-24 (only Hard Cost i.e. without considering Employee Costs capitalized , Interest during Construction and GRIDCO's Contribution in kind) is as summarized below

Table 1-1: Summary of Capex plan for FY 2023-24 (only Hard Cost i.e. without considering Employee Cost ,IDC capitalization & GRIDCO's Contribution in kind)

Main Budget head	Activity planned	Capex Plan as per Board approved amount
Safety & Statutory	Safety & Security arrangement at critical locations	0.25
	Testing Equipment for STS	3
	Interposing Pole	3.25
	Fencing / Boundary Wall / DT plinth	5
	Unsafe to Safe	4.5
	Safety & Statutory	16
Loss reduction	Defective Cable Replacement	5
	33KV & 11kv Feeder Metering for Energy Accounting	10
	Conversion of LT Bare to LT AB Cable	20
	Loss reduction	35
Reliability	SCADA Enablement of 50 Nos. of 33/11 kV Primary Substations	8
	FRTUs and Communication for RMU	1
	GSAS Implementation	13.75
	Weather stations installation and central integration with data accumulation and analytics	0.25
	Replacement of Sick Equipment	5
	Installation of Micro Grid (5 Nos)	3
	LVRT (10 Nos)	4
	Capacitor Bank Installation for Reactive Power compensation	1
	33KV Network Infrastructure	45
	11KV Network Infrastructure	22
	AR/FPI/MCCB/RMU	13
	33KV Feeder Refurbishment	7
	Earthing	1
	Reliability	124
Load Growth	New Connection Release	10
	Power Transformer Augmentation	30
	DT Augmentation	10
	Load Growth	50.00
Infrastructure	Call Management System for PSCC	1
	:- APSCC Modernization work for 15 APSCC at all Divisions	1
	IT - Software, User & Storage Devices, Back up system, Applications	11
	Server Room PAC & BMS	25
	Civil Works at various stores	21
	RMU / DT Workshop	1.2
	GIS Implementation	13
	Ready to Use Admin Asset	1.84
	Infrastructure	75.04
	Grand Total	300.04



1.4. Employee Costs and Interest During Construction to be capitalised

It is submitted that Employee Cost associated with the projects or capex schemes would also form a part of the Capex and would be eventually capitalized with the capital expenditure scheme. We wish to submit that the cost towards Employees working on such projects would be separate i.e in addition to the amount that is approved by the Hon'ble Commission under this petition.

Similarly, the Interest During Construction (IDC) is required to be worked out on the Debt Component (70%) of the Capex. The same would depend on the quantum of the capital expenditure spread during the year and hence the estimation has not been made at present in this petition. However we wish to submit that Interest During Construction amount would need to be added in addition to Hard Cost and Employee Cost to be capitalised.

2 Annual Capex Plan

2.1 Safety and Statutory

The proposed budget for Safety & Statutory under CAPEX FY 23-24 is Rs 16 Cr. The details of the same are as given in the table below:

Table 2-1: Capital Expenditure Safety and Security

Main Budget head	Activity planned	FY 23-24 (Rs. Cr)
Safety & Statutory	Safety & Security arrangement at critical locations	0.25
	Testing Equipment for STS	3.00
	Interposing Pole	3.25
	Fencing / Boundary Wall / DT plinth	5.00
	Unsafe to Safe	4.50
Safety & Statutory		16.00

The description of the various schemes are as under

2.1.1 Safety & Security Arrangement at various locations

Scheme Proposed	A. CCTV Installation, Racking system Installation B. Access control system for PSCC
Capex Amount	₹ 0.25 Cr
Benefit to customer	Safety & security of materials at stores

A. CCTV Installation, Racking System Installation

Sl. no.	Activity Points	Justification
1.	Installation of CCTV at all stores.	For proper watch and ward, safety, security and monitoring of all high value items, also to avoid the risk of theft/burglary CCTV installation is necessary at all stores.

2.	Racking system at Choudwar & Bhubaneswar Store.	Due to space constraint we are not able to keep meters & meters box, jointing kit etc. within available space inside the store. As these items cannot be kept in open space. Racking system is required for proper storage of these indoor items.
	Cost Estimate	Rs. 0.1 Cr

B. Access control system for PSCC

Scheme Proposed	Implementation of access control system for PSCC for controlling unauthorized access
Capex Amount	₹ 0.15 Cr
Benefit to customer	<ul style="list-style-type: none"> • Critical power supply arrangements would be controlled by group of pre-approved individuals • Employee safety during public unrest, mob, etc. • Record of entry and exit of all personnel in PSCC

Existing System

TPCODL has 374 nos. of 33/11 kV Primary substations (PSS) out of which 105 nos. are controlled remotely via SCADA from Power System Control Centre (PSCC). Also, another 100 nos. of PSS are planned to operate from PSCC SCADA system. This makes PSCC a vital installation of TPCODL License area from where entire power system is managed. Currently, there is no mechanism to restrict unauthorized access to PSCC.

Need of the Project

As PSCC acts as a nerve centre of TPCODL, it is imperative that such vital installation be accessible to only group of approved individuals in order to avoid any unfavourable circumstance or any unnecessary disruption.

Proposed Scheme

Since there is no mechanism to check unauthorized access to PSCC currently, it is proposed to develop an access control system specifically for PSCC to avoid unauthorized entry.

Scope of Proposal

The scope of this proposal includes implementation of access control system for PSCC for

controlling unauthorized access and to protect PSCC desk engineers during unfavourable scenarios like public unrest, mob, etc.

Cost Estimate with Execution Timelines

Cost estimate: **Rs. 0.15 Cr.**

Proposed System after Implementation

With implementation of access control, PSCC will have entry to only preapproved employees and limit the access to external public.

2.1.2 Testing Equipment for STS

Scheme Proposed	Procurement of standardized testing kits/equipment, calibration of the kits, distribution of the kits to each EMR office and providing training wherever required.
Capex Amount	₹ 3.00 Cr
Benefit to Consumer	<ul style="list-style-type: none"> • Reliable and Quality power supply to the consumers • Reduction of frequent tripping • Downtime will reduce due to fast response in diagnosis of problem and reduced downtime

• Background

TPCODL has been agile in the adoption of latest technology in the power utility sector. Together with its culture of Consumer Service Excellence, Continuous Learning, Performance Orientation, Innovation and Empowerment; we are eager to set benchmarks in accelerated reduction of AT&C losses, improve power reliability, enhance consumer satisfaction and improve employee productivity.

Testing of electrical equipment is one of the major job of a power distribution utility. Testing decides healthiness of equipment with the passage of time.

• Business Objective

After taking over the electricity distribution business from erstwhile CESU, one of the major operational challenge in front of TPCODL was to provide uninterrupted power supply. The expectation of consumers' kept on rising continuously with the improvement in power reliability over period of time. Meeting the regulatory targets of improving AT&C loss along

with reliability and safety improvement is also one of the foremost requirement of TPCODL.

- **Justification**

TPCODL has a wide operational area of 30,000 Sq. Km, consisting of 5 Electrical circles & 20 Divisions. We have nearly 400 nos. of 33/11kV substations with nearly 1200 nos. of PTRs along with 4200+ protective relays. Our jurisdiction has traditional as well as modern substation. The oldest substations are as old as 50years that has either electromagnetic or static type of relay.

The broader periphery requires large number of testing kits for smooth operation of the utility. However, we have only two locations for the storage of equipment testing kit in Bhubaneswar & Cuttack. We have very few numbers of working testing kits (54 nos. of defective testing equipment). Lesser number of testing equipment has impacted our swift responses in breakdown cases and thus resulted in consumer dissatisfaction along with unreliability and poor quality of power. Few of those kits are old, traditional and heavier in the range of 10-15 kg. Transportation of the heavy kits is one of the major concerns during the exigency breakdown condition. Due to presence of mechanical and electrical parts, there are few instances when long transportation has caused problems in the circuit because of damping and vibration.

Additionally, persisting fault in a network may cause failure of equipment and it is a major safety concern for lives. In the past, we were forced to charge the equipment in a hurry due to public agitation in the odd hours, which is also one of the major safety concern.

- **Proposed Solution**

Advanced testing kits will be provided at decentralized locations for better and quick response in the case of exigency. Enough amount of testing equipment will help us to monitor the healthiness of power equipment throughout the year. It will also help to take proactive initiatives in case of abnormalities in the trend of healthiness.

- **Scope of the Proposal**

Under the scope of proposal we plan to purchase standardize testing kits/equipment, calibration of the kits, distribution of the kits to each EMR office and provide training wherever required. We had estimated that for smooth functioning of TPCODL network in an ideal situation, we need testing equipment of 20.13 crore. But at the same time with maturity of the



system as well as manpower skill enhancement we need high end testing kits. TPCODL in an endeavour to implement new technologies in testing field as well, has decided to break this budget in several years so as to phase this expenditure. In FY 20-21 we got a budget of 4.71 crore, in FY 21-22 we got no budget for testing equipment. In FY 22-23 we got a budget of 2.51 crore for testing equipment. So in FY 23-24 we appeal for a budget of 3 crore.

- **Cost Estimate and Execution Timelines**

Table 2-2 : Testing kit to be purchased in FY 2023-24

Testing equipment	Unit price	Qty	Total Rs
Tan delta Testing kit	2650000	1	2650000
CRM kit	144491	2	288982
Timer kit	93364	2	186728
IR testing kit	81674	50	4083700
industrial grade laptops	200000	2	400000
WRM	292373	4	1169492
TTR	222881	3	668643
Leakage current meter (DC)	15000	10	150000
AC clamp on meter	12000	75	900000
Tool kit	14500	20	290000
Multi meter	11900	25	297500
Low end thermovision camera	68000	10	680000
Oil PPM Test Kit	51920	1	51920
Galvanometer	1000	2	2000
Disolve Gas Analyzer Test Kit	5000000	1	5000000
Earth Resistance Tester	8968	50	448400
Man lifter	4350000	2	8700000
Drone	2000000	2	4000000
			29967365

• Proposed System after Implementation

There are few benefits from this scheme:

1. Downtime will reduce due to fast response in diagnosis of problem
2. Reduction in ENS due to reduction in downtime.
3. Reliability improvement of the network.
4. Enhanced consumer delight due to improved reliability.
5. Reduction in overall equipment failure.
6. Employee satisfaction due to reduction in repeated calls.
7. Ease of monitoring of power equipment healthiness.
8. Continuous monitoring of equipment will lead to enhanced lifecycle of equipment.

Additionally, it is proposed to bring the technological interventions in the area of safety to reduce the risk of fall from height while carrying out the work on the poles for trimming of the trees. It is proposed to procure 2 numbers of man lifters to carry out the height work. The man lifter will be provided to the circles of TPCODL in phase manner.

TPCODL has always been at the forefront to adopt new technologies for Improvement of existing conditions, in line to the same, it is proposed to Procure Drone Technology, as a pilot project for various operational applications.

2.1.3 Interposing Poles

Scheme Proposed	It is proposed to erect intermediate poles to ensure safety and reliable power supply to end consumers.
Capex Amount	₹ 3.25 Cr
Benefit to customer	To ensure safety and reliable power supply to end consumers

Existing System

TPCODL spanning over a geographical area of 29,354 sq.km has a vast network having 33kV network of 3717 Ckm, 11kV network of 35719 Ckm & LT network of 53914 Ckm. 8m, 9m & 11m PSC poles as well as WPB poles are used majorly in the existing network. There have been several irregularities in the span length of these networks where the span length ranges from 70mtr to more than 100mtr at some places. These large span lengths have resulted in:

- 1) Sagging of conductors,
- 2) Low ground clearances - vertical clearance of conductor from ground is lower than the permissible limits of 5.5 m (for LT Lines) and 5.8 m (for HT Lines) and
- 3) Accidents due to sagging & low ground clearances.

Need of Project

To overcome such scenarios, where the span length is on the higher side and violates the safety and statutory guidelines, it is of utmost importance to provide intermediate poles in between the spans. Addition of intermediate poles will address the issue of sagging, low ground clearances & accidents caused due to this. Proper upkeep of the feeders is important for ensuring safety and reliability of power supply. During site visits, it was observed that most of the 33kV / 11kV / LT feeders are in deteriorated condition and pose safety threat to the human beings and animals. Most of the feeders have binding wire / multiple joints. As a result, there are chances of snapping of conductors and subsequent electrocution of human beings / animals since cradle guards are not provided.

Tree branches / creepers are exposed to live conductors at many locations. Huge number of tripping have been reported on 33kV and 11kV feeders in the previous years. With poor condition of network and absence of maintenance activities, it is difficult for utility to ensure reliable and quality power supply to the end users. During site visits, it has been observed that conductor of different sizes are being used in different phases which limits the circuit capacity. Moreover, over sagged wires in 33kV or 11kV feeders are posing major threat to the lives of human beings and animals. At some places, due to re-construction / widening of roads, vertical/horizontal clearances of the feeders have been reduced. This is not only causing violation of statutory guidelines but also increasing the chances of accidents.

Proposal for CAPEX Investment

To ensure safety and cater reliable power supply to end consumers TPCODL proposes refurbishment of 33kV, 11kV and LV lines, i.e., installation of interposing poles in a phased manner emphasizing critical areas such as schools, hospitals, markets and other key installations of frequent human mobility. This is an ongoing activity for which capex is being sought in a phased manner.

Table 2-3 : Cost Estimate for Interposing Poles

Sl. No.	Description	Quantity	Amount
		(in nos.)	(in Rs. cr.)
1	13mtr WPB Poles	130	0.81
2	11mtr WPB Poles	320	1.63
3	9mtr PSC Poles	525	0.81
Total			3.25

Costing details are available in **Annexure – 1**.

Benefit

In many locations of transmission and distribution network of TPCODL, the span length is much more than standard limits as mentioned above. This leads to statutory violations of vertical clearances, as per guidelines.

With use of interposing poles at low clearance locations, statutory compliances will be met and hence safety of employee, public and animals will be enhanced, reducing the chances of electrocution.

2.1.4 Installation / Construction of DT Plinth, Boundary Wall and Fencing of DSS

Scheme Proposed	Installation of Boundary Wall Fencing, DT Plinth.
Capex Amount	₹ 5.00 Cr
Benefit to customer	Improving the safety of people & stray animals.

Existing System

Distribution Substations are located at various locations catering the power supply requirement to consumers. These are installed at various scattered locations along the road, public places, near the commercial areas etc. At many places, it was found that the condition of the Boundary wall of DSS are in a very poor and unsafe condition and DT plinth are in

deteriorated condition. This allows public and animals to have unattended access to the charged electrical equipment.

Need of Project

During the survey, it is observed that boundary walls or fencing and also transformer plinth is either damaged or not exists thus posing safety threat to stray animal and public at large. Ensuring safety of people & equipment is very important and hence is required to be attended on priority.

Proposal for CAPEX Investment

To ensure safety to end consumers TPCODL proposes construction of boundary wall/ fencing and plinth for the DSS wherever required in a phased manner.

Table 2-4 : Cost Estimate for DT plinth and fencing

Sl. No.	Description	Quantity (in Nos.)	Amount (in Rs. cr.)
1	DT Plinth (250kVA)	190	0.57
2	DT Plinth (500kVA)	160	0.64
3	Boundary Wall	160	1.856
4	Fencing	210	1.92
Total			5.0

Costing details are available in **Annexure – 2**.

Benefit

In many locations the boundary wall fencing and DT plinths throughout the network of TPCODL are in deteriorated condition. This leads to safety protocol violations and pose threat to public and animals which can have unattended access to charged electrical equipment resulting in accidents. With use of interposing poles at low clearance locations, statutory compliances can be met and hence safety of employee, public and animals will be enhanced, reducing the chances of electrocution.

2.1.5 Unsafe to Safe Location

Scheme Proposed	It is proposed for replacement of defective LT AB cable/ LT Bare conductor to new LT AB cable, replacement of HT conductors to ensure safety of humans and animals along with ensuring reliability of power supply to the end consumer.
Capex Amount	₹ 4.50 Cr
Benefit to customer	To ensure safety of humans and animals along with ensuring reliability of power supply to the end consumer

Existing System

TPCODL has a vast LT network of 53914 Ckm. This comprises of LT OH bare conductors, UG cables and LT AB cables. LT network plays important role of the power supply distribution system and spread across TPCODL licensed area for power distribution. There have been many LT Bare conductors and defective LT AB cables in the network, which result in accidents of common commuters in the area and animals. Insulation of LT AB cable degrades due to sun exposure.

The LT bare overhead lines and defective LT AB cables used are more prone to transient fault due to tree branch touching or any foreign particle falls on the line. Due to this, consumer experiences frequent faults.

Need of Project

To overcome such scenarios, where there are LT Bare overhead conductors and defective LT AB cables, it is of utmost importance to replace the same with new LT AB cables. Replacement with new overhead LT AB cable will address the issue of accidents caused due to this along with mitigation of overloading issues. Proper upkeep of the feeders is important for ensuring safety and reliability of power supply. During site visits, it was observed that there are many LT Bare overhead conductors and LT AB cables that are in defective condition, which pose safety threat to the human beings and animals. As a result, there are chances of less vertical clearances of conductors w.r.t ground and subsequent electrocution of human beings / animals.

It has been observed that LT Bare conductors and LT AB cables of different sizes are being used. This is not only causing violation of statutory guidelines but also increasing the chances of accidents.

Proposal for CAPEX Investment

To ensure safety and cater reliable power supply to end consumers TPCODL proposes replacement of LT Bare overhead conductors and defective LT AB cable with new LT AB cable in phased manner emphasizing critical areas such as schools, hospitals, markets and other key installations.

Table 2-5 : Cost Estimate for Unsafe to Safe Locations

Sl. No.	DESCRIPTION OF WORK	Unit	Quantity	Amount
			(in km)	(in Rs. cr.)
1	Conversion of LT Bare/ deteriorated LT AB Cable to LT AB Cable (4X95 sq.mm)	Km	9	0.81
2	Conversion of LT Bare/ deteriorated LT AB Cable to LT AB Cable (4CX70 sq.mm)	Km	14	1.12
3	Conversion LT Bare/ deteriorated LT AB Cable to LT AB Cable (4CX50 sq.mm)	Km	18	1.26
4	Conversion LT Bare/ deteriorated LT AB Cable to LT AB Cable (4CX35 sq.mm)	Km	14	0.8
5	Conversion LT Bare/ deteriorated LT AB Cable to LT AB Cable (2CX35 sq.mm+1CX35 sq.mm)	Km	11	0.46
Total			66	4.5

Costing details are available in **Annexure – 3**.

Benefit

By executing the proposals as made in this head, 415V network can be strengthened and we would be able to serve our consumers in much better way. Following benefits are envisaged from this investment:

1. Reliable Power supply to the consumers.
2. To avoid contact of LT Bare overhead conductors and defective LT AB cable due to degraded insulation with public and animals and avoid electrocution.

To improve the safety factor, minimize the accident risk, reduce the chances of fault & strengthen existing 415V network, it is suggested for replacement of LT Bare overhead conductors and defective LT AB cables with new LT AB cables. This in turn will help in providing reliable power supply for all consumers & stakeholders.

2.2 Loss Reduction

The Various schemes for loss reduction envisaged for FY 2023-24 is as follows:

Table 2-6 : Break up of Capital Expenditure under Loss Reduction

Main Budget head	Activity planned	FY 23-24 (Rs. Cr)
Loss Reduction	Damaged Service line replacement	₹ 5.00
	33KV & 11kv Feeder Metering for Energy Accounting	₹ 10.00
	Conversion of LT Bare to LT AB Cable	₹ 20.00
Total		35.00

2.2.1 Damaged Service Line Replacement

Scheme Proposed	Replacement of defective service cable
Capex Amount	₹ 5.00 Cr
Benefit to customer	<ul style="list-style-type: none"> Reliable power supply Safety of person

Existing system-

During various site visit and review of data base it has been seen that about 2 Lac meters are still electromechanical meters. More over all these mechanical meters are more than 10 years old and have already completed their useful life. The above issues are resulting into reduction in billing efficiency, high AT&C losses and thus hampers the collection efficiency. Further, it is also observed that, every year 50,000 to 1 Lac defective meters are identified. These meters also have cables with joints and they can become cause of electrocution and electricity pilferage.

Statutory compliance-

As per CEA (Installation and Operations of Meters) regulations 2006, Clause 4(1) and Clause 4(2), there should be No Mechanical Meter in utilities. Abstract of clause 4 (1) and (2) of CEA (Installation and Operations of Meters) regulations 2006. *Clause 4 (1) : All interface meters, consumer meters and energy accounting and audit meters shall be of static type. Clause 4(2)*



: The meters not complying with these regulations shall be replaced by the licensee on his own or on request of the consumer. The meters may also be replaced as per the regulations or directions of the Appropriate Commission or pursuant to the reforms programme of the Appropriate Government. Same is covered in OERC supply code 2019 clause no 97.

Proposal-

Based on the above condition, a budget of Rs.5.00 Cr has been requested for replacement of defective cables if a cable is identified as damaged or having joint on inspection by officers.

Cost estimate-

As per estimate Cost of Cables required or installation of meters. These cases are where the service line is already damaged or are having joints from where pilferage is possible.

Table 2-7 : Cost of cables

Cost of cable

Cable Size (Core * Sq mm)	Cable length -KM	Cost per unit (Rs) without GST	Rate of Installation / Replacement (Rs) without GST	Cost per unit (Rs)	Rate of installation (Rs)	Cost of Mat (Cr)	Cost of Inst (Cr)	Total Cost (Rs CR)
2*4	401	55.17	890.96	65.10	891.0	2.61	1.18	3.79
2*6	56	61.87	890.96	73.01	891.0	0.41	0.29	0.70
4*10	4.025	100.33	1104.29	118.39	1104.3	0.05	0.02	0.07
4*25	2	159.61	1120.75	188.34	1120.7	0.03	0.01	0.04
4*50	0.8424	250.00	1571	479.60	1571.0	0.04	0.00	0.04
4*95	0.5616	470.56	2219.44	479.60	2219.4	0.03	0.00	0.03
4*150	0.54	824.01	2219.44	732.10	2219.4	0.04	0.01	0.05
4*300	0.36	1378.62	3000.00	732.10	3000.0	0.03	0.00	0.03
4*2.5	1	117.8	890.96	732.10	891.0	0.07	0.04	0.11
6*2.5	1	184.24	890.96	732.10	891.0	0.07	0.04	0.11
10*2.5	1.24	202.00	0.00	200.00	0.0	0.02	0.00	0.02
Grand Total	468					3.40	1.59	5.00

Total CAPEX under this Head: Rs.5.00 Cr.

Table 2-8 : Differential Cost of Service Line

Differential cost of Service Line									
Cable Size	Cost per Meter with GST (A) Rs / M	Length (B) (M)	Total Cost C=A*B (Rs)	Cable installation cost per length (D) (Rs)	Total cost of cable installation E=C+D (Rs)	Cost recovered upfront (F) (Rs)	Differential Cost G=(E-F) (Rs)	Count of Connections (H) Count	CAPEX Required (J) Rs in Cr
2C X 4 sq mm	65.1006	25	1627.515	653.76	2281.275	1500	781.275	80000	6.25
2C X 6 sq.mm	73.0066	25	1825.165	662.14	2487.305	2500	-12.695	20000	-0.03
Total									6.22

For Three Phase meters cost on actual will be considered.

2.2.2 Metering at Feeder level for Energy Accounting

Scheme Proposed	Procurement of Metering accessories, CT, PT, Breakers, Control cables etc
Capex Amount	₹ 10.00 Cr
Benefit to customer	Accurate Energy accounting & billing, customer satisfaction

Energy Accounting prescribes accounting of all energy inflows at various voltage levels in the distribution periphery of the network, including renewable energy generation and open access consumers, as well as energy consumption by the end consumers.

The Bureau of Energy Efficiency with the previous approval of Central Government, in The Gazette of India, has made the following regulations:

Bureau of Energy Efficiency (Manner and Intervals for conduct of Energy Audit in electricity distribution companies) Regulation 2021 on 06th Oct 2021.

As per the regulations, Distribution Companies shall:

- Ensure that all feeder wise, circle wise and division wise periodic energy accounting shall be conducted by the energy manager of the electricity distribution company for each quarter of the financial year;*
- Submit the periodic accounting report to the Bureau and State Designated Agency and also made available on the website of the electricity distribution company within 45 days from the date of the periodic accounting; and*

- c. Conduct an annual energy audit for every financial year, submit the annual energy audit report to the Bureau and respective State Designated Agency and also made available on the website of the electricity distribution company within a period of four months from the expiry of the relevant financial year.

Prerequisite for annual energy audit and periodic energy accounting includes:

- a. Installation of functional meters for all consumers, transformers and feeders
Provided that the meter installation is done in a phased manner within a period of three financial years (i.e. by FY 25) from the date of commencement of these regulations.

Further, going forward, we will be requiring CAPEX for maintenance (rectification/replacement) of faulty feeder meters in subsequent years.

- (i) energy flow between transmission and 33kV/11kV incoming distribution feeders(33kV Feeder Loss);
- (ii) Energy flow between 11 kV O/G Feeders to consumers (11kV Loss).
- (iii) Energy flow between distribution transformer to consumers (DT Loss)

A budget of Rs.10.00 Cr has been requested for metering at 33 and 11kV feeders including replacement of defective CTs/PTs/breakers, control cables etc., if same are identified as defective or not present on site on inspection by officers. Further, going forward, CAPEX will be required for maintenance of Metering system at Feeders level.

Table 2-9 : Cost Estimate -33 kv & 11 kv feeder metering for Energy Accounting

Items	Quantity	Cost per unit (INR)	Cost per unit (INR) including GST @18%	Total Material Cost (Cr.)	Per unit Installation cost (including transportation)	Total Installation Cost (Cr.)	Total Cost (Cr.)
1 Ph 11 KV I/D CT 400/1 A	4	30,000	35,400	0.014	7788	0.003	0.017
1 Ph 11 KV O/D CT 400/1 A	36	30,000	35,400	0.127	7788	0.028	0.155
1 Ph 33 KV I/D CT 200/1 A	32	30,000	35,400	0.113	7788	0.025	0.138
1 Ph 33 KV O/D CT	104	30,000	35,400	0.368	7788	0.081	0.449
10 core ,2.5 mmsq Control Cable (Mtrs.)	5594	240	283	0.158		0.000	0.158
11kV C/R Panel	20	3,00,000	3,54,000	0.708	77880	0.156	0.864
11KV DP structure	18	1,50,000	1,77,000	0.319	38940	0.070	0.389
11KV MU 100-50/5A	4	38,500	45,430	0.018	9994.6	0.004	0.022
11KV MU 200-100/5A	11	38,500	45,430	0.050	9994.6	0.011	0.061
11KV MU 400-200/5A	7	38,500	45,430	0.032	9994.6	0.007	0.039
19/25mmsq Cable gland	777	100	118	0.009		0.000	0.009
1Ph I/D 11KV PT	65	25,000	29,500	0.192	6490	0.042	0.234
1Ph O/D 11KV PT	160	35,000	41,300	0.661	9086	0.145	0.806
1Ph O/D 33KV PT	181	30,000	35,400	0.641	7788	0.141	0.782

Items	Quantity	Cost per unit (INR)	Cost per unit (INR) including GST @18%	Total Material Cost (Cr.)	Per unit Installation cost (including transportation)	Total Installation Cost (Cr.)	Total Cost (Cr.)
2 core ,2.5 mmsq Control Cable (Mtrs.)	1088	150	177	0.019		0.000	0.019
33kV OUTDOOR VCB	26	3,00,000	3,54,000	0.920	77880	0.202	1.123
33kV C/R Panel	21	3,00,000	3,54,000	0.743	77880	0.164	0.907
33KV DP structure	21	2,00,000	2,36,000	0.496	51920	0.109	0.605
33KV MU 200-100/5A	6	67,797	80,000	0.048	17600.1	0.011	0.059
33KV MU 400-200/5A	6	67,797	80,000	0.048	17600.1	0.011	0.059
33KV MU of Capacity 100/5A	7	74,119	87,460	0.061	19241.29	0.013	0.075
33KV MU of Capacity 200/1A	7	69,117	81,558	0.057	17942.77	0.013	0.070
33KV MU of Capacity 200/5A	4	67,797	80,000	0.032	17600.1	0.007	0.039
33KV MU of Capacity 400/1A	5	69,117	81,558	0.041	17942.77	0.009	0.050
33KV MU of Capacity 400/5A	10	67,797	80,000	0.080	17600.1	0.018	0.098
11KV MU of Capacity 11KV/110V,100/1A	4	30,664	36,184	0.014	7960.374	0.003	0.018
11KV MU of Capacity 11KV/110V,100/5A	4	38,500	45,430	0.018	9994.6	0.004	0.022
11KV MU of Capacity 11KV/110V,200/1A	7	30,664	36,184	0.025	7960.374	0.006	0.031
11KV MU of Capacity 11KV/110V,200/5A	7	38,500	45,430	0.032	9994.6	0.007	0.039
11KV MU of Capacity 11KV/110V,400/1A	7	30,664	36,184	0.025	7960.374	0.006	0.031
11KV MU of Capacity 11KV/110V,400/5A	8	38,500	45,430	0.036	9994.6	0.008	0.044
3Ph I/D 11KV PT	7	25,000	29,500	0.021	6490	0.005	0.025
3Ph I/D 33KV PT	13	30,000	35,400	0.046	7788	0.010	0.056
4 core ,2.5 sqmm Control Cable (Mtrs.)	6660	135	159	0.106		0.000	0.106
7 core Control Cable (Mtr.)	740	200	236	0.017		0.000	0.017
CT Junction box	7	7,000	8,260	0.006	1817.2	0.001	0.007
LA, EARTHING	4	2,000	2,360	0.001	519.2	0.000	0.001
Mounting Structure for PT	4	50,000	59,000	0.024	12980	0.005	0.029
Panel (7'X2')	39	15,000	17,700	0.069	3894	0.015	0.084
PT console box	11	7,000	8,260	0.009	1817.2	0.002	0.011
Smart Meter with Box -100/5A DT Meters (63kVA)	270	16,385	19,334	0.522	4253.546	0.115	0.637
Smart Meters 11kv	1069	8,055	9,505	1.016	2091.078	0.224	1.240
Smart Meters 33kv	246	8,055	9,505	0.234	2091.078	0.051	0.285
TB Disconnected	3996	50	59	0.024		0.000	0.024
TTB	222	404	477	0.011		0.000	0.011
TOTAL CAPEX				8.21		1.73	9.94

2.2.3 LT Bare to LT AB Cable Conversion

Scheme Proposed	It is proposed for replacement of LT bare conductor with LT AB Cable to ensure reduced direct 'hooking' done on bare LT conductor lines thereby reducing commercial losses drastically in theft prone areas.
Capex Amount	₹ 20 Cr
Benefit to Consumer	To ensure quality power supply to the consumers and reduction of frequent tripping and ensuring safety to public and animals.

Existing System

In power distribution, LT network plays an important role for power supply distribution system and it is spread across TPCODL licensed area for power distribution. The bare overhead used is more prone to transient fault due to tree branch touching or when any foreign objects fall on the line. Due to this, consumer experiences frequent fault and LT technical losses also increases. These bare conductor lines are subject to electricity theft through direct hooking and thus causing revenue leakage in the system. Through conversion of LT bare conductor to LT ABC, safety will be ensured and it will help TPCODL in maintaining the adequate clearance from consumer's premises.

Need of the Project

This is an ongoing project. Frequent tripping can be avoided by use of aerial bunched insulated cables instead of bare conductors. Theft of electricity through hooking will be reduced leading to lower AT&C losses. To avoid direct hooking, it is proposed to convert LT OH bare conductor into LT AB cable. This will help in eliminating the direct theft and thus protecting the revenue leakage.

Through the execution of this scheme, we are envisaging 8 MU reduction through theft of electricity in a year. By execution of this scheme, approximately 13200 span of LT bare conductor to be changed. If we take 5 hooking per span we will be able to remove and regularize approximately 0.6 Lakh hooking.

Statutory Compliance requirement

Hon'ble OERC had given target of AT&C loss reduction for TPCODL and the same has been mandated in vesting order. By implementation of aerial bunched insulated cables instead of bare conductors pilferage of electricity can be curtailed which subsequently helps in reduction of AT&C losses.

Cost Estimate

Table 2-10: Cost Estimate for Conversion for :LT bare to LT AB cable

Sl. No.	DESCRIPTION OF WORK	Unit	Quantity	Amount
			(in km)	(in Rs.Cr.)
1	Conversion of LT Bare to LT AB Cable (4X95 sq.mm)	Km	24	2.2
2	Conversion of LT Bare to LT AB Cable (4CX70 sq.mm)	Km	60	4.9
3	Conversion LT Bare to LT AB Cable (4CX50 sq.mm)	Km	104	7.2
4	Conversion LT Bare to LT AB Cable (4CX35 sq.mm)	Km	60	3.6
5	Conversion LT Bare to LT AB Cable (2CX35 sq.mm+1CX35 sq.mm)	Km	48	2.1
Total			296	20

Costing details are available in **Annexure – 4**.

Benefits

By executing the proposals as made in this head, 415V network can be strengthened and we would be able to serve our consumers in much better way. Following benefits are envisaged from this investment:

1. Reliable Power supply to the Consumers since bare conductor will be replaced into insulated cable.
2. Comparatively safer than the LT Bare conductor and eliminate the element of risk if comes in close proximity.
3. Simpler installation, as crossbars and insulators are not required.
4. Suitable for congested lanes as well.
5. Electricity theft becomes difficult as hooking would not be possible.
6. Maintenance required is less and necessary inspection of lines.

To improve the safety factor, minimize the safety accident risk, reduce the chances of fault and strengthen existing 415V network, it is suggested for replacement of overhead bare conductors with new aerial bundled cables. This in turn will help in providing reliable power supply for all consumers & stakeholders.

2.3 Reliability

The Various schemes under the head of Reliability envisaged for FY 2023-24 is as follows:

Table 2-11: Break up of Capital Expenditure under Reliability

Main Budget Head	Activity planned	FY 23 - 24 (Rs. In Crs)
Reliability	50 Nos. 33/11 kV PSS in FY23-24 Balance 70 Nos. 33/11 kV PSS in FY24-25 RTU, DC System, Real-time Visual Monitoring	₹ 8.00
	FRTU and RMU communication - 30 Nos RMU per year	₹ 1.00
	GSAS for 55 Nos PSS.	₹ 13.75
	Weather stations installation and central integration with data accumulation and analytics	₹ 0.25
	Sick Equipment includes defective VCBs, RMUs,	₹ 5.00
	Micro Grid for 2 Locations to improve the Reliability and address Low voltage issues	₹ 3.00
	Line Voltage Regulators for 10 Nos 11KV Feeders	₹ 4.00
	Capacitor Banks installation for 10 Locations	₹ 1.00
	33KV Network Infrastructure	₹ 45.00
	11KV Network Infrastructure	₹ 22.00
	AR/FPI/MCCB/RMU	₹ 13.00
	Refurbishment of 33KV feeders	₹ 7.00
	1000 Nos earthing	₹ 1.00
		124

2.3.1 SCADA enablement of conventional substation

Scheme Proposed	SCADA Enablement of Conventional Sub Stations
Capex Amount	₹ 8.00 Cr

Note: Detailed DPR for the same is annexed as **Annexure-5**

2.3.2 FRTU and Communication for RMU

Scheme Proposed	FRTU & Communication for RMU
Capex Amount	₹ 1.00 Cr

Note: Detailed DPR for the same is annexed as **Annexure-5**.

2.3.3 GSAS Implementation

Scheme Proposed	GSAS Implementation
Capex Amount	₹ 13.75 Cr

Background

TPCODL has been in the forefront in the adoption of latest technology in the power utility sector pan Odisha. Together with its culture of Consumer Service Excellence, Continuous Learning, Performance Orientation, Innovation and Empowerment, it has been able to set benchmarks in accelerated reduction of tripping, equipment failure, enhance consumer satisfaction and improve employee productivity.

One of the significant challenges that the utilities face is restricting the fault at minimum possible section of the electrical network and clearing the fault in minimum possible time. To achieve this feat and utility works round the clock to minimize equipment failure, equipment down time and faster restoration thus ensuring reliability and enhanced MTTR. All the utility across the globe moving towards deployment of smart grid in order to ensure above mentioned goals. Going towards that direction TPCODL deploys GSAS (Grid station automation system) in its working region – the very first step towards the direction of the integrated smart grid. TPCODL already deployed GSAS in FY 20-21 and till now integrated 52 RAPDRP stations and 100 ODSSP stations from a centralized location in Bhubaneshwar and unmanned 35 stations overall and determined to unman another 65 stations by the end of FY 21-22. GSAS being a budget influenced project for any utility it is being divided into phases over the several financial years, as follows

- I. Phase 1: FY 20-21: Integration of 52 RAPDRP stations, 4 PNP stations and 54 ODSSP stations
- II. Phase 2: FY 21-22: Integration of 80 ODSSP stations and 22 conventional old stations in urban areas



- III. Phase 3: FY 22-23: Integration of 67 conventional old stations spread across TPCODL area covering BBSR1, BBSR2 and Cuttack
- IV. Phase 4: FY 23-24: Integration of rest of the stations spread across TPCODL area including rural stations of Dhenkanal and Paradeep.
- V. Phase 5: FY 24-25: Left over stations of rural areas, if any.

Need of the Project

After taking over the electricity distribution business from erstwhile CESU, one of the major operational challenges in front of TPCODL was to improve the reliability of power supply. Implementation of GSAS comes in an integrated package of involvement of less manpower, smart utilization of asset, quick decision making, automated remote monitoring and control along with state of the art asset management. Till H-1 FY-23 74 stations have been unmanned and estimate by end of FY-24 is 100.

1. Quick decision making for restoration of faults
2. Fact based energization/ restoration
3. Centralized PSCC taking all the decisions for charging/ restoration
4. Human intervention free system at sub-station level
5. The unmanned substation provided required manpower for manning other stations as per statutory requirement
6. Safety for operators/ public who were visiting sub-stations for complaint/ operation/ commercial purposes.

Proposed Solution

There are large number of sub-stations where considerable MUs are being lost with significant number of tripping and with informal trial closing. Keeping in view of remarkable improvement in terms of reliability and MTTR under 1st phase of unmanned of 56 stations till now, we would like to request the Hon'ble Commission to kindly consider for GSAS for 60 stations of Industrial, Urban and Semi urban areas phase-3. This would lead to further improvement of reliability and MTTR with strategic trial closing guidance leading to less equipment failure and adherence to the PA timeline. Along with this there will be huge saving in account of unmanned of the stations by allowing relocation of the available manpower to some other jobs.

Scope of the proposal

Primarily, 67 stations of Urban, Industrial and Semi urban categories are selected across TPCODL area for GSAS in FY 22-23 which will accelerate the future reliability indices of the system along with the unmanned of the stations in TPCODL area. Since due to restricted



budget of only 16 crore in FY 22-23 we could implement GSAS in 27 stations with improvised solutions. So in this period there are left over $67-27 = 40$ stations which will be covered in FY 23-24 and to make total 60 stations we will take another 20 stations from phase 3 as mentioned above.

Cost

In FY 22-23 the budget of the 27 conventional sub-stations, tentative cost is INR. Rs.16 Cr.

So, based on that basis in FY 23-24 the budget of the 30 conventional stations, tentative cost is **Rs.13.75 Cr.**

Cost Benefit Analysis

TANGIBLE BENEFIT

- 1) Improvement in power reliability and MTTR.
- 2) Reduction in MU loss due to unwanted tripping's.
- 3) Major difference will be APSCC supervised charging, thus
- 4) Significant reduction in equipment failure due to repetitive charging
- 5) Unmanning of the stations in future course.

INTANGIBLE BENEFIT:

Installation of LDRs would definitely lead to increase the reliability of the power system network, which would help to increase customer delight and thus loyalty.

2.3.4 Weather Stations Installations and Central Integration with Data Accumulation and Analytics

Weather data is the basic requirement for enablement of accurate load forecasting. Procuring this data from available external services is unreliable and expensive. Hence, internally weather stations are proposed to be put strategically across TPCODL.

Existing System in Place

Presently day ahead load forecasting done using an Excel based approach with some historical data. This is submitted on the earlier day to SLDC for incorporation as the discoms day ahead schedule. The historical data used comprises of two main components viz. load trends yesterday, yester month and yesteryear along with climatic condition variation. Currently, this climatic data is taken from third parties which are expensive and unreliable.

Need of the Project

DISCOM demand varies significantly with change in weather. In order to study Discom's demand variation with respect to change in weather, historical weather database is required. This is currently procured from third parties and is often very subjective, superficial, expensive and unreliable. Hence, it is required to deploy our own weather stations to gather all essential weather parameters reliably at one place.

Proposal for Capex Investment

Since there is no mechanism to record historical weather format in-house currently, it is proposed to develop a weather monitoring network specifically for TPCODL to be able to have a bird eye view of current weather condition of all major locations across our license area.

Scope of Proposal

The scope of this proposal includes installation of weather stations at 20 strategic locations at TPCODL and establishing connectivity of all field devices to a central server where all the weather data can be stored.

Cost Estimate with Execution timelines

Cost estimate for FY24: Rs.0.25 Cr. Execution Timeline: Phase wise over the course of 3 financial years.



Proposed system after implementation

With implementation of weather monitoring system, PSCC will have a live picture of current weather condition of major locations of TPCODL as well as availability of a weather data repository for usage in trend mapping and load forecasting.

Cost benefit analysis

After implementation of the above stated infrastructure, following tangible and intangible benefits will be there:

- Weather of critical locations of TPCODL can be centrally monitored
- Central database for historical weather information across license area
- Accurate and reliable data for load forecasting and trend monitoring

2.3.5 Replacement of Sick Equipment

Brief description	The Power distribution network & its equipment health is a critical factor for ensuring reliable & quality power supply to the end consumers.
Capex Amount	₹ 5.00 Cr.
Benefit to Consumer	To ensure reliable and quality power supply to the consumers.

Existing System

For any distribution company, apart from a strong 33kV & 11kV network, healthy & trouble free network equipment or asset base is a must. It forms the base for reliable power supply to the consumer.

In TPCODL, based on the detailed survey reports, it was found that at some places intervention at Equipment level is required to make the network strong & trouble free, so as to ensure reliable power distribution till customer point.

Need of the Project

To strengthen the existing network, it is suggested to replace the sick equipment in the existing network.

Further, this replacement will help in utilization of the resource to the optimum level, managing the load in case of any exigency and mitigate the issue of overloading etc.



Proposal for Capex investment

Although TPCODL field teams are committed to upkeep the equipment by doing preventive maintenance, but still some of the equipment gets faulty and may result to pre-mature failure due to frequent tripping.

Pre-mature failure of the equipment results into long duration outage as it becomes difficult to restore the power supply if it happens during odd hours or if spare equipment is not available in the inventory.

Hence, to ensure highest reliability and achieve utmost efficiency, all equipment needs to operate properly at all the times. In last year of operations, TPCODL has done the survey to identify the sick equipment that exists in the system, which may fail, or lying faulty and proposed for their replacement so that reliability to the end consumers can be ensured.

In this scheme, we have proposed replacement of faulty network equipment in phased manner at priority locations.

Cost Estimate

Detailed annexure is available for reference in **Annexure 6**

Benefit

TPCODL intends to implement the following actions to improve the reliability of power supply. Identification and replacement of faulty / sick equipment causing frequent tripping's.

Introduction of new technology to ensure faster restoration of supply in case of any tripping.

2.3.6 Installation of Micro Grids

Brief description	In order to ensure reliable power supply to the consumers having loads in scattered locations and sparsely populated, huge investments like construction of substations, network connectivity lines, etc. are not justifiable. Thus in order to mitigate the issue and provide reliable and quality power supply to the consumers, micro grids are proposed.
Capex Amount	₹ 3.00 Cr.
Benefit to Consumer	To facilitate reliable, resilient and quality power supply to the distant consumers.

TPCODL license area is spread over a geography of 29354 Sq. km and serve the registered consumer base of 2.6 million. The complete geography comprises of many different types of



terrains, dense forest areas, rural areas with sparse population, etc. which restricts the utility to serve reliable power supply to the areas. Mainly the areas of Nayagarh, Dhenkanal circle having hilly terrain, huge river crossings and dense forest cover causing challenges to TPCODL to provide reliable and quality Power Supply IN these area. In order to ensure reliable power supply to the consumer huge investments like construction of substations, network connectivity lines, etc. are not appropriate as long term load demand in such area is also not promising. Thus in order to mitigate the issue and provide reliable and quality power supply to the consumers, micro grids are proposed.

A micro grid is a local electrical grid with defined electrical boundaries, acting as a single and controllable entity. It is a group of interconnected loads and distributed energy resources that acts as a single controllable entity with respect to the grid. It can connect and disconnect from the grid to operate in grid-connected or island mode. Micro grids can improve customer reliability and resilience to grid disturbances. Micro grids provide efficient, low-cost, clean energy, enhance local resiliency, and improve the operation and stability of the regional electric grid. A micro grid is a self-sufficient energy system that serves a discrete geographic footprint, such as inaccessible places, difficult terrains, etc.

A micro grid typically uses one or more distributed energy sources (solar panels, battery storage etc.) to produce its power. In addition, many newer micro grids contain energy storage, typically from batteries. Some also include electric vehicle charging stations.

Quicker Adoption of Clean Energy

On the principle that big projects take longer than to develop than smaller ones, micro grids can accelerate the transition to clean energy. With smaller footprints and reduced environmental impacts, micro grids are subject to fewer regulations and to less community opposition, expediting development.

Benefits of Micro grids to the environment, to utility operators and to customers

- Micro grids offer the opportunity to deploy more zero-emission electricity sources, thereby reducing greenhouse gas emissions.
- Micro grids can make use of on-site energy that would otherwise be lost through transmission lines and heat that would otherwise be lost up the smokestack.
- Micro grids can improve local management of power supply and demand, which can help defer costly investments by utilities in new power generation.
- Provide efficient, low-cost, clean energy.
- Critical infrastructure that increases reliability and resilience.

- Reduce grid congestion and peak loads.
- Providing power supply to inaccessible places and difficult terrains.
- Use local energy resources and jobs.

2.3.7 Installation of LVRT (Low Voltage Regulator Transformer) at Low Voltage Areas

Brief description	In order to mitigate low voltage issues in the 11kV network and reduce huge investments LVRT are proposed in the existing network.
Capex Amount	₹ 4.0 Cr.
Benefit to Consumer	To ensure quality power supply to the consumers.

Low voltage causes serious problems for motors and reduces the efficiency of all types of electrical appliances including LED lamp heater, AC, refrigerator etc. Many 11kV lines in TPCODL service area are extended over long distances (up to 100km) to feed loads scattered over large rural areas. Poor Voltage regulation / Low voltages has been a common problem for years. Consumers those are connected at remote locations are continuously facing low voltage problems. Actually measured customer's voltage is found in the range of 60 to 70% of standard supply voltage in many remote areas. The major causes of low voltages experienced is due to lengthy and radial feeders. Low voltage at 11kV level is experienced in many areas of TPCODL network namely Dudurukote, Town-1, Siminai areas of DED division, Satyabhamapur, Dasbatia, Mangalpur, Pipili Bazar areas of NED division, Shyamsundarpur, Kuanria, Daspalla, Poibadi, Golapokhari areas of NYED division and many more.

Most of the remote areas are smaller load pockets with scattered loads, generally 200kVA, 500kVA or 1000kVA at the most.

Table 2-12 : Cost estimate for installation of LVRT

Sl. No.	DESCRIPTION OF WORK	Quantity	Amount
		(in nos.)	(in Rs. cr.)
1	7/11kV 1000 kVA Line Voltage Regulator DTR	8	4.0
Total			4.0

Detailed annexure is available for reference in **Annexure 7**

Benefits

Constructing a new 33kV substation is very expensive & therefore cannot be justified for the area where total load is very small i.e. < 1000kVA. Installation of Line Voltage Regulator Transformer at mid line location which will boost the voltages up to 35% on downstream network. LVRT is a specially designed Autotransformer with inbuilt on load Tap Changer & a voltage control relay. LVRT is the most economical solution & it is an “alternative to costly grid expansion”.

2.3.8 Capacitor Bank Installation for Reactive Power Compensation

Brief description	In order to mitigate low voltage issues in the downstream network, i.e. LT network, improvement of voltage at LT side of the DT is proposed to mitigate low voltage issues and avoid huge investments.
Capex Amount	₹ 1 Cr.
Benefit to Consumer	To ensure quality power supply to consumers.

TPCODL caters to a vast area of consumers for which an elaborate distribution network is in place to cater the power supply to the licensed area. This network comprises of many radial and lengthy feeders which results in low voltage pockets due to poor power factor in certain pockets. In order to mitigate the low voltage issues in the downstream network, i.e. DT LT side, huge investments are required in the form of construction of new feeders/ new substation/ feeder bifurcation, etc. with numerous RoW issues during execution of the works along with an extended timeline for work completion. Further, to compensate the reactive power, it is always advisable to install the Capacitor Banks closer to the load end to improve the voltage profile.

Benefits

Improvement Technical loss reduction, power factor correction and improvement of the system voltage profiles are among the capacitor allocation benefits.

2.3.9 33kV Network Infrastructure

Scheme Proposed	Proposal for construction of new 33kV lines, conductor augmentation, 33kV bus splitting and proposal for HT AVR at PSS in order to optimize the feeder loadings, mitigate feeder overloading, mitigate low voltage issues, power evacuation from Grids and achieving N-1 redundancy.
Capex Amount	₹ 45.00 Cr
Benefit to customer	By executing the proposals as made in this head, 33kV network can be strengthened and consumers can avail reliable and quality power supply.

In TPCODL, 33kV network is the backbone of power supply system and spread across TPCODL licensed area and connected with various 33/11kV structures from where the power is transformed at 11kV for further distribution. 33kV network is lengthy and radial in nature at most of the places.

To summarize, following areas where interventions can be made to strengthen the existing network are identified:

- Lengthy and radial connectivity of the network.
- Overloading of the 33kV feeders.
- 33kV feeders facing low voltage issues.
- Power evacuation from recently charged/ proposed GSS.
- Absence of N-1 redundancy at least to critical installations.
- Circuit capacity restricted to lower size of conductor in existing line.

In order to mitigate overloading and low voltage issues in the 33kV network, various proposals are put forward vis-à-vis, conductor augmentation, construction of new feeders, bus splitting to bifurcate loading of the overloaded or low voltage experiencing feeders, installation of HT AVR in substations to improve the voltage at the downstream network. In addition, new feeders have been proposed to evacuate power from the existing lightly loaded or recently commissioned OPTCL grid substations. To strengthen existing 33kV network, it is suggested to construct interlinking lines in the existing network to make the system in ring and mitigate the issue of single connectivity. Further, this interconnection would help in managing the load in case of any exigency and mitigate the issue of overloading.

HT AVR: The automatic voltage regulator is used to regulate the voltage. It steps up the fluctuating voltage into a constant 33KV voltage. The fluctuation in the voltage mainly occurs due to the variation in load on the supply system. The variation in voltage damages the



equipment of the power system. The variation in the voltage can be controlled by installing the voltage control equipment at several places like near the transformers, feeders, etc. The voltage regulator is provided in more than one point in the power system for controlling the voltage variations. In TPCODL 33KV network, low voltages issues are being experienced and in order to mitigate the same various mitigation proposals are proposed in the network. Many of these proposals require huge capex investments and longer timelines. In order to optimize the investment requirement and also timely addressing these issues, this approach of installing 33KV Automatic Voltage Regulators are being proposed.

In order to provide the reliable and quality power supply to the consumers in TPCODL's licensed area, we have conducted the survey of all 33kv feeders to identify the weaker sections that require immediate attention. Based on the survey reports, it is observed that in some of the feeders, conductor sizes are different resulting into compromising the circuit capacity, which is limited to the lowest size of the conductor available in the circuit. However, looking at the existing load demand after Covid and factoring the projected load growth as per the trend, it is required to be rectified so as to avoid overloading and low voltage issues of the network. This will help in optimizing the feeder loading and will support in shifting the load to another structure or OPTCL grid in case of any source failure.

Moreover, in various forums, OPTCL has raised the issue of recently commissioned or to be commissioned 220/33kv or 132/33kv which are either lightly loaded or even have no loading. OPTCL has asked TPCODL to evacuate power from these Grid substations and ease out the loading on other OPTCL Grids that are currently catering the loads. Therefore, TPCODL is also proposing evacuation of power from these OPTCL Grid substations by constructing new 33kv feeders or interconnectors to transfer the loads.

This overall expenditure will help in strengthening the 33kv network to some extent since the requirement is huge but considering the resource availability, it will be done in a phased manner.

To strengthen existing 33kv network, it is suggested to lay some interconnectors in the existing network to convert the system in ring and mitigate the issue of single connectivity. Further, this interconnection would help in managing the load in case of any exigency and mitigate the issue of overloading. Apart from the interconnectors, we have also proposed conductor augmentation, 33kv new lines, 33kv bus splitting and installation of HT AVR in substations to address the overloading and low voltage issues.

Detailed annexure is available for reference in **Annexure 8**

2.3.10 11kV Network Infrastructure

Scheme Proposed	Proposal for conductor augmentation, new 11kV line to optimize the feeder loadings, achieving N-1 contingency condition, avoiding feeder overloading and low voltages.
Capex Amount	₹ 22 Cr
Benefit to customer	<ul style="list-style-type: none"> Reliable power supply to consumers Improvement in reliability Indices like SAIDI & SAIFI.

Existing System

11kV feeders are the main power link between Primary substations (PSS) with the distribution substation (DSS) and give power supply to 11kV HT consumers. Below are the major observations in the existing 11kV network:

- Many 11kV feeders have conductor of different sizes used in different phases, which restricts the circuit capacity limiting to the lowest size of the conductor used in the circuit. This lead to overloading of the feeder, low voltage issue and Higher Technical losses.
- Most of the places, the protection devices (Lighting arrester, LT Distribution Board (LTDB) and Air Break (AB) Switch) are either not available or in bypassed condition.
- Interconnection between feeders mostly are done through jumpering and some places through off-load AB switches, for normal load transferring from one feeder to another feeder it requires shutdown of both feeder.
- Most of the feeders are passing through dense vegetation area and this leads frequent tripping of feeder on Transient fault.
- The feeders are lengthy with multiple T-off branches without isolating device. Any fault in any of the branches leads to shutdown of entire feeder and it takes longer time for restoration since disconnection of the faulty branches requires physical disconnection.
- Many 11kV feeder are overloaded.
- Many of the feeders are having binding wire / multiple joints in a single span. As a result, there are chances of snapping of conductors and subsequent electrocution of human beings / animals since cradle guards are not provided.
- Houses / Structures are found constructed directly below 11kV feeders / close to 11kV feeders at many locations both in urban and rural areas.
- It is also observed that no intermediate are used in 11kV feeders for mechanical strength and for conductor jointing. These double poles are essential to avoid cascading effect of failure of poles uprooting during any disaster.



- Large number of interruptions were reported on 11kV feeders prior to TPCODL commencing operation on 1st June 2020 (>250 per feeder per annum).

Need of Proposal

In TPCODL, most of the 11kV feeders are long and radial in nature. During contingency, it is not possible for the field teams to transfer the load to the healthy section and thus all consumers connected to the affected feeders remain out of service until the field team locates and repairs the fault.

This scheme is proposed to ensure flexibility to the field teams in 11kV feeder operation. In this head, all such issues can be mitigated by:

- i. Laying of new 11kV feeders.
- ii. Augmenting the existing 11kV feeders to address overloading issues of the feeders. This will help in strengthening the existing 11kV network.

Cost Estimate

Detailed annexure is available for reference in **Annexure-9**.

Benefit

These proposals will help in converting the radial network into ring and mitigate the issue of single connectivity. Further, this interconnection would help in managing the load in case of any exigency and mitigate the issue of overloading. Thus, will lead to lower interruption and ensure quality power supply hence leading to satisfaction of our consumers.

2.3.11 33 kV and 11kV Auto Recloser /MCCB/ RMU

Scheme Proposed	To strengthen & make existing 33kV and 11kV network more reliable, it is suggested to install Auto Recloser, RMU and MCCBs.
Capex Amount	₹ 13 Cr
Benefit to customer	<ul style="list-style-type: none">▪ Ease of operation to the field teams▪ Improving the safety in terms of Equipment operation

Existing System

During contingency or in case of any fault in the network, it is not possible for the field teams to transfer the load to the healthy section/ isolate the faulty section from the healthy section



and thus all consumers connected to the affected feeders remain out of service until the field team locates and repairs the fault.

Provision of Auto Recloser

Auto Reclosers are used in overhead lines, distribution systems so that they can prevent or interrupt faults. The auto recloser is a protective device that would automatically trip and reclose for a preset number of times. The auto recloser is composed of a relay that would automatically close the recloser after clearing the fault. An auto recloser is a circuit breaker equipped with a mechanism that can automatically close the breaker after it has been opened due to a fault. These are used on overhead distribution systems to interrupt temporary faults. It has been found that majority of the faults are transient faults which exist in a system for a short time. This means these types of faults clear themselves and line can be charged. In this case the auto recloser restores the supply automatically by being closed and improves service reliability.

Protective devices are installed in the network to protect the network from damages which may take place in abnormal cases, short circuits etc. Major problem exists in dealing with transient faults. For e.g. a tree branch that is blown off a tree during windstorm and lands on the line may cause a short circuit that could cause damage. However, the fault will quickly clear itself as the branch falls to the ground. If the only protection system were the breakers at the substations/distribution centres, large areas of the substation would be blacked out while the operating personnel reset the breakers.

Reclosers address this problem by further dividing up the network into smaller sections. This means reclosers may be installed at each branch. As the reclosers are installed at smaller sections, they handle much less power than the breakers at feeder stations and therefore can be set to trip at much lower power levels. This means that a single event of fault will cut off only the section handled by the single recloser, long before the feeder station would notice a problem.

Provision of Ring Main Unit

Ring Main Unit is a compact Gas Insulated Switchgear cubicle equipped with SF6 Switch disconnector and SF6 circuit breakers. Ring Main Units are the major part of Ring Main Network. The power is distributed through these RMUs for the end consumers.

The main aim of this ring main network is to provide consumers uninterrupted supply. This is possible by feeding consumers with another healthy feeder in case of loss of supply due to working feeder. If a fault occurs in any branch of sub transmission circuit, that branch is



removed from service and power continues from the remaining loop without discontinuity in the supply. Every consumer has redundant supply in Ring main distribution system.

Advantages of Ring Main Units:

- The major advantage of Ring Main Units is the safety they provide to the operators. Like the operation of switching devices with interlocking system requires less knowledge and effort.
- Working with IEDs allows remote operation. SCADA implementation is easy with smart Ring main units.
- The space occupied by RMUs is less as they are Gas Insulated Switchgear.
- The time taken for installation and commissioning of RMUs is very less. RMUs require less maintenance.

Provision of LTDB at DSS

Distribution Substation (DSS) comprises of various equipment, which perform specific task to ensure delivering the power supply at appropriate voltage to the end consumers. Main components are 11kV AB Switch, 11kV HG Fuse, Transformer, LV Protection, Earthing, Fencing and LT Distribution Box.

The most expensive equipment in the DSS is Transformer and its life depends upon healthy condition of all other components be it LV Protection, HV Protection, Earthing or fencing. It is observed at many location the LT side & HT Side protection is bypassed through GI Wires. Due to this bypassed scenario, for any maintenance or corrective work at LT level, due to non-availability of switching equipment, outage / Hand trip is taken from the 33/11kV PSS resulting into interruption to all the consumers connected on that 11KV feeder even though for a short duration. Similarly, for any fault on LV Side lead to tripping of 11KV Feeder breaker at DSS.

However, this can be addressed by installing a LTDB after Distribution transformer so that only that LT feeder needs to be taken into outage where the work is supposed to be carried out. The main function of LTDB is to individually control the LT feeders thus helping in attending the complaint of any feeder without disturbing the power supply to other LT feeders from same Distribution transformer. This will help in reducing the affected consumer count and thus improving the reliability indices.

It is therefore recommended to carry out the refurbishment of the Distribution substation so that majority of the consumers are benefitted.

Need of Project

This scheme is proposed to ensure flexibility to the field teams in 11kV feeder operation. At some locations there is no LT protection at Distribution Transformers and therefore to

attend/work at LT feeder, outage to be taken from 33/11kV structure which results into interruption to all consumers connected to particular 11kV feeder.

Moreover, in city area, interconnectors & load break switch is required to address the issue of overloading, load shifting during exigencies & improving reliability.

With installation of RMU, equipment safety will increase for field operation team, with less maintenance & beautification of the network. SCADA implementation will become easy with smart Ring Main Units.

Cost Estimate

Table 2-13 : Cost Estimate for 33 kV & 11 kV Auto Recloser/MCCB/RMU

Sl. No.	Description	Quantity	Amount
		(in nos.)	(in Rs.Cr.)
1	11kV line DP with Auto Re-closure	21	2.58
2	LT Distribution Box with MCCB, for 100kVA transformer	80	0.90
3	LT Distribution Box with MCCB, for 250kVA transformer	54	1.70
4	LT Distribution Box with MCCB, for 500kVA transformer	40	1.69
5	3W 11kV RMU (LLV) along with 3C, 400sqmm UG Cable, jointing kits and LA.	10	1.53
6	4W 11kV RMU (LLVV) along with 3C, 400sqmm UG Cable, jointing kits and LA.	8	1.41
7	4W 33kV RMU (LLVV) along with 1C, 630sqmm UG Cable, jointing kits and LA.	7	3.19
Total			13

Detailed annexure are available for reference in **Annexure 10**

Benefit

This will lead to:

1. Reliable power supply to consumers
2. Improvement in Reliability Indices like SAIDI & SAIFI.
3. Ease of operation to the field teams
4. Improving the safety in terms of Equipment operation



With auto-reclosers in 11KV feeders, field engineers would have flexibility to isolate the section locally instead of switching off entire feeder. In case of any tripping, maintenance engineer can isolate the faulty section and restore the supply of remaining consumers thereby improving the reliability. Consumer will experience less power cut and thus reduction in consumer complaint.

2.3.12 33 kV Feeder Refurbishment

Scheme Proposed	33kV feeder refurbishment for reliable and quality power supply to consumers.
Capex Amount	₹ 7 Cr
Benefit to customer	<ul style="list-style-type: none">▪ Reliable power supply to the consumers.▪ Improving the circuit capacity by replacing the weaker section with appropriate sized conductor.

In order to provide the reliable and quality power supply to the consumers in TPCODL's licensed area, we have conducted the survey of all 33kV feeders to identify the weaker section, which require immediate attention. Based on the survey reports, it is observed that in some of the feeders, conductor sizes are different resulting into compromising the circuit capacity, which is limited to the lowest size of the conductor available in the circuit. Taking into consideration the existing load demand and factoring the projected load growth, it is required to be rectified so as to avoid overloading of the network.

Cost Estimate

This overall expenditure will help in strengthening the 33kV network to some extent since the requirement is huge but considering the resource availability, it will be done in a phased manner.

Detailed annexure is available for reference in **Annexure 11**

2.3.13 Earthing

Scheme Proposed	Strengthening of the earthing system in power distribution system.
Capex Amount	₹ 1 Cr
Benefit to consumer	<ul style="list-style-type: none"> ▪ Lesser chances of fault ▪ Reliable power supply ▪ Equipment Safety

Existing System

During the site visits, it is observed that at most of the places earthing is in either damaged condition or not available. This is because of the depletion of the earthing electrodes or connections and such situations may pose safety threat to the human beings or animals in the form of shocks. Therefore, as a corrective measure, earthing is required to be done to ensure safety of man and material.

Need of the Project/ Statutory Compliance

The main objective of an earthing system is to provide an alternate path for the fault current to flow so that it will not endanger the user, maintain the voltage at any part of an electrical system at a known value and prevent excessive voltage on the equipment.

As per Central Electricity Authority Regulations (Measures relating to Safety and Electric Supply, 2010) rule 41, there is provision of earthing, neutral wire in a 3-phase, 4-wire system and the additional third wire in a 2- phase, 3-wire system.

Earthing- (1) All metal supports and all Reinforced and Pre-stressed Cement Concrete supports of overhead lines and metallic fittings attached thereto, shall be either permanently and efficiently earthed by providing a continuous earth wire and securely fastening to each pole and connecting with earth ordinarily at three points in every km with the spacing between the points being as neatly equidistant as possible or each support and the metallic fitting attached thereto shall be efficiently earthed.

(2) Metallic bearer wire used for supporting insulated wire of overhead service lines of voltage not exceeding 650 V shall be efficiently earthed or insulated.

(3) Each stay-wire shall be similarly earthed unless insulator has been placed in it at a height not less than 3.0 meters from the ground.



In an electrical installation, earthing system plays an important role for proper working of the power distribution system, and protection of human beings against electric shock.

In case the earthing of any power equipment or network becomes weak or defective due to corroded connections or damaged connection, clearance of fault may take more time and putting stress on the equipment connected in the network

Cost Estimate

Table 2-14 : Cost Estimate for Earthing

Sl. No.	DESCRIPTION OF WORK	Quantity (in nos.)	Amount (in Rs.Cr.)
1	Earthing	990	1.00

Detailed annexure is available for reference in **Annexure 12**

2.4 Load Growth

The overall capital Expenditure under this head is a given in the table below:

Table 2-15 : Estimated Capital Investment in Load Growth

Main Budget head	Activity planned	FY 23 – 24 (Rs. Cr)
Load Growth	New Connection Release	₹ 10.00
	Power Transformer Augmentation	₹ 30.00
	DT Augmentation	₹ 10.00
Total		50.00

2.4.1 New Connection Release

Scheme Proposed	In order to meet this growing load, network infrastructure needs to be strengthened, and new energy meters to be installed to release the new connection. Some of the connections can be released from the existing network and some may require augmentation/addition/extension before release of new connection. For carrying out network extension/ augmentation/addition, we propose expenditure to the tune of Rs 20 Crores under this head. To consider load growth, network extension / augmentation / addition is expected to be carried out to cater the new demand.
Capex Amount	₹ 10 Cr.
Benefit to customer	Better the availability of materials, faster will be process of providing new connection hence more will be the customer satisfaction

2.4.2 Power Transformer Augmentation

Scheme Proposed	To cater the increasing load demand, PTR augmentation is required to avoid any overloading conditions. In addition, to ensure reliable power supply to our consumers, PTRs has to be kept at optimum loading so as to avoid any mechanical stress on the transformers due to overloading.
Capex Amount	₹ 30.00 Cr.
Benefit to customer	To reduce over-burdening of existing PTRs thereby reducing load shedding and improving quality of power supply to the consumers.

To avoid any overloading issues especially in urban areas where the load growth is high, TPCODL has undertaken the assessment of the loading of the power transformers and found that to meet the estimated summer'23 load, it is required to augment some of the power transformers which may get overloaded considering the current peak and load growth for the next two years.

To carry out the detailed study of the PTR, inputs were collected from existing log sheet data and SCADA data from each 33/11 kV substations. Then we analysed the loading pattern & fixed the load growth for next 2 years.

While superimposing the future loading pattern on the existing network we found that some of the Power Transformers might be overloaded and the present capacity of transformers will not suffice the overloading criteria of >75% loading of PTR.

Hence based on the survey reports and discussion with the field teams, few proposals have been identified where we need to augment the Power transformers to have a trouble free summer.

To mitigate the same, various proposals are put forth for approval where we have considered:

1. Power Transformer augmentation
2. Power Transformer swapping
3. Load shifting from one transformer to other transformer within the substation

Cost Estimate

Table 2-16 : Cost Estimate Power Transformer Augmentation

Sl No.	Description	Quantity	Amount in Crs
1	Augmentation of 7.5MVA and 8 MVA PTRs to 16MVA PTR	11	30.06
Total Budget			₹ 30.06

Detailed annexure is available for reference in **Annexure13**

These proposals will thereby reduce the overloading of PTRs and in turn improve the reliability and ensure quality power supply to the consumers.

2.4.3 DT Augmentation

Scheme Proposed	To cater the increasing load demand, especially with the introduction of schemes like 5T and others, DT augmentation is required to avoid overloading of transformer leading to transformer failure and power interruptions.
Capex Amount	₹ 10 Cr.
Benefit to customer	Reliable power supply by reducing chances of fault in network, thereby reducing power interruptions along with reduction of over-burdening of existing Distribution transformers thereby reducing power cuts.

Existing System - To cater the increasing load demand, especially with the introduction of schemes like 5T and others, DT augmentation is required to avoid overloading of transformer leading to transformer failure and power interruptions.

Also to ensure reliable power supply to our consumers, Distribution Transformers has to be kept at optimum loading so as to avoid any mechanical stress on the transformers due to overloading.

When a distribution transformer loading exceeds 100% of the rated capacity of the transformer, then it is considered to be “overloaded”. After capturing the loading of the

Distribution Transformers, it has been observed that at several locations, especially in urban area, DTs are operating at overloaded condition.

To avoid these overloading issues especially in urban areas where the load growth is high, it is required to augment the capacity of the Distribution transformers so as to mitigate the overloading issue.

Need of Project - In case of overloading of the Distribution Transformer, it not only hampers the power supply to the consumers but also may cause pre-mature failure of DT occurs due to operating for long hours on overload condition. Thus to abide by the safe loading limits, augmentation of distribution transformers are proposed for locations, where loading is exceeding the maximum value.

When a distribution transformer loading exceeds 90% of the rated capacity of the transformer, then it is considered to be “overloaded”.

After capturing the loading of the Distribution Transformers, it has been observed that at several locations, especially in urban area, DTs are operating at overloaded condition.

To avoid these overloading issues especially in urban areas where the load growth is high, it is required to augment the capacity of the Distribution transformers so as to mitigate the overloading issue.

Proposal for Capex investment - In this proposal, TPCODL intends to carry out Distribution Transformer’s augmentation for those DTs, which are identified as overloaded based on the peak load served.

Cost Estimate

Table 2-17 : Cost estimate – DT Augmentation

Sl. No.	Description	Quantity (in nos.)	Amount (in Rs.Cr.)
1	100kVA to 250kVA	43	5.5
2	250kVA to 500kVA	20	4.49
Total			10.00

Detailed annexure is available for reference in **Annexure 14**

Benefits - To cater the increasing load demand, especially with the introduction of schemes like 5T and others, DT augmentation is required to avoid overloading of transformer leading to transformer failure and power interruptions.



In addition, to ensure reliable power supply to our consumers, Distribution Transformers has to be kept at optimum loading to avoid any mechanical stress on the transformers due to overload.

2.5 Technology & Infrastructure

The Capital Expenditure for capital expenditure under this head is as follows:

Table 2-18 : Capital Cost for Technology & Infrastructure Development

Main head	Budget	Activity planned	FY 23 – 24 (Rs. Cr)
Technology & Infrastructure		Call management system for PSCC	₹ 1.00
		APSCC Modernization work for 15 APSCC at all divisions	₹ 1.00
		IT-Software , User Devices, Backup system, Storage devices and Applications	₹ 11.00
		Centralized Server Room at Technology Center, PAC & BMS	₹ 25.00
		Civil Upgradation	₹ 21.00
		RMU & DT Workshop	₹ 1.20
		GIS Implementation	₹ 13.00
		Ready to Use Office Assets	₹ 1.84
Total			₹ 75.04

2.5.1 Call Management System for PSCC

Existing system in place - Presently TPCODL has 374 nos. of 33/11 kV Primary substations (PSS) out of which 105 nos. controlled remotely via SCADA from Power System Control Centre (PSCC). Also, another 100 nos. of PSS are being planned to operate from PSCC SCADA system. This is managed remotely by regular communication between PSCC, field staff and operators. Currently, the entire operational communications are managed from standalone mobile phones. To cater to these vital areas and additionally to migrate to remote operation coverage area from BBSR1 and Cuttack to other circles and CPSCC operation of other circle grids, PSCC employee strength has increased which has resulted in need of infrastructure development.

Need of the project - Due to the significant growth in number of PSS controlled centrally from PSCC, there is a huge call inrush during peak outage hours as well as in inclement weather conditions. Managing those calls from standalone mobile phones are difficult since there is no option of call forwarding, recording and logging of incoming/outgoing calls.



Proposal for capex investment - A central call management system is required in order to streamline and manage the operation desk effectively so that the outages can be managed in minimum possible time without any hassle to the on-desk engineer as well as the person who has requested for an outage over call.

Scope of proposal - The scope of this proposal includes implementation of a central call management system for PSCC. In order to increase the efficiency of calls being attended by on-desk engineer at PSCC, it is being proposed.

Cost estimate - Cost estimate: **Rs.1 Cr.**

Table 2-19 : Cost Estimate for Call Management System for PSCC

Activities	Budget Req (Rs. Cr)
Call Management System for PSCC	0.25
Infra for PSCC: Desktops, Lan Printer, Scanner	0.15
Ergonomic Chairs for PSCC Operations Desk with high rest and lumbar support	0.13
Pantry Accessories for shift duty engineers: Fridge, Microwave, Coffee Vending Machine, etc	0.03
Noise Dampening for reduction of ambient noise between operation desks in PSCC	0.05
Development of AR/VR integrated PSCC tour guide	0.25
Body and mind Fitness enhancing equipment for PSCC desk engineer	0.15
Total	1.01

2.5.2 APSCC Modernization Work for 15 Nos of APSCC at all Divisions

Existing system in place - Presently TPCODL has 374 no. of 33/11 kV Primary substations (PSS) out of which 105 numbers controlled remotely via SCADA from Power System Control Centre (PSCC) and balance 269 no. of PSS monitored and managed by APSCC (Area Power System Control Centre). These APSCC are placed strategically across the license area in order to be able to control a dedicated area under its purview.

Need of the project - These APSCC centres are very crucial from system operation and statistics gathering point of view. It is with the help of these APSCC centres that operations of



entire TPCODL have been streamline, standardized and monitored centrally. These APSCC centres are currently devoid of a proper control room setup. Due to this basic infra such as an enclosed neat area, desktop table, desktops with stable internet connection, drinking water and toilet facilities are not properly available at all places. This might serve as a hindrance for smooth and effective operations management.

Proposal for capex investment - It is proposed to modernize these APSCC centres and equip them with better facilities. This would not only stabilize the operation mechanism but also help to have a better control.

Scope of proposal - The scope of this proposal includes installation of two no. of workstations at each APSCC along with necessary infra for control room such as tables, chairs, toilets, drinking water facility, etc. in order to establish the same with typical control room standards.

Cost estimate - Cost estimate for FY24: **Rs.1.00 Cr.**

Proposed system after implementation - With implementation of APSCC modernization work, the APSCCs will be better equipped and more stabilized to manage the control area more effectively.

Benefit - After implementation of the above stated infrastructure, following tangible and intangible benefits will be there:

- Better equipment with APSCC control rooms
- Desktops with better internet connectivity would ensure seamless operation

2.5.3 IT-Software ,User Devices, Backup System ,Storage Devices and Application

Activity planned	FY 23 – 24 (Rs. Cr)
IT - Software, User Devices, Backup system, Storage devices and Applications	11.00

Information Technology Schemes- Capex Proposals for FY 2023-24 to FY 2027-28, List of IT Capex Schemes

Table 2-20 : List of IT capex schemes

S No	Scheme Description	Expenditure Planned					Total Budget Requirement (Cr.)
		FY 23 - 24 (Cr.)	FY 24 - 25 (Cr.)	FY 25 - 26 (Cr.)	FY 26 - 27 (Cr.)	FY 27 - 28 (Cr.)	
1	Desktops and Laptops	1.18	3.00	7.00	7.00	1.00	19.18
2	Printers and Scanners		2.12			1.06	3.18
3	Enterprise Grade Next GEN Firewall	2.30					2.30
4	Enterprise aggregation Router	0.21					0.21
5	Storage capacity Increase		0.95			3.10	4.05
6	Backup Software	0.27					0.27
7	Upgrade Existing Tape library	1.20					1.20
8	Document Digitization	6.00					6.00
9	Server with OS at DR and DC		9.00 (DR)			9.00 (DC)	18.00
	Total	11	15.07	7.00	7.00	14.16	54.39

Scheme Wise Detailed Justification

1. Laptops / Desktops

Background - All locations offices of Central Odisha are needed to be enabled with IT system to provide reliable and quality power and best in class services to consumers. To enable employees to work on automated systems, and for providing various services to the Consumers, Laptops and Desktops are being required. Total 1932 Nos of front-end computing devices (1557 Nos of Laptop and 375 Nos of Desktop) have been procured since June 2020 and provided to the employees for this purpose. Also with increase in consumer base and adoption/implementation of new technologies, an additional requirement of front-end devices arises.

Requirement - In order to achieve best in class services for consumers (increasing at around 6% per annum), it is proposed to procure Laptops and Desktops with 5 years' warranty till FY: 2024-25 and to replace out of Warranty Devices during FY25-26 - FY27-28.

Proposal - It is proposed to procure/ replace total 1950 Nos of Laptops and Desktops during FY23-24 to FY27-28.

Scope of Proposal

Table 2-21 : Scope of Proposals for Laptops and Desktops

User Devices				
FY	Item Description	Estimated Nos.	Unit Cost including GST (in Rupees)	Amount (in Rs.Cr.)
FY 23 - 24	Laptops	60	100000	0.60
	Desktops	80	73000	0.58
FY 24 - 25	Laptops	270	100000	2.70
	Desktops	40	73000	0.29
FY 25 - 26	Laptops	700	100000	7.00
FY 26 - 27	Laptops	700	100000	7.00
FY 27 - 28	Laptops	100	100000	1.00
Total Budget Requirement for 5 Years (Cr.)				19.18

Benefits

- Performing automated business processes 3
- Office automation
- Improved employee productivity
- Enhanced Consumer Satisfaction
- Faster communication

Scheme Completion Time

Five years from date of CAPEX approval by OERC.

2. Printers & Scanners

Background - All offices of Central Odisha need to be enabled with IT system, Printing and Scanning facility to provide best in class services to consumers. Total 385 Nos of Printers and 365 Nos of Scanners have been procured since June 2020 for different offices. Also with increase in consumer base and adoption/implementation of new technologies, an additional requirement of printers and scanners arises.

Requirement - For functioning of important business processes and meeting the PA timelines, TPCODL is required to procure approx. 600 numbers of printers and 600 numbers of scanners for the office locations. Out of which 400 numbers of printers and 400 numbers of scanners is being procured during FY: 2024-25 and 200 numbers of printers and 200 numbers of scanners is being procured during FY: 2027-28.



Requirement - TPCODL is required to procure approx. 600 numbers of printers and 600 numbers of scanners during FY: 2024-25 to FY: 2027-28 to cater to the new requirements

Scope of Proposal

Table 2-22 : Scope of Proposals for Printers and Scanners

Printers and Scanners				
FY	Item Description	Estimated Nos.	Unit Cost including GST (in Rupees)	Amount (in Rs. Crores.)
FY 24 - 25	Printer	400	18000	0.72
	Scanner	400	35000	1.40
FY 27 - 28	Printer	200	18000	0.36
	Scanner	200	35000	0.70
Total Budget Requirement for 5 Years (Cr.)				3.18

Benefits

- Duplicate Bill and other important document print at Customer Care.
- Official document print.
- Record keeping.
- Door step Bill print and delivery.
- Scanning of official document.
- Copy of official/important documents.
- Payment receipt printing.
- Cheque printing for Business Associates.
- Printing of various reports for Regulator and other stake holders
- Scanning of documents related to PA timelines for sending to Regulator.
- Printing of Finance data.
- Other official work.

Scheme Completion Time - Five years from date of CAPEX approval by OERC.

3. Enterprise Grade Next GEN Firewall



Background - TPCODL leverages Information Technology to conduct its business critical operations such as metering, billing, collection, recording consumer & employee information, monitoring & management of electrical network assets etc. To conduct these functions, software applications such as SAP ERP, SAP ISU, AMR, AMI, ADMS, GIS, Mobile Apps and other Applications have been deployed. Business critical data is being collected, processed, stored and made available to users through these applications. TPCODL also provides Web/Mobile Applications to its customers and employees on Internet and sends information through emails, SMS alerts etc. to consumers & employees.

More and more IT applications and services are being exposed to internet in order to make employees, consumers, vendors and other stakeholders to work from remote / home and ensure the continuity of business in unforeseen situations. Accessing and using IT applications and services through internet poses the risk of Cyber-attacks. This increases the probability of penetration into our network with cyber-attacks by unauthorized users / hackers may result in disruption of critical business processes. Hence, it is important to protect our network, digital infrastructure, software applications and other services from malicious attacks and cybercrimes for business continuity and protection of customers and other stakeholders' confidential data.

Requirement - Next-generation firewalls (NGFWs) are a core cybersecurity product, up there with endpoint protection as a foundational security tool that our organization needs. As defending data and applications become more complicated, the security products built to withstand evolving threats also grow more powerful. The vast expansion of IoT devices, remote work, and advanced threats like ransomware has made protecting the perimeter both harder and more critical than ever, thus making firewall evaluation more complicated. So, additional security measure should be adopted to ensure data protection, traffic filtration, and vulnerability assessment of deployed additional IT applications in the data center and disaster recovery center.

Proposal - It is proposed for Procurement of Enterprise Grade Next GEN Firewall as IT security equipment.

Benefits

- Protect networks and data from unauthorized access.
- Better management of security.
- Improved information security and business continuity management.



- Improved stakeholder confidence in your information security arrangements.
- Improved company credentials with the correct security controls in place.

Scheme Completion Time - One year from date of CAPEX approval by Hon'ble OERC.

4. Enterprise aggregation router

Background - To support business growth, multiple offices have been opened up at various locations of TPCODL. Users are also expected to increase at existing locations due to automation of business processes. Network connectivity at these locations is required to enable employees to perform business critical processes like metering, billing, collection, power outage management and meeting performance assurance timelines. Unavailability of network will increase the restoration time of power outage and delay in providing other critical services to consumers thereby affecting the consumer satisfaction. Hence, network connectivity at these locations are required to be enabled through network equipment like enterprise aggregation Routers. These devices combine traffic links at greater speeds to support the growing need for remote access to internal networks and external networks like the internet and cloud.

Requirement - Link Aggregation increases bandwidth and throughput by aggregating multiple network interfaces and provides traffic failover to maintain the network connection in case the connection is down.

Proposal - It is required to procure enterprise aggregation Routers to provide robust and secure network connectivity at office locations.

Benefits

- Robust and secure IT network connectivity at various locations
- Meeting PA timelines leading to consumer satisfaction
- Efficiency in performing critical business processes
- Aggregation services in routers and edge platforms help enable network edge routing.

Scheme Completion Time - One year from date of CAPEX approval by OERC.

5. Storage upgrade

Background - TPCODL has leveraged the power of Information Technology to provide best in class services to consumers, earn consumer delight, and improve satisfaction among other stakeholders. Hence, a proper facility of storing and keeping important business data is



needed for smooth function and to cater the customer needs. For this, SAN Storage with capacity of 250 TB effective has already been in use. A SAN (storage area network) is a network of storage devices that can be accessed by multiple servers or computers, providing a shared pool of storage space. Each computer on the network can access storage on the SAN as though they were local disks connected directly to the computer.

Requirement - IT systems have been implemented to provide end-to-end solutions for important business functions viz. Commercial, Operations, Finance, HR and Administration etc. SAP ERP is the backbone for various enterprise functions. SAP ISU has been implemented for Customer Relationship Management, Billing and other commercial processes. Hence, a proper facility of storing and keeping important/ voluminous data, documents and files is needed for smooth function and to cater the customer needs. Storage systems are helpful in keeping all these data, documents and files in a neat and systematic manner. Also for business continuity purpose, Disaster recovery center (DR site to recover and restore its data, technology infrastructure and operations when its primary data center is unavailable) is being set up to quickly recover data from disasters such as hardware failure, ransomware attack, human error, accidental/malicious deletion, any unforeseen situations etc.

For DC-DR Replication and Storage allocation to DR servers and to accommodate more upcoming applications, Storage upgrade is proposed.

Proposal - It is proposed to upgrade storage for business continuity purpose when its primary data center is unavailable.

Benefits

- Stringent data integrity to avoid any revenue leakage
- Optimum Data management.
- Improved System Performance
- The Power to Handle Bigger Data.
- Streamline system administration
- Data Security & Safety

6. Backup Software



Background - A proper facility of Backup and restore of important business-critical data is needed for smooth function of the IT system and to cater the customer needs in efficient manner. The biggest benefit of regular remote data backup is its Higher Reliability. Remote backup can be automated and updated on a daily basis or at a set time interval based on importance and requirement. Since backup is done via the internet, quick recovery of any files/ data is possible.

Requirement - Back up software create copies of business data & keep them secure and restore backup data onto devices if and when necessary. It offers protection for business data by copying data from servers, databases, desktops, laptops and other devices in case user error, corrupt files or physical disaster. In the event of data loss, data is restored to its previous state from a backup.

Proposal - It is proposed to procure 70 instances back up software with 7 Years Warranty to cater the new backup requirement.

Benefits

- Restore business critical data
- Disaster Recovery
- Remote Backup
- On-Demand Restoration
- Security and Compliance
- Greater Reliability

Scheme Completion Time - One years from date of CAPEX approval by OERC.

7. Upgrade Existing Tape library

Background - Tape backup is the practice of periodically copying data from a primary storage device to a tape cartridge so the data can be recovered if there is a hard disk crash or failure. Tape backups can be done manually or be programmed to happen automatically with appropriate software. A proper facility of Backup and restore of important business-critical data is needed for smooth function of the IT system.

Requirement - All offices of TP Central Odisha need to be enabled with IT system to provide best in class services to consumers. For functioning of important business processes, backup and archiving of massive amount of business data and meeting the PA timelines, TPCODL is



required to upgrade existing Tape Library.

Proposal - TPCODL is required to upgrade existing Tape Library during FY: 2023-24 to cater to increasing amount of business data.

Benefits

- Durability.
- Record keeping.
- Backup and archiving
- Reduction in storage cost
- Less prone to Cyber-attacks.

Scheme Completion Time - One years from date of CAPEX approval by OERC.

8. Digitization of Documents

Background - TP Odisha DISCOMs has envisaged the requirement for Implementation of Centralized Digital Workplace Suite (namely, TP DWS) for its distribution companies within Odisha namely, TPSODL, TPWODL, TPNODL and TPCODL as a centralized web-based application which can be accessed by its employees of various divisions/ sub-divisions/ circle offices/ other offices of the state over Omni Channels such as Laptops, Mobile application, desktop, Chatbot etc. This application will help TP Odisha DISCOMs to effectively automate their Inward and Outward processes/documents/workflows etc. It is submitted that TPCODL will incur expenditure of the portion it is going to use.

Requirement - Implementation of Centralized Digital Workplace Suite (namely, TP DWS) will bring transparency & accountability in the system and provide additional tool for TP Odisha DISCOMs Officials to effectively track the Inwards and Outwards communications across the organization over One Integrated platform.

The proposed system is expected to be a proven framework, which can be leveraged for other business process automation in future as per future business needs. Therefore, the proposed solution is expected to be flexible, scalable and modular framework with provision for future service configuration and customization.

Proposal -It is proposed for implementation of Centralized Digital Workplace Suite (namely, TP DWS) for its distribution companies within Odisha.

Benefits -

- a) One Integrated System driven by a proven framework-based solution
- b) Multi-Tenant platform enabling all DISCOMs over an integrated centralized platform
- c) Improve Automation / Digitization Quotient
- d) Integrated Dashboard & Real Time Legacy
- e) Omni Channel access



- f) Digitization of Legacy
- g) A scalable and flexible futuristic framework-based platform based on open source and open standards for enabling business services incrementally in future

9. Server with OS at DR and DC

Background - TPCODL has leveraged the power of Information Technology to provide best in class services to consumers, earn consumer delight, and improve satisfaction among other stakeholders. Hence, a proper IT Infrastructure is needed for smooth function of IT system and to cater the customer needs.

Requirement - IT systems have been implemented to provide end-to-end solutions for important business functions viz. Commercial, Operations, Finance, HR and Administration etc. Also for business continuity purpose, Disaster recovery center (DR site to recover and restore its data, technology infrastructure and operations when its primary data center is unavailable) is being set up to quickly recover data from disasters. For business continuity purpose, 30 numbers of Servers with operating system is being proposed to procure and install at DR Center during FY: 2024-25. In addition, as the warranty of the existing Servers at Data Center shall expire after 5 years from date of installation, it is proposed to procure and install 30 numbers of Servers with operating system at Data Center during FY: 2027-28.

Proposal -It is proposed to procure and install 30numbers of Servers with OS at DR for business continuity purpose and to procure and install 30numbers of Servers with OS at DC to replace the out of warranty Servers.

Benefits -

- Optimum Data management.
- Improved System Performance
- Streamline system administration
- Efficiency in performing critical business processes

Scheme Completion Time -Five years from date of CAPEX approval by OERC.

Conclusion - Strengthening of IT infrastructures shall result in

- Υ Ease of operational activities and communication
- Υ Better customer handling and service
- Υ Enhanced customer satisfaction

2.5.4 Centralized Server Room at Technology Center , PAC, & BMS –IT Scheme

Activity planned	FY 23 - 24
Set up of Centralized Server Room at Technology Center, PAC & BMS	₹ 25.00 Cr

Background - A robust, reliable, resilient, scalable and secure IT and OT system is vital for providing reliable power and services to consumers. To ensure the running of critical IT & OT applications, set up of Server Room is required for housing of hardware, server, rack and network communication equipment.

Requirement - Technology Centre which is being established at Power House Area to host all the IT and OT systems pertaining to Metering, Billing, collection and SCADA for all 4 utilities – TPCODL, TPWODL, TPNODL and TPSODL. These systems being used for delivering distribution services to all the consumers of Odisha – approx. 1 Cr. Electricity distribution comes under the critical infrastructure for the nation and continuous, reliable along with stable power distribution services is vital. Continuous operations of technology components are mandatory to ensure stable supply in the distribution services. In order to keep all the technology components functioning, reliable power supply from multiple power sources are mandatory. Design of technology centre as per best practices are being built by providing power through Online UPS and DG Set, online redundant UPS will ensure clean power to the Servers whereas DG Set provide power services in case of electricity outages due to simultaneous maintenance or failure at Grid level, UPS level, Batteries level.

Many critical services like AMR, GIS, CRM, SAP ERP, SAP-ISU etc. are being implemented and run on 24x7 basis for providing reliable power supply to consumers and ensuring best in class customer services. It is proposed to set up of Server Room at Technology centre, which will enable operational excellence, value added customer services, optimized distribution system asset performance, energy efficiency and conservations, and environmental sustainability.

Following aspects have been taken into consideration for the Centralised Data Center.

1. New Technology Centre at Bhubaneswar will house the Data Center facility for TPCODL along with other three (03) Discoms (TPNODL, TPSODL, and TPWODL) of Odisha.
2. Data Center shall hold Production, Development and Testing / Staging Server environments for both IT and OT applications like SAP-ISU, SAP-ERP, SAP BW HANA, GIS, Smart Metering (Head End System & Meter Data Management System), Call Center



System, Mobile and Web applications like Spot Billing, Spot Collection, Counter Collection, Payment Gateway Integration, Mera MMG, Suraksha Kavach, Samadhan, Vishleshan, Heatmap, BIRD, CSAT, iCAMS, Permit to Leave, Biometric System, Integration Server, NMS & EMS Solution SCADA & DMS etc.

3. Apart from above to handle proper communication, networking and Cyber-Security, various network, Communication & Security appliances (e.g. Next-Gen Firewall, SIEM, SOAR, WAF, PAM, IPS / IDS, Centralised Console for End-Point & Servers etc) shall also be placed to facilitate monitoring of smooth running of network via NOC, smooth running of DC via Security Operation Centre (SOC) endpoint Security.
4. Additionally, to support the huge data, Racks with Unified Storage, Tape Library, and Backup Infra are to be placed inside the Data Center for each Discom.
5. Even Racks should also be kept for the expansion towards delivery of future projects.
6. Like TPCODL, 25 Racks shall be utilized by each Discom to handle IT & OT applications totaling to 100 Rack provision.
7. Online UPS is to be provisioned to supply uninterrupted (0 ms), rectified and clean power to these sensitive equipment in the 100 Racks. Similarly, precision AC provisioning is also to be done for cooling of these servers along with controlled environment.
8. While housing the Server of other three Discoms, they shall enter into agreement with TPCODL for colocation Charges per Rack basis. This will lead to quick achievement of RoI.

Proposal -It is proposed for Set up of Server room with 100-rack space at Technology Center.

Scope of Proposal –

Server Room PAC, BMS & UPS		FY 23-24			
Sr. No	Item Description	Unit	Unit Price (Rs.Cr)	Total Price (Rs. Cr)	Total Price with GST (Rs. Cr)
PAC with 5 Years Warranty Support					
1	Supply of floor mounted bottom discharge 30TR Air cooled Precision Air Conditioner with scroll compressor & SNMP card	6	0.42	2.52	3.23
2	Installation and commissioning of floor mounted bottom discharge 30TR Air cooled Precision Air Conditioner	6	0.06	0.36	0.42
PAC Sub Total					3.65
BMS with 3 Years Warranty Support					
1	Addressable Fire Alarm System	1	0.44	0.44	0.56
2	Server Room Gas based Suppression system	1	0.6	0.6	0.76
3	VESDA (Very Early Smoke Detection Apparatus)	1	0.08	0.08	0.1
4	WLD (Water Leakage Detection System)	1	0.05	0.05	0.06
5	Rodent Repellent	1	0.04	0.04	0.06
6	CCTV system	1	0.25	0.25	0.36
7	Access Doors	1	0.25	0.25	0.33
8	DCIM (Data Centre Infrastructure Management System)	1	0.34	0.34	0.43
BMS Sub Total					2.66
UPS with 4 Years Warranty Support					
1	Supply & installation of 600 KVA UPS System 3Ph/ 3Ph. With Battery circuit breaker, SNMP card and Paralleling kit to work in N+N configuration - Set	2	1.2	2.4	2.832
2	Supply & installation of LI-ION Battery with 1 hour back up on 600KVA load (Battery Bank) – Set	2	5.704	11.4	14.592
3	Power distribution unit with K13 rated Isolation Transformer in N+N configuration	2	0.4	0.8	0.944
4	60 KVA UPS for auxiliary load and emergency lighting (SCADA Display Panel, IT Display Panel, Camera, Access Control & Biometric) - Set	1	0.192	0.192	0.224
5	SMF Battery for 1 hour back up – Set	1	0.08	0.08	0.104
UPS Sub Total					18.696
Total (PAC, BMS & UPS)					25.006

Budgetary Requirement - The approx. Capex budget requirement for set up of Server room with 100-rack space at Technology Centre is **Rs.25 Cr.** While this centralized server room is going to be built by TPCODL, it will be used by all four DISCOMs. Other three DISCOMs will enter into agreement for hosting their servers in this server room on chargeable basis.

Benefits -

- Infrastructure for business critical applications.
- Providing reliable power supply to consumers through availability of IT & OT services



- Ease in monitoring and control of IT & OT system.
- Meeting PA timelines leading to consumer satisfaction
- Efficiency in performing critical business processes
- Ease in inter office communication and ease of availability of legacy documents

Scheme Completion Time - One years from date of CAPEX approval by OERC.

2.5.5 Civil Upgradation

In the Infrastructure Head, many civil related activities are planned in the next 5 years. Details of the same along with Total Budget requirement are mentioned below:

Activity Planned	Budget req. (Rs. Cr)	Justification
Distribution Transformer foundation - 100 numbers/year	1.0	Currently many DT foundations are coming under submerged condition and most of the DT transformer need to be upgraded in coming years for load enhancement. New DT foundations will be constructed to mitigate the DT foundation Requirement.
PSS Compound Wall works - 25 numbers / year	2.0	At many locations, the existing compound wall is of only 1mtr to 1.4 metre height. Also at many locations there are no compound walls available to protect form theft and encroachment. In view of above it is planned to take up upgradation of existing compound wall and also to construct new compound wall to secure the area.
Chain-link fencing in switch yard	1.0	Bill collection centers and Section offices are housed inside our PSS premises. Local public visit these locations for bill payment and bill resolution. Due to unavailability of barricading inside switchyard side, it has become and identified as high hazard area. Under this project it is planned to take up chain-link fencing in a phased manner of such locations to restrict unauthorized entry of local public.
Structural strengthening of Section Offices	2.5	We have already completed renovation of section offices about 150 numbers out of 247 in previous year capex Budget as planned in phased manner. Under this plan it is intended to take up renovation of remaining section offices. Also around 40 section offices are under rented premises and are operating form nonuser friendly work environment. It is proposed to construct new section offices in nearby PSS premises utilizing our land available, thereby creating a user friendly and hygienic workplace to employees and consumers.
New construction for Rented to own locations	2.5	
Workshop at Infocity	0.4	It is proposed to utilize the existing discarded/ retired equipment and do refurbishment of the equipment. Currently there are no sheds/workshop available for carrying out such activities. Hence it is proposed construct a workshop at Infocity PSS.
Furniture at offices	2.1	We have upcoming technology center of seating capacity 180 numbers and an office building at Nayapalli by OPTCL of seating capacity 200 Nos and SCRIPS building 4 numbers of 30 seating capacity each. Budget proposed under this shall be used to cater to above said buildings and to newly renovated and constructed Section offices.
New Store Shed at KED-I	0.4	During Cyclones it is envisaged that material movement form Cuttack to Paradeep circle becomes difficult and are readily non-available due to lack of proper storage facility. It is proposed to construct a storage shed in KED -1 premises to store necessary materials and equipment at these stores.
Store-Security enhancement and Concrete flooring	2.5	During erstwhile CESU period, materials were stored haphazardly on open ground and at present, they are beyond revival due to formation of sludge. Under this Capex it is proposed to upgrade the flooring by GSB and Concreting of store Area which will in turn help in proper and safe storage and revival of material. Also security arrangements such as security chowky, watch tower, Compound wall are proposed.



DT overhauling workshop division wise	1.0	Currently there are no workshops for transformer overhauling. Hence all the repairs are conducted in open, which in turn provides less output. Therefore is it proposed to construct a DT overhauling workshop in each circle which can cater to repair needs of transformer.
Civil Infrastructure for Technology centre	4.61	Escalated cost of HVAC and other materials to complete the construction of Technology Center
Total	21.0	

2.5.6 RMU / DT Workshop

Scheme Proposed	RMU / DT workshop
Capex Amount	₹ 1.20 Cr
Benefit to customer	<ul style="list-style-type: none"> Improving the safety of people & stray animal Improving safety of the equipment. Improved working environment for comfort of customer and employees.

Existing system in Place - TPCODL has a vast ring network comprising of 750 RMU, 238 CSS & 270 auto reclosers, which deliver reliable and quality power supply to its valuable customer base. Further, ACB is also being installed by project team on continuous basis. Various issues which generally arises during day to day operations are being attended by cable & switchgear team. A total of 93 numbers of complaints have been resolved as on Sep-22. However, there are several other issues which can't be repaired on site. Either the switchgear needs to be lifted by OEM for repairing at their manufacturing plant or it is scrapped along with installation of a new one.

Repairing at vendor premises is again a very costly affair as the transportation charges for "To & Fro" journey is too expensive in addition to repairing cost.

These type of issues are generally as follows -

- SF6 Leakage from Tank Surface or Bushings
- Damaged/Faulty Bushings of RMU
- Flashover
- Internal Contact Problem inside SF6 Tank
- Internal short circuit inside SF6 Tank etc.

Proposed system- In view of above, we propose to set up a switchgear workshop with basic in-house testing & repair facility. The various activities that can be carried out in the workshop are repairing SF6 gas tanks, fabrication of switchgear doors & covers, replacement of complete mechanisms, renovation of flash over RMU/CSS with painting, ACB pole replacement, CSS overhauling, auto recloser spare replacement with testing etc.

Benefits- We do hope that this activity would help to enhance the life of switchgear through in-house 'testing & repair' facility as well as reduce the operational expenditure (OPEX) as compared to repairing of this high value assets at vendor premises.

2.5.7 GIS Implementation

Scheme Proposed	GIS Implementation
Capex Amount	₹ 13.00 Cr
Benefit to customer	Improving the safety of people & stray animal Improving safety of the equipment

Existing system in place-As per approved Road map of GIS, status of GIS implementation is as follows:

Activity	Up to FY 23 Plan	FY23 Actuals till Oct'22	Expected by March'23	Remarks
33/11kV Network including GSS Boundary, All PSS and its Connected Network for entire TPCODL Area	All total 374 Nos PSS, 820 Nos Power Transformer 3,743.28 Km of Network Length captured	Completed and available in GIS System		Data and Application Rolled out
11 kV (line UG and OH) network for entire TPCODL	Approx. 35000 Linear Km of Network and its connected 79034 Nos of DT to be captured	22076 Km Linear Length and its connected poles captured 53282 Nos of DT Captured	Activity to be completed by Mid of March	Data and Application to be Rolled out
LT Line (UG and OH) network to be captured for entire TPCODL	Approx. 58205 Linear Km of Network and its connected DT to be captured	20197 Km Linear Length and its connected poles captured	Another 25000 Km Linear Length to be captured	Data and Application to be Rolled out
Consumer Indexing to be completed for entire TPCODL	Approx. 27 Lakhs consumer to be captured	12.8 Lakhs consumer captured	Another 10 lakhs consumer to be captured	Data and Application to be Rolled out
Implementation of ESRI enterprise GIS Solution	Upgradation of Hardware, Software and Its installation, Configuration and Integration with other modules (SAP, NA, MDAS, SCADA and Energy Audit)	Database and Application Configured in DC environment Cut off data migrated and Production environment rolled out Staging Table for Integration is ready for data exchange	All integration to be active and made synch able	Depending on readiness of other module the data will flow from and to other systems. DR to be established

Need of the Project – Due to climatic condition and local resistances, the consumer indexing activity got delayed and to be completed by FY 24. In the meantime, the changes happening at site is also being captured to make the GIS data updated till final roll out of the project.

Proposal for the capex investment – Due to delay and absence of funds (**As only 20 Cr approved against 33 Cr for FY 23**), work order for Land base, Data Migration activity couldn't be processed. Implementation of upgraded GIS with DC and DR Configuration along with other modules (SCADA, Smart Meter/ MDAS) could also not be started.

2.5.8 Ready to Use Office Assets

In TPCODL, the office space is currently crowded and lacks proper seating plan. Some of offices are owned and others are on rented property. One of the challenges existing in TPCODL in using current buildings and infrastructure is to accommodate more employees in already existing property and providing a hygienic, well ventilated and spacious working environment to our colleagues.

In last 3 FY, we have renovated many parts of our existing offices, which included shifting of old files and shelves – thereby increasing the floor area and also using proper seating arrangement in a planned manner.

With the objective to provide best in class services to consumers, earn consumer delight, and improve satisfaction among other stakeholders and maintaining a clean & safe working environment, following infrastructures are required at work place:

- a) Most of the chairs currently existing in our office are wooden, which is not the best option to be considered from ergonomic point of view. That is why, ergonomic office chairs are designed for sitting long periods with ease. This naturally helps employees work more efficiently and productively. Another benefit is reduction in healthcare expenses related to poor posture from unsuitable office chairs. Already replacement have been made in few of our offices.
- b) Considering the fact that the state of Orissa is one of the most humid states of our country, Water cooler & R.O Water Purifiers are required for proper hydration employees and to ensure good health and improve overall efficiency.
- c) Office air conditioning systems are required to provide a comfortable working environment to bring and control Energy Efficiency, Humidity, Air Quality, and Reduction in Noise & Keeping Business Critical Equipment at the Right Temperature. In addition, stabilizers are advised along with A.Cs to avoid voltage fluctuations.



To facilitate smooth operation and support hygiene and conducive work environment, TPCODL proposes **Rs.1.84 Cr.** under Admin head to support various departments / locations.

Table 2-23 : Cost estimate Ready to use Office Assets

Sl.no.	Item	Value (in Rs. Cr)
1	Office Furniture	1.00
2	Water Cooler / Purifier	0.13
3	Air conditioner	0.55
4	Office Ready to use Asset	0.16
	TOTAL	1.84

ANNEXURE-1 Interposing Poles			
Sl. No.	Description	Quantity (in nos.)	Amount (in cr.)
1	13mtr WPB Poles	130	0.8
2	11mtr WPB Poles	320	1.6
3	9mtr PSC Poles	525	0.8
Total			3.25

Standard BoQ for 13mtr WPB Pin point Pole					
No. of 13mtr WPB Pin point poles			1		
MATERIALS FOR 33 KV Pin Points					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	1	31,200.00
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	1	1,959.20
3	Top bracket 100x50x6mm GI channel (2kg each)	No.	186.00	1	186.00
4	Danger Plate, 1 no's.	No.	99.20	1	99.20
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	0.30	27.98
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	3.00	297.60
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	1.20	111.93
8	33KV pin insulator polymer	No.	595.20	3	1,785.60
9	Earthing of Support (Coil Type)	No.	205.84	1	205.84
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	0.26	24.37
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	1.45	140.24
12	Black Paint	Ltr	272.80	1.0	272.80
13	Yellow Colour Paint for Background	Ltr	272.80	2.0	545.60
A	Total Cost of materials				36,856.37
B	Stock, Storage & Insurance i.e 3% of A				1,105.69
C	Sub Total (A+B)				37,962.06
D	Contingency @ 3% of C				1,138.86
E	Tools & Plants @ 2% of C				759.24
F	Transportation @ 7.5% of C				2,847.15
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,606.80
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				582.61
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				44,896.72
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	0.55	3,575.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.11	731.25
K	Total Civil & Services				4,306.25
L	Total (J+K)				49,202.97
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				2,952.18
N	Sub Total (L+M)				52,155.15
O	Total GST @ 18% of (N)				9,387.93
P	Total CESS @1% of (N)				521.55
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				62,064.63

Standard BoQ for 11mtr WPB Pin point Pole					
No. of 11mtr WPB Pin point poles			1		
MATERIALS FOR 11 KV Pin Points With WPB					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (11Mtr. Long, 30.44KG/Mtr.)	No.	26,516.95	1	26,516.95
2	11 KV V cross Arm (10.2 K.g. each)	No.	1,004.40	1	1,004.40
3	Top bracket 100x50X6 mm GI channel (2kg each)	No.	186.00	1	186.00
4	Danger Plate, 1 no's. for each pole	No.	99.20	1	99.20
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	0.30	27.98
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	3.00	297.60
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	1.20	111.93
8	11 KV pin insulator polymer, 3 Nos. required for each support	No.	248.00	3	744.00
9	Earthing of Support (Coil Type)	No.	205.84	1	205.84
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	0.26	24.37
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	1.45	140.24
12	Black Paint	Ltr	272.80	1.0	272.80
13	Yellow Colour Paint for Background	Ltr	272.80	2.0	545.60
A	Total Cost of materials				30,176.92
B	Stock, Storage & Insurance i.e 3% of A				905.31
C	Sub Total (A+B)				31,082.23
D	Contingency @ 3% of C				932.47
E	Tools & Plants @ 2% of C				621.64
F	Transportation @ 7.5% of C				2,331.17
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,365.62
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				376.98
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				36,710.10
Civil & Services					
1	Concreting ratio 1:1.5:3 (500mmX500mmX1800mm) = 0.45Cu.mtr	Cu.mtr	6,500.00	0.45	2,925.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.11	731.25
K	Total Civil & Services				3,656.25
L	Total Material+Services (I+K)				40,366.35
M	Other overheads (Including 6% supervision charges) (for 11 KV Pin Points With WPB)				2,421.98
N	Sub Total (L+M)				42,788.34
O	Total GST @ 18% of (N)				7,701.90
P	Total CESS @1% of (N)				427.88
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				50,918.12

Standard BoQ for 9mtr PSC Pole					
No. of 9mtr PSC Poles			1		
MATERIALS FOR 9mtr PSC Poles					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	PSC POLE 9 METER LONG 300 KG	No	3,720.00	1	3,720.00
2	PSC Pole V cross Arm Back Clamp	EA	99.20	1	99.20
3	11 KV V cross Arm (10.2 K.g. each)	No.	1,004.40	1	1,004.40
3	Top bracket 100x50X6 mm GI channel (2kg each)	No.	186.00	1	186.00
5	Danger Plate, 1 no's. for each pole	No.	99.20	1	99.20
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	0.30	27.98
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	3.00	297.60
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	1.20	111.93
9	11 KV pin insulator polymer, 3 Nos. required for each support	No.	248.00	3	744.00
10	Earthing of Support (Coil Type)	No.	205.84	1	205.84
11	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	0.26	24.37
12	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	1.45	140.24
13	Black Paint	Ltr	272.80	1.0	272.80
14	Yellow Colour Paint for Background	Ltr	272.80	2.0	545.60
A	Total Cost of materials				7,479.17
B	Stock, Storage & Insurance i.e 3% of A				224.38
C	Sub Total (A+B)				7,703.54
D	Contingency @ 3% of C				231.11
E	Tools & Plants @ 2% of C				154.07
F	Transportation @ 7.5% of C				577.77
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/ LT Stay set/PSC Pole)				387.19
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				766.32
J	Sum of (C to I)				9,820.00
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	0.38	2,437.50
K	Total Civil & Services				2,437.50
L	Total (J+K)				12,257.50
M	Other overheads (Including 6% supervision charges) of L				735.45
N	Sub Total (L+M)				12,992.95
O	Total GST @ 18% of (N)				2,338.73
P	Total CESS @1% of (N)				129.93
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				15,461.61

ANNEXURE-2 DT Plinth, Boundary Wall Fencing			
Sl. No.	Description	Quantity (in Nos.)	Amount (in cr.)
1	DT Plinth (250kVA)	190	0.6
2	DT Plinth (500kVA)	160	0.6
3	Boundary Wall	160	1.9
4	Fencing	210	1.9
Total			5.0

Standard estimate for a DTR Plinth for 250 KVA Trf.					
<i>Sl. No.</i>	<i>Description of Materials</i>	<i>Unit</i>	<i>Unit Rate</i>	<i>Total Quantity</i>	<i>Total Amount</i>
1	Construction of Plinth with Brick, Mortar, 12 mm cement plaster for 250KVA transformer as per TPCODL drawing.Scope of work includes excavation of earth,supply of Civil material, machinery for construction of plinth as per TPCODL Drawing desposal of extra malba as per EIC instruction.	No.	25,000.00	1	25,000.00
A	Total Civil & Services				25,000.00
B	Other overheads (Including 6% supervision charges) of A				1,500.00
C	Sub Total (A+B)				26,500.00
D	Total GST @ 18% of (C)				4,770.00
E	Total CESS @ 1% of (C)				265.00
F	Gross Total Material +Services (C+D+E)				31,535.00

Standard estimate for a DTR Plinth upto 500KVA Trf.					
<i>Sl. No.</i>	<i>Description of Materials</i>	<i>Unit</i>	<i>Unit Rate</i>	<i>Total Quantity</i>	<i>Total Amount</i>
1	Construction of Plinth with Brick, Mortar, 12 mm cement plaster for 500KVA transformer as per TPCODL drawing.Scope of work includes excavation of earth,supply of Civil material, machinery for construction of plinth as per TPCODL Drawing desposal of extra malba as per EIC instruction.	No.	30,360.00	1	30,360.00
A	Total Civil & Services				30,360.00
B	Other overheads (Including 6% supervision charges) of A				1,821.60
C	Sub Total (A+B)				32,181.60
D	Total GST @ 18% of (C)				5,792.69
E	Total CESS @ 1% of (C)				321.82
F	Gross Total Material +Services (C+D+E)				38,296.10

Standard estimate for Boundary Wall Fencing							
<i>Sl. No.</i>	<i>Description of Materials</i>	<i>Unit</i>	<i>Quantity for 1 No's DSS</i>	<i>No. of DSS Requirement</i>	<i>Unit Rate</i>	<i>Total Quantity</i>	<i>Total Amount</i>
1	Boundary wall fencing with 2Mtr Height	Sqmtr.	20	1	4,620.00	20	92,400.00
A	Total Civil & Services						92,400.00
B	Other overheads (Including 6% supervision charges) of A						5,544.00
C	Sub Total (A+B)						97,944.00
D	Total GST @ 18% of (C)						17,629.92
E	Total CESS @ 1% of (C)						979.44
F	Gross Total Material +Services (C+D+E)						1,16,553.36

Standard estimate for Fencing							
<i>Sl. No.</i>	<i>Description of Materials</i>	<i>Unit</i>	<i>Quantity for 1 No's DSS</i>	<i>No. of DSS Requirment</i>	<i>Unit Rate</i>	<i>Total Quantity</i>	<i>Total Amount</i>
1	Supply and Erection of GI Fencing with Gate	Sqmtr.	20	1	3,600.00	20	72,000.00
A	Total Civil & Services						72,000.00
B	Other overheads (Including 6% supervision charges) of A						4,320.00
C	Sub Total (A+B)						76,320.00
D	Total GST @ 18% of (C)						13,737.60
E	Total CESS @ 1% of (C)						763.20
F	Gross Total Material +Services (C+D+E)						90,820.80

ANNEXURE-3 Unsafe to Safe				
Sl. No.	DESCRIPTION OF WORK	Unit	Quantity (in km)	Amount (in cr.)
1	Conversion of LT Bare/ deteriorated LT AB Cable to LT AB Cable (4X95 sq.mm)	Km	8.5	0.8
2	Conversion of LT Bare/ deteriorated LT AB Cable to LT AB Cable (4CX70 sq.mm)	Km	14	1.2
3	Conversion LT Bare/ deteriorated LT AB Cable to LT AB Cable (4CX50 sq.mm)	Km	18	1.2
4	Conversion LT Bare/ deteriorated LT AB Cable to LT AB Cable (4CX35 sq.mm)	Km	14	0.8
5	Conversion LT Bare/ deteriorated LT AB Cable to LT AB Cable (2CX35 sq.mm+1CX35 sq.mm)	Km	11	0.5
Total			65.5	4.50

Conversion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span using - 4C×95 mm ² (3P+1N)+1C×95 mm ² (M)+1CX16 mm ² (Street Light)					
AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.- TPCODL-.....)			1		
MATERIALS FOR Conversion of LT Bare to LT AB Cable					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	10	37,200.00
2	LT Stay set Complete	Set	644.80	5	3,224.00
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00
4	LT stay Clamp (1.40Kg/pair)	Pair	136.40	5	682.00
5	LT Stay insulator	No.	37.20	5	186.00
6	LT Accessories with Eye hook and Clamp				-
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60
7	4C×95 mm ² (3P+1N)+1C×95 mm ² (M)+1CX16 mm ² (Street Light)	K.M	3,68,640.00	1.05	3,87,072.00
8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00	2	9,920.00
10	Insulated piercing connector.Type-A-main 50 to 150 sq.mm & Tap-50 to 150 sq.mm	No.	98.62	4	394.48
11	Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77	40	2,070.80
12	Insulated piercing connector.Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm	No.	40.06	30	1,201.80
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00
14	Coil Earthing	No's	205.84	5	1,029.20
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	Kg	93.00	3	243.66
16	Danger plate (LT)	No	99.20	10	992.00
17	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3	279.84
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	250	9,120.00
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27	200	13,854.00
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60
22	Black Paint	Ltr	272.80	10	2,728.00
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00
A	Total Cost of materials				5,28,694.98
B	Stock, Storage & Insurance i.e 3% of A				15,860.85
C	Sub Total (A+B)				5,44,555.83
D	Contingency @ 3% of C				16,336.67
E	Tools & Plants @ 2% of C				10,891.12
F	Transportation @ 7.5% of C				40,841.69
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/ LT Stay set/PSC Pole)				48,957.24
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				7,663.20

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
J	Sum of (C to I)				6,69,245.74
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of LT Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	5	11,250.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00
3	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00
5	Dismantling of ACSR/AAAC 34/ 55mm2 from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/ site store	KM	6,300.00	1.00	6,300.00
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00
K	Total Civil & Services				66,896.00
L	Total (J+K)				7,36,141.74
M	Other overheads (Including 6% supervision charges) of L				44,168.50
N	Sub Total (L+M)				7,80,310.25
O	Total GST @ 18% of (O)				1,40,455.84
P	Total CESS @ 1% of (P)				7,803.10
Q	Gross Total Material +Services (N+O+P) for LT AB Cable Line				9,28,569.19

Conversion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span using - 4C×70 mm ² (3P+1N)+1C×70 mm ² (M)+1CX16 mm ² (Street Light)					
AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.- TPCODL-.....)			1		
MATERIALS FOR Conversion of LT Bare to LT AB Cable					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	10	37,200.00
2	LT Stay set Complete	Set	644.80	5	3,224.00
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00
4	LT stay Clamp (1.40Kg/pair)	Pair	136.40	5	682.00
5	LT Stay insulator	No.	37.20	5	186.00
6	LT Accessories with Eye hook and Clamp				-
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60
7	4C×70 mm ² (3P+1N)+1C×70 mm ² (M)+1CX16 mm ² (Street Light)	K.M	3,05,000.00	1.05	3,20,250.00
8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00	2	9,920.00
10	Insulated piercing connector.Type-A-main 50 to 150 sq.mm & Tap-50 to 150 sq.mm	No.	98.62	4	394.48
11	Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77	40	2,070.80
12	Insulated piercing connector.Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm	No.	40.06	30	1,201.80
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00
14	Coil Earthing	No's	205.84	5	1,029.20
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	Kg	93.00	2.62	243.66
16	Danger plate (LT)	No	99.20	10	992.00
17	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.01	279.84
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	250	9,120.00
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27	200	13,854.00
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60
22	Black Paint	Ltr	272.80	10	2,728.00
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00
A	Total Cost of materials				4,61,872.98
B	Stock, Storage & Insurance i.e 3% of A				13,856.19
C	Sub Total (A+B)				4,75,729.17
D	Contingency @ 3% of C				14,271.87
E	Tools & Plants @ 2% of C				9,514.58
F	Transportation @ 7.5% of C				35,679.69
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/ LT Stay set/PSC Pole)				42,074.57
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				7,663.20
J	Sum of (C to I)				5,84,933.08

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
<u>Civil & Services</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of LT Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including excavation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	5	11,250.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00
3	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within 10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00
5	Dismantling of ACSR/AAAC 34/ 55mm ² from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/ site store	KM	6,300.00	1.00	6,300.00
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00
K	Total Civil & Services				66,896.00
L	Total (J+K)				6,51,829.08
M	Other overheads (Including 6% supervision charges) of L				39,109.74
N	Sub Total (L+M)				6,90,938.83
O	Total GST @ 18% of (O)				1,24,368.99
P	Total CESS @ 1% of (P)				6,909.39
Q	Gross Total Material +Services (N+O+P) for LT AB Cable Line				8,22,217.20

Conversion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span using - 4C×50 mm ² (3P+1N)+1C×50 mm ² (M)+1CX16 mm ² (Street Light)					
AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.- TPCODL-.....)			1		
MATERIALS FOR Conversion of LT Bare to LT AB Cable					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	10	37,200.00
2	LT Stay set Complete	Set	644.80	5	3,224.00
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00
4	LT stay Clamp (1.40Kg/pair)	Pair	136.40	5	682.00
5	LT Stay insulator	No.	37.20	5	186.00
6	LT Accessories with Eye hook and Clamp				-
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60
7	4C×50 mm ² (3P+1N)+1C×50 mm ² (M)+1CX16 mm ² (Street Light)	K.M	2,26,000.00	1.05	2,37,300.00
8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00	2	9,920.00
10	Insulated piercing connector.Type-A-main 50 to 150 sq.mm & Tap-50 to 150 sq.mm	No.	98.62	4	394.48
11	Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77	40	2,070.80
12	Insulated piercing connector.Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm	No.	40.06	30	1,201.80
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00
14	Coil Earthing	No's	205.84	5	1,029.20
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	Kg	93.00	2.62	243.66
16	Danger plate (LT)	No	99.20	10	992.00
17	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.01	279.84
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	250	9,120.00
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27	200	13,854.00
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60
22	Black Paint	Ltr	272.80	10	2,728.00
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00
A	Total Cost of materials				3,78,922.98
B	Stock, Storage & Insurance i.e 3% of A				11,367.69
C	Sub Total (A+B)				3,90,290.67
D	Contingency @ 3% of C				11,708.72
E	Tools & Plants @ 2% of C				7,805.81
F	Transportation @ 7.5% of C				29,271.80
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/ LT Stay set/PSC Pole)				33,530.72
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				7,663.20
J	Sum of (C to I)				4,80,270.92
Civil & Services					

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of LT Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including excavation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	5	11,250.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00
3	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within 10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00
5	Dismantling of ACSR/AAAC 34/ 55mm ² from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/ site store	KM	6,300.00	1.00	6,300.00
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00
K	Total Civil & Services				66,896.00
L	Total (J+K)				5,47,166.92
M	Other overheads (Including 6% supervision charges) of L				32,830.02
N	Sub Total (L+M)				5,79,996.94
O	Total GST @ 18% of (O)				1,04,399.45
P	Total CESS @ 1% of (P)				5,799.97
Q	Gross Total Material +Services (N+O+P) for LT AB Cable Line				6,90,196.35

Conversion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span using - 4C×35 mm ² (3P+1N)+1C×35 mm ² (M)+1CX16 mm ² (Street Light)					
AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.- TPCODL-.....)			1		
MATERIALS FOR Conversion of LT Bare to LT AB Cable					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	10	37,200.00
2	LT Stay set Complete	Set	644.80	5	3,224.00
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00
4	LT stay Clamp (1.40Kg/pair)	Pair	136.40	5	682.00
5	LT Stay insulator	No.	37.20	5	186.00
6	LT Accessories with Eye hook and Clamp				-
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60
7	4C×35 mm ² (3P+1N)+1C×35 mm ² (M)+1CX16 mm ² (Street Light)	K.M	1,69,000.00	1.05	1,77,450.00
8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00	2	9,920.00
10	Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77	4	207.08
11	Insulated piercing connector.Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm	No.	40.06	40	1,602.40
12	Insulated piercing connector.Type-D-main 10 to 50 sq.mm & Tap-1.5 to 10 sq.mm	No.	34.21	30	1,026.30
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00
14	Coil Earthing	No's	205.84	5	1,029.20
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	Kg	93.00	2.62	243.66
16	Danger plate (LT)	No	99.20	10	992.00
17	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.01	279.84
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	250	9,120.00
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27	200	13,854.00
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60
22	Black Paint	Ltr	272.80	10	2,728.00
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00
A	Total Cost of materials				3,18,241.68
B	Stock, Storage & Insurance i.e 3% of A				9,547.25
C	Sub Total (A+B)				3,27,788.93
D	Contingency @ 3% of C				9,833.67
E	Tools & Plants @ 2% of C				6,555.78
F	Transportation @ 7.5% of C				24,584.17
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/ LT Stay set/PSC Pole)				27,280.55
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				7,663.20
J	Sum of (C to I)				4,03,706.29
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of LT Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	5	11,250.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00
3	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00
5	Dismantling of ACSR/AAAC 34/ 55mm2 from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/ site store	KM	6,300.00	1.00	6,300.00
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00
K	Total Civil & Services				66,896.00
L	Total (J+K)				4,70,602.29
M	Other overheads (Including 6% supervision charges) of L				28,236.14
N	Sub Total (L+M)				4,98,838.43
O	Total GST @ 18% of (O)				89,790.92
P	Total CESS @ 1% of (P)				4,988.38
Q	Gross Total Material +Services (N+O+P) for LT AB Cable Line				5,93,617.73

Conversion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span using - 2C×35 mm ² (1P+1N)+1C×25 mm ² (M)					
AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.- TPCODL-.....)			1		
MATERIALS FOR Conversion of LT Bare to LT AB Cable					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	10	37,200.00
2	LT Stay set Complete	Set	644.80	5	3,224.00
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00
4	LT stay Clamp (1.40Kg/pair)	Pair	136.40	5	682.00
5	LT Stay insulator	No.	37.20	5	186.00
6	LT Accessories with Eye hook and Clamp				-
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60
7	2C×35 mm ² (1P+1N)+1C×35 mm ² (M)	K.M	85,140.00	1.05	89,397.00
8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00	2	9,920.00
10	Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77	2	103.54
11	Insulated piercing connector.Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm	No.	40.06	20	801.20
12	Insulated piercing connector.Type-D-main 10 to 50 sq.mm & Tap-1.5 to 10 sq.mm	No.	34.21	20	684.20
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00
14	Coil Earthing	No's	205.84	5	1,029.20
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	Kg	93.00	2.62	243.66
16	Danger plate (LT)	No	99.20	10	992.00
17	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.01	279.84
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	500	18,240.00
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27		
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60
22	Black Paint	Ltr	272.80	10	2,728.00
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00
A	Total Cost of materials				2,24,207.84
B	Stock, Storage & Insurance i.e 3% of A				6,726.24
C	Sub Total (A+B)				2,30,934.07
D	Contingency @ 3% of C				6,928.02
E	Tools & Plants @ 2% of C				4,618.68
F	Transportation @ 7.5% of C				17,320.06
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/ LT Stay set/PSC Pole)				17,595.06
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				7,663.20
J	Sum of (C to I)				2,85,059.09
Civil & Services					

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of LT Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including excavation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	5	11,250.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00
3	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within 10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00
5	Dismantling of ACSR/AAAC 34/ 55mm ² from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/ site store	KM	6,300.00	1.00	6,300.00
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00
K	Total Civil & Services				66,896.00
L	Total (J+K)				3,51,955.09
M	Other overheads (Including 6% supervision charges) of L				21,117.31
N	Sub Total (L+M)				3,73,072.40
O	Total GST @ 18% of (O)				67,153.03
P	Total CESS @ 1% of (P)				3,730.72
Q	Gross Total Material +Services (N+O+P) for LT AB Cable Line				4,43,956.15

ANNEXURE-4 LT Bare to AB Cable				
Sl. No.	DESCRIPTION OF WORK	Unit	Quantity (in km)	Amount (in cr.)
1	Conversion of LT Bare to LT AB Cable (4X95 sq.mm)	km	24	2.2
2	Conversion of LT Bare to LT AB Cable (4CX70 sq.mm)	km	60	4.9
3	Conversion LT Bare to LT AB Cable (4CX50 sq.mm)	km	104	7.2
4	Conversion LT Bare to LT AB Cable (4CX35 sq.mm)	km	60	3.6
5	Conversion LT Bare to LT AB Cable (2CX35 sq.mm+1CX35 sq.mm)	km	48	2.1
Total			296.0	20.0

Conversion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span using - 4C×95 mm ² (3P+1N)+1C×95 mm ² (M)+1CX16 mm ² (Street Light)					
AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.- TPCODL-.....)			1		
MATERIALS FOR Conversion of LT Bare to LT AB Cable					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	10	37,200.00
2	LT Stay set Complete	Set	644.80	5	3,224.00
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00
4	LT stay Clamp (1.40Kg/pair)	Pair	136.40	5	682.00
5	LT Stay insulator	No.	37.20	5	186.00
6	LT Accessories with Eye hook and Clamp				-
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60
7	4C×95 mm ² (3P+1N)+1C×95 mm ² (M)+1CX16 mm ² (Street Light)	K.M	3,68,640.00	1.05	3,87,072.00
8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00	2	9,920.00
10	Insulated piercing connector.Type-A-main 50 to 150 sq.mm & Tap-50 to 150 sq.mm	No.	98.62	4	394.48
11	Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77	40	2,070.80
12	Insulated piercing connector.Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm	No.	40.06	30	1,201.80
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00
14	Coil Earthing	No's	205.84	5	1,029.20
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	Kg	93.00	3	243.66
16	Danger plate (LT)	No	99.20	10	992.00
17	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3	279.84
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	250	9,120.00
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27	200	13,854.00
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60
22	Black Paint	Ltr	272.80	10	2,728.00
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00
A	Total Cost of materials				5,28,694.98
B	Stock, Storage & Insurance i.e 3% of A				15,860.85
C	Sub Total (A+B)				5,44,555.83
D	Contingency @ 3% of C				16,336.67
E	Tools & Plants @ 2% of C				10,891.12
F	Transportation @ 7.5% of C				40,841.69
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/ LT Stay set/PSC Pole)				48,957.24

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				7,663.20
J	Sum of (C to I)				6,69,245.74
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of LT Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	5	11,250.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00
3	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00
5	Dismantling of ACSR/AAAC 34/ 55mm2 from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/ site store	KM	6,300.00	1.00	6,300.00
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00
K	Total Civil & Services				66,896.00
L	Total (J+K)				7,36,141.74
M	Other overheads (Including 6% supervision charges) of L				44,168.50
N	Sub Total (L+M)				7,80,310.25
O	Total GST @ 18% of (O)				1,40,455.84
P	Total CESS @ 1% of (P)				7,803.10
Q	Gross Total Material +Services (N+O+P) for LT AB Cable Line				9,28,569.19

Conversion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span using - 4C×70 mm ² (3P+1N)+1C×70 mm ² (M)+1CX16 mm ² (Street Light)					
AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.- TPCODL-.....)			1		
MATERIALS FOR Conversion of LT Bare to LT AB Cable					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	10	37,200.00
2	LT Stay set Complete	Set	644.80	5	3,224.00
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00
4	LT stay Clamp (1.40Kg/pair)	Pair	136.40	5	682.00
5	LT Stay insulator	No.	37.20	5	186.00
6	LT Accessories with Eye hook and Clamp				-
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60
7	4C×70 mm ² (3P+1N)+1C×70 mm ² (M)+1CX16 mm ² (Street Light)	K.M	3,05,000.00	1.05	3,20,250.00
8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00	2	9,920.00
10	Insulated piercing connector.Type-A-main 50 to 150 sq.mm & Tap-50 to 150 sq.mm	No.	98.62	4	394.48
11	Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77	40	2,070.80
12	Insulated piercing connector.Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm	No.	40.06	30	1,201.80
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00
14	Coil Earthing	No's	205.84	5	1,029.20
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	Kg	93.00	2.62	243.66
16	Danger plate (LT)	No	99.20	10	992.00
17	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.01	279.84
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	250	9,120.00
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27	200	13,854.00
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60
22	Black Paint	Ltr	272.80	10	2,728.00
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00
A	Total Cost of materials				4,61,872.98
B	Stock, Storage & Insurance i.e 3% of A				13,856.19
C	Sub Total (A+B)				4,75,729.17
D	Contingency @ 3% of C				14,271.87
E	Tools & Plants @ 2% of C				9,514.58
F	Transportation @ 7.5% of C				35,679.69
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/ LT Stay set/PSC Pole)				42,074.57
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				7,663.20
J	Sum of (C to I)				5,84,933.08
Civil & Services					

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of LT Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including excavation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	5	11,250.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00
3	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within 10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00
5	Dismantling of ACSR/AAAC 34/ 55mm ² from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/ site store	KM	6,300.00	1.00	6,300.00
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00
K	Total Civil & Services				66,896.00
L	Total (J+K)				6,51,829.08
M	Other overheads (Including 6% supervision charges) of L				39,109.74
N	Sub Total (L+M)				6,90,938.83
O	Total GST @ 18% of (O)				1,24,368.99
P	Total CESS @ 1% of (P)				6,909.39
Q	Gross Total Material +Services (N+O+P) for LT AB Cable Line				8,22,217.20

Conversion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span using - 4C×50 mm ² (3P+1N)+1C×50 mm ² (M)+1CX16 mm ² (Street Light)					
AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.- TPCODL-.....)			1		
MATERIALS FOR Conversion of LT Bare to LT AB Cable					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	10	37,200.00
2	LT Stay set Complete	Set	644.80	5	3,224.00
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00
4	LT stay Clamp (1.40Kg/pair)	Pair	136.40	5	682.00
5	LT Stay insulator	No.	37.20	5	186.00
6	LT Accessories with Eye hook and Clamp				-
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60
7	4C×50 mm ² (3P+1N)+1C×50 mm ² (M)+1CX16 mm ² (Street Light)	K.M	2,26,000.00	1.05	2,37,300.00
8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00	2	9,920.00
10	Insulated piercing connector.Type-A-main 50 to 150 sq.mm & Tap-50 to 150 sq.mm	No.	98.62	4	394.48
11	Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77	40	2,070.80
12	Insulated piercing connector.Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm	No.	40.06	30	1,201.80
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00
14	Coil Earthing	No's	205.84	5	1,029.20
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	Kg	93.00	2.62	243.66
16	Danger plate (LT)	No	99.20	10	992.00
17	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.01	279.84
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	250	9,120.00
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27	200	13,854.00
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60
22	Black Paint	Ltr	272.80	10	2,728.00
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00
A	Total Cost of materials				3,78,922.98
B	Stock, Storage & Insurance i.e 3% of A				11,367.69
C	Sub Total (A+B)				3,90,290.67
D	Contigency @ 3% of C				11,708.72
E	Tools & Plants @ 2% of C				7,805.81
F	Transportation @ 7.5% of C				29,271.80
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/ LT Stay set/PSC Pole)				33,530.72
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				7,663.20
J	Sum of (C to I)				4,80,270.92
Civil & Services					

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of LT Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including excavation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	5	11,250.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00
3	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within 10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00
5	Dismantling of ACSR/AAAC 34/ 55mm ² from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/ site store	KM	6,300.00	1.00	6,300.00
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00
K	Total Civil & Services				66,896.00
L	Total (J+K)				5,47,166.92
M	Other overheads (Including 6% supervision charges) of L				32,830.02
N	Sub Total (L+M)				5,79,996.94
O	Total GST @ 18% of (O)				1,04,399.45
P	Total CESS @ 1% of (P)				5,799.97
Q	Gross Total Material +Services (N+O+P) for LT AB Cable Line				6,90,196.35

Conversion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span using - 4C×35 mm ² (3P+1N)+1C×35 mm ² (M)+1CX16 mm ² (Street Light)					
AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.- TPCODL-.....)			1		
MATERIALS FOR Conversion of LT Bare to LT AB Cable					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	10	37,200.00
2	LT Stay set Complete	Set	644.80	5	3,224.00
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00
4	LT stay Clamp (1.40Kg/pair)	Pair	136.40	5	682.00
5	LT Stay insulator	No.	37.20	5	186.00
6	LT Accessories with Eye hook and Clamp				-
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60
7	4C×35 mm ² (3P+1N)+1C×35 mm ² (M)+1CX16 mm ² (Street Light)	K.M	1,69,000.00	1.05	1,77,450.00
8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00	2	9,920.00
10	Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77	4	207.08
11	Insulated piercing connector.Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm	No.	40.06	40	1,602.40
12	Insulated piercing connector.Type-D-main 10 to 50 sq.mm & Tap-1.5 to 10 sq.mm	No.	34.21	30	1,026.30
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00
14	Coil Earthing	No's	205.84	5	1,029.20
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	Kg	93.00	2.62	243.66
16	Danger plate (LT)	No	99.20	10	992.00
17	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.01	279.84
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	250	9,120.00
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27	200	13,854.00
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60
22	Black Paint	Ltr	272.80	10	2,728.00
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00
A	Total Cost of materials				3,18,241.68
B	Stock, Storage & Insurance i.e 3% of A				9,547.25
C	Sub Total (A+B)				3,27,788.93
D	Contingency @ 3% of C				9,833.67
E	Tools & Plants @ 2% of C				6,555.78
F	Transportation @ 7.5% of C				24,584.17
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/ LT Stay set/PSC Pole)				27,280.55
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				7,663.20
J	Sum of (C to I)				4,03,706.29
Civil & Services					

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of LT Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including excavation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	5	11,250.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00
3	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation, soil treatment with bentonide powder, calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe. BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within 10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00
5	Dismantling of ACSR/AAAC 34/ 55mm ² from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/ site store	KM	6,300.00	1.00	6,300.00
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00
K	Total Civil & Services				66,896.00
L	Total (J+K)				4,70,602.29
M	Other overheads (Including 6% supervision charges) of L				28,236.14
N	Sub Total (L+M)				4,98,838.43
O	Total GST @ 18% of (O)				89,790.92
P	Total CESS @ 1% of (P)				4,988.38
Q	Gross Total Material +Services (N+O+P) for LT AB Cable Line				5,93,617.73

Conversion of LT Bare to LT AB Cable Line Length with 33 Mtr. Span using - 2C×35 mm ² (1P+1N)+1C×25 mm ² (M)					
AB Cable LT Line Length In KM with 33 Mtr. Span Ref. Drawing No.- TPCODL-.....)			1		
MATERIALS FOR Conversion of LT Bare to LT AB Cable					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	9 Mtr. long 300 Kg. PSC Pole	No.	3,720.00	10	37,200.00
2	LT Stay set Complete	Set	644.80	5	3,224.00
3	7/12 SWG GI stay wire, Grade -2	Kg	93.00	60.00	5,580.00
4	LT stay Clamp (1.40Kg/pair)	Pair	136.40	5	682.00
5	LT Stay insulator	No.	37.20	5	186.00
6	LT Accessories with Eye hook and Clamp				-
6.i.	Pole clamp for EYE hook for (XLPE Aerial bunched Cable)	Pair	248.00	39	9,672.00
6.ii.	EYE hook for XLPE Aerial bunched Cable	No.	74.40	18	1,339.20
6.iii.	Dead End Clamp suitable for messenger XLPE Aerial bunched Cable	No.	80.60	18	1,450.80
6.iv.	Suspension Clamp with EYE hook for ABC	Pair	421.60	21	8,853.60
7	2C×35 mm ² (1P+1N)+1C×35 mm ² (M)	K.M	85,140.00	1.05	89,397.00
8	4 WAY SERVICE Distb. Box with kit kat fuse and Aluminium bus bar.	No.	2,740.40	5	13,702.00
9	8 WAY SERVICE Distb.Box with kit kat fuse and Aluminium bus bar.	No.	4,960.00	2	9,920.00
10	Insulated piercing connector.Type-B-main 25 to 150 sq.mm & Tap-6 to 35 sq.mm	No.	51.77	2	103.54
11	Insulated piercing connector.Type-C-main 16 to 95 sq.mm & Tap-1.5 to 16 sq.mm	No.	40.06	20	801.20
12	Insulated piercing connector.Type-D-main 10 to 50 sq.mm & Tap-1.5 to 10 sq.mm	No.	34.21	20	684.20
13	Pipe Earthing (each 5th pole to earth)	No.	1,302.00	5	6,510.00
14	Coil Earthing	No's	205.84	5	1,029.20
15	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	Kg	93.00	2.62	243.66
16	Danger plate (LT)	No	99.20	10	992.00
17	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.01	279.84
18	2C X 4sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	36.48	500	18,240.00
19	2C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	54.50	100	5,450.00
20	4C X 10sq. mm. Armoured Aluminium Cable - XLPE Insulated	Mtr.	69.27		
21	GI Nut , Bolt & Washer of different sizes (0.5 Kg/ Pole)	Kg	96.72	5.00	483.60
22	Black Paint	Ltr	272.80	10	2,728.00
23	Yellow Colour Paint for Background	Ltr	272.80	20	5,456.00
A	Total Cost of materials				2,24,207.84
B	Stock, Storage & Insurance i.e 3% of A				6,726.24
C	Sub Total (A+B)				2,30,934.07
D	Contingency @ 3% of C				6,928.02
E	Tools & Plants @ 2% of C				4,618.68
F	Transportation @ 7.5% of C				17,320.06
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/ LT Stay set/PSC Pole)				17,595.06
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				7,663.20
J	Sum of (C to I)				2,85,059.09
Civil & Services					

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of LT Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including excavation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	5	11,250.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375Cu.mtr	Cu.mtr	6,500.00	3.75	24,375.00
3	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No.	3,700.00	5	18,500.00
4	Dismantling of 9/8 Mtr. PCC/Joist Pole (Serviceable Pole) after digging the pit and taking out the pole, transportation and stacking the pole at a proper place in safe position within 10km /site store and refilling the pit with loose earth and amming including removal and disposal of malba at proper location as per instruction of EIC.	No.	900.00	5	4,500.00
5	Dismantling of ACSR/AAAC 34/ 55mm ² from overhead line, recoiling, loading, transportation, unloading and staking at a proper place in safe position/ site store	KM	6,300.00	1.00	6,300.00
6	Dismantling of Insulator with Pin including loading, transportation, unloading and staking at a proper place in safe position/ site store.	EA	8.10	90	729.00
7	Dismantling / Removal of V Cross arm/ channel from pole including loading, transportation, unloading and staking of dismantled material at a proper place in safe position at Site Store.	EA	41.40	30	1,242.00
K	Total Civil & Services				66,896.00
L	Total (J+K)				3,51,955.09
M	Other overheads (Including 6% supervision charges) of L				21,117.31
N	Sub Total (L+M)				3,73,072.40
O	Total GST @ 18% of (O)				67,153.03
P	Total CESS @ 1% of (P)				3,730.72
Q	Gross Total Material +Services (N+O+P) for LT AB Cable Line				4,43,956.15

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1.0 Background

TPCODL has been in the forefront, in adoption of latest technology in the power utility sector pan Odisha. Together with its culture of Consumer Service Excellence, Continuous Learning, Performance Orientation, Innovation and Empowerment, it has been able to set benchmarks in accelerated reduction of tripping, equipment failure, enhance consumer satisfaction and improve employee productivity.

One of the significant challenges that the utilities face is restricting the fault at minimum possible section of the electrical network and clearing the fault in minimum possible time. To achieve this feature utility works round the clock to minimize equipment failure, equipment down time and faster restoration thus ensuring reliability and enhanced MTTR. All the utility across the globe moving towards deployment of technology to make the Grid smarter in order to ensure operation excellence and serve the consumer with green and continuous power supply with any interruption. To achieve the TPCODL Vision and Mission, TPCODL deploying the latest technology for automation of Primary Substation for Centralised monitoring and control of entire distribution network for faster decision making and corrective action for restoration of the network ensuring. TPCODL already deployed Substation Automation System in FY 20-21 and till now integrated 52 Nos. of R-APDRP stations and 112 Nos. of ODSSP stations from a centralized location in Bhubaneswar and unmanned 58 Nos. of Substations.

In FY 21-22, 22 Nos. of 33/11 kV Primary substations are SCADA enabled and in a process of integration with SCADA/ADMS System being commissioned. In FY22-23, 45 Nos. 33/11 kV Primary Substations are in process of SCADA enablement and expected to be commissioned by end of FY22-23.

2.0 Existing Systems in Place

2.1 SCADA/DMS System at Bhubaneswar and Cuttack Town

The SCADA/DMS System was implemented in Bhubaneswar and Cuttack Town of TPCODL under R-APDRP (Part-A) Scheme in the year 2016. Some major components and functionalities of SCADA/DMS System are as below:

- a. Independent SCADA Control Centre (SCADA CC) at Bhubaneswar and Cuttack
- b. Disaster Recovery (DR) Centre at Berhampur for Data Recovery
- c. DF8000 SCADA/DMS System have the following functions:
 - SCADA Applications
 - Information Storage and Retrieval (ISR)
- d. Integration with R-APDRP Customer Care, GIS, Billing System & SLDC

In addition to SCADA / DMS implementation, the Remote Terminal Units were also installed at 56 nos. of 33 / 11 kV Substations. These RTUs was integrated over MPLS / VPN link with the respective Control

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Centres (CC) located in Bhubaneswar, Cuttack and Puri. The protection BCPUs of 33 kV and 11 kV feeders are integrated to the respective RTUs on IEC61850. The Digital Input / Output (Status, Open/Close/Reset/Tap Change control, Protection Alarms) of the respective bay are acquired through these BCPUs on SCADA System. For monitoring of the Analog measurement, separate Multifunction Meters are used, which are integrated to the Station RTU over MODBUS (Serial) Protocol. The Communication link for integration of these RTUs is MPLS network of the Network Bandwidth Service Provider (i.e. Airtel).

In addition to BCPUs of the 33 kV and 11 kV feeders, some of the installed FRTUs of RMU and data concentrators of FPI of the 33 kV/11 kV network are also integrated with the respective SCADA System. The FRTUs and data concentrators of FPIs are communicating over GPRS/SIM modems for remote monitoring and control through respective SCADA System as applicable.

Currently appx. 190 Nos. of 33/11 kV Substations are integrated with the SCADA System at Bhubaneswar & Cuttack for remote monitoring & control from Centralize Power System Control Center (CPSCC).

2.2 Deployment of New SCADA/ADMS System with MCC & BCC:

The new SCADA/ADMS System with a concept of MCC and BCC is being commissioned and expected to Go-live by March 2023 with SCADA functionality. The Newly deployed SCADA/ADMS system will have centralized monitoring & control of entire distribution network of TPCODL. The proposed system has capacity to handle more than 500 Primary Substation and is based on Concept of Main Control Centre & Backup Control Centre working in Synchronization with shared operational philosophy in real-time. The deployed System Consist of Cyber Security infrastructure for addressing the cyber Vulnerabilities, automatic backups of servers for faster restoration of system in case of any failures, Network management Systems for health monitoring of OT equipment, Patch management & antivirus system for regular patch and definitions updates, Reporting and Analytics utility for analysis & MIS reporting. The deployed System provides a platform for training the workforce for different operational situations by simulation of different scenarios. The proposed System will provide the better visibility of the network, better situational awareness, security and enhanced operational safety.

Both the SCADA/DMS Systems will be operational and running in parallel till all the Substations are migrated and tested successfully in new SCADA/ADMS System.

2.3 SCADA Enabled Sub-station

Out of 371 Nos. of Substations, 190 Nos. of sub-Stations are SCADA enabled and remotely monitored and controlled from Centralised SCADA System.

TPCODL distribution area is spread over in 5 Circles, 20 Distribution Divisions and 64 Sub-divisions with 371 numbers of 33/11 kV Primary Sub-Stations. The substations are implemented under various schemes and broadly categorized as under:

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Circle Name	Total No. of S/s	RAPDRP Scheme	ODSSP Scheme	PNP Scheme	Conventional Substation
BBSR-I	71	30	31		10
BBSR-II	90		30	4	56
Cuttack	75	22	22		31
Dhenkanal	70		27		43
Paradeep	65		24		41
Total	371	52	134	4	181

Table # 1 : 33/11 kV Primary Substations in TPCODL Network

Details of Substation Automation and its integration with SCADA System are as below

2.3.1 Sub-station Automation System under RAPDRP Scheme

56 Nos. of substations under RAPDRP and PNP Nabakalebar scheme are automated and equipped with 33/11 kV CRPs, Numerical Relays, VCBs, Battery Charger and Multi-Function Meters (MFMs). All these devices are integrated at sub-station level RTU. The numerical relays and Multifunction meters are communicating with RTU over IEC 61850/IEC-103 and Modbus protocol respectively. Equipment status, alarms and control are through BCPUs over IEC61850 and status of auxiliary system are provisioned through hardwiring to RTU. These RTUs are communicating to respective control Centre SCADA System i.e. Bhubaneswar and Cuttack over IEC60870-5-104 using service provider MPLS network.

2.3.2 Sub-station Automation System under ODSSP Scheme

The ODSSP scheme focused on supply of quality power to consumers and intends to address the problem of low voltage in rural areas. The scheme focusses on construction of 33/11 kV Sub-stations in the state; over 134 Nos. of 33/11 kV sub stations has been planned to commission under three phases in TPCODL Distribution network. All 134 Nos. 33/11 kV Substation are integrated with centralised SCADA System and being operated from Power System Control Centre, Bhubaneswar.

2.3.3 SCADA Enablement of 33/11 kV Primary Substations (Conventional Type Substations)

In TPCODL distribution network approx. 181 Nos. of 33/11 kV Primary Substations (*Refer Table # 1 : 33/11 kV Primary Substations in TPCODL Network*) are Conventional type (Old Substations Commissioned with mechanical and electromechanical Protection and Switchgear system). These Substations are not SCADA enabled and feeders are equipped with electromechanical or non-communicable static relays. These conventional type substations are locally monitored and controlled manually from CRP/Switchgear/Field panels under the coordination of Power System Control Centre.

It is planned to integrate these substations to SCADA/ADMS System for Centralized Monitoring and Control of entire distribution network in phased manner.

Phase # 1 : Under FY 21-22 Capex Scheme, 22 Nos. of 33/11 kV Primary substations are SCADA enabled and in a process of integration with SCADA/ADMS System being commissioned.

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Phase # 2 : Under FY22-23 Capex Scheme, 45 Nos. of 33/11 kV Primary Substations are in a process of SCADA enablement and expected to be commissioned by end of FY22-23.

Balance 114 Nos., 33/11 kV Conventional Substations are planned to be SCADA enabled in subsequent financial years i.e. FY23-24, FY24-25. SCADA enablement of all Substations are expected to be completed by FY24-25.

3.0 Purpose and Necessity

3.1 SCADA Enablement of 114 Nos. 33/11 kV Primary Substations (Conventional Type Substations)

To automate appx. 181 nos. of Conventional type sub-stations for centralize remote monitoring and control, phase wise implementation plan is as below:

Sl. No.	Phases	Total No. of Substations	Execution Timeline	Present Status
1	Phase#1	22	FY 2021-22	Capex Approved and Job Completed
2	Phase#2	45	FY 2022-23	Capex Approved and Job is in Progress
3	Phase#3	50	FY 2023-24	Capex Planned FY23-24
4	Phase#4	64	FY 2024-25	Capex Planned FY24-25

Table # 2A : 33/11 kV Primary Substations SCADA Enablement Plan

As per the above table this proposal is for SCADA enablement of 50 Nos. of 33/11 kV Primary Substations (Conventional Type) in FY23-24 under Phase # 3.

Balance 64 Nos. of 33/11 kV Primary Substations (Conventional Type) will be SCADA enabled in FY24-25 under Phase # 4.

It is also proposed to replace the existing old and depleted low-capacity DC system by New Substation DC system to cater the load of existing electrical and protection equipment as well as substation automation system, which in turn will enhance the reliability and availability of the system. New Battery Charger (FC & FCBC) with Batteries are considered along with the SCADA enablement of conventional substations to maintain the DC Supply and adequate Backup for the substation equipment and automation system.

3.2 Remote Monitoring of RMUs

Standalone RMUs are being installed and commissioned across the distribution network to improve the reliability of the network. So, FRTUs with GPRS/3G/4G/5G modems are proposed to be installed at RMUs locations for remote monitoring and control. This enables centralized visibility of Secondary Distribution

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network at Centralised Power System Control Centre (PSCC) for faster decision-making and restoration of the network. The Automation of RMU are essential for implementation of ADMS applications for localization of fault, for faster isolation and restoration of the secondary distribution network.

To automate RMUs progressively and its integration with SCADA/ADMS system is planned in phased manner as per the table below :

Sl. No.	Phases	Approximate No. of RMUs to be Automated	Execution Timeline	Present Status
1	Phase # 1	50	FY 2023-24	Capex Planned FY23-24
2	Phase # 2	50	FY 2024-25	Capex Planned FY24-25
3	Phase # 3	50	FY 2025-26	Capex Planned FY25-26
4	Phase # 4	50	FY 2026-27	Capex Planned FY26-27
5	Phase # 5	50	FY 2027-28	Capex Planned FY27-28

Table # 3 : Secondary Distribution Network Automation Plan (RMU)

As per the above table this proposal is for SCADA enablement of 50 Nos. of RMUs in FY23-24 under Phase # 1. SCADA enablement of RMUs will be completed and integrated with SCADA/ADMS system progressively till FY2027-28 as per the Table # 3.

3.3 Operational Video Management System (OVMS)

Operational Video Management System (OVMS) is maybe first of its kind advanced video monitoring and management system envisaged to assist operational team (PSCC) in day to day remote operation and monitoring by providing live video feed of the switching devices, transformers etc. This system will require minimal effort by operational team to navigate as the same is tightly integrated with the SCADA system.

In addition to the above, the OVMS also provides the following functions for operational safety:

- Helmet Detection: Detects if the person working or entering the switchyard is wearing safety helmet or not. Any person detected without helmet will trigger an alarm.
- Thermal Detection: Detects fire in the region specified and raises alarm.
- Adaptive Motion: Detects and tracks objects that enter a scene and then triggers an alarm then the objects enter a user-defined zone. This behaviour is primarily used in outdoor environments with light traffic to reduce the number of false alarms caused by environmental changes.
- Camera Sabotage: Detects contrast changes in the field of view. An alarm is triggered if the lens is obstructed with spray paint, a cloth, or a lens cap. Any unauthorized repositioning of the camera also triggers an alarm.

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For real-time Video monitoring of Substation Operations are planned in phased manner as per the table below:

Sl. No.	Phases	Approximate No. of 33/11 kV Primary Substation	Execution Timeline	Present Status
1	Phase # 1	10	FY 2023-24	Capex Planned FY23-24
2	Phase # 2	90	FY 2024-25	Capex Planned FY24-25
3	Phase # 3	90	FY 2025-26	Capex Planned FY25-26
4	Phase # 4	90	FY 2026-27	Capex Planned FY26-27
5	Phase # 5	90	FY 2027-28	Capex Planned FY27-28

Table # 4 : Implementation Plan of OVMS

As per the above table this proposal is for Operational Video management system at 10 nos. of 33/11 kV Critical Primary Substations along with Centralised System at Control Centre in FY23-24 under Phase # 1. On successful commissioning and observation of the performance of the system deployed, same will further be installed at all Substations progressively as per the plan mentioned in the above Table # 4.

3.4 Communication, Network Management & Cyber Security Bridge System

- Enhancement of Software licences in Network Management System for monitoring of Operational Technology equipment at Substation and Control Centre
- Implementation of IPS and IDS System at Main Control Centre and Backup Control Centre.
- Establishment of Communication link between TPCODL Technology Centre and Backup Control Centre (MCC & BCC).

Enhancement of the Software license in Network Management System, installation of IPS & IDS and Establishment of Communication link will be completed in FY23-24.

4.0 Statutory Compliance Requirement

All statutory requirement complied as and when required for the proposed CAPEX plan.

The communication infrastructure proposed for the integration of SCADA & Substation Automation System are from the services of Network Bandwidth Service Provider (NBSP). All statutory compliance with respect to communication infrastructure will be managed by NBSP in consultation with TPCODL.

The proposed SAS System will have the provision to comply all the guidelines issued of CERT-IN, NCIIPC during the implementation.

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5.0 Proposal for the Capex Investment

TPCODL has identified a number of challenges related to Safety, 33KV/11KV/0.415KV network, Automation infrastructure and Technology usage. These challenges are planned to be addressed through a systematic investment plan by TPCODL. The proposed “Capex Plan” represents a justified and efficient level of total capital investment estimated by TPCODL to meet the service obligation; improving safety, reliability of network and level of service standards.

Summary of Capex requirement for FY 2023-24:

Sl. No.	Activity Planned	Capex Proposed (FY 2023-24)
1	SCADA Enablement of Conventional Substation – 50 Nos. of 33/11 kV Primary Substations	8.00 Cr
1.a	Substation Automation System for 50 Nos. of 33/11 kV Primary Substations (Conventional Type)	4.30 Cr.
1.b	DC System for 50 Nos. of 33/11 kV Primary Substations (Conventional Type)	1.70 Cr.
1.c	Operational Video Management System (OVMS) – 10 Nos. of 33/11 kV Critical Primary Substations	0.50 Cr.
1.d	Communication, Network Management & Cyber Security Bridge System	1.5 Cr.
2	FRTUs for RMUs and Communication for RMUs	1.00 Cr
	Total Cost in INR for FY23-24	9.00 Cr

Table # 5 : CAPEX Proposal for FY23-24

6.0 Scope of the Proposal

6.1 SCADA Enablement of Conventional Substation

In TPCODL there are approx. 181 Nos. of 33/11 kV conventional Sub-stations and are planned to automate these substations in 4 phases as mentioned in the table below:

Sl. No.	Phases	No. of Substation	Execution Plan
1	Phase#1	22	FY2021-22
2	Phase#2	45	FY2022-23
3	Phase#3	50	FY2023-24
4	Phase#4	64	FY2024-25
Total No. of Substation to be Covered		181	

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Table # 2B : 33/11 kV Primary Substations SCADA Enablement Plan

As per the above table this proposal is for SCADA enablement of 50 Nos. of 33/11 kV Primary Substations (Conventional Type) in FY23-24 under Phase # 3.

It is also proposed to replace the existing old and depleted low-capacity DC system by New Substation DC system to cater the load of existing electrical and protection equipment as well as substation automation system, which in turn will enhance the reliability and availability of the system. New Battery Charger (FC & FCBC) with Batteries are considered along with the SCADA enablement of conventional substations to maintain the DC Supply and adequate Backup for the substation equipment and automation system.

6.2 Remote Monitoring of RMUs

As per the above table (Refer *Table # 3: Secondary Distribution Network Automation Plan (RMU)*) this proposal is for SCADA enablement of 30 Nos. of RMUs in FY23-24 under Phase # 1.

6.3 Operational Video Management System (OVMS)

Technology initiative undertaken to facilitate control room engineers/operators by visualizing the real-time status of equipment while carrying out any remote operation.

As per the above table (Refer *Table # 4 : Implementation Plan of OVMS*) this proposal is for Operational Video management system at 10 Nos. of 33/11 kV Primary Substations along with Centralised System at Control Centre in FY23-24 under Phase # 1

6.4 Communication, Network Management & Cyber Security Bridge System

Integration of Conventional substation with the Control center requires NBSP Services for data exchange with SCADA System.

Similarly, high bandwidth (100 MBPS) communication link will be established between Main Control Center & Back-Up Control Center and NBSP NoC to respective Control center (MCC & BCC).

Enhancement of Software licences in Network Management System for monitoring of Operational Technology equipment at Substation and Control Centre

Implementation of IPS and IDS System at Main Control Centre and Backup Control Centre

7.0 Cost Estimation and Execution Timelines

Sl. No.	Activity Planned	Discovered / Estimated Cost	Execution Timelines	Remarks
1	SCADA Enablement of Conventional Substation –	8.00 Cr	FY 2023-24	Substation Automation System / DC System

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	50 Nos. of 33/11 kV Primary Substations			
1.a	Substation Automation System for 50 Nos. of 33/11 kV Primary Substations (Conventional Type)	4.30 Cr.	FY 2023-24	Appx. INR 7,00,000.00 for RTU System and 2 Mbps MPLS Link INR 75,000.00 per Substation
1.b	DC System for 50 Nos. of 33/11 kV Primary Substations (Conventional Type)	1.70 Cr.	FY 2023-24	Appx. INR 3,00,000.00 per Substation
1.c	Operational Video Management System (OVMS) for 10 Nos. 33/11 kV Primary Substations	0.5 Cr.	FY 2023-24	Appx. INR 5,00,000.00 per Substation and Integration with SCADA System
1.d	Communication, Network Management & Cyber Security Bridge System	1.5 Cr.	FY 2023-24	Real-time Network Monitoring and Cyber Security Compliance as per the Guidelines of CERT-IN
2	Remote Monitoring of RMUs – 30 Nos. of RMU Locations	1 Cr	FY 2023-24	Appx. INR 3,00,00.00 for FRTU and INR 24,000.00 for Modem, per RMU locations

Table # 6 : Cost Estimation for CAPEX Proposal of FY23-24

8.0 Benefits

8.1 Tangible and Intangible

Centralized operation would ensure optimum resource utilization of the hardware and software and functionalities used in the SCADA System. Other benefits include:

- This will ensure efficient operation & monitoring under steady state, dynamic & transient condition of the system.
- To achieve improvement in operations considering complex Load- Demand cycle changes to bring in better and holistic visibility while making critical decisions.
- Optimize on unscheduled power interchange, maximize utilization of the assets
- Better Inventory management, low maintenance cost
- Ease of Operation and Operational flexibility
- Multi-skilling of operational and maintenance personals
- Enhanced operational safety
- Better Control on Cyber Security Management, optimization of cyber security measures implementation.

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- ix. N-2 Communication redundancy will be provided at critical location for communication by using advanced MPLS Technology.
- x. Improved reliability of service.

8.2 Benefits to Customer

- i. Reduction in restoration time of outage
- ii. Improved reliability of service
- iii. Better control of power quality and enhanced use of reactive power sources
- iv. Useful feedback information to the customer in terms of expected outage duration time etc.
- v. Monitoring the potential quality problems and also the reliability problems due to supply interruptions.

8.3 Indirect Savings/Improvements

- i. Reduction in overall maintenance and inventory carrying cost.
- ii. Strengthening of existing operational technology infrastructure.
- iii. Detection and protection of operational system from Cyber Security vulnerabilities.
- iv. Improvement in reliability of power supply to consumers.

8.4 Cost Benefit

SCADA Enablement of Primary and Secondary distribution network will enable centralize operation through PSCC lead to optimization of resources and cost to company.

Currently all the substations are operated by the substation operators locally and there are 7 nos. of substation operators, operating each substation.

- i. For each substation 3 manpower can be optimized & redeployed which result in saving of INR 2.52 L/Substation per year.
- ii. Due to improvement in reliability, unserved unit will be available for distribution, which is contributing 2 % of total load.

9.0 Revenue Return/Pay Back Period

10.0 Recommendation and Conclusion

The above Capex proposal for SCADA enablement of Primary Substations, Secondary Distribution Network (RMU) and Real time Video Management system for primary substations will facilitate Centralized monitoring and Control, enabling Power System Control centre faster decision making and restoration with utmost safety.

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Above Capex proposal also includes efficient monitoring of Operation Technology Communication Infrastructure along with resilient secured communication network.

Annexure-6 Summary of Costing for Sick Equipment replacement (33kV & 11kV)						
SI no.	Description	Unit	Quantity (in nos.)	Amount (in Rs.)	Total Cost (in cr.)	Annexure No.
1	33kV Isolator with Earth switch	EA	8	16,75,668.47	0.17	Annexure-6.1
2	33kV Isolator without Earth switch	EA	11	10,41,758.33	0.10	Annexure-6.2
3	11kV Isolator with Earth switch	EA	12	13,75,791.41	0.14	Annexure-6.3
4	11kV Isolator without Earth switch	EA	0	-	0.00	Annexure-6.4
5	33kV IND OG CRP	EA	5	22,55,994.69	0.23	Annexure-6.5
6	33kV IND TRF CRP	EA	5	27,18,460.61	0.27	Annexure-6.6
7	33kV BKR	EA	12	46,92,274.20	0.47	Annexure-6.7
8	11kV IND CRP	EA	8	35,35,351.51	0.35	Annexure-6.8
9	11kV IND VCB	EA	0	-	0.00	Annexure-6.9
10	11kV OD VCB	EA	15	1,04,03,036.38	1.04	Annexure-6.10
11	33kV OD C.T	EA	16	15,92,993.17	0.16	Annexure-6.11
12	33kV OD P.T	EA	5	4,67,417.72	0.05	Annexure-6.12
13	11kV OD C.T	EA	6	4,42,251.52	0.04	Annexure-6.13
14	11kV OD P.T	EA	5	3,84,331.32	0.04	Annexure-6.14
15	4W 11kV RMU (LLVV)	EA	1	8,22,471.19	0.08	Annexure-6.15
16	5W 11kV RMU (LLVVV)	EA	2	35,82,116.13	0.36	Annexure-6.16
17	6W 11kV RMU (LLVVVV)	EA	1	22,36,386.19	0.22	Annexure-6.17
18	630kVA CSS	EA	3	1,28,18,355.01	1.28	Annexure-6.18
Total					₹ 5.00	

Annexure-6.1

<u>BOQ for 33 KV, 1250 A Isolator with Earth Switch</u>					
<u>Materials for 33 KV, 1250 A Isolator with Earth Switch</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator with earth switch with PI (Polymer)	Set	1,25,103.60	1	1,25,103.60
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
3	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr for Isolator Body)= 10x2.36	KG	93.00	23.60	2,194.80
A	Total Cost of materials				1,28,600.40
B	Stock, Storage & Insurance i.e 3% of A				3,858.01
C	Sub Total (A+B)				1,32,458.41
D	Contingency @ 3% of C				3,973.75
E	Tools & Plants @ 2% of C				2,649.17
F	Transportation @ 7.5% of C				9,934.38
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC/GI Pipe)				13,111.74
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				1,62,127.45
<u>Civil & Services</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flataround pipe .	No.	3,700.00	1	3,700.00
K	Total Civil & Services				3,700.00
<u>Dismantling Portion</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 33 KV Isolator with Earth Switch	SET	225.00	1	225.00
L	Total Dismantling				225.00
M	Total (J+K+L)				1,66,052.45
N	Other overheads (Including 6% supervision charges) of M (for 33 KV Isolator with Earth switch)				9,963.15
O	Sub Total (L+M)				1,76,015.60
P	Total GST @ 18% of (O)				31,682.81
Q	Total CESS @ 1% of (O)				1,760.16
R	Gross Total Material +Services (O+P+Q) for 33 KV Isolator with Earth Switch				2,09,458.56

Annexure-6.2

<u>BOQ for 33 KV, 1250 A Isolator without Earth Switch</u>					
<u>Materials for 33 KV, 1250 A Isolator without Earth Switch</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	53,003.00	1	53,003.00
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr for Isolator Body)= 10x2.36	KG	93.00	23.60	2,194.80
A	Total Cost of materials				56,499.80
B	Stock, Storage & Insurance i.e 3% of A				1,694.99
C	Sub Total (A+B)				58,194.79
D	Contingency @ 3% of C				1,745.84
E	Tools & Plants @ 2% of C				1,163.90
F	Transportation @ 7.5% of C				4,364.61
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC/GI Pipe)				5,685.37
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				71,154.52
<u>Civil & Services</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	1	3,700.00
K	Total Civil & Services				3,700.00
<u>Dismantling Portion</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 33 KV Isolator without Earth Switch	Set	225.00	1	225.00
L	Total Dismantling				225.00
M	Total (J+K+L)				75,079.52
N	Other overheads (Including 6% supervision charges) of M (for 33 KV Isolator without Earth switch)				4,504.77
O	Sub Total (L+M)				79,584.29
P	Total GST @ 18% of (O)				14,325.17
Q	Total CESS @ 1% of (O)				795.84
R	Gross Total Material +Services (O+P+Q) for 33 KV Isolator without Earth Switch				94,705.30

Annexure-6.3

BOQ for 11 KV, 800 A Isolator with Earth Switch					
Materials for 11 KV, 800 A Isolator with Earth Switch					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	11 KV 800 AMP isolator with earth switch with PI(polymer)	Set	65,534.00	1	65,534.00
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
3	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr for Isolator Body)= 10x2.36	KG	93.00	23.60	2,194.80
A	Total Cost of materials				69,030.80
B	Stock, Storage & Insurance i.e 3% of A				2,070.92
C	Sub Total (A+B)				71,101.72
D	Contingency @ 3% of C				2,133.05
E	Tools & Plants @ 2% of C				1,422.03
F	Transportation @ 7.5% of C				5,332.63
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC/GI Pipe)				6,976.07
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				86,965.51
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	1	3,700.00
K	Total Civil & Services				3,700.00
Dismantling Portion					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 11 KV Isolator with Earth Switch	No.	225.00	1	225.00
L	Total Dismantling				225.00
M	Total (J+K+L)				90,890.51
N	Other overheads (Including 6% supervision charges) of M (for 11 KV Isolator with Earth switch)				5,453.43
O	Sub Total (L+M)				96,343.94
P	Total GST @ 18% of (O)				17,341.91
Q	Total CESS @ 1% of (O)				963.44
R	Gross Total Material +Services (O+P+Q) for 11 KV Isolator with Earth Switch				1,14,649.28

Annexure-6.4

BOQ for 11 KV, 800 A Isolator without Earth Switch					
Materials for 11 KV, 800 A Isolator without Earth Switch					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	11 KV 800 AMP isolator without earth switch with PI(polymer)	Set	53,617.60	1	53,617.60
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr for Isolator Body)= 10x2.36	KG	93.00	23.60	2,194.80
A	Total Cost of materials				57,114.40
B	Stock, Storage & Insurance i.e 3% of A				1,713.43
C	Sub Total (A+B)				58,827.83
D	Contigency @ 3% of C				1,764.83
E	Tools & Plants @ 2% of C				1,176.56
F	Transportation @ 7.5% of C				4,412.09
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC/GI Pipe)				5,748.68
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				71,929.99
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	1	3,700.00
K	Total Civil & Services				3,700.00
Dismantling Portion					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 11 KV Isolator without Earth Switch	No.	225.00	1	225.00
L	Total Dismantling				225.00
M	Total (J+K+L)				75,854.99
N	Other overheads (Including 6% supervision charges) of M (for 11 KV Isolator without Earth switch)				4,551.30
O	Sub Total (L+M)				80,406.29
P	Total GST @ 18% of (O)				14,473.13
Q	Total CESS @ 1% of (O)				804.06
R	Gross Total Material +Services (O+P+Q) for 11 KV Isolator without Earth Switch				95,683.48

Annexure-6.5

<u>BOQ for 33 KV Control & Relay Panel (CRP) for Line Bay</u>					
<u>Materials for 33 KV Control & Relay Panel (CRP) for Line Bay</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	33 KV Control & Relay Panel (CRP) for Line Bay	EA	2,63,650.00	1	2,63,650.00
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
3	50x6mm GI Flat for earthing, 2.36kg/mtr., (5 Mtr for each CRP)= 5x2.36	KG	93.00	11.80	1,097.40
	Control Cable				-
4	4Core x 2.5 mm ²	Mtr	138.88	50.00	6,944.00
5	7Core x 2.5 mm ²	Mtr	225.68	50.00	11,284.00
A	Total Cost of materials				2,84,277.40
B	Stock, Storage & Insurance i.e 3% of A				8,528.32
C	Sub Total (A+B)				2,92,805.72
D	Contingency @ 3% of C				8,784.17
E	Tools & Plants @ 2% of C				5,856.11
F	Transportation @ 7.5% of C				21,960.43
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC/GI Pipe)				1,990.52
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				3,31,396.95
<u>Civil & Services</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Erection of 33 KV Control & Relay Panel (CRP) for Line Bay	No.	17,600.00	1	17,600.00
2	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	1	3,700.00
K	Total Civil & Services				21,300.00
<u>Dismantling Portion</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 33 KV CRP	No.	5,000.00	1	5,000.00
L	Total Dismantling				5,000.00
M	Total (J+K+L)				3,57,696.95
N	Other overheads (Including 6% supervision charges) of M				21,461.82
O	Sub Total (L+M)				3,79,158.77
P	Total GST @ 18% of (O)				68,248.58
Q	Total CESS @ 1% of (O)				3,791.59
R	Gross Total Material +Services (O+P+Q)				4,51,198.94

Annexure-6.6

BOQ for 33 KV Control & Relay Panel (CRP) for Transformer Bay					
Materials for 33 KV Control & Relay Panel (CRP) for Transformer Bay					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	33 KV Control & Relay Panel (CRP) for Transformar Bay	EA	3,26,930.10	1	3,26,930.10
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
3	50x6mm GI Flat for earthing, 2.36kg/mtr., (5 Mtr for each CRP)= 5x2.36	KG	93.00	11.80	1,097.40
	Control Cable				-
4	4Core x 2.5 mm ²	Mtr	138.88	50.00	6,944.00
5	7Core x 2.5 mm ²	Mtr	225.68	50.00	11,284.00
A	Total Cost of materials				3,47,557.50
B	Stock, Storage & Insurance i.e 3% of A				10,426.73
C	Sub Total (A+B)				3,57,984.23
D	Contingency @ 3% of C				10,739.53
E	Tools & Plants @ 2% of C				7,159.68
F	Transportation @ 7.5% of C				26,848.82
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC/GI Pipe)				1,990.52
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				4,04,722.77
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Erection of 33 KV Control & Relay Panel (CRP) for Line Bay	No.	17,600.00	1	17,600.00
2	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	1	3,700.00
K	Total Civil & Services				21,300.00
Dismantling Portion					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 33 KV CRP	No.	5,000.00	1	5,000.00
L	Total Dismantling				5,000.00
M	Total (J+K+L)				4,31,022.77
N	Other overheads (Including 6% supervision charges) of M				25,861.37
O	Sub Total (L+M)				4,56,884.14
P	Total GST @ 18% of (O)				82,239.14
Q	Total CESS @ 1% of (O)				4,568.84
R	Gross Total Material +Services (O+P+Q)				5,43,692.12

Annexure-6.7

BOQ for 33 KV, 1250 A Outdoor VCB					
Materials for 33 KV, 1250 A Outdoor VCB					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	33 KV, 1250 A Outdoor VCB	EA	2,16,000.00	1	2,16,000.00
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr for each VCB)= 10x2.36	KG	93.00	23.60	2,194.80
	Control Cable				-
3	4Core x 2.5 mm ²	Mtr	138.88	50.00	6,944.00
4	7Core x 2.5 mm ²	Mtr	225.68	50.00	11,284.00
A	Total Cost of materials				2,37,724.80
B	Stock, Storage & Insurance i.e 3% of A				7,131.74
C	Sub Total (A+B)				2,44,856.54
D	Contingency @ 3% of C				7,345.70
E	Tools & Plants @ 2% of C				4,897.13
F	Transportation @ 7.5% of C				18,364.24
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				11,124.00
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC/GI Pipe)				2,103.55
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				2,88,691.16
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	1	3,700.00
K	Total Civil & Services				3,700.00
Dismantling Portion					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 33 KV VCB	No.	17,600.00	1	17,600.00
L	Total Dismantling				17,600.00
M	Total (J+K+L)				3,09,991.16
N	Other overheads (Including 6% supervision charges) of M				18,599.47
O	Sub Total (L+M)				3,28,590.63
P	Total GST @ 18% of (O)				59,146.31
Q	Total CESS @ 1% of (O)				3,285.91
R	Gross Total Material +Services (O+P+Q)				3,91,022.85

Annexure-6.8

<u>BOQ for 11 KV Control & Relay Panel (CRP) - Indoor</u>					
<u>Materials for 11 KV Control & Relay Panel (CRP) - Indoor</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	11 KV Control & Relay Panel (CRP) - Indoor	EA	2,57,301.00	1	2,57,301.00
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr., (5 Mtr for each CRP)= 5x2.36	KG	93.00	11.80	1,097.40
	Control Cable				-
3	4Core x 2.5 mm ²	Mtr	138.88	50.00	6,944.00
4	7Core x 2.5 mm ²	Mtr	225.68	50.00	11,284.00
A	Total Cost of materials				2,77,928.40
B	Stock, Storage & Insurance i.e 3% of A				8,337.85
C	Sub Total (A+B)				2,86,266.25
D	Contingency @ 3% of C				8,587.99
E	Tools & Plants @ 2% of C				5,725.33
F	Transportation @ 7.5% of C				21,469.97
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC/GI Pipe)				1,990.52
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				3,24,040.05
<u>Civil & Services</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Erection of 11 KV Control & Relay Panel (CRP) - Indoor	No.	17,600.00	1	17,600.00
2	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	1	3,700.00
K	Total Civil & Services				21,300.00
<u>Dismantling Portion</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 11 KV CRP	No.	5,000.00	1	5,000.00
L	Total Dismantling				5,000.00
M	Total (J+K+L)				3,50,340.05
N	Other overheads (Including 6% supervision charges) of M				21,020.40
O	Sub Total (L+M)				3,71,360.45
P	Total GST @ 18% of (O)				66,844.88
Q	Total CESS @ 1% of (O)				3,713.60
R	Gross Total Material +Services (O+P+Q)				4,41,918.94

Annexure-6.9

BOQ for 11 KV, Indoor VCB					
Materials for 11 KV, Indoor VCB					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	11 KV Indoor VCB with CR panel without PT, CT (CTR- 600-300-150/1-1. 30VA, STC 25KA/3see, class: 0.5. 5P10) for feeder protection	EA	4,27,800.00	1	4,27,800.00
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
3	50x6mm GI Flat for earthing, 2.36kg/mtr., (5 Mtr for each VCB)= 5x2.36	KG	93.00	11.80	1,097.40
A	Total Cost of materials				4,30,199.40
B	Stock, Storage & Insurance i.e 3% of A				12,905.98
C	Sub Total (A+B)				4,43,105.38
D	Contingency @ 3% of C				13,293.16
E	Tools & Plants @ 2% of C				8,862.11
F	Transportation @ 7.5% of C				33,232.90
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				22,031.70
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole/GI Pipe)				113.03
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				
J	Sum of (C to I)				5,20,638.29
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	1	3,700.00
K	Total Civil & Services				3,700.00
Dismantling Portion					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 11 KV VCB	No.	17,600.00	1	17,600.00
L	Total Dismantling				17,600.00
M	Total (J+K+L)				5,41,938.29
N	Other overheads (Including 6% supervision charges) of M				32,516.30
O	Sub Total (L+M)				5,74,454.58
P	Total GST @ 18% of (O)				1,03,401.83
Q	Total CESS @ 1% of (O)				5,744.55
R	Gross Total Material +Services (O+P+Q)				6,83,600.96

Annexure-6.10

BOQ for 11 KV, Outdoor VCB					
Materials for 11 KV, Outdoor VCB					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	11KV Outdoor VCB with outdoor CR panel, without PT & 2Core. CT (CTR-600-300-150/1-1A, STC 25KA/3Sec., class: 0.5 & 5P10) feeder protection	EA	4,14,160.00	1	4,14,160.00
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr for each VCB)= 10x2.36	KG	93.00	23.60	2,194.80
	Control Cable				-
3	4Core x 2.5 mm ²	Mtr	138.88	50.00	6,944.00
4	7Core x 2.5 mm ²	Mtr	225.68	50.00	11,284.00
A	Total Cost of materials				4,35,884.80
B	Stock, Storage & Insurance i.e 3% of A				13,076.54
C	Sub Total (A+B)				4,48,961.34
D	Contingency @ 3% of C				13,468.84
E	Tools & Plants @ 2% of C				8,979.23
F	Transportation @ 7.5% of C				33,672.10
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				21,329.24
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole/GI Pipe)				2,103.55
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				5,28,514.30
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	1	3,700.00
K	Total Civil & Services				3,700.00
Dismantling Portion					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 11 KV VCB	No.	17,600.00	1	17,600.00
L	Total Dismantling				17,600.00
M	Total (J+K+L)				5,49,814.30
N	Other overheads (Including 6% supervision charges) of M				32,988.86
O	Sub Total (L+M)				5,82,803.16
P	Total GST @ 18% of (O)				1,04,904.57
Q	Total CESS @ 1% of (O)				5,828.03
R	Gross Total Material +Services (O+P+Q)				6,93,535.76

Annexure-6.11

BOQ for 33 KV, Outdoor CT					
Materials for 33 KV, Outdoor CT					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	33 KV Oil cooled CT with CTR (600-300-150/5-5) A,MCT 0.5 Class, protection 5P10, STC 25KA/3 sec & ISF <5	EA	35,340.00	1	35,340.00
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
3	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr)= 10x2.36	KG	93.00	23.60	2,194.80
	Control Cable				-
4	4Core x 2.5 mm ²	Mtr	138.88	50.00	6,944.00
A	Total Cost of materials				45,780.80
B	Stock, Storage & Insurance i.e 3% of A				1,373.42
C	Sub Total (A+B)				47,154.22
D	Contingency @ 3% of C				1,414.63
E	Tools & Plants @ 2% of C				943.08
F	Transportation @ 7.5% of C				3,536.57
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole/GI PIPE)				4,581.32
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				57,629.82
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	1	3,700.00
K	Total Civil & Services				3,700.00
Dismantling Portion					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 33 KV CT	No.	17,600.00	1	17,600.00
L	Total Dismantling				17,600.00
M	Total (J+K+L)				78,929.82
N	Other overheads (Including 6% supervision charges) of M				4,735.79
O	Sub Total (L+M)				83,665.61
P	Total GST @ 18% of (O)				15,059.81
Q	Total CESS @ 1% of (O)				836.66
R	Gross Total Material +Services (O+P+Q)				99,562.07

Annexure-6.12

<u>BOQ for 33 KV, Outdoor PT</u>					
<u>Materials for 33 KV, Outdoor PT</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled) CLASS 0.5 / 3P, with O/P burden of 100VA	EA	31,520.80	1	31,520.80
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr)= 10x2.36	KG	93.00	23.60	2,194.80
	Control Cable				-
3	4Core x 2.5 mm ²	Mtr	138.88	50.00	6,944.00
A	Total Cost of materials				41,961.60
B	Stock, Storage & Insurance i.e 3% of A				1,258.85
C	Sub Total (A+B)				43,220.45
D	Contingency @ 3% of C				1,296.61
E	Tools & Plants @ 2% of C				864.41
F	Transportation @ 7.5% of C				3,241.53
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole/GI PIPE)				4,187.94
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				52,810.94
<u>Civil & Services</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/ 50mm including welding of GI flat around pipe .	No.	3,700.00	1	3,700.00
K	Total Civil & Services				3,700.00
<u>Dismantling Portion</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 33 KV PT	No.	17,600.00	1	17,600.00
L	Total Dismantling				17,600.00
M	Total (J+K+L)				74,110.94
N	Other overheads (Including 6% supervision charges) of M				4,446.66
O	Sub Total (L+M)				78,557.60
P	Total GST @ 18% of (O)				14,140.37
Q	Total CESS @ 1% of (O)				785.58
R	Gross Total Material +Services (O+P+Q)				93,483.54

Annexure-6.13

<u>BOQ for 11 KV, Outdoor CT</u>					
<u>Materials for 11 KV, Outdoor CT</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	11 KV Oil cooled CT with CTR (600-300-150/5-5) A, MCT 0.5 Class, protection 5P10, STC 25KA/3 sec & ISF <5	EA	19,096.00	1	19,096.00
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr)= 10x2.36	KG	93.00	23.60	2,194.80
	Control Cable				-
3	4Core x 2.5 mm ²	Mtr	138.88	50.00	6,944.00
A	Total Cost of materials				29,536.80
B	Stock, Storage & Insurance i.e 3% of A				886.10
C	Sub Total (A+B)				30,422.90
D	Contingency @ 3% of C				912.69
E	Tools & Plants @ 2% of C				608.46
F	Transportation @ 7.5% of C				2,281.72
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole/GI Pipe)				2,908.18
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				37,133.95
<u>Civil & Services</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	1	3,700.00
K	Total Civil & Services				3,700.00
<u>Dismantling Portion</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 11 KV CT	No.	17,600.00	1	17,600.00
L	Total Dismantling				17,600.00
M	Total (J+K+L)				58,433.95
N	Other overheads (Including 6% supervision charges) of M				3,506.04
O	Sub Total (L+M)				61,939.99
P	Total GST @ 18% of (O)				11,149.20
Q	Total CESS @ 1% of (O)				619.40
R	Gross Total Material +Services (O+P+Q)				73,708.59

Annexure-6.14

<u>BOQ for 11 KV, Outdoor PT</u>					
<u>Materials for 11 KV, Outdoor PT</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	11KV,1 -Phase oil cooled PT (11000V / V3 / 110V/ V3) CLASS 0.5 / 3P, with O/P burden of 30VA	EA	21,080.00	1	21,080.00
2	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
3	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr)= 10x2.36	KG	93.00	23.60	2,194.80
	Control Cable				-
4	4Core x 2.5 mm ²	Mtr	138.88	50.00	6,944.00
A	Total Cost of materials				31,520.80
B	Stock, Storage & Insurance i.e 3% of A				945.62
C	Sub Total (A+B)				32,466.42
D	Contingency @ 3% of C				973.99
E	Tools & Plants @ 2% of C				649.33
F	Transportation @ 7.5% of C				2,434.98
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole/GI PIPE)				3,112.54
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				39,637.26
<u>Civil & Services</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	1	3,700.00
K	Total Civil & Services				3,700.00
<u>Dismantling Portion</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Dismantling for 11 KV PT	No.	17,600.00	1	17,600.00
L	Total Dismantling				17,600.00
M	Total (J+K+L)				60,937.26
N	Other overheads (Including 6% supervision charges) of M				3,656.24
O	Sub Total (L+M)				64,593.50
P	Total GST @ 18% of (O)				11,626.83
Q	Total CESS @ 1% of (O)				645.93
R	Gross Total Material +Services (O+P+Q)				76,866.26

Annexure-6.15

Standard BoQ and Estimate for 11kV RMU					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of 11kV RMU				
a	No. of 11kV 4Way RMU (LLVV)	nos.	1		
1.1	Supply of 11kV RMU 4 Way, 2 Iso & 2 Brk 630A (LLVV)	Nos.	1	5,57,710.00	5,57,710.00
	Sub Total (Supply Portion) (in Rs.)				5,57,710.00
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning, Wiring and Testing of 11kV RMU				
1.1	Erection of 11kV RMU 4 Way, 2 Iso & 2 Brk 630A (LLVV)	Nos.	1	9,639.00	9,639.00
	Sub Total (Erection Portion) (in Rs.)				9,639.00
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Dismantling of RMU	Nos.	1	7,633.80	7,633.80
	Sub Total (Civil Portion) (in Rs.)				7,633.80
A	Sub Total (Supply Portion)				5,57,710.00
B	Stock, Storage & Insurance @ 3 % of A				16,731.30
C	Sub Total (A+B)				5,74,441.30
D	Contingency @ 3 % of C				17,233.24
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				43,083.10
G	Erection Charges @ 10% of earthing items				-
H	Total (C+D+E+F+G)				6,34,757.64
I	Sub Total (Erection Portion + Civil Portion)				17,272.80
J	Total Cost (H+I)				6,52,030.44
K	Other Overhead /(including Supervision Charges) @ 6 % of J				39,121.83
L	Total Estimated Capital Cost i.e. (J+K)				6,91,152.26
M	GST @ 18% of L				1,24,407.41
M1	CESS @ 1% of L				6,911.52
N	Grand Total (L+M+M1)				8,22,471.19

Annexure-6.16

Standard BoQ and Estimate 11kV RMU					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of 11kV RMU				
a	No. of 11kV 5Way RMU (LLVVV)	nos.	1		
1.1	Supply of 11kV RMU 5 Way, 2 Iso & 3 Brk 630A (LLVVV)	Nos.	1	12,32,372.00	12,32,372.00
	Sub Total (Supply Portion) (in Rs.)				12,32,372.00
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning, Wiring and Testing of 11kV RMU				
1.1	Erection of 11kV RMU 5 Way, 2 Iso & 3 Brk 630A (LLVVV)	Nos.	1	9,639.00	9,639.00
	Sub Total (Erection Portion) (in Rs.)				9,639.00
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Dismantling of RMU	Nos.	1	7,633.80	7,633.80
	Sub Total (Civil Portion) (in Rs.)				7,633.80
A	Sub Total (Supply Portion)				12,32,372.00
B	Stock, Storage & Insurance @ 3 % of A				36,971.16
C	Sub Total (A+B)				12,69,343.16
D	Contingency @ 3 % of C				38,080.29
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				95,200.74
G	Erection Charges @ 10% of earthing items				-
H	Total (C+D+E+F+G)				14,02,624.19
I	Sub Total (Erection Portion + Civil Portion)				17,272.80
J	Total Cost (H+I)				14,19,896.99
K	Other Overhead /(including Supervision Charges) @ 6 % of J				85,193.82
L	Total Estimated Capital Cost i.e. (J+K)				15,05,090.81
M	GST @ 18% of L				2,70,916.35
M1	CESS @ 1% of L				15,050.91
N	Grand Total (L+M+M1)				17,91,058.07

Annexure-6.17

Standard BoQ and Estimate for 11kV RMU					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of 11kV RMU				
a	No. of 11kV 6Way RMU (LLVVVV)	nos.	1		
1.1	Supply of 11kV RMU 6 Way, 2 Iso & 4 Brk 630A (LLVVV)	Nos.	1	15,42,562.00	15,42,562.00
	Sub Total (Supply Portion) (in Rs.)				15,42,562.00
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning, Wiring and Testing of 11kV RMU				
1.1	Erection of 11kV RMU 6 Way, 2 Iso & 4 Brk 630A (LLVVVV)	Nos.	1	9,639.00	9,639.00
	Sub Total (Erection Portion) (in Rs.)				9,639.00
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Dismantling of RMU	Nos.	1	7,633.80	7,633.80
	Sub Total (Civil Portion) (in Rs.)				7,633.80
A	Sub Total (Supply Portion)				15,42,562.00
B	Stock, Storage & Insurance @ 3 % of A				46,276.86
C	Sub Total (A+B)				15,88,838.86
D	Contingency @ 3 % of C				47,665.17
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				1,19,162.91
G	Erection Charges @ 10% of earthing items				-
H	Total (C+D+E+F+G)				17,55,666.94
I	Sub Total (Erection Portion + Civil Portion)				17,272.80
J	Total Cost (H+I)				17,72,939.74
K	Other Overhead /(including Supervision Charges) @ 6 % of J				1,06,376.38
L	Total Estimated Capital Cost i.e. (J+K)				18,79,316.12
M	GST @ 18% of L				3,38,276.90
M1	CESS @ 1% of L				18,793.16
N	Grand Total (L+M+M1)				22,36,386.19

Annexure-6.18

Standard BoQ and Estimate for 630kVA CSS					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of 630kVA CSS				
a	No. of 630kVA CSS	nos.	1		
1.1	Supply of 630kVA CSS	Nos.	1	29,34,734.00	29,34,734.00
	Sub Total (Supply Portion) (in Rs.)				29,34,734.00
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning, Wiring and Testing of 630kVA CSS				
1.1	Erection of 630kVA CSS	Nos.	1	38,168.00	38,168.00
	Sub Total (Erection Portion) (in Rs.)				38,168.00
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Dismantling of CSS	Nos.	1	9,000.00	9,000.00
	Sub Total (Civil Portion) (in Rs.)				9,000.00
A	Sub Total (Supply Portion)				29,34,734.00
B	Stock, Storage & Insurance @ 3 % of A				88,042.02
C	Sub Total (A+B)				30,22,776.02
D	Contingency @ 3 % of C				90,683.28
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				2,26,708.20
G	Erection Charges @ 10% of earthing items				-
H	Total (C+D+E+F+G)				33,40,167.50
I	Sub Total (Erection Portion + Civil Portion)				47,168.00
J	Total Cost (H+I)				33,87,335.50
K	Other Overhead /(including Supervision Charges) @ 6 % of J				2,03,240.13
L	Total Estimated Capital Cost i.e. (J+K)				35,90,575.63
M	GST @ 18% of L				6,46,303.61
M1	CESS @ 1% of L				35,905.76
N	Grand Total (L+M+M1)				42,72,785.00

ANNEXURE-7 LVRT				
Sl. No.	DESCRIPTION OF WORK	Quantity (in nos.)	Unit Price (in Rs.)	Amount (in cr.)
1	7/11kV 1000 kVA Line Voltage Regulator DTR	8	50,39,765.36	4.0
Total				4.0

7/11kV 1000 kVA Line Voltage Regulator DTR					
	Nos.	1			
	MATERIALS OF 11kV LVRT				
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS					
1	WPB 160x152 (11Mtr. Long, 30.44KG/Mtr.)	Nos.	26,516.95	2	53,033.90
2	Straight Cross Arm 100X50X6mm, 9.56 KG/Mtr., each channel length 1.2 mtr., 4 no's channel required =(4x9.56x1.2)	Kg	76.00	45.888	3,487.49
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	3.9648	368.73
4	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's (Each 2x0.59x0.510)	Kg	76.00	0.60	45.74
5	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5x7 mtr. For mesh formation, 12 Mtr. For LA and 2.5 mtr. For raising, 5x2 mtr. for DTR Nutral, (1.3+4.5) mtr. For DTR Body, 0.500 mtr for LTDB, 3 mtr. for Fencing, 2X2 mtr. for ICOG) (Each 55.3x 2.36= 130.51 Kg)	KG	93.00	130.51	12,137.24
6	1000 KVA , 7/11 KV Line Voltage Regulator Transformer	Nos.	19,50,000.00	1	19,50,000.00
7	Supply of 11kV, 3Core, 120 sqmm, Aluminium UG cable for 3Core (Set)	Mtr.	817.16	100	81,716.00
8	Supply of Indoor termination kits Heat Shrinkable type suitable for 11kV, 3Core, 120 sqmm, HT UG cable for 3Core (Set)	Set	10,546.20	8	84,369.60
9	Supply of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 3Core, 120 sqmm, HT UG cable for 3Core (Set)	Set	14,577.44	8	1,16,619.52
10	11 kV RMU VCB ICOG	Set	2,84,742.00	2	5,69,484.00
11	Disc insulator (B&S)70 KN polymer	No	1,426.00	6	8,556.00
12	H W fitting (B&S)70KN(3bolted)	Set	434.00	6	2,604.00
13	Lightning Arrester(12KV,10KA) Station Class 2	Nos.	4,402.00	6	26,412.00
14	11KV pin insulator polymer	No	248.00	6	1,488.00
15	HT stay set complete	Set	1,302.00	2	2,604.00
16	HT stay Clamp (1.9Kg/pair)	Pair	155.00	2	310.00
17	HT stay insulator TYPE-C	No	62.00	2	124.00
18	7/10 SWG GI stay wire, Grade -2 (15Kg./ Set)	Kg	93.00	30	2,790.00
19	40 mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr .Long	No	1,302.00	10	13,020.00
20	GI Nuts & Bolts of Assorted size (25 Kg/ DSS DP)	Kg	96.72	25	2,418.00
21	GI Barbed wire/Anticlimbing device (3Kg /Pole)	Kg	99.20	6	595.20
22	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	2.4072	223.87
23	Danger plate 11kv	No	99.20	2	198.40
24	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	0.6018	55.97
25	Name plate	No	99.20	1	99.20
26	Structure Numbering and Marking				-
26.i	Yellow Colour Paint for Background	Ltr	272.80	2	545.60
26.ii	Black Colour Paint for numbering	Ltr	272.80	1	272.80
A	Total Cost of materials				29,33,579.25
B	Stock, Storage & Insurance i.e 3% of A				88,007.38
C	Sub Total (A+B)				30,21,586.63
D	Contingency @ 3% of C				90,647.60
E	Tools & Plants @ 2% of C				54,517.23
F	Transportation @ 7.5% of C				2,26,619.00
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,32,484.67
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC Pole)				6,129.35
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				35,31,984.48
Civil and Services Works (As per Technical Specification)					
1	Concreting ratio 1:1.5:3 (500mmX500mmX1800mm) = 0.450Cu.mtr	Cu.mtr	6,500.00	0.9	5,850.00

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
2	Couping ratio 1:1.5:3 (500mmX500mmX450mm) = 0.113Cu.mtr	Cu.mtr	6,500.00	0.226	1,469.00
3	Fixing of stay set with 0.5Cum cement concrete foundation 1:3:6 size (900mmx600mmx900mm) using 40mm BHG metal with all labor and material except stay set , stay wire , stay insulator .	No.	2,250.00	2	4,500.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No.	3,700.00	10	37,000.00
5	Laying, Commissioning, Testing of 11kV, 3core, 400sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method.	Mtr.	94.50	100	9,450.00
6	Erection of Indoor termination kits Heat Shrinkable type suitable for 11kV, 3Core, 400sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	8	15,206.40
7	Erection of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 3Core, 400sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	8	15,206.40
8	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench			0	-
1.1	Earth work excavation of soil (1mtr. width X 1mtr. depth)			0	-
1.1.a	Earth work excavation of soil	Cum	700.00	35	24,500.00
1.1.b	Earth work excavation of hard rock	Cum	1,720.00	15	25,800.00
1.2	Back filling with excavated soil outside and above the trench	Cum	202.00	50	10,100.00
9	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	1463.4	64	93,657.60
	Construction of 3-way/4-way/5way RMU Plinth with Brick, Mortar, 12 mm cement plaster as per drawing.Scope of work includes excavation of earth for foundation and supply of raw material i.e. sand, cement, bricks and removal of extra malba if any as per site requirement including labour required for the same as per site requirement & With respect to TPCODL drawing .	EA	23,145.30	2	46,290.60
6	Construction of Plinth with Brick, Mortar, 12 mm cement plaster upto 1000KVA transformer as per TPCODL drawing.Scope of work includes excavation of earth,supply of Civil material, machinery for construction of plinth as per TPCODL Drawing desposal of extra malba as per EIC instruction.	No.	30,360.00	1	30,360.00
7	Supply and Erection of GI Fencing with Gate	Sqmtr.	3,600.00	40	1,44,000.00
K	Total Civil & Services				4,63,390.00
L	Total (J+K)				39,95,374.48
M	Other overheads (Including 6% supervision charges) of L				2,39,722.47
N	Sub Total (L+M)				42,35,096.94
O	Total GST @ 18% of (N)				7,62,317.45
P	Total CESS @ 1% of (N)				42,350.97
Q	Gross Total Material +Services (N+O+P)				50,39,765.36

ANNEXURE-8**33kV NETWORK INFRASTRUCTURE**

Sl. No.	Proposal	Costing (in cr.)	Annexure Nos.
1	Proposal for mitigation of Overloading issue	₹ 18.7	Annexure-8.1 to 8.10
2	Proposal for mitigation of Low Voltage Issue	₹ 26.3	Annexure-8.11 to 8.19
TOTAL		₹ 45.0	

Summary of proposal details for mitigation of Overloading issue:

Sl. No.	Circle	Division	Name of 33kV Feeder	Proposal Details	Costing in Cr	Annexure No.
1	BBSR-1	BCDD-2	Vipul	Installation of 4nos. of 33kV RMUs at 33/11kV Kalinga Nagar PSS for mitigating overloading issue of 33kV Vipul Feeder by splitting the 33kV bus along with laying of 33kV UG cable.	₹ 2	Annexure-8.1
2	BBSR-1	NED	Kakatpur	Augmentation of 33kV line from DIGHALO GSS to Kakatpur PSS from 100/148sqmm to 232sqmm conductor for 26km length with LILO arrangement at Chharichak PSS.	₹ 7.24	Annexure-8.2
3	Cuttack	CED	Badachana	Augmentation of existing Badachana feeder for 4Ckm from 80sq.mm, AAAC to 232sq.mm from Chandikhole 132/33kV GSS to 33/11kV Badachana PSS.	₹ 1	Annexure-8.3
4	Cuttack	AED	Khuntuni	Augmentation of existing Khuntuni Feeder for 4.5Ckm from 100 sq.mm, AAAC to 232 sq.mm from 132/33kV, Khuntuni GSS to 33/11kV, Khuntuni PSS along with installation 2nos. 4Way RMUs to sectionalise the 33kV bus of Khuntuni PSS	₹ 2.08	Annexure-8.4
5	Cuttack	CED	Choudwar	Augmentation of existing Choudwar Feeder for 0.8Ckm from 100 sq.mm, AAAC to 232 sq.mm from 132/33kV, Choudwar GSS, to 33/11kV, Choudwar PSS.	₹ 0.23	Annexure-8.5
6	BBSR-2	KHD	Nuagaon	Installation of bus sectionalizer at 33/11kV Jatani PSS to mitigate overloading issue of 33kV Nuagaon feeder emanating from 132/33kV Argul GSS.	₹ 1.58	Annexure-8.6

Sl. No.	Circle	Division	Name of 33kV Feeder	Proposal Details	Costing in Cr	Annexure No.
7	Dhenkanal	ANED	Angul-1	Laying of 0.575km 33kV 1CX630 Sq.mm. XLPE U/G cable along with 1no. 33kV 4-way RMU (LLVV) to mitigate overloading of 33kV Angul-1 feeder and ensure reliability of 33kV Angul-1 & Ganesh Sponge feeders.	₹ 1.28	Annexure-8.7
8	Paradeep	JED	Balikuda	Augmentation of 3.35Ckm existing 33kV Balikuda feeder from 80sqmm & 100 sq.mm. AAAC to 232 sq.mm. AAAC.	₹ 1.16	Annexure-8.8
9	Paradeep	PDP	Gorada	Augmentation of 8Ckm existing 33kV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC along 33kV Gorada feeder.	₹ 2.03	Annexure-8.9
10	Paradeep	KED-1 & KED-2	Danpur	Installation of 1no. 4-Pole and stringing of 0.1Ckm 148sqmm conductor from Danpur 4Pole to Danpur PSS for bifurcation of 33kV Danpur New feeder	₹ 0.08	Annexure-8.10
TOTAL					₹ 18.7	

Summary of proposal details for mitigation of Low Voltage Issue:

Sl. No.	Circle	Division	Proposal Details	Costing in Cr	Annexure No.
1	BBSR-1	BCDD-2	Installation of 3nos. 33kV RMU along with laying of 33kV UG cable at 33/11kV Barmunda PSS for mitigating low voltage issue by splitting the PSS load at multiple 33kV feeder sources.	₹ 1.31	Annexure-8.11
2	BBSR-1	BCDD-2	Installation of 4nos. 33kV RMU along with laying of 33kV UG cable at 33/11kV Bharatpur PSS for mitigating low voltage issue by splitting the PSS load at multiple 33kV feeder sources.	₹ 1.76	Annexure-8.12
3	BBSR-1	BCDD-2	Installation of 3nos. 33 kV RMU along with laying of 33kV UG cable at 33/11kV CS Pur-1 PSS for mitigating low voltage issue by splitting the PSS load at multiple 33kV feeder sources.	₹ 1.42	Annexure-8.13
4	Dhenkanal	DED	Installation of 2nos. 33 kV RMU along with laying of 33kV UG cable at 33/11kV College PSS for mitigating low voltage issue by splitting the PSS load at multiple 33kV feeder sources.	₹ 0.87	Annexure-8.14
5	Cuttack	CED	Installation of 3nos. 33 kV RMU along with laying of 33kV UG cable at 33/11 kV Tangi PSS for mitigating low voltage issue by splitting the PSS load at multiple 33kV feeder sources.	₹ 1.45	Annexure-8.15
6	Paradeep	PDP	Construction of 33kV interlinking line from Chikinia PSS to Raghunathpur PSS for mitigating low voltage issue by diverting load of 33kV Kandarpur/	₹ 5.06	Annexure-8.16

<i>Sl. No.</i>	<i>Circle</i>	<i>Division</i>	<i>Proposal Details</i>	<i>Costing in Cr</i>	<i>Annexure No.</i>
			Jagatsinghpur feeder to 33kV Tirtol-Jagatsinghpur Feeder.		
7	Cuttack	CED	Installation of 1no. 26.5/33kV, 10MVA AVR Unit at Niali PSS and 1no. 5MVA AVR Unit at Kulakapasi PSS with augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS 14.5km.	₹ 8.50	Annexure-8.17
8	BBSR-II	BAED	Augmentation of 33kV Bhusandpur feeder for 5.5Ckm line between Bharat Electricals to Jankia PSS and construction of 2nos. 33kV RMU with laying of UG cable at Jankia PSS.	₹ 1.89	Annexure-8.18
9	BBSR-II	NYED	Installation of 1no. 26.5/33kV, 1no. 5MVA AVR Unit at Bolagarh PSS and 1no. 5MVA AVR Unit at Hatabasta PSS.	₹ 4.06	Annexure-8.19
TOTAL				₹ 26.30	

Mitigation of 33kV Feeder Overloading Issue

1.0 Proposal for overloading mitigation of 33kV Vipul Feeder:

Proposal: Installation of 4nos. of 33kV RMUs at 33/11kV Kalinga Nagar PSS for mitigating overloading issue of 33kV Vipul Feeder by splitting the 33kV bus along with laying of 33kV UG cable.

Objective: To ensure reliable power supply to the end consumers by splitting the 33kV bus at PSS for mitigating overloading issues.

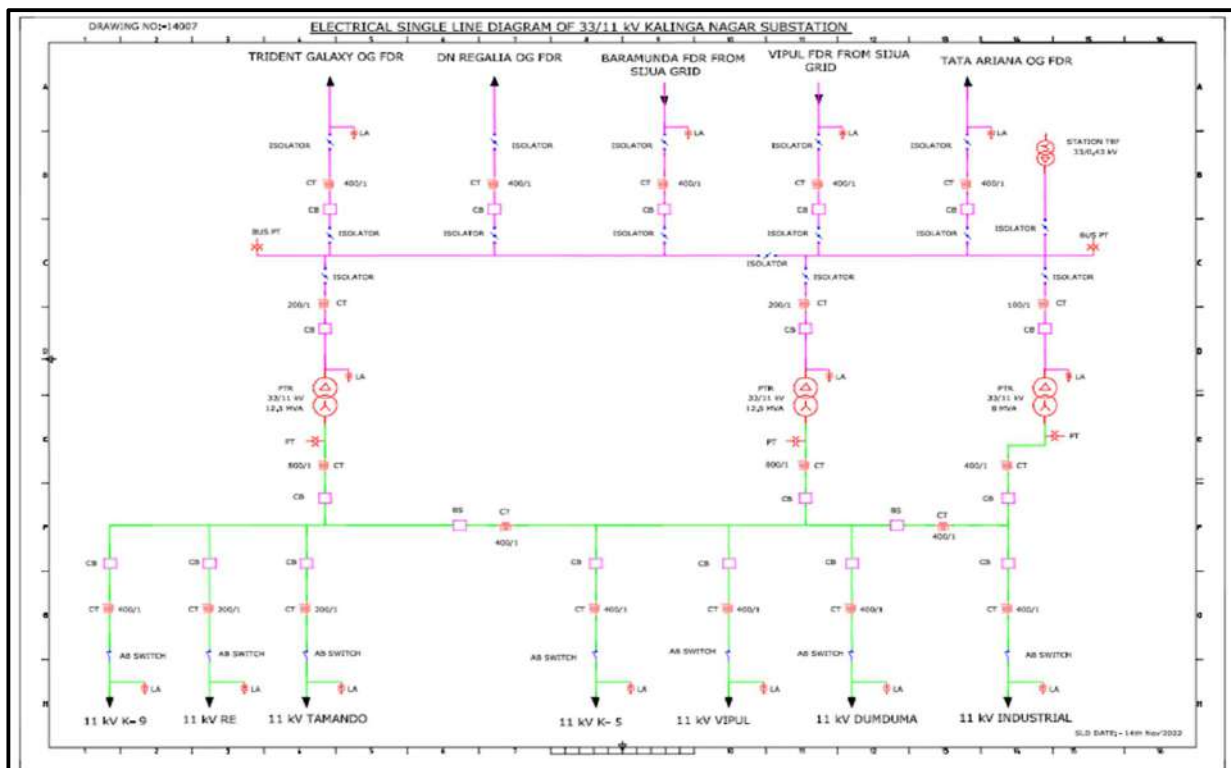
Existing Scenario:

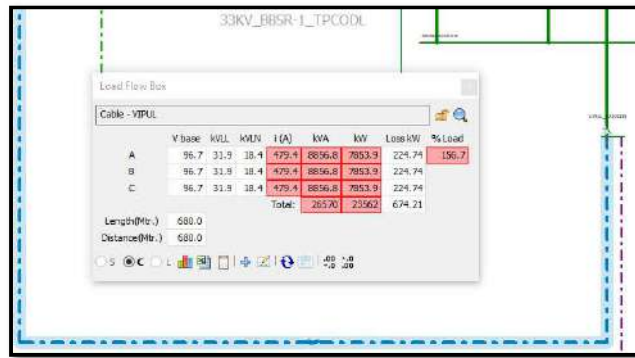
- At present, 33kV Vipul feeder is emanating from 132/33kV Ranasinghpur GSS and feeding power supply to 6nos. high value consumer along with 33/11kV Kalinga Nagar PSS. Total length of the 33kV feeder is 8.66km and the peak loading at Summer'22 is 21.71MVA.
- At present 3 nos. of 33kV feeder connectivity is available at Kalinga Nagar PSS, but due to unavailability of bus splitting arrangement, load diversion is not operationable at Kalinga Nagar PSS. All the PTR loads of 33/11kV Kalinga Nagar PSS are fed power supply through 33kV Vipul Feeder.
- Considering load growth for 5years (10% load growth per year for 2years, 6% load growth per year for next 3years) 33kV feeder is overloaded as mentioned below.

Existing Summer'22 Loading and projected load at 33kV Vipul Feeder:

33kV Feeder Name	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Overloading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading	Feeder Overloading Status
Vipul	17.49	21.71	124.13%	Overload	26.27	31.29	178.92%	Overload

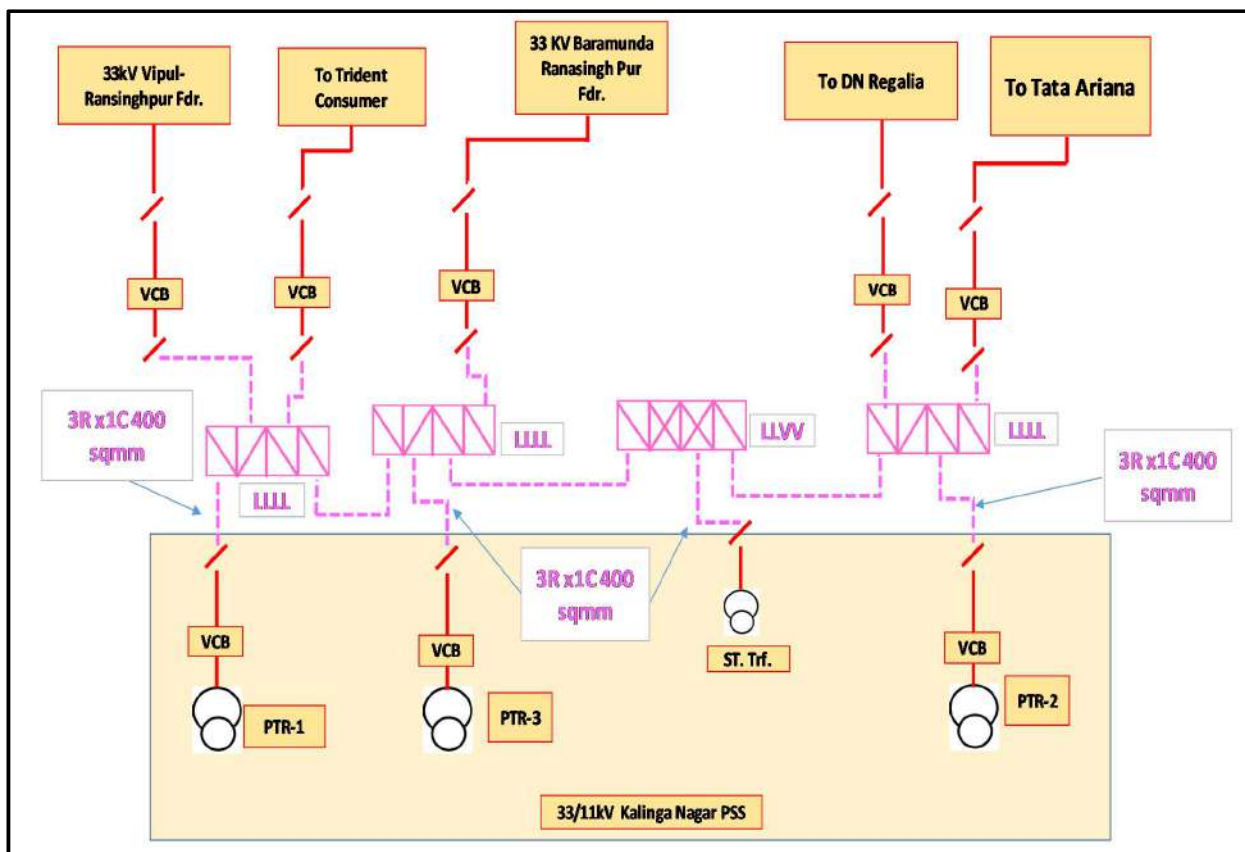
Existing SLD:

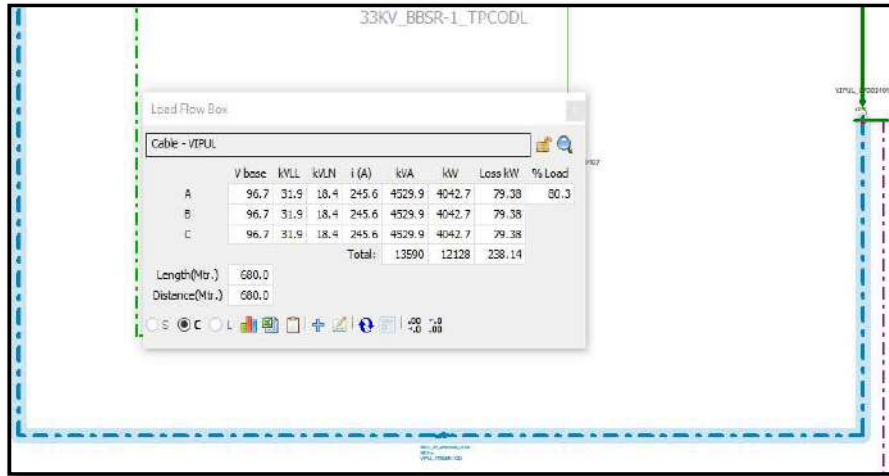


Load Flow Study of existing scenario in Cyme Software:**Proposed Scenario:**

- Installation of 4nos. of 33kV, 4 Way RMUs at kalinga Nagar PSS for bus splitting arrangement.
- Overloading mitigation of 33kV Vipul feeder by bifurcating the load as shown in the below table.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Vipul	17.49	13.12	15.62	89.32%	OK
Gothapatna	26.51	8.43	10.04	37.89%	OK
Barmunda	20	4.72	5.62	28.10%	OK

Proposed SLD:

Load Flow Study of proposed scenario in Cyme Software:**Detailed Scope of Work:**

- Laying of 33kV UG Cable of length of 185mtr, 1Cx630sqmm from 33kV line VCB & 33kV consumer VCB to proposed RMU.
- Installation of 3nos. of 33kV 4 Way (LLLL) RMU & 1 no. of 33kV 4 way (LLVV) RMU at Kalinga nagar PSS.
- Laying of 33kV UG Cable of length of 85mtr using 1Cx400sqmm, 33kV UG cable from proposed RMU to PTR VCB & proposed RMU to station transformer.

BoQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		BCDD-II	
Name of the Sub-Division : -		Khandagiri	
Name of the Work :-		Mitigation of 33kV Feeder Overloading: Installation of 4 Nos. of 33 KV RMU at Kalinga Nagar PSS for BUS Splitting operation & mitigation of overloading issue of 33KV Vipul feeder.	
Scope:-		Part-A:- 1. Laying of 33 KV UG Cable of length - 185 Mtr. using 1Cx630 mm2, 33KV UG cable. (From 33 KV Line VCB & 33 KV Consumer VCB to Proposed RMU). 2. Installation of 3 Nos. of 33 KV 4 Way (LLLL) RMU & 1 no. of 33 KV 4 way (LLVV) RMU at Kalinga nagar PSS. Part-B:- Laying of 33 KV UG Cable of length - 85 Mtr. using 1Cx400 mm2, 33KV UG cable. (From Proposed RMU to PTR VCB & Proposed RMU to station Transformer)	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount

1	A	Part-A:- 1. Laying of 33 KV UG Cable of length - 185 Mtr. using 1Cx630 mm ² , 33KV UG cable.(From 33 KV Line VCB & 33 KV Consumer VCB to Proposed RMU). 2. Installation of 3 Nos. of 33 KV 4 Way(LLLL) RMU & 1 no. of 33 KV 4 way (LLVV) RMU at Kalinga nagar PSS.	1,50,99,601.19
2	B	Part-B:- Laying of 33 KV UG Cable of length - 85 Mtr. using 1Cx400 mm ² , 33KV UG cable.(From Proposed RMU to PTR VCB & from Proposed RMU to station Transformer)	7,11,352.42
		Total Amount	1,58,10,953.61
		Total Amount (In Cr)	1.58
Total estimated cost is Rs. 1.58 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 1.58cr. (For detailed BoQ refer Annexure-8.1).

Benefit:

- Mitigating overloading issues of 33kV Vipul Feeder.
- Ensuring reliability of power supply for consumers & connected PSS.

2.0 Proposal for overloading mitigation of 33kV Kakatpur Feeder:

Proposal: Augmentation of 33kV line from DIGHALO GSS to Kakatpur PSS from 100/148sqmm to 232sqmm conductor for 29.5km length with LILO arrangement at Chharichak PSS to mitigate overloading.

Objective: To ensure reliable power supply by mitigating overloading and strengthening of the existing network.

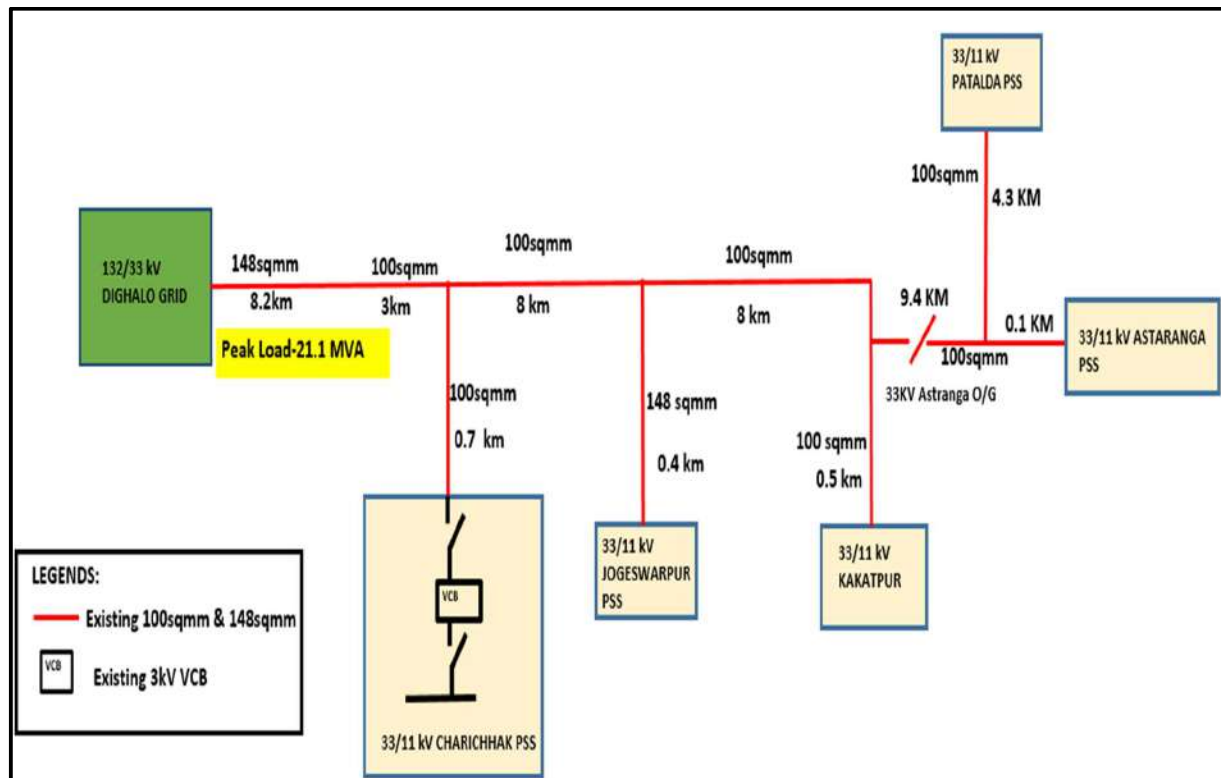
Existing Scenario:

- At present, 33kV Kakatpur feeder is emanating from Dighalo Grid, having mixed type conductor 148/100sqmm with a length of 43km.
- Present peak load of Kakatpur 33kV feeder is 21.14 MVA, w.r.t., the current carrying capacity of conductor 15.54 MVA.
- Considering present scenario, there is overloading of the feeder and low voltage in some areas.
- Considering load growth for 5years (4% load growth per year for 5years) 33kV feeder is overloaded as mentioned below.

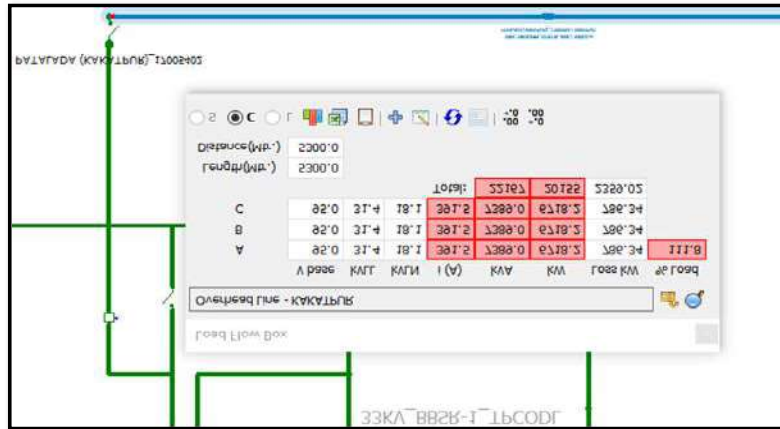
Existing Summer'22 Loading and projected load at 33kV Kakatpur Feeder:

33kV Feeder Name	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Overloading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading	Feeder Overloading Status
Kakatpur	15.54	21.14	136.05%	Overload	22.87	25.72	165.53%	Overload

Existing SLD:



Load Flow Study of existing scenario in Cyme Software:

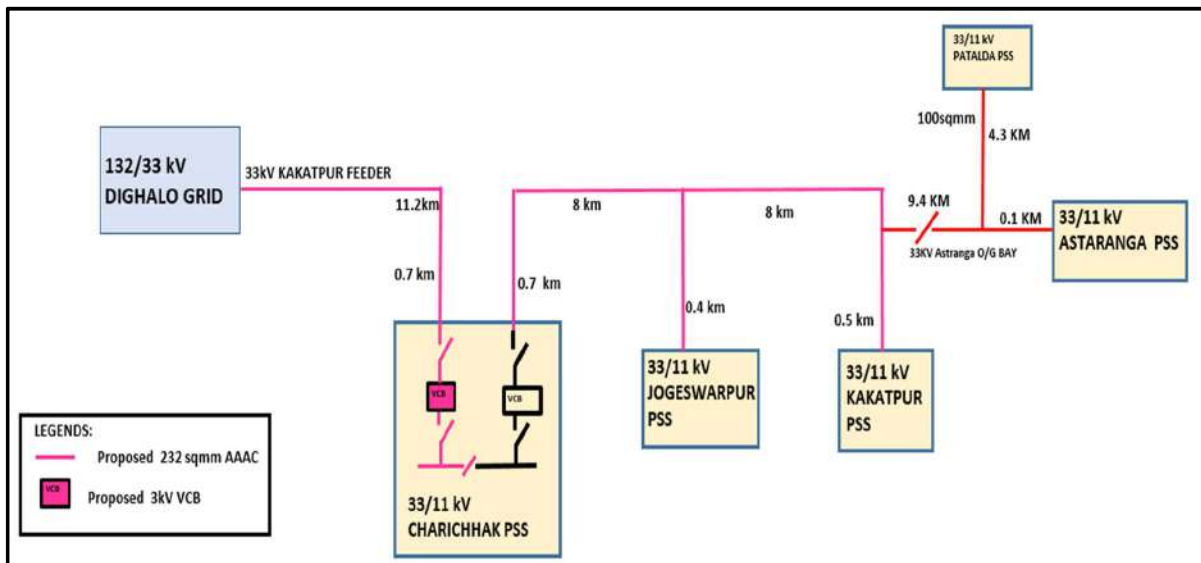


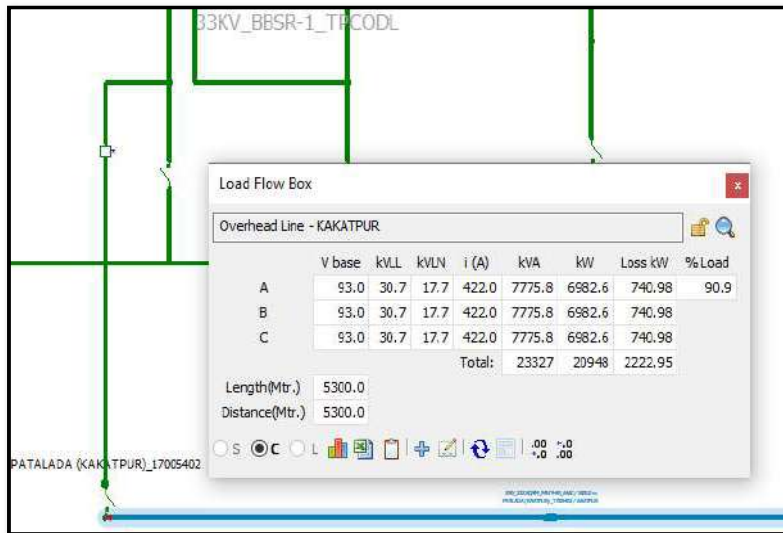
Proposed Scenario:

- Installation of 33kV VCB and provision of LILO arrangement is proposed at Charichhak PSS to reduce frequent interruptions.
- 33kV Kakatpur feeder augmentation is proposed from Dighalo Grid to Kakatpur PSS for a length of 26km.
- Overloading mitigation of 33kV Kakatpur feeder by conductor augmentation as shown in below table.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Kakatpur	26.51	22.87	25.72	97%	OK

Proposed SLD:



Load Flow Study of proposed scenario in Cyme Software:**Detailed Scope of Work:**

- Augmentation of Kaktapur feeder from 100/148 sq.mm OH conductor to 232sqmm conductor for 26km length.
- Construction of additional 33kV bay at Charichhak PSS.

BoQ:

ANNEXURE-8.2			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		NED	
Name of the Sub-Division : -		KAKATPUR	
Name of the Work :-		Mitigation of 33kV Feeder Overloading: Proposal for augmentation of 33 kV line from DIGHALO GSS to Kakatpur PSS with LILO arrangement at Charichhak PSS to mitigate overloading and low Voltage issue.	
Scope:-		PART A: Replacement of 100 sqmm conductor with 232sqmm along with Intermediate H- Poles from Dighalo GSS to Kakatpur PSS of Ckt. Line length - 26 Ckm PART B: Installation of 33kV Isolator- 3 no.s and 33kv VCB- 1 no.s at CHARICHHAK PSS.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	PART A: Replacement of 100 sqmm conductor with 232sqmm along with Intermediate H- Poles from Dighalo GSS to Kakatpur PSS of Ckt. Line length - 26 Ckm	6,88,13,541.59

2	B	PART B: Installation of 33kV Isolator- 3 no.s and 33kv VCB- 1 no.s at CHARICHHAK PSS.	36,30,897.07
		Total Amount	7,24,44,438.66
		Total Amount (In Cr)	7.24
Total estimated cost is Rs. 7.24 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 7.24cr. (For detailed BoQ refer Annexure-8.2).

Benefit:

- Ensuring reliable power supply by mitigating overloading.
- VCB and LILO arrangement is proposed at Charichhak PSS to reduce frequent interruptions.

3.0 Proposal for overloading mitigation of 33kV Badachana Feeder:

Proposal: Augmentation of existing Badachana feeder for 4Ckm from 80sq.mm, AAAC to 232sq.mm from Chandikhole 132/33kV GSS to 33/11kV Badachana PSS.

Objective: To ensure reliable power supply by mitigating overloading and strengthening of the existing network.

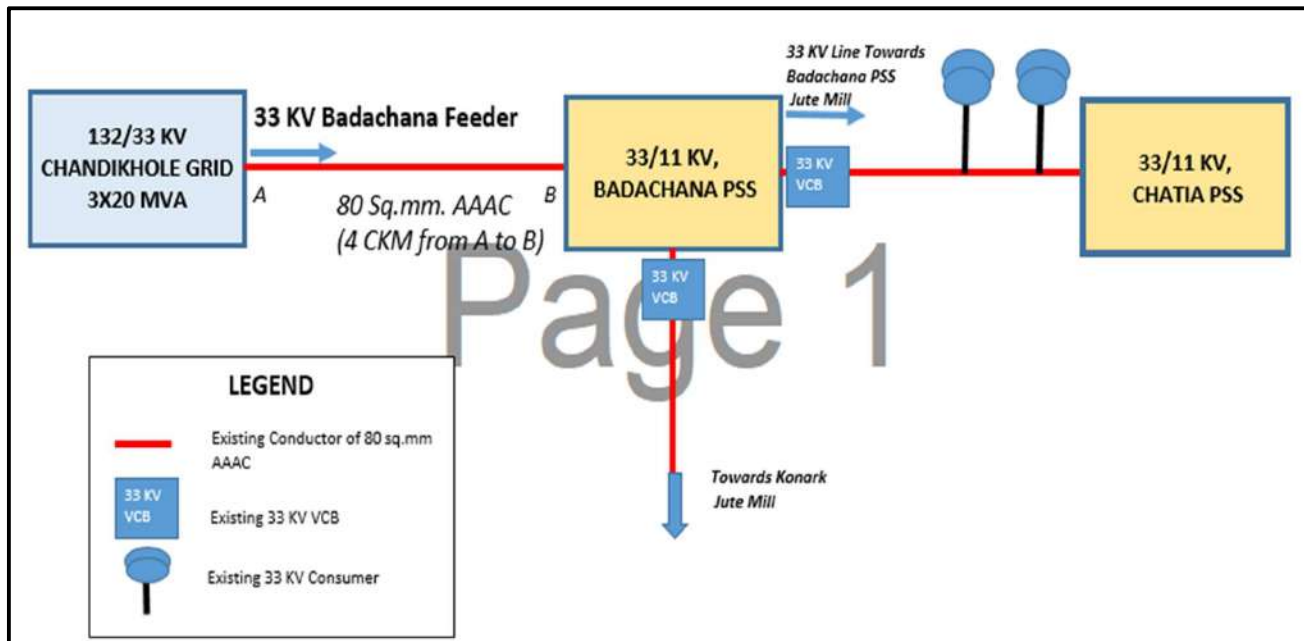
Existing Scenario:

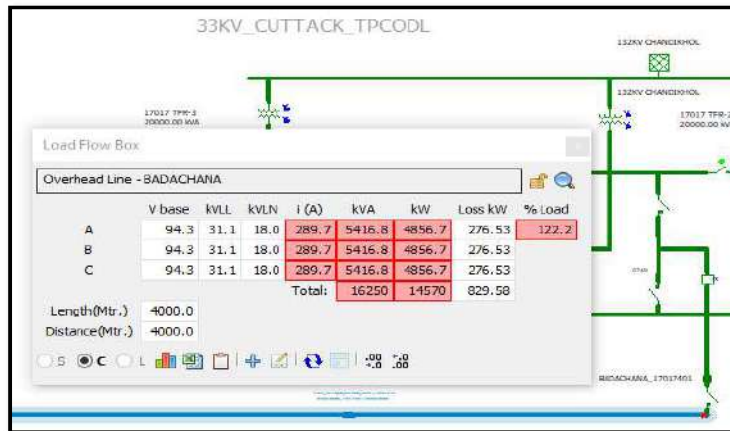
- At present, 33kV Badachana feeder is emanating from Chandikhole Grid, having conductor size of 80sq.mm, AAAC for a length of 4 Ckm.
- Present peak load of Badachana 33kV feeder is 15.2 MVA, w.r.t., the current carrying capacity of conductor 13.5MVA.
- Considering present scenario, there is overloading issue on the existing 33kV Badachana feeder.
- Considering load growth for 5years (4% load growth per year for 5years) 33kV feeder is overloaded as mentioned below.

Existing Summer'22 Loading and projected load at 33kV Badachana Feeder:

33kV Feeder Name	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Overloading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Badachana	13.5	15.2	112.59%	Overload	16.44	18.49	136.99%	Overload

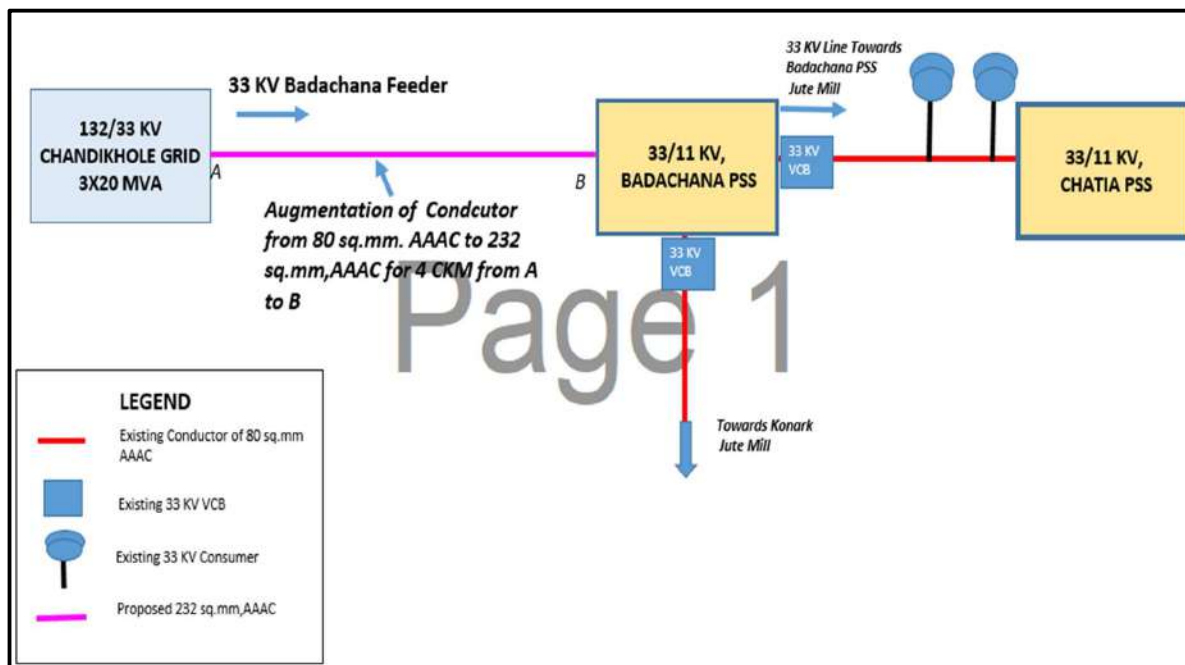
Existing SLD:

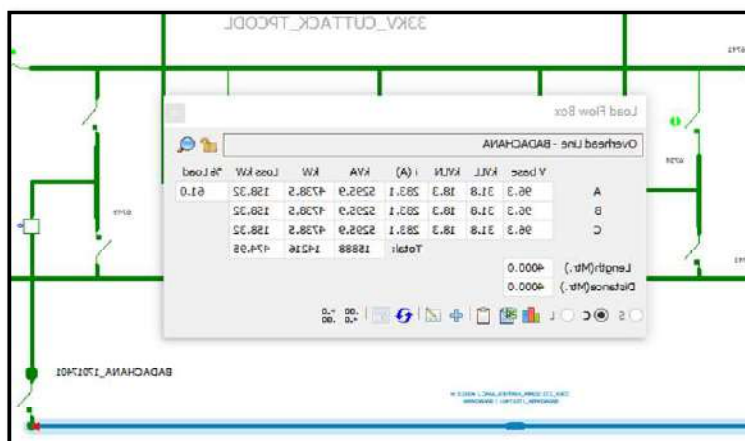


Load Flow Study of existing scenario in Cyme Software:**Proposed Scenario:**

- 33kV Badachana feeder augmentation is proposed from Chandikhole Grid to Badachana PSS for a length of 4km.
- Overloading issue mitigation of 33kV Badachana feeder by conductor augmentation as shown in below table.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Badachana	26.51	16.44	18.49	69.76%	OK

Proposed SLD:

Load Flow Study of proposed scenario in Cyme Software:**Detailed Scope of Work:**

Augmentation of existing Badachana Feeder for 4Ckm from 80 sq.mm, AAAC to 232 sq.mm from Chandikhole 132/33kV Grid to 33/11kV Badachana PSS for providing reliable power supply by mitigating overloading issue.

BoQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		CED	
Name of the Sub-Division : -		BADACHANA	
Name of the Work :-		Mitigation of 33kV Feeder Overloading: Proposal for conductor augmentation of 33 KV Badachana feeder of 4 CKM from 80 sq.mm, O/H, AAA conductor to 232 sq.mm, AAA conductor to mitigate overloading issue.	
Scope:-		Augmentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Chandikhole 132/33 KV, GSS to 33/11 KV, Badachana PSS.	
Names of Schemes: -		TPCODL CAPEX(FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Augmentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Chandikhole 132/33 KV, GSS to 33/11 KV, Badachana PSS.	92,30,071.27
		Total Amount	92,30,071.27
		Total Amount (In Cr)	0.92
Total estimated cost is Rs. 0.92 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 0.92cr. (For detailed BoQ refer Annexure-8.3).

Benefit:

- Mitigating overloading issue of 33kV Badachana feeder.
- Ensuring reliability of power supply.

4.0 Proposal for overloading mitigation of 33kV Khuntuni Feeder:

Proposal: Augmentation of existing Khuntuni Feeder for 4.5Ckm from 100 sq.mm, AAAC to 232 sq.mm from 132/33kV, Khuntuni GSS to 33/11kV, Khuntuni PSS along with installation 2nos. 4Way RMUs to sectionalise the 33kV bus of Khuntuni PSS.

Objective: To ensure reliable power supply by mitigating overloading issue and strengthening of the existing network.

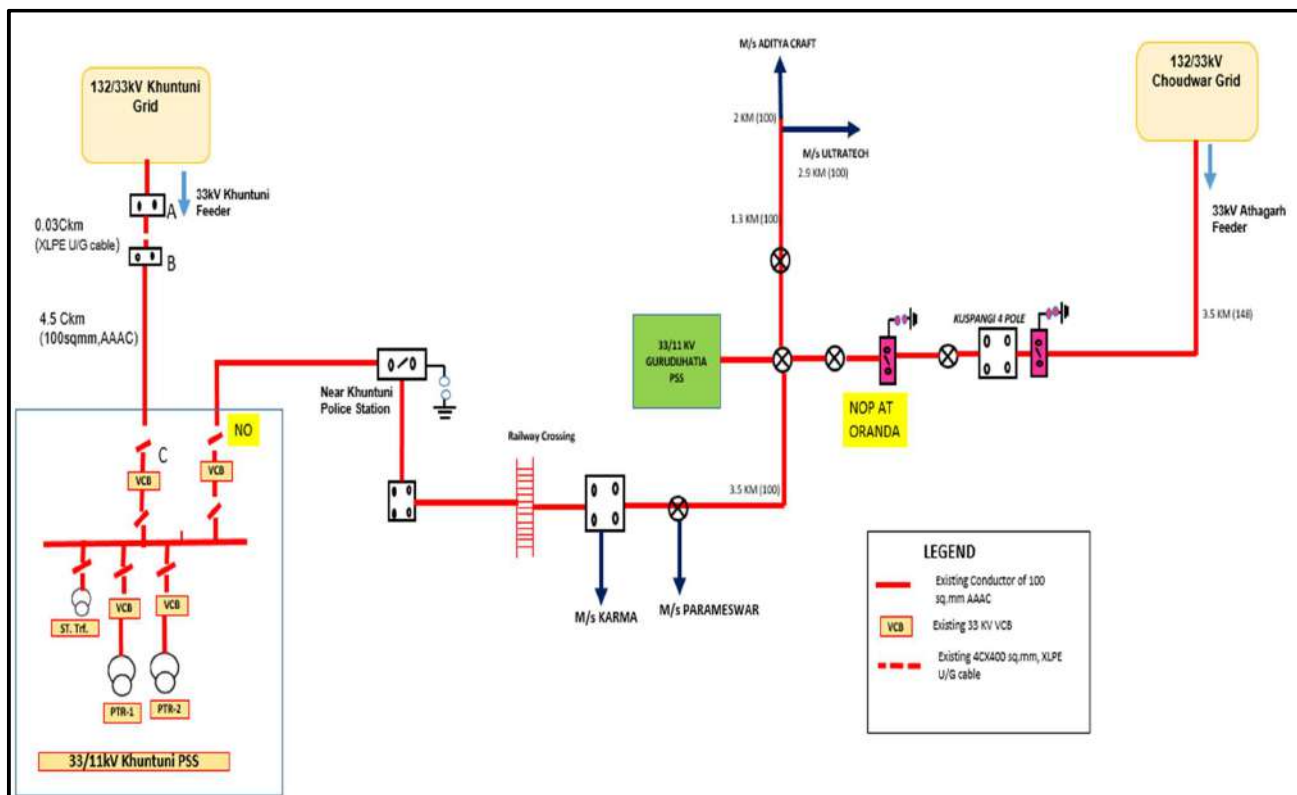
Existing Scenario:

- At present, length of feeder from Khuntuni Grid to Khuntuni PSS, having conductor of 100 sq.mm, AAAC for a total length of 4.5Ckm.
- Present peak load of 33kV Khuntuni feeder is 15.9MVA, w.r.t., the current carrying capacity of conductor 15.5MVA.
- Considering load growth for 5years (4% load growth per year for 5years) 33kV feeder is overloaded as mentioned below.

Existing Summer'22 Loading and projected load at 33kV Khuntuni Feeder:

33kV Feeder Name	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Overloading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Khuntuni	15.5	15.9	102.58%	Overload	17.20	19.34	124.81%	Overload

Existing SLD:



33KV_CUTTACK_TPCODL

KHUNTUNI_17044401

Load Flow Box

Overhead Line - KHUNTUNI

	V base	kVLL	kVLN	i (A)	kVA	kW	Loss kW	% Load
A	97.1	32.0	18.5	318.4	5892.4	5282.8	202.55	117.1
B	97.1	32.0	18.5	318.4	5892.4	5282.8	202.55	
C	97.1	32.0	18.5	318.4	5892.4	5282.8	202.55	
Total:					17677	15898	607.65	

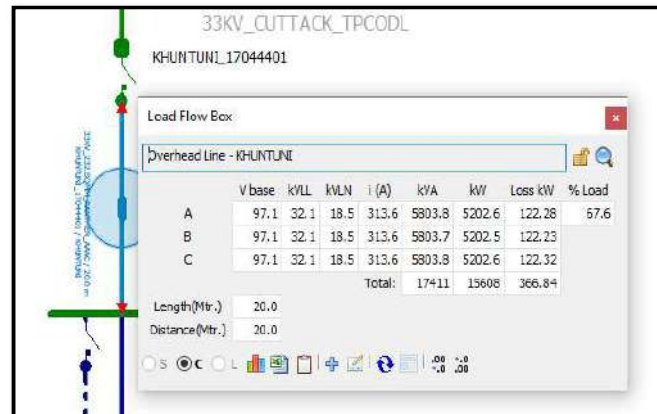
Length (Mtr.) 20.0
Distance (Mtr.) 20.0

Buttons: S, C, L, [Icons], [Icons], [Icons], [Icons]

Units: 0.00, 0.00, 0.00

- 33kV Khuntuni feeder augmentation is proposed from 132/33kV, Khuntuni GSS to 33/11kV, Khuntuni PSS for a length of 4.5Ckm.
- Installation of 2 nos. 33KV, 4 way RMU proposed in Khuntuni PSS to improve the operational activities.
- Overloading issue mitigation of 33kV Khuntuni feeder by conductor augmentation as shown in below table.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Khuntuni	26.51	17.20	19.34	72.97%	OK

Load Flow Study of proposed scenario in Cyme Software:**Detailed Scope of Work:**

Augmentation of existing Khuntuni feeder of 4.5Ckm from 100 sq.mm, AAAC to 232 sq.mm from Khuntuni 132/33kV GSS to 33/11kV Khuntuni PSS for providing reliable power supply by mitigating overloading issue.

BoQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		AED	
Name of the Sub-Division :-		Athagarh	
Name of the Work :-		Mitigation of 33kV Feeder Overloading: Proposal for augmentation of existing 33 kV Khuntuni Feeder from Khuntuni GSS to Khuntuni PSS for providing reliable power supply.	
Scope:-		1. Augmentation of existing Khuntuni Feeder of 4.5 CKM from 100 sq.mm, AAAC to 232 sq.mm from 132/33 KV, Khuntuni GSS to 33/11 KV, Khuntuni PSS. 2. Laying of 33 KV U/G line of 0.12 km using 1CX630 sq.mm, XLPE cable without spare and Installation of 2 nos of 33KV, 4 WAY RMU at Khuntuni PSS. 3. Laying of 33 KV U/G line of 0.60 km using 1CX400 sq.mm, XLPE cable without spare.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Augmentation of existing Khuntuni Feeder of 4.5 CKM from 100 sq.mm, AAAC to 232 sq.mm from 132/33 KV, Khuntuni GSS to 33/11 KV, Khuntuni PSS.	1,09,15,984.25
2	B	Part-B Laying of 33 KV U/G line of 0.12 km using 1CX630 sq.mm, XLPE cable without spare and Installation of 2 nos of 33KV, 4 WAY RMU at Khuntuni PSS.	91,30,614.96

3	C	Part-C Laying of 33 KV U/G line of 0.60 km using 1CX400 sq.mm, XLPE cable without spare.	7,56,143.07
		Total Amount	2,08,02,742.28
		Total Amount (In Cr)	2.08
Total estimated cost is Rs. 2.08 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 2.08cr. (For detailed BoQ refer Annexure-8.4).

Benefit:

- Mitigating overloading issue of 33kV Khuntuni feeder.
- Ensuring reliability of power supply.

5.0 Proposal for overloading mitigation of 33kV Choudwar Feeder:

Proposal: Augmentation of existing Choudwar Feeder for 0.8Ckm from 100 sq.mm, AAAC to 232 sq.mm from 132/33kV, Choudwar GSS, to 33/11kV, Choudwar PSS.

Objective: To ensure reliable power supply by mitigating overloading issue and strengthening of the existing network.

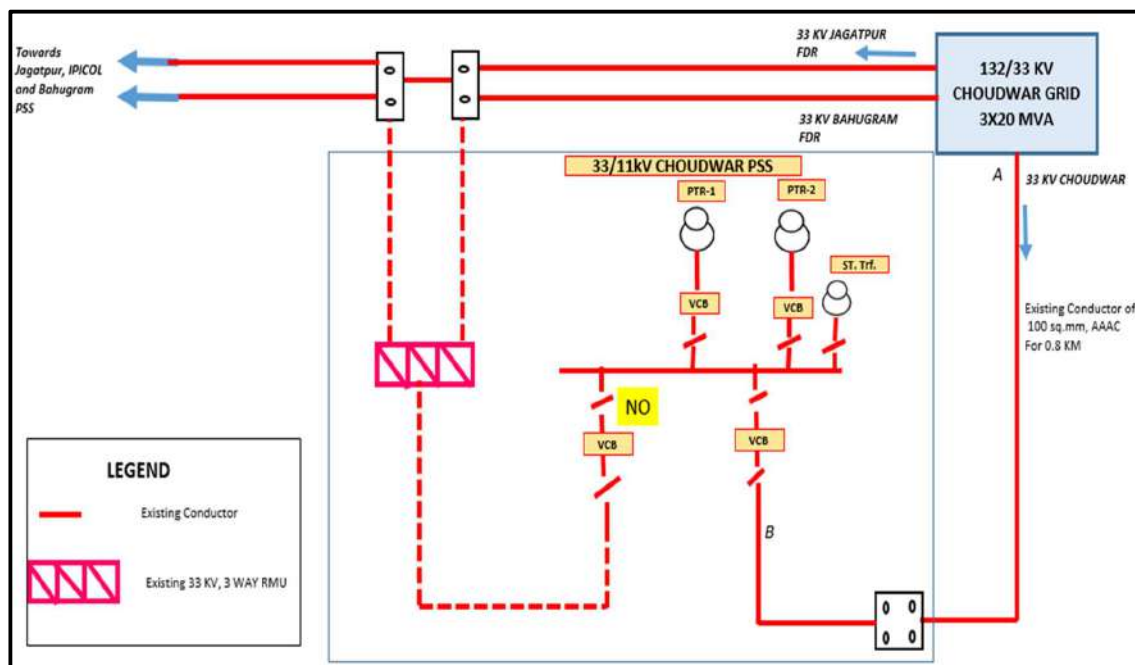
Existing Scenario:

- At present, 33kV Choudwar feeder is emanating from Choudwar Grid, having conductor of 100 sq.mm, AAAC for a length of 0.8Ckm.
- Present peak load of 33kV Choudwar feeder is 15.9MVA, w.r.t., the current carrying capacity of conductor 15.5MVA.
- Considering load growth for 5years (3% load growth per year for 5years) 33kV feeder is overloaded as mentioned below.

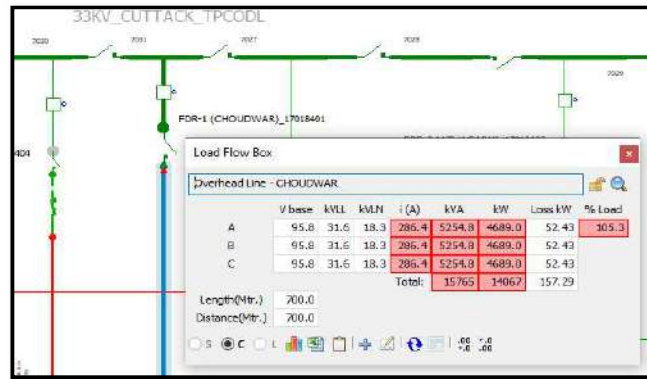
Existing Summer'22 Loading and projected load at 33kV Choudwar Feeder:

33kV Feeder Name	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Overloading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Choudwar	15.5	15.9	102.58%	Overload	16.87	18.43	118.92%	Overload

Existing SLD:



Load Flow Study of existing scenario in Cyme Software:

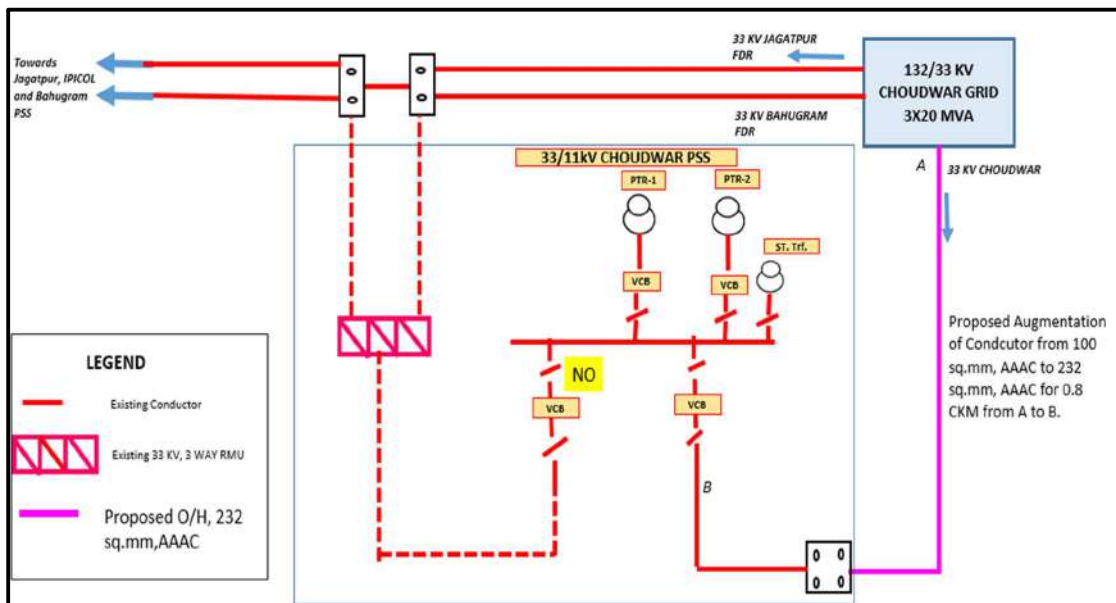


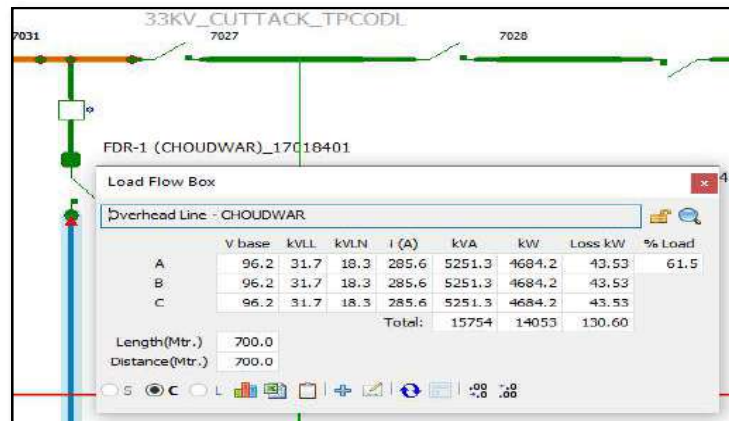
Proposed Scenario:

- 33kV Choudwar feeder augmentation is proposed from 132/33kV, Choudwar GSS to 33/11kV, Choudwar PSS for a length of 0.8Ckm.
- Overloading issue mitigation of 33kV Choudwar feeder by conductor augmentation as shown in below table.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Choudwar	26.51	16.87	18.43	69.53%	OK

Proposed SLD:



Load Flow Study of existing scenario in Cyme Software:**Detailed Scope of Work:**

Augmentation of existing Choudwar feeder of 0.8Ckm from 100 sq.mm, AAAC to 232 sq.mm from Choudwar 132/33kV GSS to 33/11kV Choudwar PSS for providing reliable power supply by mitigating overloading issue.

BoQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		CED	
Name of the Sub-Division :-		Choudwar	
Name of the Work :-		Mitigation of 33kV Feeder Overloading: Proposal for augmentation of existing 33 kV Choudwar Feeder from Choudwar GSS to Choudwar PSS for providing reliable power supply.	
Scope:-		Augmentation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm from Choudwar 132/33 KV, GSS to 33/11 KV, Choudwar PSS.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Augmentation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm from Choudwar 132/33 KV, GSS to 33/11 KV, Choudwar PSS.	22,69,171.09
		Total Amount	22,69,171.09
		Total Amount (In Cr)	0.23
Total estimated cost is Rs. 0.23 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 0.23cr. (For detailed BoQ refer Annexure-8.5).

Benefit:

- Mitigating overloading issue of 33kV Choudwar feeder.
- Ensuring reliability of power supply.

Load Flow Study of existing scenario in Cyme Software:

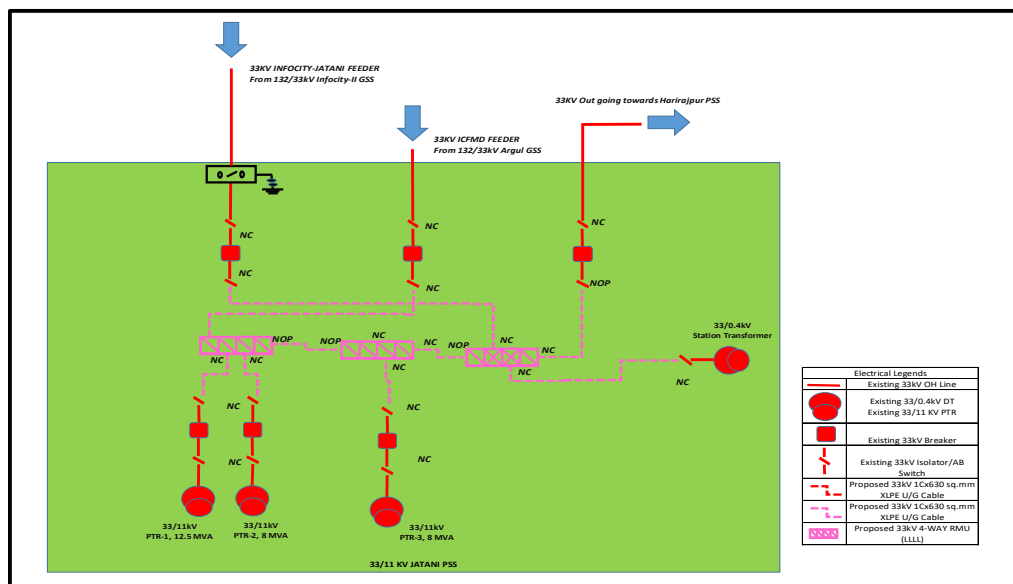


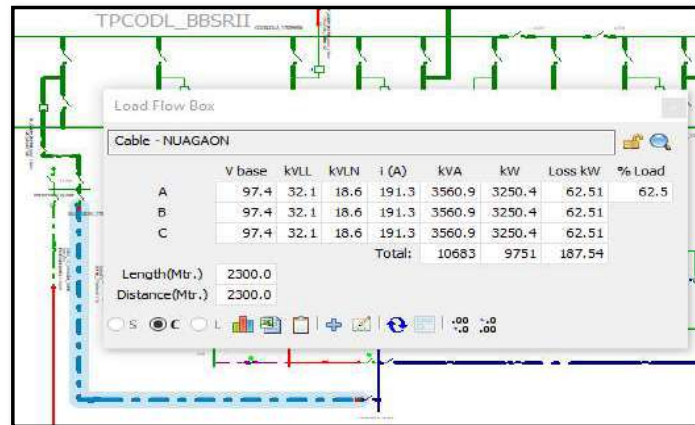
Proposed Scenario:

- 2nos. 33kV 4-Way RMU (LLLL) and 1no. 4-Way RMU (LLVV) are proposed to sectionalize bus at Jatani PSS.
- After Bus sectionalization at Jatani PSS Nuagaon feeder will feed the load of PTR-1 and PTR-2 of Jatani PSS and Nuagaon PSS. 33kV Infosys-Jatani feeder will feed PTR-3 load of Jatani PSS along with 33kV consumers and 33kV Kurki I.E feeder (proposal under deposit work) will feed 33kV industrial consumers along with 33/11kV Harirajpur and Bharatipur PSS.
- Overloading issue mitigation of 33kV Nuagaon feeder by bus sectionalization as shown in below table.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Nuagaon	15.43	10.83	12.90	83.59%	OK
Infosys-Jatani	20	12.60	15.00	75.01%	OK
Kurki I.E	17.49	8.26	9.84	56.28%	OK

Proposed SLD:



Load Flow Study of proposed scenario in Cyme Software:**Detailed Scope of Work:**

Installation 2nos. 33kV 4-Way RMU (LLLL) and 1no. 4-Way RMU (LLVV) along with UG cable at Jatani PSS for sectionalize 33kV bus to mitigate overloading issue of Nuagaon feeder.

BOQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED			
	Name of the Division :-	KHD	
	Name of the Sub-Division : -	Jatani	
	Name of the Work :-	Mitigation of 33kV Feeder Overloading: Installation 3 Nos. 33kV 4-Way RMU at Jatani PSS for sectionalize 33kV Bus to mitigate overloading issue of Nuagaon feeder.	
	Scope of work:-	PART A- Installation 3 Nos. 33kV 4-Way RMU at Jatani PSS for sectionalize 33kV Bus to mitigate overloading issue of Nuagaon feeder.	
	Names of Schemes: -	TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Installation 3 Nos. 33kV 4-Way RMU at Jatani PSS for sectionalize 33kV Bus to mitigate overloading issue of Nuagaon feeder.	₹ 1,58,44,670.47
		Total Amount	₹ 1,58,44,670.47
		Total Amount (In Cr)	1.58
Total estimated cost is Rs. 1.58 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 1.58cr. (For detailed BoQ refer Annexure-8.6).

Benefit:

- Mitigating overloading issues of 33kV Nuagaon Feeder.
- Ensuring reliability of power supply for consumers & connected PSS.

7.0 Proposal for overloading mitigation of 33kV Angul-1 Feeder:

Proposal: Laying of 0.575km 33kV 1CX630sq.mm. XLPE U/G cable along with 1no. 33kV 4-way RMU (LLVV) to mitigate overloading of 33kV Angul-1 feeder and ensure reliability of 33kV Angul-1 feeder.

Objective: To maintain reliable power supply along with overloading mitigation of 33 KV Angul-1 feeder and strengthening of existing network.

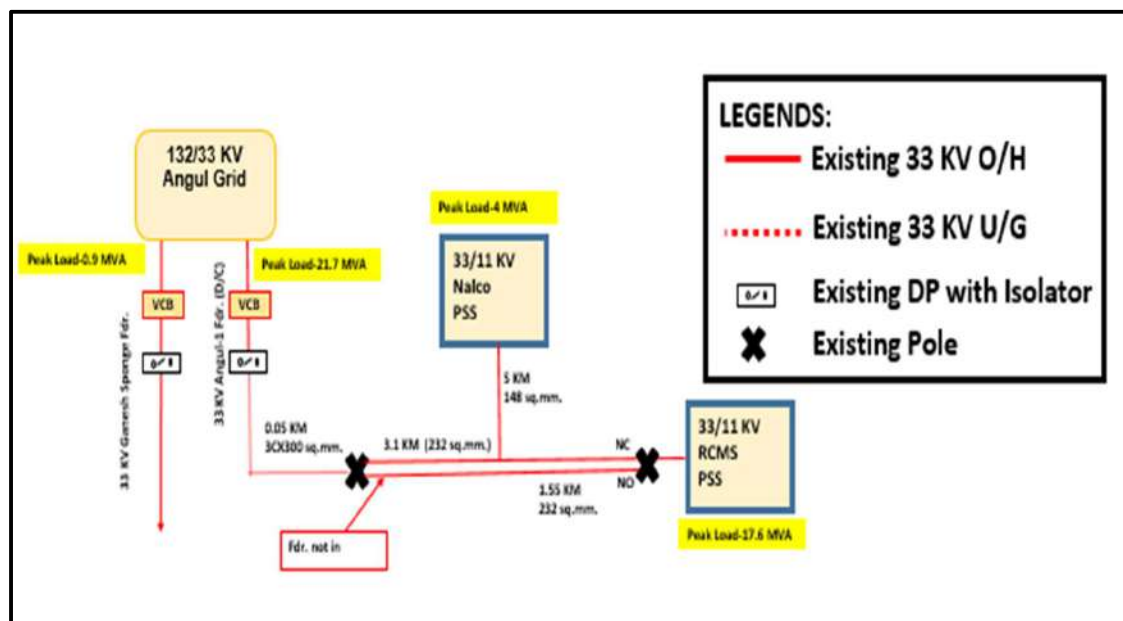
Existing Scenario:

- At present, 33 KV Angul-1 feeder is emanating from 132/33kV Angul Grid providing supply to 33/11kV Nalco & RCMS PSS. Peak load of Nalco & RCMS PSS are 4 MVA & 17.6 MVA respectively.
- Peak load of 33kV Angul-1 feeder is 21.71 MVA, w.r.t., the conductor current carrying capacity of 17.08MVA.
- 33kV Angul-1 feeder is Double circuit but 33/11kV Nalco & RCMS PSS are availing supply through circuit-1. Circuit-2 is not in service due to unavailability of 33kV feeder bay at Angul 132/33kV GSS.
- Considering load growth for 5years (8% load growth per year for 5years) 33kV feeder is overloaded as mentioned below.

Existing Summer'22 Loading and projected load at 33kV Angul-1 Feeder:

33kV Feeder Name	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Overloading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Angul-1	17.08	21.71	127.13%	Overload	25.33	31.91	186.80%	Overload

Existing SLD:



Load Flow Study of existing scenario in Cyme Software:

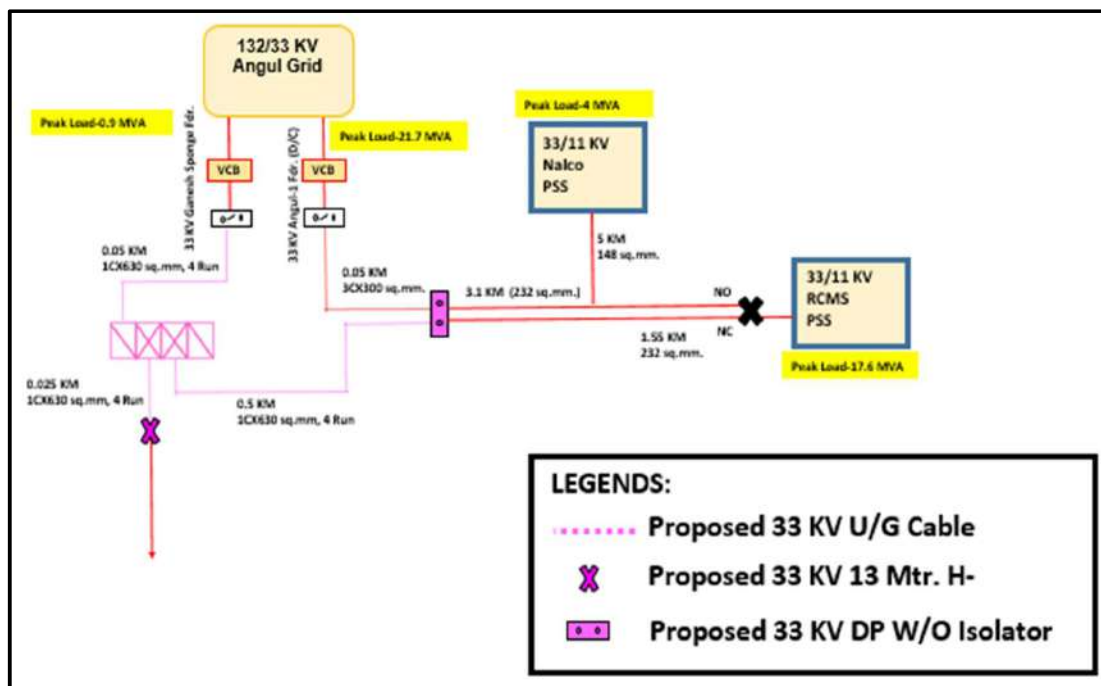
	V base	kVLL	kVLN	i (A)	kVA	kW	Loss kW	% Load
A	95.3	31.4	18.2	455.4	8268.1	7381.8	226.94	168.6
B	95.3	31.4	18.2	455.4	8268.1	7381.8	226.94	168.6
C	95.3	31.4	18.2	455.4	8268.1	7381.8	226.94	168.6
Total:					24804	22145	680.83	

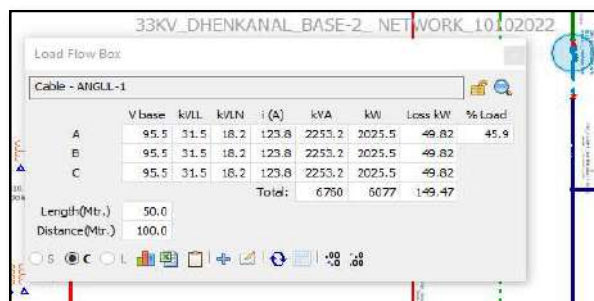
Length(Mtr.) 50.0
Distance(Mtr.) 100.0

Proposed Scenario:

- Laying of 0.575km 33kV 1CX630 Sq.mm. XLPE U/G cable along with 1no. 33kV 4-way RMU (LLVV), using existing 33kV Ganesh Sponge feeder bay to link with circuit-2 of Angul-1 33kV feeder.
- After load distribution between two circuits of 33 KV Angul-1 feeder overloading issue will be solved as shown in below table.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Angul-1	17.08	5.25	6.61	38.71%	OK
Angul-1 ckt-2	26.51	20.08	25.29	95.41%	OK

Proposed SLD:

Load Flow Study of proposed scenario in Cyme Software:**Detailed Scope of Work:**

- Laying of 575mtr. 33kV 1CX630 Sq.mm. XLPE U/G Cable in open trench method.
- Installation of 1no. 33kV 4-way RMU (LLVV).
- Installation of 1no. 33kV DP without Isolator along with 1no. cut point for simultaneous operation of spare cable near Angul GSS.

BOQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		ANED	
Name of the Sub-Division :-		Angul	
Name of the Work :-		Mitigation of 33kV Feeder Overloading: Proposal for Simultaneous operation of spare cable near Angul GSS to ensure reliability of 33 KV Angul-1 feeder.	
Scope:-		1. Supply & laying of 575 Mtr. 33 KV 1CX630 Sq.mm. XLPE U/G Cable, 4 run in open trench Method. 2. Installation of 01 NO. 33 KV 4-way RMU(LLVV). 3. Installation of 01 NO. 33 KV DP W/O Isolator along with 01 NO. Cut point for simultaneous operation of spare cable near Angul GSS.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	PART A: 1. Supply & laying of 575 Mtr. 33 KV 1CX630 Sq.mm. XLPE U/G Cable, 4 run in open trench Method. 2. Installation of 01 NO. 33 KV 4-way RMU (LLVV).	1,23,91,476.92
2	B	Part B:- 1. Installation of 01 NO. 33 KV DP W/O Isolator along with 01 NO. Cut point for simultaneous operation of spare cable near Angul GSS.	3,95,905.57
		Total Amount	1,27,87,382.49
		Total Amount (In Cr)	1.28
Total estimated cost is Rs. 1.28 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 1.28cr. (For detailed BoQ refer Annexure-8.7).

Benefit:

- Ensuring reliable power supply by mitigating overloading issue.

8.0 Proposal for overloading mitigation of 33kV Balikuda Feeder:

Proposal: Augmentation of 3.35Ckm existing 33kV Balikuda feeder from 80sqmm & 100 sq.mm. AAAC to 232 sq.mm. AAAC.

Objective: To maintain reliable power supply by mitigating overloading and strengthening the existing network.

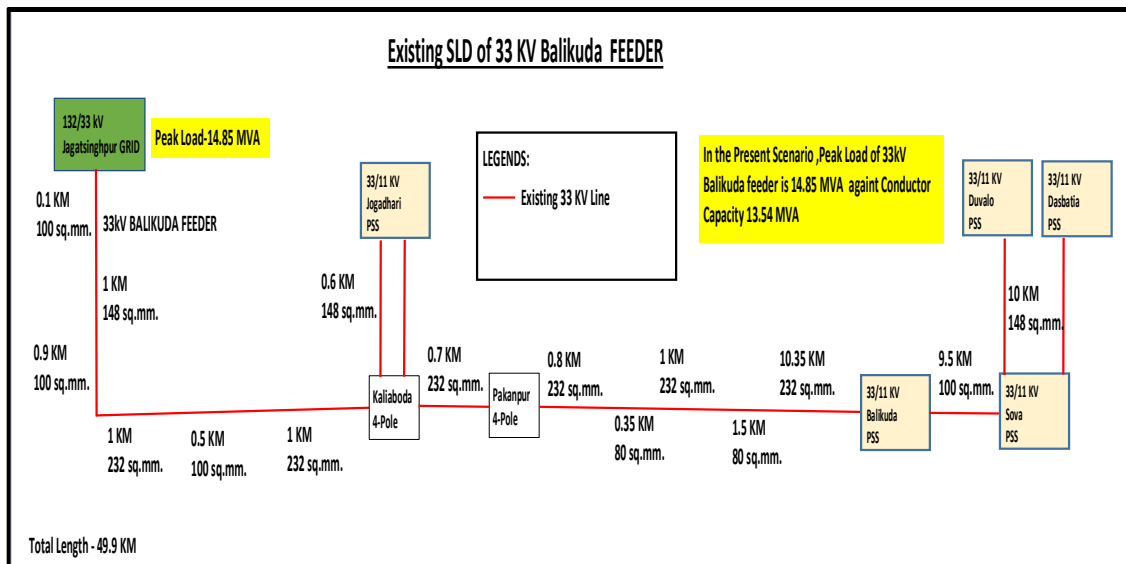
Existing Scenario:

- At present, Balikuda 33kV feeder is emanating from Jagatsinghpur Grid, having mixed type conductor (80/100/148/232) sq.mm with a total length of 49.9Ckm.
- Peak load of 33kV Balikuda feeder is 14.86 MVA, w.r.t., the conductor current carrying capacity of 13.54MVA.
- In the present scenario, there is overloading of the feeder. Thus, feeder is not capable to meet the future load demand of the entire area.
- Considering load growth for 5years (4% load growth per year for 5years) 33kV feeder is overloaded as mentioned below.

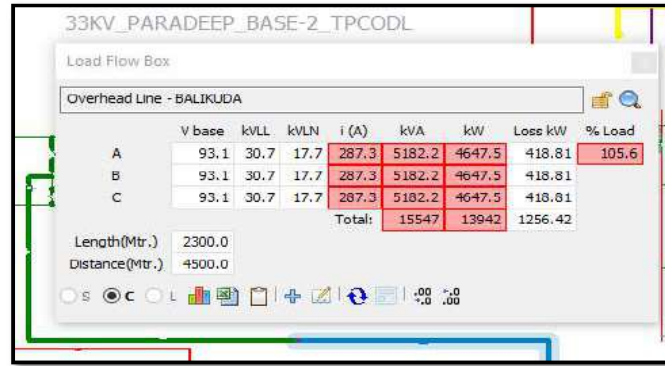
Existing Summer'22 Loading and projected load at 33kV Balikuda Feeder:

33kV Feeder Name	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Overloading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Balikuda	13.54	14.86	109.73%	Overload	16.07	18.08	133.50%	Overload

Existing SLD:



Load Flow Study of existing scenario in Cyme Software:

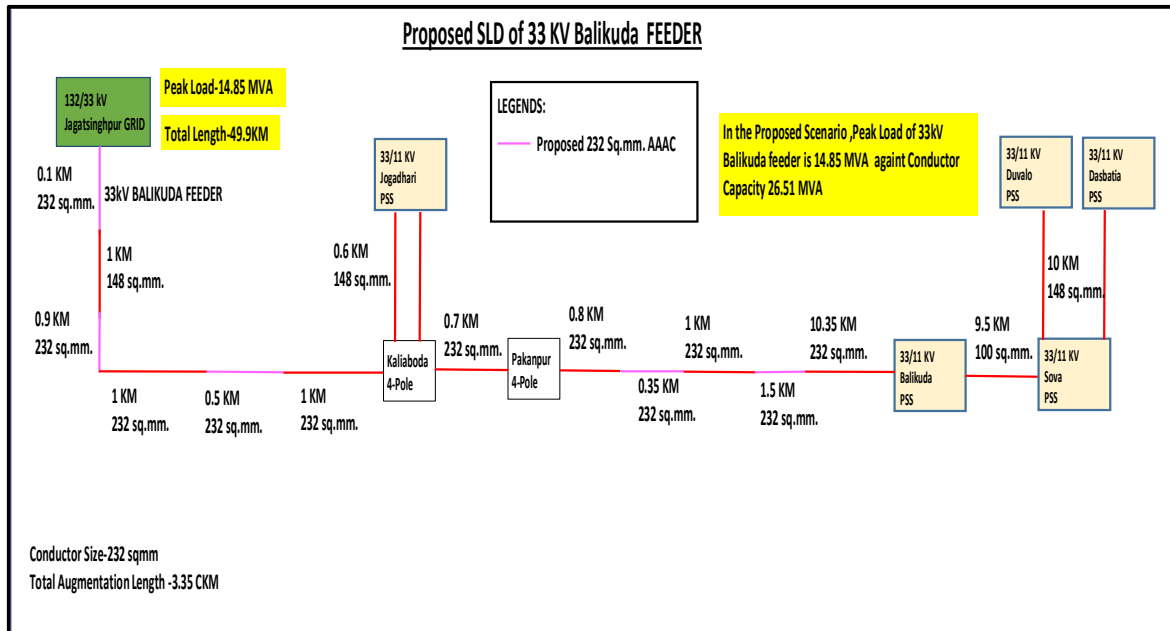


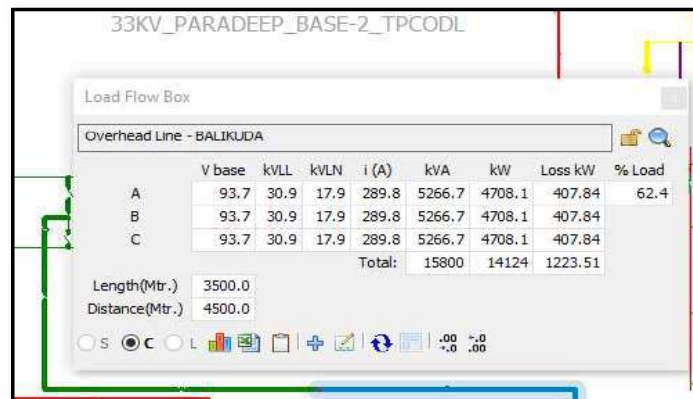
Proposed Scenario:

- Augmentation of 3.35Ckm from 80/100 sq.mm to 232 sq.mm along Balikuda feeder to strengthen the feeder capacity to 26.51MVA.
- Overloading mitigation of 33kV Balikuda feeder by conductor augmentation as shown in below table.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Balikuda	26.51	16.07	18.08	68.19%	OK

Proposed SLD:



Load Flow Study of proposed scenario in Cyme Software:**Detailed Scope of Work:**

- Augmentation of 3.35Ckm existing 33kV Balikuda feeder from 80 & 100 sq.mm. AAAC to 232 sq.mm. AAAC.
- Installation of 18 nos. interposing pole with accessories for 1Ckm existing line of 33kV Balikuda feeder.

BOQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		JED	
Name of the Sub-Division :-		BALIKUDA	
Name of the Work :-		Mitigation of 33kV Overloading: Proposal for augmentation of existing 33 kV line from Jagatsinghpur GSS to Balikuda PSS to mitigate overloading issue & providing reliable power supply.	
Scope:-		Part A:- 1. Augmentation of 3.35 CKM existing 33KV Line from 80 & 100 sq.mm. AAAC to 232 sq.mm. AAAC for 33 KV Balikuda Fdr. 2. Installation of interposing pole for 1 KM existing line of 33 KV Balikuda Feeder.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Part A:- 1. Augmentation of 3.35 CKM existing 33KV Line from 80 & 100 sq.mm. AAAC to 232 sq.mm. AAAC for 33 KV Balikuda Fdr. 2. Installation of 18 nos interposing pole with accessories for 1 KM existing line of 33 KV Balikuda Feeder.	1,16,12,733.39
		Total Amount	1,16,12,733.39
		Total Amount (In Cr)	1.16
Total estimated cost is Rs. 1.16 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 1.16cr. (For detailed BoQ refer Annexure-8.8).

Benefit:

- Ensuring reliable power supply by mitigating overloading issue.

9.0 Proposal for overloading mitigation of 33kV Gorada Feeder:

Proposal: Augmentation of 8Ckm existing 33kV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC along 33kV Gorada feeder.

Objective: To ensure reliable power supply by mitigating overloading issue.

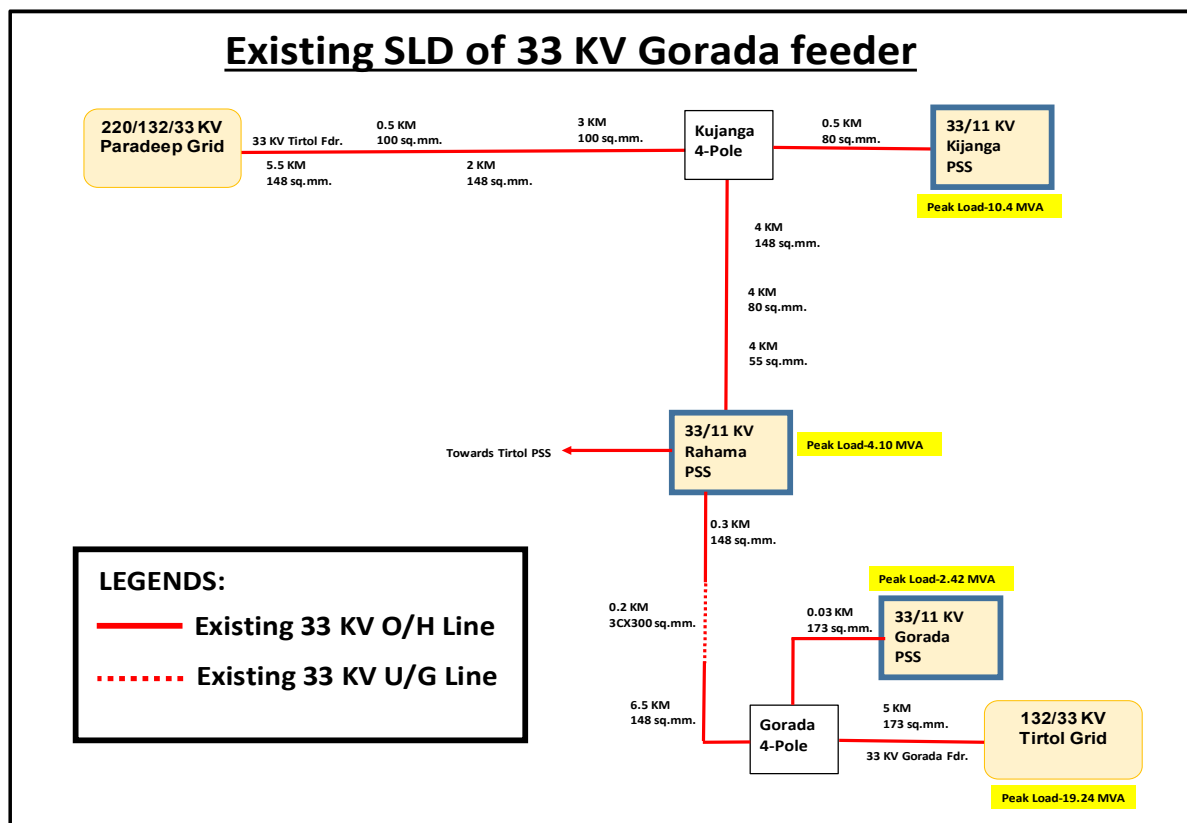
Existing Scenario:

- At present, 33kV Gorada feeder is emanating from 132/33kV Tirtol/Bodhei Grid and feeding supply to 33/11kV Gorada, Rahama & Kujanga PSS. 33/11kV Kujanga PSS is having connectivity with 220/132/33 KV Paradeep Grid (3X20 MVA). However, 1no. 20MVA PTR is out of service for which the total load is fed from Gorada feeder instead of Tirtol feeder during peak load condition.
- The peak load of 33kV Gorada feeder is 19.25MVA, which is overloaded, w.r.t conductor current carrying capacity of 10.62MVA.
- Considering load growth for 5years (4% load growth per year for 5years) 33kV feeder is overloaded as mentioned below.

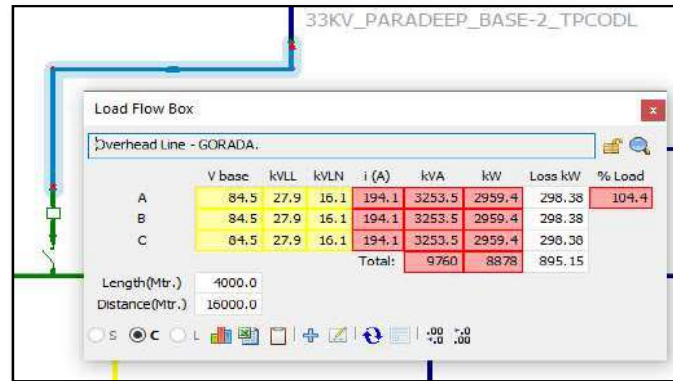
Existing Summer'22 Loading and projected load at 33kV Gorada Feeder:

33kV Feeder Name	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Overloading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Gorada	10.62	19.25	181.22%	Overload	20.82	23.42	220.48%	Overload

Existing SLD:



Load Flow Study of existing scenario in Cyme Software:

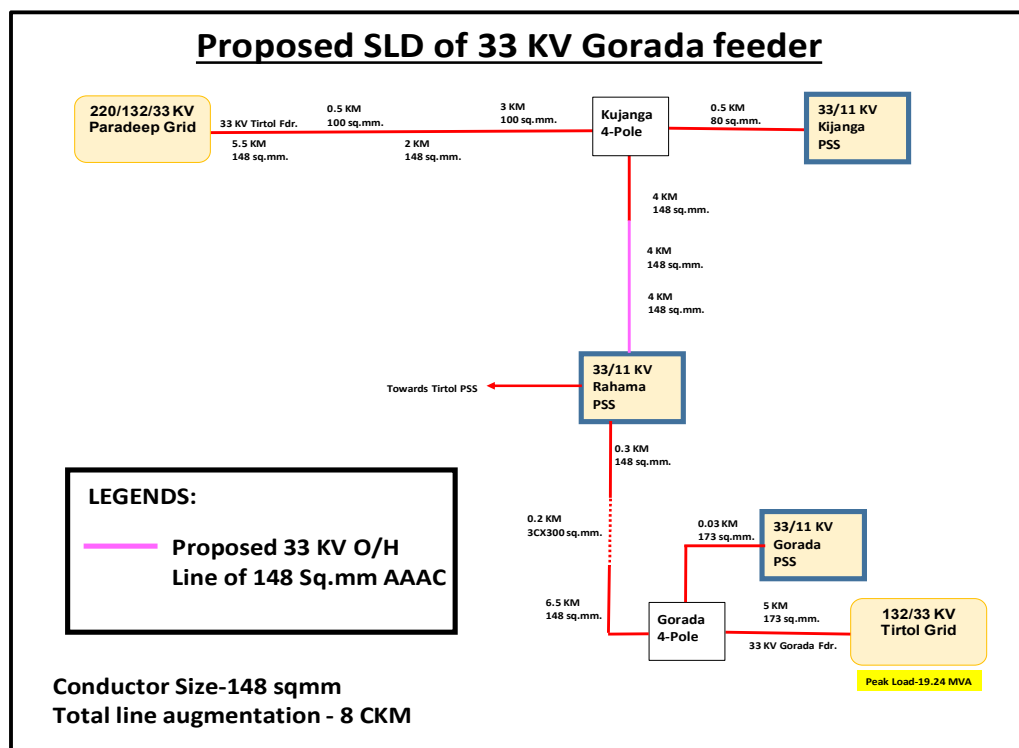


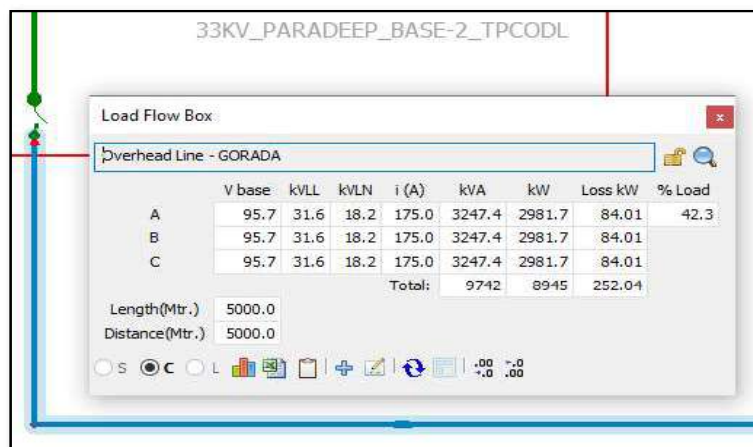
Proposed Scenario:

- 33kV Gorada feeder augmentation from 55/80 sq.mm to 148 sq.mm for a length of 8Ckm to strengthen the feeder capacity to 20MVA & enabling double source arrangement for Kujanga PSS.
- Overloading mitigation of 33kV Gorada feeder by conductor augmentation as shown below.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Gorada	20	9.57	10.76	53.81%	OK
Tirtol	15.54	11.25	12.65	81.42%	OK

Proposed SLD:



Load Flow Study of proposed scenario in Cyme Software:**Detailed Scope of Work:**

Augmentation of 8Ckm length along existing 33kV Gorada feeder from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC.

BoQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		PDP	
Name of the Sub-Division : -		Kujanga	
Name of the Work :-		Proposal for augmentation of existing 33 kV line from Rahama PSS to Kujanga PSS to improve reliability using N-1 connectivity.	
Scope:-		Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Part A:- Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Feeder.	2,02,60,704.54
		Total Amount	2,02,60,704.54
		Total Amount (In Cr)	2.03
Total estimated cost is Rs. 2.03 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 2.03cr. (For detailed BoQ refer Annexure-8.9).

Benefit:

- Ensuring reliable power supply by mitigating overloading issue.
- Reduction in energy losses along with improvement of voltage regulation.

10.0 Proposal for overloading mitigation of 33kV Danpur Feeder:

Proposal: Installation of 1no. 4-Pole and stringing of 0.1Ckm 148sqmm conductor from Danpur 4Pole to Danpur PSS for bifurcation of 33kV Danpur New feeder to mitigate overloading issue.

Objective: To ensure reliable power supply by mitigating overloading and strengthening of the existing network.

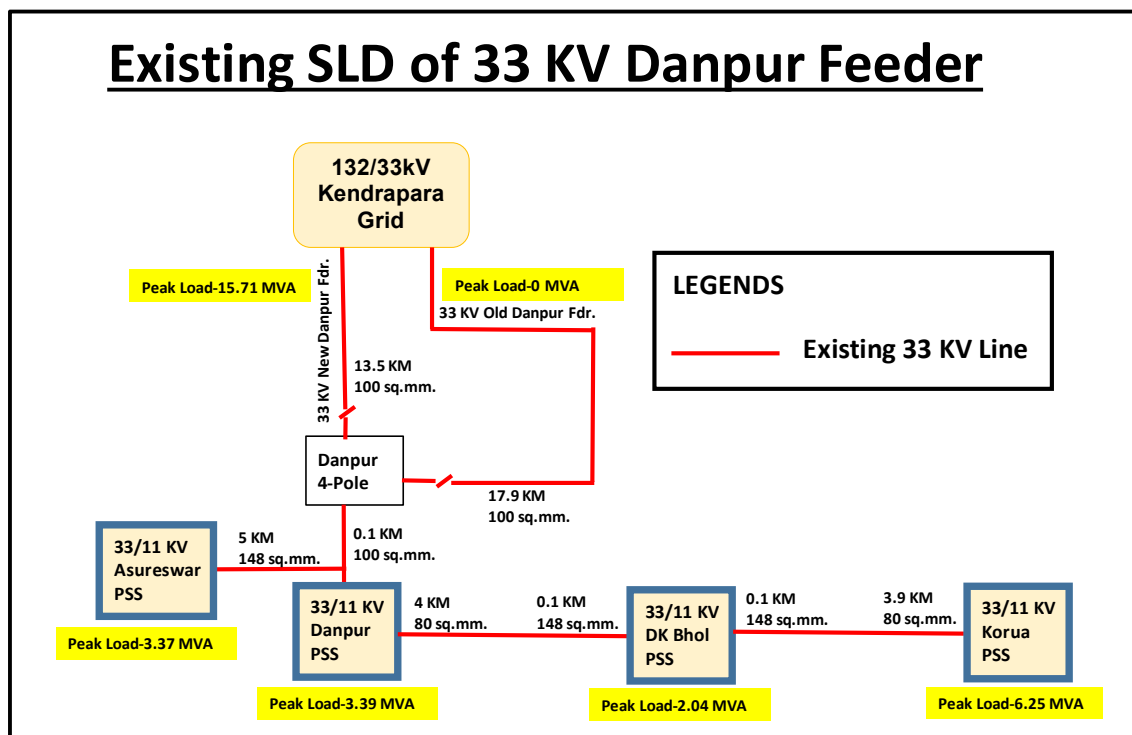
Existing Scenario:

- At present, 33kV Danpur New feeder is emanating from 132/33kV Duhuria/Kendrapara Grid providing supply to 33/11kV Danpur, DK Bhol, Korua & Asureswar PSS. However, Danpur Old feeder is in standby position due to unavailability of double source connectivity at Danpur PSS.
- Peak load of 33kV Danpur New feeder is 15.71 MVA against conductor current carrying capacity of 15.54 MVA.
- Considering load growth for 5years (5% load growth per year for 5years) 33kV feeder is overloaded as mentioned below.

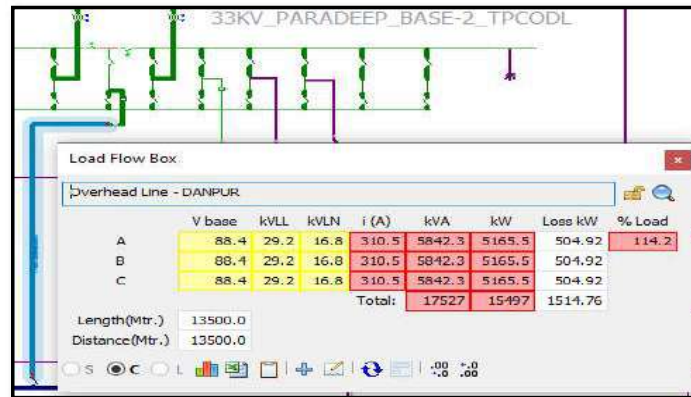
Existing Summer'22 Loading and projected load at 33kV Danpur Feeder:

33kV Feeder Name	Feeder Capacity (MVA)	Peak Loading Summer'22 (MVA)	% Loading	Feeder Overloading Status (AS IS)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Danpur	15.54	15.71	101.12%	Overload	17.33	20.06	129.06%	Overload

Existing SLD:



Load Flow Study of existing scenario in Cyme Software:

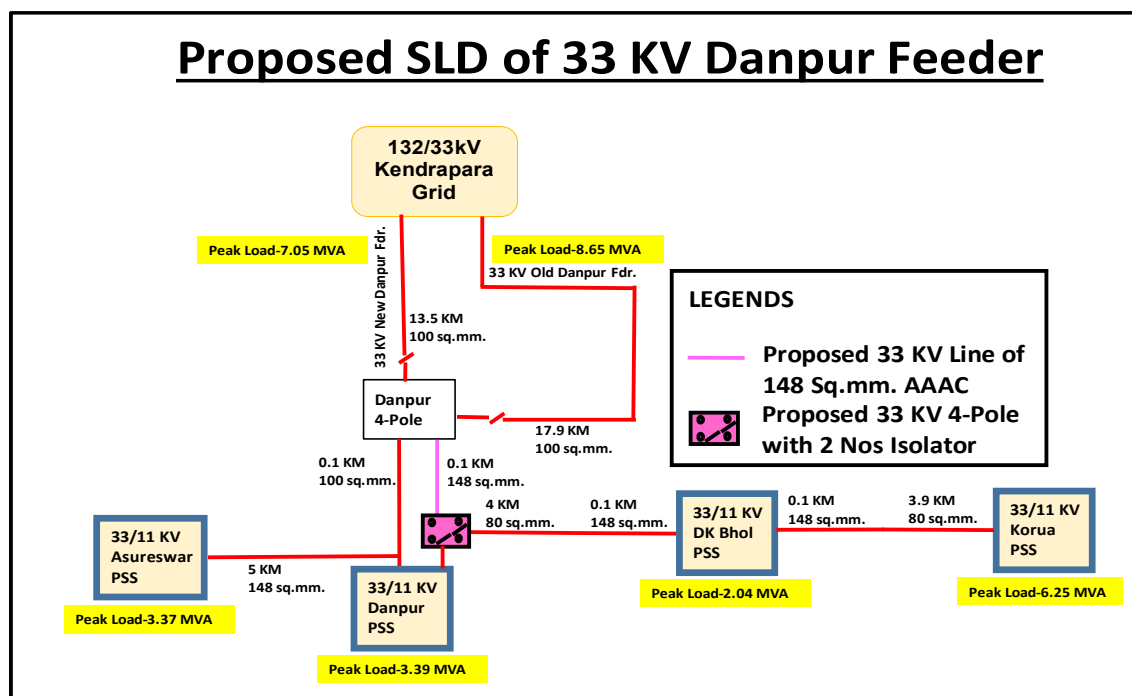


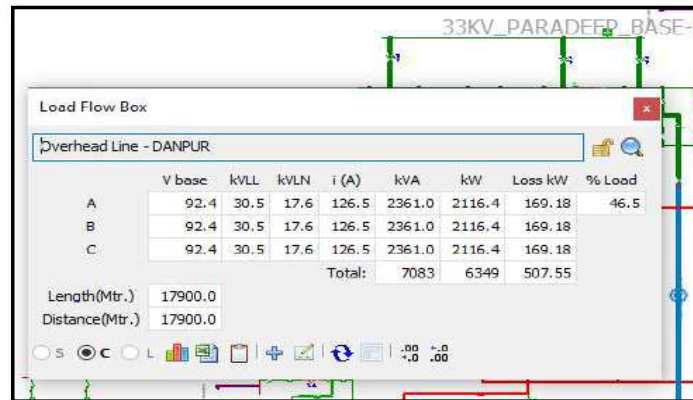
Proposed Scenario:

- Construction of 1no. 4-pole with Isolator arrangement and stringing of 0.1Ckm 148sqmm conductor from Danpur 4Pole to Danpur PSS proposed for feeder bifurcation.
- Double source supply will be assured for 33/11kV Danpur PSS.
- Overloading mitigation of 33kV Danpur New feeder as shown in below table.

33kV Feeder Name	Feeder Capacity (MVA)	Projected load FY' 24-25 (MVA)	Projected load FY' 27-28 (MVA)	% Loading FY' 27-28	Feeder Overloading Status FY' 27-28
Danpur New	15.54	7.79	9.02	58.02%	OK
Danpur Old	15.54	9.54	11.04	71.04%	OK

Proposed SLD:



Load Flow Study of proposed scenario in Cyme Software:**Detailed Scope of Work:**

Construction of 1no. 4-pole with Isolator arrangement and stringing of 0.1Ckm 148sqmm conductor from Danpur 4Pole to Danpur PSS.

BoQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		KED-1 & KED-2	
Name of the Sub-Division : -		Danpur & Marsaghai	
Name of the Work :-		Mitigation of 33kV Feeder Overloading: Proposal for Installation of 1no. 33kV 4-Pole and stringing of 0.1Ckm 148sqmm conductor for bifurcation of 33 KV Danpur New feeder to mitigate overloading issue.	
Scope:-		Part A: - 1. Installation of 1no. 33kV 4-pole with Isolator and stringing of 0.1Ckm 148sqmm conductor for feeder bifurcation.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Part A: - 1. Installation of 1no. 33kV 4-pole with Isolator and stringing of 0.1Ckm 148sqmm conductor for feeder bifurcation.	7,96,491.85
		Total Amount	7,96,491.85
		Total Amount (In Cr)	0.08
Total estimated cost is Rs. 0.08 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 0.08cr. (For detailed BoQ refer Annexure-8.10).

Benefit:

- Ensuring reliable power supply by mitigating overloading issue.

Mitigation of 33kV Feeder Low Voltage Issue

1.0 Proposal for low voltage mitigation of Baramunda PSS

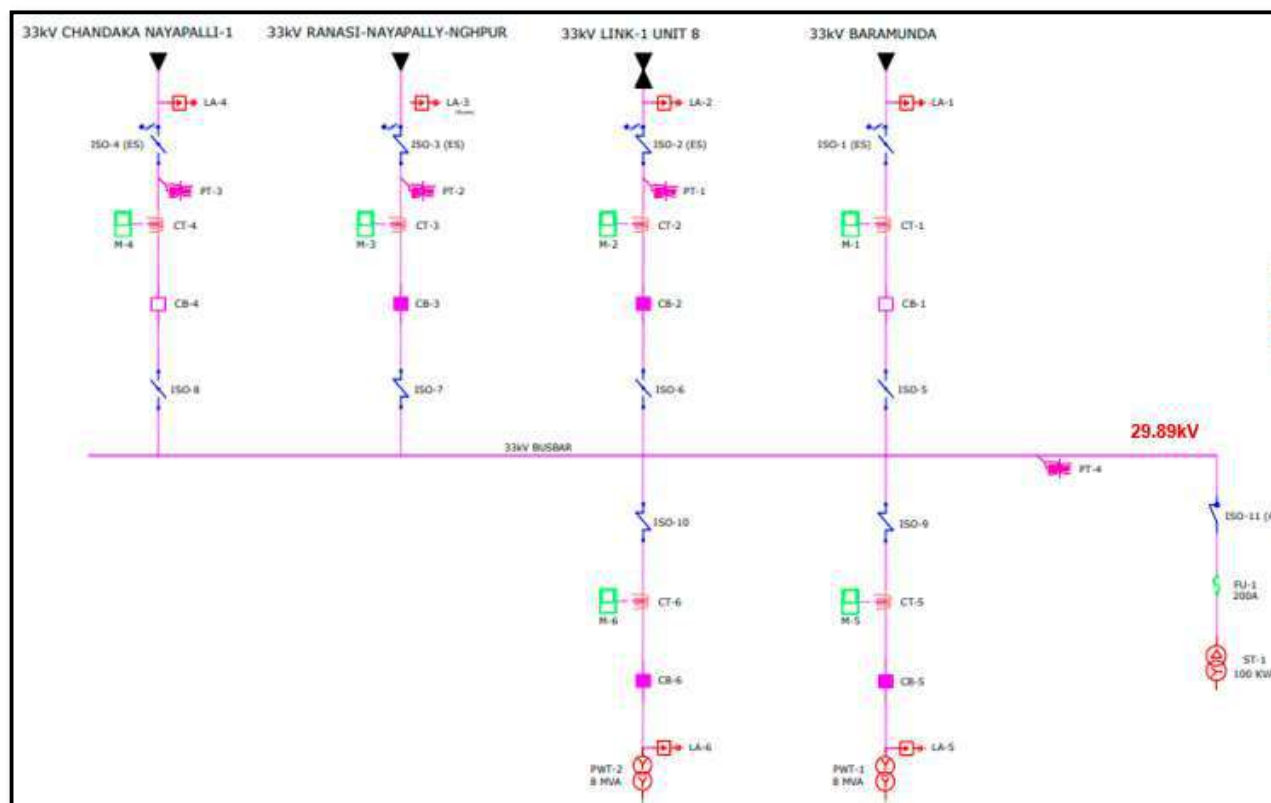
Proposal: Installation of 3nos. 33kV RMU along with laying of 33kV UG cable at 33/11kV Barmunda PSS for mitigating low voltage issue by splitting the PSS load at multiple 33kV feeder sources.

Objective: To ensure reliable power supply by splitting the 33kV bus at PSS, mitigate low voltage and improve load balancing and N-1 connectivities.

Existing Scenario:

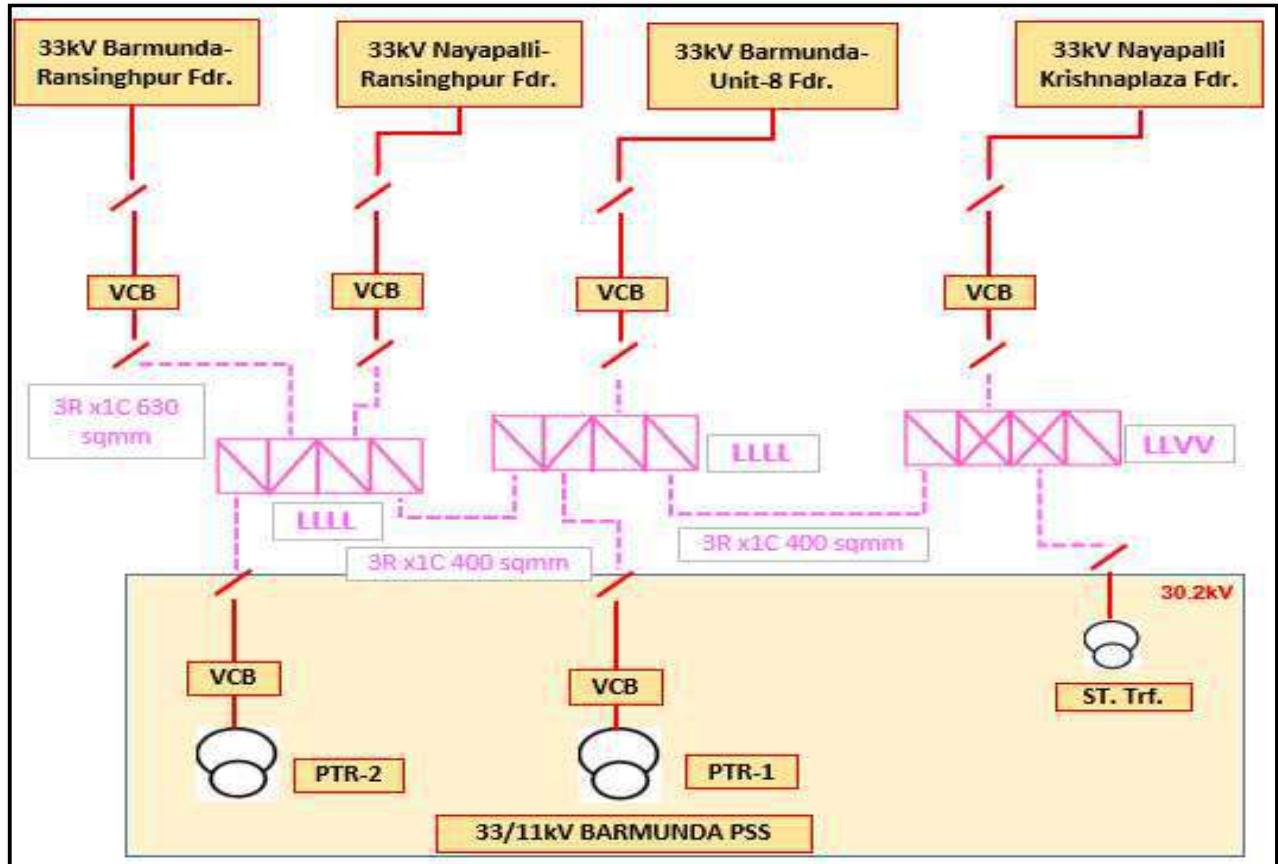
- At present, 33/11kV Barmunda PSS is getting power supply from 33kV Ransinghpur-Nayapalli feeder emanating from 132/33kV Ranasinghpur GSS. However, there are 3 nos. additional 33kV sources (33kV Nayapalli feeder from Chandaka GSS, 33kV Barmunda feeder from Unit-8 GSS and 33kV Barmunda feeder from Ransinghpur GSS) available at 33kV bus of Barmunda PSS but due to non-availability of 33kV bus sectionaliser there is restriction of utilisation of other sources at a time and result low voltage issue of about 29.89kV at 33kV side.
- The voltage experienced at PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.

Existing SLD:



Proposed Scenario:

- 3nos. of 33kV RMU proposed at 33/11kV Barmunda PSS with 33kV UG cable for interlinking lines to split PSS load on other 33kV available sources. This proposal will improve PSS voltage to 30.2kV.

Proposed SLD:**Detailed Scope of Work:**

- Installation of 3nos. 33kV RMU (1no - LLVV, 2no - LLLL).
- Laying of 33kV 3R 1Cx630 sqmm cable at Barmunda PSS for connectivity of 33kV feeders with proposed RMU.
- Laying of 33kV 3R 1Cx400 sqmm cable at Barmunda PSS for connectivity of proposed RMU with PTR.

BoQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED	
Name of the Division :-	BCDD-2
Name of the Sub-Division :-	Barmunda
Name of the Work :-	Mitigation of Low Voltage issue: Proposal for Construction of 3No's 33 kV RMU (1no - LLVV, 2no - LLLL) with 33kV cable at Barmunda PSS to split PSS load at multiple feeders for mitigate low voltage issue and improve reliability.
Scope:-	1. Construction of 3No's 33 kV RMU (1no - LLVV, 2no - LLLL). 2. Laying of 33kV 3R 1Cx630 sqmm cable at Barmunda PSS for connectivity of 33kV feeders with proposed RMU. 3. Laying of 33kV 3R 1Cx400 sqmm cable at Barmunda PSS for connectivity of proposed RMU with PTR.
Names of Schemes: -	TPCODL CAPEX (FY 23-24)

<i>ABSTRACT OF ESTIMATE</i>			
Sl. No.	Part	Description	Amount
1	A	1. Construction of 3No's 33 kV RMU (1no - LLVV, 2no - LLLL). 2. Laying of 33kV 3R 1Cx630 sqmm cable at Barmunda PSS for connectivity of 33kV feeders with proposed RMU.	1,21,44,970.19
2	B	Laying of 33kV 3R 1Cx400 sqmm cable at Barmunda PSS for connectivity of proposed RMU with PTR.	9,51,008.85
		Total Amount	1,30,95,979.04
		Total Amount (In Cr.)	₹ 1.31
Total estimated cost is Rs. 1.31 Crore. (Under TPCODL Capex Scheme)			

Cost Estimate: ₹ 1.31 Cr. (For detailed BoQ refer Annexure -8.11)

Benefit:

- Mitigation of low voltage issues at Barmunda PSS.
- Ensuring reliability of power supply along with enabling N-1 connectivity .

2.0 Proposal for low voltage mitigation of Bharatpur PSS

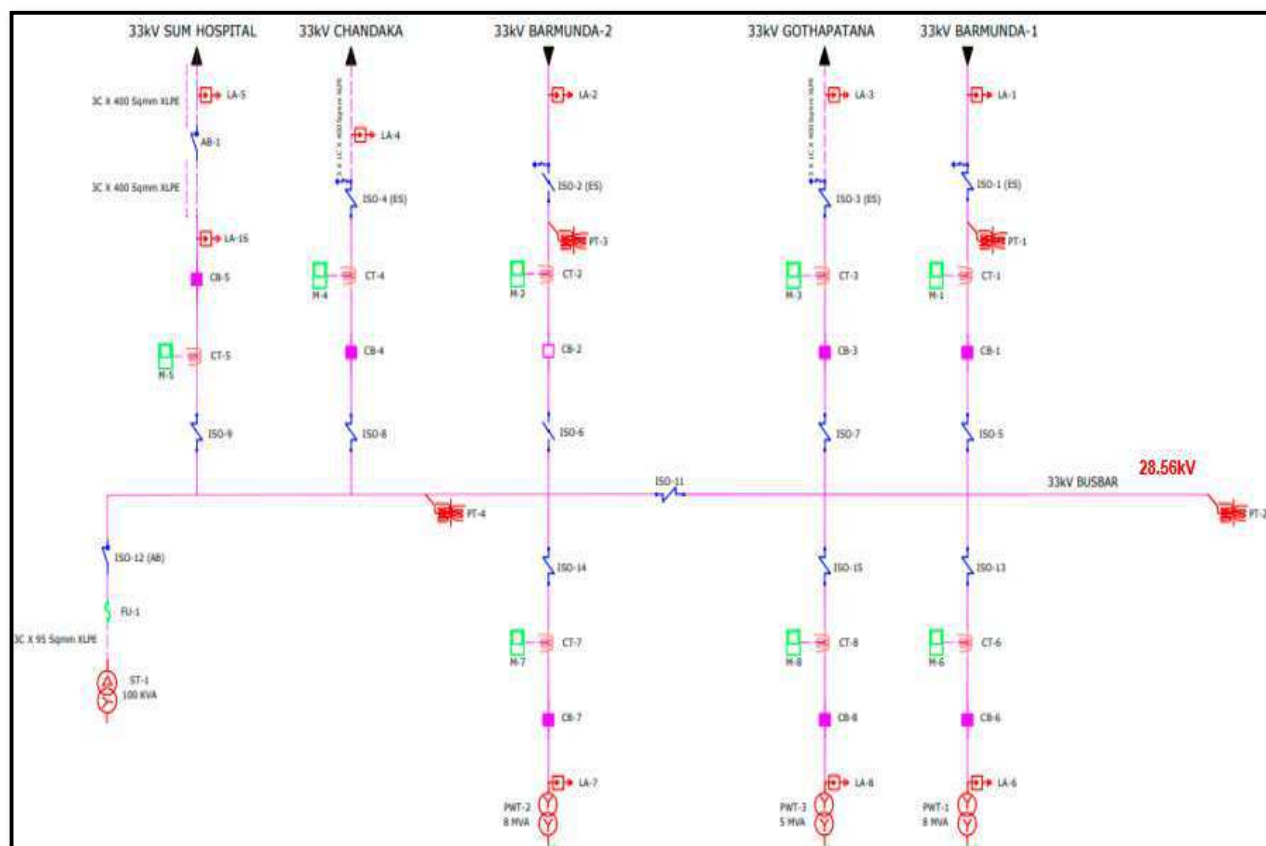
Proposal: Installation of 4nos. 33kV RMU along with laying of 33kV UG cable at 33/11kV Bharatpur PSS for mitigating low voltage issue by splitting the PSS load at multiple 33kV feeder sources.

Objective: To ensure reliable power supply by splitting the 33 kV bus at PSS, mitigate low voltage and improve load balancing and N-1 connectivities.

Existing Scenario:

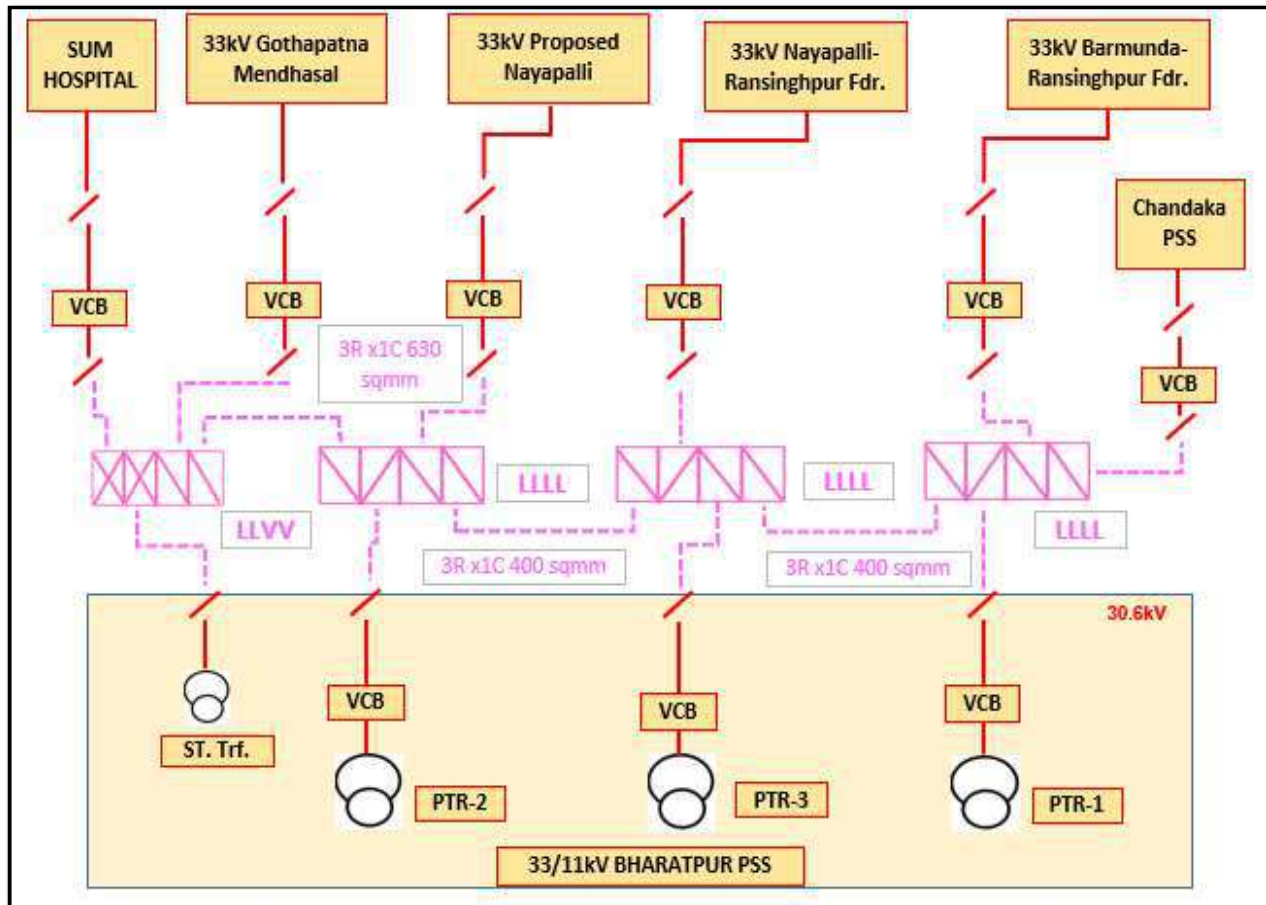
- At present, 33/11kV Bharatpur PSS is getting power supply from 33kV Ransinghpur-Barmunda feeder emanating from 132/33kV Ranasinghpur GSS. However, there are 3 nos. of additional 33kV sources (33kV Nayapalli feeder from Ransinghpur GSS, 33kV Gothapatna feeder from Mendhasal GSS and Proposed 33kV Bharatpur feeder from Nayapalli GSS) available at 33kV bus of Bharatpur PSS but due to non-availability of 33kV bus sectionaliser there is restriction of utilisation of other sources at a time and result in low voltage issue of about 28.56kV at 33kV side.
- The voltage experienced at PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.

Existing SLD:



Proposed Scenario:

- 4nos. 33kV RMU proposed at 33/11kV Bharatpur PSS with 33kV UG Cable for interlinking lines to split PSS load on other 33kV available sources. This proposal will improve PSS voltage to 30.6kV.

Proposed SLD:**Detailed Scope of Work:**

- Construction of 4nos. 33kV RMU (1no - LLVV, 3no - LLLL).
- Laying of 33kV 3R 1Cx630 sqmm cable at Bharatpur PSS for connectivity of 33kV feeders with proposed RMU.
- Laying of 33kV 3R 1Cx400 sqmm cable at Bharatpur PSS for connectivity of proposed RMU with PTR.

BoQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED	
Name of the Division :-	BCDD-2
Name of the Sub-Division :-	Bharatpur
Name of the Work :-	Mitigation of Low Voltage issue: Proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to split PSS load at multiple feeders for mitigate low voltage issue and improve reliability.
Scope:-	1. Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL). 2. Laying of 33kV 3R 1Cx630 sqmm cable at Bharatpur PSS for connectivity of 33kV feeders with proposed RMU. 3. Laying of 33kV 3R 1Cx400 sqmm cable at Bharatpur PSS for connectivity of proposed RMU with PTR.
Names of Schemes: -	TPCODL CAPEX (FY 23-24)
<u>ABSTRACT OF ESTIMATE</u>	

Sl. No.	Part	Description	Amount
1	A	1. Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL). 2. Laying of 33kV 3R 1Cx630 sqmm cable at Bharatpur PSS for connectivity of 33kV feeders with proposed RMU.	₹ 1,63,40,241.08
2	B	Laying of 33kV 3R 1Cx400 sqmm cable at Bharatpur PSS for connectivity of proposed RMU with PTR.	₹ 12,68,011.80
		Total Amount	₹ 1,76,08,252.88
		Total Amount (In Cr.)	₹ 1.76
Total estimated cost is Rs. 1.76 Crore. (Under TPCODL Capex Scheme)			

Cost Estimate: ₹ 1.76 Cr. (For detailed BoQ refer Annexure -8.12)

Benefit:

- Mitigation of low voltage issues at Bharatpur PSS.
- Ensuring reliability of power supply along with enabling N-1 connectivity.

3.0 Proposal for low voltage mitigation of CS Pur-1 PSS

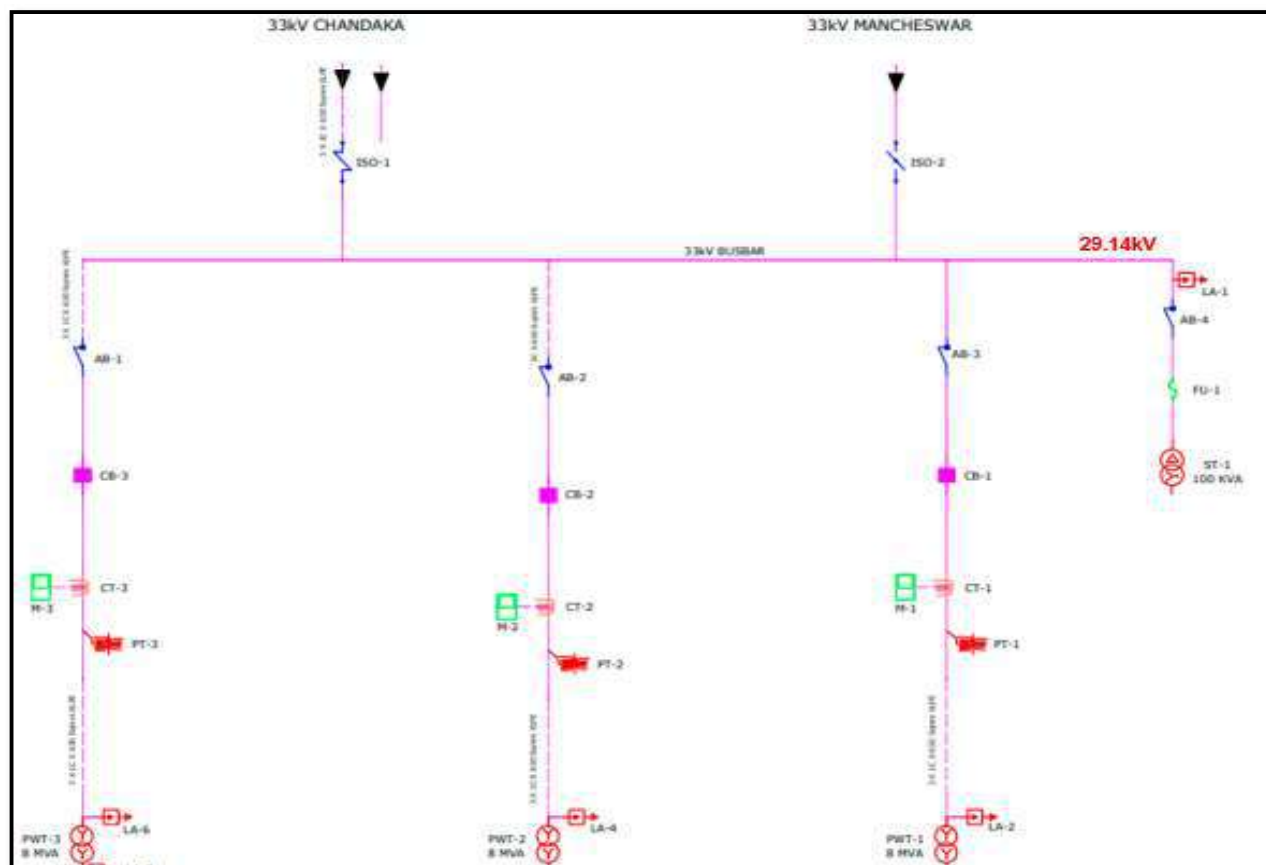
Proposal: Installation of 3nos. 33 kV RMU along with laying of 33kV UG cable at 33/11kV CS Pur-1 PSS for mitigating low voltage issue by splitting the PSS load at multiple 33kV feeder sources.

Objective: To ensure reliable power supply by splitting the 33 kV bus at PSS, mitigate low voltage and improve load balancing and N-1 connectivities.

Existing Scenario:

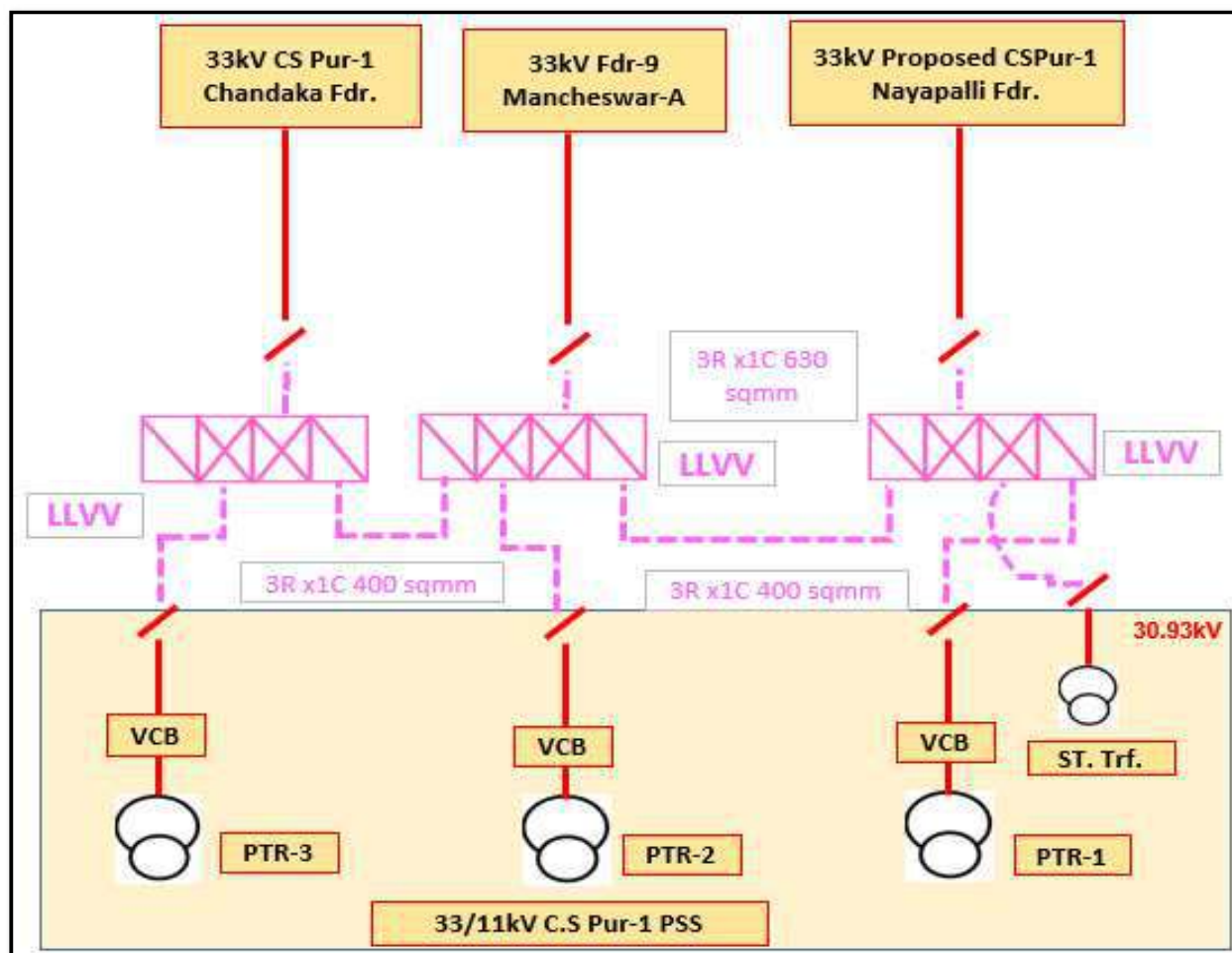
- At present, 33/11V CS Pur-1 PSS is getting power supply with 33kV CS Pur-1 feeder emanating from 132/33kV Chandaka GSS. However, there are 2 no's of additional 33kV sources (33kV Railway Fdr-9 from Mancheswar-A GSS and Proposed 33kV CS Pur-1 feeder from Nayapalli GSS) available at 33kV bus of CS Pur-1 PSS but due to non-availability of 33kV bus sectionaliser there is restriction of utilisation of other sources at a time and result low voltage issue of about 29.14kV at 33kV side.
- The voltage experienced at PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.

Existing SLD:



Proposed Scenario:

- Installation of 3nos. 33kV RMU proposed at 33/11kV CS Pur-1 PSS with 33kV UG cable for interlinking lines to split PSS load on other 33kV available sources. This proposal will improve PSS voltage to 30.93kV.

Proposed SLD:**Detailed Scope of Work:**

- Installation of 3nos. 33 kV RMU (3no - LLVV).
- Laying of 33kV 3R 1Cx630 sqmm cable at CS Pur-1 PSS for connectivity of 33kV feeders with proposed RMU.
- Laying of 33kV 3R 1Cx400 sqmm cable at CS Pur-1 PSS for connectivity of proposed RMU with PTR.

BoQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED	
Name of the Division :-	BCDD-2
Name of the Sub-Division :-	CS Pur-I
Name of the Work :-	Mitigation of Low Voltage issue: Proposal for Construction of 3No's 33 kV RMU (3no - LLVV) with cable at CS Pur-I PSS to split PSS load at multiple feeders for mitigate low voltage issue and improve reliability.
Scope:-	1. Installation of 3nos. 33 kV RMU (3no - LLVV). 2. Laying of 33kV 3R 1Cx630 sqmm cable at CS Pur-1 PSS for connectivity of 33kV feeders with proposed RMU. 3. Laying of 33kV 3R 1Cx400 sqmm cable at CS Pur-1 PSS for connectivity of proposed RMU with PTR.
Names of Schemes: -	TPCODL CAPEX (FY 23-24)

<i>ABSTRACT OF ESTIMATE</i>			
Sl. No.	Part	Description	Amount
1	A	1. Installation of 3nos. 33 kV RMU (3no - LLVV). 2. Laying of 33kV 3R 1Cx630 sqmm cable at CS Pur-1 PSS for connectivity of 33kV feeders with proposed RMU.	₹ 1,28,82,057.43
2	B	Laying of 33kV 3R 1Cx400 sqmm cable at CS Pur-1 PSS for connectivity of proposed RMU with PTR.	₹ 12,68,011.80
		Total Amount	₹ 1,41,50,069.23
		Total Amount (In Cr.)	₹ 1.42
Total estimated cost is Rs. 1.42 Crore. (Under TPCODL Capex Scheme)			

Cost Estimate: ₹ 1.42 Cr. (For detailed BoQ refer Annexure -8.13)

Benefit:

- Mitigation of low voltage issues at C.s.pur-1 PSS.
- Ensuring reliability of power supply along with enabling N-1 connectivity.

4.0 Proposal for low voltage mitigation of College PSS

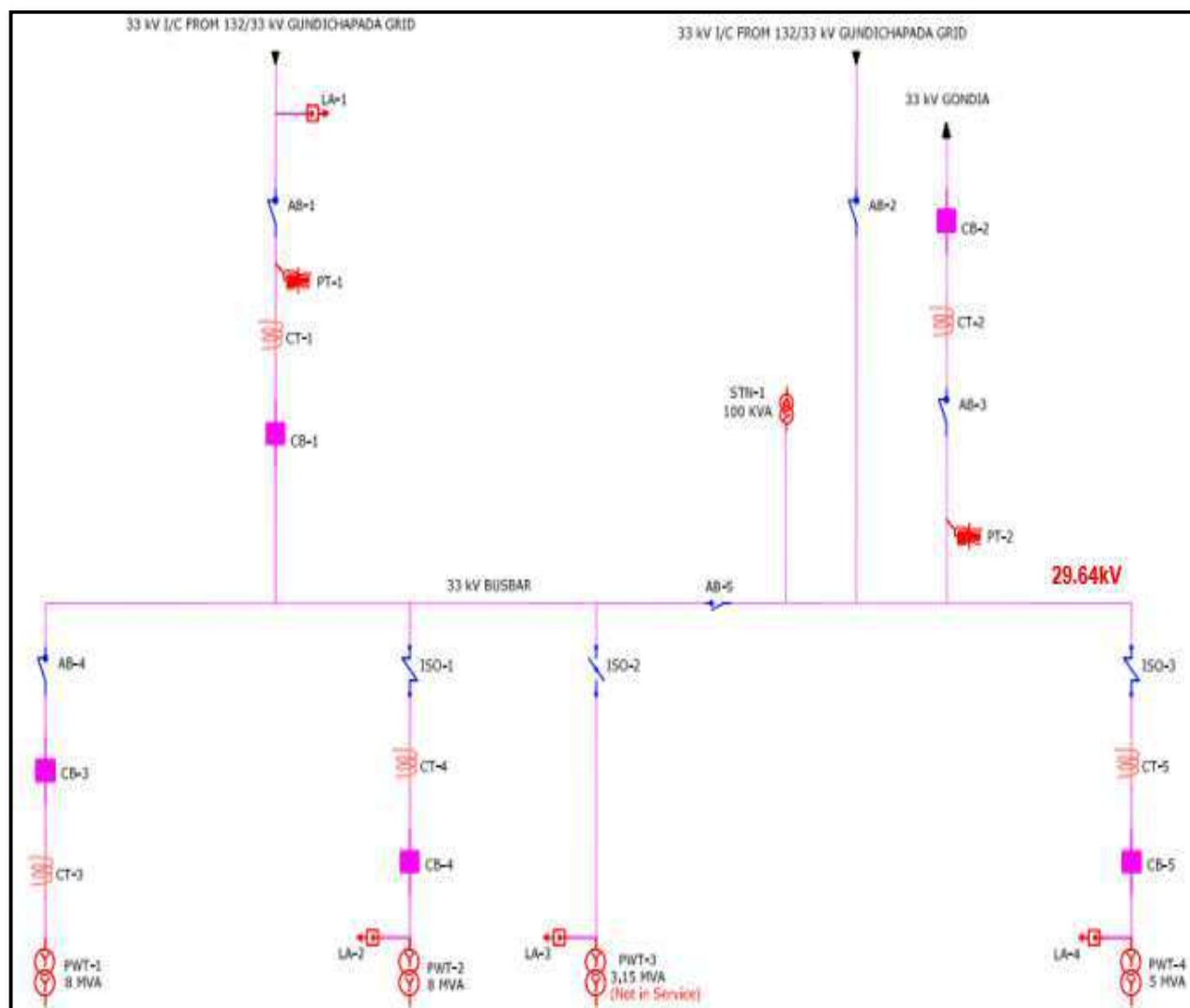
Proposal: Installation of 2nos. 33 kV RMU along with laying of 33kV UG cable at 33/11kV College PSS for mitigating low voltage issue by splitting the PSS load at multiple 33kV feeder sources.

Objective: To ensure reliable power supply by splitting the 33kV bus at PSS, mitigate low voltage and improve load balancing and N-1 connectivities.

Existing Scenario:

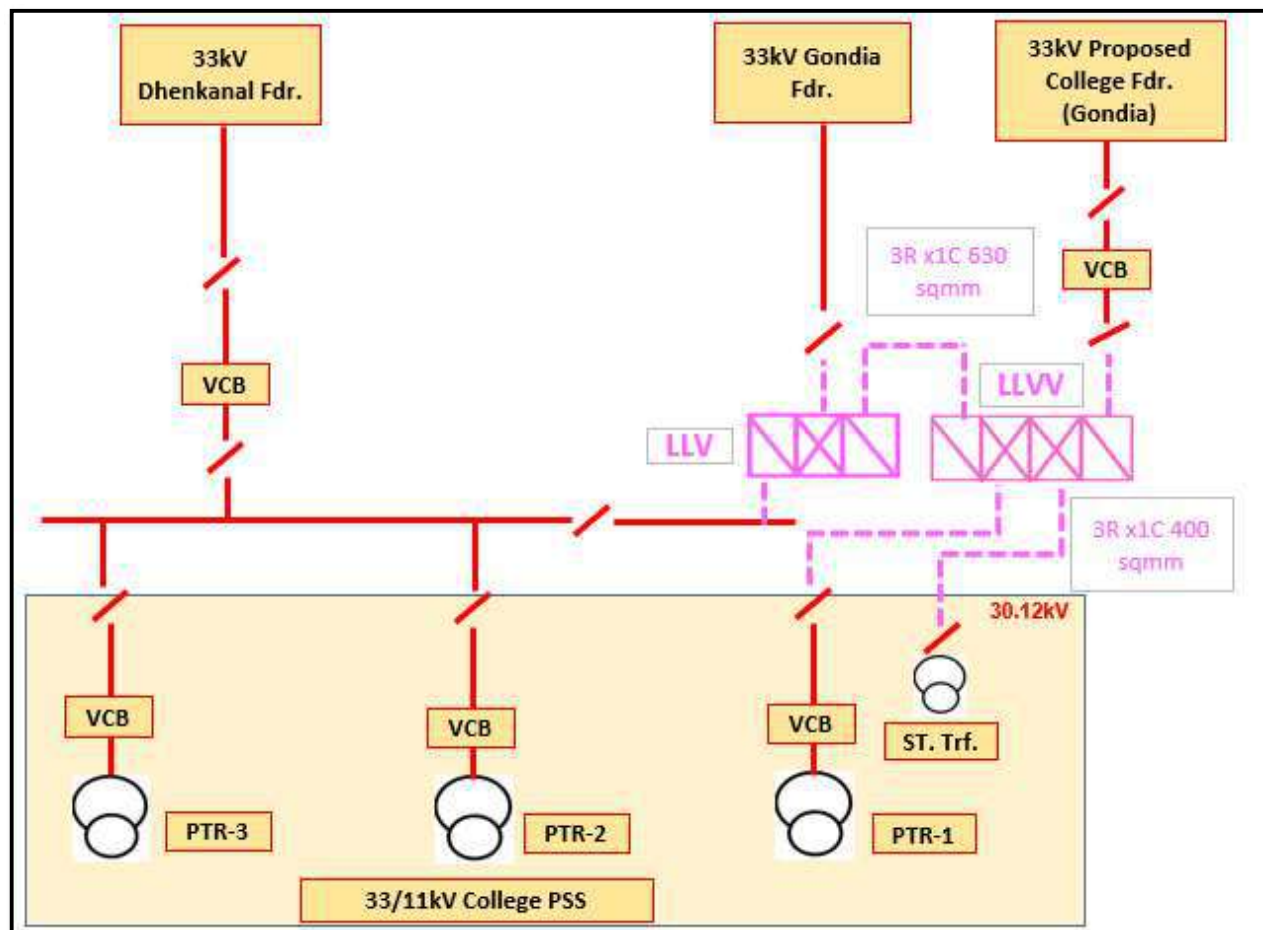
- At present, 33/11kV College PSS is getting power supply from 33kV Dhenkanal feeder emanating from 132/33kV Gundichapada GSS. However, there are 2nos. additional 33kV sources (33kV Gondia feeder from Gundichapada GSS and Proposed 33kV feeder from Gondia GSS) available at 33kV bus of College PSS but due to non-availability of 33kV bus sectionaliser there is restriction of utilisation of other sources at a time and result low voltage issue of about 29.64kV at 33kV side.
- The voltage experienced at PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.

Existing SLD:



Proposed Scenario:

- Installation of 2nos. 33kV RMU proposed at 33/11kV College PSS with 33kV UG Cable for interlinking lines to split PSS load on other 33kV available sources. This proposal will improve PSS voltage to 30.12kV.

Proposed SLD:**Detailed Scope of Work:**

- Installation of 2nos. 33kV RMU (1no - LLV, 1no - LLVV).
- Laying of 33kV 3R 1Cx630 sqmm cable at College PSS for connectivity of 33kV feeders with proposed RMU
- Laying of 33kV 3R 1Cx400 sqmm cable at College PSS for connectivity of proposed RMU with PTR.

BoQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED	
Name of the Division :-	DED
Name of the Sub-Division :-	Dhenkanal
Name of the Work :-	Mitigation of Low Voltage issue: Proposal for Installation of 2No's 33 kV RMU (1no - LLV, 1no - LLVV) with cable at College PSS to split PSS load at multiple feeders for mitigate low voltage issue and improve reliability.

Scope:-		1. Installation of 2No's 33 kV RMU (1no - LLV, 1no - LLVV). 2. Laying of 33kV 3R 1Cx630 sqmm cable at College PSS for connectivity of 33kV feeders with proposed RMU 3. Laying of 33kV 3R 1Cx400 sqmm cable at College PSS for connectivity of proposed RMU with PTR.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	1. Installation of 2No's 33 kV RMU (1no - LLV, 1no - LLVV). 2. Laying of 33kV 3R 1Cx630 sqmm cable at College PSS for connectivity of 33kV feeders with proposed RMU	₹ 77,02,305.96
2	B	Laying of 33kV 3R 1Cx400 sqmm cable at College PSS for connectivity of proposed RMU with PTR.	₹ 9,51,008.85
		Total Amount	₹ 86,53,314.81
		Total Amount (In Cr.)	₹ 0.87
Total estimated cost is Rs. 0.87 Crore. (Under TPCODL Capex Scheme)			

Cost Estimate: ₹ 0.87 Cr. (For detailed BoQ refer Annexure -8.14)

Benefit:

- Mitigation of low voltage issues at College PSS.
- Ensuring reliability of power supply along with enabling N-1 connectivity.

5.0 Proposal for low voltage mitigation of Tangi PSS

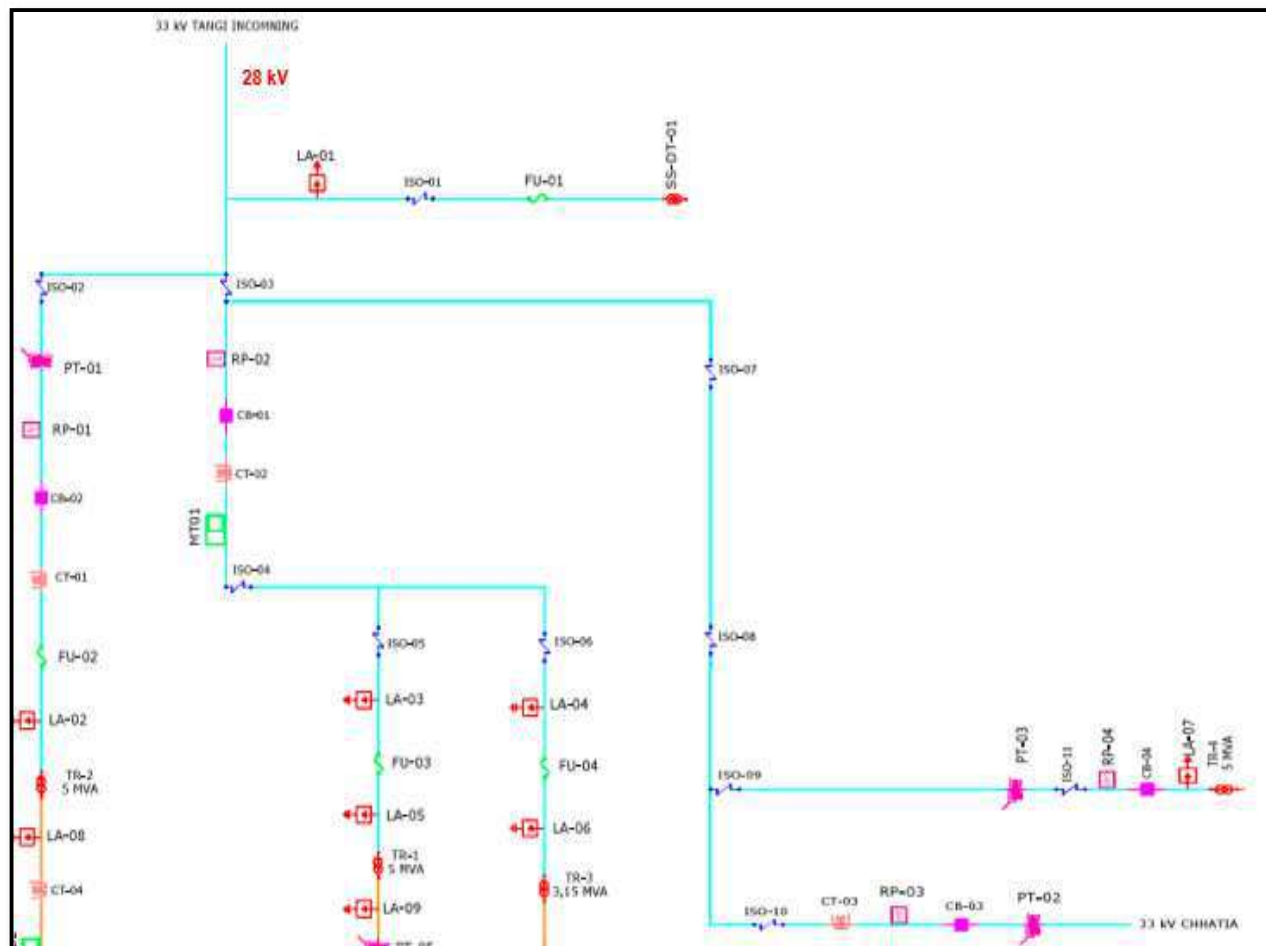
Proposal: Installation of 3nos. 33 kV RMU along with laying of 33kV UG cable at 33/11 kV Tangi PSS for mitigating low voltage issue by splitting the PSS load at multiple 33kV feeder sources.

Objective: To ensure reliable power supply by splitting the 33 kV bus at PSS, mitigate low voltage and improve load balancing and N-1 connectivities.

Existing Scenario:

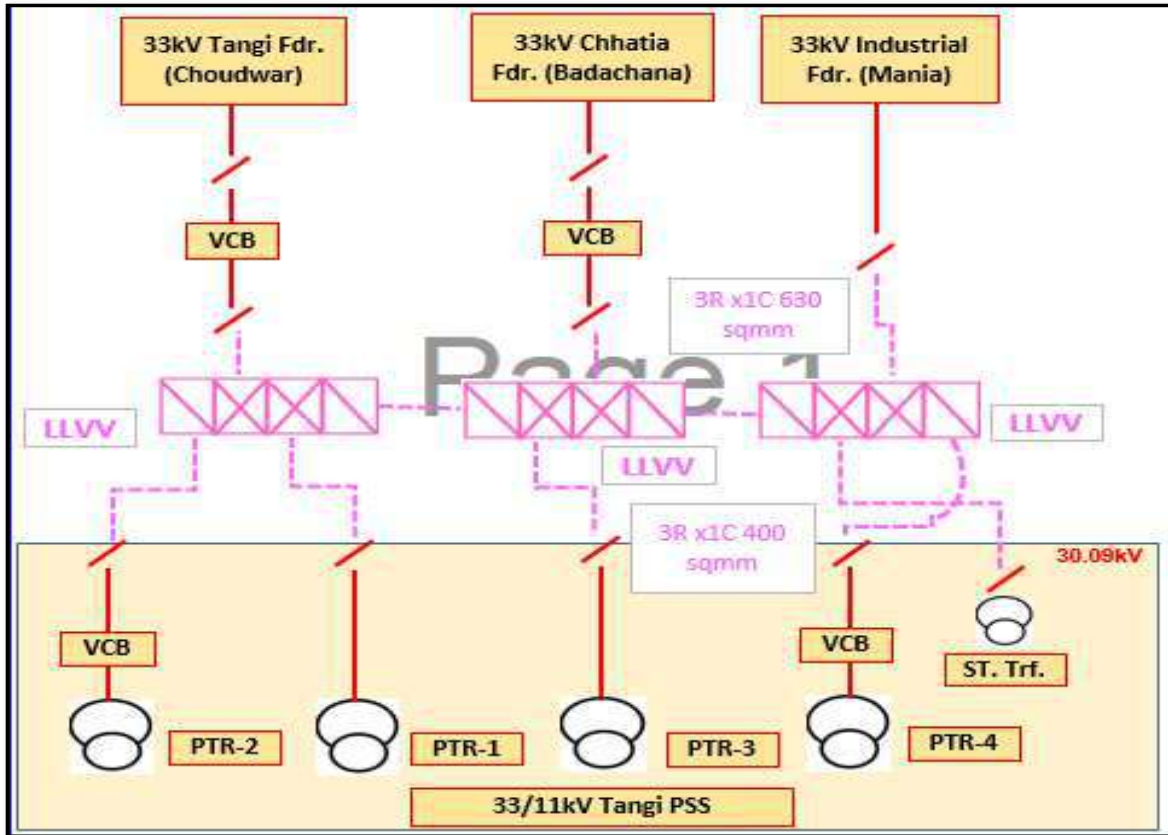
- At present, 33/11kV Tangi PSS is getting power supply from 33kV Tangi feeder emanating from 132/33kV Choudwar GSS. However, there are 2 nos. of additional 33kV sources (33kV Chhatia feeder from Badachana GSS and 33kV Industrial feeder from Mania GSS) available at 33kV bus of Tangi PSS but due to non-availability of 33kV bus sectionaliser there is restriction of utilisation of other sources at a time and result low voltage issue of about 28kV at 33kV side.
- The voltage experienced at PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.

Existing SLD:



Proposed Scenario:

- 3nos. 33kV RMU proposed at 33/11kV Tangi PSS with 33kV UG cable for interlinking lines to split PSS load on other 33kV available sources. This proposal will improve PSS voltage to 30.09kV.

Proposed SLD:**Detailed Scope of Work:**

- Construction of 3nos. 33kV RMU (3nos. - LLVV).
- Laying of 33kV 3R 1Cx630 sqmm cable at Tangi PSS for connectivity of 33kV feeders with proposed RMU.
- Laying of 33kV 3R 1Cx400 sqmm cable at Tangi PSS for connectivity of proposed RMU with PTR.

BoQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		CED	
Name of the Sub-Division :-		Tangi	
Name of the Work :-		Mitigation of Low Voltage issue: Proposal for Construction of 3No's 33 kV RMU (3no - LLVV) with cable at Tangi PSS to split PSS load at multiple feeders for mitigate low voltage issue and improve reliability.	
Scope:-		1. Construction of 3No's 33 kV RMU (3no - LLVV). 2. Laying of 33kV 3R 1Cx630 sqmm cable at Tangi PSS for connectivity of 33kV feeders with proposed RMU. 3. Laying of 33kV 3R 1Cx400 sqmm cable at Tangi PSS for connectivity of proposed RMU with PTR.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount

1	A	1. Construction of 3No's 33 kV RMU (3no - LLVV). 2. Laying of 33kV 3R 1Cx630 sqmm cable at Tangi PSS for connectivity of 33kV feeders with proposed RMU.	₹ 1,28,82,057.43
2	B	Laying of 33kV 3R 1Cx400 sqmm cable at Tangi PSS for connectivity of proposed RMU with PTR.	₹ 15,85,014.75
		Total Amount	₹ 1,44,67,072.18
		Total Amount (In Cr.)	₹ 1.45
Total estimated cost is Rs. 1.45 Crore. (Under TPCODL Capex Scheme)			

Cost Estimate: ₹ 1.45 Cr. (For detailed BoQ refer Annexure -8.15)

Benefit:

- Mitigation of low voltage issues at Tangi PSS.
- Ensuring reliability of power supply along with enabling N-1 connectivity.

6.0 Proposal for low voltage mitigation of Raghunathpur PSS

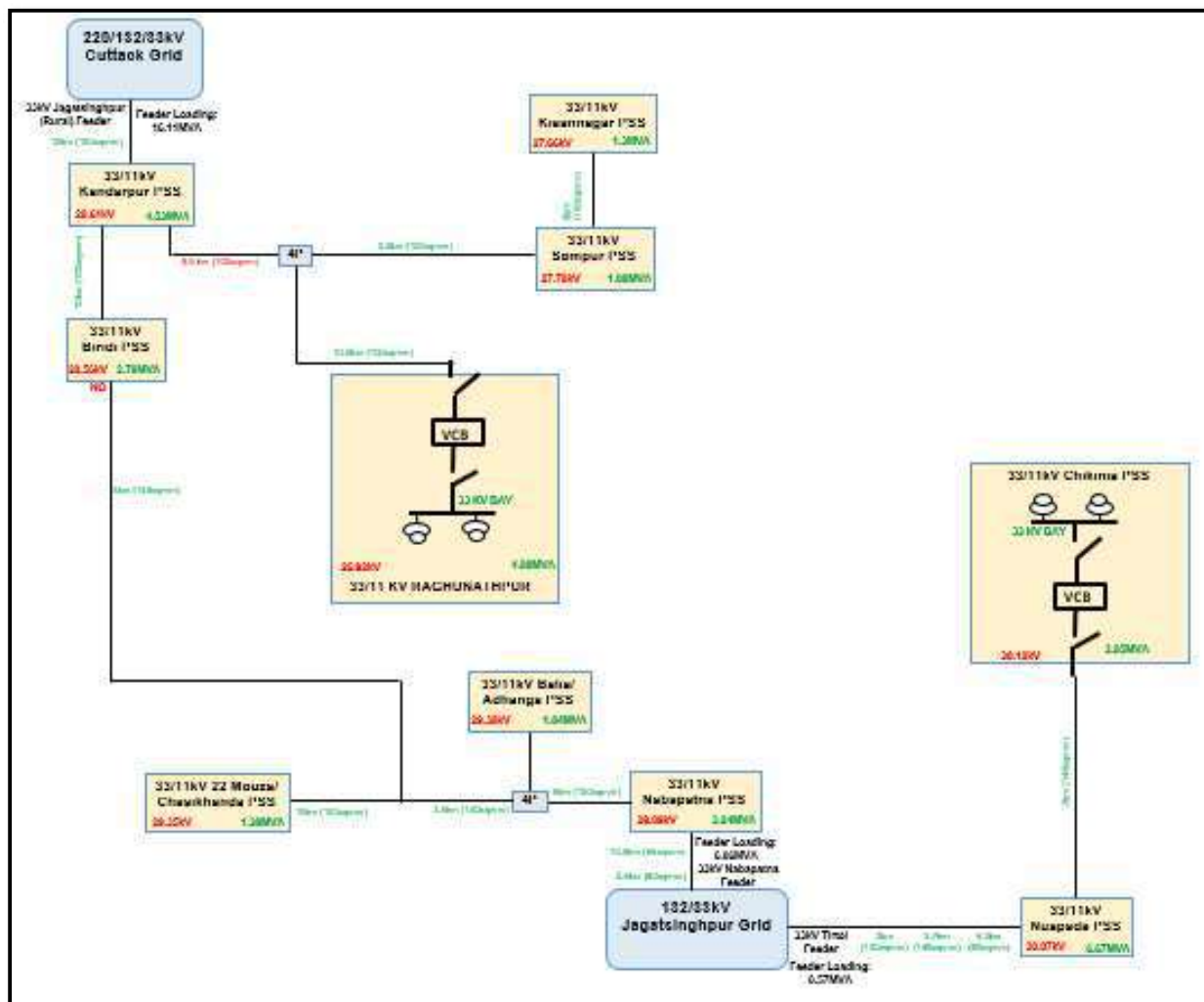
Proposal: Construction of 33kV interlinking line from Chikinia PSS to Raghunathpur PSS for mitigating low voltage issue by diverting load of 33kV Kandarpur/ Jagatsinghpur feeder to 33kV Tirtol- Jagatsinghpur Feeder.

Objective: To ensure reliable power supply by diverting load from 33kV Kandarpur/ Jagatsinghpur feeder, mitigate low voltage and provide N-1 connectivities.

Existing Scenario:

- At present, 33/11kV Kandarpur, Somapur, Kisannagar, Raghunathpur and Biridi PSS are getting power supply from 33kV Kandarpur/ Jagatsinghpur feeder emanating from 132/33kV Cuttack GSS. Total feeder length is about 48Ckm with 100sqmm conductor and 3Cx400sqmm cable with a peak load of 16.11MVA. This results in low voltage at Somapur, Kisannagar, Raghunathpur and Biridi PSS of about 27.26kV at 33kV tail end side.
- The voltage experienced at PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.

Existing SLD:



- 33kV interlinking line from Chikinia PSS to Raghunathpur PSS of 11km length has been proposed with 33kV bay at Raghunathpur and Chikinia PSS.
- This proposal will improve PSS voltage to 29.8kV at Raghunathpur PSS.

- Construction of 33kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm.
- Construction for 1no. 33kV Outdoor Bay at Raghunathpur PSS.
- Construction for 1no. 33kV Outdoor Bay at Chikinia PSS.

TP CENTRAL ODISHA DISTRIBUTION LIMITED	
Name of the Division :-	PDP
Name of the Sub-Division :-	JED
Name of the Work :-	Proposal for Construction of 33kV new line from Chikinia PSS to Raghunathpur PSS to mitigate low voltage issue.
Scope:-	1. Construction of 33kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm. 2. Construction for 1no. 33kV Outdoor Bay at Raghunathpur PSS. 3. Construction for 1no. 33kV Outdoor Bay at Chikinia PSS.
Names of Schemes: -	TPCODL CAPEX (FY 23-24)
ABSTRACT OF ESTIMATE	

Sl. No.	Part	Description	Amount
1	A	Construction of 33kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm.	₹ 4,33,13,544.18
2	B	Construction for 1 no. 33kV Outdoor Bay at Raghunathpur PSS.	₹ 36,30,897.07
3	C	Construction for 1 no. 33kV Outdoor Bay at Chikinia PSS.	₹ 36,30,897.07
		Total Amount	₹ 5,05,75,338.31
		Total Amount (In Cr.)	₹ 5.06
Total estimated cost is Rs. 5.06 Crore. (Under TPCODL Capex Scheme)			

Cost Estimate: ₹ 5.06 Cr. (For detailed BoQ refer Annexure -8.16)

Benefit:

- Improvement of low voltage issues at Somapur, Kisannagar, Raghunathpur and Biridi PSS.
- Ensuring reliability of power supply along with enabling N-1 connectivity.

7.0 Proposal for low voltage mitigation of Niali PSS and Kulakapasi PSS

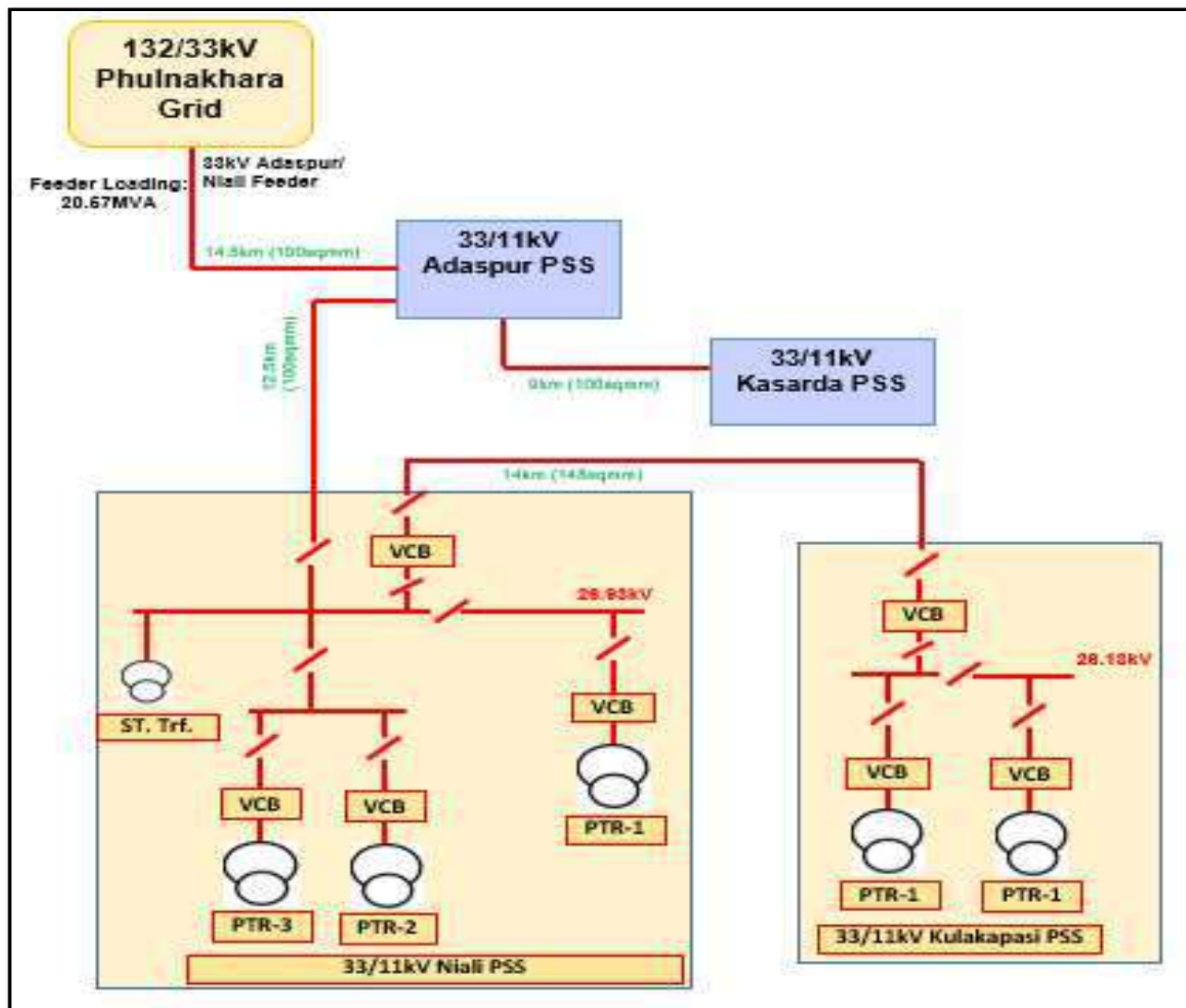
Proposal: Installation of 1no. 26.5/33kV, 10MVA AVR Unit at Niali PSS and 1no. 5MVA AVR Unit at Kulakapasi PSS with augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS 14.5km.

Objective: To ensure reliable power supply by improving voltage at PSS.

Existing Scenario:

- At present, 33/11kV Adaspur, Kasarda, Niali and Kulakapasi PSS is getting power supply with 33kV Niali feeder emanating from 132/33kV Phulnakhara GSS. Total feeder length is about 45km with 100sqmm, 148sqmm conductor and 3Cx400sqmm cable with a peak load of 20.67MVA. It will result in low voltage at Niali (26.92kV) and Kulakapasi PSS (26.13kV) at 33kV side.
- The voltage experienced at PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.

Existing SLD:

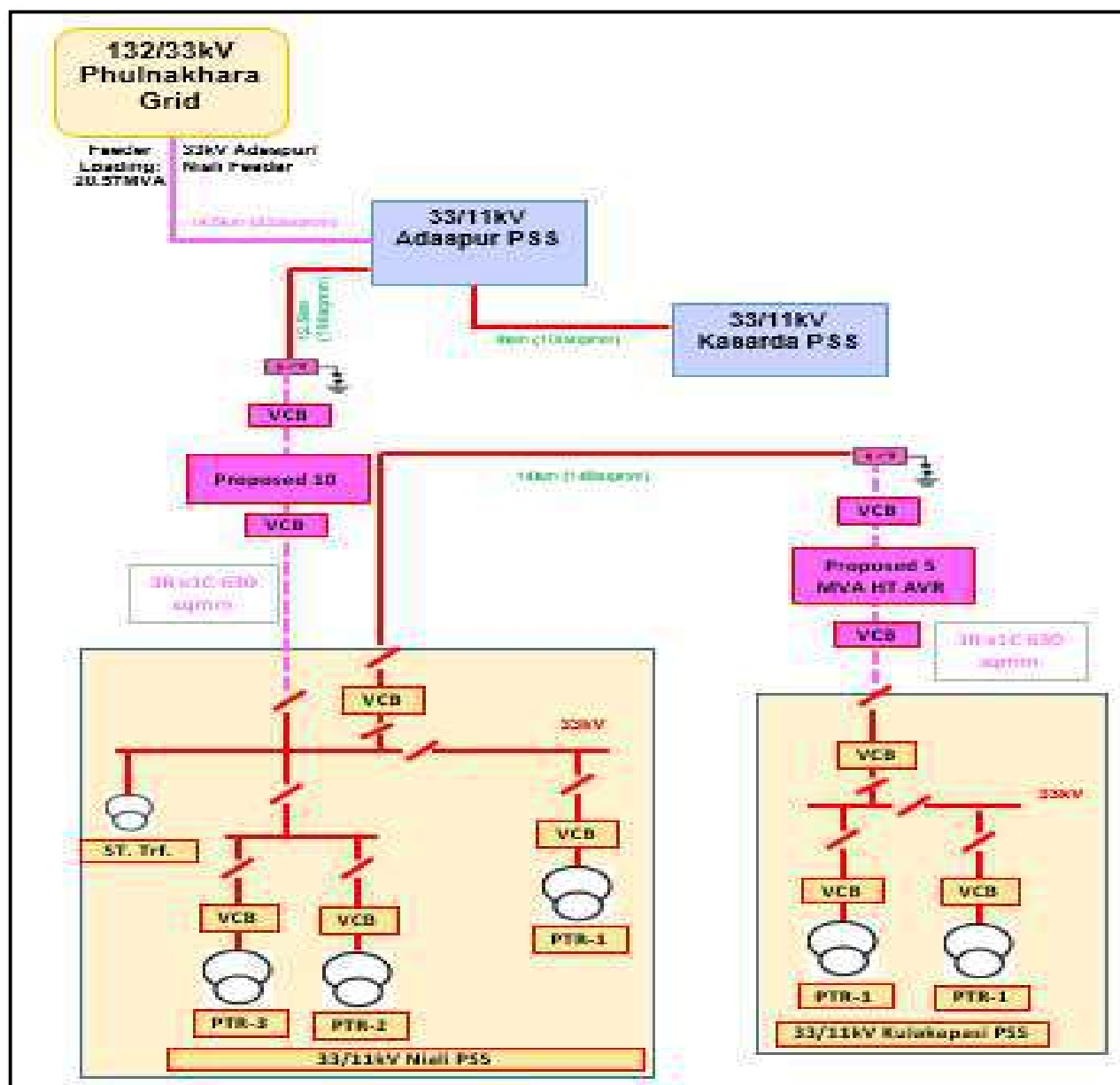


Proposed Scenario:

- Installation of 1no. 26.5/33kV 10MVA AVR Unit at Niali PSS and 1no. 5MVA AVR Unit at Kulakapasi PSS with augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS 14.5km is proposed.

- This proposal will improve PSS voltage to 33kV at Niali PSS and Kulakapasi PSS.

Proposed SLD:



Detailed Scope of Work:

- Installation of 1no. 26.5/33kV, 10MVA AVR Unit at Niali PSS.
- Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Kulakapasi PSS.
- Augmentation of 33kV Niali feeder from Phulnakhara GSS to Adaspur PSS with 232sqmm AAAC - 14.5km.

BoQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED	
Name of the Division :-	CED
Name of the Sub-Division :-	Niali

Name of the Work :-	Proposal for Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS - 14.5km along with installation of 1no. 26.5/33KV 10MVA AVR Unit at Niali PSS and 1no. 5MVA AVR Unit at Kulakapasi PSS to mitigate low voltage issue.		
Scope:-	1. Installation of 1no. 26.5/33kV, 10MVA AVR Unit at Niali PSS. 2. Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Kulakapasi PSS. 3. Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqmm AAAC - 14.5km.		
Names of Schemes: -	TPCODL CAPEX (FY 23-24)		
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Installation of 1no. 26.5/33kV, 10MVA AVR Unit at Niali PSS.	₹ 3,02,91,503.23
2	B	Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Kulakapasi PSS.	₹ 2,01,67,764.78
3	C	Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqmm AAAC - 14.5km.	₹ 3,45,75,571.62
		Total Amount	₹ 8,50,34,839.62
		Total Amount (In Cr.)	₹ 8.50
Total estimated cost is Rs. 8.50 Crore. (Under TPCODL Capex Scheme)			

Cost Estimate: ₹ 8.50 Cr. (For detailed BoQ refer Annexure -8.17)

Benefit:

- Mitigation of low voltage issues at Niali PSS and Kulakapasi PSS.
- Ensuring reliability of power supply.

8.0 Proposal for low voltage mitigation of Chhanagiri PSS and Jankia PSS

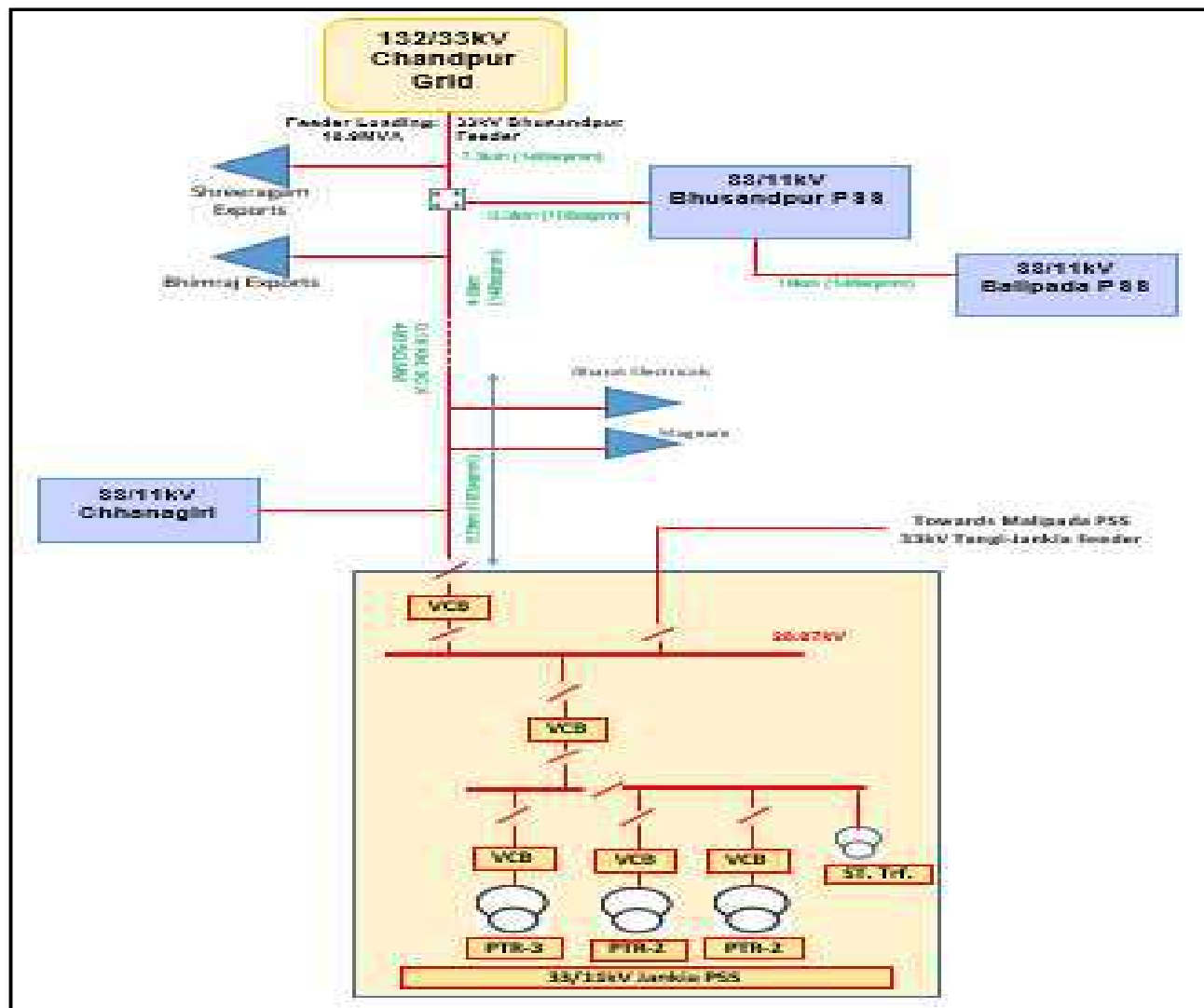
Proposal: Augmentation of 33kV Bhusandpur feeder for 5.5Ckm line between Bharat Electricals to Jankia PSS and construction of 2nos. 33kV RMU with laying of UG cable at Jankia PSS.

Objective: To ensure reliable power supply by improving voltage at PSS.

Existing Scenario:

- At present, 33/11kV Bhusandpur, Chhanagiri and Jankia PSS are getting power supply from 33kV Bhusandpur feeder emanating from 132/33kV Chandpur GSS. Total feeder length is about 44Ckm with 100sqmm, 148sqmm, 173sqmm conductor and 3Cx400sqmm cable with a peak load of 16MVA. This results in low voltage at Jankia (28.07kV) and Chhanagiri PSS (28.08kV) at 33kV side.
- The voltage experienced at PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.

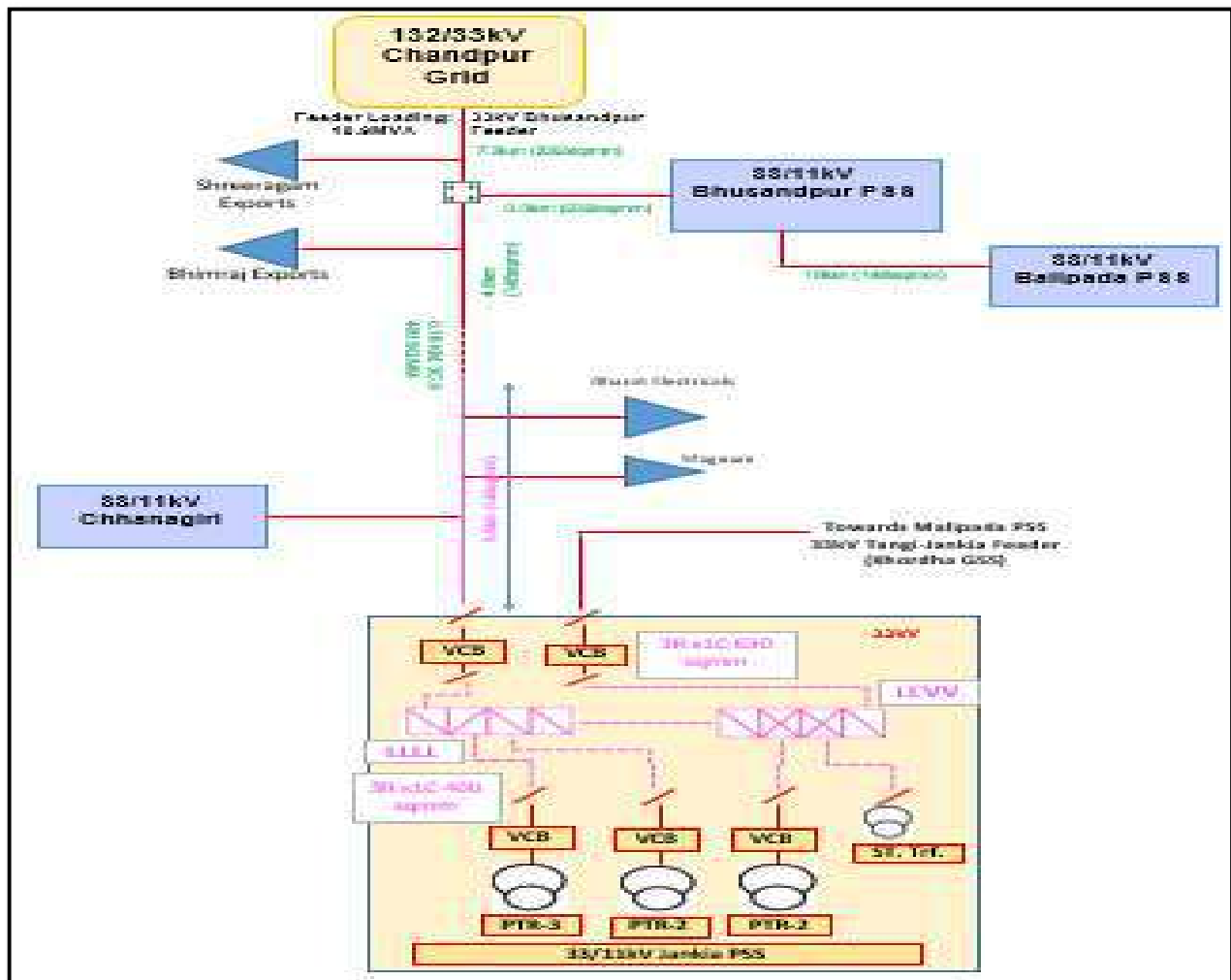
Existing SLD:



Proposed Scenario:

- Conductor augmentation of 5.5Ckm line between 33kV Bharat Electricals consumer to Jankia PSS is proposed. (10Ckm conductor augmentation from Chandpur GSS to Bhusandpur PSS is proposed under deposit scheme.)

- Proposed SLD:**



- Augmentation of 5.5Ckm with 148sqmm using 13mtr WPB-Pole between Bharat Electricals and Jankia PSS.
- Construction of 2nos. 33 kV RMU (1no - LLVV, 1no - LLLL).
- Laying of 33kV 3R 1Cx630 sqmm cable at Jankia PSS for connectivity of 33kV feeders with proposed RMU.
- Laying of 33kV 3R 1Cx400 sqmm cable at Jankia PSS for connectivity of proposed RMU with PTR.

TP CENTRAL ODISHA DISTRIBUTION LIMITED	
Name of the Division :-	BAED
Name of the Sub-Division :-	Tangi
Name of the Work :-	Proposal for Augmentation of 33kV Bhusandpur fdr. 5.5 ckm line between Bharat Electricals and Jankia PSS and Construction of 2No's 33 kV RMU with UG cable at Jankia PSS to mitigate low voltage issue and improve reliability.

Scope:-		1. Construction for Augmentation of 5.5 ckm with 148sqmm using 13mtr WPB-Pole between Bharat Electricals and Jankia PSS. 2. Construction of 2No's 33 kV RMU (1no - LLVV, 1no - LLLL). 3. Laying of 33kV 3R 1Cx630 sqmm cable at Jankia PSS for connectivity of 33kV feeders with proposed RMU. 4. Laying of 33kV 3R 1Cx400 sqmm cable at Jankia PSS for connectivity of proposed RMU with PTR.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Construction for Augmentation of 5.5 ckm with 148sqmm using 13mtr WPB-Pole between Bharat Electricals and Jankia PSS.	₹ 96,41,075.51
2	B	1. Construction of 2No's 33 kV RMU (1no - LLVV, 1no - LLLL). 2. Laying of 33kV 3R 1Cx630 sqmm cable at Jankia PSS for connectivity of 33kV feeders with proposed RMU.	₹ 79,49,699.30
3	C	Laying of 33kV 3R 1Cx400 sqmm cable at Jankia PSS for connectivity of proposed RMU with PTR.	₹ 12,68,011.80
		Total Amount	₹ 1,88,58,786.61
		Total Amount (In Cr.)	₹ 1.89
Total estimated cost is Rs. 1.89 Crore. (Under TPCODL Capex Scheme)			

Cost Estimate: ₹ 1.89 Cr. (For detailed BoQ refer Annexure -8.18)

Benefit:

- Improvement of low voltage issues at Chhanagiri PSS and Jankia PSS.
- Ensuring reliability of power supply.

9.0 Proposal for low voltage mitigation of Bolagarh PSS and Hatabasta PSS

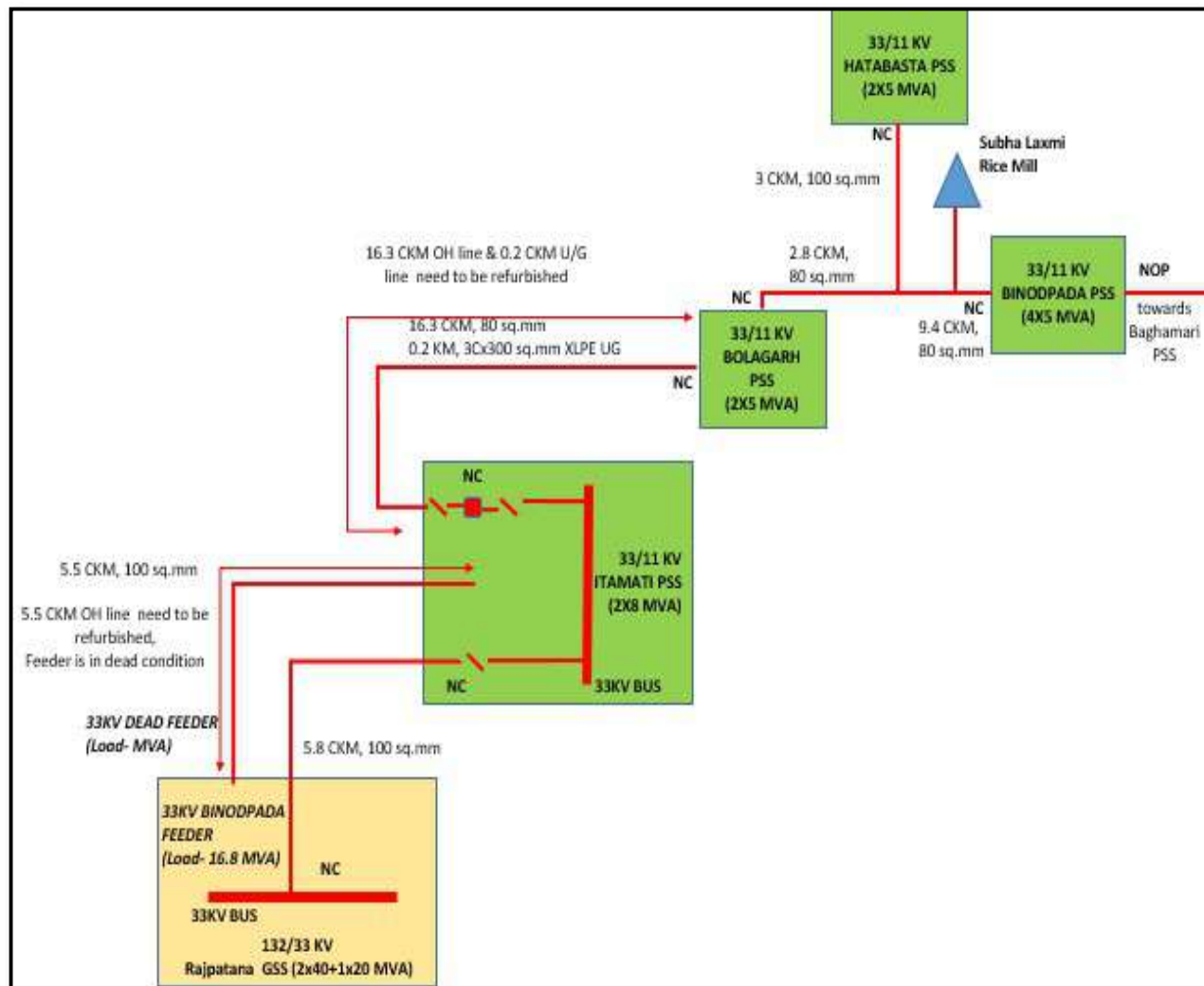
Proposal: Installation of 1no. 26.5/33kV, 1no. 5MVA AVR Unit at Bolagarh PSS and 1no. 5MVA AVR Unit at Hatabasta PSS.

Objective: To ensure reliable power supply by improving voltage at PSS.

Existing Scenario:

- At present, 33/11kV Itamati, Binodpada, Bolagarh and Hatabasta PSS is getting power supply with 33kV Binodpada feeder emanating from 132/33kV Rajpatna GSS. Total feeder length is about 40km with 100sqmm, 80sqmm conductor and 3Cx300sqmm cable with a peak load of 16.68MVA. It will result low voltage at Binodpada (23.05kV), Bolagarh (25.15kV) and Hatabasta PSS (24.55kV) at 33kV side.
- The voltage experienced at PSS is below the permissible limit of -9% of 33kV i.e; 30.03kV.

Existing SLD:

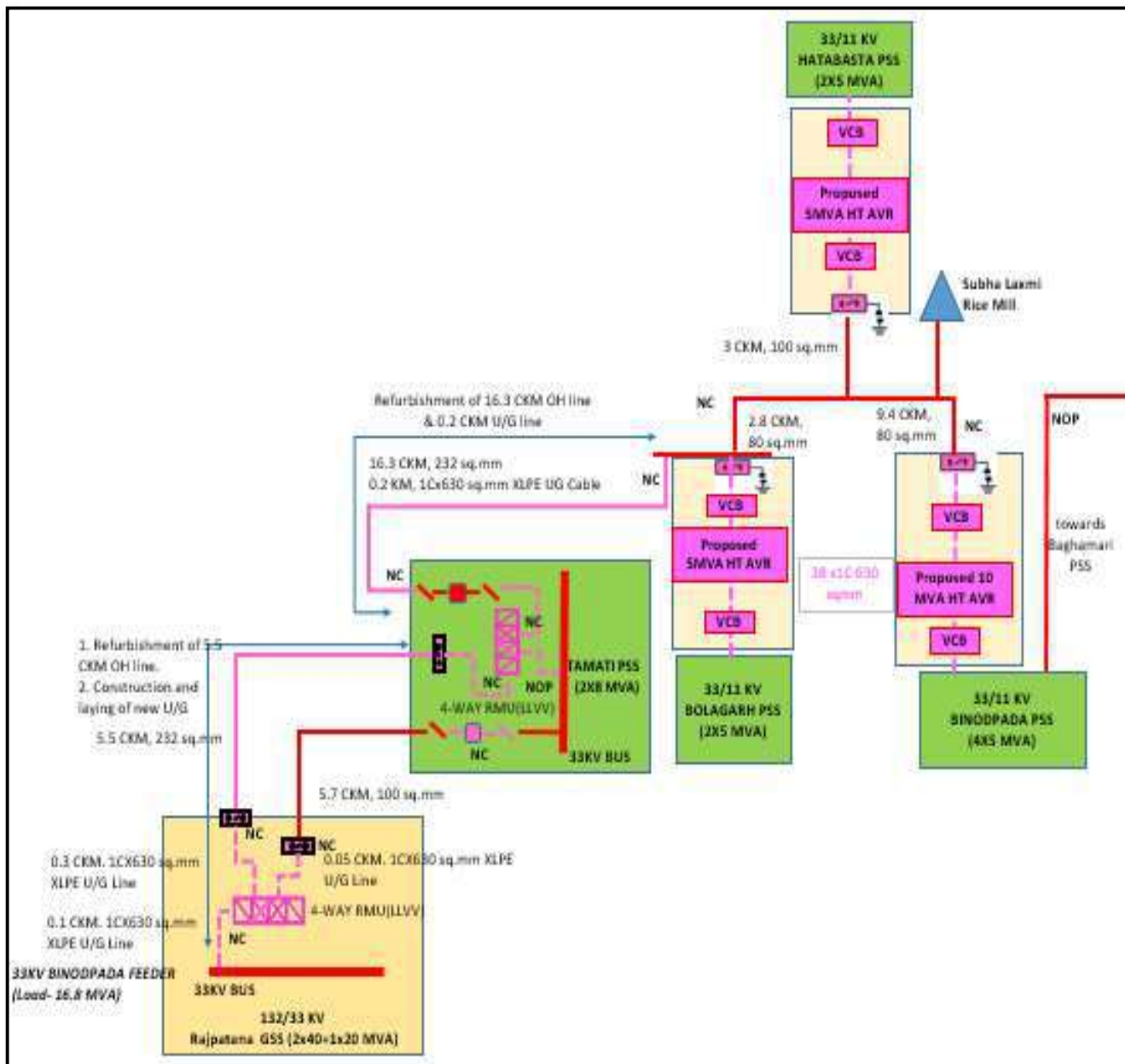


Proposed Scenario:

- Installation of 1no. 26.5/33kV, 1no. 5MVA AVR Unit at Bolagarh PSS and 1no. 5MVA AVR Unit at Hatabasta PSS is proposed.

- This proposal will improve PSS voltage to 33kV at Binodpada PSS, Bolagarh PSS and Hatabasta PSS.

Proposed SLD:



Detailed Scope of Work:

- Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Bolagarh PSS.
- Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Hatabasta PSS.

BoQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED	
Name of the Division :-	NYED
Name of the Sub-Division :-	Itamati
Name of the Work :-	Proposal for Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Bolagarh PSS and 5MVA AVR Unit at Hatabasta PSS to mitigate low voltage issue.

Scope:-		1. Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Bolagarh PSS. 2. Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Hatabasta PSS.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Bolagarh PSS.	₹ 2,01,67,764.78
2	B	Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Hatabasta PSS.	₹ 2,01,67,764.78
		Total Amount	₹ 4,03,35,529.56
		Total Amount (In Cr.)	₹ 4.04
Total estimated cost is Rs. 4.04 Crore. (Under TPCODL Capex Scheme)			

Cost Estimate: ₹ 4.04 Cr. (For detailed BoQ refer Annexure -8.19)

Benefit:

- Improvement of low voltage issues at Bolagarh PSS and Hatabasta PSS.
- Ensuring reliability of power supply.

ANNEXURE-8.1

TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		BCDD-II	
Name of the Sub-Division : -		Khandagiri	
Name of the Work :-		Mitigation of 33kV Feeder Overloading: Installation of 4 Nos. of 33 KV RMU at Kalinga Nagar PSS for BUS Splitting operation & mitigation of overloading issue of 33KV Vipul feeder.	
Scope:-		Part-A:- 1. Laying of 33 KV UG Cable of length - 185 Mtr. using 1Cx630 mm2, 33KV UG cable.(From33 KV Line VCB & 33 KV Consumer VCB to Proposed RMU). 2. Installation of 3 Nos. of 33 KV 4 Way(LLLL) RMU & 1 no. of 33 KV 4 way (LLVV) RMU at Kalinga nagar PSS. Part-B:- Laying of 33 KV UG Cable of length - 85 Mtr. using 1Cx400 mm2, 33KV UG cable.(From Proposed RMU to PTR VCB & Proposed RMU to station Transformer)	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Part-A:- 1. Laying of 33 KV UG Cable of length - 185 Mtr. using 1Cx630 mm2, 33KV UG cable.(From33 KV Line VCB & 33 KV Consumer VCB to Proposed RMU). 2. Installation of 3 Nos. of 33 KV 4 Way(LLLL) RMU & 1 no. of 33 KV 4 way (LLVV) RMU at Kalinga nagar PSS.	1,50,99,601.19
2	B	Part-B:- Laying of 33 KV UG Cable of length - 85 Mtr. using 1Cx400 mm2, 33KV UG cable.(From Proposed RMU to PTR VCB & from Proposed RMU to station Transformer)	7,11,352.42
		Total Amount	1,58,10,953.61
		Total Amount (In Cr)	1.58
Total estimated cost is Rs. 1.58 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-8.1					
Part-A:-					
1. Laying of 33 KV UG Cable of length - 185 Mtr. using 1Cx630 mm2, 33KV UG cable.(From33 KV Line VCB & 33 KV Consumer VCB to Proposed RMU).					
2. Installation of 3 Nos. of 33 KV 4 Way(LLLL) RMU & 1 no. of 33 KV 4 way (LLVV) RMU at Kalinga nagar PSS.					
Standard BoQ and Estimate for 33kv, 1C 630sqmm UG Cable along with 33kv RMU					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kv, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories				
a	Length of 33kv 1C, 630sqmm cable (open trench)	Mtr.	185		
b	Length of 33kv 1C, 630sqmm cable (HDD)	Mtr.			
1.1	Supply of 33kv, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	555	1,337.13	7,42,107.15
1.2	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kv, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	5	5,245.00	26,225.00
1.3	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kv, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	11	4,894.00	53,834.00
2	Supply of 33kv RMU				
d	No. of 33kv 4Way RMU (LLVV)	nos.	1		
f	No. of 33kv 4Way RMU (LLLL)	nos.	3		
2.1	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	23,35,264.00	23,35,264.00
2.2	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	3	19,59,421.00	58,78,263.00
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	52.80	93.00	4,910.40
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	8	1,302.00	10,416.00
4	FRTU and OFC for RMU SCADA Automation				
4.1	Supply of 12 core fibre optic cable single mode, duct type, fibre armoured laid along UG cable.	Mtr.		22.00	-
4.2	Supply of HDPE PLB duct of size 32/26mm for laying of OFC Cables.	Mtr.	0.0	77.99	-
4.3	Supply of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0	6,766.00	-
4.4	Supply of end Connector and accessories for OFC connection at RMU.	Set	8	7,535.00	60,280.00
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	4	2,19,420.00	8,77,680.00
	Sub Total (Supply Portion) (in Rs.)				99,88,979.55
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)

ANNEXURE-8.1

Part-A:-

1. Laying of 33 KV UG Cable of length - 185 Mtr. using 1Cx630 mm², 33KV UG cable.(From 33 KV Line VCB & 33 KV Consumer VCB to Proposed RMU).

2. Installation of 3 Nos. of 33 KV 4 Way (LLLL) RMU & 1 no. of 33 KV 4 way (LLVV) RMU at Kalinga nagar PSS.

1	Erection, Commissioning & Testing of 33kv new line by 3X1Core, 630sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kv, 1Core, 3Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by open trench method .	Mtr.	555	94.50	52,447.50
1.2	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kv, 1Core, 630sqmm, HT UG cable kits	Set	5	2,081.70	10,408.50
1.3	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kv, 1Core, 630sqmm, HT UG cable kits	Set	11	2,081.70	22,898.70
2	Erection, Commissioning, Wiring and Testing of 33kv RMU				
2.1	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	8,000.00	8,000.00
2.2	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	3	8,000.00	24,000.00
3	FRTU and OFC for RMU SCADA Automation				
3.1	Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kv UG cable. through open trench or HDD	Mtr.	0.0	82.00	-
3.2	Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0.0	612.54	-
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	8.0	1,225.07	9,800.56
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	4.0	6,124.36	24,497.44
	Sub Total (Erection Portion) (in Rs.)				1,52,052.70

Civil Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	155.4	700.00	1,08,780.00
1.1.b	Earth work excavation of hard rock	Cum	66.6	1,720.00	1,14,552.00
1.2	Back filling with excavated soil outside and above the trench	Cum	222	202.00	44,844.00

ANNEXURE-8.1					
Part-A:-					
1. Laying of 33 KV UG Cable of length - 185 Mtr. using 1Cx630 mm², 33KV UG cable.(From 33 KV Line VCB & 33 KV Consumer VCB to Proposed RMU).					
2. Installation of 3 Nos. of 33 KV 4 Way(LLLL) RMU & 1 no. of 33 KV 4 way (LLVV) RMU at Kalinga nagar PSS.					
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	0	2,643.67	-
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kv RMU	Nos.	4	23,145.30	92,581.20
3	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	8	3,700.00	29,600.00
4	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	40	1,463.40	58,536.00
	Sub Total (Civil Portion) (in Rs.)				4,48,893.20
A	Sub Total (Supply Portion)				99,88,979.55
B	Stock, Storage & Insurance @ 3 % of A				2,99,669.39
C	Sub Total (A+B)				1,02,88,648.94
D	Contingency @ 3 % of C				3,08,659.47
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				101.15
F	Transportation @ 7.5% of C				7,71,648.67
G	Erection Charges @ 10% of earthing items				505.77
H	Total (C+D+E+F+G)				1,13,69,564.00
I	Sub Total (Erection Portion + Civil Portion)				6,00,945.90
J	Total Cost (H+I)				1,19,70,509.90
K	Other Overhead /(including Supervision Charges) @ 6 % of J				7,18,230.59
L	Total Estimated Capital Cost i.e. (J+K)				1,26,88,740.49
M	GST @ 18% of L				22,83,973.29
M1	CESS @ 1% of L				1,26,887.40
N	Grand Total (L+M+M1)				1,50,99,601.19

ANNEXURE-8.1					
Part-B:-					
Laying of 33 KV UG Cable of length - 85 Mtr. using 1Cx400 mm ² , 33KV UG cable.(From Proposed RMU to PTR VCB & from Proposed RMU to station Transformer)					
Standard BoQ and Estimate for 33kV, 1C 400sqmm UG Cable along with 33kV RMU					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable with accessories				
a	Length of 33kV 1C, 400sqmm cable (open trench)	Mtr.	85		
b	Length of 33kV 1C, 400sqmm cable (HDD)	Mtr.			
1.1	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	255	970.92	2,47,584.60
1.2	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	4	8,517.56	34,070.24
1.3	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	4	6,488.92	25,955.68
	Sub Total (Supply Portion) (in Rs.)				3,07,610.52
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 400sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 400sqmm, XLPE insulation (extruded type) UG cable in trefoil formation by open trench method.	Mtr.	255	94.50	24,097.50
1.2	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	4	2,081.70	8,326.80
1.3	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	4	2,081.70	8,326.80
	Sub Total (Erection Portion) (in Rs.)				40,751.10
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				

ANNEXURE-8.1					
Part-B:-					
Laying of 33 KV UG Cable of length - 85 Mtr. using 1Cx400 mm², 33KV UG cable.(From Proposed RMU to PTR VCB & from Proposed RMU to station Transformer)					
1.1.a	Earth work excavation of soil	Cum	71.4	700.00	49,980.00
1.1.b	Earth work excavation of hard rock	Cum	30.6	1,720.00	52,632.00
1.2	Back filling with excavated soil outside and above the trench	Cum	102	202.00	20,604.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	32	1,463.40	46,828.80
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	3	1,012.00	3,036.00
	Sub Total (Civil Portion) (in Rs.)				1,73,080.80
A	Sub Total (Supply Portion)				3,07,610.52
B	Stock, Storage & Insurance @ 3 % of A				9,228.32
C	Sub Total (A+B)				3,16,838.84
D	Contingency @ 3 % of C				9,505.17
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				23,762.91
G	Erection Charges @ 10% of earthing items				-
H	Total (C+D+E+F+G)				3,50,106.91
I	Sub Total (Erection Portion + Civil Portion)				2,13,831.90
J	Total Cost (H+I)				5,63,938.81
K	Other Overhead /(including Supervision Charges) @ 6 % of J				33,836.33
L	Total Estimated Capital Cost i.e. (J+K)				5,97,775.14
M	GST @ 18% of L				1,07,599.53
M1	CESS @ 1% of L				5,977.75
N	Grand Total (L+M+M1)				7,11,352.42

ANNEXURE-8.2			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		NED	
Name of the Sub-Division : -		KAKATPUR	
Name of the Work :-		Mitigation of 33kV Feeder Overloading: Proposal for augmentation of 33 kV line from DIGHALO GSS to Kakatpur PSS with LILO arrangement at Charichhak PSS to mitigate overloading and low Voltage issue.	
Scope:-		PART A: Replacement of 100 sqmm conductor with 232sqmm along with Intermediate H-Poles from Dighalo GSS to Kakatpur PSS of Ckt. Line length-23Ckm PART B: Installation of 33kV Isolator- 3 no.s and 33kv VCB- 1 no.s at CHARICHHAK PSS.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	PART A: Replacement of 100 sqmm conductor with 232sqmm along with Intermediate H- Poles from Dighalo GSS to Kakatpur PSS of Ckt. Line length - 23 Ckm	6,88,13,541.59
2	B	PART B: Installation of 33kV Isolator- 3 no.s and 33kv VCB- 1 no.s at CHARICHHAK PSS.	36,30,897.07
		Total Amount	7,24,44,438.66
		Total Amount (In Cr)	7.24
Total estimated cost is Rs. 7.24 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-8.2

Part A:-

1)Augmentation of existing 33KV Line from 100sqmm to 232sqmm with LILO of line at Charichhak PSS of length -23Ckm.

33kv Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor

**No. of 33 KV DP required Without Isolator
(Ref. Drawing No.- TPCODL-HVD-0004)**

24

MATERIALS FOR 33 KV DP Without Isolator

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	48	27,23,314.29
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	1491.36	1,13,343.36
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	95.1552	8,849.43
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =(5x7.14x1.96)	KG	76.00	1679.328	1,27,628.93
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	1482.624	1,12,679.42
6	Danger Plate, 2 no's.	No.	99.20	48	4,761.60
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	14.4432	1,343.22
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	48	7,440.00
9	H.T. Stay set (Complete)	Set	1,302.00	48	62,496.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	96	5,952.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	720	66,960.00
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	24	31,248.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	283.2	26,337.60
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	144	14,284.80
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	57.7728	5,372.87
16	33KV pin insulator polymer	No.	595.20	72	42,854.40
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	144	89,280.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	144	2,05,344.00
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	144	2,05,344.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	294.264	28,461.21
21	Black Paint	Ltr	272.80	24	6,547.20
22	Yellow Colour Paint for Background	Ltr	272.80	48	13,094.40
A	Total Cost of materials				39,02,936.73
B	Stock, Storage & Insurance i.e 3% of A				1,17,088.10
C	Sub Total (A+B)				40,20,024.84
D	Contingency @ 3% of C				1,20,600.75
E	Tools & Plants @ 2% of C				80,400.50
F	Transportation @ 7.5% of C				3,01,501.86
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,40,250.69
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				1,03,569.22
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				47,66,347.85
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	48	1,08,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	26.4	1,71,600.00

ANNEXURE-8.2

Part A:-

1)Augmentation of existing 33KV Line from 100sqmm to 232sqmm with LILO of line at Charichhak PSS of length -23Ckm.

3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	5.4	35,100.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	24	88,800.00
K	Total Civil & Services				4,03,500.00
L	Total (J+K)				51,69,847.85
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				3,10,190.87
N	Sub Total (L+M)				54,80,038.72
O	Total GST @ 18% of (N)				9,86,406.97
P	Total GST @ 1% of (N)				54,800.39
Q	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				65,21,246.08

**No. of 33 KV DP required With Isolator
(Ref. Drawing No.- TPCODL-HVD-0004)**

6

MATERIALS FOR 33 KV DP With Isolator

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	12	6,80,828.57
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's channel required =(2x9.56x4.3)	KG	76.00	493.296	37,490.50
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	23.7888	2,212.36
4	Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 1 no's channel required =(1x7.14x4.3)	KG	76.00	184.212	14,000.11
5	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =(2x7.14x4.3)	KG	76.00	368.424	28,000.22
6	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 4 no's channel required =(4x7.14x4.3)	KG	76.00	736.848	56,000.45
7	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos angle required = (4*4.5*4.927)	KG	76.00	532.116	40,440.82
8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel required =(1x7.14x0.8)	KG	76.00	34.272	2,604.67
9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 nos angle required = (1*4.5*0.388)	KG	76.00	10.476	796.18
10	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos angle required = (1*4.5*0.340)	KG	76.00	9.18	697.68
11	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =(2x9.56x0.5)	KG	76.00	57.36	4,359.36
12	Danger Plate, 2 no's.	No.	99.20	12	1,190.40
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	3.6108	335.80
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	12	1,860.00
15	H.T. Stay set (Complete)	Set	1,302.00	12	15,624.00
16	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	24	1,488.00
17	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	180	16,740.00
18	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	12	15,624.00
19	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36	KG	93.00	339.84	31,605.12
20	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	36	3,571.20
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	14.4432	1,343.22
22	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	18	2,31,012.00
23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	53,003.00	6	3,18,018.00
24	33KV pin insulator polymer	No.	595.20	18	10,713.60

ANNEXURE-8.2

Part A:-

1)Augmentation of existing 33KV Line from 100sqmm to 232sqmm with LILO of line at Charichhak PSS of length -23Ckm.

25	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	36	22,320.00
26	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	36	51,336.00
27	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	36	51,336.00
28	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	96.72	132.9	12,854.09
29	Black Paint	Ltr	272.80	6	1,636.80
30	Yellow Colour Paint for Background	Ltr	272.80	12	3,273.60
A	Total Cost of materials				16,59,312.74
B	Stock, Storage & Insurance i.e 3% of A				49,779.38
C	Sub Total (A+B)				17,09,092.13
D	Contingency @ 3% of C				51,272.76
E	Tools & Plants @ 2% of C				34,181.84
F	Transportation @ 7.5% of C				1,28,181.91
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				35,062.67
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				95,496.26
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				20,53,287.58

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	12	27,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	6.6	42,900.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.35	8,775.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	12	44,400.00
K	Total Civil & Services				1,23,075.00
L	Total (J+K)				21,76,362.58
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)				1,30,581.75
N	Sub Total (L+M)				23,06,944.33
O	Total GST @ 18% of (N)				4,15,249.98
P	Total GST @ 1% of (N)				23,069.44
Q	Gross Total Material +Services (N+O+P) for 33 KV DP With Isolator				27,45,263.75

**No. of 33 KV Cut Point with 180 Degree Angle
(Ref. Drawing No.- TPCODL-HVD-0002)**

18

MATERIALS FOR 33 KV Cut Point with 180 Degree Angle

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	18	10,21,242.86
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	585.072	44,465.47
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	93.00	95.1552	8,849.43
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	105.313	8,003.78
5	Danger Plate, 1 no's.	No.	99.20	18	1,785.60
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	5.4162	503.71
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	54	5,356.80

ANNEXURE-8.2

Part A:-

1)Augmentation of existing 33KV Line from 100sqmm to 232sqmm with LILO of line at Charichhak PSS of length -23Ckm.

8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	21.6648	2,014.83
9	33KV pin insulator polymer	No.	595.20	54	32,140.80
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	108	66,960.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	108	1,54,008.00
12	Earthing of Support (Coil Type)	EA	205.84	18	3,705.12
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	4.716	438.59
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	108	1,54,008.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	87.822	8,494.14
16	Black Paint	Ltr	272.80	18	4,910.40
17	Yellow Colour Paint for Background	Ltr	272.80	36	9,820.80
A	Total Cost of materials				15,26,708.33
B	Stock, Storage & Insurance i.e 3% of A				45,801.25
C	Sub Total (A+B)				15,72,509.58
D	Contingency @ 3% of C				47,175.29
E	Tools & Plants @ 2% of C				31,450.19
F	Transportation @ 7.5% of C				1,17,938.22
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				52,594.01
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				52,062.94
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				18,73,730.23

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	9.9	64,350.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	2.025	13,162.50
K	Total Civil & Services				77,512.50
L	Total (J+K)				19,51,242.73
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				1,17,074.56
N	Sub Total (L+M)				20,68,317.30
O	Total GST @ 18% of (N)				3,72,297.11
P	Total GST @ 1% of (N)				20,683.17
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle				24,61,297.58

**No. of 33 KV Cut Point with 90 Degree Angle
(Ref. Drawing No.- TPCODL-HVD-0003)**

12

MATERIALS FOR 33 KV Cut Point with 90 Degree Angle

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	12	6,80,828.57
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	780.096	59,287.30
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	126.8736	11,799.24
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306)	K.g.	76.00	140.4173	10,671.71
5	Danger Plate, 1 no's.	No.	99.20	12	1,190.40
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.6108	335.80
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	36	3,571.20
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	14.4432	1,343.22
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	48	28,569.60
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	72	44,640.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	72	1,02,672.00

ANNEXURE-8.2

Part A:-

1)Augmentation of existing 33KV Line from 100sqmm to 232sqmm with LILO of line at Charichhak PSS of length -23Ckm.

12	Earthing of Support (Coil Type)	No.	205.84	12	2,470.08
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	3.144	292.39
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	72	1,02,672.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	12	1,860.00
16	H.T. Stay set (Complete)	Set	1,302.00	12	15,624.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	12	744.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	180	16,740.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	135.72	13,126.84
20	Black Paint	Ltr	272.80	12	3,273.60
21	Yellow Colour Paint for Background	Ltr	272.80	24	6,547.20
A	Total Cost of materials				11,08,259.16
B	Stock, Storage & Insurance i.e 3% of A				33,247.77
C	Sub Total (A+B)				11,41,506.93
D	Contingency @ 3% of C				34,245.21
E	Tools & Plants @ 2% of C				22,830.14
F	Transportation @ 7.5% of C				85,613.02
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				35,062.67
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				40,423.65
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				13,59,681.62

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	6.60	42,900.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.35	8,775.00
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	12	27,000.00
K	Total Civil & Services				78,675.00
L	Total (J+K)				14,38,356.62
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				86,301.40
N	Sub Total (L+M)				15,24,658.01
O	Total GST @ 18% of (N)				2,74,438.44
P	Total GST @ 1% of (N)				15,246.58
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle				18,14,343.04

**33 Kv Line Length In KM with 40 Mtr. Span
(Ref. Drawing No.- TPCODL-HVD-0001)**

23

MATERIALS FOR 33 KV Pin Points

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	322	1,82,68,900.00
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	322	6,30,862.40
3	Top bracket 100x50x6mm GI channel (300mm each)	No.	186.00	322	59,892.00
4	Danger Plate, 1 no's.	No.	99.20	322	31,942.40
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	96.89	9,010.75
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	966.00	95,827.20
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	387.56	36,043.01
8	33KV pin insulator polymer	No.	595.20	966	5,74,963.20
9	Earthing of Support (Coil Type)	No.	205.84	322	66,280.48
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	84.36	7,845.85

ANNEXURE-8.2

Part A:-

1)Augmentation of existing 33KV Line from 100sqmm to 232sqmm with LILO of line at Charichhak PSS of length -23Ckm.

11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	466.90	45,158.57
12	232 sq.mm AAA conductor	K.M.	1,94,060.00	71.07	1,37,91,844.20
14	Black Paint	Ltr	272.80	322.0	87,841.60
15	Yellow Colour Paint for Background	Ltr	272.80	644.0	1,75,683.20
A	Total Cost of materials				3,38,82,094.86
B	Stock, Storage & Insurance i.e 3% of A				10,16,462.85
C	Sub Total (A+B)				3,48,98,557.70
D	Contingency @ 3% of C				10,46,956.73
E	Tools & Plants @ 2% of C				6,97,971.15
F	Transportation @ 7.5% of C				26,17,391.83
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				9,40,848.35
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				16,08,159.07
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				4,18,09,884.84

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	177.10	11,51,150.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	36.23	2,35,462.50
3	Dismantalling of 100/80sqmm Conductor	km	9,000.00	69.00	6,21,000.00
K	Total Civil & Services				20,07,612.50
L	Total (J+K)				4,38,17,497.34
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				26,29,049.84
N	Sub Total (L+M)				4,64,46,547.18
O	Total GST @ 18% of (N)				83,60,378.49
P	Total GST @ 1% of (N)				4,64,465.47
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				5,52,71,391.14

6% Supervision Charges Summary

1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)	3,10,190.87
2	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)	1,30,581.75
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)	1,17,074.56
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)	86,301.40
5	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)	26,29,049.84
	Total (6% supervision charges)	32,73,198.43

Gross Total Summary

1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator	65,21,246.08
2	Gross Total Material +Services (N+O+P) for 33 KV DP With Isolator	27,45,263.75
3	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle	24,61,297.58
4	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle	18,14,343.04
5	Gross Total Material +Services (N+O+P) for 33 KV Pin Points	5,52,71,391.14
Q	Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km.	
R	Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km	
S	Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each	
T	Final decision by electrical Inspector	
U	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)	6,88,13,541.59

ANNEXURE-8.2					
Cost of Construction for 1 no. of 33kV Outdoor Bay arrangement Consisting of 1 VCB and 2 isolator).					
No. of Bus isolator requirement			3		
No. of VCB Requirement			1		
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	T-1 GI Column(7.25 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel) for 33kV incoming line, Nominal Unit Wt - 0.35 MT	Nos.	26,600.00	1	26,600.00
2	T-2 GI Column (7.25mtr long, consisting of 2 Nos 175X75X6 mm channel) for 33kV incoming line -1 no, Nominal Unit Wt - 0.42 MT	Nos.	31,920.00	1	31,920.00
3	T-1A GI Column (for 33 kv Bus) (6 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel jointed by plates) Nominal Unit Wt - 0.31 MT	Nos.	23,560.00	2	47,120.00
4	T-2A GI Column (for 33 kv Bus) (6 mtr long, consisting of 2 Nos 175X75X6 mm channel jointed by plates) Nominal Unit Wt - 0.37 MT	Nos.	28,120.00	2	56,240.00
5	G-3 GI Beam(5.05mtr long, consisting of 2 Nos 150X75 X5.7mm) for 33kV incoming line - (2 nos. Beam- one for Surge Arrester and other for Isolator, Nominal Unit Wt - 0.2 MT)	Nos.	15,200.00	1	15,200.00
6	G-2 GI Beam (6.1 mtr long, consisting of 2 Nos 125X65 X5.3 mm channel jointed by plates) for 33kV Bus Stringing , Nominal Unit Wt - 0.175 MT)	Nos.	13,300.00	4	53,200.00
7	Equipment Structures (GI) For 33 KV Isolator (Unit Wt of Equipment Structures per set - 0.33 MT)	KG	76.00	990	75,240.00
8	Equipment Structures (GI) For 33 KV Vacuum Circuit Breaker (Unit Wt of Equipment Structures per set - 0.2 MT)	KG	76.00	200	15,200.00
9	GI Column for 33 KV CT (Unit Wt of Equipment Structures per set - 0.285 MT)	KG	76.00	285	21,660.00
10	GI Spikes with cone and GI (2 nos) base plate 10mm (50x3000 mm GI pipe) (Unit Wt=0.035 MT)	Nos.	3,641.92	4	14,567.67
11	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	8	10,416.00
12	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr. For Isolator/VCB , 10 metre mesh formation)= 20x2.36	KG	93.00	188.8	17,558.40
13	400 sq.mm ACSR for 33kV side jumpering and Bus Formation etc.	KM	2,61,640.00	0.1	26,164.00
14	33 kV 1250 AMP Double break (Turn & twist center rotating) isolator with earth switch with PI(Polymer)	Set	1,25,103.60	3	3,75,310.80
15	33KV Outdoor VCB-1600A, with indoor CR panel without PT, with outdoor CT (CTR- 600-300-150/1-1A, 15VA, STC 25KA/3sec, class: 0.5, 5P10) for feeder protection	EA	6,69,600.00	1	6,69,600.00
16	33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled) CLASS 0.5 / 3P, with O/P burden of 100VA	EA	31,520.80	3	94,562.40
17	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	12	1,54,008.00
18	Control Cable 10Core x 2.5 mm ²	Mtr	409.20	150	61,380.00
19	Control Cable 16Core x 2.5 mm ²	Mtr	499.72	150	74,958.00
20	Control Cable 4Core x 2.5 mm ²	Mtr	138.88	50	6,944.00
21	Control Cable 7Core x 2.5 mm ²	Mtr	43.68	50	2,184.00
22	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	18	25,668.00
23	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	18	11,160.00
24	8 bolted (M-12) "T" clamp ACSR Zebra run & 232 mm ² drop	No.	1,339.20	18	24,105.60
25	PG Clamp for 232 sq.mm AAA conductor	NO.	276.00	48	13,248.00
26	GI Nut , Bolt & Washer of different sizes (13.718 Kg each Strcutures)	K.g.	96.72	54.872	5,307.22
27	Black Paint	Ltr	272.80	4	1,091.20
28	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40
A	Total Cost of materials				19,32,795.69
B	Stock, Storage & Insurance i.e 3% of A				57,983.87
C	Sub Total (A+B)				19,90,779.56
D	Contingency @ 3% of C				59,723.39
E	Tools & Plants @ 2% of C				39,815.59
F	Transportation @ 7.5% of C				1,49,308.47

ANNEXURE-8.2					
Cost of Construction for 1 no. of 33kV Outdoor Bay arrangement Consisting of 1 VCB and 2 isolator).					
G	Erection Charges @ 5% on Trf/Breaker/Joist				34,484.40
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole/GI Earthing)				1,29,036.31
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				24,03,147.72
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
A	VCB Foundation				
1	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	7.28	3,508.96
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	4.00	800.00
3	Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.	Cum	1020.00	0.34	348.08
4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	0.46	2,334.15
5	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	2.83	18,362.50
6	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	13.25	3,988.25
7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	140.00	15,260.00
B	CT & PT Foundation			0.00	-
1	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	7.97	3,840.94
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	4.50	900.00
3	Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.	Cum	900.00	0.36	326.70
4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	0.36	1,862.19
5	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	2.36	15,356.25
6	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	14.94	4,496.94
7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	122.43	13,344.87
C	Column as per Drawing Schedule-			0.00	-
1	Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	51.31	24,731.30

ANNEXURE-8.2					
Cost of Construction for 1 no. of 33kV Outdoor Bay arrangement Consisting of 1 VCB and 2 isolator).					
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	24.00	4,800.00
3	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	2.10	10,773.00
4	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	14.18	92,137.50
5	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	89.64	26,981.64
6	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	734.58	80,069.22
D	Isolator				
1	Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	14.18	6,832.35
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	6.00	1,200.00
3	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	0.85	4,363.07
4	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	8.55	55,575.00
5	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	44.82	13,490.82
6	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	367.29	40,034.61
7	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat	No.	3700.00	8	29,600.00
K	Total Civil & Services				4,75,318.33
L	Total (J+K)				28,78,466.04
M	Other overheads (Including 6% supervision charges) of L				1,72,707.96
N	Sub Total (L+M)				30,51,174.01
O	Total GST @ 18% of (N)				5,49,211.32
P	Total Cess @ 1% of (N)				30,511.74
Q	Gross Total Material +Services (N+O+P)				36,30,897.07

ANNEXURE-8.3			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		CED	
Name of the Sub-Division : -		BADACHANA	
Name of the Work :-		Mitigation of 33kV Feeder Overloading: Proposal for conductor augmentation of 33 KV Badachana feeder of 4 CKM from 80 sq.mm, O/H, AAA conductor to 232 sq.mm, AAA conductor to mitigate overloading issue.	
Scope:-		Augmentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Chandikhole 132/33 KV, GSS to 33/11 KV, Badachana PSS.	
Names of Schemes: -		TPCODL CAPEX(FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Augmentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Chandikhole 132/33 KV, GSS to 33/11 KV, Badachana PSS.	92,30,071.27
		Total Amount	92,30,071.27
		Total Amount (In Cr)	0.92
Total estimated cost is Rs. 0.92 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-8.3				
Augmentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Chandikhole 132/33 KV, GSS to 33/11 KV, Badachana PSS.				
No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)			3	
MATERIALS FOR 33 KV DP Without Isolator				
Sl. No.	Description of Materials	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	31,200.00	6	1,87,200.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	76.00	186.42	14,167.92
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	93.00	11.8944	1,106.18
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =(5x7.14x1.96)	76.00	209.916	15,953.62
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	76.00	185.328	14,084.93
6	Danger Plate, 2 no's.	99.20	6	595.20
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	93.00	1.8054	167.90
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	155.00	6	930.00
9	H.T. Stay set (Complete)	1,302.00	6	7,812.00
10	H.T. Stay Insulator Type-C (2 No's.)	62.00	12	744.00
11	7/8 SWG Stay Wire 15kg /stay	93.00	90	8,370.00
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	1,302.00	3	3,906.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	93.00	35.4	3,292.20
14	GI barbed wire anticlimbing device 3 Kg. Per support	99.20	18	1,785.60
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	93.00	7.2216	671.61
16	33KV pin insulator polymer	595.20	9	5,356.80
17	H W fitting(B&S) 90KN,4 Bolt	620.00	18	11,160.00
18	Disc insulator (B&S) 90 KN polymer	1,426.00	18	25,668.00
19	PG Clamp for 232 sq.mm AAA conductor	1,426.00	18	25,668.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	96.72	36.783	3,557.65
21	Black Paint	272.80	3	818.40
22	Yellow Colour Paint for Background	272.80	6	1,636.80
A	Total Cost of materials			3,34,652.81
B	Stock, Storage & Insurance i.e 3% of A			10,039.58
C	Sub Total (A+B)			3,44,692.39
D	Contingency @ 3% of C			10,340.77
E	Tools & Plants @ 2% of C			6,893.85
F	Transportation @ 7.5% of C			25,851.93
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole			9,640.80
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)			12,946.15
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv			-
J	Sum of (C to I)			4,10,365.89
Civil & Services				
Sl. No.	Description of Materials	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	2,250.00	6	13,500.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	6,500.00	3.3	21,450.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	6,500.00	0.675	4,387.50

ANNEXURE-8.3				
Augmentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Chandikhole 132/33 KV, GSS to 33/11 KV, Badachana PSS.				
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	3,700.00	3	11,100.00
K	Total Civil & Services			50,437.50
L	Total (J+K)			4,60,803.39
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)			27,648.20
N	Sub Total (L+M)			4,88,451.60
O	Total GST @ 18% of (N)			87,921.29
P	Total CESS @ 1% of (N)			4,884.52
Q	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator			5,81,257.40
No. of 33 KV DP required With Isolator(Ref. Drawing No.- TPCODL-HVD-0004)		1		
<u>MATERIALS FOR 33 KV DP With Isolator</u>				
Sl. No.	Description of Materials	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	31,200.00	2	62,400.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's channel required =(2x9.56x4.3)	76.00	82.216	6,248.42
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	93.00	3.9648	368.73
4	Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 1 no's channel required =(1x7.14x4.3)	76.00	30.702	2,333.35
5	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =(2x7.14x4.3)	76.00	61.404	4,666.70
6	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 4 no's channel required =(4x7.14x4.3)	76.00	122.808	9,333.41
7	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos angle required = (4*4.5*4.927)	76.00	88.686	6,740.14
8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel required =(1x7.14x0.8)	76.00	5.712	434.11
9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 nos angle required = (1*4.5*0.388)	76.00	1.746	132.70
10	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos angle required = (1*4.5*0.340)	76.00	1.53	116.28
11	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =(2x9.56x0.5)	76.00	9.56	726.56
12	Danger Plate, 2 no's.	99.20	2	198.40
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	93.00	0.6018	55.97
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	155.00	2	310.00
15	H.T. Stay set (Complete)	1,302.00	2	2,604.00
16	H.T. Stay Insulator Type-C (2 No's.)	62.00	4	248.00
17	7/8 SWG Stay Wire 15kg /stay	93.00	30	2,790.00
18	Gi Pipe Earthing 40mm. 3 Mtr. Long	1,302.00	2	2,604.00
19	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36	93.00	56.64	5,267.52
20	GI barbed wire anticlimbing device 3 Kg. Per support	99.20	6	595.20
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	93.00	2.4072	223.87
22	Lightning Arrester(30KV,10KA) (Station Class,class-2)	12,834.00	3	38,502.00
23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	53,003.00	1	53,003.00
24	33KV pin insulator polymer	595.20	3	1,785.60
25	H W fitting(B&S) 90KN,4 Bolt	620.00	6	3,720.00
26	Disc insulator (B&S) 90 KN polymer	1,426.00	6	8,556.00

ANNEXURE-8.3				
Augmentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Chandikhole 132/33 KV, GSS to 33/11 KV, Badachana PSS.				
27	PG Clamp for 232 sq.mm AAA conductor	1,426.00	6	8,556.00
28	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	96.72	22.15	2,142.35
29	Black Paint	272.80	1	272.80
30	Yellow Colour Paint for Background	272.80	2	545.60
A	Total Cost of materials			2,25,480.70
B	Stock, Storage & Insurance i.e 3% of A			6,764.42
C	Sub Total (A+B)			2,32,245.12
D	Contingency @ 3% of C			6,967.35
E	Tools & Plants @ 2% of C			4,644.90
F	Transportation @ 7.5% of C			17,418.38
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole			3,213.60
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pole/PSC pole)			15,916.04
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv			-
J	Sum of (C to I)			2,80,405.40
<u>Civil & Services</u>				
Sl. No.	Description of Materials	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	2,250.00	2	4,500.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	6,500.00	1.1	7,150.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	6,500.00	0.225	1,462.50
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	3,700.00	2	7,400.00
K	Total Civil & Services			20,512.50
L	Total (J+K)			3,00,917.90
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)			18,055.07
N	Sub Total (L+M)			3,18,972.97
O	Total GST @ 18% of (N)			57,415.14
P	Total CESS @ 1% of (N)			3,189.73
Q	Gross Total Material +Services (N+O) for 33 KV DP With Isolator			3,79,577.84
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002)			4	
<u>MATERIALS FOR 33 KV Cut Point with 180 Degree Angle</u>				
Sl. No.	Description of Materials	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	31,200.00	4	1,24,800.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	76.00	130.016	9,881.22
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	93.00	21.1456	1,966.54
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	76.00	23.40288	1,778.62
5	Danger Plate, 1 no's.	99.20	4	396.80
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	93.00	1.2036	111.93
7	GI barbed wire anticlimbing device 3 Kg. Per support	99.20	12	1,190.40
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	93.00	4.8144	447.74
9	33KV pin insulator polymer	595.20	12	7,142.40

ANNEXURE-8.3				
Augmentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Chandikhole 132/33 KV, GSS to 33/11 KV, Badachana PSS.				
10	H W fitting(B&S)90KN,4 Bolt	620.00	24	14,880.00
11	Disc insulator (B&S)90 KN polymer	1,426.00	24	34,224.00
12	Earthing of Support (Coil Type)	205.84	4	823.36
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	93.00	1.048	97.46
14	PG Clamp for 232 sq.mm AAA conductor	1,426.00	24	34,224.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	96.72	19.516	1,887.59
16	Black Paint	272.80	4	1,091.20
17	Yellow Colour Paint for Background	272.80	8	2,182.40
A	Total Cost of materials			2,37,125.66
B	Stock, Storage & Insurance i.e 3% of A			7,113.77
C	Sub Total (A+B)			2,44,239.43
D	Contingency @ 3% of C			7,327.18
E	Tools & Plants @ 2% of C			4,884.79
F	Transportation @ 7.5% of C			18,317.96
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole			6,427.20
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)			11,569.54
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv			-
J	Sum of (C to I)			2,92,766.10
Civil & Services				
Sl. No.	Description of Materials	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	6,500.00	2.2	14,300.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	6,500.00	0.45	2,925.00
K	Total Civil & Services			17,225.00
L	Total (J+K)			3,09,991.10
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)			18,599.47
N	Sub Total (L+M)			3,28,590.57
O	Total GST @ 18% of (N)			59,146.30
P	Total CESS @ 1% of (N)			3,285.91
Q	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle			3,91,022.78
No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0003)		4		
MATERIALS FOR 33 KV Cut Point with 90 Degree Angle				
Sl. No.	Description of Materials	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	31,200.00	4	1,24,800.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's of Channel = (4x 9.56x1.7)	76.00	260.032	19,762.43
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	93.00	42.2912	3,933.08
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306)	76.00	46.80576	3,557.24
5	Danger Plate, 1 no's.	99.20	4	396.80
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	93.00	1.2036	111.93
7	GI barbed wire anticlimbing device 3 Kg. Per support	99.20	12	1,190.40
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	93.00	4.8144	447.74
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	595.20	16	9,523.20
10	H W fitting(B&S)90KN,4 Bolt	620.00	24	14,880.00
11	Disc insulator (B&S)90 KN polymer	1,426.00	24	34,224.00
12	Earthing of Support (Coil Type)	205.84	4	823.36
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	93.00	1.048	97.46

ANNEXURE-8.3				
Augmentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Chandikhole 132/33 KV, GSS to 33/11 KV, Badachana PSS.				
14	PG Clamp for 232 sq.mm AAA conductor	1,426.00	24	34,224.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	155.00	4	620.00
16	H.T. Stay set (Complete)	1,302.00	4	5,208.00
17	H.T. Stay Insulator Type-C (2 No's.)	62.00	4	248.00
18	7/8 SWG Stay Wire 15kg /stay	93.00	60	5,580.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	96.72	45.24	4,375.61
20	Black Paint	272.80	4	1,091.20
21	Yellow Colour Paint for Background	272.80	8	2,182.40
A	Total Cost of materials			2,67,276.86
B	Stock, Storage & Insurance i.e 3% of A			8,018.31
C	Sub Total (A+B)			2,75,295.17
D	Contingency @ 3% of C			8,258.86
E	Tools & Plants @ 2% of C			5,505.90
F	Transportation @ 7.5% of C			20,647.14
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole			6,427.20
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)			13,474.55
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv			-
J	Sum of (C to I)			3,29,608.81
<u>Civil & Services</u>				
Sl. No.	Description of Materials	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	6,500.00	2.20	14,300.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	6,500.00	0.45	2,925.00
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	2,250.00	4	9,000.00
K	Total Civil & Services			26,225.00
L	Total (J+K)			3,55,833.81
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)			21,350.03
N	Sub Total (L+M)			3,77,183.84
O	Total GST @ 18% of (N)			67,893.09
P	Total CESS @ 1% of (N)			3,771.84
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle			4,48,848.77
33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No.- TPCODL-HVD-0001)			4	
<u>MATERIALS FOR 33 KV Pin Points</u>				
Sl. No.	Description of Materials	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	31,200.00	56	17,47,200.00
2	33 KV V cross Arm (GI) 22Kg each	1,959.20	56	1,09,715.20
3	Top bracket 100x50x6mm GI channel (2kg each)	186.00	56	10,416.00
4	Danger Plate, 1 no's.	99.20	56	5,555.20
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	93.00	16.85	1,567.09
6	GI barbed wire anticlimbing device 3 Kg. Per support	99.20	168.00	16,665.60
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	93.00	67.40	6,268.35
8	33KV pin insulator polymer	595.20	168	99,993.60
9	Earthing of Support (Coil Type)	205.84	56	11,527.04

ANNEXURE-8.3				
Augmentation of existing Badachana Feeder of 4 CKM from 80 sq.mm, AAAC to 232 sq.mm from Chandikhole 132/33 KV, GSS to 33/11 KV, Badachana PSS.				
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	93.00	14.67	1,364.50
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	96.72	81.20	7,853.66
12	232 sq.mm AAA conductor	1,94,060.00	12.36	23,98,581.60
13	Crimping type Midspan Compression Joint for 232 sq.mm AAA conductor	648.42		-
14	Black Paint	272.80	56.0	15,276.80
15	Yellow Colour Paint for Background	272.80	112.0	30,553.60
A	Total Cost of materials			44,62,538.24
B	Stock, Storage & Insurance i.e 3% of A			1,33,876.15
C	Sub Total (A+B)			45,96,414.38
D	Contingency @ 3% of C			1,37,892.43
E	Tools & Plants @ 2% of C			91,928.29
F	Transportation @ 7.5% of C			3,44,731.08
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole			89,980.80
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)			2,79,679.84
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv			-
J	Sum of (C to I)			55,40,626.82
Civil & Services				
Sl. No.	Description of Materials	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	6,500.00	30.80	2,00,200.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	6,500.00	6.30	40,950.00
	Dismantalling of 80sqmm Conductor	9,000.00	12.00	1,08,000.00
K	Total Civil & Services			3,49,150.00
L	Total (J+K)			58,89,776.82
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)			3,53,386.61
N	Sub Total (L+M)			62,43,163.43
O	Total GST @ 18% of (N)			11,23,769.42
P	Total CESS @ 1% of (N)			62,431.63
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points			74,29,364.48
6% Supervision Charges Summary				
1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)			27,648.20
2	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)			18,055.07
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)			18,599.47
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)			21,350.03
5	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)			3,53,386.61
	Total (6% supervision charges)			4,39,039.38
Gross Total Summary				
1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator			5,81,257.40
2	Gross Total Material +Services (N+O) for 33 KV DP With Isolator			3,79,577.84
3	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle			3,91,022.78
4	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle			4,48,848.77
5	Gross Total Material +Services (N+O+P) for 33 KV Pin Points			74,29,364.48
Q	Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km.			
R	Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km			
S	Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each			
T	Final decision by electrical Inspector			
U	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)			92,30,071.27

ANNEXURE-8.4			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		AED	
Name of the Sub-Division : -		AED,ATHAGARH	
Name of the Work :-		Mitigation of 33kV Feeder Overloading: Proposal for augmentation of existing 33 kV Khuntuni Feeder from Khuntuni GSS to Khuntuni PSS for providing reliable power supply.	
Scope:-		1.Augmenation of existing Khuntuni Feeder of 4.5 CKM from 100 sq.mm, AAAC to 232 sq.mm from 132/33 KV, Khuntuni GSS to 33/11 KV, Khuntuni PSS. 2. Laying of 33 KV U/G line of 0.12 km using 1CX630 sq.mm, XLPE cable without spare and Installation of 2 nos of 33KV, 4 WAY RMU at Khuntuni PSS. 3. Laying of 33 KV U/G line of 0.60 km using 1CX400 sq.mm, XLPE cable without spare.	
Names of Schemes: -		TPCODL CAPEX(FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Augmenation of existing Khuntuni Feeder of 4.5 CKM from 100 sq.mm, AAAC to 232 sq.mm from 132/33 KV, Khuntuni GSS to 33/11 KV, Khuntuni PSS.	1,09,15,984.25
2	B	Part-B Laying of 33 KV U/G line of 0.12 km using 1CX630 sq.mm, XLPE cable without spare and Installation of 2 nos of 33KV, 4 WAY RMU at Khuntuni PSS.	91,30,614.96
3	C	Part-C Laying of 33 KV U/G line of 0.60 km using 1CX400 sq.mm, XLPE cable without spare.	7,56,143.07
		Total Amount	2,08,02,742.28
		Total Amount (In Cr)	2.08
Total estimated cost is Rs. 2.08 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-8.4					
Augmenation of Khuntini Feeder of 4.5 CKM from 100 sq.mm, AAAC to 232 sq.mm from 132/33 KV, Khuntuni GSS to 33/11 KV, Khuntuni PSS.					
No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)			4		
MATERIALS FOR 33 KV DP Without Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	8	2,49,600.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	248.56	18,890.56
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	15.8592	1,474.91
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =(5x7.14x1.96)	KG	76.00	279.888	21,271.49
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	247.104	18,779.90
6	Danger Plate, 2 no's.	No.	99.20	8	793.60
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	2.4072	223.87
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	8	1,240.00
9	H.T. Stay set (Complete)	Set	1,302.00	8	10,416.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	16	992.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	120	11,160.00
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	4	5,208.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	47.2	4,389.60
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	24	2,380.80
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	9.6288	895.48
16	33KV pin insulator polymer	No.	595.20	12	7,142.40
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	24	14,880.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	24	34,224.00
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	49.044	4,743.54
21	Black Paint	Ltr	272.80	4	1,091.20
22	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40
A	Total Cost of materials				4,46,203.74
B	Stock, Storage & Insurance i.e 3% of A				13,386.11
C	Sub Total (A+B)				4,59,589.85
D	Contingency @ 3% of C				13,787.70
E	Tools & Plants @ 2% of C				9,191.80
F	Transportation @ 7.5% of C				34,469.24
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				12,854.40
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				17,261.54
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				5,47,154.52
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	8	18,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	4.4	28,600.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.9	5,850.00

ANNEXURE-8.4					
Augmenation of Khuntini Feeder of 4.5 CKM from 100 sq.mm, AAAC to 232 sq.mm from 132/33 KV, Khuntuni GSS to 33/11 KV, Khuntuni PSS.					
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	4	14,800.00
K	Total Civil & Services				67,250.00
L	Total (J+K)				6,14,404.52
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				36,864.27
N	Sub Total (L+M)				6,51,268.79
O	Total GST @ 18% of (N)				1,17,228.38
P	Total CESS @ 1% of (N)				6,512.69
Q	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				7,75,009.86
No. of 33 KV DP required With Isolator(Ref. Drawing No.- TPCODL-HVD-0004)		2			
MATERIALS FOR 33 KV DP With Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	4	1,24,800.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's channel required =(2x9.56x4.3)	KG	76.00	164.432	12,496.83
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	7.9296	737.45
4	Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 1 no's channel required =(1x7.14x4.3)	KG	76.00	61.404	4,666.70
5	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =(2x7.14x4.3)	KG	76.00	122.808	9,333.41
6	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 4 no's channel required =(4x7.14x4.3)	KG	76.00	245.616	18,666.82
7	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos angle required = (4*4.5*4.927)	KG	76.00	177.372	13,480.27
8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel required =(1x7.14x0.8)	KG	76.00	11.424	868.22
9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 nos angle required = (1*4.5*0.388)	KG	76.00	3.492	265.39
10	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos angle required = (1*4.5*0.340)	KG	76.00	3.06	232.56
11	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =(2x9.56x0.5)	KG	76.00	19.12	1,453.12
12	Danger Plate, 2 no's.	No.	99.20	4	396.80
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	1.2036	111.93
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	4	620.00
15	H.T. Stay set (Complete)	Set	1,302.00	4	5,208.00
16	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	8	496.00
17	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	60	5,580.00
18	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	4	5,208.00
19	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36	KG	93.00	113.28	10,535.04
20	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	12	1,190.40
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	4.8144	447.74
22	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	6	77,004.00
23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	53,003.00	2	1,06,006.00
24	33KV pin insulator polymer	No.	595.20	6	3,571.20
25	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	12	7,440.00
26	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	12	17,112.00

ANNEXURE-8.4					
Augmenation of Khuntini Feeder of 4.5 CKM from 100 sq.mm, AAAC to 232 sq.mm from 132/33 KV, Khuntuni GSS to 33/11 KV, Khuntuni PSS.					
27	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	12	17,112.00
28	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	96.72	44.3	4,284.70
29	Black Paint	Ltr	272.80	2	545.60
30	Yellow Colour Paint for Background	Ltr	272.80	4	1,091.20
A	Total Cost of materials				4,50,961.39
B	Stock, Storage & Insurance i.e 3% of A				13,528.84
C	Sub Total (A+B)				4,64,490.23
D	Contingency @ 3% of C				13,934.71
E	Tools & Plants @ 2% of C				9,289.80
F	Transportation @ 7.5% of C				34,836.77
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				6,427.20
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pole/PSC pole)				31,832.09
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				5,60,810.80
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	4	9,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.2	14,300.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	4	14,800.00
K	Total Civil & Services				41,025.00
L	Total (J+K)				6,01,835.80
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)				36,110.15
N	Sub Total (L+M)				6,37,945.95
O	Total GST @ 18% of (N)				1,14,830.27
P	Total CESS @ 1% of (N)				6,379.46
Q	Gross Total Material +Services (N+O) for 33 KV DP With Isolator				7,59,155.68
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002)		4			
MATERIALS FOR 33 KV Cut Point with 180 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	4	1,24,800.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	130.016	9,881.22
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	93.00	21.1456	1,966.54
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	23.40288	1,778.62
5	Danger Plate, 1 no's.	No.	99.20	4	396.80
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.2036	111.93
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	12	1,190.40
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	4.8144	447.74
9	33KV pin insulator polymer	No.	595.20	12	7,142.40
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	24	14,880.00

ANNEXURE-8.4

Augmentation of Khuntini Feeder of 4.5 CKM from 100 sq.mm, AAAC to 232 sq.mm from 132/33 KV, Khuntuni GSS to 33/11 KV, Khuntuni PSS.

11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	24	34,224.00
12	Earthing of Support (Coil Type)	EA	205.84	4	823.36
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.048	97.46
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	19.516	1,887.59
16	Black Paint	Ltr	272.80	4	1,091.20
17	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40
A	Total Cost of materials				2,37,125.66
B	Stock, Storage & Insurance i.e 3% of A				7,113.77
C	Sub Total (A+B)				2,44,239.43
D	Contingency @ 3% of C				7,327.18
E	Tools & Plants @ 2% of C				4,884.79
F	Transportation @ 7.5% of C				18,317.96
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				6,427.20
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				11,569.54
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				2,92,766.10

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.2	14,300.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
K	Total Civil & Services				17,225.00
L	Total (J+K)				3,09,991.10
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				18,599.47
N	Sub Total (L+M)				3,28,590.57
O	Total GST @ 18% of (N)				59,146.30
P	Total CESS @ 1% of (N)				3,285.91
Q	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle				3,91,022.78

**No. of 33 KV Cut Point with 90 Degree Angle
(Ref. Drawing No.- TPCODL-HVD-0003)**

4

MATERIALS FOR 33 KV Cut Point with 90 Degree Angle

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	4	1,24,800.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	260.032	19,762.43
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	42.2912	3,933.08
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306)	K.g.	76.00	46.80576	3,557.24
5	Danger Plate, 1 no's.	No.	99.20	4	396.80
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.2036	111.93
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	12	1,190.40
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	4.8144	447.74
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	16	9,523.20
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	24	14,880.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	24	34,224.00
12	Earthing of Support (Coil Type)	No.	205.84	4	823.36
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.048	97.46
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00

ANNEXURE-8.4

Augmentation of Khuntini Feeder of 4.5 CKM from 100 sq.mm, AAAC to 232 sq.mm from 132/33 KV, Khuntuni GSS to 33/11 KV, Khuntuni PSS.

15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	4	620.00
16	H.T. Stay set (Complete)	Set	1,302.00	4	5,208.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	4	248.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	60	5,580.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	45.24	4,375.61
20	Black Paint	Ltr	272.80	4	1,091.20
21	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40
A	Total Cost of materials				2,67,276.86
B	Stock, Storage & Insurance i.e 3% of A				8,018.31
C	Sub Total (A+B)				2,75,295.17
D	Contingency @ 3% of C				8,258.86
E	Tools & Plants @ 2% of C				5,505.90
F	Transportation @ 7.5% of C				20,647.14
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				6,427.20
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				13,474.55
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				3,29,608.81

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.20	14,300.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	4	9,000.00
K	Total Civil & Services				26,225.00
L	Total (J+K)				3,55,833.81
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				21,350.03
N	Sub Total (L+M)				3,77,183.84
O	Total GST @ 18% of (N)				67,893.09
P	Total CESS @ 1% of (N)				3,771.84
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle				4,48,848.77

33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No.- TPCODL-HVD-0001)

4.5

MATERIALS FOR 33 KV Pin Points

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	63	19,65,600.00
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	63	1,23,429.60
3	Top bracket 100x50x6mm GI channel (2kg each)	No.	186.00	63	11,718.00
4	Danger Plate, 1 no's.	No.	99.20	63	6,249.60
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	18.96	1,762.97
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	189.00	18,748.80
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	75.83	7,051.89
8	33KV pin insulator polymer	No.	595.20	189	1,12,492.80
9	Earthing of Support (Coil Type)	No.	205.84	63	12,967.92
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	16.51	1,535.06
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	91.35	8,835.37
12	232 sq.mm AAA conductor	K.M.	1,94,060.00	13.91	26,98,404.30

ANNEXURE-8.4					
Augmenation of Khuntini Feeder of 4.5 CKM from 100 sq.mm, AAAC to 232 sq.mm from 132/33 KV, Khuntuni GSS to 33/11 KV, Khuntuni PSS.					
13	Crimping type Midspan Compression Joint for 232 sq.mm AAA conductor	EA	648.42		-
14	Black Paint	Ltr	272.80	63.0	17,186.40
15	Yellow Colour Paint for Background	Ltr	272.80	126.0	34,372.80
A	Total Cost of materials				50,20,355.52
B	Stock, Storage & Insurance i.e 3% of A				1,50,610.67
C	Sub Total (A+B)				51,70,966.18
D	Contingency @ 3% of C				1,55,128.99
E	Tools & Plants @ 2% of C				1,03,419.32
F	Transportation @ 7.5% of C				3,87,822.46
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,01,228.40
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				3,14,639.82
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				62,33,205.17
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	34.65	2,25,225.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	7.09	46,068.75
	Dismantalling of 100/80sqmm Conductor	km	9,000.00	13.50	1,21,500.00
K	Total Civil & Services				5,38,593.75
L	Total (J+K)				67,71,798.92
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				4,06,307.94
N	Sub Total (L+M)				71,78,106.86
O	Total GST @ 18% of (N)				12,92,059.23
P	Total CESS @ 1% of (N)				71,781.07
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				85,41,947.16
6% Supervision Charges Summary					
1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				36,864.27
2	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)				36,110.15
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				18,599.47
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				21,350.03
5	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				4,06,307.94
	Total (6% supervision charges)				5,19,231.85
Gross Total Summary					
1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				7,75,009.86
2	Gross Total Material +Services (N+O) for 33 KV DP With Isolator				7,59,155.68
3	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle				3,91,022.78
4	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle				4,48,848.77
5	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				85,41,947.16
Q	Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km.				
R	Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km				
S	Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each				
T	Final decision by electrical Inspector				
U	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)				1,09,15,984.25

ANNEXURE-8.4					
Part-B					
Laying of 33 KV U/G line of 0.12 km using 1CX630 sq.mm, XLPE cable without spare and Installation of 2 nos of 33KV, 4 WAY RMU at Khuntuni PSS.					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories				
a	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	90		
b	Length of 33kV 1C, 630sqmm cable (HDD)	Mtr.	30		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA- 20kA)	Mtr.	360	1,337.13	4,81,366.80
1.2	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	12	5,245.00	62,940.00
1.3	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	18	4,894.00	88,092.00
2	Supply of 33kV RMU				
a	No. of 33kV 3Way RMU (LLV+M)	nos.			
b	No. of 33kV 4Way RMU (LLVV+M)	nos.			
c	No. of 33kV 3Way RMU (LLV)	nos.			
d	No. of 33kV 4Way RMU (LLVV)	nos.	2		
e	No. of 33kV 3Way RMU (LLL)	nos.			
f	No. of 33kV 4Way RMU (LLLL)	nos.			
2.1	Supply of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	31,74,874.00	-
2.3	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	17,87,101.00	-
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	2	23,35,264.00	46,70,528.00
2.5	Supply of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	14,46,210.00	-
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	19,59,421.00	-
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	26.40	93.00	2,455.20
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	4	1,302.00	5,208.00
4	FRTU and OFC for RMU SCADA Automation				
4.1	Supply of 12 core fibre optic cable single mode, duct type, fibre armoured laid along UG cable.	Mtr.		22.00	-
4.2	Supply of HDPE PLB duct of size 32/26mm for laying of OFC Cables.	Mtr.	0.0	77.99	-
4.3	Supply of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0	6,766.00	-
4.4	Supply of end Connector and accessories for OFC connection at RMU,	Set	4	7,535.00	30,140.00
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	2	2,19,420.00	4,38,840.00

ANNEXURE-8.4					
Part-B					
Laying of 33 KV U/G line of 0.12 km using 1CX630 sq.mm, XLPE cable without spare and Installation of 2 nos of 33KV, 4 WAY RMU at Khuntuni PSS.					
	Sub Total (Supply Portion) (in Rs.)				57,79,570.00
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by open trench method .	Mtr.	270	94.50	25,515.00
1.2	Erection of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits	Set	0	2,400.00	-
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	18	2,081.70	37,470.60
1.5	Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruded type) UG cable including looping at cable terminations and straight through joints by HDD method with HDPE pipe (110mm dia, PN8 PE80) for laying of individual run of UG cable at main road and unaccessible place.	Mtr.	90	2,300.00	2,07,000.00
1.6	Laying of 110mm dia PE 80-PN8, HDPE pipe inside open trench.	Mtr.	0.00	300.00	-
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.1	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	15,000.00	-
2.2	Erection of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	15,000.00	-
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	8,000.00	-
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	2	8,000.00	16,000.00
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	-
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	8,000.00	-
3	FRTU and OFC for RMU SCADA Automation				
3.1	Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD	Mtr.	0.0	82.00	-
3.2	Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0.0	612.54	-
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	4.0	1,225.07	4,900.28
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	2.0	6,124.36	12,248.72
	Sub Total (Erection Portion) (in Rs.)				3,28,115.00
Civil Portion					

ANNEXURE-8.4					
Part-B					
Laying of 33 KV U/G line of 0.12 km using 1CX630 sq.mm, XLPE cable without spare and Installation of 2 nos of 33KV, 4 WAY RMU at Khuntuni PSS.					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	75.6	700.00	52,920.00
1.1.b	Earth work excavation of hard rock	Cum	32.4	1,720.00	55,728.00
1.2	Back filling with excavated soil outside and above the trench	Cum	108	202.00	21,816.00
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	0	2,643.67	-
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kv RMU	Nos.	2	23,145.30	46,290.60
3	Supply of GI Fencing with Gate around each RMU	sqmtr		3,600.00	-
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	4	3,700.00	14,800.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	96	1,463.40	1,40,486.40
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.		1,012.00	-
	Sub Total (Civil Portion) (in Rs.)				3,32,041.00
A	Sub Total (Supply Portion)				57,79,570.00
B	Stock, Storage & Insurance @ 3 % of A				1,73,387.10
C	Sub Total (A+B)				59,52,957.10
D	Contingency @ 3 % of C				1,78,588.71
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				50.58
F	Transportation @ 7.5% of C				4,46,471.78
G	Erection Charges @ 10% of earthing items				252.89
H	Total (C+D+E+F+G)				65,78,321.06
I	Sub Total (Erection Portion + Civil Portion)				6,60,156.00
J	Total Cost (H+I)				72,38,477.06
K	Other Overhead /(including Supervision Charges) @ 6 % of J				4,34,308.62
L	Total Estimated Capital Cost i.e. (J+K)				76,72,785.68
M	GST @ 18% of L				13,81,101.42
M1	CESS @ 1% of L				76,727.86
N	Grand Total (L+M+M1)				91,30,614.96

ANNEXURE-8.4

Part-C

Laying of 33 KV U/G line of 0.60 km using 1CX400 sq.mm, XLPE cable without spare.

Supply Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable with accessories				
<i>a</i>	<i>Length of 33kV 1C, 400sqmm cable (open trench)</i>	<i>Mtr.</i>	<i>60</i>		
<i>b</i>	<i>Length of 33kV 1C, 400sqmm cable (HDD)</i>	<i>Mtr.</i>			
1.1	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	180	970.92	1,74,765.60
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	9	8,517.56	76,658.04
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	9	6,488.92	58,400.28
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV UG cable	Mtr.		357.60	-
2	Supply of 33kV RMU				
<i>a</i>	<i>No. of 33kV 3Way RMU (LLV+M)</i>	<i>nos.</i>			
<i>b</i>	<i>No. of 33kV 4Way RMU (LLVV+M)</i>	<i>nos.</i>			
<i>c</i>	<i>No. of 33kV 3Way RMU (LLV)</i>	<i>nos.</i>			
<i>d</i>	<i>No. of 33kV 4Way RMU (LLVV)</i>	<i>nos.</i>			
<i>e</i>	<i>No. of 33kV 3Way RMU (LLL)</i>	<i>nos.</i>			
<i>f</i>	<i>No. of 33kV 4Way RMU (LLLL)</i>	<i>nos.</i>			
2.1	Supply of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	31,74,874.00	-
2.3	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	17,87,101.00	-
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	23,35,264.00	-
2.5	Supply of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	14,46,210.00	-
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	19,59,421.00	-
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	0.00	93.00	-
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	0	1,302.00	-
4	FRTU and OFC for RMU SCADA Automation				
4.1	Supply of 12 core fibre optic cable single mode, duct type, fibre armoured laid along UG cable.	Mtr.		22.00	-
4.2	Supply of HDPE PLB duct of size 32/26mm for laying of OFC Cables.	Mtr.	0.0	77.99	-
4.3	Supply of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0	6,766.00	-
4.4	Supply of end Connector and accessories for OFC connection at RMU,	Set	0	7,535.00	-
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	0	2,19,420.00	-

ANNEXURE-8.4					
Part-C					
Laying of 33 KV U/G line of 0.60 km using 1CX400 sq.mm, XLPE cable without spare.					
	Sub Total (Supply Portion) (in Rs.)				3,09,823.92
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 400sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 400sqmm, XLPE insulation (extruded type) UG cable in trefoil formation by open trench method.	Mtr.	180	94.50	17,010.00
1.2	Erection of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, aluminium UG cable kits	Set	0	2,400.00	-
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	9	2,081.70	18,735.30
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	9	2,081.70	18,735.30
1.5	Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 400sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) including looping at cable terminations and straight through joints by HDD method with HDPE pipe (110mm dia, PN8 PE80) for laying of individual run of UG cable at main road and unaccessible place.	Mtr.	0	2,300.00	-
1.6	Laying of 110mm dia PE 80-PN8, HDPE pipe inside open trench.	Mtr.	0	300.00	-
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.1	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	15,000.00	-
2.2	Erection of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	15,000.00	-
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	8,000.00	-
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	8,000.00	-
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	-
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	8,000.00	-
3	FRTU and OFC for RMU SCADA Automation				
3.1	Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD	Mtr.	0.0	82.00	-
3.2	Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0.0	612.54	-
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	0.0	1,225.07	-
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	0.0	6,124.36	-
	Sub Total (Erection Portion) (in Rs.)				54,480.60
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)

ANNEXURE-8.4					
Part-C					
Laying of 33 KV U/G line of 0.60 km using 1CX400 sq.mm, XLPE cable without spare.					
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	50.4	700.00	35,280.00
1.1.b	Earth work excavation of hard rock	Cum	21.6	1,720.00	37,152.00
1.2	Back filling with excavated soil outside and above the trench	Cum	72	202.00	14,544.00
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr		2,643.67	-
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	0	23,145.30	-
3	Supply of GI Fencing with Gate around each RMU	sqmtr	0	3,600.00	-
4	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	0	3,700.00	-
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	72	1,463.40	1,05,364.80
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.		1,012.00	-
	Sub Total (Civil Portion) (in Rs.)				1,92,340.80
A	Sub Total (Supply Portion)				3,09,823.92
B	Stock, Storage & Insurance @ 3 % of A				9,294.72
C	Sub Total (A+B)				3,19,118.64
D	Contingency @ 3 % of C				9,573.56
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				23,933.90
G	Erection Charges @ 10% of earthing items				-
H	Total (C+D+E+F+G)				3,52,626.09
I	Sub Total (Erection Portion + Civil Portion)				2,46,821.40
J	Total Cost (H+I)				5,99,447.49
K	Other Overhead /(including Supervision Charges) @ 6 % of J				35,966.85
L	Total Estimated Capital Cost i.e. (J+K)				6,35,414.34
M	GST @ 18% of L				1,14,374.58
M1	CESS @ 1% of L				6,354.14
N	Grand Total (L+M+M1)				7,56,143.07

ANNEXURE-8.5			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		CED	
Name of the Sub-Division :-		CHOUDWAR	
Name of the Work :-		Mitigation of 33kV Feeder Overloading: Proposal for augmentation of existing 33 kV Choudwar Feeder from Choudwar GSS to Choudwar PSS for providing reliable power supply.	
Scope:-		Augmenation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm from Choudwar 132/33 KV, GSS to 33/11 KV, Choudwar PSS.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Augmenation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm from Choudwar 132/33 KV, GSS to 33/11 KV, Choudwar PSS.	22,69,171.09
		Total Amount	22,69,171.09
		Total Amount (In Cr)	0.23
Total estimated cost is Rs. 0.23 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-8.5					
Augmenation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm from Choudwar 132/33 KV, GSS to 33/11 KV, Choudwar PSS.					
No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)			1		
MATERIALS FOR 33 KV DP Without Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	2	62,400.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	62.14	4,722.64
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	3.9648	368.73
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =(5x7.14x1.96)	KG	76.00	69.972	5,317.87
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	61.776	4,694.98
6	Danger Plate, 2 no's.	No.	99.20	2	198.40
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	0.6018	55.97
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	2	310.00
9	H.T. Stay set (Complete)	Set	1,302.00	2	2,604.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	4	248.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	30	2,790.00
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	11.8	1,097.40
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	6	595.20
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	2.4072	223.87
16	33KV pin insulator polymer	No.	595.20	3	1,785.60
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	6	3,720.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	6	8,556.00
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	6	8,556.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	12.261	1,185.88
21	Black Paint	Ltr	272.80	1	272.80
22	Yellow Colour Paint for Background	Ltr	272.80	2	545.60
A	Total Cost of materials				1,11,550.94
B	Stock, Storage & Insurance i.e 3% of A				3,346.53
C	Sub Total (A+B)				1,14,897.46
D	Contingency @ 3% of C				3,446.92
E	Tools & Plants @ 2% of C				2,297.95
F	Transportation @ 7.5% of C				8,617.31
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				3,213.60
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				4,315.38
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				1,36,788.63
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	2	4,500.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	1.1	7,150.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.225	1,462.50

ANNEXURE-8.5					
Augmentation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm from Choudwar 132/33 KV, GSS to 33/11 KV, Choudwar PSS.					
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	1	3,700.00
K	Total Civil & Services				16,812.50
L	Total (J+K)				1,53,601.13
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				9,216.07
N	Sub Total (L+M)				1,62,817.20
O	Total GST @ 18% of (N)				29,307.10
P	Total CESS @ 1% of (N)				1,628.17
Q	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				1,93,752.47
No. of 33 KV DP required With Isolator(Ref. Drawing No.- TPCODL-HVD-0004)		1			
MATERIALS FOR 33 KV DP With Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	2	62,400.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's channel required =(2x9.56x4.3)	KG	76.00	82.216	6,248.42
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	3.9648	368.73
4	Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 1 no's channel required =(1x7.14x4.3)	KG	76.00	30.702	2,333.35
5	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =(2x7.14x4.3)	KG	76.00	61.404	4,666.70
6	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 4 no's channel required =(4x7.14x4.3)	KG	76.00	122.808	9,333.41
7	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos angle required = (4*4.5*4.927)	KG	76.00	88.686	6,740.14
8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel required =(1x7.14x0.8)	KG	76.00	5.712	434.11
9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 nos angle required = (1*4.5*0.388)	KG	76.00	1.746	132.70
10	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos angle required = (1*4.5*0.340)	KG	76.00	1.53	116.28
11	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =(2x9.56x0.5)	KG	76.00	9.56	726.56
12	Danger Plate, 2 no's.	No.	99.20	2	198.40
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	0.6018	55.97
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	2	310.00
15	H.T. Stay set (Complete)	Set	1,302.00	2	2,604.00
16	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	4	248.00
17	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	30	2,790.00
18	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	2	2,604.00
19	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36	KG	93.00	56.64	5,267.52
20	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	6	595.20
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	2.4072	223.87
22	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	3	38,502.00
23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	53,003.00	1	53,003.00
24	33KV pin insulator polymer	No.	595.20	3	1,785.60
25	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	6	3,720.00
26	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	6	8,556.00

ANNEXURE-8.5					
Augmenation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm from Choudwar 132/33 KV, GSS to 33/11 KV, Choudwar PSS.					
27	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	6	8,556.00
28	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	96.72	22.15	2,142.35
29	Black Paint	Ltr	272.80	1	272.80
30	Yellow Colour Paint for Background	Ltr	272.80	2	545.60
A	Total Cost of materials				2,25,480.70
B	Stock, Storage & Insurance i.e 3% of A				6,764.42
C	Sub Total (A+B)				2,32,245.12
D	Contigency @ 3% of C				6,967.35
E	Tools & Plants @ 2% of C				4,644.90
F	Transportation @ 7.5% of C				17,418.38
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				3,213.60
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pole/PSC pole)				15,916.04
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				2,80,405.40
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	2	4,500.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	1.1	7,150.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.225	1,462.50
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	2	7,400.00
K	Total Civil & Services				20,512.50
L	Total (J+K)				3,00,917.90
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)				18,055.07
N	Sub Total (L+M)				3,18,972.97
O	Total GST @ 18% of (N)				57,415.14
P	Total CESS @ 1% of (N)				3,189.73
Q	Gross Total Material +Services (N+O) for 33 KV DP With Isolator				3,79,577.84
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002)				1	
MATERIALS FOR 33 KV Cut Point with 180 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	1	31,200.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	32.504	2,470.30
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	93.00	5.2864	491.64
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	5.85072	444.65
5	Danger Plate, 1 no's.	No.	99.20	1	99.20
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	0.3009	27.98
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	3	297.60
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	1.2036	111.93
9	33KV pin insulator polymer	No.	595.20	3	1,785.60
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	6	3,720.00

ANNEXURE-8.5					
Augmentation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm from Choudwar 132/33 KV, GSS to 33/11 KV, Choudwar PSS.					
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	6	8,556.00
12	Earthing of Support (Coil Type)	EA	205.84	1	205.84
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	0.262	24.37
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	6	8,556.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	4.879	471.90
16	Black Paint	Ltr	272.80	1	272.80
17	Yellow Colour Paint for Background	Ltr	272.80	2	545.60
A	Total Cost of materials				59,281.42
B	Stock, Storage & Insurance i.e 3% of A				1,778.44
C	Sub Total (A+B)				61,059.86
D	Contingency @ 3% of C				1,831.80
E	Tools & Plants @ 2% of C				1,221.20
F	Transportation @ 7.5% of C				4,579.49
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,606.80
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				2,892.39
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				73,191.53
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	0.55	3,575.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.1125	731.25
K	Total Civil & Services				4,306.25
L	Total (J+K)				77,497.78
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				4,649.87
N	Sub Total (L+M)				82,147.64
O	Total GST @ 18% of (N)				14,786.58
P	Total CESS @ 1% of (N)				821.48
Q	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle				97,755.69
No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0003)		1			
MATERIALS FOR 33 KV Cut Point with 90 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	1	31,200.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	65.008	4,940.61
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	10.5728	983.27
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306)	K.g.	76.00	11.70144	889.31
5	Danger Plate, 1 no's.	No.	99.20	1	99.20
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	0.3009	27.98
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	3	297.60
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	1.2036	111.93
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	4	2,380.80
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	6	3,720.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	6	8,556.00
12	Earthing of Support (Coil Type)	No.	205.84	1	205.84
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	0.262	24.37
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	6	8,556.00

ANNEXURE-8.5					
Augmenation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm from Choudwar 132/33 KV, GSS to 33/11 KV, Choudwar PSS.					
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	1	155.00
16	H.T. Stay set (Complete)	Set	1,302.00	1	1,302.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	1	62.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	15	1,395.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	11.31	1,093.90
20	Black Paint	Ltr	272.80	1	272.80
21	Yellow Colour Paint for Background	Ltr	272.80	2	545.60
A	Total Cost of materials				66,819.22
B	Stock, Storage & Insurance i.e 3% of A				2,004.58
C	Sub Total (A+B)				68,823.79
D	Contingency @ 3% of C				2,064.71
E	Tools & Plants @ 2% of C				1,376.48
F	Transportation @ 7.5% of C				5,161.78
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,606.80
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				3,368.64
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				82,402.20
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	0.55	3,575.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.11	731.25
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	1	2,250.00
K	Total Civil & Services				6,556.25
L	Total (J+K)				88,958.45
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				5,337.51
N	Sub Total (L+M)				94,295.96
O	Total GST @ 18% of (N)				16,973.27
P	Total CESS @ 1% of (N)				942.96
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle				1,12,212.19
33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No.- TPCODL-HVD-0001)			0.8		
MATERIALS FOR 33 KV Pin Points					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	11	3,49,440.00
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	11	21,943.04
3	Top bracket 100x50x6mm GI channel (2kg each)	No.	186.00	11	2,083.20
4	Danger Plate, 1 no's.	No.	99.20	11	1,111.04
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.37	313.42
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	33.60	3,333.12
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	13.48	1,253.67
8	33KV pin insulator polymer	No.	595.20	34	19,998.72
9	Earthing of Support (Coil Type)	No.	205.84	11	2,305.41
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	2.93	272.90
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	16.24	1,570.73

ANNEXURE-8.5					
Augmentation of existing Choudwar Feeder of 0.8 CKM from 100 sq.mm, AAAC to 232 sq.mm from Choudwar 132/33 KV, GSS to 33/11 KV, Choudwar PSS.					
12	232 sq.mm AAA conductor	K.M.	1,94,060.00	2.47	4,79,716.32
13	Crimping type Midspan Compression Joint for 232 sq.mm AAA conductor	EA	648.42		-
14	Black Paint	Ltr	272.80	11.2	3,055.36
15	Yellow Colour Paint for Background	Ltr	272.80	22.4	6,110.72
A	Total Cost of materials				8,92,507.65
B	Stock, Storage & Insurance i.e 3% of A				26,775.23
C	Sub Total (A+B)				9,19,282.88
D	Contingency @ 3% of C				27,578.49
E	Tools & Plants @ 2% of C				18,385.66
F	Transportation @ 7.5% of C				68,946.22
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				17,996.16
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				55,935.97
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				11,08,125.36
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	6.16	40,040.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.26	8,190.00
	Dismantalling of 80sqmm Conductor	km	9,000.00	2.40	21,600.00
K	Total Civil & Services				69,830.00
L	Total (J+K)				11,77,955.36
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				70,677.32
N	Sub Total (L+M)				12,48,632.69
O	Total GST @ 18% of (N)				2,24,753.88
P	Total CESS @ 1% of (N)				12,486.33
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				14,85,872.90
6% Supervision Charges Summary					
1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				9,216.07
2	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)				18,055.07
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				4,649.87
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				5,337.51
5	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				70,677.32
	Total (6% supervision charges)				1,07,935.84
Gross Total Summary					
1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				1,93,752.47
2	Gross Total Material +Services (N+O) for 33 KV DP With Isolator				3,79,577.84
3	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle				97,755.69
4	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle				1,12,212.19
5	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				14,85,872.90
Q	Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km.				
R	Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km				
S	Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each				
T	Final decision by electrical Inspector				
U	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)				22,69,171.09

ANNEXURE-8.6			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
	Name of the Division :-	KHD	
	Name of the Sub-Division : -	Jatani	
	Name of the Work :-	Mitigation of 33kV Feeder Overloading: Installation 3 Nos. 33kV 4-Way RMU at Jatani PSS for sectionalize 33kV Bus to mitigate overloading issue of nuagaon feeder.	
	Scope of work:-	PART A- Installation 3 Nos. 33kV 4-Way RMU at Jatani PSS for sectionalize 33kV Bus to mitigate overloading issue of Nuagaon feeder.	
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Installation 3 Nos. 33kV 4-Way RMU at Jatani PSS for sectionalize 33kV Bus to mitigate overloading issue of Nuagaon feeder.	₹ 1,58,44,670.47
		Total Amount	₹ 1,58,44,670.47
		Total Amount (In Cr)	1.58
Total estimated cost is Rs. 1.58 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-8.6					
PART A- Installation 3 Nos. 33kV 4-Way RMU at Jatani PSS for sectionalize 33kV Bus to mitigate overloading issue of Nuagaon feeder.					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories				
a	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	450		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	1350	1,337.13	18,05,125.50
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	21	5,245.00	1,10,145.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	33	4,894.00	1,61,502.00
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV UG cable	Mtr.	1182.00	357.60	4,22,683.20
2	Supply of 33kV RMU				
a	No. of 33kV 4Way RMU (LLVV)	nos.	1		
b	No. of 33kV 4Way RMU (LLLL)	nos.	2		
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	23,35,264.00	23,35,264.00
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	2	19,59,421.00	39,18,842.00
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	39.60	93.00	3,682.80
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	6	1,302.00	7,812.00
4	FRTU and OFC for RMU SCADA Automation				
4.1	Supply of end Connector and accessories for OFC connection at RMU.	Set	6	7,535.00	45,210.00
4.2	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	3	2,19,420.00	6,58,260.00
	Sub Total (Supply Portion) (in Rs.)				94,68,526.50
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by open trench method .	Mtr.	1350	94.50	1,27,575.00

1.2	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	21	2,081.70	43,715.70
1.3	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	33	2,081.70	68,696.10
1.4	Laying of 110mm dia PE 80-PN8, HDPE pipe inside open trench.	Mtr.	1182.00	300.00	3,54,600.00
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.1	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	8,000.00	8,000.00
2.2	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	2	8,000.00	16,000.00
3	FRTU and OFC for RMU SCADA Automation				
3.1	Erection of end Connector and accessories for OFC connection at RMU,	Set	6.0	1,225.07	7,350.42
3.2	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	3.0	6,124.36	18,373.08
Sub Total (Erection Portion) (in Rs.)					6,44,310.30
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)		394		
1.1.a	Earth work excavation of soil	Cum	330.96	700.00	2,31,672.00
1.1.b	Earth work excavation of hard rock	Cum	141.84	1,720.00	2,43,964.80
1.2	Back filling with excavated soil outside and above the trench	Cum	472.8	202.00	95,505.60
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	3	23,145.30	69,435.90
3	Supply of GI Fencing with Gate around each RMU	sqmtr	60	3,600.00	2,16,000.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	6	3,700.00	22,200.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	168	1,463.40	2,45,851.20
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	15	1,012.00	15,180.00

	Sub Total (Civil Portion) (in Rs.)				11,39,809.50
A	Sub Total (Supply Portion)				94,68,526.50
B	Stock, Storage & Insurance @ 3 % of A				2,84,055.80
C	Sub Total (A+B)				97,52,582.30
D	Contingency @ 3 % of C				2,92,577.47
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				75.87
F	Transportation @ 7.5% of C				7,31,443.67
G	Erection Charges @ 10% of earthing items				379.33
H	Total (C+D+E+F+G)				1,07,77,058.63
I	Sub Total (Erection Portion + Civil Portion)				17,84,119.80
J	Total Cost (H+I)				1,25,61,178.43
K	Other Overhead /(including Supervision Charges) @ 6 % of J				7,53,670.71
L	Total Estimated Capital Cost i.e. (J+K)				1,33,14,849.14
M	GST @ 18% of L				23,96,672.84
M1	CESS @ 1% of L				1,33,148.49
N	Grand Total (L+M+M1)				1,58,44,670.47

ANNEXURE-8.7			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		ANED	
Name of the Sub-Division : -		Angul	
Name of the Work :-		Mitigation of 33kV Feeder Overloading: Proposal for Simultaneous operation of spare cable near Angul GSS to ensure reliability of 33 KV Angul-1 feeder.	
Scope:-		1.Supply & laying of 575 Mtr. 33 KV 1CX630 Sq.mm. XLPE U/G Cable, 4 run in open trench Method. 2.Installation of 01 NO. 33 KV 4-way RMU(LLVV). 3. Installatiion of 01 NO. 33 KV DP W/O Isolator along with 01 NO. Cut point for simultanous operation of spare cable near Angul GSS.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	PART A: 1.Supply & laying of 575 Mtr. 33 KV 1CX630 Sq.mm. XLPE U/G Cable, 4 run in open trench Method. 2.Installation of 01 NO. 33 KV 4-way RMU(LLVV).	1,23,91,476.92
2	B	Part B:- 1. Installatiion of 01 NO. 33 KV DP W/O Isolator along with 01 NO. Cut point for simultanous operation of spare cable near Angul GSS.	3,95,905.57
		Total Amount	1,27,87,382.49
		Total Amount (In Cr)	1.28
Total estimated cost is Rs. 1.28 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-8.7

PART A:

1. Supply & laying of 575 Mtr. 33 KV 1CX630 Sq.mm. XLPE U/G Cable, 4 run in open trench Method.

2. Installation of 01 NO. 33 KV 4-way RMU(LLVV).

Supply Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (along with 1core spare cable) with accessories				
a	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	575		
b	Length of 33kV 1C, 630sqmm cable (HDD)	Mtr.			
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	2300	1,337.13	30,75,399.00
1.2	Supply of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG Cable kits for 1Core	Set	4	9,600.00	38,400.00
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	12	5,245.00	62,940.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	12	4,894.00	58,728.00
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV UG cable	Mtr.	2204.00	357.60	7,88,150.40
2	Supply of 33kV RMU				
a	No. of 33kV 4Way RMU (LLVV)	nos.	1		
2.1	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	23,35,264.00	23,35,264.00
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	13.20	93.00	1,227.60
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	2	1,302.00	2,604.00
4	FRTU and OFC for RMU SCADA Automation				
4.1	Supply of end Connector and accessories for OFC connection at RMU.	Set	2	7,535.00	15,070.00
4.2	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	1	2,19,420.00	2,19,420.00
	Sub Total (Supply Portion) (in Rs.)				65,97,203.00

Erection Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable with one spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by open trench method .	Mtr.	2300	94.50	2,17,350.00

ANNEXURE-8.7

PART A:

1. Supply & laying of 575 Mtr. 33 KV 1CX630 Sq.mm. XLPE U/G Cable, 4 run in open trench Method.

2. Installation of 01 NO. 33 KV 4-way RMU(LLVV).

1.2	Erection of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits	Set	4	2,400.00	9,600.00
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40
1.6	Laying of 110mm dia PE 80-PN8, HDPE pipe inside open trench.	Mtr.	2204.00	300.00	6,61,200.00
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.1	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	8,000.00	8,000.00
3	FRTU and OFC for RMU SCADA Automation				
3.1	Erection of end Connector and accessories for OFC connection at RMU,	Set	2.0	1,225.07	2,450.14
3.2	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	1.0	6,124.36	6,124.36
	Sub Total (Erection Portion) (in Rs.)				9,54,685.30

Civil Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	483	700.00	3,38,100.00
1.1.b	Earth work excavation of hard rock	Cum	207	1,720.00	3,56,040.00
1.2	Back filling with excavated soil outside and above the trench	Cum	690	202.00	1,39,380.00
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	100	2,643.67	2,64,367.06
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	1	23,145.30	23,145.30
3	Supply of GI Fencing with Gate around each RMU	sqmtr	20	3,600.00	72,000.00

ANNEXURE-8.7

PART A:

1. Supply & laying of 575 Mtr. 33 KV 1CX630 Sq.mm. XLPE U/G Cable, 4 run in open trench Method.

2. Installation of 01 NO. 33 KV 4-way RMU(LLVV).

4	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	2	3,700.00	7,400.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	96	1,463.40	1,40,486.40
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	19	1,012.00	19,228.00
	Sub Total (Civil Portion) (in Rs.)				13,60,146.76
A	Sub Total (Supply Portion)				65,97,203.00
B	Stock, Storage & Insurance @ 3 % of A				1,97,916.09
C	Sub Total (A+B)				67,95,119.09
D	Contingency @ 3 % of C				2,03,853.57
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				25.29
F	Transportation @ 7.5% of C				5,09,633.93
G	Erection Charges @ 10% of earthing items				126.44
H	Total (C+D+E+F+G)				75,08,758.33
I	Sub Total (Erection Portion + Civil Portion)				23,14,832.06
J	Total Cost (H+I)				98,23,590.39
K	Other Overhead /(including Supervision Charges) @ 6 % of J				5,89,415.42
L	Total Estimated Capital Cost i.e. (J+K)				1,04,13,005.81
M	GST @ 18% of L				18,74,341.05
M1	CESS @ 1% of L				1,04,130.06
N	Grand Total (L+M+M1)				1,23,91,476.92

ANNEXURE-8.7

Part B:-

1. Installation of 01 NO. 33 KV DP W/O Isolator along with 01 NO. Cut point for simultaneous operation of spare cable near Angul GSS.

No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)		1			
MATERIALS FOR 33 KV DP Without Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	2	1,13,471.43
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	62.14	4,722.64
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	3.9648	368.73
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =(5x7.14x1.96)	KG	76.00	69.972	5,317.87
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	61.776	4,694.98
6	Danger Plate, 2 no's.	No.	99.20	2	198.40
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	0.6018	55.97
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	2	310.00
9	H.T. Stay set (Complete)	Set	1,302.00	2	2,604.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	4	248.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	30	2,790.00
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	11.8	1,097.40
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	6	595.20
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	2.4072	223.87
16	33KV pin insulator polymer	No.	595.20	3	1,785.60
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	6	3,720.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	6	8,556.00
19	PG Clamp for 148 sq.mm AAA conductor	NO.	768.80	6	4,612.80
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	12.261	1,185.88
21	Black Paint	Ltr	272.80	1	272.80
22	Yellow Colour Paint for Background	Ltr	272.80	2	545.60
A	Total Cost of materials				1,58,679.16
B	Stock, Storage & Insurance i.e 3% of A				4,760.37
C	Sub Total (A+B)				1,63,439.54
D	Contingency @ 3% of C				4,903.19
E	Tools & Plants @ 2% of C				3,268.79
F	Transportation @ 7.5% of C				12,257.97
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				5,843.78
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				3,909.23
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				1,93,622.49
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount

ANNEXURE-8.7					
Part B:-					
1. Installiion of 01 NO. 33 KV DP W/O Isolator along with 01 NO. Cut point for simultanous operation of spare cable near Angul GSS.					
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	2	4,500.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	1.1	7,150.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.225	1,462.50
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	1	3,700.00
K	Total Civil & Services				16,812.50
L	Total (J+K)				2,10,434.99
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				12,626.10
N	Sub Total (L+M)				2,23,061.09
O	Total GST @ 18% of (N)				40,151.00
P	Total CESS @ 1% of (N)				2,230.61
Q	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				2,65,442.70
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002)		1			
MATERIALS FOR 33 KV Cut Point with 180 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	1	56,735.71
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	32.504	2,470.30
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	93.00	5.2864	491.64
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	5.85072	444.65
5	Danger Plate, 1 no's.	No.	99.20	1	99.20
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	0.3009	27.98
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	3	297.60
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	1.2036	111.93
9	33KV pin insulator polymer	No.	595.20	3	1,785.60
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	6	3,720.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	6	8,556.00
12	Earthing of Support (Coil Type)	EA	205.84	1	205.84
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	0.262	24.37
14	PG Clamp for 148 sq.mm AAA conductor	NO.	768.80	6	4,612.80
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	4.879	471.90
16	Black Paint	Ltr	272.80	1	272.80
17	Yellow Colour Paint for Background	Ltr	272.80	2	545.60
A	Total Cost of materials				80,873.93
B	Stock, Storage & Insurance i.e 3% of A				2,426.22
C	Sub Total (A+B)				83,300.15

ANNEXURE-8.7

Part B:-

1. Installatiion of 01 NO. 33 KV DP W/O Isolator along with 01 NO. Cut point for simultanous operation of spare cable near Angul GSS.

D	Contingency @ 3% of C	2,499.00
E	Tools & Plants @ 2% of C	1,666.00
F	Transportation @ 7.5% of C	6,247.51
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole	2,921.89
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)	2,486.24
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv	-
J	Sum of (C to I)	99,120.79

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	0.55	3,575.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.1125	731.25
K	Total Civil & Services				4,306.25
L	Total (J+K)				1,03,427.04
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				6,205.62
N	Sub Total (L+M)				1,09,632.66
O	Total GST @ 18% of (N)				19,733.88
P	Total CESS @ 1% of (N)				1,096.33
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle				1,30,462.87

6% Supervision Charges Summary

1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)	12,626.10
2	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)	6,205.62
	Total (6% supervision charges)	18,831.72

Gross Total Summary

1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator	2,65,442.70
2	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle	1,30,462.87
3	Gross Total Material & Services (1+2)	3,95,905.57
Q	Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km.	
R	Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km	
S	Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each	
T	Final decision by electrical Inspector	
U	Gross Total Material, Services and Inspection Fees (1+Q+R+S+T)	3,95,905.57

ANNEXURE-8.8			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		JED	
Name of the Sub-Division : -		BALIKUDA	
Name of the Work :-		Mitigation of 33kV Overloading: Proposal for augmentation of existing 33 kV line from Jagatsinghpur GSS to Balikuda PSS to mitigate overloading issue & providing reliable power supply.	
Scope:-		Part A:- 1. Augmentation of 3.35 CKM existing 33KV Line from 80 & 100 sq.mm. AAAC to 232 sq.mm. AAAC for 33 KV Balikuda Fdr. 2. Installation of interposing pole for 1 KM existing line of 33 KV Balikuda Feeder.	
Names of Schemes: -		TPCODL CAPEX(FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Part A:- 1. Augmentation of 3.35 CKM existing 33KV Line from 80 & 100 sq.mm. AAAC to 232 sq.mm. AAAC for 33 KV Balikuda Fdr. 2. Installation of 18 nos interposing pole with accessories for 1 KM existing line of 33 KV Balikuda Feeder. (To be executed and maintained by TPCODL under CAPEX Scheme).	1,16,12,733.39
		Total Amount	1,16,12,733.39
		Total Amount (In Cr)	1.16
Total estimated cost is Rs. 1.16 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-8.8

Part A:-

1. Augmentation of 3.35 CKM existing 33KV Line from 80 & 100 sq.mm. AAAC to 232 sq.mm. AAAC for 33 KV Balikuda Fdr.

2. Installation of 18 nos interposing pole with accessories for 1 KM existing line of 33 KV Balikuda Feeder.

(To be executed and maintained by TPCODL under CAPEX Scheme).

No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)	4
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MATERIALS FOR 33 KV DP Without Isolator

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	8	4,53,885.71
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	248.56	18,890.56
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	15.8592	1,474.91
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =(5x7.14x1.96)	KG	76.00	279.888	21,271.49
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	247.104	18,779.90
6	Danger Plate, 2 no's.	No.	99.20	8	793.60
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	2.4072	223.87
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	8	1,240.00
9	H.T. Stay set (Complete)	Set	1,302.00	8	10,416.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	16	992.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	120	11,160.00
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	4	5,208.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	47.2	4,389.60
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	24	2,380.80
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	9.6288	895.48
16	33KV pin insulator polymer	No.	595.20	12	7,142.40
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	24	14,880.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	24	34,224.00
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	49.044	4,743.54
21	Black Paint	Ltr	272.80	4	1,091.20
22	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40

A	Total Cost of materials	6,50,489.46
B	Stock, Storage & Insurance i.e 3% of A	19,514.68
C	Sub Total (A+B)	6,70,004.14
D	Contingency @ 3% of C	20,100.12
E	Tools & Plants @ 2% of C	13,400.08
F	Transportation @ 7.5% of C	50,250.31
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole	23,375.11
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)	17,261.54
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv	-
J	Sum of (C to I)	7,94,391.31

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	8	18,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	4.4	28,600.00

ANNEXURE-8.8

Part A:-

1. Augmentation of 3.35 CKM existing 33KV Line from 80 & 100 sq.mm. AAAC to 232 sq.mm. AAAC for 33 KV Balikuda Fdr.

2. Installation of 18 nos interposing pole with accessories for 1 KM existing line of 33 KV Balikuda Feeder.

(To be executed and maintained by TPCODL under CAPEX Scheme).

3	Coupling ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.9	5,850.00
4	Construction Earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including installation of 3Mtr GL Pipe 40mm/50mm including welding of	No.	3,700.00	4	14,800.00
K	Total Civil & Services				67,250.00
L	Total (J+K)				8,61,641.31
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				51,698.48
N	Sub Total (L+M)				9,13,339.79
O	Total GST @ 18% of (N)				1,64,401.16
P	Total GST @ 1% of (N)				9,133.40
Q	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				10,86,874.35

**No. of 33 KV Cut Point with 180 Degree Angle
(Ref. Drawing No.- TPCODL-HVD-0002)**

4

MATERIALS FOR 33 KV Cut Point with 180 Degree Angle

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	4	2,26,942.86
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	130.016	9,881.22
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	93.00	21.1456	1,966.54
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	23.40288	1,778.62
5	Danger Plate, 1 no's.	No.	99.20	4	396.80
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.2036	111.93
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	12	1,190.40
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	4.8144	447.74
9	33KV pin insulator polymer	No.	595.20	12	7,142.40
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	24	14,880.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	24	34,224.00
12	Earthing of Support (Coil Type)	EA	205.84	4	823.36
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.048	97.46
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	19.516	1,887.59
16	Black Paint	Ltr	272.80	4	1,091.20
17	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40

A	Total Cost of materials				3,39,268.52
B	Stock, Storage & Insurance i.e 3% of A				10,178.06
C	Sub Total (A+B)				3,49,446.57
D	Contingency @ 3% of C				10,483.40
E	Tools & Plants @ 2% of C				6,988.93
F	Transportation @ 7.5% of C				26,208.49
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				11,687.56
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				11,569.54
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				4,16,384.50

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.2	14,300.00

ANNEXURE-8.8					
Part A:-					
1. Augmentation of 3.35 CKM existing 33KV Line from 80 & 100 sq.mm. AAAC to 232 sq.mm. AAAC for 33 KV Balikuda Fdr.					
2. Installation of 18 nos interposing pole with accessories for 1 KM existing line of 33 KV Balikuda Feeder.					
(To be executed and maintained by TPCODL under CAPEX Scheme).					
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
K	Total Civil & Services				17,225.00
L	Total (J+K)				4,33,609.50
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				26,016.57
N	Sub Total (L+M)				4,59,626.07
O	Total GST @ 18% of (N)				82,732.69
P	Total GST @ 1% of (N)				4,596.26
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle				5,46,955.02
No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0003)		4			
<u>MATERIALS FOR 33 KV Cut Point with 90 Degree Angle</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	4	2,26,942.86
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	260.032	19,762.43
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	42.2912	3,933.08
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306)	K.g.	76.00	46.80576	3,557.24
5	Danger Plate, 1 no's.	No.	99.20	4	396.80
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.2036	111.93
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	12	1,190.40
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	4.8144	447.74
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	16	9,523.20
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	24	14,880.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	24	34,224.00
12	Earthing of Support (Coil Type)	No.	205.84	4	823.36
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.048	97.46
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	4	620.00
16	H.T. Stay set (Complete)	Set	1,302.00	4	5,208.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	4	248.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	60	5,580.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	45.24	4,375.61
20	Black Paint	Ltr	272.80	4	1,091.20
21	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40
A	Total Cost of materials				3,69,419.72
B	Stock, Storage & Insurance i.e 3% of A				11,082.59
C	Sub Total (A+B)				3,80,502.31
D	Contingency @ 3% of C				11,415.07
E	Tools & Plants @ 2% of C				7,610.05
F	Transportation @ 7.5% of C				28,537.67
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				11,687.56
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				13,474.55
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				4,53,227.21
Civil & Services					

ANNEXURE-8.8

Part A:-

1. Augmentation of 3.35 CKM existing 33KV Line from 80 & 100 sq.mm. AAAC to 232 sq.mm. AAAC for 33 KV Balikuda Fdr.

2. Installation of 18 nos interposing pole with accessories for 1 KM existing line of 33 KV Balikuda Feeder.

(To be executed and maintained by TPCODL under CAPEX Scheme).

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.20	14,300.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	4	9,000.00
K	Total Civil & Services				26,225.00
L	Total (J+K)				4,79,452.21
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				28,767.13
N	Sub Total (L+M)				5,08,219.34
O	Total GST @ 18% of (N)				91,479.48
P	Total GST @ 1% of (N)				5,082.19
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle				6,04,781.01

**33 Kv Line Length In KM with 40 Mtr. Span
(Ref. Drawing No.- TPCODL-HVD-0001)**

3.35

MATERIALS FOR 33 KV Pin Points

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	60	34,04,142.86
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	60	1,17,552.00
3	Top bracket 100x50x6mm GI channel (300mm each)	No.	186.00	60	11,160.00
4	Danger Plate, 1 no's.	No.	99.20	60	5,952.00
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	18.05	1,679.02
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	180.00	17,856.00
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	72.22	6,716.09
8	33KV pin insulator polymer	No.	595.20	180	1,07,136.00
9	Earthing of Support (Coil Type)	No.	205.84	60	12,350.40
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	15.72	1,461.96
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	87.00	8,414.64
12	232 sq.mm AAA conductor	K.M.	1,94,060.00	10.35	20,08,812.09
13	Black Paint	Ltr	272.80	60.0	16,368.00
14	Yellow Colour Paint for Background	Ltr	272.80	120.0	32,736.00
A	Total Cost of materials				57,52,337.06
B	Stock, Storage & Insurance i.e 3% of A				1,72,570.11
C	Sub Total (A+B)				59,24,907.17
D	Contingency @ 3% of C				1,77,747.22
E	Tools & Plants @ 2% of C				1,18,498.14
F	Transportation @ 7.5% of C				4,44,368.04
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,75,313.36
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				2,41,864.00
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				70,82,697.92

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	33.00	2,14,500.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	6.75	43,875.00

ANNEXURE-8.8

Part A:-

1. Augmentation of 3.35 CKM existing 33KV Line from 80 & 100 sq.mm. AAAC to 232 sq.mm. AAAC for 33 KV Balikuda Fdr.

2. Installation of 18 nos interposing pole with accessories for 1 KM existing line of 33 KV Balikuda Feeder.

(To be executed and maintained by TPCODL under CAPEX Scheme).

3	Dismantalling of 100/80sqmm Conductor	km	9,000.00	10.05	90,450.00
K	Total Civil & Services				3,48,825.00
L	Total (J+K)				74,31,522.92
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				4,45,891.38
N	Sub Total (L+M)				78,77,414.30
O	Total GST @ 18% of (N)				14,17,934.57
P	Total GST @ 1% of (N)				78,774.14
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				93,74,123.02
6% Supervision Charges Summary					
1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				51,698.48
2	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				26,016.57
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				28,767.13
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				4,45,891.38
5	Total (6% supervision charges)				5,52,373.56
Gross Total Summary					
1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				10,86,874.35
2	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle				5,46,955.02
3	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle				6,04,781.01
4	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				93,74,123.02
Q	Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km.				
R	Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km				
S	Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each				
T	Final decision by electrical Inspector				
U	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)				1,16,12,733.39

ANNEXURE-8.9			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		PDP	
Name of the Sub-Division : -		Kujanga	
Name of the Work :-		Proposal for augmentation of existing 33 kV line from Rahama PSS to Kujanga PSS to improve reliability using N-1 connectivity.	
Scope:-		Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.	2,02,60,704.54
		Total Amount	2,02,60,704.54
		Total Amount (In Cr)	2.03
Total estimated cost is Rs. 2.03 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-8.9

Part A:-

1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.

No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)			8		
MATERIALS FOR 33 KV DP Without Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	16	9,07,771.43
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	497.12	37,781.12
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	31.7184	2,949.81
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =(5x7.14x1.96)	KG	76.00	559.776	42,542.98
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	494.208	37,559.81
6	Danger Plate, 2 no's.	No.	99.20	16	1,587.20
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	4.8144	447.74
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	16	2,480.00
9	H.T. Stay set (Complete)	Set	1,302.00	16	20,832.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	32	1,984.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	240	22,320.00
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	8	10,416.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	94.4	8,779.20
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	48	4,761.60
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	19.2576	1,790.96
16	33KV pin insulator polymer	No.	595.20	24	14,284.80
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	48	29,760.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	48	68,448.00
19	PG Clamp for 148 sq.mm AAA conductor	NO.	768.80	48	36,902.40
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	98.088	9,487.07
21	Black Paint	Ltr	272.80	8	2,182.40
22	Yellow Colour Paint for Background	Ltr	272.80	16	4,364.80
A	Total Cost of materials				12,69,433.31
B	Stock, Storage & Insurance i.e 3% of A				38,083.00
C	Sub Total (A+B)				13,07,516.31
D	Contingency @ 3% of C				39,225.49
E	Tools & Plants @ 2% of C				26,150.33
F	Transportation @ 7.5% of C				98,063.72
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				46,750.23
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				31,273.88
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				15,48,979.96
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	16	36,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	8.8	57,200.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.8	11,700.00

ANNEXURE-8.9

Part A:-

1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.

4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	8	29,600.00
K	Total Civil & Services				1,34,500.00
L	Total (J+K)				16,83,479.96
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				1,01,008.80
N	Sub Total (L+M)				17,84,488.75
O	Total GST @ 18% of (N)				3,21,207.98
P	Total CESS @ 1% of (N)				17,844.89
Q	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				21,23,541.62
No. of 33 KV DP required With Isolator (Ref. Drawing No.- TPCODL-HVD-0004)		1			
MATERIALS FOR 33 KV DP With Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	2	1,13,471.43
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's channel required =(2x9.56x4.3)	KG	76.00	82.216	6,248.42
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	3.9648	368.73
4	Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 1 no's channel required =(1x7.14x4.3)	KG	76.00	30.702	2,333.35
5	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =(2x7.14x4.3)	KG	76.00	61.404	4,666.70
6	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 4 no's channel required =(4x7.14x4.3)	KG	76.00	122.808	9,333.41
7	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos angle required = (4*4.5*4.927)	KG	76.00	88.686	6,740.14
8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel required =(1x7.14x0.8)	KG	76.00	5.712	434.11
9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 nos angle required = (1*4.5*0.388)	KG	76.00	1.746	132.70
10	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos angle required = (1*4.5*0.340)	KG	76.00	1.53	116.28
11	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =(2x9.56x0.5)	KG	76.00	9.56	726.56
12	Danger Plate, 2 no's.	No.	99.20	2	198.40
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	0.6018	55.97
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	2	310.00
15	H.T. Stay set (Complete)	Set	1,302.00	2	2,604.00
16	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	4	248.00
17	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	30	2,790.00
18	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	2	2,604.00
19	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36	KG	93.00	56.64	5,267.52
20	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	6	595.20
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	2.4072	223.87
22	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	3	38,502.00

ANNEXURE-8.9

Part A:-

1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.

23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	53,003.00	1	53,003.00
24	33KV pin insulator polymer	No.	595.20	3	1,785.60
25	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	6	3,720.00
26	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	6	8,556.00
27	PG Clamp for 148 sq.mm AAA conductor	NO.	768.80	6	4,612.80
28	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	96.72	22.15	2,142.35
29	Black Paint	Ltr	272.80	1	272.80
30	Yellow Colour Paint for Background	Ltr	272.80	2	545.60
A	Total Cost of materials				2,72,608.92
B	Stock, Storage & Insurance i.e 3% of A				8,178.27
C	Sub Total (A+B)				2,80,787.19
D	Contingency @ 3% of C				8,423.62
E	Tools & Plants @ 2% of C				5,615.74
F	Transportation @ 7.5% of C				21,059.04
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				5,843.78
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				15,509.89
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				3,37,239.26

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including excavation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	2	4,500.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	1.1	7,150.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.225	1,462.50
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	2	7,400.00
K	Total Civil & Services				20,512.50
L	Total (J+K)				3,57,751.76
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)				21,465.11
N	Sub Total (L+M)				3,79,216.87
O	Total GST @ 18% of (N)				68,259.04
P	Total CESS @ 1% of (N)				3,792.17
Q	Gross Total Material +Services (N+O+P) for 33 KV DP With Isolator				4,51,268.07

**No. of 33 KV Cut Point with 180 Degree Angle
(Ref. Drawing No.- TPCODL-HVD-0002)**

8

MATERIALS FOR 33 KV Cut Point with 180 Degree Angle

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	8	4,53,885.71
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	260.032	19,762.43
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	93.00	42.2912	3,933.08
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	46.80576	3,557.24

ANNEXURE-8.9

Part A:-

1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.

5	Danger Plate, 1 no's.	No.	99.20	8	793.60
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	2.4072	223.87
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	24	2,380.80
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	9.6288	895.48
9	33KV pin insulator polymer	No.	595.20	24	14,284.80
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	48	29,760.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	48	68,448.00
12	Earthing of Support (Coil Type)	EA	205.84	8	1,646.72
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	2.096	194.93
14	PG Clamp for 148 sq.mm AAA conductor	NO.	768.80	48	36,902.40
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	39.032	3,775.18
16	Black Paint	Ltr	272.80	8	2,182.40
17	Yellow Colour Paint for Background	Ltr	272.80	16	4,364.80
A	Total Cost of materials				6,46,991.44
B	Stock, Storage & Insurance i.e 3% of A				19,409.74
C	Sub Total (A+B)				6,66,401.18
D	Contingency @ 3% of C				19,992.04
E	Tools & Plants @ 2% of C				13,328.02
F	Transportation @ 7.5% of C				49,980.09
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				23,375.11
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				19,889.89
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				7,92,966.33

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	4.4	28,600.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.9	5,850.00
K	Total Civil & Services				34,450.00
L	Total (J+K)				8,27,416.33
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				49,644.98
N	Sub Total (L+M)				8,77,061.31
O	Total GST @ 18% of (N)				1,57,871.04
P	Total CESS @ 1% of (N)				8,770.61
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle				10,43,702.96

**No. of 33 KV Cut Point with 90 Degree Angle
(Ref. Drawing No.- TPCODL-HVD-0003)**

8

MATERIALS FOR 33 KV Cut Point with 90 Degree Angle

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	8	4,53,885.71
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	520.064	39,524.86
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	84.5824	7,866.16
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306)	K.g.	76.00	93.61152	7,114.48
5	Danger Plate, 1 no's.	No.	99.20	8	793.60
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	2.4072	223.87
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	24	2,380.80

ANNEXURE-8.9

Part A:-

1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.

8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	9.6288	895.48
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	32	19,046.40
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	48	29,760.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	48	68,448.00
12	Earthing of Support (Coil Type)	No.	205.84	8	1,646.72
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	2.096	194.93
14	PG Clamp for 148 sq.mm AAA conductor	NO.	768.80	48	36,902.40
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	8	1,240.00
16	H.T. Stay set (Complete)	Set	1,302.00	8	10,416.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	8	496.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	120	11,160.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	90.48	8,751.23
20	Black Paint	Ltr	272.80	8	2,182.40
21	Yellow Colour Paint for Background	Ltr	272.80	16	4,364.80
A	Total Cost of materials				7,07,293.84
B	Stock, Storage & Insurance i.e 3% of A				21,218.82
C	Sub Total (A+B)				7,28,512.65
D	Contingency @ 3% of C				21,855.38
E	Tools & Plants @ 2% of C				14,570.25
F	Transportation @ 7.5% of C				54,638.45
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				23,375.11
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				23,699.90
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				8,66,651.75

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	4.40	28,600.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.90	5,850.00
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	8	18,000.00
K	Total Civil & Services				52,450.00
L	Total (J+K)				9,19,101.75
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				55,146.11
N	Sub Total (L+M)				9,74,247.86
O	Total GST @ 18% of (N)				1,75,364.61
P	Total CESS @ 1% of (N)				9,742.48
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle				11,59,354.95

**33 Kv Line Length In KM with 40 Mtr. Span
(Ref. Drawing No.- TPCODL-HVD-0001)**

8

MATERIALS FOR 33 KV Pin Points

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	112	63,54,400.00
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	112	2,19,430.40
3	Top bracket 100x50x6mm GI channel (300mm each)	No.	186.00	112	20,832.00
4	Danger Plate, 1 no's.	No.	99.20	112	11,110.40
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	33.70	3,134.17
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	336.00	33,331.20

ANNEXURE-8.9

Part A:-

1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.

7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	134.80	12,536.70
8	33KV pin insulator polymer	No.	595.20	336	1,99,987.20
9	Earthing of Support (Coil Type)	No.	205.84	112	23,054.08
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	29.34	2,728.99
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	162.40	15,707.33
12	148 sq.mm AAA conductor	K.M.	1,01,680.00	24.72	25,13,529.60
13	Crimping type Midspan Compression Joint for 148 sq.mm AAA conductor	EA	405.27		-
14	Black Paint	Ltr	272.80	112.0	30,553.60
15	Yellow Colour Paint for Background	Ltr	272.80	224.0	61,107.20

A	Total Cost of materials				95,01,442.87
B	Stock, Storage & Insurance i.e 3% of A				2,85,043.29
C	Sub Total (A+B)				97,86,486.16
D	Contingency @ 3% of C				2,93,594.58
E	Tools & Plants @ 2% of C				1,95,729.72
F	Transportation @ 7.5% of C				7,33,986.46
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				3,27,251.60
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				3,24,145.42
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				1,16,61,193.94

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	61.60	4,00,400.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	12.60	81,900.00
	Dismantalling of 80/100 sqmm Conductor	KM	9,000.00	24.00	2,16,000.00

K	Total Civil & Services				6,98,300.00
L	Total (J+K)				1,23,59,493.94
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				7,41,569.64
N	Sub Total (L+M)				1,31,01,063.58
O	Total GST @ 18% of (N)				23,58,191.44
P	Total CESS @ 1% of (N)				23,581.91
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				1,54,82,836.94

6% Supervision Charges Summary

1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)	1,01,008.80
2	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)	21,465.11
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)	49,644.98
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)	55,146.11
5	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)	7,41,569.64
	Total (6% supervision charges)	9,68,834.62

Gross Total Summary

1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator	21,23,541.62
2	Gross Total Material +Services (N+O+P) for 33 KV DP With Isolator	4,51,268.07
3	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle	10,43,702.96
4	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle	11,59,354.95
5	Gross Total Material +Services (N+O+P) for 33 KV Pin Points	1,54,82,836.94
Q	Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km.	
R	Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km	
S	Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each	
T	Final decision by electrical Inspector	

ANNEXURE-8.9		
Part A:- 1. Augmentation of 8 CKM existing 33KV Line from 55 & 80 sq.mm. AAAC to 148 sq.mm. AAAC for 33 KV Gorada Fdr.		
U	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)	2,02,60,704.54

ANNEXURE-8.10

TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		KED-1 & KED-2	
Name of the Sub-Division : -		Danpur & Marsaghai	
Name of the Work :-		Mitigation of 33kV Feeder Overloading: Proposal for Installation of 01 NO. 33 KV 4-Pole for bifurcation of 33 KV Danpur New feeder to mitigate overloading issue.	
Scope:-		Part A:- 1. Installation of 01 NO. 33 KV 4-pole with Isolator and stringing of 0.1Ckm 148sqmm conductor for feeder bifurcation.	
Names of Schemes: -		TPCODL CAPEX(FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Part A:- 1. Installation of 01 no. 33 KV 4-pole with Isolator and stringing of 0.1Ckm 148sqmm conductor for feeder bifurcation.	7,96,491.85
		Total Amount	7,96,491.85
		Total Amount (In Cr)	0.08
Total estimated cost is Rs. 0.08 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-8.10

Part A:-

1. Installation of 01 no. 33 KV 4-pole with Isolator and stringing of 0.1Ckm 148sqmm conductor for feeder bifurcation.

No. of 33 KV 4-Pole		1			
MATERIALS FOR 33 KV 4-Pole					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	4	1,24,800.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 8 no's channel required =(8x9.56x4.3)	KG	76.00	328.864	24,993.66
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 24 no's required = (24x2.36x0.280)	KG	93.00	15.8592	1,474.91
4	Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =(2x7.14x4.3)	KG	76.00	61.404	4,666.70
5	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 4 no's channel required =(4x7.14x4.3)	KG	76.00	122.808	9,333.41
6	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 8 no's channel required =(8x7.14x4.3)	KG	76.00	245.616	18,666.82
7	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 8 nos angle required = (8*4.5*4.927)	KG	76.00	177.372	13,480.27
8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 2 no's channel required =(2x7.14x0.8)	KG	76.00	11.424	868.22
9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 2 nos angle required = (2*4.5*0.388)	KG	76.00	3.492	265.39
10	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 2 nos angle required = (2*4.5*0.340)	KG	76.00	3.06	232.56
11	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 4 no's channel required =(4x9.56x0.5)	KG	76.00	19.12	1,453.12
12	Danger Plate, 4 no's.	No.	99.20	4	396.80
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	1.2036	111.93
14	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	4	5,208.00
15	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36	KG	93.00	113.28	10,535.04
16	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	24	2,380.80
17	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	4.8144	447.74
18	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	6	77,004.00
19	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	53,003.00	2	1,06,006.00
20	33KV pin insulator polymer	No.	595.20	6	3,571.20
21	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	12	7,440.00
22	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	12	17,112.00
23	PG Clamp for 148 sq.mm AAA conductor	NO.	768.80	12	9,225.60
24	148 sq.mm AAA conductor	K.M.	1,01,680.00	0.309	31,419.12
25	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	96.72	44.3	4,284.70
26	Black Paint	Ltr	272.80	2	545.60
27	Yellow Colour Paint for Background	Ltr	272.80	4	1,091.20
A	Total Cost of materials				4,77,014.80
B	Stock, Storage & Insurance i.e 3% of A				14,310.44
C	Sub Total (A+B)				4,91,325.24
D	Contingency @ 3% of C				14,739.76
E	Tools & Plants @ 2% of C				9,826.50
F	Transportation @ 7.5% of C				36,849.39
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				6,427.20
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				35,741.70
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				5,94,909.79
Civil & Services					

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	2	4,500.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.2	14,300.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	4	14,800.00
K	Total Civil & Services				36,525.00
L	Total (J+K)				6,31,434.79
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)				37,886.09
N	Sub Total (L+M)				6,69,320.88
O	Total GST @ 18% of (N)				1,20,477.76
P	Total CESS @ 1% of (N)				6,693.21
Q	Gross Total Material +Services (N+O+P) for 33 KV DP With Isolator				7,96,491.85
6% Supervision Charges Summary					
1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				-
2	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)				37,886.09
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				-
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				-
5	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				-
	Total (6% supervision charges)				37,886.09
Gross Total Summary					
1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				-
2	Gross Total Material +Services (N+O+P) for 33 KV DP With Isolator				7,96,491.85
3	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle				-
4	Gross Total Material +Services (N+O) for 33 KV Cut Point with 90 Degree Angle				-
5	Gross Total Material +Services (N+O) for 33 KV Pin Points				-
Q	Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km.				
R	Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km				
S	Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each				
T	Final decision by electrical Inspector				
U	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)				7,96,491.85

ANNEXURE-8.11 (ABSTRACT)			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-	BCDD-II		
Name of the Sub-Division :-	Barmunda		
Name of the Work :-	Proposal for Construction of 3No's 33 kV RMU (1no - LLVV, 2no - LLLL) with 33kV cable at Barmunda PSS to split PSS load at multiple feeders for mitigate low voltage issue and improve reliability.		
Scope:-	1. Construction of 3No's 33 kV RMU (1no - LLVV, 2no - LLLL). 2. Laying of 33kV 3R 1Cx630 sqmm cable at Barmunda PSS for connectivity of 33kV feeders with proposed RMU. 3. Laying of 33kV 3R 1Cx400 sqmm cable at Barmunda PSS for connectivity of proposed RMU with PTR.		
Names of Schemes: -	TPCODL CAPEX (FY 23-24)		
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	1. Construction of 3No's 33 kV RMU (1no - LLVV, 2no - LLLL). 2. Laying of 33kV 3R 1Cx630 sqmm cable at Barmunda PSS for connectivity of 33kV feeders with proposed RMU.	1,21,44,970.19
2	B	Laying of 33kV 3R 1Cx400 sqmm cable at Barmunda PSS for connectivity of proposed RMU with PTR.	9,51,008.85
		Total Amount	1,30,95,979.04
		Total Amount (In Cr.)	₹ 1.31
Total estimated cost is Rs. 1.31 Crore. (Under TPCODL Capex Scheme)			

ANNEXURE-8.11

Part-A

1. Construction of 3No's 33 kV RMU (1no - LLVV, 2no - LLLL).

2. Laying of 33kV 3R 1Cx630 sqmm cable at Barmunda PSS for connectivity of 33kV feeders with proposed RMU.

Supply Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories				
a	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	180		
b	Length of 33kV 1C, 630sqmm cable (HDD)	Mtr.			
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	540	1,337.13	7,22,050.20
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	12	5,245.00	62,940.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	24	4,894.00	1,17,456.00
2	Supply of 33kV RMU				
d	No. of 33kV 4Way RMU (LLVV)	nos.	1		
f	No. of 33kV 4Way RMU (LLLL)	nos.	2		
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	23,35,264.00	23,35,264.00
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	2	19,59,421.00	39,18,842.00
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	39.60	93.00	3,682.80
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	6	1,302.00	7,812.00
4	FRTU and OFC for RMU SCADA Automation				
4.4	Supply of end Connector and accessories for OFC connection at RMU.	Set	6	7,535.00	45,210.00
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	3	2,19,420.00	6,58,260.00
	Sub Total (Supply Portion) (in Rs.)				78,71,517.00

Erection Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by open trench method .	Mtr.	540	94.50	51,030.00
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40

ANNEXURE-8.11					
Part-A					
1. Construction of 3No's 33 kV RMU (1no - LLVV, 2no - LLLL).					
2. Laying of 33kV 3R 1Cx630 sqmm cable at Barmunda PSS for connectivity of 33kV feeders with proposed RMU.					
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	24	2,081.70	49,960.80
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	8,000.00	8,000.00
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	2	8,000.00	16,000.00
3	FRTU and OFC for RMU SCADA Automation				
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	6.0	1,225.07	7,350.42
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	3.0	6,124.36	18,373.08
Sub Total (Erection Portion) (in Rs.)					1,75,694.70
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	151.2	700.00	1,05,840.00
1.1.b	Earth work excavation of hard rock	Cum	64.8	1,720.00	1,11,456.00
1.2	Back filling with excavated soil outside and above the trench	Cum	216	202.00	43,632.00
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	3	23,145.30	69,435.90
4	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	6	3,700.00	22,200.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	96	1,463.40	1,40,486.40
Sub Total (Civil Portion) (in Rs.)					4,93,050.30
A	Sub Total (Supply Portion)				78,71,517.00
B	Stock, Storage & Insurance @ 3 % of A				2,36,145.51

ANNEXURE-8.11

Part-A

1. Construction of 3No's 33 kV RMU (1no - LLVV, 2no - LLLL).

2. Laying of 33kV 3R 1Cx630 sqmm cable at Barmunda PSS for connectivity of 33kV feeders with proposed RMU.

C	Sub Total (A+B)	81,07,662.51
D	Contingency @ 3 % of C	2,43,229.88
E	Tools & Plants Charges @ 2% of C (considered for earthing items)	75.87
F	Transportation @ 7.5% of C	6,08,074.69
G	Erection Charges @ 10% of earthing items	379.33
H	Total (C+D+E+F+G)	89,59,422.27
I	Sub Total (Erection Portion + Civil Portion)	6,68,745.00
J	Total Cost (H+I)	96,28,167.27
K	Other Overhead /(including Supervision Charges) @ 6 % of J	5,77,690.04
L	Total Estimated Capital Cost i.e. (J+K)	1,02,05,857.30
M	GST @ 18% of L	18,37,054.31
M1	CESS @ 1% of L	1,02,058.57
N	Gross Total Material and Services (L+M+M1)	1,21,44,970.19

ANNEXURE-8.11

Part-B

Laying of 33kV 3R 1Cx400 sqmm cable at Barmunda PSS for connectivity of proposed RMU with PTR.

Supply Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable with accessories				
a	Length of 33kV 1C, 400sqmm cable (open trench)	Mtr.	90		
1.1	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	270	970.92	2,62,148.40
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	9	8,517.56	76,658.04
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	9	6,488.92	58,400.28
	Sub Total (Supply Portion) (in Rs.)				3,97,206.72

Erection Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 400sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 400sqmm, XLPE insulation (extruded type) UG cable in trefoil formation by open trench method.	Mtr.	270	94.50	25,515.00
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	9	2,081.70	18,735.30
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	9	2,081.70	18,735.30
	Sub Total (Erection Portion) (in Rs.)				62,985.60

Civil Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	75.6	700.00	52,920.00
1.1.b	Earth work excavation of hard rock	Cum	32.4	1,720.00	55,728.00
1.2	Back filling with excavated soil outside and above the trench	Cum	108	202.00	21,816.00

ANNEXURE-8.11					
Part-B					
Laying of 33kV 3R 1Cx400 sqmm cable at Barmunda PSS for connectivity of proposed RMU with PTR.					
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	72	1,463.40	1,05,364.80
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	3	1,012.00	3,036.00
	Sub Total (Civil Portion) (in Rs.)				2,38,864.80
A	Sub Total (Supply Portion)				3,97,206.72
B	Stock, Storage & Insurance @ 3 % of A				11,916.20
C	Sub Total (A+B)				4,09,122.92
D	Contingency @ 3 % of C				12,273.69
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				30,684.22
G	Erection Charges @ 10% of earthing items				-
H	Total (C+D+E+F+G)				4,52,080.83
I	Sub Total (Erection Portion + Civil Portion)				3,01,850.40
J	Total Cost (H+I)				7,53,931.23
K	Other Overhead /(including Supervision Charges) @ 6 % of J				45,235.87
L	Total Estimated Capital Cost i.e. (J+K)				7,99,167.10
M	GST @ 18% of L				1,43,850.08
M1	CESS @ 1% of L				7,991.67
N	Grand Total (L+M+M1)				9,51,008.85

ANNEXURE-8.12 (ABSTRACT)			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		BCDD-II	
Name of the Sub-Division :-		Bharatpur	
Name of the Work :-		Proposal for Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL) with cable at Bharatpur PSS to split PSS load at multiple feeders for mitigate low voltage issue and improve reliability.	
Scope:-		1. Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL). 2. Laying of 33kV 3R 1Cx630 sqmm cable at Bharatpur PSS for connectivity of 33kV feeders with proposed RMU. 3. Laying of 33kV 3R 1Cx400 sqmm cable at Bharatpur PSS for connectivity of proposed RMU with PTR.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	1. Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL). 2. Laying of 33kV 3R 1Cx630 sqmm cable at Bharatpur PSS for connectivity of 33kV feeders with proposed RMU.	₹ 1,63,40,241.08
2	B	Laying of 33kV 3R 1Cx400 sqmm cable at Bharatpur PSS for connectivity of proposed RMU with PTR.	₹ 12,68,011.80
		Total Amount	₹ 1,76,08,252.88
		Total Amount (In Cr.)	₹ 1.76
Total estimated cost is Rs. 1.76 Crore. (Under TPCODL Capex Scheme)			

ANNEXURE-8.12

Part-A

1. Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL).

2. Laying of 33kV 3R 1Cx630 sqmm cable at Bharatpur PSS for connectivity of 33kV feeders with proposed RMU.

Supply Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories				
a	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	270		
b	Length of 33kV 1C, 630sqmm cable (HDD)	Mtr.			
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	810	1,337.13	10,83,075.30
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	18	5,245.00	94,410.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	36	4,894.00	1,76,184.00
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV UG cable	Mtr.	0.00	357.60	-
2	Supply of 33kV RMU				
d	No. of 33kV 4Way RMU (LLVV)	nos.	1		
f	No. of 33kV 4Way RMU (LLLL)	nos.	3		
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	23,35,264.00	23,35,264.00
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	3	19,59,421.00	58,78,263.00
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	52.80	93.00	4,910.40
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	8	1,302.00	10,416.00
4	FRTU and OFC for RMU SCADA Automation				
4.4	Supply of end Connector and accessories for OFC connection at RMU.	Set	8	7,535.00	60,280.00
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	4	2,19,420.00	8,77,680.00
	Sub Total (Supply Portion) (in Rs.)				1,05,20,482.70

Erection Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable without spare				

ANNEXURE-8.12

Part-A

1. Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL).

2. Laying of 33kV 3R 1Cx630 sqmm cable at Bharatpur PSS for connectivity of 33kV feeders with proposed RMU.

1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by open trench method .	Mtr.	810	94.50	76,545.00
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	18	2,081.70	37,470.60
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	36	2,081.70	74,941.20
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	8,000.00	8,000.00
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	-
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	3	8,000.00	24,000.00
3	FRTU and OFC for RMU SCADA Automation				
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	8.0	1,225.07	9,800.56
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	4.0	6,124.36	24,497.44
	Sub Total (Erection Portion) (in Rs.)				2,55,254.80

Civil Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	226.8	700.00	1,58,760.00
1.1.b	Earth work excavation of hard rock	Cum	97.2	1,720.00	1,67,184.00
1.2	Back filling with excavated soil outside and above the trench	Cum	324	202.00	65,448.00
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	4	23,145.30	92,581.20

ANNEXURE-8.12

Part-A

1. Construction of 4No's 33 kV RMU (1no - LLVV, 3no - LLLL).

2. Laying of 33kV 3R 1Cx630 sqmm cable at Bharatpur PSS for connectivity of 33kV feeders with proposed RMU.

4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	8	3,700.00	29,600.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	144	1,463.40	2,10,729.60
	Sub Total (Civil Portion) (in Rs.)				7,24,302.80
A	Sub Total (Supply Portion)				1,05,20,482.70
B	Stock, Storage & Insurance @ 3 % of A				3,15,614.48
C	Sub Total (A+B)				1,08,36,097.18
D	Contingency @ 3 % of C				3,25,082.92
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				101.15
F	Transportation @ 7.5% of C				8,12,707.29
G	Erection Charges @ 10% of earthing items				505.77
H	Total (C+D+E+F+G)				1,19,74,494.31
I	Sub Total (Erection Portion + Civil Portion)				9,79,557.60
J	Total Cost (H+I)				1,29,54,051.91
K	Other Overhead /(including Supervision Charges) @ 6 % of J				7,77,243.11
L	Total Estimated Capital Cost i.e. (J+K)				1,37,31,295.03
M	GST @ 18% of L				24,71,633.10
M1	CESS @ 1% of L				1,37,312.95
N	Gross Total Material and Services (L+M+M1)				1,63,40,241.08

ANNEXURE-8.12

Part-B

Laying of 33kV 3R 1Cx400 sqmm cable at Bhatratpur PSS for connectivity of proposed RMU with PTR.

Supply Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable with accessories				
a	Length of 33kV 1C, 400sqmm cable (open trench)	Mtr.	120		
b	Length of 33kV 1C, 400sqmm cable (HDD)	Mtr.			
1.1	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	360	970.92	3,49,531.20
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	12	8,517.56	1,02,210.72
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	12	6,488.92	77,867.04
	Sub Total (Supply Portion) (in Rs.)				5,29,608.96

Erection Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 400sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 400sqmm, XLPE insulation (extruded type) UG cable in trefoil formation by open trench method.	Mtr.	360	94.50	34,020.00
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40
	Sub Total (Erection Portion) (in Rs.)				83,980.80

Civil Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	100.8	700.00	70,560.00
1.1.b	Earth work excavation of hard rock	Cum	43.2	1,720.00	74,304.00

ANNEXURE-8.12					
Part-B					
Laying of 33kV 3R 1Cx400 sqmm cable at Bhatratpur PSS for connectivity of proposed RMU with PTR.					
1.2	Back filling with excavated soil outside and above the trench	Cum	144	202.00	29,088.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	96	1,463.40	1,40,486.40
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	4	1,012.00	4,048.00
	Sub Total (Civil Portion) (in Rs.)				3,18,486.40
A	Sub Total (Supply Portion)				5,29,608.96
B	Stock, Storage & Insurance @ 3 % of A				15,888.27
C	Sub Total (A+B)				5,45,497.23
D	Contingency @ 3 % of C				16,364.92
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				40,912.29
G	Erection Charges @ 10% of earthing items				-
H	Total (C+D+E+F+G)				6,02,774.44
I	Sub Total (Erection Portion + Civil Portion)				4,02,467.20
J	Total Cost (H+I)				10,05,241.64
K	Other Overhead /(including Supervision Charges) @ 6 % of J				60,314.50
L	Total Estimated Capital Cost i.e. (J+K)				10,65,556.14
M	GST @ 18% of L				1,91,800.10
M1	CESS @ 1% of L				10,655.56
N	Grand Total (L+M+M1)				12,68,011.80

ANNEXURE-8.13 (ABSTRACT)			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		BCDD-II	
Name of the Sub-Division :-		CS Pur-I	
Name of the Work :-		Proposal for Installation of 3No's 33 kV RMU (3no - LLVV) with cable at CS Pur-I PSS to split PSS load at multiple feeders for mitigate low voltage issue and improve reliability.	
Scope:-		1. Installation of 3No's 33 kV RMU (3no - LLVV). 2. Laying of 33kV 3R 1Cx630 sqmm cable at CS Pur-1 PSS for connectivity of 33kV feeders with proposed RMU. 3. Laying of 33kV 3R 1Cx400 sqmm cable at CS Pur-1 PSS for connectivity of proposed RMU with PTR.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	1. Installation of 3No's 33 kV RMU (3no - LLVV). 2. Laying of 33kV 3R 1Cx630 sqmm cable at CS Pur-1 PSS for connectivity of 33kV feeders with proposed RMU.	₹ 1,28,82,057.43
2	B	Laying of 33kV 3R 1Cx400 sqmm cable at CS Pur-1 PSS for connectivity of proposed RMU with PTR.	₹ 12,68,011.80
		Total Amount	₹ 1,41,50,069.23
		Total Amount (In Cr.)	₹ 1.42
Total estimated cost is Rs. 1.42 Crore. (Under TPCODL Capex Scheme)			

ANNEXURE-8.13

Part-A

1. Installation of 3No's 33 kV RMU (3no - LLVV).

2. Laying of 33kV 3R 1Cx630 sqmm cable at CS Pur-1 PSS for connectivity of 33kV feeders with proposed RMU.

Supply Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories				
a	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	150		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	450	1,337.13	6,01,708.50
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	9	5,245.00	47,205.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	21	4,894.00	1,02,774.00
2	Supply of 33kV RMU				
d	No. of 33kV 4Way RMU (LLVV)	nos.	3		
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	3	23,35,264.00	70,05,792.00
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	39.60	93.00	3,682.80
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	6	1,302.00	7,812.00
4	FRTU and OFC for RMU SCADA Automation				
4.4	Supply of end Connector and accessories for OFC connection at RMU.	Set	6	7,535.00	45,210.00
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	3	2,19,420.00	6,58,260.00
	Sub Total (Supply Portion) (in Rs.)				84,72,444.30

Erection Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by open trench method .	Mtr.	450	94.50	42,525.00
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	9	2,081.70	18,735.30

ANNEXURE-8.13

Part-A

1. Installation of 3No's 33 kV RMU (3no - LLVV).

2. Laying of 33kV 3R 1Cx630 sqmm cable at CS Pur-1 PSS for connectivity of 33kV feeders with proposed RMU.

1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	21	2,081.70	43,715.70
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	3	8,000.00	24,000.00
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	-
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	8,000.00	-
3	FRTU and OFC for RMU SCADA Automation				
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	6.0	1,225.07	7,350.42
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	3.0	6,124.36	18,373.08
	Sub Total (Erection Portion) (in Rs.)				1,54,699.50

Civil Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	126	700.00	88,200.00
1.1.b	Earth work excavation of hard rock	Cum	54	1,720.00	92,880.00
1.2	Back filling with excavated soil outside and above the trench	Cum	180	202.00	36,360.00
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	3	23,145.30	69,435.90
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	6	3,700.00	22,200.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	72	1,463.40	1,05,364.80
	Sub Total (Civil Portion) (in Rs.)				4,14,440.70

ANNEXURE-8.13

Part-A

1. Installation of 3No's 33 kV RMU (3no - LLVV).

2. Laying of 33kV 3R 1Cx630 sqmm cable at CS Pur-1 PSS for connectivity of 33kV feeders with proposed RMU.

A	Sub Total (Supply Portion)				84,72,444.30
B	Stock, Storage & Insurance @ 3 % of A				2,54,173.33
C	Sub Total (A+B)				87,26,617.63
D	Contingency @ 3 % of C				2,61,798.53
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				75.87
F	Transportation @ 7.5% of C				6,54,496.32
G	Erection Charges @ 10% of earthing items				379.33
H	Total (C+D+E+F+G)				96,43,367.67
I	Sub Total (Erection Portion + Civil Portion)				5,69,140.20
J	Total Cost (H+I)				1,02,12,507.87
K	Other Overhead /(including Supervision Charges) @ 6 % of J				6,12,750.47
L	Total Estimated Capital Cost i.e. (J+K)				1,08,25,258.35
M	GST @ 18% of L				19,48,546.50
M1	CESS @ 1% of L				1,08,252.58
N	Gross Total Material and Services (L+M+M1)				1,28,82,057.43

ANNEXURE-8.13

Part-B

Laying of 33kV 3R 1Cx400 sqmm cable at CS Pur-1 PSS for connectivity of proposed RMU with PTR.

Supply Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable with accessories				
a	Length of 33kV 1C, 400sqmm cable (open trench)	Mtr.	120		
1.1	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	360	970.92	3,49,531.20
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	12	8,517.56	1,02,210.72
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	12	6,488.92	77,867.04
	Sub Total (Supply Portion) (in Rs.)				5,29,608.96

Erection Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 400sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 400sqmm, XLPE insulation (extruded type) UG cable in trefoil formation by open trench method.	Mtr.	360	94.50	34,020.00
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40
	Sub Total (Erection Portion) (in Rs.)				83,980.80

Civil Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	100.8	700.00	70,560.00
1.1.b	Earth work excavation of hard rock	Cum	43.2	1,720.00	74,304.00
1.2	Back filling with excavated soil outside and above the trench	Cum	144	202.00	29,088.00

ANNEXURE-8.13					
Part-B					
Laying of 33kV 3R 1Cx400 sqmm cable at CS Pur-1 PSS for connectivity of proposed RMU with PTR.					
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	96	1,463.40	1,40,486.40
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	4	1,012.00	4,048.00
	Sub Total (Civil Portion) (in Rs.)				3,18,486.40
A	Sub Total (Supply Portion)				5,29,608.96
B	Stock, Storage & Insurance @ 3 % of A				15,888.27
C	Sub Total (A+B)				5,45,497.23
D	Contingency @ 3 % of C				16,364.92
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				40,912.29
G	Erection Charges @ 10% of earthing items				-
H	Total (C+D+E+F+G)				6,02,774.44
I	Sub Total (Erection Portion + Civil Portion)				4,02,467.20
J	Total Cost (H+I)				10,05,241.64
K	Other Overhead /(including Supervision Charges) @ 6 % of J				60,314.50
L	Total Estimated Capital Cost i.e. (J+K)				10,65,556.14
M	GST @ 18% of L				1,91,800.10
M1	CESS @ 1% of L				10,655.56
N	Grand Total (L+M+M1)				12,68,011.80

ANNEXURE-8.14 (ABSTRACT)			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		DED	
Name of the Sub-Division :-		Dhenkanal	
Name of the Work :-		Mitigation of Low Voltage issue: Proposal for Installation of 2No's 33 kV RMU (1no - LLV, 1no - LLVV) with cable at College PSS to split PSS load at multiple feeders for mitigate low voltage issue and improve reliability.	
Scope:-		1. Installation of 2No's 33 kV RMU (1no - LLV, 1no - LLVV). 2. Laying of 33kV 3R 1Cx630 sqmm cable at College PSS for connectivity of 33kV feeders with proposed RMU 3. Laying of 33kV 3R 1Cx400 sqmm cable at College PSS for connectivity of proposed RMU with PTR.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	1. Installation of 2No's 33 kV RMU (1no - LLV, 1no - LLVV). 2. Laying of 33kV 3R 1Cx630 sqmm cable at College PSS for connectivity of 33kV feeders with proposed RMU	₹ 77,02,305.96
2	B	Laying of 33kV 3R 1Cx400 sqmm cable at College PSS for connectivity of proposed RMU with PTR.	₹ 9,51,008.85
		Total Amount	₹ 86,53,314.81
		Total Amount (In Cr.)	₹ 0.87
Total estimated cost is Rs. 0.87 Crore. (Under TPCODL Capex Scheme)			

ANNEXURE-8.14

Part-A

1. Installation of 2No's 33 kV RMU (1no - LLV, 1no - LLVV).

2. Laying of 33kV 3R 1Cx630 sqmm cable at College PSS for connectivity of 33kV feeders with proposed RMU.

Supply Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories				
a	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	90		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	270	1,337.13	3,61,025.10
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	6	5,245.00	31,470.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	12	4,894.00	58,728.00
2	Supply of 33kV RMU				
c	No. of 33kV 3Way RMU (LLV)	nos.	1		
d	No. of 33kV 4Way RMU (LLVV)	nos.	1		
2.3	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	1	17,87,101.00	17,87,101.00
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	23,35,264.00	23,35,264.00
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	26.40	93.00	2,455.20
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	4	1,302.00	5,208.00
4	FRTU and OFC for RMU SCADA Automation				
4.4	Supply of end Connector and accessories for OFC connection at RMU,	Set	4	7,535.00	30,140.00
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	2	2,19,420.00	4,38,840.00
	Sub Total (Supply Portion) (in Rs.)				50,50,231.30

Erection Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by open trench method .	Mtr.	270	94.50	25,515.00
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	6	2,081.70	12,490.20

ANNEXURE-8.14					
Part-A					
1. Installation of 2No's 33 kV RMU (1no - LLV, 1no - LLVV).					
2. Laying of 33kV 3R 1Cx630 sqmm cable at College PSS for connectivity of 33kV feeders with proposed RMU.					
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	1	8,000.00	8,000.00
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	8,000.00	8,000.00
3	FRTU and OFC for RMU SCADA Automation				
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	4.0	1,225.07	4,900.28
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	2.0	6,124.36	12,248.72
	Sub Total (Erection Portion) (in Rs.)				96,134.60
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	75.6	700.00	52,920.00
1.1.b	Earth work excavation of hard rock	Cum	32.4	1,720.00	55,728.00
1.2	Back filling with excavated soil outside and above the trench	Cum	108	202.00	21,816.00
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	2	23,145.30	46,290.60
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	4	3,700.00	14,800.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	48	1,463.40	70,243.20
	Sub Total (Civil Portion) (in Rs.)				2,61,797.80
A	Sub Total (Supply Portion)				50,50,231.30
B	Stock, Storage & Insurance @ 3 % of A				1,51,506.94
C	Sub Total (A+B)				52,01,738.24

ANNEXURE-8.14

Part-A

1. Installation of 2No's 33 kV RMU (1no - LLV, 1no - LLVV).

2. Laying of 33kV 3R 1Cx630 sqmm cable at College PSS for connectivity of 33kV feeders with proposed RMU.

D	Contingency @ 3 % of C	1,56,052.15
E	Tools & Plants Charges @ 2% of C (considered for earthing items)	50.58
F	Transportation @ 7.5% of C	3,90,130.37
G	Erection Charges @ 10% of earthing items	252.89
H	Total (C+D+E+F+G)	57,48,224.22
I	Sub Total (Erection Portion + Civil Portion)	3,57,932.40
J	Total Cost (H+I)	61,06,156.62
K	Other Overhead /(including Supervision Charges) @ 6 % of J	3,66,369.40
L	Total Estimated Capital Cost i.e. (J+K)	64,72,526.01
M	GST @ 18% of L	11,65,054.68
M1	CESS @ 1% of L	64,725.26
N	Gross Total Material and Services (L+M+M1)	77,02,305.96

ANNEXURE-8.14

Part-B

Laying of 33kV 3R 1Cx400 sqmm cable at College PSS for connectivity of proposed RMU with PTR.

Supply Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable with accessories				
a	Length of 33kV 1C, 400sqmm cable (open trench)	Mtr.	90		
b	Length of 33kV 1C, 400sqmm cable (HDD)	Mtr.			
1.1	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	270	970.92	2,62,148.40
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	9	8,517.56	76,658.04
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	9	6,488.92	58,400.28
	Sub Total (Supply Portion) (in Rs.)				3,97,206.72

Erection Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 400sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 400sqmm, XLPE insulation (extruded type) UG cable in trefoil formation by open trench method.	Mtr.	270	94.50	25,515.00
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	9	2,081.70	18,735.30
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	9	2,081.70	18,735.30
	Sub Total (Erection Portion) (in Rs.)				62,985.60

Civil Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	75.6	700.00	52,920.00
1.1.b	Earth work excavation of hard rock	Cum	32.4	1,720.00	55,728.00
1.2	Back filling with excavated soil outside and above the trench	Cum	108	202.00	21,816.00

ANNEXURE-8.14					
Part-B					
Laying of 33kV 3R 1Cx400 sqmm cable at College PSS for connectivity of proposed RMU with PTR.					
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	72	1,463.40	1,05,364.80
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	3	1,012.00	3,036.00
	Sub Total (Civil Portion) (in Rs.)				2,38,864.80
A	Sub Total (Supply Portion)				3,97,206.72
B	Stock, Storage & Insurance @ 3 % of A				11,916.20
C	Sub Total (A+B)				4,09,122.92
D	Contingency @ 3 % of C				12,273.69
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				-
F	Transportation @ 7.5% of C				30,684.22
G	Erection Charges @ 10% of earthing items				-
H	Total (C+D+E+F+G)				4,52,080.83
I	Sub Total (Erection Portion + Civil Portion)				3,01,850.40
J	Total Cost (H+I)				7,53,931.23
K	Other Overhead /(including Supervision Charges) @ 6 % of J				45,235.87
L	Total Estimated Capital Cost i.e. (J+K)				7,99,167.10
M	GST @ 18% of L				1,43,850.08
M1	CESS @ 1% of L				7,991.67
N	Grand Total (L+M+M1)				9,51,008.85

ANNEXURE-8.15 (ABSTRACT)			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		CED	
Name of the Sub-Division : -		Tangi	
Name of the Work :-		Mitigation of Low Voltage issue: Proposal for Construction of 3No's 33 kV RMU (3no - LLVV) with cable at Tangi PSS to split PSS load at multiple feeders for mitigate low voltage issue and improve reliability.	
Scope:-		1. Construction of 3No's 33 kV RMU (3no - LLVV). 2. Laying of 33kV 3R 1Cx630 sqmm cable at Tangi PSS for connectivity of 33kV feeders with proposed RMU. 3. Laying of 33kV 3R 1Cx400 sqmm cable at Tangi PSS for connectivity of proposed RMU with PTR.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	1. Construction of 3No's 33 kV RMU (3no - LLVV). 2. Laying of 33kV 3R 1Cx630 sqmm cable at Tangi PSS for connectivity of 33kV feeders with proposed RMU.	₹ 1,28,82,057.43
2	B	Laying of 33kV 3R 1Cx400 sqmm cable at Tangi PSS for connectivity of proposed RMU with PTR.	₹ 15,85,014.75
		Total Amount	₹ 1,44,67,072.18
		Total Amount (In Cr.)	₹ 1.45
Total estimated cost is Rs. 1.45 Crore. (Under TPCODL Capex Scheme)			

ANNEXURE-8.15

Part-A

1. Construction of 3No's 33 kV RMU (3no - LLVV).

2. Laying of 33kV 3R 1Cx630 sqmm cable at Tangi PSS for connectivity of 33kV feeders with proposed RMU.

Supply Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories				
a	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	150		
b	Length of 33kV 1C, 630sqmm cable (HDD)	Mtr.			
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	450	1,337.13	6,01,708.50
1.2	Supply of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG Cable kits for 1Core	Set		9,600.00	-
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	9	5,245.00	47,205.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	21	4,894.00	1,02,774.00
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV UG cable	Mtr.	0.00	357.60	-
2	Supply of 33kV RMU				
a	No. of 33kV 3Way RMU (LLV+M)	nos.			
b	No. of 33kV 4Way RMU (LLVV+M)	nos.			
c	No. of 33kV 3Way RMU (LLV)	nos.			
d	No. of 33kV 4Way RMU (LLVV)	nos.	3		
e	No. of 33kV 3Way RMU (LLL)	nos.			
f	No. of 33kV 4Way RMU (LLLL)	nos.			
2.1	Supply of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	31,74,874.00	-
2.3	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	17,87,101.00	-
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	3	23,35,264.00	70,05,792.00
2.5	Supply of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	14,46,210.00	-
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	19,59,421.00	-
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	39.60	93.00	3,682.80
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	6	1,302.00	7,812.00
4	FRTU and OFC for RMU SCADA Automation				

ANNEXURE-8.15					
Part-A					
1. Construction of 3No's 33 kV RMU (3no - LLVV).					
2. Laying of 33kV 3R 1Cx630 sqmm cable at Tangi PSS for connectivity of 33kV feeders with proposed RMU.					
4.1	Supply of 12 core fibre optic cable single mode, duct type, fibre armoured laid along UG cable.	Mtr.		22.00	-
4.2	Supply of HDPE PLB duct of size 32/26mm for laying of OFC Cables.	Mtr.	0.0	77.99	-
4.3	Supply of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0	6,766.00	-
4.4	Supply of end Connector and accessories for OFC connection at RMU.	Set	6	7,535.00	45,210.00
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	3	2,19,420.00	6,58,260.00
	Sub Total (Supply Portion) (in Rs.)				84,72,444.30
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by open trench method .	Mtr.	450	94.50	42,525.00
1.2	Erection of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits	Set	0	2,400.00	-
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	9	2,081.70	18,735.30
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	21	2,081.70	43,715.70
1.5	Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruded type) UG cable including looping at cable terminations and straight through joints by HDD method with HDPE pipe (110mm dia, PN8 PE80) for laying of individual run of UG cable at main road and unaccessible place.	Mtr.	0	2,300.00	-
1.6	Laying of 110mm dia PE 80-PN8, HDPE pipe inside open trench.	Mtr.	0.00	300.00	-
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.1	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	15,000.00	-
2.2	Erection of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	15,000.00	-
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	8,000.00	-
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	3	8,000.00	24,000.00

ANNEXURE-8.15					
Part-A					
1. Construction of 3No's 33 kV RMU (3no - LLVV).					
2. Laying of 33kV 3R 1Cx630 sqmm cable at Tangi PSS for connectivity of 33kV feeders with proposed RMU.					
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	-
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	8,000.00	-
3	FRTU and OFC for RMU SCADA Automation				
3.1	Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD	Mtr.	0.0	82.00	-
3.2	Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0.0	612.54	-
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	6.0	1,225.07	7,350.42
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	3.0	6,124.36	18,373.08
Sub Total (Erection Portion) (in Rs.)					1,54,699.50
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	126	700.00	88,200.00
1.1.b	Earth work excavation of hard rock	Cum	54	1,720.00	92,880.00
1.2	Back filling with excavated soil outside and above the trench	Cum	180	202.00	36,360.00
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	0	2,643.67	-
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	3	23,145.30	69,435.90
3	Supply of GI Fencing with Gate around each RMU	sqmtr	0	3,600.00	-
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	6	3,700.00	22,200.00

ANNEXURE-8.15

Part-A

1. Construction of 3No's 33 kV RMU (3no - LLVV).

2. Laying of 33kV 3R 1Cx630 sqmm cable at Tangi PSS for connectivity of 33kV feeders with proposed RMU.

5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	72	1,463.40	1,05,364.80
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	0	1,012.00	-
	Sub Total (Civil Portion) (in Rs.)				4,14,440.70
A	Sub Total (Supply Portion)				84,72,444.30
B	Stock, Storage & Insurance @ 3 % of A				2,54,173.33
C	Sub Total (A+B)				87,26,617.63
D	Contingency @ 3 % of C				2,61,798.53
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				75.87
F	Transportation @ 7.5% of C				6,54,496.32
G	Erection Charges @ 10% of earthing items				379.33
H	Total (C+D+E+F+G)				96,43,367.67
I	Sub Total (Erection Portion + Civil Portion)				5,69,140.20
J	Total Cost (H+I)				1,02,12,507.87
K	Other Overhead /(including Supervision Charges) @ 6 % of J				6,12,750.47
L	Total Estimated Capital Cost i.e. (J+K)				1,08,25,258.35
M	GST @ 18% of L				19,48,546.50
M1	CESS @ 1% of L				1,08,252.58
N	Gross Total Material and Services (L+M+M1)				1,28,82,057.43

ANNEXURE-8.15

Part-B

Laying of 33kV 3R 1Cx400 sqmm cable at Tangi PSS for connectivity of proposed RMU with PTR.

Supply Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable with accessories				
a	Length of 33kV 1C, 400sqmm cable (open trench)	Mtr.	150		
b	Length of 33kV 1C, 400sqmm cable (HDD)	Mtr.			
1.1	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	450	970.92	4,36,914.00
1.2	Supply of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, aluminium UG Cable kits for 1Core	Set		8,517.56	-
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	15	8,517.56	1,27,763.40
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	15	6,488.92	97,333.80
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV UG cable	Mtr.	0.00	357.60	-
2	Supply of 33kV RMU				
a	No. of 33kV 3Way RMU (LLV+M)	nos.			
b	No. of 33kV 4Way RMU (LLVV+M)	nos.			
c	No. of 33kV 3Way RMU (LLV)	nos.			
d	No. of 33kV 4Way RMU (LLVV)	nos.			
e	No. of 33kV 3Way RMU (LLL)	nos.			
f	No. of 33kV 4Way RMU (LLLL)	nos.			
2.1	Supply of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	31,74,874.00	-
2.3	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	17,87,101.00	-
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	23,35,264.00	-
2.5	Supply of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	14,46,210.00	-
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	19,59,421.00	-
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	0.00	93.00	-
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	0	1,302.00	-
4	FRTU and OFC for RMU SCADA Automation				
4.1	Supply of 12 core fibre optic cable single mode, duct type, fibre armoured laid along UG cable.	Mtr.		22.00	-

ANNEXURE-8.15

Part-B

Laying of 33kV 3R 1Cx400 sqmm cable at Tangi PSS for connectivity of proposed RMU with PTR.

4.2	Supply of HDPE PLB duct of size 32/26mm for laying of OFC Cables.	Mtr.	0.0	77.99	-
4.3	Supply of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0	6,766.00	-
4.4	Supply of end Connector and accessories for OFC connection at RMU.	Set	0	7,535.00	-
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	0	2,19,420.00	-
Sub Total (Supply Portion) (in Rs.)					6,62,011.20

Erection Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 400sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 400sqmm, XLPE insulation (extruded type) UG cable in trefoil formation by open trench method.	Mtr.	450	94.50	42,525.00
1.2	Erection of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, aluminium UG cable kits	Set	0	2,400.00	-
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	15	2,081.70	31,225.50
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	15	2,081.70	31,225.50
1.5	Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 400sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) including looping at cable terminations and straight through joints by HDD method with HDPE pipe (110mm dia, PN8 PE80) for laying of individual run of UG cable at main road and unaccessible place.	Mtr.	0	2,300.00	-
1.6	Laying of 110mm dia PE 80-PN8, HDPE pipe inside open trench.	Mtr.	0	300.00	-
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.1	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	15,000.00	-
2.2	Erection of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	15,000.00	-
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	8,000.00	-
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	8,000.00	-
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	-

ANNEXURE-8.15

Part-B

Laying of 33kV 3R 1Cx400 sqmm cable at Tangi PSS for connectivity of proposed RMU with PTR.

2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	8,000.00	-
3	FRTU and OFC for RMU SCADA Automation				
3.1	Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD	Mtr.	0.0	82.00	-
3.2	Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0.0	612.54	-
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	0.0	1,225.07	-
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	0.0	6,124.36	-
	Sub Total (Erection Portion) (in Rs.)				1,04,976.00
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	126	700.00	88,200.00
1.1.b	Earth work excavation of hard rock	Cum	54	1,720.00	92,880.00
1.2	Back filling with excavated soil outside and above the trench	Cum	180	202.00	36,360.00
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	0	2,643.67	-
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	0	23,145.30	-
3	Supply of GI Fencing with Gate around each RMU	sqmtr	0	3,600.00	-
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	0	3,700.00	-
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	120	1,463.40	1,75,608.00
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	5	1,012.00	5,060.00

ANNEXURE-8.15

Part-B

Laying of 33kV 3R 1Cx400 sqmm cable at Tangi PSS for connectivity of proposed RMU with PTR.

	Sub Total (Civil Portion) (in Rs.)	3,98,108.00
A	Sub Total (Supply Portion)	6,62,011.20
B	Stock, Storage & Insurance @ 3 % of A	19,860.34
C	Sub Total (A+B)	6,81,871.54
D	Contingency @ 3 % of C	20,456.15
E	Tools & Plants Charges @ 2% of C (considered for earthing items)	-
F	Transportation @ 7.5% of C	51,140.37
G	Erection Charges @ 10% of earthing items	-
H	Total (C+D+E+F+G)	7,53,468.05
I	Sub Total (Erection Portion + Civil Portion)	5,03,084.00
J	Total Cost (H+I)	12,56,552.05
K	Other Overhead //(including Supervision Charges) @ 6 % of J	75,393.12
L	Total Estimated Capital Cost i.e. (J+K)	13,31,945.17
M	GST @ 18% of L	2,39,750.13
M1	CESS @ 1% of L	13,319.45
N	Grand Total (L+M+M1)	15,85,014.75

ANNEXURE-8.16 (ABSTRACT)			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		PDP	
Name of the Sub-Division : -		JED	
Name of the Work :-		Proposal for Construction of 33 kV new line from Chikinia PSS to Raghunathpur PSS to mitigate low voltage issue.	
Scope:-		1. Construction of 33kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm. 2. Construction for 1no. 33kV Outdoor Bay at Raghunathpur PSS. 3. Construction for 1no. 33kV Outdoor Bay at Chikinia PSS.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Construction of 33kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm.	₹ 4,33,13,544.18
2	B	Construction for 1 no. 33kV Outdoor Bay at Raghunathpur PSS.	₹ 36,30,897.07
3	C	Construction for 1 no. 33kV Outdoor Bay at Chikinia PSS.	₹ 36,30,897.07
		Total Amount	₹ 5,05,75,338.31
		Total Amount (In Cr.)	₹ 5.06
Total estimated cost is Rs. 5.06 Crore. (Under TPCODL Capex Scheme)			

ANNEXURE-8.16					
Part-A					
Construction of 33 kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm.					
No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)			20		
<u>MATERIALS FOR 33 KV DP Without Isolator</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	40	22,69,428.57
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	1242.8	94,452.80
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	79.296	7,374.53
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =(5x7.14x1.96)	KG	76.00	1399.44	1,06,357.44
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	1235.52	93,899.52
6	Danger Plate, 2 no's.	No.	99.20	40	3,968.00
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	12.036	1,119.35
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	40	6,200.00
9	H.T. Stay set (Complete)	Set	1,302.00	40	52,080.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	80	4,960.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	600	55,800.00
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	20	26,040.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	236	21,948.00
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	120	11,904.00
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	48.144	4,477.39
16	33KV pin insulator polymer	No.	595.20	60	35,712.00
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	120	74,400.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	120	1,71,120.00
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	120	1,71,120.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	245.22	23,717.68
21	Black Paint	Ltr	272.80	20	5,456.00
22	Yellow Colour Paint for Background	Ltr	272.80	40	10,912.00
A	Total Cost of materials				32,52,447.28
B	Stock, Storage & Insurance i.e 3% of A				97,573.42
C	Sub Total (A+B)				33,50,020.70
D	Contingency @ 3% of C				1,00,500.62
E	Tools & Plants @ 2% of C				67,000.41
F	Transportation @ 7.5% of C				2,51,251.55
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,16,875.57
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				86,307.69

ANNEXURE-8.16					
Part-A					
Construction of 33 kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm.					
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				39,71,956.54
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	40	90,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	22	1,43,000.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	4.5	29,250.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including installation of 2Mtr CL Pipe 40mm/50mm	No.	3,700.00	20	74,000.00
K	Total Civil & Services				3,36,250.00
L	Total (J+K)				43,08,206.54
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				2,58,492.39
N	Sub Total (L+M)				45,66,698.93
O	Total GST @ 18% of (N)				8,22,005.81
P	Total GST @ 1% of (N)				45,666.99
Q	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				54,34,371.73
No. of 33 KV DP required With Isolator (Ref. Drawing No.- TPCODL-HVD-0004)		2			
MATERIALS FOR 33 KV DP With Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	4	2,26,942.86
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's channel required =(2x9.56x4.3)	KG	76.00	164.432	12,496.83
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	7.9296	737.45
4	Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 1 no's channel required =(1x7.14x4.3)	KG	76.00	61.404	4,666.70
5	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =(2x7.14x4.3)	KG	76.00	122.808	9,333.41
6	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 4 no's channel required =(4x7.14x4.3)	KG	76.00	245.616	18,666.82

ANNEXURE-8.16

Part-A

Construction of 33 kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm.

7	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos angle required = (4*4.5*4.927)	KG	76.00	177.372	13,480.27
8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel required =(1x7.14x0.8)	KG	76.00	11.424	868.22
9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 nos angle required = (1*4.5*0.388)	KG	76.00	3.492	265.39
10	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos angle required = (1*4.5*0.340)	KG	76.00	3.06	232.56
11	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =(2x9.56x0.5)	KG	76.00	19.12	1,453.12
12	Danger Plate, 2 no's.	No.	99.20	4	396.80
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	1.2036	111.93
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	4	620.00
15	H.T. Stay set (Complete)	Set	1,302.00	4	5,208.00
16	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	8	496.00
17	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	60	5,580.00
18	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	4	5,208.00
19	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36	KG	93.00	113.28	10,535.04
20	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	12	1,190.40
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	4.8144	447.74
22	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	6	77,004.00
23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	53,003.00	2	1,06,006.00
24	33KV pin insulator polymer	No.	595.20	6	3,571.20
25	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	12	7,440.00
26	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	12	17,112.00
27	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	12	17,112.00
28	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	96.72	44.3	4,284.70
29	Black Paint	Ltr	272.80	2	545.60
30	Yellow Colour Paint for Background	Ltr	272.80	4	1,091.20
A	Total Cost of materials				5,53,104.25
B	Stock, Storage & Insurance i.e 3% of A				16,593.13
C	Sub Total (A+B)				5,69,697.38
D	Contingency @ 3% of C				17,090.92
E	Tools & Plants @ 2% of C				11,393.95
F	Transportation @ 7.5% of C				42,727.30
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				11,687.56
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				31,832.09
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-

ANNEXURE-8.16					
Part-A					
Construction of 33 kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm.					
J	Sum of (C to I)				6,84,429.19
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	4	9,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.2	14,300.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	4	14,800.00
K	Total Civil & Services				41,025.00
L	Total (J+K)				7,25,454.19
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)				43,527.25
N	Sub Total (L+M)				7,68,981.44
O	Total GST @ 18% of (N)				1,38,416.66
P	Total GST @ 1% of (N)				7,689.81
Q	Gross Total Material +Services (N+O+P) for 33 KV DP With Isolator				9,15,087.92
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002)		14			
MATERIALS FOR 33 KV Cut Point with 180 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	14	7,94,300.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	455.056	34,584.26
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	93.00	74.0096	6,882.89
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	81.91008	6,225.17
5	Danger Plate, 1 no's.	No.	99.20	14	1,388.80
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	4.2126	391.77
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	42	4,166.40

ANNEXURE-8.16					
Part-A					
Construction of 33 kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm.					
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	16.8504	1,567.09
9	33KV pin insulator polymer	No.	595.20	42	24,998.40
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	84	52,080.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	84	1,19,784.00
12	Earthing of Support (Coil Type)	EA	205.84	14	2,881.76
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	3.668	341.12
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	84	1,19,784.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	68.306	6,606.56
16	Black Paint	Ltr	272.80	14	3,819.20
17	Yellow Colour Paint for Background	Ltr	272.80	28	7,638.40
A	Total Cost of materials				11,87,439.81
B	Stock, Storage & Insurance i.e 3% of A				35,623.19
C	Sub Total (A+B)				12,23,063.01
D	Contingency @ 3% of C				36,691.89
E	Tools & Plants @ 2% of C				24,461.26
F	Transportation @ 7.5% of C				91,729.73
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				40,906.45
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				40,493.40
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				14,57,345.74
<u>Civil & Services</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	7.7	50,050.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.575	10,237.50
K	Total Civil & Services				60,287.50
L	Total (J+K)				15,17,633.24
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				91,057.99
N	Sub Total (L+M)				16,08,691.23
O	Total GST @ 18% of (N)				2,89,564.42
P	Total GST @ 1% of (N)				16,086.91
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle				19,14,342.56
No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0003)		8			
<u>MATERIALS FOR 33 KV Cut Point with 90 Degree Angle</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	8	4,53,885.71

ANNEXURE-8.16					
Part-A					
Construction of 33 kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm.					
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	520.064	39,524.86
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	84.5824	7,866.16
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306)	K.g.	76.00	93.61152	7,114.48
5	Danger Plate, 1 no's.	No.	99.20	8	793.60
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	2.4072	223.87
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	24	2,380.80
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	9.6288	895.48
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	32	19,046.40
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	48	29,760.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	48	68,448.00
12	Earthing of Support (Coil Type)	No.	205.84	8	1,646.72
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	2.096	194.93
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	48	68,448.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	8	1,240.00
16	H.T. Stay set (Complete)	Set	1,302.00	8	10,416.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	8	496.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	120	11,160.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	90.48	8,751.23
20	Black Paint	Ltr	272.80	8	2,182.40
21	Yellow Colour Paint for Background	Ltr	272.80	16	4,364.80
A	Total Cost of materials				7,38,839.44
B	Stock, Storage & Insurance i.e 3% of A				22,165.18
C	Sub Total (A+B)				7,61,004.62
D	Contingency @ 3% of C				22,830.14
E	Tools & Plants @ 2% of C				15,220.09
F	Transportation @ 7.5% of C				57,075.35
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				23,375.11
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				26,949.10
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				9,06,454.41
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	4.40	28,600.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.90	5,850.00

ANNEXURE-8.16

Part-A

Construction of 33 kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm.

3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	8	18,000.00
K	Total Civil & Services				52,450.00
L	Total (J+K)				9,58,904.41
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree				57,534.26
N	Sub Total (L+M)				10,16,438.68
O	Total GST @ 18% of (N)				1,82,958.96
P	Total GST @ 1% of (N)				10,164.39
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle				12,09,562.02
33 Kv Line Length In KM with 40 Mtr. Span (Ref. Drawing No.- TPCODL-HVD-0001)		11			
MATERIALS FOR 33 KV Pin Points					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	13 Mtr. Long H-Pole	No	56,735.71	231	1,31,05,950.00
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	231	4,52,575.20
3	Top bracket 100x50x6mm GI channel (300mm each)	No.	186.00	231	42,966.00
4	Danger Plate, 1 no's.	No.	99.20	231	22,915.20
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	69.51	6,464.23
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	693.00	68,745.60
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	278.03	25,856.94
8	33KV pin insulator polymer	No.	595.20	693	4,12,473.60
9	Earthing of Support (Coil Type)	No.	205.84	231	47,549.04
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	60.52	5,628.55
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	334.95	32,396.36
12	232 sq.mm AAA conductor	K.M.	1,94,060.00	33.99	65,96,099.40
13	Crimping type Midspan Compression Joint for 148 sq.mm AAA conductor	EA	648.42		-
14	Black Paint	Ltr	272.80	231.0	63,016.80
15	Yellow Colour Paint for Background	Ltr	272.80	462.0	1,26,033.60
A	Total Cost of materials				2,10,08,670.52
B	Stock, Storage & Insurance i.e 3% of A				6,30,260.12
C	Sub Total (A+B)				2,16,38,930.64
D	Contingency @ 3% of C				6,49,167.92
E	Tools & Plants @ 2% of C				4,32,778.61
F	Transportation @ 7.5% of C				16,22,919.80
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				6,74,956.43

ANNEXURE-8.16					
Part-A					
Construction of 33 kV new line from Chikinia PSS to Raghunathpur PSS of length 11Ckm.					
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				8,13,980.21
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				2,58,32,733.61
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	127.05	8,25,825.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	25.99	1,68,918.75
K	Total Civil & Services				9,94,743.75
L	Total (J+K)				2,68,27,477.36
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				16,09,648.64
N	Sub Total (L+M)				2,84,37,126.00
O	Total GST @ 18% of (N)				51,18,682.68
P	Total GST @ 1% of (N)				2,84,371.26
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				3,38,40,179.94
6% Supervision Charges Summary					
1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				2,58,492.39
2	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)				43,527.25
3	Other overheads (including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				91,057.99
4	Other overheads (including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				57,534.26
5	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				16,09,648.64
	Total (6% supervision charges)				20,60,260.54
Gross Total Summary					
1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				54,34,371.73
2	Gross Total Material +Services (N+O+P) for 33 KV DP With Isolator				9,15,087.92
3	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle				19,14,342.56
4	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle				12,09,562.02
5	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				3,38,40,179.94
6	Gross Total Material and Services (1+2+3+4+5)				4,33,13,544.18

ANNEXURE-8.16

Part-B

1. Cost of Construction for 1 no. of 33kv Outdoor Bay at Raghunathpur PSS.

No. of Bus isolator requirement					
3					
No. of VCB Requirement					
1					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	T-1 GI Column(7.25 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel) for 33kV incoming line, Nominal Unit Wt - 0.35 MT	Nos.	26,600.00	1	26,600.00
2	T-2 GI Column (7.25mtr long, consisting of 2 Nos 175X75X6 mm channel) for 33kV incoming line -1 no, Nominal Unit Wt - 0.42 MT	Nos.	31,920.00	1	31,920.00
3	T-1A GI Column (for 33 kv Bus) (6 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel jointed by plates) Nominal Unit Wt - 0.31 MT	Nos.	23,560.00	2	47,120.00
4	T-2A GI Column (for 33 kv Bus) (6 mtr long, consisting of 2 Nos 175X75X6 mm channel jointed by plates) Nominal Unit Wt - 0.37 MT	Nos.	28,120.00	2	56,240.00
5	G-3 GI Beam(5.05mtr long, consisting of 2 Nos 150X75 X5.7mm) for 33kV incoming line - (2 nos. Beam- one for Surge Arrester and other for Isolator, Nominal Unit Wt - 0.2 MT)	Nos.	15,200.00	1	15,200.00
6	G-2 GI Beam (6.1 mtr long, consisting of 2 Nos 125X65 X5.3 mm channel jointed by plates) for 33kV Bus Stringing , Nominal Unit Wt - 0.175 MT)	Nos.	13,300.00	4	53,200.00
7	Equipment Structures (GI) For 33 KV Isolator (Unit Wt of Equipment Structures per set - 0.33 MT)	KG	76.00	990	75,240.00
8	Equipment Structures (GI) For 33 KV Vacuum Circuit Breaker (Unit Wt of Equipment Structures per set - 0.2 MT)	KG	76.00	200	15,200.00
9	GI Column for 33 KV CT (Unit Wt of Equipment Structures per set - 0.285 MT)	KG	76.00	285	21,660.00
10	GI Spikes with cone and GI (2 nos) base plate 10mm (50x3000 mm GI pipe) (Unit Wt=0.035 MT)	Nos.	3,641.92	4	14,567.67
11	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	8	10,416.00
12	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr. For Isolator/VCB , 10 metre mesh formation)= 20x2.36	KG	93.00	188.8	17,558.40
13	400 sq.mm ACSR for 33kV side jumpering and Bus Formation etc.	KM	2,61,640.00	0.1	26,164.00
14	33 kV 1250 AMP Double break (Turn & twist center rotating) isolator with earth switch with PI(Polymer)	Set	1,25,103.60	3	3,75,310.80
15	33KV Outdoor VCB-1600A, with indoor CR panel without PT, with outdoor CT (CTR- 600-300-150/1-1A, 15VA, STC 25KA/3sec, class: 0.5, 5P10) for feeder protection	EA	6,69,600.00	1	6,69,600.00
16	33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled) CLASS 0.5 / 3P, with O/P burden of 100VA	EA	31,520.80	3	94,562.40
17	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	12	1,54,008.00
18	Control Cable 10Core x 2.5 mm ²	Mtr	409.20	150	61,380.00
19	Control Cable 16Core x 2.5 mm ²	Mtr	499.72	150	74,958.00
20	Control Cable 4Core x 2.5 mm ²	Mtr	138.88	50	6,944.00
21	Control Cable 7Core x 2.5 mm ²	Mtr	43.68	50	2,184.00
22	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	18	25,668.00

ANNEXURE-8.16

Part-B

1. Cost of Construction for 1 no. of 33kv Outdoor Bay at Raghunathpur PSS.

23	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	18	11,160.00
24	8 bolted (M-12) "T" clamp ACSR Zebra run & 232 mm ² drop	No.	1,339.20	18	24,105.60
25	PG Clamp for 232 sq.mm AAA conductor	NO.	276.00	48	13,248.00
26	GI Nut , Bolt & Washer of different sizes (13.718 Kg each Structures)	K.g.	96.72	54.872	5,307.22
27	Black Paint	Ltr	272.80	4	1,091.20
28	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40
A	Total Cost of materials				19,32,795.69
B	Stock, Storage & Insurance i.e 3% of A				57,983.87
C	Sub Total (A+B)				19,90,779.56
D	Contingency @ 3% of C				59,723.39
E	Tools & Plants @ 2% of C				39,815.59
F	Transportation @ 7.5% of C				1,49,308.47
G	Erection Charges @ 5% on Trf/Breaker/Joist				34,484.40
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole/GI Earthing)				1,29,036.31
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				24,03,147.72

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
A	VCB Foundation				
1	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	7.28	3,508.96
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	4.00	800.00
3	Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.	Cum	1020.00	0.34	348.08
4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	0.46	2,334.15
5	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	2.83	18,362.50
6	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	13.25	3,988.25

ANNEXURE-8.16

Part-B

1. Cost of Construction for 1 no. of 33kv Outdoor Bay at Raghunathpur PSS.

7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	140.00	15,260.00
B	CT & PT Foundation			0.00	-
1	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	7.97	3,840.94
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	4.50	900.00
3	Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.	Cum	900.00	0.36	326.70
4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	0.36	1,862.19
5	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	2.36	15,356.25
6	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	14.94	4,496.94
7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	122.43	13,344.87
C	Column as per Drawing Schedule-			0.00	-
1	Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	51.31	24,731.30
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	24.00	4,800.00
3	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	2.10	10,773.00
4	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	14.18	92,137.50

ANNEXURE-8.16

Part-B

1. Cost of Construction for 1 no. of 33kv Outdoor Bay at Raghunathpur PSS.

5	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	89.64	26,981.64
6	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	734.58	80,069.22
D	Isolator				
1	Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	14.18	6,832.35
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	6.00	1,200.00
3	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	0.85	4,363.07
4	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	8.55	55,575.00
5	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	44.82	13,490.82
6	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	367.29	40,034.61
7	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat	No.	3700.00	8	29,600.00
K	Total Civil & Services				4,75,318.33
L	Total (J+K)				28,78,466.04
M	Other overheads (Including 6% supervision charges) of L				1,72,707.96
N	Sub Total (L+M)				30,51,174.01
O	Total GST @ 18% of (N)				5,49,211.32
P	Total Cess @ 1% of (N)				30,511.74
Q	Gross Total Material +Services (N+O+P)				36,30,897.07

ANNEXURE-8.16

Part-C

1. Cost of Construction for 1 no. of 33kv Outdoor Bay at Chikinia PSS.

No. of Bus isolator requirement					
3					
No. of VCB Requirement					
1					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	T-1 GI Column(7.25 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel) for 33kV incoming line, Nominal Unit Wt - 0.35 MT	Nos.	26,600.00	1	26,600.00
2	T-2 GI Column (7.25mtr long, consisting of 2 Nos 175X75X6 mm channel) for 33kV incoming line -1 no, Nominal Unit Wt - 0.42 MT	Nos.	31,920.00	1	31,920.00
3	T-1A GI Column (for 33 kv Bus) (6 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel jointed by plates) Nominal Unit Wt - 0.31 MT	Nos.	23,560.00	2	47,120.00
4	T-2A GI Column (for 33 kv Bus) (6 mtr long, consisting of 2 Nos 175X75X6 mm channel jointed by plates) Nominal Unit Wt - 0.37 MT	Nos.	28,120.00	2	56,240.00
5	G-3 GI Beam(5.05mtr long, consisting of 2 Nos 150X75 X5.7mm) for 33kV incoming line - (2 nos. Beam- one for Surge Arrester and other for Isolator, Nominal Unit Wt - 0.2 MT)	Nos.	15,200.00	1	15,200.00
6	G-2 GI Beam (6.1 mtr long, consisting of 2 Nos 125X65 X5.3 mm channel jointed by plates) for 33kV Bus Stringing , Nominal Unit Wt - 0.175 MT)	Nos.	13,300.00	4	53,200.00
7	Equipment Structures (GI) For 33 KV Isolator (Unit Wt of Equipment Structures per set - 0.33 MT)	KG	76.00	990	75,240.00
8	Equipment Structures (GI) For 33 KV Vacuum Circuit Breaker (Unit Wt of Equipment Structures per set - 0.2 MT)	KG	76.00	200	15,200.00
9	GI Column for 33 KV CT (Unit Wt of Equipment Structures per set - 0.285 MT)	KG	76.00	285	21,660.00
10	GI Spikes with cone and GI (2 nos) base plate 10mm (50x3000 mm GI pipe) (Unit Wt=0.035 MT)	Nos.	3,641.92	4	14,567.67
11	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	8	10,416.00
12	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr. For Isolator/VCB , 10 metre mesh formation)= 20x2.36	KG	93.00	188.8	17,558.40
13	400 sq.mm ACSR for 33kV side jumpering and Bus Formation etc.	KM	2,61,640.00	0.1	26,164.00
14	33 kV 1250 AMP Double break (Turn & twist center rotating) isolator with earth switch with PI(Polymer)	Set	1,25,103.60	3	3,75,310.80
15	33KV Outdoor VCB-1600A, with indoor CR panel without PT, with outdoor CT (CTR- 600-300-150/1-1A, 15VA, STC 25KA/3sec, class: 0.5, 5P10) for feeder protection	EA	6,69,600.00	1	6,69,600.00
16	33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled) CLASS 0.5 / 3P, with O/P burden of 100VA	EA	31,520.80	3	94,562.40
17	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	12	1,54,008.00
18	Control Cable 10Core x 2.5 mm ²	Mtr	409.20	150	61,380.00
19	Control Cable 16Core x 2.5 mm ²	Mtr	499.72	150	74,958.00
20	Control Cable 4Core x 2.5 mm ²	Mtr	138.88	50	6,944.00
21	Control Cable 7Core x 2.5 mm ²	Mtr	43.68	50	2,184.00
22	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	18	25,668.00

ANNEXURE-8.16

Part-C

1. Cost of Construction for 1 no. of 33kv Outdoor Bay at Chikinia PSS.

23	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	18	11,160.00
24	8 bolted (M-12) "T" clamp ACSR Zebra run & 232 mm ² drop	No.	1,339.20	18	24,105.60
25	PG Clamp for 232 sq.mm AAA conductor	NO.	276.00	48	13,248.00
26	GI Nut , Bolt & Washer of different sizes (13.718 Kg each Structures)	K.g.	96.72	54.872	5,307.22
27	Black Paint	Ltr	272.80	4	1,091.20
28	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40
A	Total Cost of materials				19,32,795.69
B	Stock, Storage & Insurance i.e 3% of A				57,983.87
C	Sub Total (A+B)				19,90,779.56
D	Contingency @ 3% of C				59,723.39
E	Tools & Plants @ 2% of C				39,815.59
F	Transportation @ 7.5% of C				1,49,308.47
G	Erection Charges @ 5% on Trf/Breaker/Joist				34,484.40
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole/GI Earthing)				1,29,036.31
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				24,03,147.72

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
A	VCB Foundation				
1	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	7.28	3,508.96
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	4.00	800.00
3	Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.	Cum	1020.00	0.34	348.08
4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	0.46	2,334.15
5	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	2.83	18,362.50
6	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	13.25	3,988.25

ANNEXURE-8.16

Part-C

1. Cost of Construction for 1 no. of 33kv Outdoor Bay at Chikinia PSS.

7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	140.00	15,260.00
B	CT & PT Foundation			0.00	-
1	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	7.97	3,840.94
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	4.50	900.00
3	Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete.	Cum	900.00	0.36	326.70
4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	0.36	1,862.19
5	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	2.36	15,356.25
6	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	14.94	4,496.94
7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	122.43	13,344.87
C	Column as per Drawing Schedule-			0.00	-
1	Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	51.31	24,731.30
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth,consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	24.00	4,800.00
3	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement :3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	2.10	10,773.00

ANNEXURE-8.16

Part-C

1. Cost of Construction for 1 no. of 33kv Outdoor Bay at Chikinia PSS.

4	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	14.18	92,137.50
5	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	89.64	26,981.64
6	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	734.58	80,069.22
D	Isolator				
1	Excavation (2.15x2.15x1.85mtr) & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works	Cum	482.00	14.18	6,832.35
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating & compacting each deposited layer by ramming and watering as directed by Engineer-in-charge.	Cum	200.00	6.00	1,200.00
3	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:3:6 (1 Cement : 3 coarse sand (zone-III) : 6 graded stone aggregate 40 mm nominal size).	Cum	5130.00	0.85	4,363.07
4	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	Cum	6500.00	8.55	55,575.00
5	Centering and shuttering including strutting, propping etc. and removal of form for all heights: Foundations, footings, bases of columns, etc. for mass concrete.	Sqm	301.00	44.82	13,490.82
6	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete: Thermo-Mechanically Treated bars of grade Fe-500D or more.	Kg	109.00	367.29	40,034.61
7	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat	No.	3700.00	8	29,600.00
K	Total Civil & Services				4,75,318.33
L	Total (J+K)				28,78,466.04
M	Other overheads (Including 6% supervision charges) of L				1,72,707.96
N	Sub Total (L+M)				30,51,174.01
O	Total GST @ 18% of (N)				5,49,211.32

ANNEXURE-8.16		
<u>Part-C</u>		
<i>1. Cost of Construction for 1 no. of 33kv Outdoor Bay at Chikinia PSS.</i>		
P	Total Cess @ 1% of (N)	30,511.74
Q	Gross Total Material +Services (N+O+P)	36,30,897.07

ANNEXURE-8.17 (ABSTRACT)			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		CED	
Name of the Sub-Division : -		Niali	
Name of the Work :-		Proposal for Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS - 14.5km along with installation of 1no. 26.5/33kV, 10MVA AVR Unit at Niali PSS and 1no. 5MVA, AVR Unit at Kulakapasi PSS to mitigate low voltage issue.	
Scope:-		1. Installation of 1no. 26.5/33kV, 10MVA AVR Unit at Niali PSS. 2. Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Kulakapasi PSS. 3. Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqmm AAAC - 14.5km.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Installation of 1no. 26.5/33kV, 10MVA AVR Unit at Niali PSS.	₹ 3,02,91,503.23
2	B	Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Kulakapasi PSS.	₹ 2,01,67,764.78
3	C	Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqmm AAAC - 14.5km.	₹ 3,45,75,571.62
		Total Amount	₹ 8,50,34,839.62
		Total Amount (In Cr.)	₹ 8.50
Total estimated cost is Rs. 8.50 Crore. (Under TPCODL Capex Scheme)			

ANNEXURE-8.17

Part-A

Installation of 1No's 26.5/33KV 10MVA AVR Unit at Niali PSS.

No. of 33 KV AVR Unit			1		
MATERIALS FOR 33 KV AVR at Niali PSS					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Amount
1	26.5/33kv 10MVA Automatic Voltage Regulated Transformer (AVR).	EA	1,30,00,000.00	1	1,30,00,000.00
2	Supply of 33kv, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	970.92	800	7,76,736.00
3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kv, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	8,517.56	12	1,02,210.72
4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kv, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	6,488.92	4	25,955.68
5	Pipe Earthing 40mm. GI Pipe	No.	1,302.00	4	5,208.00
6	50x6mm GI Flat for earthing (2.4kg/mtr)	KG	93.00	48	4,464.00
A	Total Cost of materials				1,39,14,574.40
B	Stock, Storage & Insurance i.e 3% of A				4,17,437.23
C	Sub Total (A+B)				1,43,32,011.63
D	Contingency @ 3% of C				4,29,960.35
E	Tools & Plants @ 2% of C				2,68,438.02
F	Transportation @ 7.5% of C				10,74,900.87
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				6,69,500.00
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				459.79
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				1,67,75,270.67
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Amount
1	Plinth for 10 MVA AVR	No.	8,32,187.22	1	8,32,187.22
2	Laying, Commissioning & Testing of 33kv, 1Core, 4Runs, 400sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.	Mtr.	94.50	800	75,600.00
3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kv, 1Core, 400sqmm, HT UG cable kits	Set	2,081.70	12	24,980.40
4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kv, 1Core, 400sqmm, HT UG cable kits	Set	2,081.70	4	8,326.80
5	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
5.1	Earth work excavation of soil	Cum	700.00	84	58,800.00
5.2	Earth work excavation of hard rock	Cum	1,720.00	36	61,920.00
5.3	Back filling with excavated soil outside and above the trench	Cum	202.00	120	24,240.00

ANNEXURE-8.17

Part-A

Installation of 1No's 26.5/33KV 10MVA AVR Unit at Niali PSS.

6	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No.	3,700.00	4	14,800.00
K	Total Civil & Services				11,00,854.42
L	Total (J+K)				1,78,76,125.09
M	Other overheads (Including 6% supervision charges) of L (for 33 KV VCB UNIT)				10,72,567.51
N	SubTotal (L+M)				1,89,48,692.60
O	Total GST @ 18% of (N)				34,10,764.67
P	Total GST @ 1% of (N)				1,89,486.93
Q	Gross Total Material +Services (N+O+P) for 33 KV AVR UNIT				2,25,48,944.19
Installation of 33kV Isolator- 5 no.s and 33kv VCB- 2No's for HT AVR Unit					
No. of Bus isolator requirement			5		
No. of VCB Requirement			2		
No. of Bus isolator requirement					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	T-1 GI Column(7.25 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel) for 33kV incoming line, Nominal Unit Wt - 0.35 MT	Nos.	26,600.00	2	53,200.00
2	T-2 GI Column (7.25mtr long, consisting of 2 Nos 175X75X6 mm channel) for 33kV incoming line -1 no, Nominal Unit Wt - 0.42 MT	Nos.	31,920.00	1	31,920.00
3	T-1A GI Column (for 33 kv Bus) (6 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel jointed by plates) Nominal Unit Wt - 0.31 MT	Nos.	23,560.00	4	94,240.00
4	T-2A GI Column (for 33 kv Bus) (6 mtr long, consisting of 2 Nos 175X75X6 mm channel jointed by plates) Nominal Unit Wt - 0.37 MT	Nos.	28,120.00	2	56,240.00
5	G-3 GI Beam(5.05mtr long, consisting of 2 Nos 150X75 X5.7mm) for 33kV incoming line - (2 nos. Beam- one for Surge Arrester and other for Isolator, Nominal Unit Wt - 0.2 MT)	Nos.	15,200.00	2	30,400.00
6	G-2 GI Beam (6.1 mtr long, consisting of 2 Nos 125X65 X5.3 mm channel jointed by plates) for 33kV Bus Stringing , Nominal Unit Wt - 0.175 MT)	Nos.	13,300.00	7	93,100.00
7	Equipment Structures (GI) For 33 KV Isolator (Unit Wt of Equipment Structures per set - 0.33 MT)	KG	76.00	1650	1,25,400.00
8	Equipment Structures (GI) For 33 KV Vacuum Circuit Breaker (Unit Wt of Equipment Structures per set - 0.2 MT)	KG	76.00	400	30,400.00

ANNEXURE-8.17

Part-A

Installation of 1No's 26.5/33KV 10MVA AVR Unit at Niali PSS.

9	GI Column for 33 KV CT (Unit Wt of Equipment Structures per set - 0.285 MT)	KG	76.00	570	43,320.00
	GI Spikes with cone and GI (2 nos) base plate 10mm (50x3000 mm GI pipe) (Unit Wt=0.035 MT)	Nos.	3,641.92	8	29,135.35
10	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	14	18,228.00
11	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr. For Isolator/VCB , 10 metre mesh formation)= 20x2.36	KG	93.00	330.4	30,727.20
12	400 sq.mm ACSR for 33kv side jumpering and Bus Formation etc.	KM	2,61,640.00	0.3	78,492.00
13	33 kv 1250 AMP Double break (Turn & twist center rotating) isolator with earth switch with PI(Polymer)	Set	1,25,103.60	5	6,25,518.00
14	33KV Outdoor VCB-1600A, with indoor CR panel without PT, with outdoor CT (CTR-600-300-150/1-1 A, 15VA, STC 25KA/3sec, class: 0.5, 5P10) for Transformer protection	EA	7,31,600.00	2	14,63,200.00
15	33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled) CLASS 0.5 / 3P, with O/P burden of 100VA	EA	31,520.80	6	1,89,124.80
16	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	21	2,69,514.00
17	Control Cable 10Core x 2.5 mm ²	Mtr	409.20	250	1,02,300.00
18	Control Cable 16Core x 2.5 mm ²	Mtr	499.72	250	1,24,930.00
19	Control Cable 4Core x 2.5 mm ²	Mtr	138.88	100	13,888.00
20	Control Cable 7Core x 2.5 mm ²	Mtr	43.68	100	4,368.00
21	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	30	42,780.00
22	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	30	18,600.00
23	8 bolted (M-12) "T" clamp ACSR Zebra run & 232 mm2 drop	No.	1,339.20	30	40,176.00
24	PG Clamp for 232 sq.mm AAA conductor	NO.	276.00	168	46,368.00
25	GI Nut , Bolt & Washer of different sizes (13.718 Kg each Strcutures)	K.g.	96.72	96.026	9,287.63
26	Black Paint	Ltr	272.80	7	1,909.60
27	Yellow Colour Paint for Background	Ltr	272.80	14	3,819.20
A1	Total Cost of materials				36,70,585.78
A2	Applicable Taxes to make it Landed Cost @18%				6,60,705.44
A	Total landed Cost (A=A1 + A2)				43,31,291.22
B	Stock, Storage & Insurance i.e 3% of A				1,29,938.74
C	Sub Total (A+B)				44,61,229.96
D	Contingency @ 3% of C				1,33,836.90
E	Tools & Plants @ 2% of C				89,224.60
F	Transportation @ 7.5% of C				3,34,592.25
G	Erection Charges @ 5% on Trf/Breaker/Joist				73,160.00
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				2,25,483.25
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				53,17,526.95
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	VCB as per Drawing Schedule- OPTCL/CIVIL/9.				-
2	Excavation with back filling (2.15x1.4x1.2mtr)	Cum	214.00	7.22	1,545.08
3	PCC (1:3:6)	Cum	4708.00	0.45	2,125.66
4	RCC(1:1.5:3)	Cum	9095.00	3.70	33,651.50

ANNEXURE-8.17

Part-A

Installation of 1No's 26.5/33KV 10MVA AVR Unit at Niali PSS.

5	Column as per Drawing Schedule-			0.00	-
6	Excavation with back filling (2.15x2.15x1.85mtr)	Cum	214.00	153.93	32,940.86
7	PCC (1:3:6)	Cum	4708.00	6.30	29,660.40
8	RCC(1:1.5:3)	Cum	9095.00	42.30	3,84,718.50
9	Isolator				
10	Excavation with back filling	Cum	214.00	23.63	5,055.75
11	PCC (1:3:6)	Cum	4708.00	1.42	6,673.59
12	RCC(1:1.5:3)	Cum	9095.00	14.25	1,29,603.75
13	CT				
14	Excavation with back filling	Cum	214.00	4.30	920.20
15	PCC (1:3:6)	Cum	4708.00	0.22	1,016.93
16	RCC(1:1.5:3)	Cum	9095.00	1.72	15,661.59
17	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	14	51,800.00
K1	Total Civil & Services				6,95,373.81
K2	Applicable Taxes to make it Landed Cost @18%				1,25,167.29
K	Total landed Cost (K=K1+ K2)				8,20,541.10
L	Total (J+K)				61,38,068.05
M	Other overheads (Including 6% supervision charges) of L				3,68,284.08
N	Sub Total (L+M)				65,06,352.13
O	Total GST @ 18% of (N)				11,71,143.38
P	Total Cess @ 1% of (N)				65,063.52
Q	Gross Total Material +Services (N+O+P) for 33 KV VCB UNIT				77,42,559.04
Gross Total Summary					
1	Gross Total Material +Services (N+O+P) for 33 KV AVR UNIT				2,25,48,944.19
2	Gross Total Material +Services (N+O+P) for 33 KV VCB UNIT				77,42,559.04
3	Gross Total Material, Services and Inspection Fees (1+2+3)				3,02,91,503.23

ANNEXURE-8.17

Part-B

Installation of 1No's 26.5/33KV 5MVA AVR Unit at Kulakapasi PSS.

No. of 33 KV VCB Unit			1		
MATERIALS FOR 33 KV AVR at Kulakapasi PSS					
Sl. No	Description of Materials	Unit	Unit Rate	Total Quantity	Amount
1	26.5/33kV 5MVA Automatic Voltage Regulated Transformer (AVR).	EA	65,00,000.00	1	65,00,000.00
2	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA- 20kA)	Mtr.	970.92	800	7,76,736.00
3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	8,517.56	12	1,02,210.72
4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	6,488.92	4	25,955.68
5	Pipe Earthing 40mm. GI Pipe	No.	1,302.00	4	5,208.00
6	50x6mm GI Flat for earthing (2.4kg/mtr)	KG	93.00	48	4,464.00
A	Total Cost of materials				74,14,574.40
B	Stock, Storage & Insurance i.e 3% of A				2,22,437.23
C	Sub Total (A+B)				76,37,011.63
D	Contingency @ 3% of C				2,29,110.35
E	Tools & Plants @ 2% of C				1,34,538.02
F	Transportation @ 7.5% of C				5,72,775.87
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				3,34,750.00
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				459.79
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				89,08,645.67
Civil & Services					
Sl. No	Description of Materials	Unit	Unit Rate	Total Quantity	Amount
1	Plinth for 5MVA AVR	No.	6,73,016.72	1	6,73,016.72
2	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 400sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.	Mtr.	94.50	800	75,600.00
3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	2,081.70	12	24,980.40
4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	2,081.70	4	8,326.80
5	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
5.1	Earth work excavation of soil	Cum	700.00	84	58,800.00
5.2	Earth work excavation of hard rock	Cum	1,720.00	36	61,920.00
5.3	Back filling with excavated soil outside and above the trench	Cum	202.00	120	24,240.00
6	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No.	3,700.00	4	14,800.00

ANNEXURE-8.17					
Part-B					
Installation of 1No's 26.5/33KV 5MVA AVR Unit at Kulakapasi PSS.					
K	Total Civil & Services				9,41,683.92
L	Total (J+K)				98,50,329.59
M	Other overheads (Including 6% supervision charges) of L (for 33 KV VCB UNIT)				5,91,019.78
N	SubTotal (L+M)				1,04,41,349.37
O	Total GST @ 18% of (N)				18,79,442.89
P	Total GST @ 1% of (N)				1,04,413.49
Q	Gross Total Material +Services (N+O+P) for 33 KV AVR UNIT				1,24,25,205.74
Installation of 33kV Isolator- 5 no.s and 33kv VCB- 2No's for HT AVR Unit					
No. of Bus isolator requirement			5		
No. of VCB Requirement			2		
<u>No. of Bus isolator requirement</u>					
Sl. No	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	T-1 GI Column(7.25 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel) for 33kV incoming line, Nominal Unit Wt - 0.35 MT	Nos.	26,600.00	2	53,200.00
2	T-2 GI Column (7.25mtr long, consisting of 2 Nos 175X75X6 mm channel) for 33kV incoming line -1 no, Nominal Unit Wt - 0.42 MT	Nos.	31,920.00	1	31,920.00
3	T-1A GI Column (for 33 kv Bus) (6 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel jointed by plates) Nominal Unit Wt - 0.31 MT	Nos.	23,560.00	4	94,240.00
4	T-2A GI Column (for 33 kv Bus) (6 mtr long, consisting of 2 Nos 175X75X6 mm channel jointed by plates) Nominal Unit Wt - 0.37 MT	Nos.	28,120.00	2	56,240.00
5	G-3 GI Beam(5.05mtr long, consisting of 2 Nos 150X75 X5.7mm) for 33kV incoming line - (2 nos. Beam- one for Surge Arrester and other for Isolator, Nominal Unit Wt - 0.2 MT)	Nos.	15,200.00	2	30,400.00
6	G-2 GI Beam (6.1 mtr long, consisting of 2 Nos 125X65 X5.3 mm channel jointed by plates) for 33kV Bus Stringing , Nominal Unit Wt - 0.175 MT)	Nos.	13,300.00	7	93,100.00
7	Equipment Structures (GI) For 33 KV Isolator (Unit Wt of Equipment Structures per set - 0.33 MT)	KG	76.00	1650	1,25,400.00
8	Equipment Structures (GI) For 33 KV Vacuum Circuit Breaker (Unit Wt of Equipment Structures per set - 0.2 MT)	KG	76.00	400	30,400.00
9	GI Column for 33 KV CT (Unit Wt of Equipment Structures per set - 0.285 MT)	KG	76.00	570	43,320.00
	GI Spikes with cone and GI (2 nos) base plate 10mm (50x3000 mm GI pipe) (Unit Wt=0.035 MT)	Nos.	3,641.92	8	29,135.35
10	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	14	18,228.00
11	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr. For Isolator/VCB , 10 metre mesh formation)= 20x2.36	KG	93.00	330.4	30,727.20
12	400 sq.mm ACSR for 33kV side jumpering and Bus Formation etc.	KM	2,61,640.00	0.3	78,492.00
13	33 kV 1250 AMP Double break (Turn & twist center rotating) isolator with earth switch with PI(Polymer)	Set	1,25,103.60	5	6,25,518.00
14	33KV Outdoor VCB-1600A, with indoor CR panel without PT, with outdoor CT (CTR-600-300-150/1-1 A, 15VA, STC 25KA/3sec, class: 0.5, 5P10) for Transformer protection	EA	7,31,600.00	2	14,63,200.00

ANNEXURE-8.17

Part-B

Installation of 1No's 26.5/33KV 5MVA AVR Unit at Kulakapasi PSS.

15	33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled) CLASS 0.5 / 3P, with O/P burden of 100VA	EA	31,520.80	6	1,89,124.80
16	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	21	2,69,514.00
17	Control Cable 10Core x 2.5 mm ²	Mtr	409.20	250	1,02,300.00
18	Control Cable 16Core x 2.5 mm ²	Mtr	499.72	250	1,24,930.00
19	Control Cable 4Core x 2.5 mm ²	Mtr	138.88	100	13,888.00
20	Control Cable 7Core x 2.5 mm ²	Mtr	43.68	100	4,368.00
21	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	30	42,780.00
22	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	30	18,600.00
23	8 bolted (M-12) "T" clamp ACSR Zebra run & 232 mm ² drop	No.	1,339.20	30	40,176.00
24	PG Clamp for 232 sq.mm AAA conductor	NO.	276.00	168	46,368.00
25	GI Nut , Bolt & Washer of different sizes (13.718 Kg each Structures)	K.g.	96.72	96.026	9,287.63
26	Black Paint	Ltr	272.80	7	1,909.60
27	Yellow Colour Paint for Background	Ltr	272.80	14	3,819.20
A1	Total Cost of materials				36,70,585.78
A2	Applicable Taxes to make it Landed Cost @18%				6,60,705.44
A	Total landed Cost (A=A1 + A2)				43,31,291.22
B	Stock, Storage & Insurance i.e 3% of A				1,29,938.74
C	Sub Total (A+B)				44,61,229.96
D	Contingency @ 3% of C				1,33,836.90
E	Tools & Plants @ 2% of C				89,224.60
F	Transportation @ 7.5% of C				3,34,592.25
G	Erection Charges @ 5% on Trf/Breaker/Joist				73,160.00
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				2,25,483.25
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				53,17,526.95

Civil & Services

Sl. No	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	VCB as per Drawing Schedule- OPTCL/CIVIL/9.				-
2	Excavation with back filling (2.15x1.4x1.2mtr)	Cum	214.00	7.22	1,545.08
3	PCC (1:3:6)	Cum	4708.00	0.45	2,125.66
4	RCC(1:1.5:3)	Cum	9095.00	3.70	33,651.50
5	Column as per Drawing Schedule-			0.00	-
6	Excavation with back filling (2.15x2.15x1.85mtr)	Cum	214.00	153.93	32,940.86
7	PCC (1:3:6)	Cum	4708.00	6.30	29,660.40
8	RCC(1:1.5:3)	Cum	9095.00	42.30	3,84,718.50
9	Isolator				
10	Excavation with back filling	Cum	214.00	23.63	5,055.75
11	PCC (1:3:6)	Cum	4708.00	1.42	6,673.59
12	RCC(1:1.5:3)	Cum	9095.00	14.25	1,29,603.75
13	CT				
14	Excavation with back filling	Cum	214.00	4.30	920.20

ANNEXURE-8.17					
Part-B					
Installation of 1No's 26.5/33KV 5MVA AVR Unit at Kulakapasi PSS.					
15	PCC (1:3:6)	Cum	4708.00	0.22	1,016.93
16	RCC(1:1.5:3)	Cum	9095.00	1.72	15,661.59
17	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	14	51,800.00
K1	Total Civil & Services				6,95,373.81
K2	Applicable Taxes to make it Landed Cost @18%				1,25,167.29
K	Total landed Cost (K=K1+ K2)				8,20,541.10
L	Total (J+K)				61,38,068.05
M	Other overheads (Including 6% supervision charges) of L				3,68,284.08
N	Sub Total (L+M)				65,06,352.13
O	Total GST @ 18% of (N)				11,71,143.38
P	Total Cess @ 1% of (N)				65,063.52
Q	Gross Total Material +Services (N+O+P) for 33 KV VCB UNIT				77,42,559.04
Gross Total Summary					
1	Gross Total Material +Services (N+O+P) for 33 KV AVR UNIT				1,24,25,205.74
2	Gross Total Material +Services (N+O+P) for 33 KV VCB UNIT				77,42,559.04
3	Gross Total Material, Services and Inspection Fees (1+2+3)				2,01,67,764.78

ANNEXURE-8.17

Part-B

Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqmm AAAC - 14.5km.

No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)	12
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MATERIALS FOR 33 KV DP Without Isolator

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	24	7,48,800.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	745.68	56,671.68
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	47.5776	4,424.72
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =(5x7.14x1.96)	KG	76.00	839.664	63,814.46
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	741.312	56,339.71
6	Danger Plate, 2 no's.	No.	99.20	24	2,380.80
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	7.2216	671.61
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	24	3,720.00
9	H.T. Stay set (Complete)	Set	1,302.00	24	31,248.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	48	2,976.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	360	33,480.00
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	12	15,624.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	141.6	13,168.80
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	72	7,142.40
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	28.8864	2,686.44
16	33KV pin insulator polymer	No.	595.20	36	21,427.20
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	72	44,640.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	72	1,02,672.00
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	72	1,02,672.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	147.132	14,230.61
21	Black Paint	Ltr	272.80	12	3,273.60
22	Yellow Colour Paint for Background	Ltr	272.80	24	6,547.20

A	Total Cost of materials	13,38,611.22
B	Stock, Storage & Insurance i.e 3% of A	40,158.34
C	Sub Total (A+B)	13,78,769.56
D	Contingency @ 3% of C	41,363.09
E	Tools & Plants @ 2% of C	27,575.39
F	Transportation @ 7.5% of C	1,03,407.72
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole	38,563.20
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)	51,784.61
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv	-
J	Sum of (C to I)	16,41,463.57

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
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ANNEXURE-8.17

Part-B

Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqmm AAAC - 14.5kM.

1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	24	54,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	13.2	85,800.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	2.7	17,550.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	12	44,400.00
K	Total Civil & Services				2,01,750.00
L	Total (J+K)				18,43,213.57
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				1,10,592.81
N	Sub Total (L+M)				19,53,806.38
O	Total GST @ 18% of (N)				3,51,685.15
P	Total CESS @ 1% of (N)				19,538.06
Q	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				23,25,029.59
No. of 33 KV DP required With Isolator(Ref. Drawing No.- TPCODL-HVD-0004)		3			
MATERIALS FOR 33 KV DP With Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	6	1,87,200.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 4.3 mtr., 2 no's channel required =(2x9.56x4.3)	KG	76.00	246.648	18,745.25
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	11.8944	1,106.18
4	Insulator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 1 no's channel required =(1x7.14x4.3)	KG	76.00	92.106	7,000.06
5	Isolator Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 2 no's channel required =(2x7.14x4.3)	KG	76.00	184.212	14,000.11
6	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 4.3 Mtr., 4 no's channel required =(4x7.14x4.3)	KG	76.00	368.424	28,000.22
7	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 4.927 mtr., 4 nos angle required = (4*4.5*4.927)	KG	76.00	266.058	20,220.41
8	Isolator Operating Down Pipe Support Cahnnel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 0.8 Mtr., 1 no's channel required =(1x7.14x0.8)	KG	76.00	17.136	1,302.34
9	Down Pipe Diagonal Support Angle, 4.5Kg./mtr., each angle length 0.388mtr., 1 nos angle required = (1*4.5*0.388)	KG	76.00	5.238	398.09
10	Down Pipe Base Support Angle, 4.5Kg./mtr., each angle length 0.34mtr., 1 nos angle required = (1*4.5*0.340)	KG	76.00	4.59	348.84
11	Isolator Support Side Cahnnel 100X50X6mm, 9.56 KG/Mtr., each channel length 0.5 mtr., 2 no's channel required =(2x9.56x0.5)	KG	76.00	28.68	2,179.68
12	Danger Plate, 2 no's.	No.	99.20	6	595.20
13	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	1.8054	167.90
14	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	6	930.00
15	H.T. Stay set (Complete)	Set	1,302.00	6	7,812.00
16	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	12	744.00
17	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	90	8,370.00

ANNEXURE-8.17

Part-B

Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqmm AAAC - 14.5kM.

18	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	6	7,812.00
19	50x6mm GI Flat for earthing, 2.36kg/mtr., (15 Mtr. For L.A, 4 Mtr for Isolator Body, 2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 24x2.36	KG	93.00	169.92	15,802.56
20	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	18	1,785.60
21	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	7.2216	671.61
22	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	9	1,15,506.00
23	33 KV 1250 AMP Double break (Turn & twist center rotating) isolator without earth switch with PI(Polymer)	Set	53,003.00	3	1,59,009.00
24	33KV pin insulator polymer	No.	595.20	9	5,356.80
25	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	18	11,160.00
26	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	18	25,668.00
27	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	18	25,668.00
28	GI Nut , Bolt & Washer of different sizes (22.15 Kg each DP with Isolator)	K.g.	96.72	66.45	6,427.04
29	Black Paint	Ltr	272.80	3	818.40
30	Yellow Colour Paint for Background	Ltr	272.80	6	1,636.80
A	Total Cost of materials				6,76,442.09
B	Stock, Storage & Insurance i.e 3% of A				20,293.26
C	Sub Total (A+B)				6,96,735.35
D	Contingency @ 3% of C				20,902.06
E	Tools & Plants @ 2% of C				13,934.71
F	Transportation @ 7.5% of C				52,255.15
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				9,640.80
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pole/PSC pole)				47,748.13
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				8,41,216.20

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	6	13,500.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	3.3	21,450.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.675	4,387.50
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	6	22,200.00
K	Total Civil & Services				61,537.50
L	Total (J+K)				9,02,753.70
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)				54,165.22
N	Sub Total (L+M)				9,56,918.92
O	Total GST @ 18% of (N)				1,72,245.41
P	Total CESS @ 1% of (N)				9,569.19
Q	Gross Total Material +Services (N+O) for 33 KV DP With Isolator				11,38,733.51

No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002)

15

MATERIALS FOR 33 KV Cut Point with 180 Degree Angle

ANNEXURE-8.17

Part-B

Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqmm AAAC - 14.5kM.

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	15	4,68,000.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	487.56	37,054.56
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	93.00	79.296	7,374.53
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	87.7608	6,669.82
5	Danger Plate, 1 no's.	No.	99.20	15	1,488.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	4.5135	419.76
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	45	4,464.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	18.054	1,679.02
9	33KV pin insulator polymer	No.	595.20	45	26,784.00
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	90	55,800.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	90	1,28,340.00
12	Earthing of Support (Coil Type)	EA	205.84	15	3,087.60
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	3.93	365.49
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	90	1,28,340.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	73.185	7,078.45
16	Black Paint	Ltr	272.80	15	4,092.00
17	Yellow Colour Paint for Background	Ltr	272.80	30	8,184.00
A	Total Cost of materials				8,89,221.23
B	Stock, Storage & Insurance i.e 3% of A				26,676.64
C	Sub Total (A+B)				9,15,897.87
D	Contingency @ 3% of C				27,476.94
E	Tools & Plants @ 2% of C				18,317.96
F	Transportation @ 7.5% of C				68,692.34
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				24,102.00
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				43,385.79
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				10,97,872.89
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	8.25	53,625.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.6875	10,968.75
K	Total Civil & Services				64,593.75
L	Total (J+K)				11,62,466.64
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				69,748.00
N	Sub Total (L+M)				12,32,214.63
O	Total GST @ 18% of (N)				2,21,798.63
P	Total CESS @ 1% of (N)				12,322.15
Q	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle				14,66,335.42
No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0003)		15			
MATERIALS FOR 33 KV Cut Point with 90 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount

ANNEXURE-8.17

Part-B

Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqmm AAAC - 14.5km.

1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	15	4,68,000.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	975.12	74,109.12
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	158.592	14,749.06
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306)	K.g.	76.00	175.5216	13,339.64
5	Danger Plate, 1 no's.	No.	99.20	15	1,488.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	4.5135	419.76
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	45	4,464.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	18.054	1,679.02
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	60	35,712.00
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	90	55,800.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	90	1,28,340.00
12	Earthing of Support (Coil Type)	No.	205.84	15	3,087.60
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	3.93	365.49
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	90	1,28,340.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	15	2,325.00
16	H.T. Stay set (Complete)	Set	1,302.00	15	19,530.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	15	930.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	225	20,925.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	169.65	16,408.55
20	Black Paint	Ltr	272.80	15	4,092.00
21	Yellow Colour Paint for Background	Ltr	272.80	30	8,184.00
A	Total Cost of materials				10,02,288.23
B	Stock, Storage & Insurance i.e 3% of A				30,068.65
C	Sub Total (A+B)				10,32,356.88
D	Contingency @ 3% of C				30,970.71
E	Tools & Plants @ 2% of C				20,647.14
F	Transportation @ 7.5% of C				77,426.77
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				24,102.00
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				50,529.56
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				12,36,033.05
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	8.25	53,625.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.69	10,968.75
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	15	33,750.00
K	Total Civil & Services				98,343.75
L	Total (J+K)				13,34,376.80
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				80,062.61
N	Sub Total (L+M)				14,14,439.41
O	Total GST @ 18% of (N)				2,54,599.09

ANNEXURE-8.17

Part-B

Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqmm AAAC - 14.5km.

P	Total CESS @ 1% of (N)	14,144.39
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle	16,83,182.89

33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No.- TPCODL-HVD-0001)

15

MATERIALS FOR 33 KV Pin Points

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	210	65,52,000.00
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	210	4,11,432.00
3	Top bracket 100x50x6mm GI channel (2kg each)	No.	186.00	210	39,060.00
4	Danger Plate, 1 no's.	No.	99.20	210	20,832.00
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	63.19	5,876.58
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	630.00	62,496.00
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	252.76	23,506.31
8	33KV pin insulator polymer	No.	595.20	630	3,74,976.00
9	Earthing of Support (Coil Type)	No.	205.84	210	43,226.40
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	55.02	5,116.86
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	304.50	29,451.24
12	232 sq.mm AAA conductor	K.M.	1,94,060.00	46.35	89,94,681.00
13	Crimping type Midspan Compression Joint for 232 sq.mm AAA conductor	EA	648.42		-
14	Black Paint	Ltr	272.80	210.0	57,288.00
15	Yellow Colour Paint for Background	Ltr	272.80	420.0	1,14,576.00
A	Total Cost of materials				1,67,34,518.39
B	Stock, Storage & Insurance i.e 3% of A				5,02,035.55
C	Sub Total (A+B)				1,72,36,553.94
D	Contingency @ 3% of C				5,17,096.62
E	Tools & Plants @ 2% of C				3,44,731.08
F	Transportation @ 7.5% of C				12,92,741.55
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				3,37,428.00
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				10,48,799.39
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				2,07,77,350.57

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	115.50	7,50,750.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	23.63	1,53,562.50
3	Dismantalling of 148/232sqmm Conductor	km	10,800.00	45.00	4,86,000.00
4	Dismantalling of 100/80sqmm Conductor	km	9,000.00		-
K	Total Civil & Services				13,90,312.50
L	Total (J+K)				2,21,67,663.07
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				13,30,059.78
N	Sub Total (L+M)				2,34,97,722.86
O	Total GST @ 18% of (N)				42,29,590.11
P	Total CESS @ 1% of (N)				2,34,977.23
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				2,79,62,290.20

6% Supervision Charges Summary

ANNEXURE-8.17

Part-B

Augmentation of 33kV Niali feeder from Phulnakhra GSS to Adaspur PSS with 232sqmm AAAC - 14.5kM.

1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)	1,10,592.81
2	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)	54,165.22
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)	69,748.00
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)	80,062.61
5	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)	13,30,059.78
	Total (6% supervision charges)	16,44,628.43
<u>Gross Total Summary</u>		
1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator	23,25,029.59
2	Gross Total Material +Services (N+O) for 33 KV DP With Isolator	11,38,733.51
3	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle	14,66,335.42
4	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle	16,83,182.89
5	Gross Total Material +Services (N+O+P) for 33 KV Pin Points	2,79,62,290.20
6	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)	3,45,75,571.62

ANNEXURE-8.18 (ABSTRACT)			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		BAED	
Name of the Sub-Division :-		Tangi	
Name of the Work :-		Proposal for Augmentation of 33kv Bhusandpur fdr. 5.5 ckm line between Bharat Electricals and Jankia PSS and Construction of 2No's 33 kV RMU with UG cable at Jankia PSS to mitigate low voltage issue and improve reliability.	
Scope:-		1. Construction for Augmentation of 5.5 ckm with 148sqmm using 13mtr WPB-Pole between Bharat Electricals and Jankia PSS. 2. Construction of 2No's 33 kV RMU (1no - LLVV, 1no - LLLL). 3. Laying of 33kV 3R 1Cx630 sqmm cable at Jankia PSS for connectivity of 33kV feeders with proposed RMU. 4. Laying of 33kV 3R 1Cx400 sqmm cable at Jankia PSS for connectivity of proposed RMU with PTR.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Construction for Augmentation of 5.5 ckm with 148sqmm using 13mtr WPB-Pole between Bharat Electricals and Jankia PSS.	₹ 96,41,075.51
2	B	1. Construction of 2No's 33 kV RMU (1no - LLVV, 1no - LLLL). 2. Laying of 33kV 3R 1Cx630 sqmm cable at Jankia PSS for connectivity of 33kV feeders with proposed RMU.	₹ 79,49,699.30
3	C	Laying of 33kV 3R 1Cx400 sqmm cable at Jankia PSS for connectivity of proposed RMU with PTR.	₹ 12,68,011.80
		Total Amount	₹ 1,88,58,786.61
		Total Amount (In Cr.)	₹ 1.89
Total estimated cost is Rs. 1.89 Crore. (Under TPCODL Capex Scheme)			

ANNEXURE-8.18

Part-A

Construction for Augmentation of 5.5 ckm with 148sqmm using 13mtr WPB-Pole between Bharat Electricals and Jankia PSS.

**No. of 33 KV DP required Without Isolator
(Ref. Drawing No.- TPCODL-HVD-0004)**

5

MATERIALS FOR 33 KV DP Without Isolator

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	10	3,12,000.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	310.7	23,613.20
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	19.824	1,843.63
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =(5x7.14x1.96)	KG	76.00	349.86	26,589.36
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	308.88	23,474.88
6	Danger Plate, 2 no's.	No.	99.20	10	992.00
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	3.009	279.84
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	10	1,550.00
9	H.T. Stay set (Complete)	Set	1,302.00	10	13,020.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	20	1,240.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	150	13,950.00
12	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	5	6,510.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	59	5,487.00
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	30	2,976.00
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	12.036	1,119.35
16	33KV pin insulator polymer	No.	595.20	15	8,928.00
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	30	18,600.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	30	42,780.00
19	PG Clamp for 148 sq.mm AAA conductor	NO.	768.80	30	23,064.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	61.305	5,929.42
21	Black Paint	Ltr	272.80	5	1,364.00
22	Yellow Colour Paint for Background	Ltr	272.80	10	2,728.00
A	Total Cost of materials				5,38,038.68
B	Stock, Storage & Insurance i.e 3% of A				16,141.16
C	Sub Total (A+B)				5,54,179.84
D	Contingency @ 3% of C				16,625.40
E	Tools & Plants @ 2% of C				11,083.60
F	Transportation @ 7.5% of C				41,563.49
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				16,068.00
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				19,546.17
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				6,59,066.49
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	10	22,500.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	5.5	35,750.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.125	7,312.50

ANNEXURE-8.18

Part-A

Construction for Augmentation of 5.5 ckm with 148sqmm using 13mtr WPB-Pole between Bharat Electricals and Jankia PSS.

4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	5	18,500.00
K	Total Civil & Services				84,062.50
L	Total (J+K)				7,43,128.99
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				44,587.74
N	SubTotal (L+M)				7,87,716.73
O	Total GST @ 18% of (N)				1,41,789.01
P	Total CESS @ 1% of (N)				7,877.17
Q	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				9,37,382.91

**No. of 33 KV Cut Point with 180 Degree Angle
(Ref. Drawing No.- TPCODL-HVD-0002)**

5

MATERIALS FOR 33 KV Cut Point with 180 Degree Angle

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	5	1,56,000.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	162.52	12,351.52
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	93.00	26.432	2,458.18
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	29.2536	2,223.27
5	Danger Plate, 1 no's.	No.	99.20	5	496.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.5045	139.92
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	15	1,488.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	6.018	559.67
9	33KV pin insulator polymer	No.	595.20	15	8,928.00
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	30	18,600.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	30	42,780.00
12	Earthing of Support (Coil Type)	EA	205.84	5	1,029.20
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.31	121.83
14	PG Clamp for 148 sq.mm AAA conductor	NO.	768.80	30	23,064.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	24.395	2,359.48
16	Black Paint	Ltr	272.80	5	1,364.00
17	Yellow Colour Paint for Background	Ltr	272.80	10	2,728.00

A	Total Cost of materials				2,76,691.08
B	Stock, Storage & Insurance i.e 3% of A				8,300.73
C	Sub Total (A+B)				2,84,991.81
D	Contingency @ 3% of C				8,549.75
E	Tools & Plants @ 2% of C				5,699.84
F	Transportation @ 7.5% of C				21,374.39
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				8,034.00
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				12,431.18
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				3,41,080.97

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.75	17,875.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.5625	3,656.25
K	Total Civil & Services				21,531.25
L	Total (J+K)				3,62,612.22

ANNEXURE-8.18

Part-A

Construction for Augmentation of 5.5 ckm with 148sqmm using 13mtr WPB-Pole between Bharat Electricals and Jankia PSS.

M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)	21,756.73
N	Sub Total (L+M)	3,84,368.95
O	Total GST @ 18% of (N)	69,186.41
P	Total CESS @ 1% of (N)	3,843.69
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle	4,57,399.05

**No. of 33 KV Cut Point with 90 Degree Angle
(Ref. Drawing No.- TPCODL-HVD-0003)**

5

MATERIALS FOR 33 KV Cut Point with 90 Degree Angle

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	5	1,56,000.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	325.040	24,703.04
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	52.864	4,916.35
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306)	K.g.	76.00	58.507	4,446.55
5	Danger Plate, 1 no's.	No.	99.20	5	496.00
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.505	139.92
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	15	1,488.00
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	6.018	559.67
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	20	11,904.00
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	30	18,600.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	30	42,780.00
12	Earthing of Support (Coil Type)	No.	205.84	5	1,029.20
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.31	121.83
14	PG Clamp for 148 sq.mm AAA conductor	NO.	768.80	30	23,064.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	5	775.00
16	H.T. Stay set (Complete)	Set	1,302.00	5	6,510.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	5	310.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	75	6,975.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	56.55	5,469.52
20	Black Paint	Ltr	272.80	5	1,364.00
21	Yellow Colour Paint for Background	Ltr	272.80	10	2,728.00

A	Total Cost of materials	3,14,380.08
B	Stock, Storage & Insurance i.e 3% of A	9,431.40
C	Sub Total (A+B)	3,23,811.48
D	Contingency @ 3% of C	9,714.34
E	Tools & Plants @ 2% of C	6,476.23
F	Transportation @ 7.5% of C	24,285.86
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole	8,034.00
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)	14,812.44
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv	-
J	Sum of (C to I)	3,87,134.35

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.75	17,875.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.56	3,656.25

ANNEXURE-8.18

Part-A

Construction for Augmentation of 5.5 ckm with 148sqmm using 13mtr WPB-Pole between Bharat Electricals and Jankia PSS.

3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	5	11,250.00
K	Total Civil & Services				32,781.25
L	Total (J+K)				4,19,915.60
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				25,194.94
N	Sub Total (L+M)				4,45,110.54
O	Total GST @ 18% of (N)				80,119.90
P	Total CESS @ 1% of (N)				4,451.11
Q	Gross Total Material +Services (N+O) for 33 KV Cut Point with 90 Degree Angle				5,29,681.54
33 Kv Line Length In KM with 40 Mtr. Span (Ref. Drawing No.- TPCODL-HVD-0001)		5.5			
MATERIALS FOR 33 KV Pin Points					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	77	24,02,400.00
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	77	1,50,858.40
3	Top bracket 100x50x6mm GI channel (2kg each)	No.	186.00	77	14,322.00
4	Danger Plate, 1 no's.	No.	99.20	77	7,638.40
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	23.17	2,154.74
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	231.00	22,915.20
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	92.68	8,618.98
8	33KV pin insulator polymer	No.	595.20	231	1,37,491.20
9	Earthing of Support (Coil Type)	No.	205.84	77	15,849.68
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	20.17	1,876.18
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	111.65	10,798.79
12	148 sq.mm AAA conductor	K.M.	1,01,680.00	17.00	17,28,051.60
13	Crimping type Midspan Compression Joint for 148 sq.mm AAA conductor	EA	405.27		-
14	Black Paint	Ltr	272.80	77.0	21,005.60
15	Yellow Colour Paint for Background	Ltr	272.80	154.0	42,011.20
A	Total Cost of materials				45,65,991.97
B	Stock, Storage & Insurance i.e 3% of A				1,36,979.76
C	Sub Total (A+B)				47,02,971.73
D	Contingency @ 3% of C				1,41,089.15
E	Tools & Plants @ 2% of C				94,059.43
F	Transportation @ 7.5% of C				3,52,722.88
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,23,723.60
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				2,22,849.97
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				56,37,416.77
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	42.35	2,75,275.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	8.66	56,306.25
3	Dismantalling of 80/100 sqmm Conductor	KM	9,000.00	16.50	1,48,500.00
K	Total Civil & Services				4,80,081.25
L	Total (J+K)				61,17,498.02
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				3,67,049.88

ANNEXURE-8.18

Part-A

Construction for Augmentation of 5.5 ckm with 148sqmm using 13mtr WPB-Pole between Bharat Electricals and Jankia PSS.

N	Sub Total (L+M)	64,84,547.91
O	Total GST @ 18% of (N)	11,67,218.62
P	Total CESS @ 1% of (N)	64,845.48
Q	Gross Total Material +Services (N+O) for 33 KV Pin Points	77,16,612.01
<u>6% Supervision Charges Summary</u>		
1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)	44,587.74
2	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)	-
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)	21,756.73
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)	25,194.94
5	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)	3,67,049.88
	Total (6% supervision charges)	4,58,589.29
<u>Gross Total Summary</u>		
1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator	9,37,382.91
2	Gross Total Material +Services (N+O+P) for 33 KV DP With Isolator	-
3	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 180 Degree Angle	4,57,399.05
4	Gross Total Material +Services (N+O) for 33 KV Cut Point with 90 Degree Angle	5,29,681.54
5	Gross Total Material +Services (N+O) for 33 KV Pin Points	77,16,612.01
6	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)	96,41,075.51

ANNEXURE-8.18

Part-B

1. Construction of 2No's 33 kV RMU (1no - LLVV, 1no - LLLL).

2. Laying of 33kV 3R 1Cx630 sqmm cable at Jankia PSS for connectivity of 33kV feeders with proposed RMU.

Supply Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories				
a	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	90		
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	270	1,337.13	3,61,025.10
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	6	5,245.00	31,470.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	12	4,894.00	58,728.00
2	Supply of 33kV RMU				
d	No. of 33kV 4Way RMU (LLVV)	nos.	1		
f	No. of 33kV 4Way RMU (LLLL)	nos.	1		
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	23,35,264.00	23,35,264.00
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	1	19,59,421.00	19,59,421.00
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	26.40	93.00	2,455.20
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	4	1,302.00	5,208.00
4	FRTU and OFC for RMU SCADA Automation				
4.4	Supply of end Connector and accessories for OFC connection at RMU,	Set	4	7,535.00	30,140.00
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	2	2,19,420.00	4,38,840.00
	Sub Total (Supply Portion) (in Rs.)				52,22,551.30

Erection Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by open trench method .	Mtr.	270	94.50	25,515.00
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	6	2,081.70	12,490.20

ANNEXURE-8.18					
Part-B					
1. Construction of 2No's 33 kV RMU (1no - LLVV, 1no - LLLL).					
2. Laying of 33kV 3R 1Cx630 sqmm cable at Jankia PSS for connectivity of 33kV feeders with proposed RMU.					
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	8,000.00	8,000.00
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	1	8,000.00	8,000.00
3	FRTU and OFC for RMU SCADA Automation				
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	4.0	1,225.07	4,900.28
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	2.0	6,124.36	12,248.72
	Sub Total (Erection Portion) (in Rs.)				96,134.60
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	75.6	700.00	52,920.00
1.1.b	Earth work excavation of hard rock	Cum	32.4	1,720.00	55,728.00
1.2	Back filling with excavated soil outside and above the trench	Cum	108	202.00	21,816.00
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	2	23,145.30	46,290.60
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	4	3,700.00	14,800.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	48	1,463.40	70,243.20
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	0	1,012.00	-
	Sub Total (Civil Portion) (in Rs.)				2,61,797.80
A	Sub Total (Supply Portion)				52,22,551.30
B	Stock, Storage & Insurance @ 3 % of A				1,56,676.54
C	Sub Total (A+B)				53,79,227.84

ANNEXURE-8.18		
<u>Part-B</u>		
1. Construction of 2No's 33 kV RMU (1no - LLVV, 1no - LLLL).		
2. Laying of 33kV 3R 1Cx630 sqmm cable at Jankia PSS for connectivity of 33kV feeders with proposed RMU.		
D	Contingency @ 3 % of C	1,61,376.84
E	Tools & Plants Charges @ 2% of C (considered for earthing items)	50.58
F	Transportation @ 7.5% of C	4,03,442.09
G	Erection Charges @ 10% of earthing items	252.89
H	Total (C+D+E+F+G)	59,44,350.22
I	Sub Total (Erection Portion + Civil Portion)	3,57,932.40
J	Total Cost (H+I)	63,02,282.62
K	Other Overhead /(including Supervision Charges) @ 6 % of J	3,78,136.96
L	Total Estimated Capital Cost i.e. (J+K)	66,80,419.58
M	GST @ 18% of L	12,02,475.52
M1	CESS @ 1% of L	66,804.20
N	Gross Total Material and Services (L+M+M1)	79,49,699.30

ANNEXURE-8.18

Part-B

Laying of 33kV 3R 1Cx400 sqmm cable at Jankia PSS for connectivity of proposed RMU with PTR.

Supply Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable with accessories				
a	Length of 33kV 1C, 400sqmm cable (open trench)	Mtr.	120		
1.1	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	360	970.92	3,49,531.20
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	12	8,517.56	1,02,210.72
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	12	6,488.92	77,867.04
	Sub Total (Supply Portion) (in Rs.)				5,29,608.96

Erection Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 400sqmm, XLPE UG cable without spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 3Runs, 400sqmm, XLPE insulation (extruded type) UG cable in trefoil formation by open trench method.	Mtr.	360	94.50	34,020.00
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	12	2,081.70	24,980.40
	Sub Total (Erection Portion) (in Rs.)				83,980.80

Civil Portion

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	100.8	700.00	70,560.00
1.1.b	Earth work excavation of hard rock	Cum	43.2	1,720.00	74,304.00
1.2	Back filling with excavated soil outside and above the trench	Cum	144	202.00	29,088.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	96	1,463.40	1,40,486.40
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	4	1,012.00	4,048.00
	Sub Total (Civil Portion) (in Rs.)				3,18,486.40
A	Sub Total (Supply Portion)				5,29,608.96
B	Stock, Storage & Insurance @ 3 % of A				15,888.27
C	Sub Total (A+B)				5,45,497.23

ANNEXURE-8.18

Part-B

Laying of 33kV 3R 1Cx400 sqmm cable at Jankia PSS for connectivity of proposed RMU with PTR.

D	Contingency @ 3 % of C	16,364.92
E	Tools & Plants Charges @ 2% of C (considered for earthing items)	-
F	Transportation @ 7.5% of C	40,912.29
G	Erection Charges @ 10% of earthing items	-
H	Total (C+D+E+F+G)	6,02,774.44
I	Sub Total (Erection Portion + Civil Portion)	4,02,467.20
J	Total Cost (H+I)	10,05,241.64
K	Other Overhead /(including Supervision Charges) @ 6 % of J	60,314.50
L	Total Estimated Capital Cost i.e. (J+K)	10,65,556.14
M	GST @ 18% of L	1,91,800.10
M1	CESS @ 1% of L	10,655.56
N	Grand Total (L+M+M1)	12,68,011.80

ANNEXURE-8.19 (ABSTRACT)			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		NYED	
Name of the Sub-Division : -		Itamati	
Name of the Work :-		Proposal for Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Bolagarh PSS and 5MVA AVR Unit at Hatabasta PSS to mitigate low voltage issue.	
Scope:-		1. Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Bolagarh PSS. 2. Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Hatabasta PSS.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Bolagarh PSS.	₹ 2,01,67,764.78
2	B	Installation of 1no. 26.5/33kV, 5MVA AVR Unit at Hatabasta PSS.	₹ 2,01,67,764.78
		Total Amount	₹ 4,03,35,529.56
		Total Amount (In Cr.)	₹ 4.03
Total estimated cost is Rs. 4.03 Crore. (Under TPCODL Capex Scheme)			

ANNEXURE-8.19

Part-B

Construction of 1No's 26.5/33KV 5MVA AVR Unit at Bolagarh PSS.

No. of 33 KV AVR Unit			1		
MATERIALS FOR 33 KV AVR at Bolagarh PSS					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Amount
1	26.5/33kV 5MVA Automatic Voltage Regulated Transformer (AVR).	EA	65,00,000.00	1	65,00,000.00
2	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	970.92	800	7,76,736.00
3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	8,517.56	12	1,02,210.72
4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	6,488.92	4	25,955.68
5	Pipe Earthing 40mm. GI Pipe	No.	1,302.00	4	5,208.00
6	50x6mm GI Flat for earthing (2.4kg/mtr)	KG	93.00	48	4,464.00
A	Total Cost of materials				74,14,574.40
B	Stock, Storage & Insurance i.e 3% of A				2,22,437.23
C	Sub Total (A+B)				76,37,011.63
D	Contingency @ 3% of C				2,29,110.35
E	Tools & Plants @ 2% of C				1,34,538.02
F	Transportation @ 7.5% of C				5,72,775.87
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				3,34,750.00
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				459.79
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				89,08,645.67
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Amount
1	Plinth for 5MVA AVR	No.	6,73,016.72	1	6,73,016.72
2	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 400sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.	Mtr.	94.50	800	75,600.00
3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	2,081.70	12	24,980.40
4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	2,081.70	4	8,326.80
5	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
5.1	Earth work excavation of soil	Cum	700.00	84	58,800.00
5.2	Earth work excavation of hard rock	Cum	1,720.00	36	61,920.00
5.3	Back filling with excavated soil outside and above the trench	Cum	202.00	120	24,240.00
6	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No.	3,700.00	4	14,800.00
K	Total Civil & Services				9,41,683.92

ANNEXURE-8.19

Part-B

Construction of 1No's 26.5/33KV 5MVA AVR Unit at Bolagarh PSS.

L	Total (J+K)				98,50,329.59
M	Other overheads (Including 6% supervision charges) of L (for 33 KV VCB UNIT)				5,91,019.78
N	SubTotal (L+M)				1,04,41,349.37
O	Total GST @ 18% of (N)				18,79,442.89
P	Total GST @ 1% of (N)				1,04,413.49
Q	Gross Total Material +Services (N+O+P) for 33 KV AVR UNIT				1,24,25,205.74
Installation of 33kV Isolator- 5 no.s and 33kv VCB- 2No's for HT AVR Unit					
No. of Bus isolator requirement			5		
No. of VCB Requirement			2		
No. of Bus isolator requirement					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	T-1 GI Column(7.25 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel) for 33kV incoming line, Nominal Unit Wt - 0.35 MT	Nos.	26,600.00	2	53,200.00
2	T-2 GI Column (7.25mtr long, consisting of 2 Nos 175X75X6 mm channel) for 33kV incoming line -1 no, Nominal Unit Wt - 0.42 MT	Nos.	31,920.00	1	31,920.00
3	T-1A GI Column (for 33 kv Bus) (6 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel jointed by plates) Nominal Unit Wt - 0.31 MT	Nos.	23,560.00	4	94,240.00
4	T-2A GI Column (for 33 kv Bus) (6 mtr long, consisting of 2 Nos 175X75X6 mm channel jointed by plates) Nominal Unit Wt - 0.37 MT	Nos.	28,120.00	2	56,240.00
5	G-3 GI Beam(5.05mtr long, consisting of 2 Nos 150X75 X5.7mm) for 33kV incoming line - (2 nos. Beam- one for Surge Arrester and other for Isolator, Nominal Unit Wt - 0.2 MT)	Nos.	15,200.00	2	30,400.00
6	G-2 GI Beam (6.1 mtr long, consisting of 2 Nos 125X65 X5.3 mm channel jointed by plates) for 33kV Bus Stringing , Nominal Unit Wt - 0.175 MT)	Nos.	13,300.00	7	93,100.00
7	Equipment Structures (GI) For 33 KV Isolator (Unit Wt of Equipment Structures per set - 0.33 MT)	KG	76.00	1650	1,25,400.00
8	Equipment Structures (GI) For 33 KV Vacuum Circuit Breaker (Unit Wt of Equipment Structures per set - 0.2 MT)	KG	76.00	400	30,400.00
9	GI Column for 33 KV CT (Unit Wt of Equipment Structures per set - 0.285 MT)	KG	76.00	570	43,320.00
	GI Spikes with cone and GI (2 nos) base plate 10mm (50x3000 mm GI pipe) (Unit Wt=0.035 MT)	Nos.	3,641.92	8	29,135.35
10	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	14	18,228.00
11	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr. For Isolator/VCB , 10 metre mesh formation)= 20x2.36	KG	93.00	330.4	30,727.20
12	400 sq.mm ACSR for 33kV side jumpering and Bus Formation etc.	KM	2,61,640.00	0.3	78,492.00
13	33 kV 1250 AMP Double break (Turn & twist center rotating) isolator with earth switch with PI(Polymer)	Set	1,25,103.60	5	6,25,518.00
14	33KV Outdoor VCB-1600A, with indoor CR panel without PT, with outdoor CT (CTR-600-300-150/1-1 A, 15VA, STC 25KA/3sec, class: 0.5, 5P10) for Transformer protection	EA	7,31,600.00	2	14,63,200.00
15	33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled) CLASS 0.5 / 3P, with O/P burden of 100VA	EA	31,520.80	6	1,89,124.80
16	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	21	2,69,514.00
17	Control Cable 10Core x 2.5 mm ²	Mtr	409.20	250	1,02,300.00
18	Control Cable 16Core x 2.5 mm ²	Mtr	499.72	250	1,24,930.00

ANNEXURE-8.19

Part-B

Construction of 1No's 26.5/33KV 5MVA AVR Unit at Bolagarh PSS.

19	Control Cable 4Core x 2.5 mm ²	Mtr	138.88	100	13,888.00
20	Control Cable 7Core x 2.5 mm ²	Mtr	43.68	100	4,368.00
21	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	30	42,780.00
22	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	30	18,600.00
23	8 bolted (M-12) "T" clamp ACSR Zebra run & 232 mm2 drop	No.	1,339.20	30	40,176.00
24	PG Clamp for 232 sq.mm AAA conductor	NO.	276.00	168	46,368.00
25	GI Nut , Bolt & Washer of different sizes (13.718 Kg each Strcutures)	K.g.	96.72	96.026	9,287.63
26	Black Paint	Ltr	272.80	7	1,909.60
27	Yellow Colour Paint for Background	Ltr	272.80	14	3,819.20
A1	Total Cost of materials				36,70,585.78
A2	Applicable Taxes to make it Landed Cost @18%				6,60,705.44
A	Total landed Cost (A=A1 + A2)				43,31,291.22
B	Stock, Storage & Insurance i.e 3% of A				1,29,938.74
C	Sub Total (A+B)				44,61,229.96
D	Contingency @ 3% of C				1,33,836.90
E	Tools & Plants @ 2% of C				89,224.60
F	Transportation @ 7.5% of C				3,34,592.25
G	Erection Charges @ 5% on Trf/Breaker/Joist				73,160.00
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				2,25,483.25
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				53,17,526.95
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	VCB as per Drawing Schedule- OPTCL/CIVIL/9.				
2	Excavation with back filling (2.15x1.4x1.2mtr)	Cum	214.00	7.22	1,545.08
3	PCC (1:3:6)	Cum	4708.00	0.45	2,125.66
4	RCC(1:1.5:3)	Cum	9095.00	3.70	33,651.50
5	Column as per Drawing Schedule-			0.00	-
6	Excavation with back filling (2.15x2.15x1.85mtr)	Cum	214.00	153.93	32,940.86
7	PCC (1:3:6)	Cum	4708.00	6.30	29,660.40
8	RCC(1:1.5:3)	Cum	9095.00	42.30	3,84,718.50
9	Isolator				
10	Excavation with back filling	Cum	214.00	23.63	5,055.75
11	PCC (1:3:6)	Cum	4708.00	1.42	6,673.59
12	RCC(1:1.5:3)	Cum	9095.00	14.25	1,29,603.75
13	CT				
14	Excavation with back filling	Cum	214.00	4.30	920.20
15	PCC (1:3:6)	Cum	4708.00	0.22	1,016.93
16	RCC(1:1.5:3)	Cum	9095.00	1.72	15,661.59
17	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	14	51,800.00
K1	Total Civil & Services				6,95,373.81
K2	Applicable Taxes to make it Landed Cost @18%				1,25,167.29
K	Total landed Cost (K=K1+ K2)				8,20,541.10

ANNEXURE-8.19

Part-B

Construction of 1No's 26.5/33KV 5MVA AVR Unit at Bolagarh PSS.

L	Total (J+K)	61,38,068.05
M	Other overheads (Including 6% supervision charges) of L	3,68,284.08
N	Sub Total (L+M)	65,06,352.13
O	Total GST @ 18% of (N)	11,71,143.38
P	Total Cess @ 1% of (N)	65,063.52
Q	Gross Total Material +Services (N+O+P) for 33 KV VCB UNIT	77,42,559.04
<u>Gross Total Summary</u>		
1	Gross Total Material +Services (N+O+P) for 33 KV AVR UNIT	1,24,25,205.74
2	Gross Total Material +Services (N+O+P) for 33 KV VCB UNIT	77,42,559.04
3	Gross Total Material, Services and Inspection Fees (1+2+3)	2,01,67,764.78

ANNEXURE-8.19

Part-C

Construction of 1No's 26.5/33KV 5MVA AVR Unit at Hatabasta PSS.

No. of 33 KV AVR Unit			1		
MATERIALS FOR 33 KV AVR at Hatabasta PSS					
Sl.N o.	Description of Materials	Unit	Unit Rate	Total Quantity	Amount
1	26.5/33kV 5MVA Automatic Voltage Regulated Transformer (AVR).	EA	65,00,000.00	1	65,00,000.00
2	Supply of 33kV, 1Core, 400sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA-20kA)	Mtr.	970.92	800	7,76,736.00
3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	8,517.56	12	1,02,210.72
4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG Cable kits for 1Core	Set	6,488.92	4	25,955.68
5	Pipe Earthing 40mm. GI Pipe	No.	1,302.00	4	5,208.00
6	50x6mm GI Flat for earthing (2.4kg/mtr)	KG	93.00	48	4,464.00
A	Total Cost of materials				74,14,574.40
B	Stock, Storage & Insurance i.e 3% of A				2,22,437.23
C	Sub Total (A+B)				76,37,011.63
D	Contingency @ 3% of C				2,29,110.35
E	Tools & Plants @ 2% of C				1,34,538.02
F	Transportation @ 7.5% of C				5,72,775.87
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				3,34,750.00
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				459.79
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				89,08,645.67
Civil & Services					
Sl.N o.	Description of Materials	Unit	Unit Rate	Total Quantity	Amount
1	Plinth for 5MVA AVR	No.	6,73,016.72	1	6,73,016.72
2	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 400sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 400sqmm, XLPE cable as spare) in trefoil formation by open trench method.	Mtr.	94.50	800	75,600.00
3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	2,081.70	12	24,980.40
4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 400sqmm, HT UG cable kits	Set	2,081.70	4	8,326.80
5	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
5.1	Earth work excavation of soil	Cum	700.00	84	58,800.00
5.2	Earth work excavation of hard rock	Cum	1,720.00	36	61,920.00
5.3	Back filling with excavated soil outside and above the trench	Cum	202.00	120	24,240.00
6	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No.	3,700.00	4	14,800.00

ANNEXURE-8.19

Part-C

Construction of 1No's 26.5/33KV 5MVA AVR Unit at Hatabasta PSS.

K	Total Civil & Services	9,41,683.92
L	Total (J+K)	98,50,329.59
M	Other overheads (Including 6% supervision charges) of L (for 33 KV VCB UNIT)	5,91,019.78
N	SubTotal (L+M)	1,04,41,349.37
O	Total GST @ 18% of (N)	18,79,442.89
P	Total GST @ 1% of (N)	1,04,413.49
Q	Gross Total Material +Services (N+O+P) for 33 KV AVR UNIT	1,24,25,205.74

Installation of 33kv Isolator- 5 no.s and 33kv VCB- 2No's for HT AVR Unit

No. of Bus isolator requirement	5
No. of VCB Requirement	2

No. of Bus isolator requirement

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	T-1 GI Column(7.25 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel) for 33kV incoming line, Nominal Unit Wt - 0.35 MT	Nos.	26,600.00	2	53,200.00
2	T-2 GI Column (7.25mtr long, consisting of 2 Nos 175X75X6 mm channel) for 33kV incoming line -1 no, Nominal Unit Wt - 0.42 MT	Nos.	31,920.00	1	31,920.00
3	T-1A GI Column (for 33 kv Bus) (6 mtr long, consisting of 2 Nos of 150X76X6.5 mm channel jointed by plates) Nominal Unit Wt - 0.31 MT	Nos.	23,560.00	4	94,240.00
4	T-2A GI Column (for 33 kv Bus) (6 mtr long, consisting of 2 Nos 175X75X6 mm channel jointed by plates) Nominal Unit Wt - 0.37 MT	Nos.	28,120.00	2	56,240.00
5	G-3 GI Beam(5.05mtr long, consisting of 2 Nos 150X75 X5.7mm) for 33kV incoming line - (2 nos. Beam- one for Surge Arrester and other for Isolator, Nominal Unit Wt - 0.2 MT)	Nos.	15,200.00	2	30,400.00
6	G-2 GI Beam (6.1 mtr long, consisting of 2 Nos 125X65 X5.3 mm channel jointed by plates) for 33kV Bus Stringing , Nominal Unit Wt - 0.175 MT)	Nos.	13,300.00	7	93,100.00
7	Equipment Structures (GI) For 33 KV Isolator (Unit Wt of Equipment Structures per set - 0.33 MT)	KG	76.00	1650	1,25,400.00
8	Equipment Structures (GI) For 33 KV Vacuum Circuit Breaker (Unit Wt of Equipment Structures per set - 0.2 MT)	KG	76.00	400	30,400.00
9	GI Column for 33 KV CT (Unit Wt of Equipment Structures per set - 0.285 MT)	KG	76.00	570	43,320.00
	GI Spikes with cone and GI (2 nos) base plate 10mm (50x3000 mm GI pipe) (Unit Wt=0.035 MT)	Nos.	3,641.92	8	29,135.35
10	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	14	18,228.00
11	50x6mm GI Flat for earthing, 2.36kg/mtr., (10 Mtr. For Isolator/VCB , 10 metre mesh formation)= 20x2.36	KG	93.00	330.4	30,727.20
12	400 sq.mm ACSR for 33kV side jumpering and Bus Formation etc.	KM	2,61,640.00	0.3	78,492.00
13	33 kv 1250 AMP Double break (Turn & twist center rotating) isolator with earth switch with PI(Polymer)	Set	1,25,103.60	5	6,25,518.00
14	33KV Outdoor VCB-1600A, with indoor CR panel without PT, with outdoor CT (CTR-600-300-150/1-1 A, 15VA, STC 25KA/3sec, class: 0.5, 5P10) for Transformer protection	EA	7,31,600.00	2	14,63,200.00
15	33KV.Single Phase PT(33KV/ V3 / 110V/ V3) (Oil cooled) CLASS 0.5 / 3P, with O/P burden of 100VA	EA	31,520.80	6	1,89,124.80

ANNEXURE-8.19

Part-C

Construction of 1No's 26.5/33KV 5MVA AVR Unit at Hatabasta PSS.

16	Lightning Arrester(30KV,10KA) (Station Class,class-2)	EA	12,834.00	21	2,69,514.00
17	Control Cable 10Core x 2.5 mm ²	Mtr	409.20	250	1,02,300.00
18	Control Cable 16Core x 2.5 mm ²	Mtr	499.72	250	1,24,930.00
19	Control Cable 4Core x 2.5 mm ²	Mtr	138.88	100	13,888.00
20	Control Cable 7Core x 2.5 mm ²	Mtr	43.68	100	4,368.00
21	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	30	42,780.00
22	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	30	18,600.00
23	8 bolted (M-12) "T" clamp ACSR Zebra run & 232 mm ² drop	No.	1,339.20	30	40,176.00
24	PG Clamp for 232 sq.mm AAA conductor	NO.	276.00	168	46,368.00
25	GI Nut , Bolt & Washer of different sizes (13.718 Kg each Strcutures)	K.g.	96.72	96.026	9,287.63
26	Black Paint	Ltr	272.80	7	1,909.60
27	Yellow Colour Paint for Background	Ltr	272.80	14	3,819.20
A1	Total Cost of materials				36,70,585.78
A2	Applicable Taxes to make it Landed Cost @18%				6,60,705.44
A	Total landed Cost (A=A1 + A2)				43,31,291.22
B	Stock, Storage & Insurance i.e 3% of A				1,29,938.74
C	Sub Total (A+B)				44,61,229.96
D	Contingency @ 3% of C				1,33,836.90
E	Tools & Plants @ 2% of C				89,224.60
F	Transportation @ 7.5% of C				3,34,592.25
G	Erection Charges @ 5% on Trf/Breaker/Joist				73,160.00
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				2,25,483.25
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				53,17,526.95

Civil & Services

Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	VCB as per Drawing Schedule- OPTCL/CIVIL/9.				-
2	Excavation with back filling (2.15x1.4x1.2mtr)	Cum	214.00	7.22	1,545.08
3	PCC (1:3:6)	Cum	4708.00	0.45	2,125.66
4	RCC(1:1.5:3)	Cum	9095.00	3.70	33,651.50
5	Column as per Drawing Schedule-			0.00	-
6	Excavation with back filling (2.15x2.15x1.85mtr)	Cum	214.00	153.93	32,940.86
7	PCC (1:3:6)	Cum	4708.00	6.30	29,660.40
8	RCC(1:1.5:3)	Cum	9095.00	42.30	3,84,718.50
9	Isolator				
10	Excavation with back filling	Cum	214.00	23.63	5,055.75
11	PCC (1:3:6)	Cum	4708.00	1.42	6,673.59
12	RCC(1:1.5:3)	Cum	9095.00	14.25	1,29,603.75
13	CT				
14	Excavation with back filling	Cum	214.00	4.30	920.20
15	PCC (1:3:6)	Cum	4708.00	0.22	1,016.93
16	RCC(1:1.5:3)	Cum	9095.00	1.72	15,661.59

ANNEXURE-8.19

Part-C

Construction of 1No's 26.5/33KV 5MVA AVR Unit at Hatabasta PSS.

17	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	14	51,800.00
K1	Total Civil & Services				6,95,373.81
K2	Applicable Taxes to make it Landed Cost @18%				1,25,167.29
K	Total landed Cost (K=K1+ K2)				8,20,541.10
L	Total (J+K)				61,38,068.05
M	Other overheads (Including 6% supervision charges) of L				3,68,284.08
N	Sub Total (L+M)				65,06,352.13
O	Total GST @ 18% of (N)				11,71,143.38
P	Total Cess @ 1% of (N)				65,063.52
Q	Gross Total Material +Services (N+O+P) for 33 KV VCB UNIT				77,42,559.04
Gross Total Summary					
1	Gross Total Material +Services (N+O+P) for 33 KV AVR UNIT				1,24,25,205.74
2	Gross Total Material +Services (N+O+P) for 33 KV VCB UNIT				77,42,559.04
3	Gross Total Material, Services and Inspection Fees (1+2+3)				2,01,67,764.78

Annexure-9 11kV Network Infrastructure				
11kV Low Voltage & Overload Mitigation				
Sl. No.	Mitigation Type	Unit	Quantity	Amount (in Rs.)
1	11kV Feeder Low Voltage	km	22.00	6,20,13,355.11
2	11kV Feeder Overloading	km	105.33	15,72,11,249.50
Total Cost				21,92,24,605
Total Cost in Cr.				22

Annexure-9 11kV Feeder Overloading																
Sl. No.	Circle	Division	PSS Name	11 KV Feeder Name	Proposals (New fdr OH/ UG/Cond.Augm.	FROM	TO	Proposed New Fdr Length in Ckm (OH)	Total cost (OH)(A)	Proposed Length in Ckm (Augmentation in 100 mm2)	Total cost (Augm.) (B) (in Rs.)	Proposed Length in Ckm (U/G)	Total cost (UG)-(C) (in Rs.)	Proposed Nos of Line DP with ABS	Total cost (Line DP with ABS) (D) (in Rs.)	GRAND Total - A+B+C+D (in Rs.)
1	BBSR-1	BCDD-I	Delta	Fire Station	New 11KV UG feeder from Delta PSS till Baramunda Kalimandir -2km Sushree Villa-200 mtr and 1 line DP at SBI and sushree Villa. dedicated fdr meet from Delta PSS -2km Cable augmentation from 185sqmm to 400sqmm of length 3x50 mtr (For three fdr-inside PSS) Note-Total Cost OH -A is for 2nos of DP	Delta PSS	Barmunda Kali Mandir		4,64,483.26		-	2.35	1,73,02,318.14		-	1,77,66,801.40
2	BBSR-1	BCDD-I	Delta	Shatabdi Nagar	A) Conductor augmentation 34/55/80 to 100sqmm from Delta PSS till P.GopalKrishna DT -3km	Delta PSS	P.Gopal Krishna DTR		-	3	33,44,479.44		-		-	33,44,479.44
3	BBSR-1	BCDD-I	Delta	Siripur	11KV feeder-4 from Delta PSS will charge & 500Mtr interlinking along with 2No's DP is proposed for diverting Siripur feeder load to new FDR -4 with 2nos of DP with ABS	Delta PSS	near Steward School to charge Fdr-4	0.5	8,42,036.67		-		-		-	8,42,036.67
4	BBSR-1	BCDD-II	CSPUR-2	HB-3	Aug. of existing UG cable from 3Cx185sqmm to 3cx400sqmm of length 100mtr with spare (From Cspur-2 PSS VCB to 11 kV DP inside PSS)	CS-PUR-2 PSS	inside CS-PUR-2 PSS		-		-	0.1	7,36,268.86		-	7,36,268.86
5	BBSR-1	BCDD-II	Nayapalli	Jayadev Vihar (NP)	Aug. of existing UG cable from 3Cx95sqmm to 3cx400sqmm of length 110 mtr with spare (From VCB to 11 kV DP inside PSS)	Nayapally PSS	Inside Nayapally PSS		-		-	0.11	8,09,895.74		-	8,09,895.74
6	BBSR-1	BED	NaharKanta	Atala	Conductor augmentation from 35sqmm/55sqmm to 100sqmm of length 1.3km				-	1.3	14,49,274.42		-		-	14,49,274.42
7	BBSR-1	BED	NaharKanta	Balianta	New Feeder to be propose from Same pss to Near Kanplate Ab switch. With 100sqmm.-1.2km and 2nos of DP.			1.2	20,20,888.00		-		-		-	20,20,888.00
8	BBSR-1	BED	Mulapadia	Kapilleshwar	3Cx400SQM to Kapileswar Canal upto 300mtr with spare for load bifurcation	Mulapadia PSS	Kapileswar Canal		-		-	0.3	22,08,806.57		-	22,08,806.57
9	BBSR-1	BED	Phulnakhara	Govindpur	New UG line using 3Cx400sqmm from Phulnakhara pss to AB Switch near Nakhara gada for 700mtr	Phulnakhara PSS	AB Switch near Nakhara gada		-		-	0.7	51,53,882.00		-	51,53,882.00
10	BBSR-1	NED	Kakatpur	Kakatpur-1&2	1. Location:- Pss to Malamach. Conductor Upgrdation 34/55 to 80:- 7 CKM, 11 M WPB Pole:- 15. 2. Location:- Samia AB Switch to Panchumatha AB Switch. Conductor Upgradation 34/55 to 80:- 8 ckm, 11 M WPB Pole:- 25 3.Malamach to Lataharan Conductor upgradation 34 to 80:- 6 ckm, 11 M WPB Pole :- 10	Kakatpur PSS	Malamach		-	21	2,34,11,356.08		-		-	2,34,11,356.08
11	BBSR-1	NED	Kakatpur	Nilakanthapur	1. Location:- Odapadi cut point to Barakana & Mahadev basta. Upgradation from 34/55 to 80 sqmm:- 10 CKM, 11 M WPB POLE:- 20. 2.Nilkanthapur to Fakirsahi Patna. Upgradation from 34/55 to 80 sqmm:- 8 ckm, 11 M WPB Pole :- 30 3. Location:- Odapadi cutpoint to Patharpaka upgradation from 34 to 80 :- 5 ckm, 11 m WPB Pole:- 25	Odapadi	Barakana &Mahadev Basta		-	22	2,50,50,151.01		-		-	2,50,50,151.01
12	BBSR-1	NED	Pipili	Pipili Bazar	Construction of new line using 100sqmm of length 1km from Bhartipur PSS to Pipili feeder	Bhartipur PSS	Pipli Feeder	1	16,84,073.33		-		-		-	16,84,073.33
13	BBSR-2	BAED	Balugaon	Balugaon	1- Approx. 3km D/C from Gandhi Chhak to LIC required to separate the Ruran & Urban Part	Gandhi Chhak	LIC	3	50,52,219.99		-		-		-	50,52,219.99
14	BBSR-2	BAED	Tangi	Kalupada	Augmentation from Putana to Sorana approx. 7Ckm to be upgraded from 34sqmm to 100sqmm	Putana	Sorana		-	7.0	78,03,785.36		-		-	78,03,785.36
15	BBSR-2	BAED	Ankulapadar	Town-1	1- Ankulapadar PSS to 4-pole appx. 5Ckm to be upgraded from 55sqmm to 100sqmm	Ankulapadar PSS	4Pole		-	5.0	55,74,132.40		-		-	55,74,132.40
16	BBSR-2	BAED	Ranapur	Ranpur	1- Hatasahi school 100kVA to Maninagaswar RWSS 63kVA appx. 1.5Ckm to be upgraded from 34sqmm to 100sqmm.	Hata sahi school 100kVA	Maninagaswar RWSS 63kVA		-	1.5	16,72,239.72		-		-	16,72,239.72
17	BBSR-2	KHD	Harirajpur	Kudiary	From Golapada 11kv feeder with 800mtr line extension around 7 nos of DTs will be shifted from kudiary to Golapada feeder.	Kudiary	Golapada feeder.	1	16,84,073.33		-		-		-	16,84,073.33
18	BBSR-2	KHD	Gurujanga	Haladia	Proposed New feeder upto Gini AB Switch Keranga with 100sqmm upto 4km for load bifurcation.	From Gurujanga PSS	GINI AB switch Keranga	4	67,36,293.32		-		-		-	67,36,293.32
19	BBSR-2	PURI	Bramhagiri	Alarnath	Conductor Augmentation from 35sqmmto 100sqmm of length 2.1 km	Brahmigiri pSS	Block office DTR		-	2.1	23,41,135.61		-		-	23,41,135.61
20	BBSR-2	PURI	Sakhigopal	Express	Conductor Augmentation from 80 qmm to 100sqmm of length 4 km	Sakhigopal PSS	Sarugudha ABS		-	4.0	44,59,305.92		-		-	44,59,305.92
21	CUTTACK	CDD-I	Kalinga	Choudhury Bazar-II	Conductor Augumentation 148sqmm from Kalinga PSS to Moonlight AB Switch via KBK switch 2.5 km	Kalinga PSS	Moonlight AB Switch via KBK switch		-	2.5	38,79,613.25		-		-	38,79,613.25

Annexure-9 11kV Feeder Overloading																
Sl. No.	Circle	Division	PSS Name	11 KV Feeder Name	Proposals (New fdr OH/ UG/Cond.Augm.	FROM	TO	Proposed New Fdr Length in Ckm (OH)	Total cost (OH)(A)	Proposed Length in Ckm (Augmentation in 100 mm2)	Total cost (Augm.) (B) (in Rs.)	Proposed Length in Ckm (U/G)	Total cost (UG)-(C) (in Rs.)	Proposed Nos of Line DP with ABS	Total cost (Line DP with ABS) (D) (in Rs.)	GRAND Total - A+B+C+D (in Rs.)
22	CUTTACK	CDD-I	Kalinga	High Court	Augumentation From Kalinga PSS to Saitani Bagicha Line AB Switch with 1.2ckm 148sqmm	Kalinga PSS	Saitani Bagicha Line AB Switch		-	1.2	18,62,214.36		-		-	18,62,214.36
23	CUTTACK	CDD-II	Jagatpur	Old Industry	Bifurcation of existing 11 kV Old Industry Feeder emanating from 33/11 kV Jagatpur PSS by constructing 1 No. of new feeder from 33/11 kV Jagatpur PSS to Gayana Chhak AB Switch with UG 1.5km				-		-	1.5	1,10,44,032.86		-	1,10,44,032.86
24	CUTTACK	CED	Tangi	Manguli	Refurbishment Tangi PSS to Manguli Chowk 8km.-100sqmm	Tangi PSS	Manguli Chowk		-	8.0	89,18,611.84		-		-	89,18,611.84
25	Dhenkanal	ANED	Hemarpada	Jarasingha	Augmentation of existing conductor 55 sqmm to 100sqmm from Hemasarpada PSS to near Jarasingha Sant Mandir AB switch of length -0.5 km	Hemarpada	Near Jarasingha Sant Mandir AB switch		-	0.5	5,57,413.24		-		-	5,57,413.24
26	Dhenkanal	DED	Mathakargola	Jiral	Augmentation of existing conductor 55 sqmm to 100sqmm from Mathakargola PSS to Sasapasi L.I DTR 63KVA of length -2 km	Mathakargola	Sasapasi L.I 63 kVA DTR		-	2.0	22,29,652.96		-		-	22,29,652.96
27	Paradeep	KED-II	Korua/ Kudanagari	Narendrapur	Augmentation of Conductor from 55sqmm to 100sqmm of length from Kudanagari PSS to Narendrapur line AB switch	Kudanagari PSS	Naredrapur lline AB switch		-	2.0	22,29,652.96		-		-	22,29,652.96
28	Paradeep	KED-II	Mahakalpada	Chapali	Augmentation of Conductor from 55sqmm to 100sqmm of length from Mahakalpada PSS to Khiastan line AB switch	Mahakalapada PSS	Khiastan AB S		-	6.0	66,88,958.88		-		-	66,88,958.88
TOTAL								10.70	1,84,84,067.89	89.57	10,14,71,977.45	5.06	3,72,55,204.16	-	-	15,72,11,249.50

Annexure-9
11kV Feeder Low Voltage

Sr No.	Circle	Division	PSS Name	11 KV Feeder Name	Proposals (New fdr OH/UG/Cond.Augm.	Proposals in Details	Proposed Length in Ckm for 100mm2 (OH)-Augmentation	Per Unit Cost	Total cost (Aug)(A)	Proposed Length in Ckm for 148mm2 (OH) Augmentation	Total cost (Aug)(B)	Proposed Length in Ckm (For New Line in 100mm2)	Total cost (OH new) (C)	Proposed Length in Ckm (U/G) with spare	Total cost (UG)- (C)	Proposed Length in Ckm (U/G) without spare	Total cost (UG)- (D)	GRAND Total - A+B+C+D
1	Cuttack	AED	Athagarh	Karikole	Augmentation	1. Augmentation of conductor from 34 /55 mm2 to 100mm2 of length 11 KM from Back Side Medical(Near PSS) to Madhusudan Medical .	11.00	11,14,826.48	1,22,63,091.29		-		-		-		-	1,22,63,091.29
2	Cuttack	AED	Athagarh	Kandarpur	Augmentation	1. Augmentation of conductor from 34 mm2 to 100mm2 of length 5 KM from Medical back Side to Kandar Pur .	5.00	11,14,826.48	55,74,132.40		-		-		-		-	55,74,132.40
3	BBSR-II	KHD	Khordha I.E (10 Pole)	Town-II	New Line & Augmentation	1. Proposed 2 no. of new feeder from Ten Pole PSS to Nabina Bag Near gandhi Padia in Ug cable of length (3+3)Km.(One Feeder is for Nabina bag & 1 is for Gada Khordha)		11,14,826.48	-		-		-		-	6	4,41,76,131.42	4,41,76,131.42
TOTAL							16.00		1,78,37,223.69	-	-	-	-	-	-	6.00	4,41,76,131.42	6,20,13,355.11

Annexure-10 Auto Reclosure, LTDB, RMU			
Sl. No.	Description	Quantity (in nos.)	Amount (in cr.)
1	11kV line DP with Auto Reclosure	21	2.58
2	LT Distribution Box with MCCB, for 100kVA trf.	80	0.90
3	LT Distribution Box with MCCB, for 250kVA trf.	54	1.70
4	LT Distribution Box with MCCB, for 500kVA trf.	40	1.69
5	3W 11kV RMU (LLV) along with 3C, 400sqmm UG Cable, jointing kits and LA.	10	1.53
6	4W 11kV RMU (LLVV) along with 3C, 400sqmm UG Cable, jointing kits and LA.	8	1.41
7	3W 33kV RMU (LLV) along with 1C, 630sqmm UG Cable, jointing kits and LA.	0	0.00
8	4W 33kV RMU (LLVV) along with 1C, 630sqmm UG Cable, jointing kits and LA.	7	3.19
Total			13.00

11kV line DP with Auto Reclosure					
No. of DP required Without AB switch (Ref. Drawing No.- TPCODL-MVD-0012) and Auto reclosure			1		
MATERIALS OF DP Without Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (11Mtr. Long, 30.44KG/Mtr.)	No	26,516.95	2	53,033.90
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 2.3 mtr., 2 no's channel required =(2x9.56x2.3)	KG	76.00	43.976	3,342.18
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	76.00	3.9648	301.32
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.66 Mtr., 4 no's channel required =(7.14x1.66x4)	KG	76.00	47.4096	3,603.13
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 2.671 mtr., 4 nos angle required = (4.5x2.671x4)	KG	76.00	48.078	3,653.93
6	Danger Plate, 2 no's.	No.	99.20	2	198.40
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	0.6018	55.97
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.551 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	2	310.00
9	H.T. Stay set (Complete)	Set	1,302.00	2	2,604.00
10	H.T. Stay Insulator Type-C	No.	62.00	2	124.00
11	7/10 SWG Stay Wire 15kg /stay	K.g.	93.00	30	2,790.00
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	1	1,302.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	11.8	1,097.40
14	GI barbed wire anticlimbing device 3 Kg. Per support, 2 no's qty. required =(2x3kg)	Kg	99.20	6	595.20
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	2.4072	223.87
16	11 KV pin insulator polymer	No.	248.00	3	744.00
17	H W fitting(B&S) 70KN, 3Bolt	No.	434.00	6	2,604.00
18	Disc insulator (B&S) 70 KN polymer	No.	1,426.00	6	8,556.00
19	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without AB Switch)	K.g.	96.72	12.261	1,185.88
20	Black Paint	Ltr	272.80	1	272.80
21	Yellow Colour Paint for Background	Ltr	272.80	2	545.60
22	Auto Reclosure - 11kV Outdoor	EA	6,75,701.24	1	6,75,701.24
A	Total Cost of materials				7,62,844.82
B	Stock, Storage & Insurance i.e 3% of A				22,885.34
C	Sub Total (A+B)				7,85,730.16
D	Contingency @ 3% of C				23,571.90
E	Tools & Plants @ 2% of C				15,714.60
F	Transportation @ 7.5% of C				58,929.76
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				2,731.25
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				72,376.13
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				9,59,053.81

<u>Civil & Services</u>					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of complete 11KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5) Stay clamps with Nuts & bolts BA will do the excavation including excavation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material as per TPCODL Drawing & Standard.	No.	2,250.00	2	4,500.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX1800mm) = 0.45Cu.mtr	Cu.mtr	6,500.00	0.90	5,850.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.23	1,462.50
4	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL. The installation will be done as per TPCODL drawing	No.	3,700.00	1	3,700.00
K	Total Civil & Services				15,512.50
L	Total (J+K)				9,74,566.31
M	Other overheads (Including 6% supervision charges) of L (for DP Without Isolator)				58,473.98
N	Sub Total (L+M)				10,33,040.29
O	Total GST @ 18% of (N)				1,85,947.25
P	Total CESS @ 1% of (N)				10,330.40
Q	Gross Total Material +Services (N+O+P) for DP Without Isolator				12,29,317.95

LTDB for 100kVA DTR					
	No. of DP Mounted DSS (Ref. Drawing No.- TPCODL-.....)	1			
	MATERIALS FOR DP Mounted DSS				
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS					
1	PSC POLE 9 METER LONG 300 KG	EA	3,720.00	1	3,720.00
2	LT Distribution Box with MCCB, Aluminium Busbar of single Bay with kit kat fuse for 100 KVA S/S	Nos.	42,950.00	1	42,950.00
3	4 Cx 150 mm2 LT XLPE Cable(Armoured) - FOR 100 KVA Trf. to LTDB	Mtr.	732.12	15	10,981.80
4	4 Cx 70 mm2 LT XLPE Cable(Armoured) - FOR LTDB O/G to AB Cable	Mtr.	376.78	10	3,767.80
5	4 Cx 35 mm2 LT XLPE Cable(Armoured) - FOR LTDB O/G to AB Cable	Mtr.	213.38	10	2,133.80
6	40 mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr .Long	No	1,302.00	1	1,302.00
7	50x6mm GI Flat for earthing, 2.36kg/mtr., 2 mtr for LTDB)	KG	100.00	4.72	472.00
A	Total Cost of materials				65,327.40
B	Stock, Storage & Insurance i.e 3% of A				1,959.82
C	Sub Total (A+B)				67,287.22
D	Contingency @ 3% of C				2,018.62
E	Tools & Plants @ 2% of C				1,345.74
F	Transportation @ 7.5% of C				5,046.54
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)				6,211.46
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				766.32
J	Sum of (C to I)				82,675.90
Civil and Services Works					
1	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375 Cu.mtr	Cu.mtr	6,500.00	0.375	2,437.50
2	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation ,soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No	3,700.00	1	3,700.00
3	Dismantling				-
i	Dismantling of LTDB	EA	550.00	1	550.00
K	Total Civil & Services				6,687.50
L	Total (J+K)				89,363.40
M	Other overheads (Including 6% supervision charges) of L				5,361.80
N	Sub Total (L+M)				94,725.21
O	Total GST @ 18% of (N)				17,050.54
P	Total CESS @ 1%of (N)				947.25
Q	Gross Total Material +Services (N+O+P)				1,12,722.99

LTDB for 250kVA DTR					
	No. of DP Mounted DSS (Ref. Drawing No.- TPCODL-.....)	1			
	<u>MATERIALS FOR DP Mounted DSS</u>				
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS					
1	PSC POLE 9 METER LONG 300 KG	EA	3,720.00	1	3,720.00
2	LT Distribution Box with MCCB, Aluminium Busbar for 3 Bay with kit kat fuse for 250 KVA S/S	Nos.	1,30,000.00	1	1,30,000.00
3	1 Cx 400 mm2 LT XLPE Cable(Un-Armoured) - Trf. to LTDB	Mtr.	359.66	120	43,159.20
4	4 Cx 70 mm2 LT XLPE Cable(Armoured) - FOR LTDB O/G to AB Cable	Mtr.	376.78	30	11,303.40
5	40 mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr .Long	No	1,302.00	1	1,302.00
6	50x6mm GI Flat for earthing, 2.36kg/mtr., 2 mtr for LTDB)	KG	100.00	4.72	472.00
A	Total Cost of materials				1,89,956.60
B	Stock, Storage & Insurance i.e 3% of A				5,698.70
C	Sub Total (A+B)				1,95,655.30
D	Contingency @ 3% of C				5,869.66
E	Tools & Plants @ 2% of C				3,913.11
F	Transportation @ 7.5% of C				14,674.15
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)				19,048.26
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				766.32
J	Sum of (C to I)				2,39,926.79
Civil and Services Works					
1	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375 Cu.mtr	Cu.mtr	6,500.00	0.375	2,437.50
2	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation ,soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No	3,700.00	1	3,700.00
3	LTDB Plinth	NO	3,000.00	1	3,000.00
4	Dismantling				-
i	Dismantling of LTDB	EA	550.00	1	550.00
K	Total Civil & Services				9,687.50
L	Total (J+K)				2,49,614.29
M	Other overheads (Including 6% supervision charges) of L				14,976.86
N	Sub Total (L+M)				2,64,591.15
O	Total GST @ 18% of (N)				47,626.41
P	Total CESS @ 1%of (N)				2,645.91
Q	Gross Total Material +Services (N+O+P)				3,14,863.47

LTDB for 500kVA DTR					
	No. of DP Mounted DSS (Ref. Drawing No.- TPCODL-.....)	1			
	MATERIALS FOR DP Mounted DSS				
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS					
1	PSC POLE 9 METER LONG 300 KG	EA	3,720.00	1	3,720.00
2	LT Distribution Box with MCCB, Aluminium Busbar for 3 Bay with kit kat fuse for 500 KVA S/S	Nos.	1,70,000.00	1	1,70,000.00
3	1 Cx 400 mm2 LT XLPE Cable(Un-Armoured) - Trf. to LTDB	Mtr.	359.66	180	64,738.80
4	4 Cx 95 mm2 LT XLPE Cable(Armoured) - FOR LTDB O/G to AB Cable	Mtr.	479.61	20	9,592.20
5	4 Cx 70 mm2 LT XLPE Cable(Armoured) - FOR LTDB O/G to AB Cable	Mtr.	376.78	20	7,535.60
6	40 mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr .Long	No	1,302.00	1	1,302.00
7	50x6mm GI Flat for earthing, 2.36kg/mtr., 2 mtr for LTDB)	KG	100.00	4.72	472.00
A	Total Cost of materials				2,57,360.60
B	Stock, Storage & Insurance i.e 3% of A				7,720.82
C	Sub Total (A+B)				2,65,081.42
D	Contingency @ 3% of C				7,952.44
E	Tools & Plants @ 2% of C				5,301.63
F	Transportation @ 7.5% of C				19,881.11
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)				25,990.88
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				766.32
J	Sum of (C to I)				3,24,973.79
Civil and Services Works					
1	Concreting ratio 1:1.5:3 (500mmX500mmX1500mm) = 0.375 Cu.mtr	Cu.mtr	6,500.00	0.375	2,437.50
2	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation ,soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No	3,700.00	1	3,700.00
3	LTDB Plinth	NO	3,000.00	1	3,000.00
4	Dismantling				-
i	Dismantling of LTDB	EA	550.00	1	550.00
K	Total Civil & Services				9,687.50
L	Total (J+K)				3,34,661.29
M	Other overheads (Including 6% supervision charges) of L				20,079.68
N	Sub Total (L+M)				3,54,740.97
O	Total GST @ 18% of (N)				63,853.37
P	Total CESS @ 1%of (N)				3,547.41
Q	Gross Total Material +Services (N+O+P)				4,22,141.75

Standard BoQ and Estimate for 11kv 3C, 400sqmm UG Cable along with 11kv RMU					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 11kv, 3Core, 400sqmm, XLPE insulation armoured UG cable with accessories				
a	Length of 11kv 3C, 400sqmm cable (open trench)	Mtr.	45		
b	Length of 11kv 3C, 400sqmm cable (HDD)	Mtr.			
1.1	Supply of 11kv, 3Core, 400sqmm, XLPE insulation armoured UG cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA- 15kA)	Mtr.	45.00	1,860.00	83,700.00
1.2	Supply of Straight through jointing kits Heat Shrinkable type suitable for 11kv, 3Core, 400 sqmm, Aluminium UG cable for 3Core (Set)	Set		31,393.08	-
1.3	Supply of Indoor termination kits Heat Shrinkable type suitable for 11kv, 3Core, 400 sqmm, HT UG cable for 3Core (Set)	Set		11,881.68	-
1.4	Supply of Outdoor termination kits Heat Shrinkable type suitable for 11kv, 3Core, 400 sqmm, HT UG cable for 3Core (Set)	Set	3	17,240.96	51,722.88
1.5	Supply of HDPE PE 80-PN8 pipe of 160mm diameter (for 400sqmm HT cable laying)	Mtr.	45.00	775.40	34,893.00
2	Supply of 11kv RMU				
a	No. of 11kv 3Way RMU (LLV)	nos.	1		
b	No. of 11kv 4Way RMU (LLVV)	nos.			
c	No. of 11kv 3Way RMU (LLV+M)	nos.			
d	No. of 11kv 4Way RMU (LLVV+M)	nos.			
2.1	Supply of 11kv RMU 3 Way, 2 Iso & 1 Brk 630A (LLV)	Nos.	1	3,99,034.00	3,99,034.00
2.2	Supply of 11kv RMU 4 Way, 2 Iso & 2 Brk 630A (LLVV)	Nos.	0	5,57,710.00	-
2.3	Supply of RMU 3W 11kv 630A with metering unit (LLV+M)	Nos.	0	5,76,739.00	-
2.4	Supply of RMU 4W 11kv 630A with metering unit (LLVV+M)	Nos.	0	8,13,749.00	-
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	13.20	93.00	1,227.60
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	2	1,302.00	2,604.00
4	FRTU and OFC for RMU SCADA Automation				
4.1	Supply of 12 core fibre optic cable single mode, duct type, fibre armoured laid along UG cable.	Mtr.		22.00	-
4.2	Supply of HDPE PLB duct of size 32/26mm for laying of OFC Cables.	Mtr.	0.0	77.99	-
4.3	Supply of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0	6,766.00	-
4.4	Supply of end Connector and accessories for OFC connection at RMU,	Set	2	7,535.00	15,070.00
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	1	2,19,420.00	2,19,420.00
	Sub Total (Supply Portion) (in Rs.)				8,07,671.48
Erection Portion					

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Laying, Commissioning, Testing of 11kV, 3core, 400sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method and HDD method				
1.1	Laying, Commissioning, Testing of 11kV, 3core, 400sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method .	Mtr.	45.00	94.50	4,252.50
1.2	Erection of Straight through jointing kits Heat Shrinkable type suitable for 11kV, 3Core, 400sqmm, aluminium UG cable kits for 3core (set)	Set	0	2,400.00	-
1.3	Erection of Indoor termination kits Heat Shrinkable type suitable for 11kV, 3Core, 400sqmm, aluminium UG cable kits for 3core (set)	Set	0	1,900.80	-
1.4	Erection of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 3Core, 400sqmm, aluminium UG cable kits for 3core (set)	Set	3	1,900.80	5,702.40
1.5	Supply, Installation, Laying, Commissioning, Testing of 11kV, 3core, 1Run, 400sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable in HDD method with HDPE pipe (160mm dia, PN8 PE80) for laying of individual run of UG cable at main road and unaccessible place.	Mtr.	0	2,800.00	-
1.6	Laying of 160mm dia PE 80-PN8, HDPE pipe inside open trench.	Mtr.	45.00	300.00	13,500.00
2	Erection, Commissioning, Wiring and Testing of 11kV RMU				
2.1	Erection of 11kV RMU 3 Way, 2 Iso & 1 Brk 630A (LLV)	Nos.	1	9,639.00	9,639.00
2.2	Erection of 11kV RMU 4 Way, 2 Iso & 2 Brk 630A (LLVV)	Nos.	0	9,639.00	-
2.3	Erection of RMU 3W 11kV 630A with metering unit (LLV+M)	Nos.	0	15,000.00	-
2.4	Erection of RMU 4W 11kV 630A with metering unit (LLVV+M)	Nos.	0	15,000.00	-
3	FRTU and OFC for RMU SCADA Automation				
3.1	Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD	Nos.	0.0	82.00	-
3.2	Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0.0	612.54	-
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	2.0	1,225.07	2,450.14
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along wilh associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	1.0	6,124.36	6,124.36
	Sub Total (Erection Portion) (in Rs.)				41,668.40
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1mtr. depth)				

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1.1.a	Earth work excavation of soil	Cum	31.5	700.00	22,050.00
1.1.b	Earth work excavation of hard rock	Cum	13.5	1,720.00	23,220.00
1.2	Back filling with excavated soil outside and above the trench	Cum	45	202.00	9,090.00
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	22.5	2,643.67	59,482.59
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 11kV RMU	Nos.	1	23,145.30	23,145.30
3	Supply of GI Fencing with Gate around each RMU	sqmtr	20	3,600.00	72,000.00
4	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	2	3,700.00	7,400.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	24	1,463.40	35,121.60
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	2	1,012.00	2,024.00
	Sub Total (Civil Portion) (in Rs.)				2,53,533.49
A	Sub Total (Supply Portion)				8,07,671.48
B	Stock, Storage & Insurance @ 3 % of A				24,230.14
C	Sub Total (A+B)				8,31,901.62
D	Contingency @ 3 % of C				24,957.05
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				25.29
F	Transportation @ 7.5% of C				62,392.62
G	Erection Charges @ 10% of earthing items				126.44
H	Total (C+D+E+F+G)				9,19,403.03
I	Sub Total (Erection Portion + Civil Portion)				2,95,201.89
J	Total Cost (H+I)				12,14,604.92
K	Other Overhead /(including Supervision Charges) @ 6 % of J				72,876.29
L	Total Estimated Capital Cost i.e. (J+K)				12,87,481.21
M	GST @ 18% of L				2,31,746.62
M1	CESS @ 1% of L				12,874.81
N	Grand Total (L+M+M1)				15,32,102.64

Standard BoQ and Estimate for 11kV 3C, 400sqmm UG Cable along with 11kV RMU					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 11kV, 3Core, 400sqmm, XLPE insulation armoured UG cable with accessories				
a	Length of 11kV 3C, 400sqmm cable (open trench)	Mtr.	45		
b	Length of 11kV 3C, 400sqmm cable (HDD)	Mtr.			
1.1	Supply of 11kV, 3Core, 400sqmm, XLPE insulation armoured UG cable (SC rating of cable in kA- 37.7kA and SC rating of Armour in kA- 15kA)	Mtr.	45.00	1,860.00	83,700.00
1.2	Supply of Straight through jointing kits Heat Shrinkable type suitable for 11kV, 3Core, 400 sqmm, Aluminium UG cable for 3Core (Set)	Set		31,393.08	-
1.3	Supply of Indoor termination kits Heat Shrinkable type suitable for 11kV, 3Core, 400 sqmm, HT UG cable for 3Core (Set)	Set		11,881.68	-
1.4	Supply of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 3Core, 400 sqmm, HT UG cable for 3Core (Set)	Set	3	17,240.96	51,722.88
1.5	Supply of HDPE PE 80-PN8 pipe of 160mm diameter (for 400sqmm HT cable laying)	Mtr.	45.00	775.40	34,893.00
2	Supply of 11kV RMU				
a	No. of 11kV 3Way RMU (LLV)	nos.			
b	No. of 11kV 4Way RMU (LLVV)	nos.	1		
c	No. of 11kV 3Way RMU (LLV+M)	nos.			
d	No. of 11kV 4Way RMU (LLVV+M)	nos.			
2.1	Supply of 11kV RMU 3 Way, 2 Iso & 1 Brk 630A (LLV)	Nos.	0	3,99,034.00	-
2.2	Supply of 11kV RMU 4 Way, 2 Iso & 2 Brk 630A (LLVV)	Nos.	1	5,57,710.00	5,57,710.00
2.3	Supply of RMU 3W 11kV 630A with metering unit (LLV+M)	Nos.	0	5,76,739.00	-
2.4	Supply of RMU 4W 11kV 630A with metering unit (LLVV+M)	Nos.	0	8,13,749.00	-
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	13.20	93.00	1,227.60
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	2	1,302.00	2,604.00
4	FRTU and OFC for RMU SCADA Automation				
4.1	Supply of 12 core fibre optic cable single mode, duct type, fibre armoured laid along UG cable.	Mtr.		22.00	-
4.2	Supply of HDPE PLB duct of size 32/26mm for laying of OFC Cables.	Mtr.	0.0	77.99	-
4.3	Supply of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0	6,766.00	-
4.4	Supply of end Connector and accessories for OFC connection at RMU,	Set	2	7,535.00	15,070.00
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	1	2,19,420.00	2,19,420.00
	Sub Total (Supply Portion) (in Rs.)				9,66,347.48
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Laying, Commissioning, Testing of 11kV, 3core, 400sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method and HDD method				
1.1	Laying, Commissioning, Testing of 11kV, 3core, 400sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method .	Mtr.	45.00	94.50	4,252.50
1.2	Erection of Straight through jointing kits Heat Shrinkable type suitable for 11kV, 3Core, 400sqmm, aluminium UG cable kits for 3core (set)	Set	0	2,400.00	-
1.3	Erection of Indoor termination kits Heat Shrinkable type suitable for 11kV, 3Core, 400sqmm, aluminium UG cable kits for 3core (set)	Set	0	1,900.80	-
1.4	Erection of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 3Core, 400sqmm, aluminium UG cable kits for 3core (set)	Set	3	1,900.80	5,702.40
1.5	Supply, Installation, Laying, Commissioning, Testing of 11kV, 3core, 1Run, 400sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable in HDD method with HDPE pipe (160mm dia, PN8 PE80) for laying of individual run of UG cable at main road and unaccessible place.	Mtr.	0	2,800.00	-
1.6	Laying of 160mm dia PE 80-PN8, HDPE pipe inside open trench.	Mtr.	45.00	300.00	13,500.00
2	Erection, Commissioning, Wiring and Testing of 11kV RMU				
2.1	Erection of 11kV RMU 3 Way, 2 Iso & 1 Brk 630A (LLV)	Nos.	0	9,639.00	-
2.2	Erection of 11kV RMU 4 Way, 2 Iso & 2 Brk 630A (LLVV)	Nos.	1	9,639.00	9,639.00
2.3	Erection of RMU 3W 11kV 630A with metering unit (LLV+M)	Nos.	0	15,000.00	-
2.4	Erection of RMU 4W 11kV 630A with metering unit (LLVV+M)	Nos.	0	15,000.00	-
3	FRTU and OFC for RMU SCADA Automation				
3.1	Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD	Nos.	0.0	82.00	-
3.2	Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0.0	612.54	-
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	2.0	1,225.07	2,450.14
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	1.0	6,124.36	6,124.36
	Sub Total (Erection Portion) (in Rs.)				41,668.40
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	31.5	700.00	22,050.00
1.1.b	Earth work excavation of hard rock	Cum	13.5	1,720.00	23,220.00
1.2	Back filling with excavated soil outside and above the trench	Cum	45	202.00	9,090.00
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	22.5	2,643.67	59,482.59

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 11kV RMU	Nos.	1	23,145.30	23,145.30
3	Supply of GI Fencing with Gate around each RMU	sqmtr	20	3,600.00	72,000.00
4	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	2	3,700.00	7,400.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	24	1,463.40	35,121.60
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	2	1,012.00	2,024.00
	Sub Total (Civil Portion) (in Rs.)				2,53,533.49
A	Sub Total (Supply Portion)				9,66,347.48
B	Stock, Storage & Insurance @ 3 % of A				28,990.42
C	Sub Total (A+B)				9,95,337.90
D	Contingency @ 3 % of C				29,860.14
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				25.29
F	Transportation @ 7.5% of C				74,650.34
G	Erection Charges @ 10% of earthing items				126.44
H	Total (C+D+E+F+G)				11,00,000.12
I	Sub Total (Erection Portion + Civil Portion)				2,95,201.89
J	Total Cost (H+I)				13,95,202.00
K	Other Overhead /(including Supervision Charges) @ 6 % of J				83,712.12
L	Total Estimated Capital Cost i.e. (J+K)				14,78,914.13
M	GST @ 18% of L				2,66,204.54
M1	CESS @ 1% of L				14,789.14
N	Grand Total (L+M+M1)				17,59,907.81

Standard BoQ and Estimate for 33kV, 1C 630sqmm UG Cable along with 33kV RMU					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories				
<i>a</i>	<i>Length of 33kV 1C, 630sqmm cable (open trench)</i>	<i>Mtr.</i>	<i>45</i>		
<i>b</i>	<i>Length of 33kV 1C, 630sqmm cable (HDD)</i>	<i>Mtr.</i>			
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	135	1,337.13	1,80,512.55
1.2	Supply of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG Cable kits for 1Core	Set		9,600.00	-
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	6	5,245.00	31,470.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set		4,894.00	-
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV UG cable	Mtr.	135.00	357.60	48,276.00
2	Supply of 33kV RMU				
<i>a</i>	<i>No. of 33kV 3Way RMU (LLV+M)</i>	<i>nos.</i>			
<i>b</i>	<i>No. of 33kV 4Way RMU (LLVV+M)</i>	<i>nos.</i>			
<i>c</i>	<i>No. of 33kV 3Way RMU (LLV)</i>	<i>nos.</i>	<i>1</i>		
<i>d</i>	<i>No. of 33kV 4Way RMU (LLVV)</i>	<i>nos.</i>			
<i>e</i>	<i>No. of 33kV 3Way RMU (LLL)</i>	<i>nos.</i>			
<i>f</i>	<i>No. of 33kV 4Way RMU (LLLL)</i>	<i>nos.</i>			
2.1	Supply of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	31,74,874.00	-
2.3	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	1	17,87,101.00	17,87,101.00
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	23,35,264.00	-
2.5	Supply of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	14,46,210.00	-
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	19,59,421.00	-
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	13.20	93.00	1,227.60
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	2	1,302.00	2,604.00
4	FRTU and OFC for RMU SCADA Automation				
4.1	Supply of 12 core fibre optic cable single mode, duct type, fibre armoured laid along UG cable.	Mtr.		22.00	-
4.2	Supply of HDPE PLB duct of size 32/26mm for laying of OFC Cables.	Mtr.	0.0	77.99	-
4.3	Supply of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0	6,766.00	-
4.4	Supply of end Connector and accessories for OFC connection at RMU,	Set	2	7,535.00	15,070.00
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	1	2,19,420.00	2,19,420.00
	Sub Total (Supply Portion) (in Rs.)				22,85,681.15

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable with one spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by open trench method .	Mtr.	135	94.50	12,757.50
1.2	Erection of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits	Set	0	2,400.00	-
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	6	2,081.70	12,490.20
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	0	2,081.70	-
1.5	Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) including looping at cable terminations and straight through joints by HDD method with HDPE pipe (110mm dia, PN8 PE80) for laying of individual run of UG cable at main road and unaccessible place.	Mtr.	0	2,300.00	-
1.6	Laying of 110mm dia PE 80-PN8, HDPE pipe inside open trench.	Mtr.	135.00	300.00	40,500.00
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.1	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	15,000.00	-
2.2	Erection of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	15,000.00	-
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	1	8,000.00	8,000.00
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	0	8,000.00	-
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	-
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	8,000.00	-
3	FRTU and OFC for RMU SCADA Automation				
3.1	Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD	Mtr.	0.0	82.00	-
3.2	Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0.0	612.54	-
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	2.0	1,225.07	2,450.14
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	1.0	6,124.36	6,124.36
Sub Total (Erection Portion) (in Rs.)					82,322.20
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	37.8	700.00	26,460.00
1.1.b	Earth work excavation of hard rock	Cum	16.2	1,720.00	27,864.00

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1.2	Back filling with excavated soil outside and above the trench	Cum	54	202.00	10,908.00
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	22.5	2,643.67	59,482.59
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	1	23,145.30	23,145.30
3	Supply of GI Fencing with Gate around each RMU	sqmtr	20	3,600.00	72,000.00
4	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	2	3,700.00	7,400.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	48	1,463.40	70,243.20
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	2	1,012.00	2,024.00
	Sub Total (Civil Portion) (in Rs.)				2,99,527.09
A	Sub Total (Supply Portion)				22,85,681.15
B	Stock, Storage & Insurance @ 3 % of A				68,570.43
C	Sub Total (A+B)				23,54,251.58
D	Contingency @ 3 % of C				70,627.55
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				25.29
F	Transportation @ 7.5% of C				1,76,568.87
G	Erection Charges @ 10% of earthing items				126.44
H	Total (C+D+E+F+G)				26,01,599.73
I	Sub Total (Erection Portion + Civil Portion)				3,81,849.29
J	Total Cost (H+I)				29,83,449.02
K	Other Overhead /(including Supervision Charges) @ 6 % of J				1,79,006.94
L	Total Estimated Capital Cost i.e. (J+K)				31,62,455.96
M	GST @ 18% of L				5,69,242.07
M1	CESS @ 1% of L				31,624.56
N	Grand Total (L+M+M1)				37,63,322.60

Standard BoQ and Estimate for 33kV, 1C 630sqmm UG Cable along with 33kV RMU					
Supply Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Supply of materials for 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable with accessories				
a	Length of 33kV 1C, 630sqmm cable (open trench)	Mtr.	45		
b	Length of 33kV 1C, 630sqmm cable (HDD)	Mtr.			
1.1	Supply of 33kV, 1Core, 630sqmm Aluminium, XLPE insulation UG Cable (SC rating of cable in kA- 59.4kA and SC rating of Armour in kA-20kA)	Mtr.	135	1,337.13	1,80,512.55
1.2	Supply of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG Cable kits for 1Core	Set		9,600.00	-
1.3	Supply of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set	6	5,245.00	31,470.00
1.4	Supply of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG Cable kits for 1Core	Set		4,894.00	-
1.5	Supply of materials for High Density Polyethelene (HDPE) pipe 110mm diameter, PE 80- PN8 for laying of 33kV UG cable	Mtr.	135.00	357.60	48,276.00
2	Supply of 33kV RMU				
a	No. of 33kV 3Way RMU (LLV+M)	nos.			
b	No. of 33kV 4Way RMU (LLVV+M)	nos.			
c	No. of 33kV 3Way RMU (LLV)	nos.			
d	No. of 33kV 4Way RMU (LLVV)	nos.	1		
e	No. of 33kV 3Way RMU (LLL)	nos.			
f	No. of 33kV 4Way RMU (LLLL)	nos.			
2.1	Supply of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	22,93,723.00	-
2.2	Supply of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	31,74,874.00	-
2.3	Supply of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	17,87,101.00	-
2.4	Supply of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	23,35,264.00	23,35,264.00
2.5	Supply of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	14,46,210.00	-
2.6	Supply of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	19,59,421.00	-
3	Earthing				
3.1	Earthing Conductor: 50X6 mm (2.4kg./mtr.) GI Flat for equipment, structure etc.)	kg	13.20	93.00	1,227.60
3.2	Pipe Earthing 40mm. GI Pipe	Nos.	2	1,302.00	2,604.00
4	FRTU and OFC for RMU SCADA Automation				
4.1	Supply of 12 core fibre optic cable single mode, duct type, fibre armoured laid along UG cable.	Mtr.		22.00	-
4.2	Supply of HDPE PLB duct of size 32/26mm for laying of OFC Cables.	Mtr.	0.0	77.99	-
4.3	Supply of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0	6,766.00	-
4.4	Supply of end Connector and accessories for OFC connection at RMU,	Set	2	7,535.00	15,070.00

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
4.5	Supply of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	1	2,19,420.00	2,19,420.00
	Sub Total (Supply Portion) (in Rs.)				28,33,844.15
Erection Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Erection, Commissioning & Testing of 33kV new line by 3X1Core, 630sqmm, XLPE UG cable with one spare				
1.1	Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) in trefoil formation by open trench method.	Mtr.	135	94.50	12,757.50
1.2	Erection of Straight through jointing kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, aluminium UG cable kits	Set	0	2,400.00	-
1.3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	6	2,081.70	12,490.20
1.4	Erection of Indoor termination kits Heat Shrinkable type suitable for 33kV, 1Core, 630sqmm, HT UG cable kits	Set	0	2,081.70	-
1.5	Supply, Installation, Laying, Commissioning & Testing of 33kV, 1Core, 4Runs, 630sqmm, XLPE insulation (extruded type) UG cable (with one single 1core, 630sqmm, XLPE cable as spare) including looping at cable terminations and straight through joints by HDD method with HDPE pipe (110mm dia, PN8 PE80) for laying of individual run of UG cable at main road and unaccessible place.	Mtr.	0	2,300.00	-
1.6	Laying of 110mm dia PE 80-PN8, HDPE pipe inside open trench.	Mtr.	135.00	300.00	40,500.00
2	Erection, Commissioning, Wiring and Testing of 33kV RMU				
2.1	Erection of RMU 33KV 3WAY 630A WITH METERING UNIT (LLV+M)	Nos.	0	15,000.00	-
2.2	Erection of RMU 33KV 4WAY 630A WITH METERING UNIT (LLVV+M)	Nos.	0	15,000.00	-
2.3	Erection of RMU 33KV 3WAY 630A (2ISLTR+ 1BKR) (LLV)	Nos.	0	8,000.00	-
2.4	Erection of RMU 33KV 4WAY 630A (2ISLTR+2 BKR) (LLVV)	Nos.	1	8,000.00	8,000.00
2.5	Erection of RMU 33KV 3WAY 630AMP (3 ISOLATORS) (LLL)	Nos.	0	8,000.00	-
2.6	Erection of RMU 33KV 4WAY 630AMP (4 ISOLATORS) (LLLL)	Nos.	0	8,000.00	-
3	FRTU and OFC for RMU SCADA Automation				
3.1	Laying of 12 core fibre optic cable single mode, duct type, fibre armoured in HDPE PLB duct of size 32/26mm for laying of OFC Cables.laid along 11kV UG cable. through open trench or HDD	Mtr.	0.0	82.00	-
3.2	Erection of Straight through connectors (Plastic coupler) and accessories for OFC connection.	Set	0.0	612.54	-
3.3	Erection of end Connector and accessories for OFC connection at RMU,	Set	2.0	1,225.07	2,450.14
3.4	Erection, Commissioning, Testing of Standard FRTU 4Way with FRTU networking Equipment consisting of Fibre Optic switch (Mono mode along with associate LIU unit for connection of FO Cable. for 3 Way & 4 way RMU.	Nos.	1.0	6,124.36	6,124.36
	Sub Total (Erection Portion) (in Rs.)				82,322.20

Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
Civil Portion					
Sl. No.	Description of items	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
1	Civil works with supply of all materials like cement, MS tor rod, brick, coarse & fine aggregates and labour, T&P, etc for UG Cable Trench				
1.1	Earth work excavation of soil (1mtr. width X 1.2mtr. depth)				
1.1.a	Earth work excavation of soil	Cum	37.8	700.00	26,460.00
1.1.b	Earth work excavation of hard rock	Cum	16.2	1,720.00	27,864.00
1.2	Back filling with excavated soil outside and above the trench	Cum	54	202.00	10,908.00
1.3	Damage of asphalt/tar road and other utilities and reconstructing to bring to its original shape after laying of cable in open trench (1mtr. width)	Mtr	22.5	2,643.67	59,482.59
2	Civil works for Prefabricated RCC foundation with supply of all materials				
2.1	Prefabricated RCC foundation of 33kV RMU	Nos.	1	23,145.30	23,145.30
3	Supply of GI Fencing with Gate around each RMU	sqmtr	20	3,600.00	72,000.00
4	Construction Earthing chamber including installation of earthing pipe. Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	Set	2	3,700.00	7,400.00
5	Supply and erection of GI Pipe of dia. 150mm, Class-B (8Mtr.)	Mtr	48	1,463.40	70,243.20
6	Supply and Erection of Cable Route Marker along the cable route at an interval of 30mtrs with civil works	Nos.	2	1,012.00	2,024.00
	Sub Total (Civil Portion) (in Rs.)				2,99,527.09
A	Sub Total (Supply Portion)				28,33,844.15
B	Stock, Storage & Insurance @ 3 % of A				85,015.32
C	Sub Total (A+B)				29,18,859.47
D	Contingency @ 3 % of C				87,565.78
E	Tools & Plants Charges @ 2% of C (considered for earthing items)				25.29
F	Transportation @ 7.5% of C				2,18,914.46
G	Erection Charges @ 10% of earthing items				126.44
H	Total (C+D+E+F+G)				32,25,491.45
I	Sub Total (Erection Portion + Civil Portion)				3,81,849.29
J	Total Cost (H+I)				36,07,340.74
K	Other Overhead /(including Supervision Charges) @ 6 % of J				2,16,440.44
L	Total Estimated Capital Cost i.e. (J+K)				38,23,781.18
M	GST @ 18% of L				6,88,280.61
M1	CESS @ 1% of L				38,237.81
N	Grand Total (L+M+M1)				45,50,299.61

ANNEXURE-11**Summary of proposal details for 33kV Feeder Refurbishment:**

Sl. No.	Circle	Division	Name of 33kV Feeder	Proposal Details	Costing in Cr	Annexure Nos.
1	Cuttack	CED	Athagarh	Strengthening of existing 33kV Athagarh feeder emanating from 132/33kV Choudwar GSS by augmentation of 148 sqmm conductor with 232sqmm conductor for a length of 4.5Ckm from Choudwar GSS to 33/11kV Chatisha PSS.	₹ 1.0	Annexure-11.1
2	Cuttack	AED	Khuntuni	Strengthening of existing 33kV Narangbasta feeder emanating from 132/33kV Khuntuni GSS by augmentation of conductor of 148 sqmm conductor with 232sqmm conductor for a length of 6Ckm from Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda.	₹ 1.4	Annexure-11.2
3	Cuttack	AED	Kanpur	Strengthening of existing 33kV Kanpur feeder emanating from 132/33kV Narsinghpur GSS by augmentation of 100/55 sqmm conductor with 232sqmm conductor for a length of 10Ckm from Narsinghpur Grid to Kandhabareni PSS.	₹ 2.0	Annexure-11.3
4	Dhenkanal	ANED	Angul-2	Strengthening of existing 33kV Angul-2 feeder emanating from 132/33kV Angul GSS by augmentation of Conductor of 80/55 sqmm conductor with 232sqmm conductor for a length of 7Ckm from 33/11kV Badakera PSS to Shree Metallik Pvt Ltd. tapping.	₹ 1.6	Annexure-11.4
5	Dhenkanal	ANED	Angul-2	Strengthening of existing 33kV Angul-2 feeder emanating from 132/33kV Angul GSS by augmentation of Conductor of 80/55 sqmm conductor with 232sqmm conductor for a length of 4.5Ckm from Bhata ABS to Tarini Nursery.	₹ 1.00	Annexure-11.5
TOTAL					₹ 7.0	

1.0 33kV Athagarh Feeder Refurbishment (Choudwar Grid to Chatisha PSS)

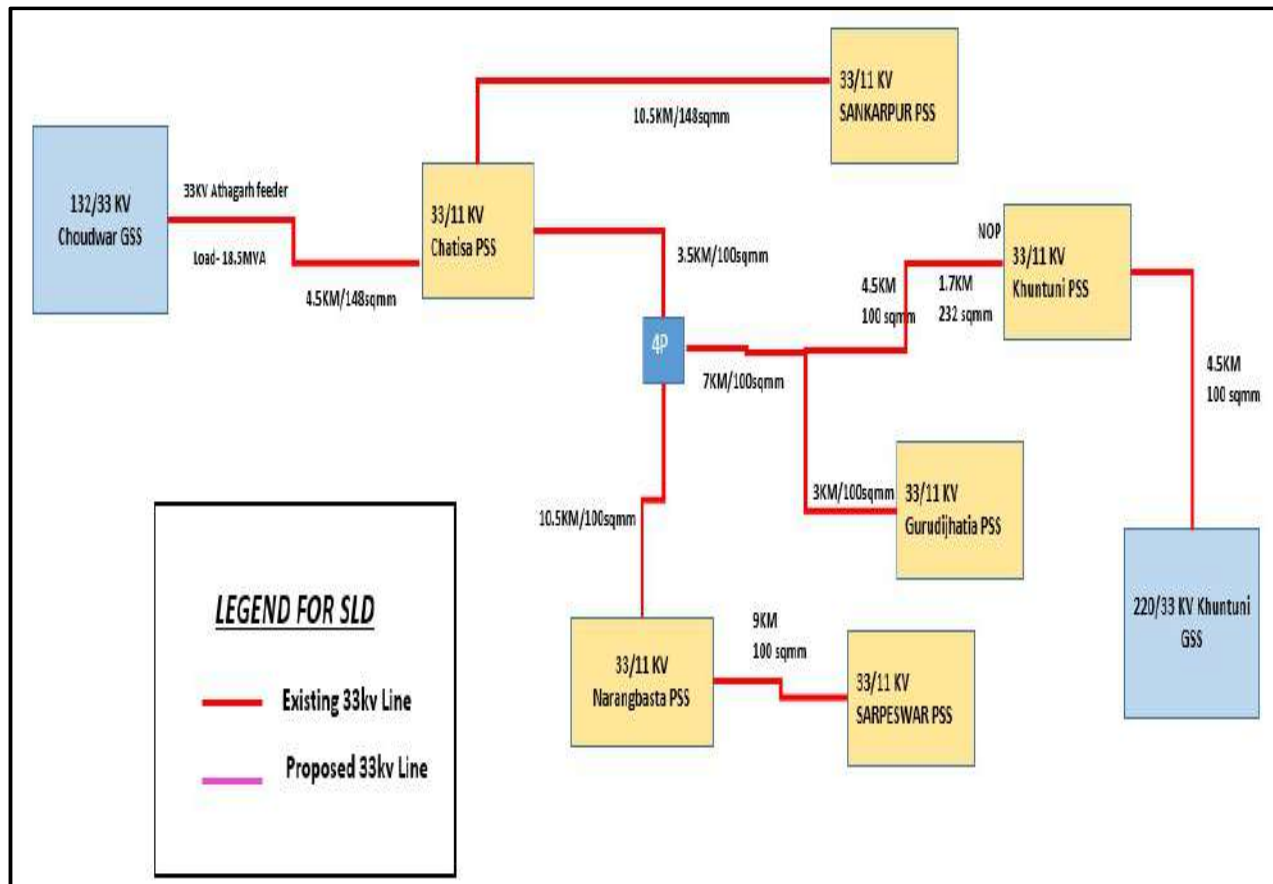
Proposal: Strengthening of existing 33kV Athagarh feeder emanating from 132/33kV Choudwar GSS by augmentation of 148 sqmm conductor with 232sqmm conductor for a length of 4.5Ckm from Choudwar GSS to 33/11kV Chatisha PSS.

Objective: To maintain reliability of power supply, reduction if frequent interruptions in the feeder, reduction of conductor snapping and strengthening the existing network by augmenting weak section and lower conductor size.

Existing Scenario:

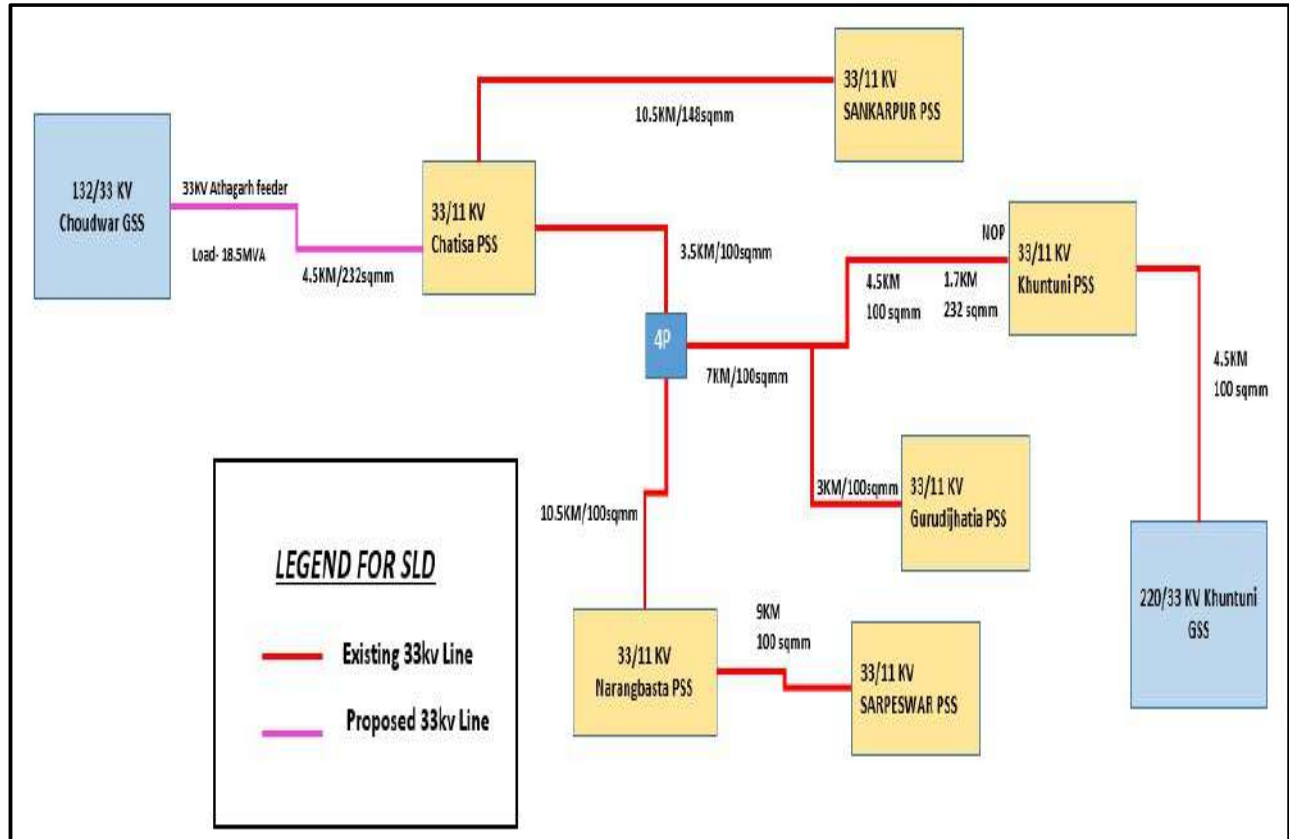
- At present, 33kV Athagarh feeder is emanating from 132/33kV Choudwar GSS. 5 no. of 33/11kV PSS i.e, Chatisa PSS, Sankarpur PSS, Narangbasta PSS, Sarpeswar PSS, Gurudijhatia PSS and other 33kV consumers are connected from this feeder. The existing feeder is lengthy with 45.2Ckm and the peak load is 18.5MVA.
- Existing Athagarh feeder from Choudwar GSS to Chatisha PSS with existing line is in unsafe condition. Conductor has become weak due to past fault feeding. In addition, conductor snapping is experienced along with tiled poles along the feeder and span length is high. Minimum ground clearance has not been maintained in several places over the feeder.
- The length of conductor for above-mentioned distance is 4.5Ckm.

Existing SLD:



Proposed Scenario:

- Peak load for FY' 27-28 will be 23.4 MVA on 33kV Athagarh feeder considering load growth of 6% per annum.
- Augmentation & refurbishment is proposed for 4.5Ckm from 148 sq.mm to 232 sq.mm from Choudwar GSS to Chatisa PSS.

Proposed SLD:**Detailed Scope of Work:**

Augmentation & refurbishment of line for 4.5Ckm from 148 sq.mm to 232 sq.mm along with installation of 79nos. of interposing pole on existing line.

BOQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED			
	Name of the Division :-	CED	
	Name of the Sub-Division :-	Choudwar	
	Name of the Work :-	33kV Feeder Refurbishment	
	Scope of work:-	Part-A :- 33kV Athagarh Feeder Refurbishment with Conductor Augmentation (from existing 148 sqmm to 232sqmm) from Choudwar Grid to Chatisha PSS- Total Length 4.5Ckm	
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Part-A :- 33kV Athagarh Feeder Refurbishment with Conductor Augmentation (from existing 148 sqmm to 232sqmm) from Choudwar Grid to Chatisha PSS- Total Length 4.5Ckm	1,00,03,568.47
		Total Amount	1,00,03,568.47
		Total Amount (In Cr)	1.00
Total estimated cost is Rs. 1 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 1.00cr. (For detailed BoQ refer Annexure-11.1).

Benefit:

- Ensuring existing feeder strengthening, upgrading feeder capacity which can supply the upcoming future load with proper safety.
- Ensuring reduction of feeder interruptions, conductor snapping in turn providing reliable power supply to the industrial and residential consumers.

2.0 33kV Narangbasta Feeder Refurbishment (Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda)

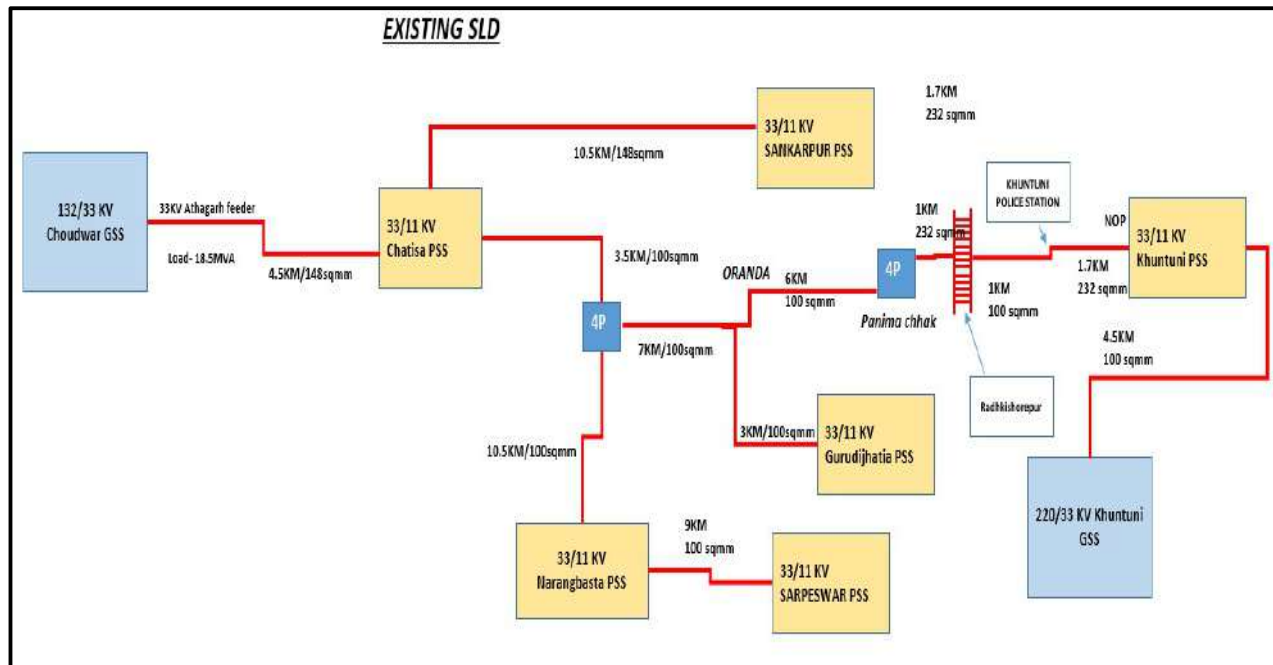
Proposal: Strengthening of existing 33kV Narangbasta feeder emanating from 132/33kV Khuntuni GSS by augmentation of conductor of 148 sqmm conductor with 232sqmm conductor for a length of 6Ckm from Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda.

Objective: To maintain reliability of power supply, mitigating N-1 and strengthening the existing network by augmenting lower conductor size.

Existing Scenario:

- At present, 33kV Narangbasta feeder is emanating from 132/33kV Choudwar GSS. 1 no. of 33/11kV PSS i.e, Khuntuni and other 33kV consumers are connected from this feeder. Total length of this feeder is 4.5km and the peak load is 11.5MVA.
- Existing Narangbasta feeder from Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda is in unsafe condition. Conductor has become weak due to past fault feeding. Conductor has become weak due to past fault feeding. In addition, conductor snapping is experienced along with tiled poles along the feeder and span length is high. Minimum ground clearance has not been maintained in several places over the feeder.
- The length of conductor for above-mentioned distance is 6Ckm.
- It is also not possible to backfeed 4 no.s of PSS which are connected from Choudwar GSS which hampers the N-1 contingency condition.

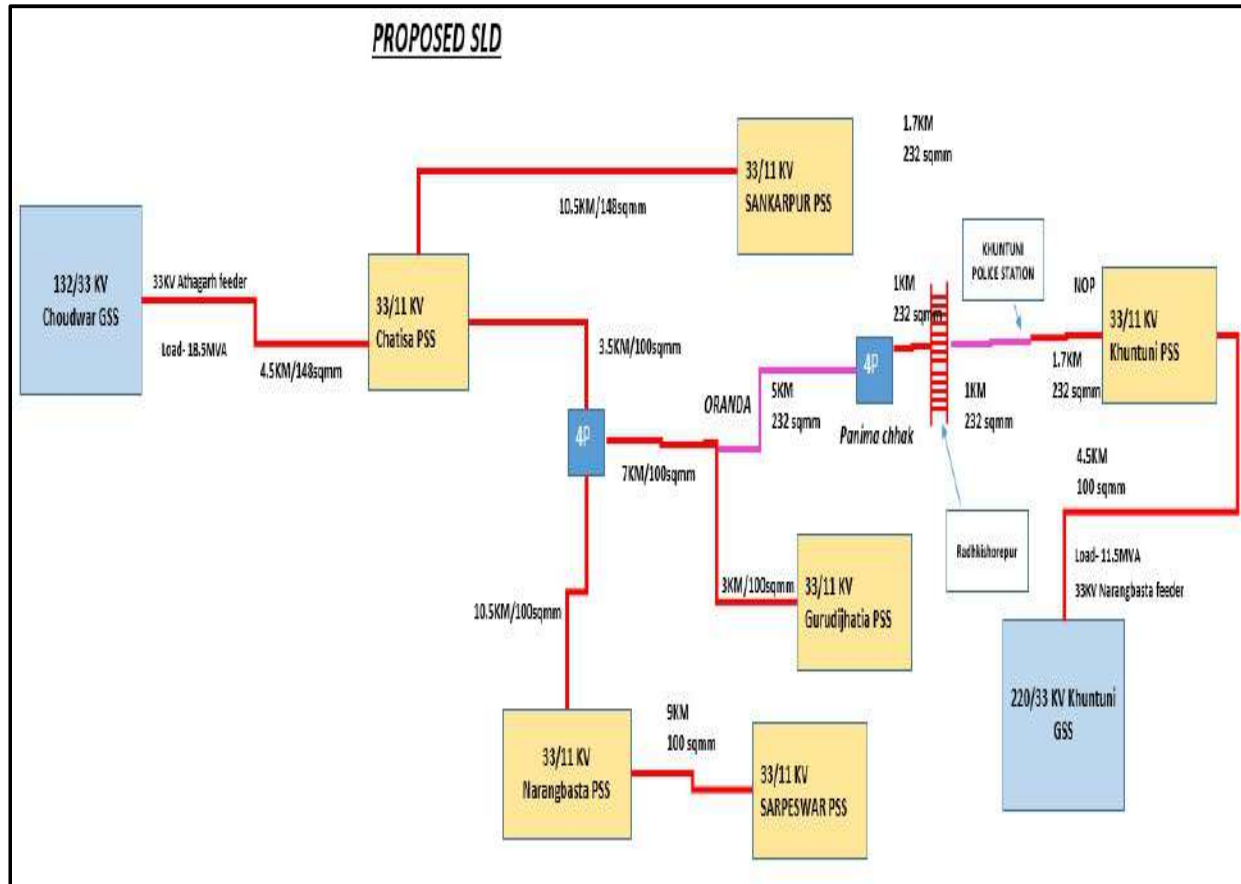
Existing SLD:



Proposed Scenario:

- Peak load for FY' 27-28 will be 12.58 MVA on 33kV Narangbasta feeder considering load growth of 2% per annum.
- Augmentation & refurbishment is proposed for 6Ckm from 100 sq.mm to 232 sq.mm from Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda.

Proposed SLD:



Detailed Scope of Work:

Augmentation & refurbishment of line for 6Ckm from 100 sq.mm to 232 sq.mm. In along with installation of 108nos. of interposing pole on existing line.

BOQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED			
	Name of the Division :-	AED ATHAGARH	
	Name of the Sub-Division :-	ATHAGARH	
	Name of the Work :-	33kV Feeder Refurbishment	
	Scope of work:-	Part-A :- 33kV Narangbasta Feeder Refurbishment with Conductor Augmentation (from existing 100 sqmm to 232sqmm) Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda- Total Length 6Ckm	
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Part-A :- 33kV Narangbasta Feeder Refurbishment with Conductor Augmentation (from existing 100 sqmm to 232sqmm) Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda- Total Length 6Ckm	1,35,66,368.84
		Total Amount	1,35,66,368.84
		Total Amount (In Cr)	1.36
Total estimated cost is Rs. 1.36 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 1.36cr. (For detailed BoQ refer Annexure-11.2).

Benefit:

- Ensuring existing feeder strengthening, upgrading feeder capacity which can supply the upcoming future load with proper safety.
- Ensuring reduction of feeder interruptions, conductor snapping in turn providing reliable power supply to the industrial and residential consumers.

3.0 **33kV Kanpur Feeder Refurbishment (Narsinghpur Grid to Kandhabareni PSS)**

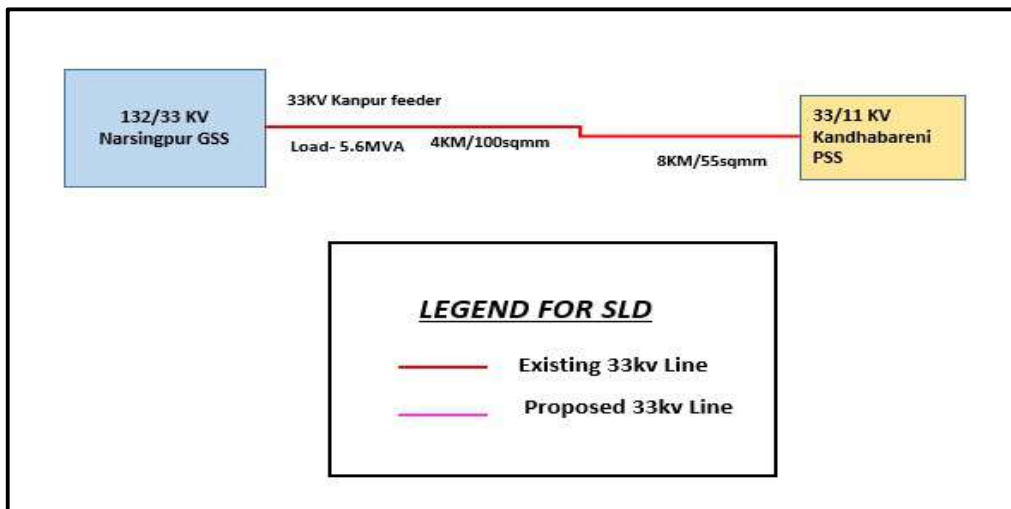
Proposal: Strengthening of existing 33kV Kanpur feeder emanating from 132/33kV Narsinghpur GSS by augmentation of 100/55 sqmm conductor with 232sqmm conductor for a length of 12Ckm from Narsinghpur Grid to Kandhabareni PSS.

Objective: To maintain reliability of power supply, reduction if frequent interruptions in the feeder, reduction of conductor snapping and strengthening the existing network by augmenting weak section and lower conductor size.

Existing Scenario:

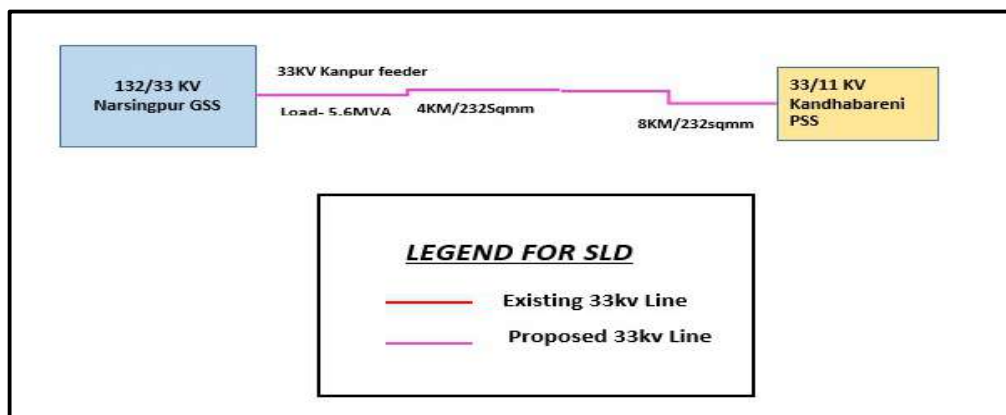
- At present, 33kV Kanpur feeder is emanating from 132/33kV Narsinghpur GSS. 1 no. of 33/11kV PSS i.e, Kandhabareni and other 33kV consumers are connected from this feeder. The existing feeder total length is 12km and the peak load is 5.6MVA.
- Existing Kanpur feeder from Narsinghpur GSS to Kandhabareni PSS with existing line is in unsafe condition. Conductor has become weak due to past fault feeding. In addition, conductor snapping is experienced along with tiled poles along the feeder and span length is high. Minimum ground clearance has not been maintained in several places over the feeder.
- The length of conductor for above-mentioned distance is 12Ckm.

Existing SLD:



Proposed Scenario:

- Peak load for FY' 27-28 will be 6.55 MVA on 33kV Narangbasta feeder considering load growth of 4% per annum.
- Augmentation & refurbishment is proposed for 10km from 100/55 sq.mm to 232 sq.mm from Narsinghpur Grid to Kandhabareni PSS.

Proposed SLD:**Detailed Scope of Work:**

Augmentation & refurbishment of line for 10Ckm from 100 and 55sq.mm to 232 sq.mm along with installation of 108nos. of interposing pole on existing line.

BOQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED			
	Name of the Division :-	AED ATHAGARH	
	Name of the Sub-Division : -	NARSINGHPUR	
	Name of the Work :-	33kV Feeder Refurbishment	
	Scope of work:-	Part-A :- 33kV Kanpur Feeder Refurbishment with Conductor Augmentation (from existing 100 and 55 sqmm to 232sqmm) from Narsinghpur Grid to Kandhabareni PSS- Total Length 10Ckm	
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Part-A :- 33kV Kanpur Feeder Refurbishment with Conductor Augmentation (from existing 100 and 55 sqmm to 232sqmm) from Narsinghpur Grid to Kandhabareni PSS- Total Length 12Ckm	2,09,21,847.12
		Total Amount	2,09,21,847.12
		Total Amount (In Cr)	2.09
Total estimated cost is Rs. 2.09 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 2.09cr. (For detailed BoQ refer Annexure-11.3).

Benefit:

- Ensuring existing feeder strengthening, upgrading feeder capacity which can supply the upcoming future load with proper safety.
- Ensuring reduction of feeder interruptions, conductor snapping in turn providing reliable power supply to the industrial and residential consumers.

4.0 33kV Angul-2 Feeder Refurbishment (Badakera PSS to Shree Metallik tapping)

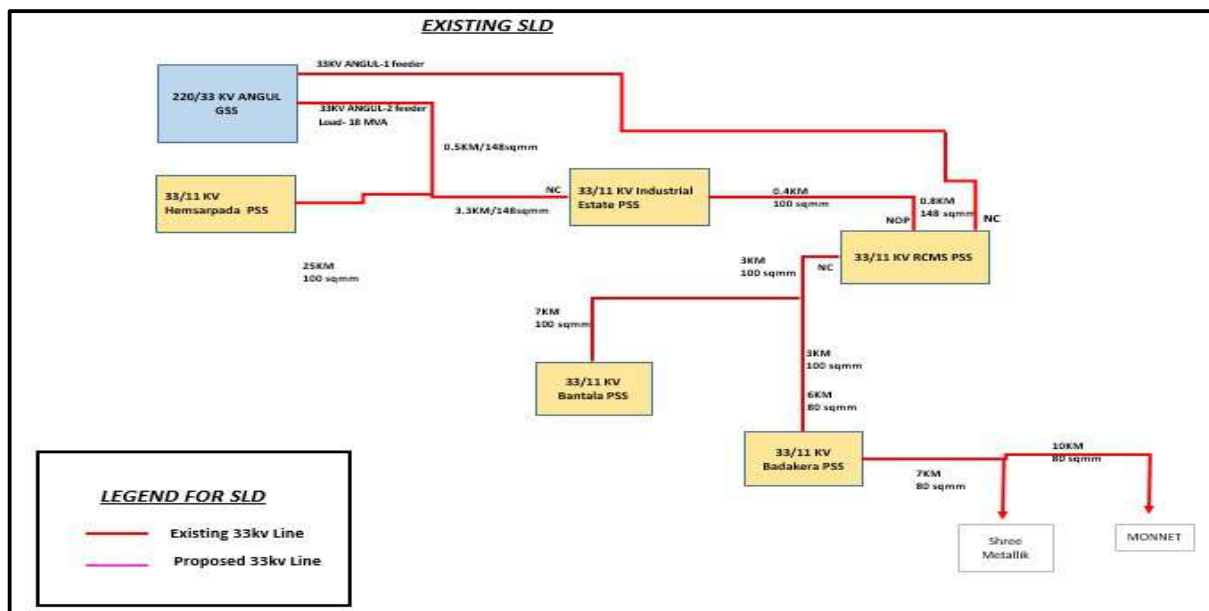
Proposal: Strengthening of existing 33kV Angul-2 feeder emanating from 132/33kV Angul GSS by augmentation of Conductor of 80/55 sqmm conductor with 232sqmm conductor for a length of 7Ckm from 33/11kV Badakera PSS to Shree Metallik Pvt Ltd. tapping.

Objective: To maintain reliability of power supply, improvement of low voltage issue, improvement of N-1 contingency condition, reduction if frequent interruptions in the feeder, reduction of conductor snapping and strengthening the existing network by augmenting weak section and lower conductor size.

Existing Scenario:

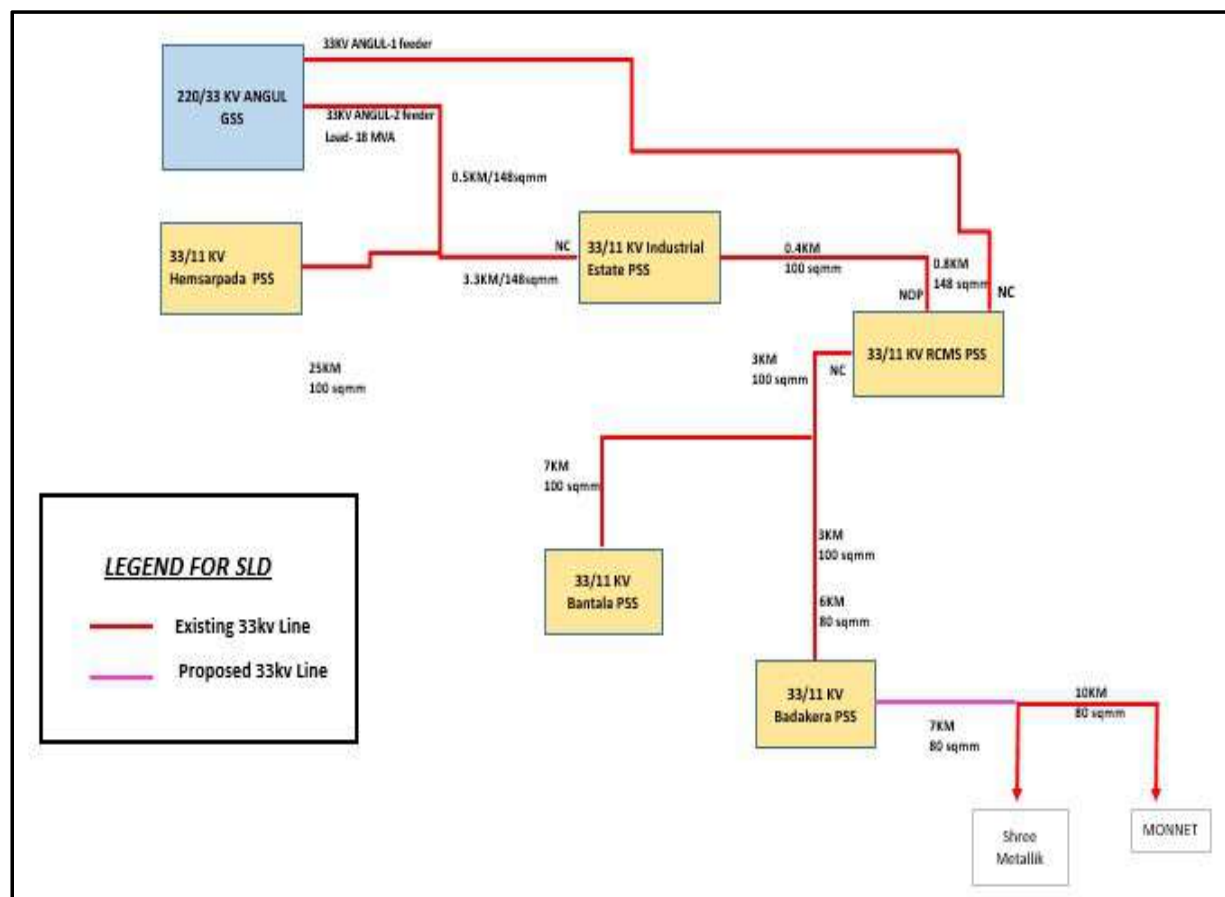
- At present, 33kV Angul-2 feeder is emanating from 132/33kV Angul GSS. 3 no. of 33/11kV PSS i.e, Industrial Estate, Bantala, Badakera and few 33kV consumers including Shree Metallik Pvt Ltd. which are connected from this feeder. The existing total length of the feeder is 40.2Ckm and the peak load is 18.8MVA.
- Existing Angul-2 feeder from Badakera PSS to 33kV consumer Shree Metallik with existing line is on 8/9 mtr PSC pole. In addition, conductor snapping is experienced along with tiled poles along the feeder and span length is high. Also V-cross arm are damaged and minimum ground clearance has not been maintained in several places over the feeder.
- The length of conductor for above-mentioned distance is 7Ckm. Due to low size of conductor and lengthy line from Angul Grid, the 33kV consumers connected to the tail end of feeder, i.e., Shree Metallik and MONNET are experiencing low voltage.

Existing SLD:



Proposed Scenario:

- Peak load for FY' 27-28 will be 25.6 MVA on Angul-2 feeder considering load growth of 8% per annum.
- Augmentation & refurbishment is proposed for 7Ckm from 80 sq.mm to 232 sq.mm from Badakera to Shree Metallik tapping.

Proposed SLD:**Detailed Scope of Work:**

Augmentation & refurbishment of line for 7Ckm from 80 sq.mm to 232 sq.mm along with installation of 126nos. of interposing pole on existing line.

BOQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED	
Name of the Division :-	ANGUL
Name of the Sub-Division :-	ANGUL
Name of the Work :-	33kV Feeder Refurbishment
Scope of work:-	Part-A : 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Badakera PSS to Shree Metallik tapping point. Total Length- 7Ckm.
Names of Schemes: -	TPCODL CAPEX(FY 23-24)

<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Part-A : 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Badakera PSS to Shree Metallik tapping point. Total Length- 7Ckm.	1,58,27,430.31
		Total Amount	1,58,27,430.31
		Total Amount (In Cr)	1.58
Total estimated cost is Rs. 1.58 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 1.58cr. (For detailed BoQ refer Annexure-11.4).

Benefit:

- Ensuring existing feeder strengthening, upgrading feeder capacity which can supply the upcoming future load with proper safety.
- Ensuring reduction of feeder interruptions, conductor snapping in turn providing reliable power supply to the industrial and residential consumers.

5.0 33kV Angul-2 Feeder Refurbishment (Bhata ABS to Tarini Nursery)

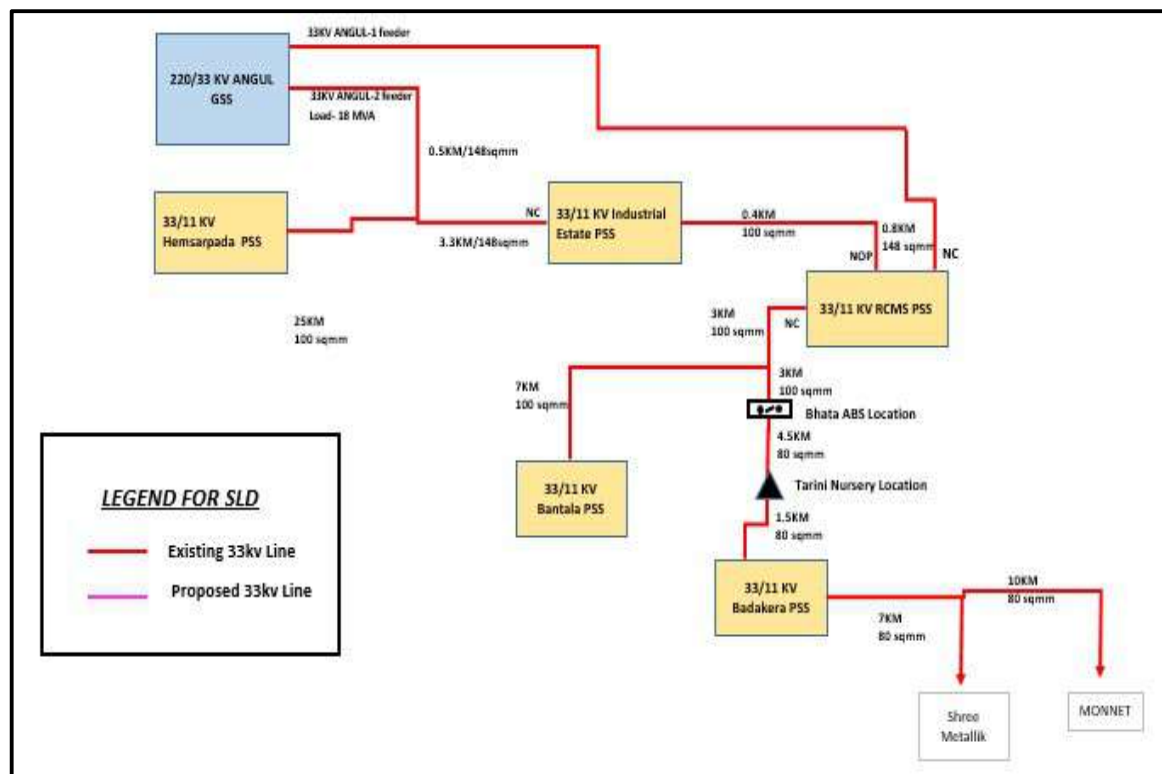
Proposal: Strengthening of existing 33kV Angul-2 feeder emanating from 132/33kV Angul GSS by augmentation of Conductor of 80/55 sqmm conductor with 232sqmm conductor for a length of 4.5Ckm from Bhata ABS to Tarini Nursery.

Objective: To maintain reliability of power supply, improvement of low voltage issue, improvement of N-1 contingency condition, reduction if frequent interruptions in the feeder, reduction of conductor snapping and strengthening the existing network by augmenting weak section and lower conductor size.

Existing Scenario:

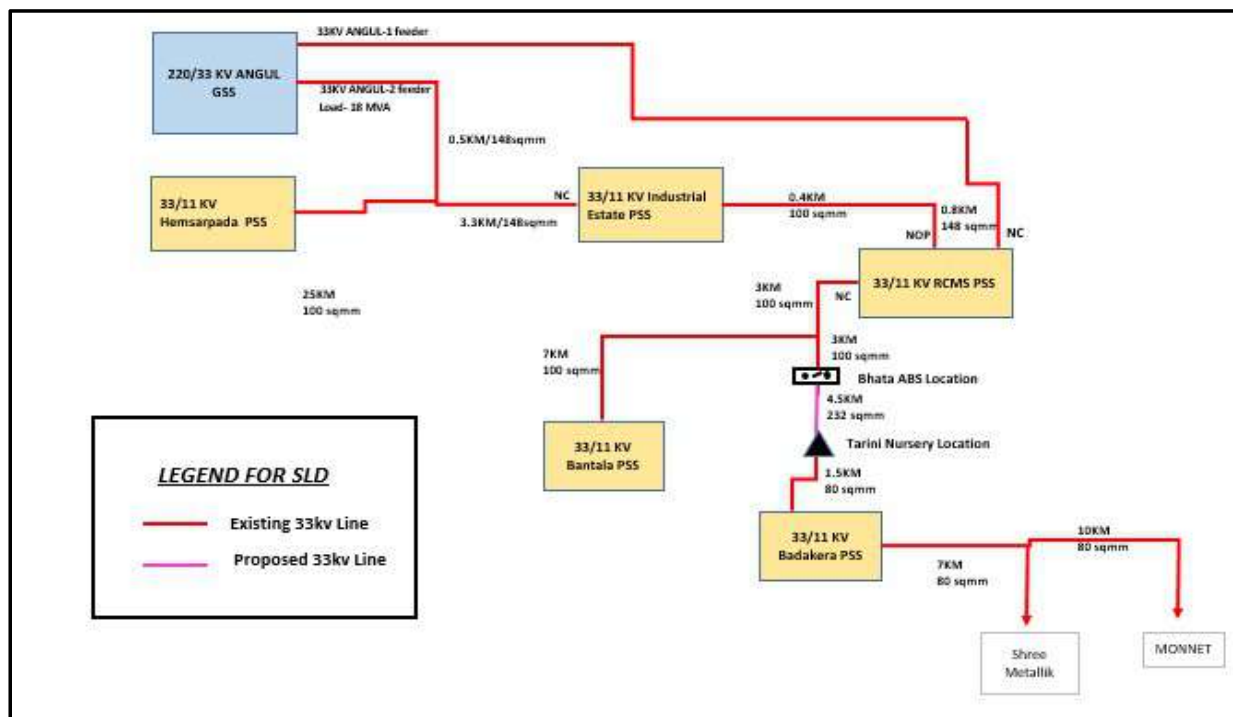
- At present, 33kV Angul-2 feeder is emanating from 132/33kV Angul GSS. 3 no. of 33/11kV PSS i.e, Industrial Estate, Bantala, Badakera and few 33kV consumers including Shree Metallik Pvt Ltd. which are connected from this feeder. The existing total length of the feeder is 40.2Ckm and the peak load is 18.8MVA.
- Existing Angul-2 feeder from Badakera PSS to 33kV consumer Shree Metallik with existing line is on 8/9 mtr PSC pole. In addition, conductor snapping is experienced along with tiled poles along the feeder and span length is high. Also V-cross arm are damaged and minimum ground clearance has not been maintained in several places over the feeder.
- The length of conductor for above-mentioned distance is 4.5Ckm. Due to low size of conductor and lengthy line from Angul Grid, the 33kV consumers connected to the tail end of feeder, i.e., Shree Metallik and MONNET are also experiencing low voltage.

Existing SLD:



Proposed Scenario:

- Peak load for FY' 27-28 will be 25.6 MVA on Angul-2 feeder considering load growth of 8% per annum.
- Augmentation & refurbishment is proposed for 4.5km from 80 sq.mm to 232 sq.mm from Bhata ABS to Tarini Nursery.

Proposed SLD:**Detailed Scope of Work:**

Augmentation & refurbishment of line for 4.5Ckm from 80 sq.mm to 232 sq.mm along with installation of 79nos. of interposing pole on existing line.

BOQ:

TP CENTRAL ODISHA DISTRIBUTION LIMITED			
	Name of the Division :-	ANGUL	
	Name of the Sub-Division : -	ANGUL	
	Name of the Work :-	33kV Feeder Refurbishment	
	Scope of work:-	Part-A : 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Bhata ABS to Tarini Nursery- Total Length 4.5Ckm	
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount

1	A	Part-A : 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Bhata ABS to Tarini Nursery- Total Length 4.5Ckm	99,72,916.45
		Total Amount	99,72,916.45
		Total Amount (In Cr)	1.00
Total estimated cost is Rs. 1.00 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 1.00cr. (For detailed BoQ refer Annexure-11.5).

Benefit:

- Ensuring existing feeder strengthening, upgrading feeder capacity which can supply the upcoming future load with proper safety.
- Ensuring reduction of feeder interruptions, conductor snapping in turn providing reliable power supply to the industrial and residential consumers.

ANNEXURE-11.1 (ABSTRACT)

TP CENTRAL ODISHA DISTRIBUTION LIMITED			
	Name of the Division :-	CED	
	Name of the Sub-Division : -	CHOUDWAR	
	Name of the Work :-	33kV Feeder Refurbishment	
	Scope of work:-	Part-A :- 33kV Athagarh Feeder Refurbishment with Conductor Augmentation (from existing 148 sqmm to 232sqmm) from Choudwar Grid to Chatisha PSS- Total Length 4.5Ckm	
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Part-A :- 33kV Athagarh Feeder Refurbishment with Conductor Augmentation (from existing 148 sqmm to 232sqmm) from Choudwar Grid to Chatisha PSS- Total Length 4.5Ckm	1,00,03,568.47
		Total Amount	1,00,03,568.47
		Total Amount (In Cr)	1.00
Total estimated cost is Rs. 1.00 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-11.1					
Part-A :- 33kV Athagarh Feeder Refurbishment with Conductor Augmentation (from existing 148 sqmm to 232sqmm) from Choudwar Grid to Chatisha PSS- Total Length 4.5Ckm					
No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)			4		
MATERIALS FOR 33 KV DP Without Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	8	2,49,600.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	248.56	18,890.56
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	15.8592	1,474.91
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =(5x7.14x1.96)	KG	76.00	279.888	21,271.49
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	247.104	18,779.90
6	Danger Plate, 2 no's.	No.	99.20	8	793.60
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	2.4072	223.87
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	8	1,240.00
9	H.T. Stay set (Complete)	Set	1,302.00	8	10,416.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	16	992.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	120	11,160.00
12	GI Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	4	5,208.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	47.2	4,389.60
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	24	2,380.80
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	9.6288	895.48
16	33KV pin insulator polymer	No.	595.20	12	7,142.40
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	24	14,880.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	24	34,224.00
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	49.044	4,743.54
21	Black Paint	Ltr	272.80	4	1,091.20
22	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40
A	Total Cost of materials				4,46,203.74
B	Stock, Storage & Insurance i.e 3% of A				13,386.11
C	Sub Total (A+B)				4,59,589.85
D	Contingency @ 3% of C				13,787.70
E	Tools & Plants @ 2% of C				9,191.80
F	Transportation @ 7.5% of C				34,469.24
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				12,854.40
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				17,261.54
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				5,47,154.52
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	8	18,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	4.4	28,600.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.9	5,850.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	4	14,800.00

ANNEXURE-11.1					
Part-A :- 33kV Athagarh Feeder Refurbishment with Conductor Augmentation (from existing 148 sqmm to 232sqmm) from Choudwar Grid to Chatisha					
PSS- Total Length 4.5Ckm					
K	Total Civil & Services				67,250.00
L	Total (J+K)				6,14,404.52
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				36,864.27
N	Sub Total (L+M)				6,51,268.79
O	Total GST @ 18% of (N)				1,17,228.38
P	Total CESS @ 1% of (N)				6,512.69
Q	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				7,75,009.86
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002)			4		
MATERIALS FOR 33 KV Cut Point with 180 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	4	1,24,800.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	130.016	9,881.22
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	93.00	21.1456	1,966.54
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	23.40288	1,778.62
5	Danger Plate, 1 no's.	No.	99.20	4	396.80
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.2036	111.93
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	12	1,190.40
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	4.8144	447.74
9	33KV pin insulator polymer	No.	595.20	12	7,142.40
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	24	14,880.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	24	34,224.00
12	Earthing of Support (Coil Type)	EA	205.84	4	823.36
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.048	97.46
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	19.516	1,887.59
16	Black Paint	Ltr	272.80	4	1,091.20
17	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40
A	Total Cost of materials				2,37,125.66
B	Stock, Storage & Insurance i.e 3% of A				7,113.77
C	Sub Total (A+B)				2,44,239.43
D	Contingency @ 3% of C				7,327.18
E	Tools & Plants @ 2% of C				4,884.79
F	Transportation @ 7.5% of C				18,317.96
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				6,427.20
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				11,569.54
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				2,92,766.10
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.2	14,300.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
K	Total Civil & Services				17,225.00
L	Total (J+K)				3,09,991.10
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				18,599.47
N	Sub Total (L+M)				3,28,590.57
O	Total GST @ 18% of (N)				59,146.30

ANNEXURE-11.1					
Part-A :- 33kV Athagarh Feeder Refurbishment with Conductor Augmentation (from existing 148 sqmm to 232sqmm) from Choudwar Grid to Chatisha PSS- Total Length 4.5Ckm					
P	Total CESS @ 1% of (N)				3,285.91
Q	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle				3,91,022.78
No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0003)				4	
MATERIALS FOR 33 KV Cut Point with 90 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	4	1,24,800.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	260.032	19,762.43
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	42.2912	3,933.08
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306)	K.g.	76.00	46.80576	3,557.24
5	Danger Plate, 1 no's.	No.	99.20	4	396.80
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.2036	111.93
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	12	1,190.40
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	4.8144	447.74
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	16	9,523.20
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	24	14,880.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	24	34,224.00
12	Earthing of Support (Coil Type)	No.	205.84	4	823.36
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.048	97.46
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	4	620.00
16	H.T. Stay set (Complete)	Set	1,302.00	4	5,208.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	4	248.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	60	5,580.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	45.24	4,375.61
20	Black Paint	Ltr	272.80	4	1,091.20
21	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40
A	Total Cost of materials				2,67,276.86
B	Stock, Storage & Insurance i.e 3% of A				8,018.31
C	Sub Total (A+B)				2,75,295.17
D	Contingency @ 3% of C				8,258.86
E	Tools & Plants @ 2% of C				5,505.90
F	Transportation @ 7.5% of C				20,647.14
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				6,427.20
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				13,474.55
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				3,29,608.81
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.20	14,300.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	4	9,000.00
K	Total Civil & Services				26,225.00
L	Total (J+K)				3,55,833.81

ANNEXURE-11.1					
Part-A :- 33kV Athagarh Feeder Refurbishment with Conductor Augmentation (from existing 148 sqmm to 232sqmm) from Choudwar Grid to Chatisha					
PSS- Total Length 4.5Ckm					
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				21,350.03
N	Sub Total (L+M)				3,77,183.84
O	Total GST @ 18% of (N)				67,893.09
P	Total CESS @ 1% of (N)				3,771.84
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle				4,48,848.77
33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No.- TPCODL-HVD-0001)			4.5		
MATERIALS FOR 33 KV Pin Points					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	63	19,65,600.00
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	63	1,23,429.60
3	Top bracket 100x50x6mm GI channel (2kg each)	No.	186.00	63	11,718.00
4	Danger Plate, 1 no's.	No.	99.20	63	6,249.60
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	18.96	1,762.97
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	189.00	18,748.80
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	75.83	7,051.89
8	33KV pin insulator polymer	No.	595.20	189	1,12,492.80
9	Earthing of Support (Coil Type)	No.	205.84	63	12,967.92
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	16.51	1,535.06
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	91.35	8,835.37
12	232 sq.mm AAA conductor	K.M.	1,94,060.00	13.91	26,98,404.30
13	Crimping type Midspan Compression Joint for 232 sq.mm AAA conductor	EA	648.42		-
14	Black Paint	Ltr	272.80	63.0	17,186.40
15	Yellow Colour Paint for Background	Ltr	272.80	126.0	34,372.80
A	Total Cost of materials				50,20,355.52
B	Stock, Storage & Insurance i.e 3% of A				1,50,610.67
C	Sub Total (A+B)				51,70,966.18
D	Contingency @ 3% of C				1,55,128.99
E	Tools & Plants @ 2% of C				1,03,419.32
F	Transportation @ 7.5% of C				3,87,822.46
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,01,228.40
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				3,14,639.82
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				62,33,205.17
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	34.65	2,25,225.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	7.09	46,068.75
3	Dismantalling of 148/232sqmm Conductor	km	10,800.00	13.50	1,45,800.00
K	Total Civil & Services				4,17,093.75
L	Total (J+K)				66,50,298.92
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				3,99,017.94
N	Sub Total (L+M)				70,49,316.86
O	Total GST @ 18% of (N)				12,68,877.03
P	Total CESS @ 1% of (N)				70,493.17
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				83,88,687.06
6% Supervision Charges Summary					
1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				36,864.27

ANNEXURE-11.1		
Part-A :- 33kV Athagarh Feeder Refurbishment with Conductor Augmentation (from existing 148 sqmm to 232sqmm) from Choudwar Grid to Chatisha PSS- Total Length 4.5Ckm		
2	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)	-
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)	18,599.47
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)	21,350.03
5	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)	3,99,017.94
	Total (6% supervision charges)	4,75,831.70
Gross Total Summary		
1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator	7,75,009.86
2	Gross Total Material +Services (N+O) for 33 KV DP With Isolator	-
3	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle	3,91,022.78
4	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle	4,48,848.77
5	Gross Total Material +Services (N+O+P) for 33 KV Pin Points	83,88,687.06
Q	Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km.	
R	Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km	
S	Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each	
T	Final decision by electrical Inspector	
U	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)	1,00,03,568.47

ANNEXURE-11.2 (ABSTRACT)			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
	Name of the Division :-	AED ATHAGARH	
	Name of the Sub-Division : -	ATHAGARH	
	Name of the Work :-	33kV Feeder Refurbishment	
	Scope of work:-	Part-A :- 33kV Narangbasta Feeder Refurbishment with Conductor Augmentation (from existing 100 sqmm to 232sqmm) Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda- Total Length 6Ckm	
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Part-A :- 33kV Narangbasta Feeder Refurbishment with Conductor Augmentation (from existing 100 sqmm to 232sqmm) Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda- Total Length 6Ckm	1,35,66,368.84
		Total Amount	1,35,66,368.84
		Total Amount (In Cr)	1.36
Total estimated cost is Rs. 1.36 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-11.2					
Part-A :- 33kV Narangbasta Feeder Refurbishment with Conductor Augmentation (from existing 100 sqmm to 232sqmm) Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda- Total Length 6Ckm					
No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)				6	
MATERIALS FOR 33 KV DP Without Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	12	3,74,400.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	372.84	28,335.84
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	23.7888	2,212.36
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =(5x7.14x1.96)	KG	76.00	419.832	31,907.23
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	370.656	28,169.86
6	Danger Plate, 2 no's.	No.	99.20	12	1,190.40
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	3.6108	335.80
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	12	1,860.00
9	H.T. Stay set (Complete)	Set	1,302.00	12	15,624.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	24	1,488.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	180	16,740.00
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	6	7,812.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	70.8	6,584.40
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	36	3,571.20
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	14.4432	1,343.22
16	33KV pin insulator polymer	No.	595.20	18	10,713.60
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	36	22,320.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	36	51,336.00
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	36	51,336.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	73.566	7,115.30
21	Black Paint	Ltr	272.80	6	1,636.80
22	Yellow Colour Paint for Background	Ltr	272.80	12	3,273.60
A	Total Cost of materials				6,69,305.61
B	Stock, Storage & Insurance i.e 3% of A				20,079.17
C	Sub Total (A+B)				6,89,384.78
D	Contingency @ 3% of C				20,681.54
E	Tools & Plants @ 2% of C				13,787.70
F	Transportation @ 7.5% of C				51,703.86
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				19,281.60
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				25,892.31
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				8,20,731.78
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	12	27,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	6.6	42,900.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.35	8,775.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	6	22,200.00
K	Total Civil & Services				1,00,875.00
L	Total (J+K)				9,21,606.78
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				55,296.41
N	Sub Total (L+M)				9,76,903.19
O	Total GST @ 18% of (N)				1,75,842.57

ANNEXURE-11.2					
Part-A :- 33kV Narangbasta Feeder Refurbishment with Conductor Augmentation (from existing 100 sqmm to 232sqmm) Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda- Total Length 6Kkm					
P	Total CESS @ 1% of (N)				9,769.03
Q	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				11,62,514.80
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002)			6		
MATERIALS FOR 33 KV Cut Point with 180 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	6	1,87,200.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	195.024	14,821.82
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	93.00	31.7184	2,949.81
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	35.10432	2,667.93
5	Danger Plate, 1 no's.	No.	99.20	6	595.20
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.8054	167.90
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	18	1,785.60
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	7.2216	671.61
9	33KV pin insulator polymer	No.	595.20	18	10,713.60
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	36	22,320.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	36	51,336.00
12	Earthing of Support (Coil Type)	EA	205.84	6	1,235.04
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.572	146.20
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	36	51,336.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	29.274	2,831.38
16	Black Paint	Ltr	272.80	6	1,636.80
17	Yellow Colour Paint for Background	Ltr	272.80	12	3,273.60
A	Total Cost of materials				3,55,688.49
B	Stock, Storage & Insurance i.e 3% of A				10,670.65
C	Sub Total (A+B)				3,66,359.15
D	Contingency @ 3% of C				10,990.77
E	Tools & Plants @ 2% of C				7,327.18
F	Transportation @ 7.5% of C				27,476.94
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				9,640.80
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				17,354.31
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				4,39,149.15
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	3.3	21,450.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.675	4,387.50
K	Total Civil & Services				25,837.50
L	Total (J+K)				4,64,986.65
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				27,899.20
N	Sub Total (L+M)				4,92,885.85
O	Total GST @ 18% of (N)				88,719.45
P	Total CESS @ 1% of (N)				4,928.86
Q	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle				5,86,534.17
No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0003)			6		
MATERIALS FOR 33 KV Cut Point with 90 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	6	1,87,200.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	390.048	29,643.65
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	63.4368	5,899.62

ANNEXURE-11.2					
Part-A :- 33kV Narangbasta Feeder Refurbishment with Conductor Augmentation (from existing 100 sqmm to 232sqmm) Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda- Total Length 6Ckm					
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306)	K.g.	76.00	70.20864	5,335.86
5	Danger Plate, 1 no's.	No.	99.20	6	595.20
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.8054	167.90
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	18	1,785.60
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	7.2216	671.61
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	24	14,284.80
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	36	22,320.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	36	51,336.00
12	Earthing of Support (Coil Type)	No.	205.84	6	1,235.04
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.572	146.20
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	36	51,336.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	6	930.00
16	H.T. Stay set (Complete)	Set	1,302.00	6	7,812.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	6	372.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	90	8,370.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	67.86	6,563.42
20	Black Paint	Ltr	272.80	6	1,636.80
21	Yellow Colour Paint for Background	Ltr	272.80	12	3,273.60
A	Total Cost of materials				4,00,915.29
B	Stock, Storage & Insurance i.e 3% of A				12,027.46
C	Sub Total (A+B)				4,12,942.75
D	Contingency @ 3% of C				12,388.28
E	Tools & Plants @ 2% of C				8,258.86
F	Transportation @ 7.5% of C				30,970.71
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				9,640.80
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				20,211.82
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				4,94,413.22
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	3.30	21,450.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.68	4,387.50
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	6	13,500.00
K	Total Civil & Services				39,337.50
L	Total (J+K)				5,33,750.72
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				32,025.04
N	Sub Total (L+M)				5,65,775.76
O	Total GST @ 18% of (N)				1,01,839.64
P	Total CESS @ 1% of (N)				5,657.76
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle				6,73,273.16
33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No.- TPCODL-HVD-0001)			6		
MATERIALS FOR 33 KV Pin Points					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	84	26,20,800.00
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	84	1,64,572.80
3	Top bracket 100x50x6mm GI channel (2kg each)	No.	186.00	84	15,624.00
4	Danger Plate, 1 no's.	No.	99.20	84	8,332.80
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	25.28	2,350.63
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	252.00	24,998.40

ANNEXURE-11.2					
Part-A :- 33kV Narangbasta Feeder Refurbishment with Conductor Augmentation (from existing 100 sqmm to 232sqmm) Khuntuni Police Station to Radhakishorepur UG and from Panima chhak to Oranda- Total Length 6Ckm					
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	101.10	9,402.52
8	33KV pin insulator polymer	No.	595.20	252	1,49,990.40
9	Earthing of Support (Coil Type)	No.	205.84	84	17,290.56
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	22.01	2,046.74
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	121.80	11,780.50
12	232 sq.mm AAA conductor	K.M.	1,94,060.00	18.54	35,97,872.40
13	Crimping type Midspan Compression Joint for 232 sq.mm AAA conductor	EA	648.42		-
14	Black Paint	Ltr	272.80	84.0	22,915.20
15	Yellow Colour Paint for Background	Ltr	272.80	168.0	45,830.40
A	Total Cost of materials				66,93,807.35
B	Stock, Storage & Insurance i.e 3% of A				2,00,814.22
C	Sub Total (A+B)				68,94,621.57
D	Contingency @ 3% of C				2,06,838.65
E	Tools & Plants @ 2% of C				1,37,892.43
F	Transportation @ 7.5% of C				5,17,096.62
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,34,971.20
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				4,19,519.76
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				83,10,940.23
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	46.20	3,00,300.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	9.45	61,425.00
3	Dismantalling of 100/80sqmm Conductor	km	9,000.00	18.00	1,62,000.00
K	Total Civil & Services				5,23,725.00
L	Total (J+K)				88,34,665.23
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				5,30,079.91
N	Sub Total (L+M)				93,64,745.14
O	Total GST @ 18% of (N)				16,85,654.13
P	Total CESS @ 1% of (N)				93,647.45
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				1,11,44,046.72
6% Supervision Charges Summary					
1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				55,296.41
2	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)				-
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				27,899.20
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				32,025.04
5	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				5,30,079.91
	Total (6% supervision charges)				6,45,300.56
Gross Total Summary					
1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				11,62,514.80
2	Gross Total Material +Services (N+O) for 33 KV DP With Isolator				-
3	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle				5,86,534.17
4	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle				6,73,273.16
5	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				1,11,44,046.72
Q	Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km.				
R	Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km				
S	Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each				
T	Final decision by electrical Inspector				
U	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)				1,35,66,368.84

ANNEXURE-11.3 (ABSTRACT)			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
	Name of the Division :-	AED	
	Name of the Sub-Division :-	NARSINGHPUR	
	Name of the Work :-	33kV Feeder Refurbishment	
	Scope of work:-	Part-A :- 33kV Kanpur Feeder Refurbishment with Conductor Augmentation (from existing 100 and 55 sqmm to 232sqmm) from Narsinghpur Grid to Kandhabareni PSS- Total Length 10Ckm	
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Part-A :- 33kV Kanpur Feeder Refurbishment with Conductor Augmentation (from existing 100 and 55 sqmm to 232sqmm) from Narsinghpur Grid to Kandhabareni PSS- Total Length 10Ckm	2,09,21,847.12
		Total Amount	2,09,21,847.12
		Total Amount (In Cr)	2.09
Total estimated cost is Rs. 2.09 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-11.3					
Part-A :- 33kV Kanpur Feeder Refurbishment with Conductor Augmentation (from existing 100 and 55 sqmm to 232sqmm) from Narsinghpur Grid to Kandhabareni PSS- Total Length 10Ckm					
No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)			12		
MATERIALS FOR 33 KV DP Without Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	24	7,48,800.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	745.68	56,671.68
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	47.5776	4,424.72
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =(5x7.14x1.96)	KG	76.00	839.664	63,814.46
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	741.312	56,339.71
6	Danger Plate, 2 no's.	No.	99.20	24	2,380.80
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	7.2216	671.61
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	24	3,720.00
9	H.T. Stay set (Complete)	Set	1,302.00	24	31,248.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	48	2,976.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	360	33,480.00
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	12	15,624.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	141.6	13,168.80
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	72	7,142.40
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	28.8864	2,686.44
16	33KV pin insulator polymer	No.	595.20	36	21,427.20
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	72	44,640.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	72	1,02,672.00
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	72	1,02,672.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	147.132	14,230.61
21	Black Paint	Ltr	272.80	12	3,273.60
22	Yellow Colour Paint for Background	Ltr	272.80	24	6,547.20
A	Total Cost of materials				13,38,611.22
B	Stock, Storage & Insurance i.e 3% of A				40,158.34
C	Sub Total (A+B)				13,78,769.56
D	Contingency @ 3% of C				41,363.09
E	Tools & Plants @ 2% of C				27,575.39
F	Transportation @ 7.5% of C				1,03,407.72
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				38,563.20
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				51,784.61
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				16,41,463.57
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	24	54,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	13.2	85,800.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	2.7	17,550.00

ANNEXURE-11.3					
Part-A :- 33kV Kanpur Feeder Refurbishment with Conductor Augmentation (from existing 100 and 55 sqmm to 232sqmm) from Narsinghpur Grid to Kandhabareni PSS- Total Length 10Ckm					
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	12	44,400.00
K	Total Civil & Services				2,01,750.00
L	Total (J+K)				18,43,213.57
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				1,10,592.81
N	Sub Total (L+M)				19,53,806.38
O	Total GST @ 18% of (N)				3,51,685.15
P	Total CESS @ 1% of (N)				19,538.06
Q	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				23,25,029.59
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002)		12			
MATERIALS FOR 33 KV Cut Point with 180 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	12	3,74,400.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	390.048	29,643.65
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	93.00	63.4368	5,899.62
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	70.20864	5,335.86
5	Danger Plate, 1 no's.	No.	99.20	12	1,190.40
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.6108	335.80
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	36	3,571.20
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	14.4432	1,343.22
9	33KV pin insulator polymer	No.	595.20	36	21,427.20
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	72	44,640.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	72	1,02,672.00
12	Earthing of Support (Coil Type)	EA	205.84	12	2,470.08
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	3.144	292.39
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	72	1,02,672.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	58.548	5,662.76
16	Black Paint	Ltr	272.80	12	3,273.60
17	Yellow Colour Paint for Background	Ltr	272.80	24	6,547.20
A	Total Cost of materials				7,11,376.98
B	Stock, Storage & Insurance i.e 3% of A				21,341.31
C	Sub Total (A+B)				7,32,718.29
D	Contingency @ 3% of C				21,981.55
E	Tools & Plants @ 2% of C				14,654.37
F	Transportation @ 7.5% of C				54,953.87
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				19,281.60
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				34,708.63
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				8,78,298.31
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	6.6	42,900.00

ANNEXURE-11.3					
Part-A :- 33kV Kanpur Feeder Refurbishment with Conductor Augmentation (from existing 100 and 55 sqmm to 232sqmm) from Narsinghpur Grid to Kandhabareni PSS- Total Length 10Ckm					
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.35	8,775.00
K	Total Civil & Services				51,675.00
L	Total (J+K)				9,29,973.31
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				55,798.40
N	Sub Total (L+M)				9,85,771.71
O	Total GST @ 18% of (N)				1,77,438.91
P	Total CESS @ 1% of (N)				9,857.72
Q	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle				11,73,068.33
No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0003)		12			
MATERIALS FOR 33 KV Cut Point with 90 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	12	3,74,400.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	780.096	59,287.30
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	126.8736	11,799.24
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306)	K.g.	76.00	140.4173	10,671.71
5	Danger Plate, 1 no's.	No.	99.20	12	1,190.40
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	3.6108	335.80
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	36	3,571.20
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	14.4432	1,343.22
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	48	28,569.60
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	72	44,640.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	72	1,02,672.00
12	Earthing of Support (Coil Type)	No.	205.84	12	2,470.08
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	3.144	292.39
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	72	1,02,672.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	12	1,860.00
16	H.T. Stay set (Complete)	Set	1,302.00	12	15,624.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	12	744.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	180	16,740.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	135.72	13,126.84
20	Black Paint	Ltr	272.80	12	3,273.60
21	Yellow Colour Paint for Background	Ltr	272.80	24	6,547.20
A	Total Cost of materials				8,01,830.59
B	Stock, Storage & Insurance i.e 3% of A				24,054.92
C	Sub Total (A+B)				8,25,885.50
D	Contingency @ 3% of C				24,776.57
E	Tools & Plants @ 2% of C				16,517.71
F	Transportation @ 7.5% of C				61,941.41
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				19,281.60
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				40,423.65
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				9,88,826.44
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	6.60	42,900.00

ANNEXURE-11.3					
Part-A :- 33kV Kanpur Feeder Refurbishment with Conductor Augmentation (from existing 100 and 55 sqmm to 232sqmm) from Narsinghpur Grid to Kandhabareni PSS- Total Length 10Ckm					
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.35	8,775.00
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	12	27,000.00
K	Total Civil & Services				78,675.00
L	Total (J+K)				10,67,501.44
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				64,050.09
N	Sub Total (L+M)				11,31,551.52
O	Total GST @ 18% of (N)				2,03,679.27
P	Total CESS @ 1% of (N)				11,315.52
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle				13,46,546.31
33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No.- TPCODL-HVD-0001)		10			
MATERIALS FOR 33 KV Pin Points					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	100	31,20,000.00
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	100	1,95,920.00
3	Top bracket 100x50x6mm GI channel (2kg each)	No.	186.00	100	18,600.00
4	Danger Plate, 1 no's.	No.	99.20	100	9,920.00
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	30.09	2,798.37
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	300.00	29,760.00
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	120.36	11,193.48
8	33KV pin insulator polymer	No.	595.20	300	1,78,560.00
9	Earthing of Support (Coil Type)	No.	205.84	100	20,584.00
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	26.20	2,436.60
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	145.00	14,024.40
12	232 sq.mm AAA conductor	K.M.	1,94,060.00	30.90	59,96,454.00
13	Crimping type Midspan Compression Joint for 232 sq.mm AAA conductor	EA	648.42		-
14	Black Paint	Ltr	272.80	100.0	27,280.00
15	Yellow Colour Paint for Background	Ltr	272.80	200.0	54,560.00
A	Total Cost of materials				96,82,090.85
B	Stock, Storage & Insurance i.e 3% of A				2,90,462.73
C	Sub Total (A+B)				99,72,553.58
D	Contingency @ 3% of C				2,99,176.61
E	Tools & Plants @ 2% of C				1,99,451.07
F	Transportation @ 7.5% of C				7,47,941.52
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,60,680.00
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				6,75,895.36
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				1,20,55,698.13
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	55.00	3,57,500.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	11.25	73,125.00

ANNEXURE-11.3

Part-A :- 33kV Kanpur Feeder Refurbishment with Conductor Augmentation (from existing 100 and 55 sqmm to 232sqmm) from Narsinghpur Grid to Kandhabareni PSS- Total Length 10Ckm

3	Dismantalling of 100/80sqmm Conductor	km	9,000.00	12.00	1,08,000.00
4	Dismantalling of 55sqmm Conductor	km	6,300.00	24.00	1,51,200.00
K	Total Civil & Services				6,89,825.00
L	Total (J+K)				1,27,45,523.13
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				7,64,731.39
N	Sub Total (L+M)				1,35,10,254.52
O	Total GST @ 18% of (N)				24,31,845.81
P	Total CESS @ 1% of (N)				1,35,102.55
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				1,60,77,202.88
6% Supervision Charges Summary					
1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				1,10,592.81
2	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)				-
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				55,798.40
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				64,050.09
5	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				7,64,731.39
	Total (6% supervision charges)				9,95,172.69
Gross Total Summary					
1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				23,25,029.59
2	Gross Total Material +Services (N+O) for 33 KV DP With Isolator				-
3	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle				11,73,068.33
4	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle				13,46,546.31
5	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				1,60,77,202.88
Q	Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km.				
R	Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km				
S	Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each				
T	Final decision by electrical Inspector				
U	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)				2,09,21,847.12

ANNEXURE-11.4 (ABSTRACT)			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
	Name of the Division :-	ANGUL	
	Name of the Sub-Division :-	ANGUL	
	Name of the Work :-	33kV Feeder Refurbishment	
	Scope of work:-	Part-A : 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Badakera PSS to Shree Metallik tapping point. Total Length- 7Ckm.	
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Part-A : 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Badakera PSS to Shree Metallik tapping point. Total Length- 7Ckm.	1,58,27,430.31
		Total Amount	1,58,27,430.31
		Total Amount (In Cr)	1.58
Total estimated cost is Rs. 1.58 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-11.4					
Part-A : 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Badakera PSS to Shree Metallik tapping point. Total Length- 7Ckm.					
33kV Line Length with 40 Mtr. Span using 232 SQ.MM. -AAA Conductor					
No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)			7		
MATERIALS FOR 33 KV DP Without Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	14	4,36,800.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	434.98	33,058.48
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	27.7536	2,581.08
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =(5x7.14x1.96)	KG	76.00	489.804	37,225.10
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	432.432	32,864.83
6	Danger Plate, 2 no's.	No.	99.20	14	1,388.80
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	4.2126	391.77
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	14	2,170.00
9	H.T. Stay set (Complete)	Set	1,302.00	14	18,228.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	28	1,736.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	210	19,530.00
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	7	9,114.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	82.6	7,681.80
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	42	4,166.40
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	16.8504	1,567.09
16	33KV pin insulator polymer	No.	595.20	21	12,499.20
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	42	26,040.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	42	59,892.00
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	42	59,892.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	85.827	8,301.19
21	Black Paint	Ltr	272.80	7	1,909.60
22	Yellow Colour Paint for Background	Ltr	272.80	14	3,819.20
A	Total Cost of materials				7,80,856.55
B	Stock, Storage & Insurance i.e 3% of A				23,425.70
C	Sub Total (A+B)				8,04,282.24
D	Contingency @ 3% of C				24,128.47
E	Tools & Plants @ 2% of C				16,085.64
F	Transportation @ 7.5% of C				60,321.17
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				22,495.20
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				30,207.69
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				9,57,520.41
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	14	31,500.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	7.7	50,050.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	1.575	10,237.50

ANNEXURE-11.4					
Part-A : 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Badakera PSS to Shree Metallik tapping point. Total Length- 7Ckm.					
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	7	25,900.00
K	Total Civil & Services				1,17,687.50
L	Total (J+K)				10,75,207.91
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				64,512.47
N	Sub Total (L+M)				11,39,720.39
O	Total GST @ 18% of (N)				2,05,149.67
P	Total CESS @ 1% of (N)				11,397.20
Q	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				13,56,267.26
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002)			7		
MATERIALS FOR 33 KV Cut Point with 180 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	7	2,18,400.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	227.528	17,292.13
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	93.00	37.0048	3,441.45
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	40.95504	3,112.58
5	Danger Plate, 1 no's.	No.	99.20	7	694.40
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	2.1063	195.89
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	21	2,083.20
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	8.4252	783.54
9	33KV pin insulator polymer	No.	595.20	21	12,499.20
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	42	26,040.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	42	59,892.00
12	Earthing of Support (Coil Type)	EA	205.84	7	1,440.88
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.834	170.56
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	42	59,892.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	34.153	3,303.28
16	Black Paint	Ltr	272.80	7	1,909.60
17	Yellow Colour Paint for Background	Ltr	272.80	14	3,819.20
A	Total Cost of materials				4,14,969.91
B	Stock, Storage & Insurance i.e 3% of A				12,449.10
C	Sub Total (A+B)				4,27,419.00
D	Contingency @ 3% of C				12,822.57
E	Tools & Plants @ 2% of C				8,548.38
F	Transportation @ 7.5% of C				32,056.43
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				11,247.60
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				20,246.70
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				5,12,340.68
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	3.85	25,025.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.7875	5,118.75
K	Total Civil & Services				30,143.75
L	Total (J+K)				5,42,484.43

ANNEXURE-11.4					
Part-A : 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Badakera PSS to Shree Metallik tapping point. Total Length- 7Ckm.					
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				32,549.07
N	Sub Total (L+M)				5,75,033.50
O	Total GST @ 18% of (N)				1,03,506.03
P	Total CESS @ 1% of (N)				5,750.33
Q	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle				6,84,289.86
No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0003)			7		
MATERIALS FOR 33 KV Cut Point with 90 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	7	2,18,400.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	455.056	34,584.26
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	74.0096	6,882.89
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306)	K.g.	76.00	81.91008	6,225.17
5	Danger Plate, 1 no's.	No.	99.20	7	694.40
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	2.1063	195.89
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	21	2,083.20
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	8.4252	783.54
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	28	16,665.60
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	42	26,040.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	42	59,892.00
12	Earthing of Support (Coil Type)	No.	205.84	7	1,440.88
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.834	170.56
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	42	59,892.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	7	1,085.00
16	H.T. Stay set (Complete)	Set	1,302.00	7	9,114.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	7	434.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	105	9,765.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	79.17	7,657.32
20	Black Paint	Ltr	272.80	7	1,909.60
21	Yellow Colour Paint for Background	Ltr	272.80	14	3,819.20
A	Total Cost of materials				4,67,734.51
B	Stock, Storage & Insurance i.e 3% of A				14,032.04
C	Sub Total (A+B)				4,81,766.54
D	Contingency @ 3% of C				14,453.00
E	Tools & Plants @ 2% of C				9,635.33
F	Transportation @ 7.5% of C				36,132.49
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				11,247.60
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				23,580.46
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				5,76,815.42
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	3.85	25,025.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.79	5,118.75

ANNEXURE-11.4					
Part-A : 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Badakera PSS to Shree Metallik tapping point. Total Length- 7Ckm.					
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	7	15,750.00
K	Total Civil & Services				45,893.75
L	Total (J+K)				6,22,709.17
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				37,362.55
N	Sub Total (L+M)				6,60,071.72
O	Total GST @ 18% of (N)				1,18,812.91
P	Total CESS @ 1% of (N)				6,600.72
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle				7,85,485.35
33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No.- TPCODL-HVD-0001)			7		
MATERIALS FOR 33 KV Pin Points					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	98	30,57,600.00
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	98	1,92,001.60
3	Top bracket 100x50x6mm GI channel (2kg each)	No.	186.00	98	18,228.00
4	Danger Plate, 1 no's.	No.	99.20	98	9,721.60
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	29.49	2,742.40
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	294.00	29,164.80
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	117.95	10,969.61
8	33KV pin insulator polymer	No.	595.20	294	1,74,988.80
9	Earthing of Support (Coil Type)	No.	205.84	98	20,172.32
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	25.68	2,387.87
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	142.10	13,743.91
12	232 sq.mm AAA conductor	K.M.	1,94,060.00	21.63	41,97,517.80
13	Crimping type Midspan Compression Joint for 232 sq.mm AAA conductor	EA	648.42		-
14	Black Paint	Ltr	272.80	98.0	26,734.40
15	Yellow Colour Paint for Background	Ltr	272.80	196.0	53,468.80
A	Total Cost of materials				78,09,441.91
B	Stock, Storage & Insurance i.e 3% of A				2,34,283.26
C	Sub Total (A+B)				80,43,725.17
D	Contingency @ 3% of C				2,41,311.76
E	Tools & Plants @ 2% of C				1,60,874.50
F	Transportation @ 7.5% of C				6,03,279.39
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,57,466.40
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				4,89,439.72
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				96,96,096.93
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	53.90	3,50,350.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	11.03	71,662.50
3	Dismantalling of 100/80sqmm Conductor	km	9,000.00	21.00	1,89,000.00
K	Total Civil & Services				6,11,012.50
L	Total (J+K)				1,03,07,109.43
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				6,18,426.57
N	Sub Total (L+M)				1,09,25,536.00

ANNEXURE-11.4				
Part-A : 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Badakera PSS to Shree Metallik tapping point. Total Length- 7Ckm.				
O	Total GST @ 18% of (N)			19,66,596.48
P	Total CESS @ 1% of (N)			1,09,255.36
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points			1,30,01,387.84
6% Supervision Charges Summary				
1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)			64,512.47
2	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)			-
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)			32,549.07
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)			37,362.55
5	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)			6,18,426.57
	Total (6% supervision charges)			7,52,850.66
Gross Total Summary				
1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator			13,56,267.26
2	Gross Total Material +Services (N+O) for 33 KV DP With Isolator			
3	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle			6,84,289.86
4	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle			7,85,485.35
5	Gross Total Material +Services (N+O+P) for 33 KV Pin Points			1,30,01,387.84
Q	Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km.			
R	Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km			
S	Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each			
T	Final decision by electrical Inspector			
U	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)			1,58,27,430.31

ANNEXURE-11.5 (ABSTRACT)			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
	Name of the Division :-	ANGUL	
	Name of the Sub-Division :-	ANGUL	
	Name of the Work :-	33kV Feeder Refurbishment	
	Scope of work:-	Part-A : 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Bhata ABS to Tarini Nursery- Total Length 4.5Ckm	
	Names of Schemes: -	TPCODL CAPEX(FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Part-A : 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Bhata ABS to Tarini Nursery- Total Length 4.5Ckm	99,72,916.45
		Total Amount	99,72,916.45
		Total Amount (In Cr)	1.00
Total estimated cost is Rs. 1.00 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-11.5					
Part-A : 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Bhata ABS to Tarini Nursery- Total Length 4.5Ckm					
No. of 33 KV DP required Without Isolator (Ref. Drawing No.- TPCODL-HVD-0004)			4		
MATERIALS FOR 33 KV DP Without Isolator					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	8	2,49,600.00
2	Top Channel 100X50X6mm, 9.56 KG/Mtr., each channel length 3.25 mtr., 2 no's channel required =(2x9.56x3.25)	KG	76.00	248.56	18,890.56
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 6 no's required = (6x2.36x0.280)	KG	93.00	15.8592	1,474.91
4	Double Pole Belting Channel 75X40X 4.8mm., 7.14KG/Mtr., each channel length 1.96 Mtr., 5 no's channel required =(5x7.14x1.96)	KG	76.00	279.888	21,271.49
5	50x50x6mm.GI Bracing Angle, 4.5Kg./mtr., each angle length 3.432 mtr., 4 nos angle required = (4*4.5*3.432)	KG	76.00	247.104	18,779.90
6	Danger Plate, 2 no's.	No.	99.20	8	793.60
7	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 2 no's = (2x0.59x0.510)	KG	93.00	2.4072	223.87
8	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	8	1,240.00
9	H.T. Stay set (Complete)	Set	1,302.00	8	10,416.00
10	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	16	992.00
11	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	120	11,160.00
12	Gi Pipe Earthing 40mm. 3 Mtr. Long	No.	1,302.00	4	5,208.00
13	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5 mtr. For mesh formation and 2.5 mtr. For raising)= 5x2.36	KG	93.00	47.2	4,389.60
14	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	24	2,380.80
15	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 8 no's = (8x0.59x0.510)	KG	93.00	9.6288	895.48
16	33KV pin insulator polymer	No.	595.20	12	7,142.40
17	H W fitting(B&S) 90KN,4 Bolt	No.	620.00	24	14,880.00
18	Disc insulator (B&S) 90 KN polymer	No.	1,426.00	24	34,224.00
19	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00
20	GI Nut , Bolt & Washer of different sizes (12.261 Kg each DP without Isolator)	K.g.	96.72	49.044	4,743.54
21	Black Paint	Ltr	272.80	4	1,091.20
22	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40
A	Total Cost of materials				4,46,203.74
B	Stock, Storage & Insurance i.e 3% of A				13,386.11
C	Sub Total (A+B)				4,59,589.85
D	Contingency @ 3% of C				13,787.70
E	Tools & Plants @ 2% of C				9,191.80
F	Transportation @ 7.5% of C				34,469.24
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				12,854.40
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/GI Pipe/PSC pole)				17,261.54
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				5,47,154.52
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvaton, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	8	18,000.00
2	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	4.4	28,600.00
3	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.9	5,850.00
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation , soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe .	No.	3,700.00	4	14,800.00
K	Total Civil & Services				67,250.00

ANNEXURE-11.5					
Part-A : 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Bhata ABS to Tarini Nursery- Total Length 4.5Ckm					
L	Total (J+K)				6,14,404.52
M	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)				36,864.27
N	Sub Total (L+M)				6,51,268.79
O	Total GST @ 18% of (N)				1,17,228.38
P	Total CESS @ 1% of (N)				6,512.69
Q	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator				7,75,009.86
No. of 33 KV Cut Point with 180 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0002)			4		
MATERIALS FOR 33 KV Cut Point with 180 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	4	1,24,800.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 2 No's of Channel = (2x 9.56x1.7)	K.g.	76.00	130.016	9,881.22
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 8 no's required = (8x2.36x0.280)	K.g.	93.00	21.1456	1,966.54
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 2 No's of Channel = (2x 9.56x0.306)	K.g.	76.00	23.40288	1,778.62
5	Danger Plate, 1 no's.	No.	99.20	4	396.80
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.2036	111.93
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	12	1,190.40
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	4.8144	447.74
9	33KV pin insulator polymer	No.	595.20	12	7,142.40
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	24	14,880.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	24	34,224.00
12	Earthing of Support (Coil Type)	EA	205.84	4	823.36
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.048	97.46
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00
15	GI Nut , Bolt & Washer of different sizes (4.879 Kg each 180 deg. Cut point)	K.g.	96.72	19.516	1,887.59
16	Black Paint	Ltr	272.80	4	1,091.20
17	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40
A	Total Cost of materials				2,37,125.66
B	Stock, Storage & Insurance i.e 3% of A				7,113.77
C	Sub Total (A+B)				2,44,239.43
D	Contingency @ 3% of C				7,327.18
E	Tools & Plants @ 2% of C				4,884.79
F	Transportation @ 7.5% of C				18,317.96
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				6,427.20
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				11,569.54
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				2,92,766.10
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.2	14,300.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
K	Total Civil & Services				17,225.00
L	Total (J+K)				3,09,991.10
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)				18,599.47
N	Sub Total (L+M)				3,28,590.57
O	Total GST @ 18% of (N)				59,146.30
P	Total CESS @ 1% of (N)				3,285.91

ANNEXURE-11.5					
Part-A : 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Bhata ABS to Tarini Nursery- Total Length 4.5Ckm					
Q	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle				3,91,022.78
No. of 33 KV Cut Point with 90 Degree Angle (Ref. Drawing No.- TPCODL-HVD-0003)			4		
MATERIALS FOR 33 KV Cut Point with 90 Degree Angle					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	4	1,24,800.00
2	Straight Cross Arm Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 1.7 Mtr., 4 No's of Channel = (4x 9.56x1.7)	K.g.	76.00	260.032	19,762.43
3	Fish Plate 50x6 mm., 2.36 kg/Mtr., each 0.280 mtr. length, 16 no's required = (16x2.36x0.280)	K.g.	93.00	42.2912	3,933.08
4	Straight Cross Arm Top Channel 100 x 50 x 6 mm, 9.56 KG/mtr, each channel length 0.306 Mtr., 4 No's of Channel = (4x 9.56x0.306)	K.g.	76.00	46.80576	3,557.24
5	Danger Plate, 1 no's.	No.	99.20	4	396.80
6	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	1.2036	111.93
7	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	12	1,190.40
8	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	4.8144	447.74
9	33KV pin insulator polymer (4 No's each 90 Deg. Cut point)	No.	595.20	16	9,523.20
10	H W fitting(B&S)90KN,4 Bolt	No.	620.00	24	14,880.00
11	Disc insulator (B&S)90 KN polymer	No.	1,426.00	24	34,224.00
12	Earthing of Support (Coil Type)	No.	205.84	4	823.36
13	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	1.048	97.46
14	PG Clamp for 232 sq.mm AAA conductor	NO.	1,426.00	24	34,224.00
15	H.T. Stay clamp, 50x8 mm. flat, 3.14Kg/Mtr., 0.511 Mtr. Length, 2 no's qty. required (1 Pair)	Pair	155.00	4	620.00
16	H.T. Stay set (Complete)	Set	1,302.00	4	5,208.00
17	H.T. Stay Insulator Type-C (2 No's.)	No.	62.00	4	248.00
18	7/8 SWG Stay Wire 15kg /stay	K.g.	93.00	60	5,580.00
19	GI Nut , Bolt & Washer of different sizes (11.31 Kg each 90 deg. Cut point)	K.g.	96.72	45.24	4,375.61
20	Black Paint	Ltr	272.80	4	1,091.20
21	Yellow Colour Paint for Background	Ltr	272.80	8	2,182.40
A	Total Cost of materials				2,67,276.86
B	Stock, Storage & Insurance i.e 3% of A				8,018.31
C	Sub Total (A+B)				2,75,295.17
D	Contingency @ 3% of C				8,258.86
E	Tools & Plants @ 2% of C				5,505.90
F	Transportation @ 7.5% of C				20,647.14
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				6,427.20
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				13,474.55
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				3,29,608.81
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	2.20	14,300.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	0.45	2,925.00
3	Fixing of 33KV line Complete stay set includes 1) Turn Buckle Assembly 2) Stay Rod & Stay plate 3) Stay Insulator 4) Stay Wire. 5)Stay clamps with Nuts & bolts, including excvation, supply of 0.5Cum cement concrete foundation 1:2:4 size (500mmx500mmx800mm) using 20mm BHG metal with all labour and material (Excavation of earth will be done of size 500X500X1500 mm.)	No.	2,250.00	4	9,000.00
K	Total Civil & Services				26,225.00

ANNEXURE-11.5					
Part-A : 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Bhata ABS to Tarini Nursery- Total Length 4.5Ckm					
L	Total (J+K)				3,55,833.81
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)				21,350.03
N	Sub Total (L+M)				3,77,183.84
O	Total GST @ 18% of (N)				67,893.09
P	Total CESS @ 1% of (N)				3,771.84
Q	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle				4,48,848.77
33 Kv Line Length In KM with 40 Mtr. Span Ref. Drawing No.- TPCODL-HVD-0001)			4.5		
MATERIALS FOR 33 KV Pin Points					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	WPB 160x152 (13Mtr. Long, 30.44KG/Mtr.)	No	31,200.00	63	19,65,600.00
2	33 KV V cross Arm (GI) 22Kg each	No.	1,959.20	63	1,23,429.60
3	Top bracket 100x50x6mm GI channel (2kg each)	No.	186.00	63	11,718.00
4	Danger Plate, 1 no's.	No.	99.20	63	6,249.60
5	Back Clamp for danger Plate 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 1 no's = (1x0.59x0.510)	KG	93.00	18.96	1,762.97
6	GI barbed wire anticlimbing device 3 Kg. Per support	Kg	99.20	189.00	18,748.80
7	Back Clamp for anticlimbing device 25X3 mm. flat, 0.59Kg/Mtr. Flat of 0.510mtr length 4 no's = (4x0.59x0.510)	KG	93.00	75.83	7,051.89
8	33KV pin insulator polymer	No.	595.20	189	1,12,492.80
9	Earthing of Support (Coil Type)	No.	205.84	63	12,967.92
10	No-8 GI wire (Dia 4.6mm) 0.131 KG/ Mtr.- 2 Mtr. For connecting pole with Coil earthing	K.g.	93.00	16.51	1,535.06
11	GI Nut , Bolt & Washer of different sizes (1.45 Kg/ Pin Point)	K.g.	96.72	91.35	8,835.37
12	232 sq.mm AAA conductor	K.M.	1,94,060.00	13.91	26,98,404.30
13	Crimping type Midspan Compression Joint for 232 sq.mm AAA conductor	EA	648.42		-
14	Black Paint	Ltr	272.80	63.0	17,186.40
15	Yellow Colour Paint for Background	Ltr	272.80	126.0	34,372.80
A	Total Cost of materials				50,20,355.52
B	Stock, Storage & Insurance i.e 3% of A				1,50,610.67
C	Sub Total (A+B)				51,70,966.18
D	Contingency @ 3% of C				1,55,128.99
E	Tools & Plants @ 2% of C				1,03,419.32
F	Transportation @ 7.5% of C				3,87,822.46
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				1,01,228.40
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC pole)				3,14,639.82
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				62,33,205.17
Civil & Services					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Concreting ratio 1:1.5:3 (500mmX500mmX2200mm) = 0.55Cu.mtr	Cu.mtr	6,500.00	34.65	2,25,225.00
2	Couping ratio 1:1.5:3 with dimension (500X500X450)= 0.1125 Cu mtr	Cu.mtr	6,500.00	7.09	46,068.75
3	Dismantalling of 100/80sqmm Conductor	km	9,000.00	13.50	1,21,500.00
K	Total Civil & Services				3,92,793.75
L	Total (J+K)				66,25,998.92
M	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)				3,97,559.94
N	Sub Total (L+M)				70,23,558.86
O	Total GST @ 18% of (N)				12,64,240.59
P	Total CESS @ 1% of (N)				70,235.59
Q	Gross Total Material +Services (N+O+P) for 33 KV Pin Points				83,58,035.04

ANNEXURE-11.5		
Part-A : 33kV Angul-2 Feeder Refurbishment with Conductor Augmentation (from existing 80sqmm to 232sqmm) from Bhata ABS to Tarini Nursery- Total Length 4.5Ckm		
<u>6% Supervision Charges Summary</u>		
1	Other overheads (Including 6% supervision charges) of L (for 33 KV DP Without Isolator)	36,864.27
2	Other overheads (Including 6% supervision charges) of L (for 33 KV DP With Isolator)	-
3	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 180 Degree Angle)	18,599.47
4	Other overheads (Including 6% supervision charges) of L (for 33 KV Cut Point with 90 Degree Angle)	21,350.03
5	Other overheads (Including 6% supervision charges) of L (for 33 KV Pin Points)	3,97,559.94
	Total (6% supervision charges)	4,74,373.70
<u>Gross Total Summary</u>		
1	Gross Total Material +Services (N+O+P) for 33 KV DP Without Isolator	7,75,009.86
2	Gross Total Material +Services (N+O) for 33 KV DP With Isolator	-
3	Gross Total Material +Services (N+O) for 33 KV Cut Point with 180 Degree Angle	3,91,022.78
4	Gross Total Material +Services (N+O+P) for 33 KV Cut Point with 90 Degree Angle	4,48,848.77
5	Gross Total Material +Services (N+O+P) for 33 KV Pin Points	83,58,035.04
Q	Inspection Fee of Over Head Line (HT) - Rs. 1500/- upto 1km.	
R	Inspection Fee of Over Head Line (HT) - Rs. 750/- Additional Km	
S	Inspection Fee of Drawing Checking and Approval (For each drawing of the installation)- Rs. 750/- each	
T	Final decision by electrical Inspector	
U	Gross Total Material, Services and Inspection Fees (P+Q+R+S+T)	99,72,916.45

Annexure-12 Earthing			
Sl. No.	DESCRIPTION OF WORK	Quantity (in nos.)	Amount (in cr.)
1	Earthing	990	1.00

Standard Estimate & BoQ for Earthing					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS					
1	40 mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr .Long	No	1,302.00	1	1,302.00
2	50x6mm GI Flat for earthing	KG	100.00	22.12	2,212.00
A	Total Cost of materials				3,514.00
B	Stock, Storage & Insurance i.e 3% of A				105.42
C	Sub Total (A+B)				3,619.42
D	Contingency @ 3% of C				108.58
E	Tools & Plants @ 2% of C				72.39
F	Transportation @ 7.5% of C				271.46
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				-
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)				227.84
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				4,299.68
Civil and Services Works (As per Technical Specification)					
1	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation ,soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No.	3,700.00	1	3,700.00
K	Total Civil & Services				3,700.00
L	Total (J+K)				7,999.68
M	Other overheads (Including 6% supervision charges) of L				479.98
N	Sub Total (L+M)				8,479.66
O	Total GST @ 18% of (N)				1,526.34
P	Total CESS @ 1% of (N)				84.80
Q	Gross Total Material +Services (N+O+P)				10,090.80

ANNEXURE-13**PTR Augmentation**

Overloading of PTR is an alarming issue and need immediate attention for implementing mitigation proposals. PTR overloading issue can be mitigated by replacement of existing PTR with higher rating of PTR.

Since the priority of PTR overloading is very high we have prioritized & considered wherein PTR loading is greater than 75% in 2years timeline.

Approx. costing is given below:

Summary of Proposal Details for PTR Augmentation:

Sl. No.	Name of Circle	Name of Division	Name of 33/11kV PSS	PTR No.	Proposal Details	Amount (in cr.)	Annexure
1	BBSR-1	BCDD-2	INFOCITY	PTR-2	Augmentation of 01no. Power Transformer (PTR-2) from 7.5MVA to 16MVA at Infocity 33/11kV PSS with other civil works.	2.73	Annexure-13.1
2	BBSR-1	BED	NAHARKANTA	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Naharkanta 33/11kV PSS with other civil works.	2.73	Annexure-13.3
3	BBSR-1	BCDD-2	SAINIK SCHOOL	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Sainik School 33/11kV PSS with other civil works.	2.73	Annexure-13.3
4	BBSR-1	BED	MULAPADIA	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mulapadia 33/11kV PSS with other civil works.	2.73	Annexure-13.4
5	BBSR-1	BCDD-2	KALINGA NAGAR	PTR-3	Augmentation of 01no. Power Transformer (PTR-3) from 8MVA to 16MVA at Kalinga Nagar 33/11kV PSS with other civil works.	2.73	Annexure-13.5
6	BBSR-2	PED	KACHERI	PTR-1 & PTR-2	Augmentation of 02nos. Power Transformers (PTR-1 & PTR-2) from 8MVA to 16MVA each at Kacheri 33/11kV PSS with other civil works.	5.47	Annexure-13.6
7	BBSR-2	PED	BALIAPANDA	PTR-2	Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Baliapanda 33/11kV PSS with other civil works.	2.73	Annexure-13.7

Sl. No.	Name of Circle	Name of Division	Name of 33/11kV PSS	PTR No.	Proposal Details	Amount (in cr.)	Annexure
8	CUTTACK	CDD-2	MAHANADI VIHAR	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mahanadi Vihar 33/11kV PSS with other civil works.	2.73	Annexure-13.8
9	CUTTACK	CDD-1	SECTOR-6 (CDA)	PTR-2	Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Sector-6 (CDA) 33/11kV PSS with other civil works.	2.73	Annexure-13.9
10	DHENKANAL	ANED	HEMSURPADA	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Hemsurpada 33/11kV PSS with other civil works.	2.73	Annexure-13.10
TOTAL						30.06	

1.0 Augmentation of Power Transformer at INFOCITY Substation

Proposal:

Augmentation of existing 1no. 33/11kV, 7.5MVA Power Transformer (PTR-2) to 16MVA at Infocity 33/11kV Substation in BCDD-2 division of BBSR-1 circle to mitigate overloading condition.

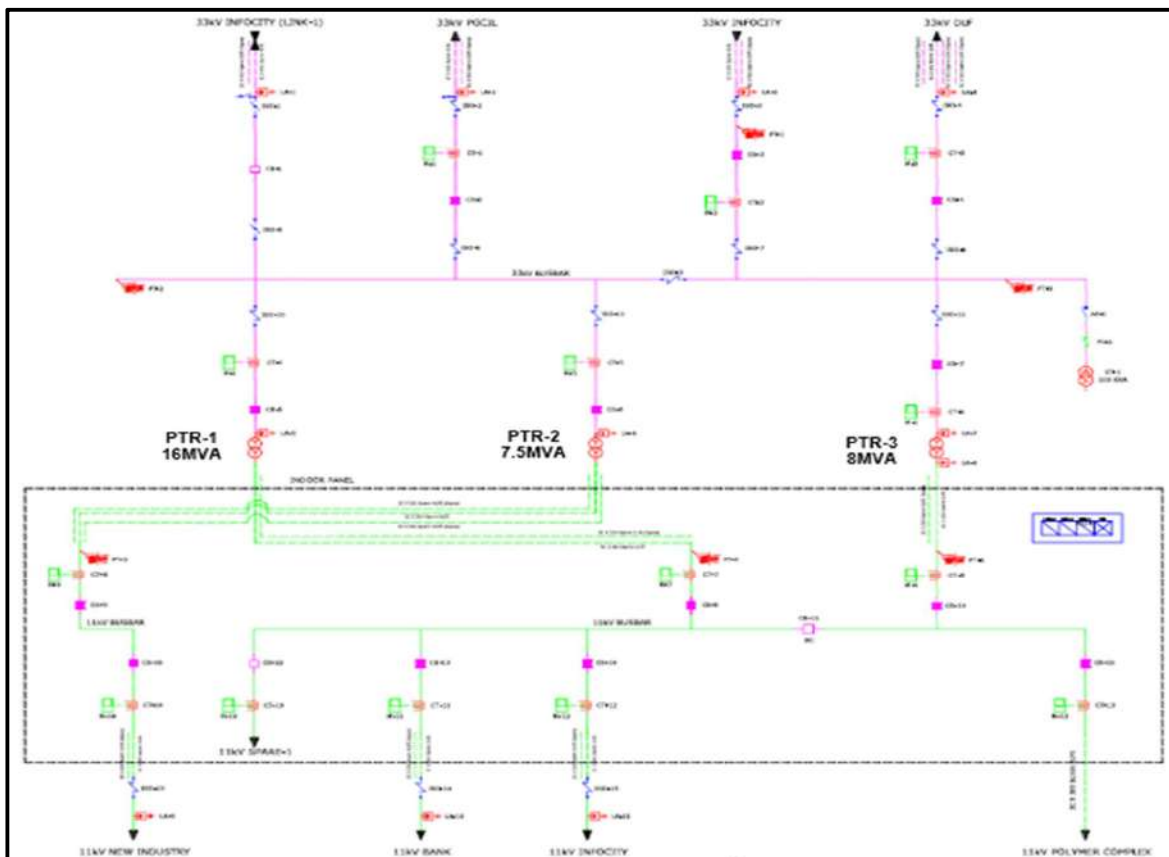
Existing Scenario:

- Loading of 33/11kV Infocity PTR-1, 2 and 3 are 2.74MVA, 5.33MVA and 3.21MVA respectively at peak load condition of Summer'22. Considering load growth for 2years (10% load growth per year for 2years), the projected loading of Summer'24 for PTR-1, 2 and 3 would be 3.22MVA, 6.44MVA and 3.89MVA respectively.
- PTR-2 will be loaded up to 86%, w.r.t, the existing transformer capacity of 7.5MVA in Summer'24 which is greater than the permissible limit of 75% loading resulting in overloading of the PTR.

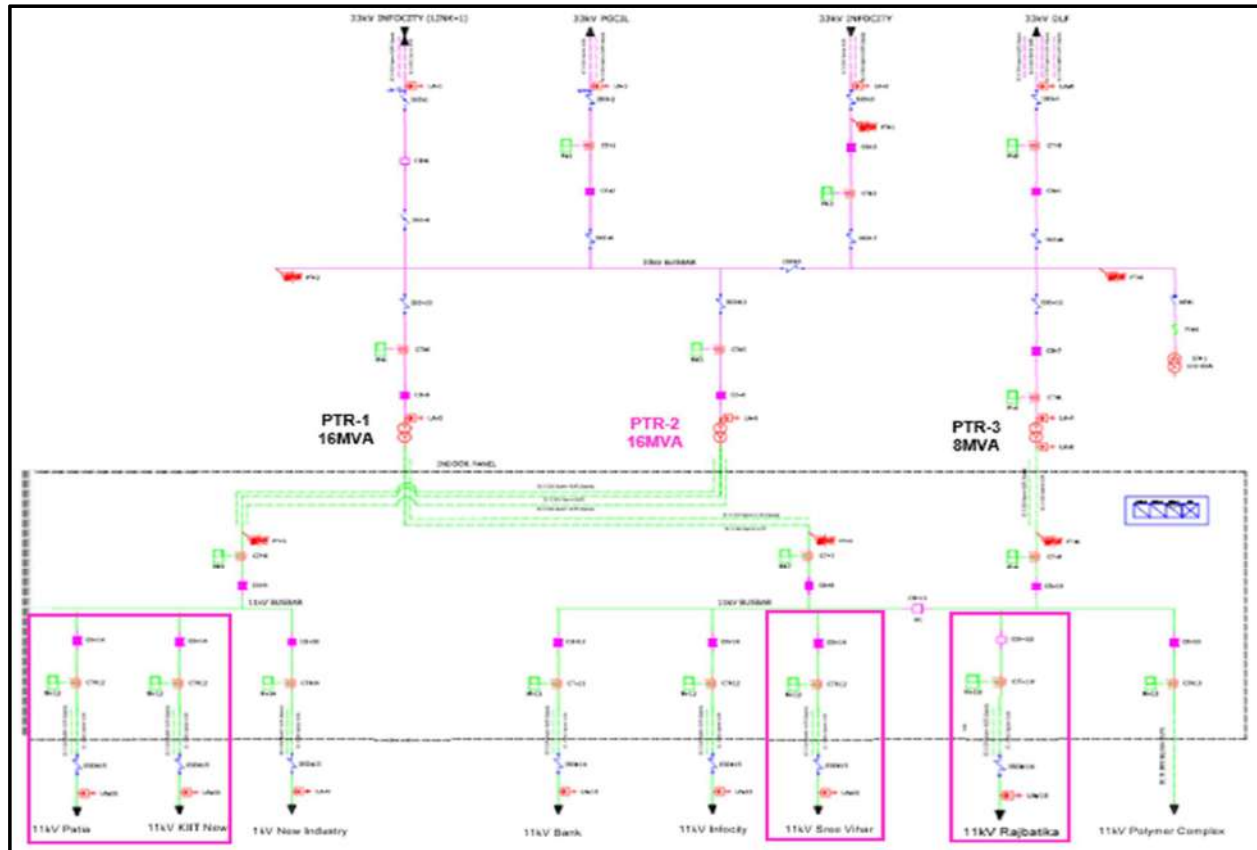
Existing Summer'22 Loading and projected load at Infocity PTRs:

Sl. No.	Name of 33/11kV PSS	PTR No.	PTR Rating AS IS (in MVA)	AS IS			Projected Load (2yrs. Load Growth)		
				Peak Load (in MVA)	% Loading (As-Is)	%Loading Range	Peak Load (in MVA)	% Loading (As-Is)	%Loading Range
1	INFOCITY	PTR-1	16	2.74	17%	0-50%	3.32	21%	0-50%
2	INFOCITY	PTR-2	7.5	5.33	71%	50%-75%	6.44	86%	75%-90%
3	INFOCITY	PTR-3	8	3.21	40%	0-50%	3.89	49%	0-50%

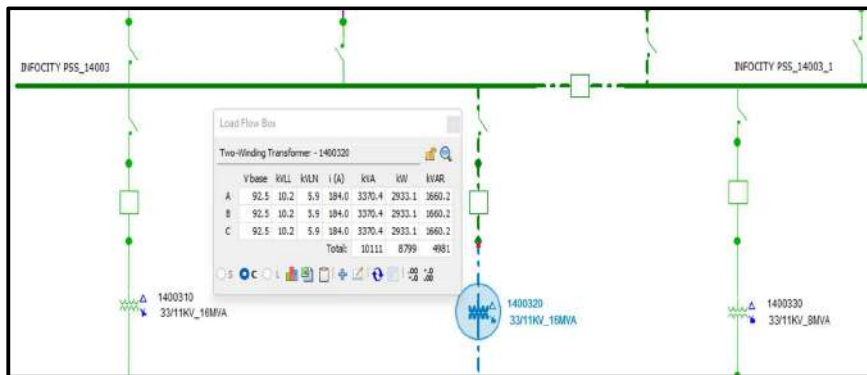
Existing SLD of INFOCITY 33/11kV PSS:



Proposed SLD of INFOCITY 33/11kV PSS:



Load Flow Study of proposed scenario in Cyme Software:



BoQ for PTR Augmentation (PTR-2):

Name of the Division :-	BCDD-2
Name of the Sub-Division :-	Periphery
Name of the Work :-	Mitigation of 33/11kV PTR Overloading
Scope:-	Augmentation of 1no. Power Transformer (PTR-2) from 7.5MVA to 16MVA at Infocity 33/11kV PSS with other civil works.
Names of Schemes: -	TPCODL CAPEX (FY 23-24)
<u>ABSTRACT OF ESTIMATE</u>	

Sl. No.	Part	Description	Amount
1	A	Augmentation of 01no. Power Transformer (PTR-2) from 7.5MVA to 16MVA at Infocity 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 2.73cr. (For detailed BoQ refer Annexure-13.1).

Benefits:

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To ensure reliable power supply to the consumers.

2.0 Augmentation of Power Transformer at NAHARKANTA Substation

Proposal:

Augmentation of existing 1no. 33/11kV 8MVA Power Transformer (PTR-1) to 16MVA at Naharkanta 33/11kV Substation in BED division of BBSR-1 circle to mitigate overloading condition.

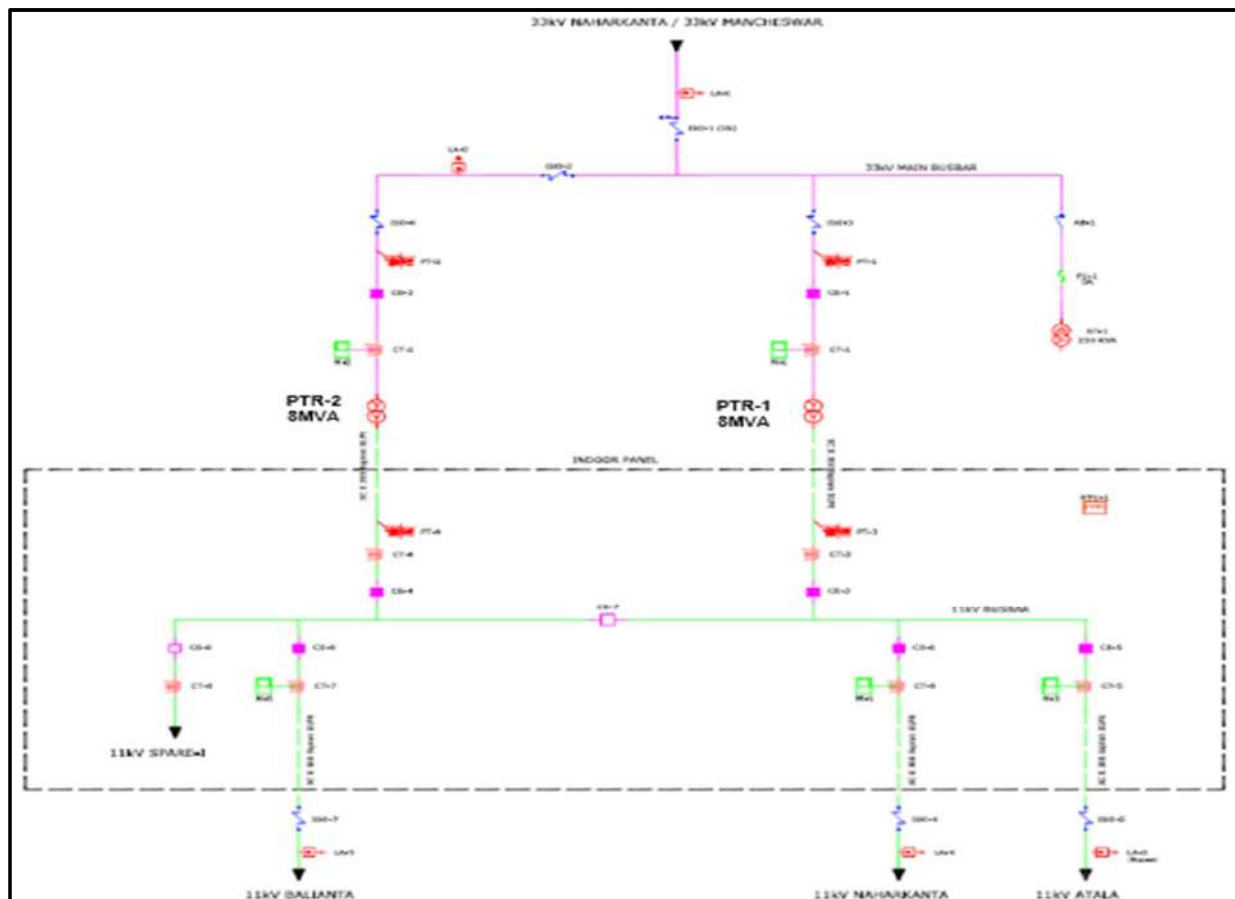
Existing Scenario:

- Loading of 33/11kV Naharkanta PTR-1 and 2 are 6.57MVA and 3.94MVA respectively at peak load condition of Summer'22. Considering load growth for 2years (10% load growth per year for 2years), the projected loading of Summer'24 for PTR-1 and 2 would be 7.95MVA and 4.77MVA respectively.
- PTR-1 will be loaded up to 99%, w.r.t, the existing transformer capacity of 8MVA in Summer'24 which is greater than the permissible limit of 75% loading resulting in overloading of the PTR.

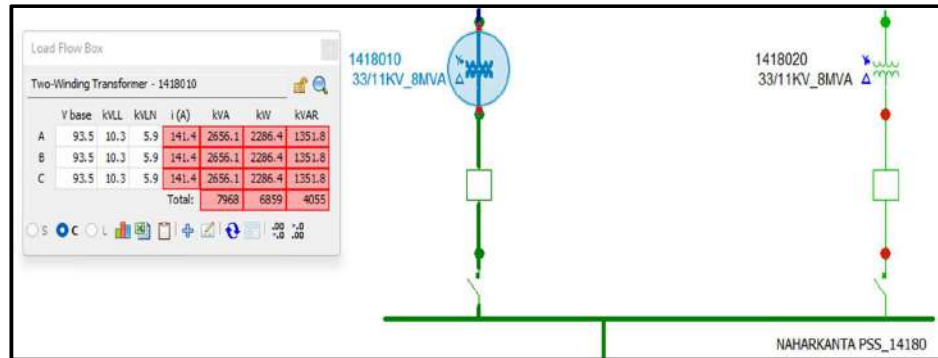
Existing Summer'22 Loading and projected load at Naharkanta PTRs:

Sl. No.	Name of 33/11kV PSS	PTR No.	PTR Rating AS IS (in MVA)	AS IS			Projected Load (2yrs. Load Growth)		
				Peak Load (in MVA)	% Loading (As-Is)	% Loading (As-Is)	% Loading (As-Is)	% Loading (After 2Yrs. LG)	%Loading Range after 2yrs. LG
1	NAHARKANTA	PTR-1	8	6.57	82%	75%-90%	7.95	99%	90%-100%
2	NAHARKANTA	PTR-2	8	3.94	49%	0-50%	4.77	60%	50%-75%

Existing SLD of NAHARKANTA 33/11kV PSS:



Load Flow Study of proposed scenario in Cyme Software:

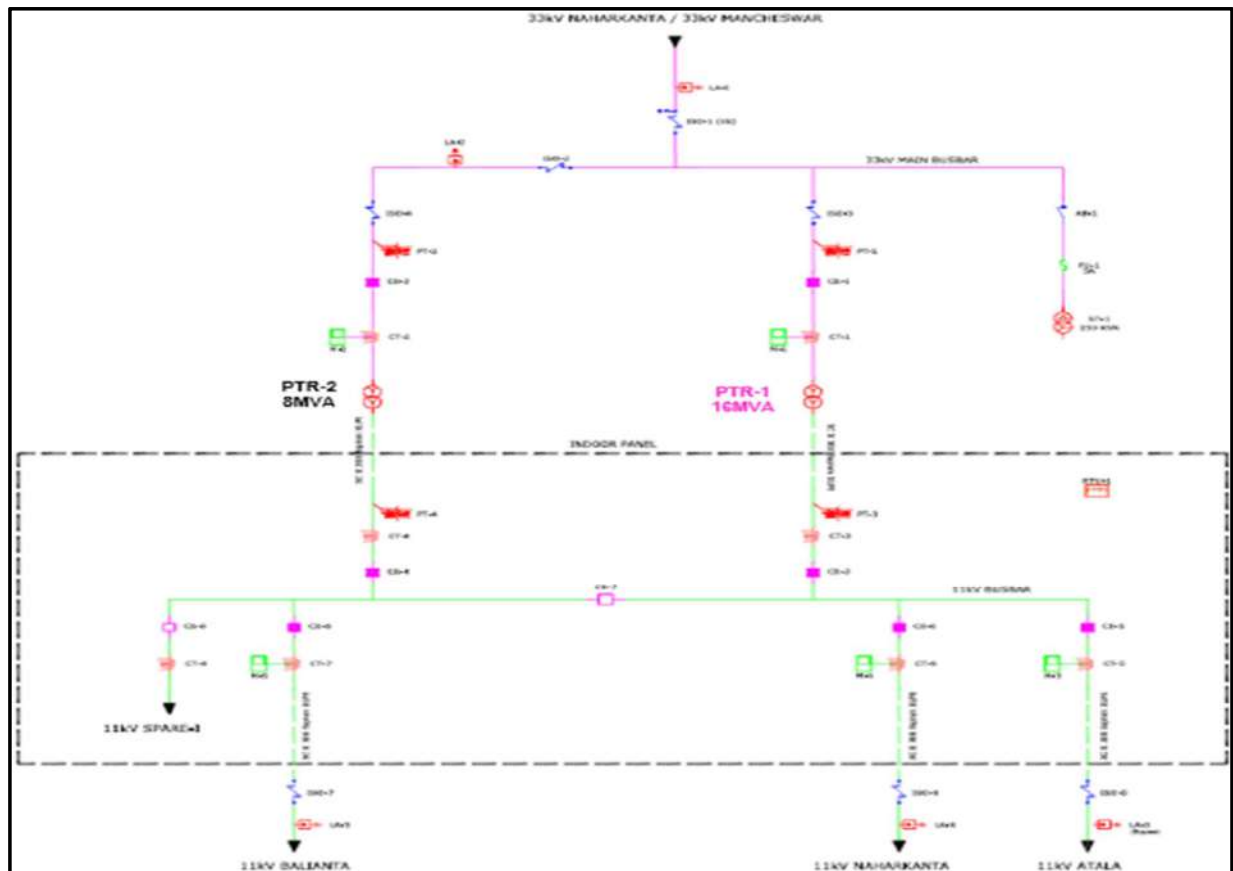


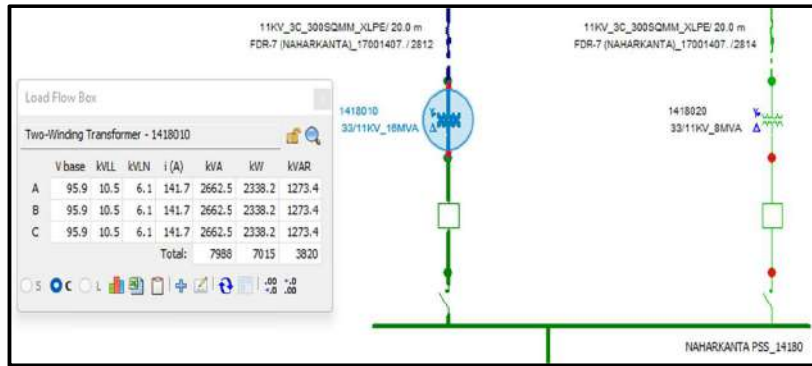
Proposed Scenario:

- Augmentation of PTR-1 from 8 MVA to 16MVA at Naharkanta PSS is proposed to meet the full load of Naharkanta PSS along with PTR-2 at peak load condition after 2years load growth.

Sl. No.	Name of 33/11kV PSS	PTR No.	PTR Rating (in MVA)	Projected Load (2yrs. Load Growth) (after implementation of Proposal) (in MVA)	% Loading (After 2Yrs.)	%Loading Range
1	NAHARKANTA	PTR-1	16	7.95	50%	0-50%
2	NAHARKANTA	PTR-2	8	4.77	60%	50%-75%

Proposed SLD of NAHARKANTA 33/11kV PSS:



Load Flow Study of proposed scenario in Cyme Software:**BoQ for PTR Augmentation (PTR-1):**

Name of the Division :-	BED		
Name of the Sub-Division :-	Rasulgarh		
Name of the Work :-	Mitigation of 33/11kV PTR Overloading		
Scope:-	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Naharkanta 33/11kV PSS with other civil works.		
Names of Schemes: -	TPCODL CAPEX (FY 23-24)		
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Naharkanta 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 2.73cr. (For detailed BoQ refer Annexure-13.2).

Benefits:

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To ensure reliable power supply to the consumers.

3.0 Augmentation of Power Transformer at SAINIK SCHOOL Substation

Proposal:

Augmentation of existing 1no. 33/11kV, 8MVA Power Transformer (PTR-1) to 16MVA at Sainik School 33/11kV Substation in BCDD-2 division of BBSR-1 circle to mitigate overloading condition.

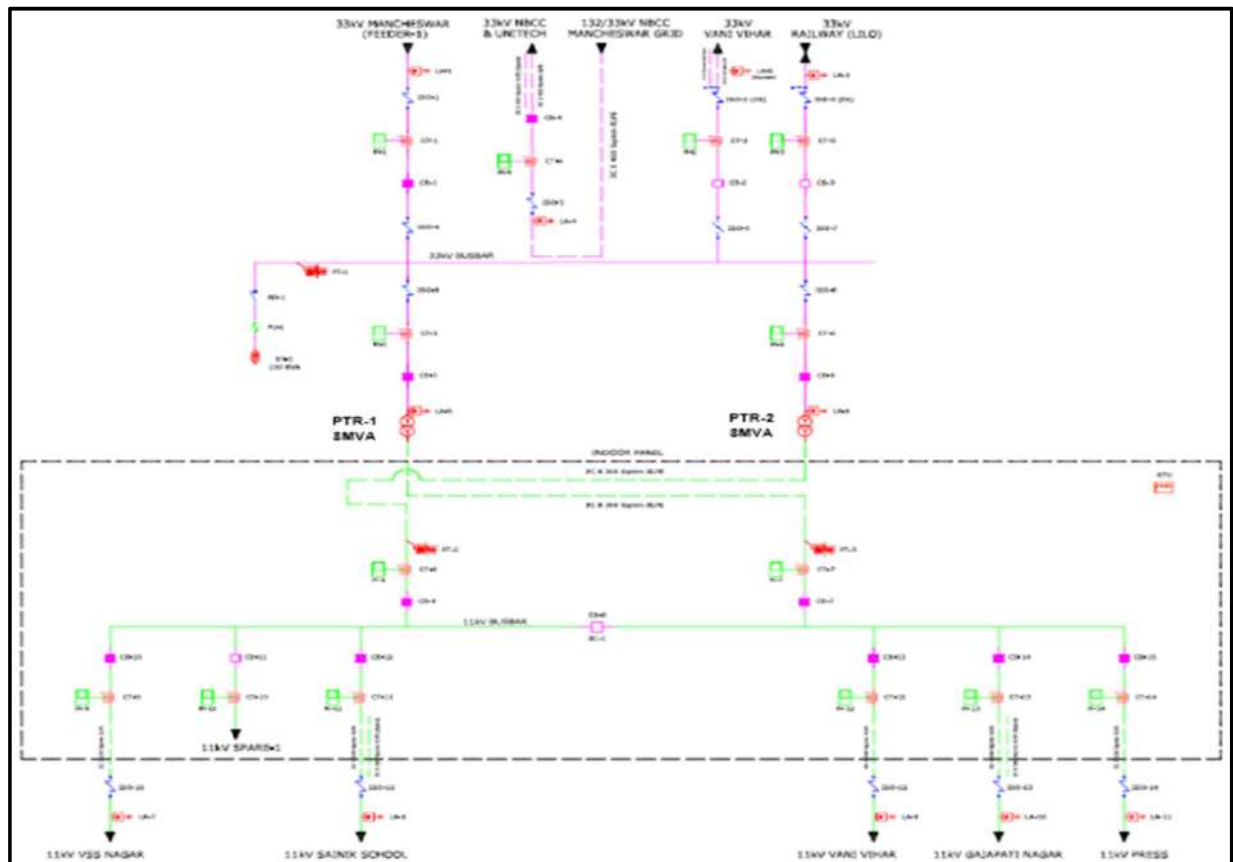
Existing Scenario:

- Loading of 33/11kV Sainik School PTR-1 and 2 are 5.87MVA and 4.29MVA respectively at peak load condition of Summer'22. Considering load growth for 2years (10% load growth per year for 2years), the projected loading of Summer'24 for PTR-1 and 2 would be 7.11MVA and 5.19MVA.
- PTR-1 will be loaded up to 89%, w.r.t, the existing transformer capacity of 8MVA in Summer'24 which is greater than the permissible limit of 75% loading resulting in overloading of the PTR.

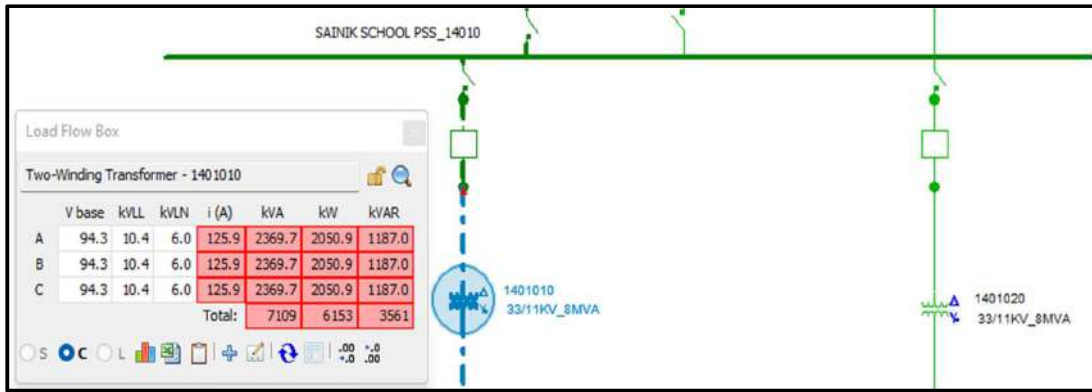
Existing Summer'22 Loading and projected load at Naharkanta PTRs:

Sl. No.	Name of 33/11kV PSS	PTR No.	PTR Rating AS IS (in MVA)	AS IS			Projected Load (2yrs. Load Growth)		
				Peak Load (in MVA)	% Loading (As-Is)	% Loading (As-Is)	% Loading (As-Is)	% Loading (After 2Yrs. LG)	%Loading Range after 2yrs. LG
1	Sainik School	PTR-1	8	5.87	73%	50%-75%	7.11	89%	75%-90%
2	Sainik School	PTR-2	8	4.29	54%	50%-75%	5.19	65%	50%-75%

Existing SLD of SAINIK SCHOOL 33/11kV PSS:



Load Flow Study of existing scenario in Cyme Software:

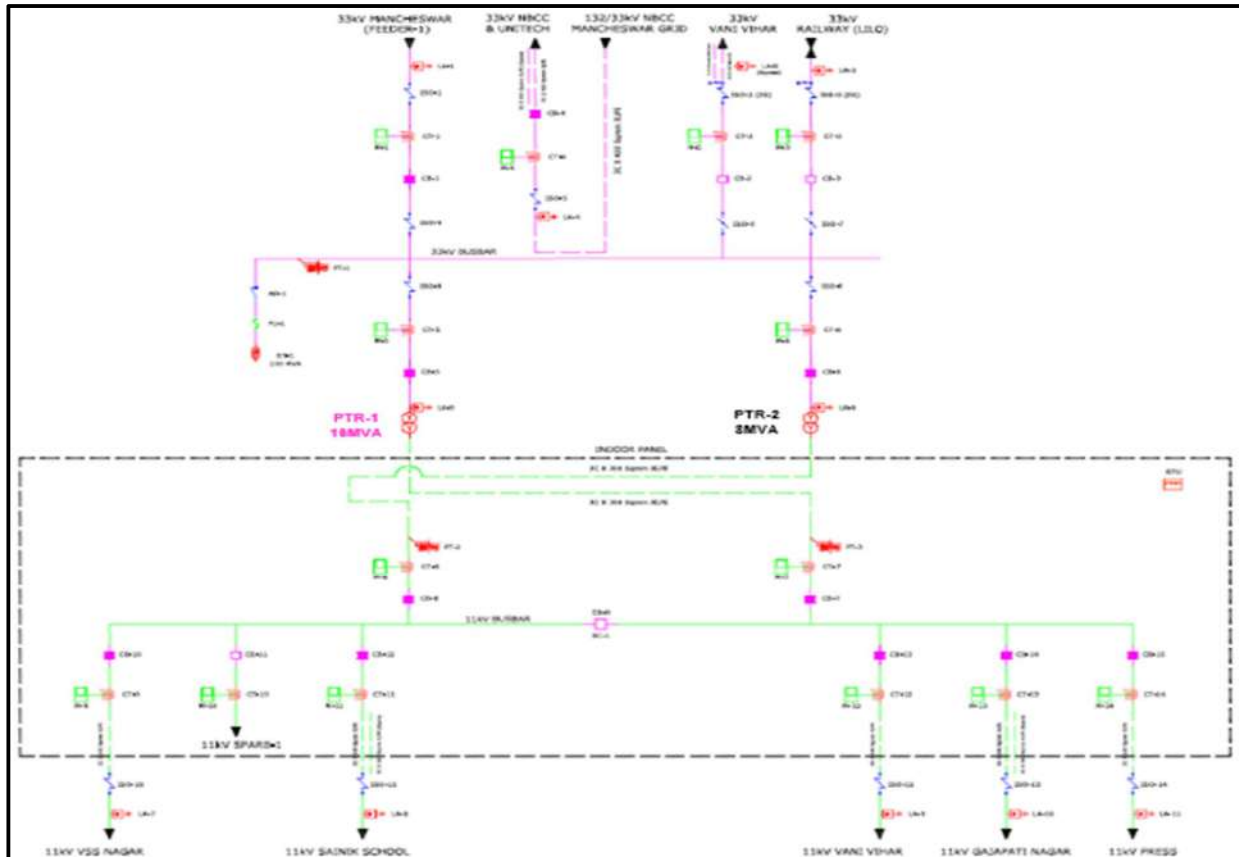


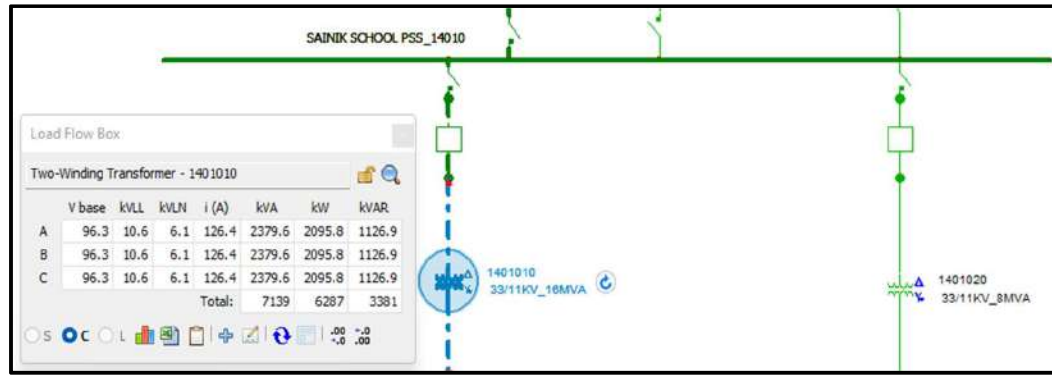
Proposed Scenario:

- Augmentation of PTR-1 from 8 MVA to 16MVA at Sainik School PSS is proposed to meet the full load of Sainik School PSS along with PTR-2 at peak load condition after 2years load growth.

Sl. No.	Name of 33/11kV PSS	PTR No.	PTR Rating (in MVA)	Projected Load (2yrs. Load Growth) (after implementation of Proposal) (in MVA)	% Loading (After 2Yrs.)	%Loading Range
1	Sainik School	PTR-1	16	7.11	44%	0-50%
2	Sainik School	PTR-2	8	5.19	65%	50%-75%

Proposed SLD of SAINIK SCHOOL 33/11kV PSS:



Load Flow Study of proposed scenario in Cyme Software:**BoQ for PTR Augmentation (PTR-1):**

Name of the Division :-	BCDD-2		
Name of the Sub-Division :-	Nayapalli		
Name of the Work :-	Mitigation of 33/11kV PTR Overloading		
Scope:-	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Sainik School 33/11kV PSS with other civil works.		
Names of Schemes: -	TPCODL CAPEX (FY 23-24)		
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Sainik School 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 2.73cr. (For detailed BoQ refer Annexure-13.3).

Benefits:

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To ensure reliable power supply to the consumers.

4.0 Augmentation of Power Transformer at MULAPADIA Substation

Proposal:

Augmentation of existing 1no. 33/11kV, 8MVA Power Transformer (PTR-1) to 16MVA at Mulapadia 33/11kV Substation in BED division of BBSR-1 circle to mitigate overloading condition.

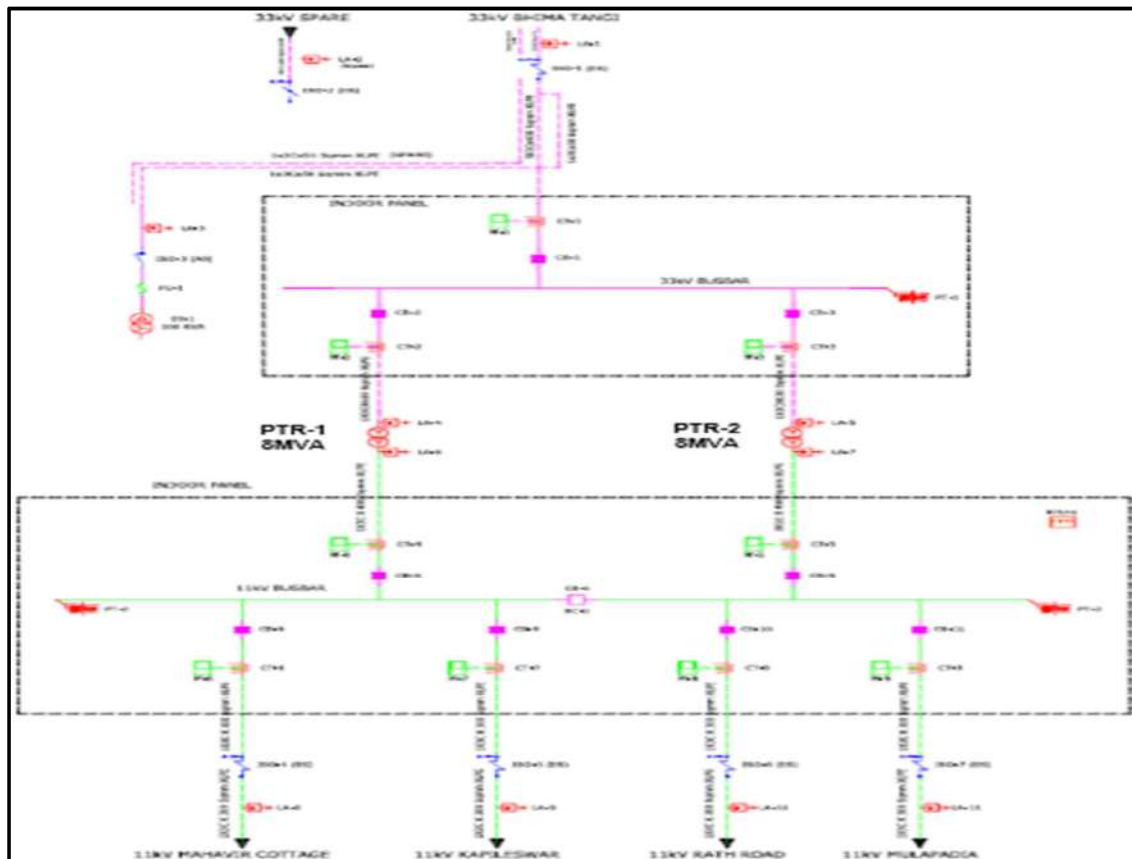
Existing Scenario:

- Loading of 33/11kV Mulapadia PTR-1 and 2 are 5.49MVA and 7.89MVA respectively at peak load condition of Summer'22. Considering load growth for 2years (10% load growth per year for 2years), the projected loading of Summer'24 for PTR-1 and 2 would be 6.64MVA and 9.54MVA respectively.
- PTR-1 and PTR-2 will be loaded up to 83% and 119% respectively, w.r.t, the existing transformer capacity of 8MVA each in Summer'24 which is greater than the permissible limit of 75% loading resulting in overloading of the PTR.

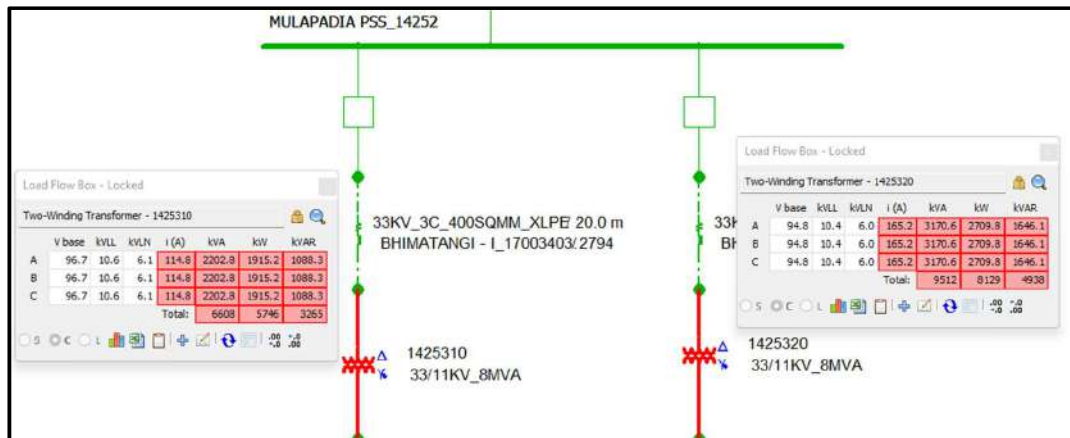
Existing Summer'22 Loading and projected load at Mulapadia PTRs:

Sl. No.	Name of 33/11kV PSS	PTR No.	PTR Rating AS IS (in MVA)	AS IS			Projected Load (2yrs. Load Growth)		
				Peak Load (in MVA)	% Loading (As-Is)	% Loading (As-Is)	% Loading (As-Is)	% Loading (After 2Yrs. LG)	%Loading Range after 2yrs. LG
1	MULAPADIA	PTR-1	8	5.49	69%	50%-75%	6.64	83%	75%-90%
2	MULAPADIA	PTR-2	8	7.89	99%	90%-100%	9.54	119%	>100%

Existing SLD of MULAPADIA 33/11kV PSS:



Load Flow Study of existing scenario in Cyme Software:

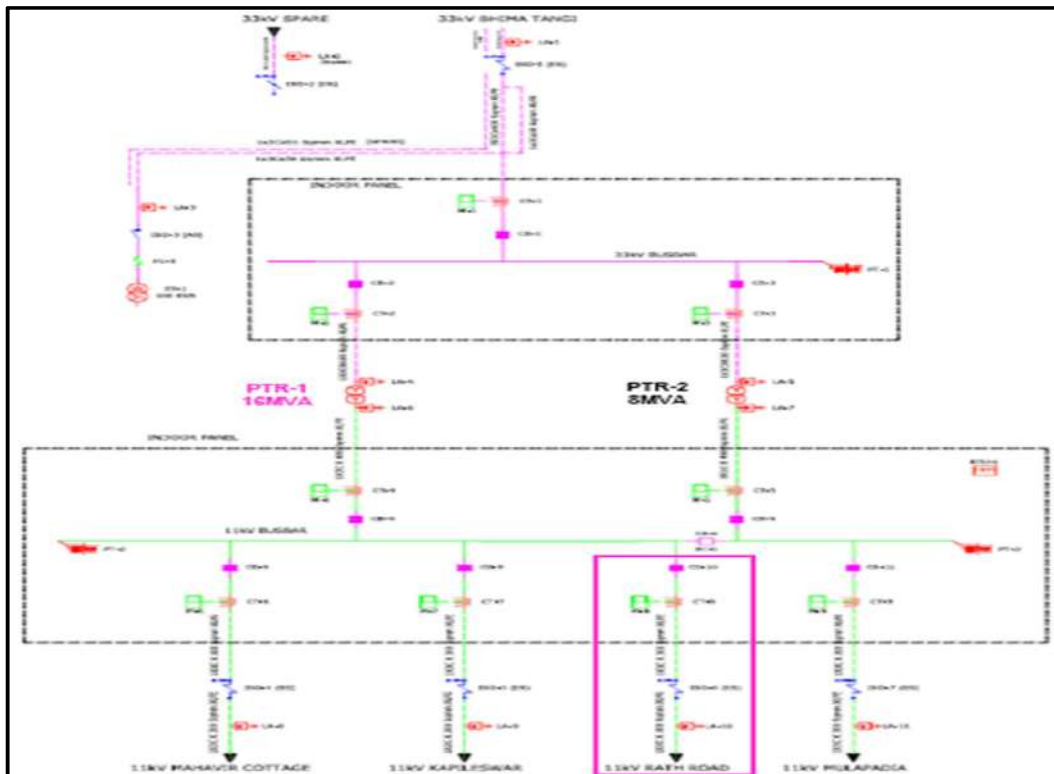


Proposed Scenario:

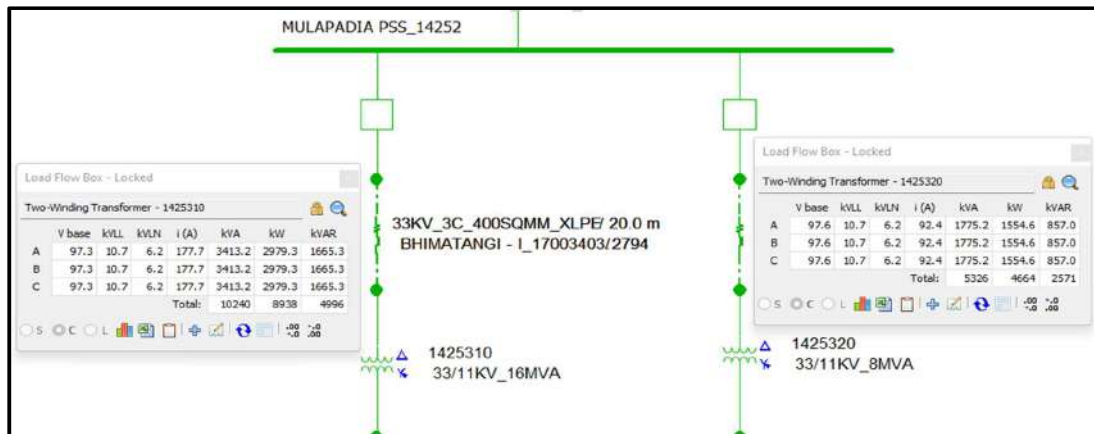
- Augmentation of PTR-1 from 8 MVA to 16MVA at Mulapadia PSS is proposed to meet the full load of Mulapadia PSS along with PTR-2 at peak load condition after 2years load growth.
- Subsequently, 11kV feeder shifting of Mulapadia feeder (3.5MVA) from PTR-2 to PTR-1 is proposed in order to mitigate the overloading of PTR-1 and PTR-2 at Summer'24.

Sl. No.	Name of 33/11kV PSS	PTR No.	PTR Rating (in MVA)	Projected Load (2yrs. Load Growth) (after implementation of Proposal) (in MVA)	% Loading (After 2Yrs.)	%Loading Range
1	MULAPADIA	PTR-1	16	10.87	68%	50%-75%
2	MULAPADIA	PTR-2	8	5.31	66%	50%-75%

Proposed SLD of MULAPADIA 33/11kV PSS:



Load Flow Study of proposed scenario in Cyme Software:



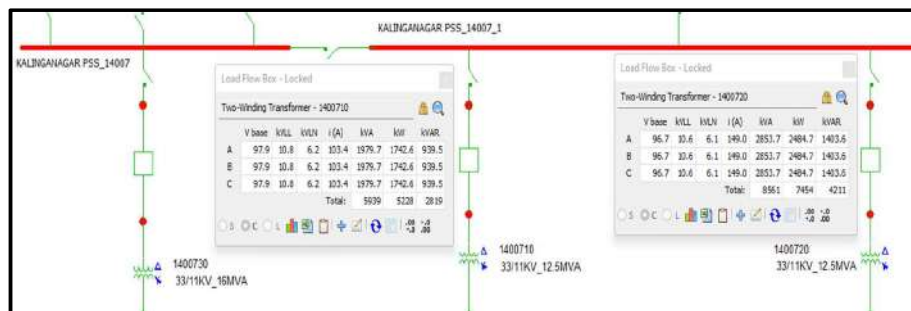
BoQ for PTR Augmentation (PTR-1):

Name of the Division :-	BED		
Name of the Sub-Division :-	Temple		
Name of the Work :-	Mitigation of 33/11kV PTR Overloading		
Scope:-	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mulapadia 33/11kV PSS with other civil works.		
Names of Schemes: -	TPCODL CAPEX (FY 23-24)		
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mulapadia 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 2.73cr. (For detailed BoQ refer Annexure-13.4).

Benefits:

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To ensure reliable power supply to the consumers.

Load Flow Study of proposed scenario in Cyme Software:**BoQ for PTR Augmentation (PTR-3):**

Name of the Division :-	BCDD-2		
Name of the Sub-Division :-	Khandagiri		
Name of the Work :-	Mitigation of 33/11kV PTR Overloading		
Scope:-	Augmentation of 01no. Power Transformer (PTR-3) from 8MVA to 16MVA at Kalinga Nagar 33/11kV PSS with other civil works.		
Names of Schemes: -	TPCODL CAPEX (FY 23-24)		
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 01no. Power Transformer (PTR-3) from 8MVA to 16MVA at Kalinga Nagar 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 2.73cr. (For detailed BoQ refer Annexure-13.5).

Benefits:

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To ensure reliable power supply to the consumers.

6.0 Augmentation of Power Transformer at KACHERI Substation

Proposal:

Augmentation of existing 2nos. 33/11kV, 8MVA Power Transformers (PTR-1 and PTR-2) to 16MVA at Kacheri 33/11kV Substation in PED division of BBSR-2 circle to mitigate overloading condition.

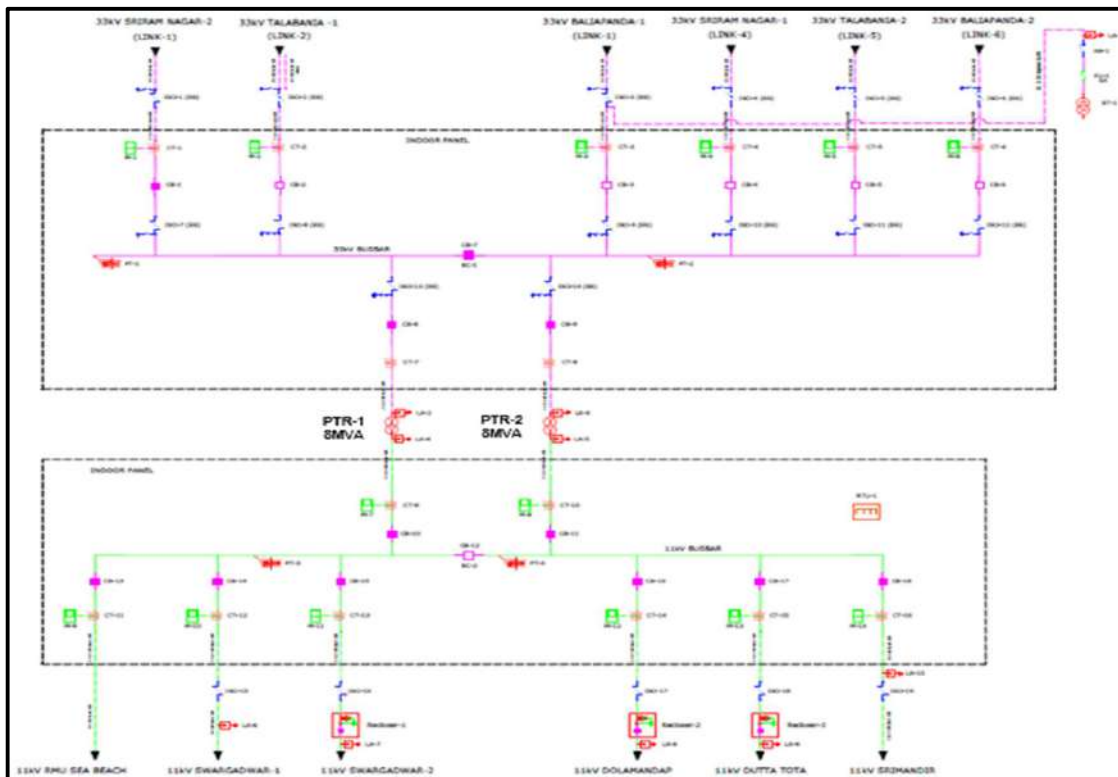
Existing Scenario:

- Loading of 33/11kV Kacheri PTR-1 and 2 are 7.49MVA and 4.97MVA respectively at peak load condition of Summer'22. Considering load growth for 2years (10% load growth per year for 2years), the projected loading of Summer'24 for PTR-1 and 2 would be 9.06MVA and 6.02MVA respectively.
- PTR-1 and PTR-2 will be loaded up to 113% and 75.2% respectively, w.r.t, the existing transformer capacity of 8MVA each in Summer'24 which is greater than the permissible limit of 75% loading resulting in overloading of the PTR.
- Taking into consideration the significance of reliable power supply during Ratha Yatra, N-1 contingency condition is also not met in the existing scenario.

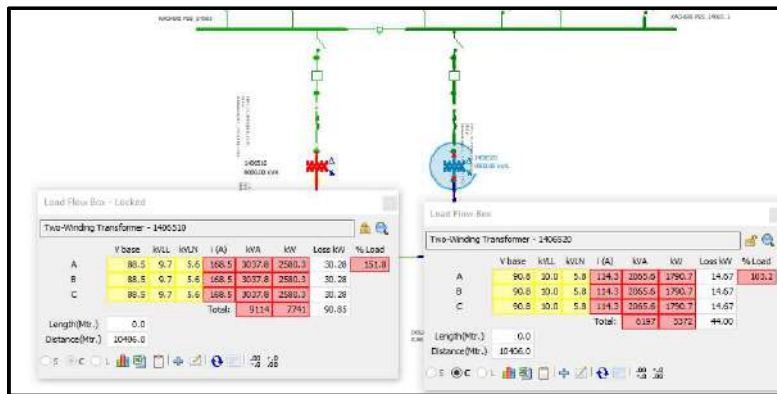
Existing Summer'22 Loading and projected load at Kacheri PTRs:

Sl. No.	Name of 33/11kV PSS	PTR No.	PTR Rating AS IS (in MVA)	AS IS			Projected Load (2yrs. Load Growth)		
				Peak Load (in MVA)	% Loading (As-Is)	% Loading (As-Is)	% Loading (As-Is)	% Loading (After 2Yrs. LG)	%Loading Range after 2yrs. LG
1	KACHERI	PTR-1	8	7.49	94%	90%-100%	9.06	113%	>100%
2	KACHERI	PTR-2	8	4.97	62%	50%-75%	6.02	75.2%	75%-90%

Existing SLD of KACHERI 33/11kV PSS:



Load Flow Study of existing scenario in Cyme Software:

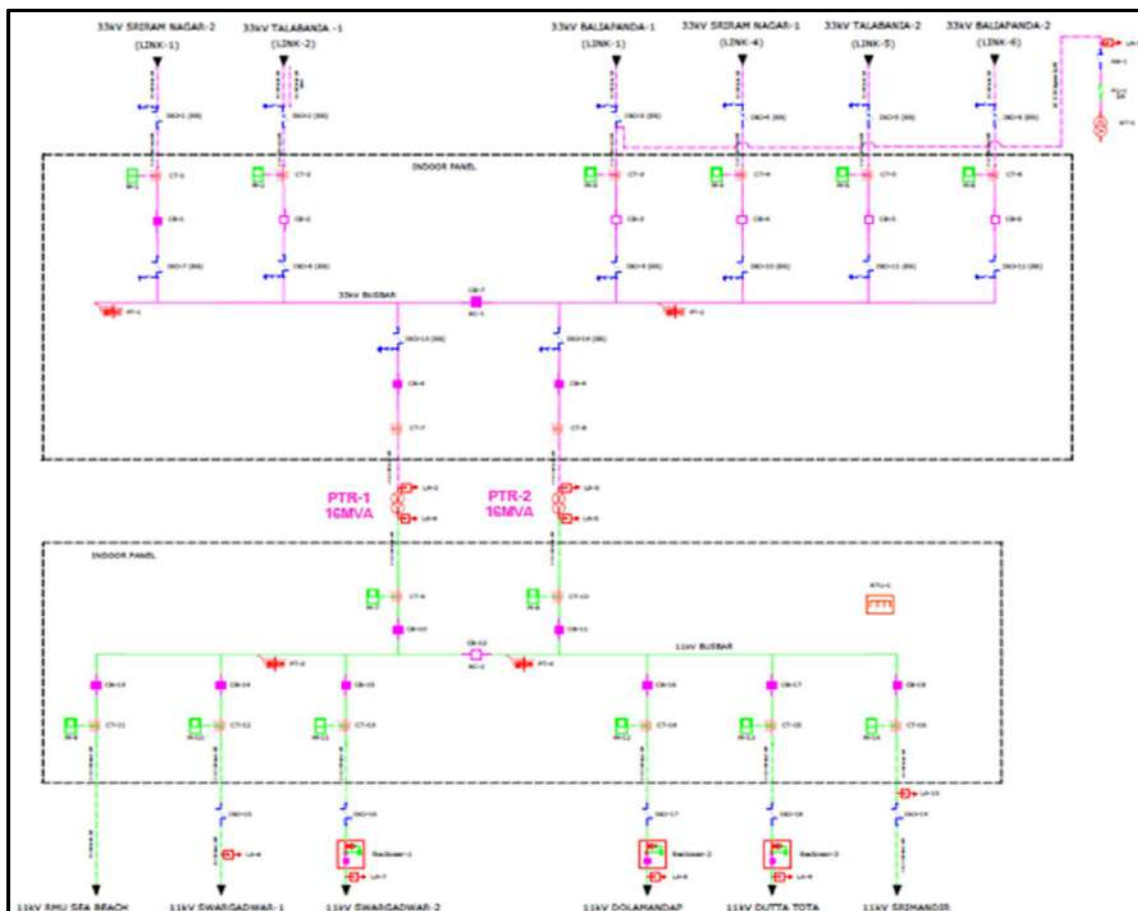


Proposed Scenario:

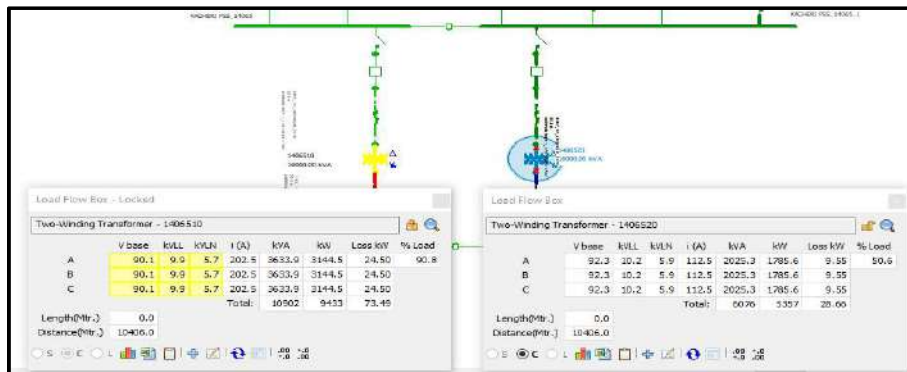
- Augmentation of PTR-1 and PTR-2 from 8 MVA to 16MVA at Kacheri PSS is proposed to meet the full load of Kacheri PSS at peak load condition along with N-1 contingency issue after 2years load growth due to criticality of the area during Rath Yatra.

Sl. No.	Name of 33/11kV PSS	PTR No.	PTR Rating (in MVA)	Projected Load (2yrs. Load Growth) (after implementation of Proposal) (in MVA)	% Loading (After 2Yrs.)	%Loading Range
1	KACHERI	PTR-1	16	10.87	68%	50%-75%
2	KACHERI	PTR-2	16	6.02	37.6%	0-50%

Proposed SLD of KACHERI 33/11kV PSS:



Load Flow Study of proposed scenario in Cyme Software:



BoQ for PTR Augmentation (PTR-1 & PTR-2):

Name of the Division :-	PED		
Name of the Sub-Division :-	Puri-1		
Name of the Work :-	Mitigation of 33/11kV PTR Overloading		
Scope:-	Augmentation of 02nos. Power Transformers (PTR-1 & PTR-2) from 8MVA to 16MVA each at Kacheri 33/11kV PSS with other civil works.		
Names of Schemes: -	TPCODL CAPEX (FY 23-24)		
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 02nos. Power Transformers (PTR-1 & PTR-2) from 8MVA to 16MVA each at Kacheri 33/11kV PSS with other civil works.	₹ 5,46,61,960.59
		Total Amount	₹ 5,46,61,960.59
		Total Amount (In Cr)	5.47
Total estimated cost is Rs. 5.47 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 5.47cr. (For detailed BoQ refer Annexure-13.6).

Benefits:

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To mitigate N-1 contingency issue.
- To ensure reliable power supply to the consumers.

7.0 Augmentation of Power Transformer at BALIAPANDA Substation

Proposal:

Augmentation of existing 1no. 33/11kV, 8MVA Power Transformer (PTR-2) to 16MVA at Baliapanda 33/11kV Substation in PED division of BBSR-2 circle to mitigate overloading condition.

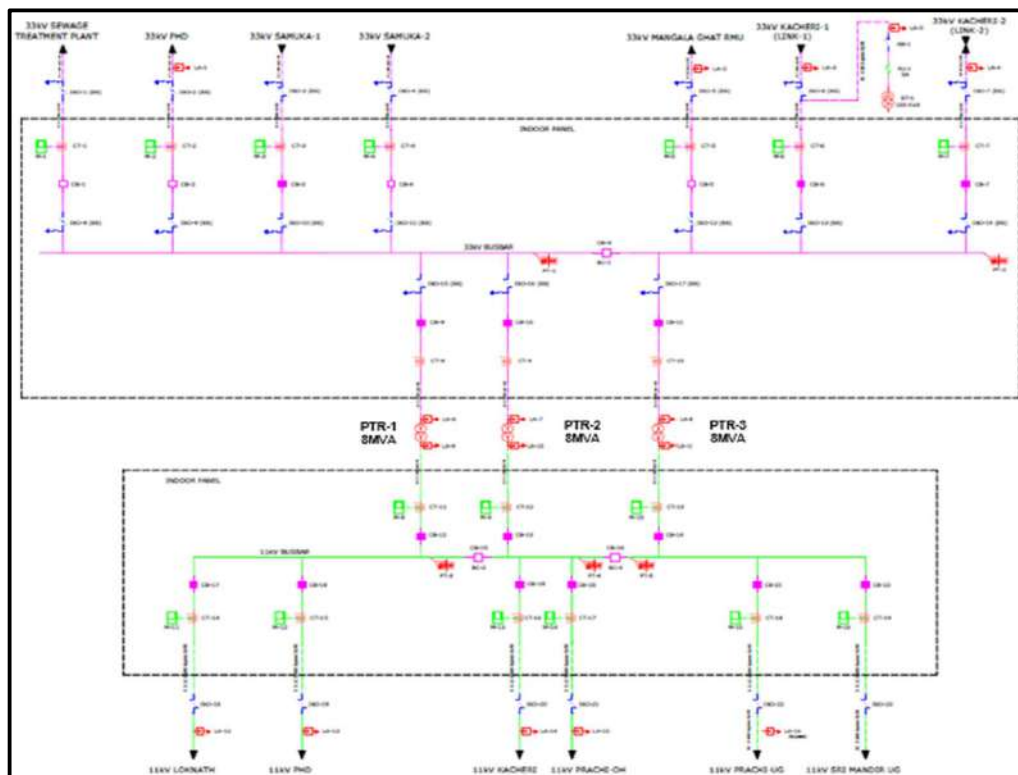
Existing Scenario:

- Loading of 33/11kV Baliapanda PTR-1, 2 and 3 are 6.23MVA, 7.83MVA and 4.37MVA respectively at peak load condition of Summer'22. Considering load growth for 2years (10% load growth per year for 2years), the projected loading of Summer'24 for PTR-1, 2 and 3 would be 7.54MVA, 9.47MVA and 5.29MVA respectively.
- PTR-1 and PTR-2 will be loaded up to 94% and 118% respectively, w.r.t, the existing transformer capacity of 8MVA each in Summer'24 which is greater than the permissible limit of 75% loading resulting in overloading of the PTR.

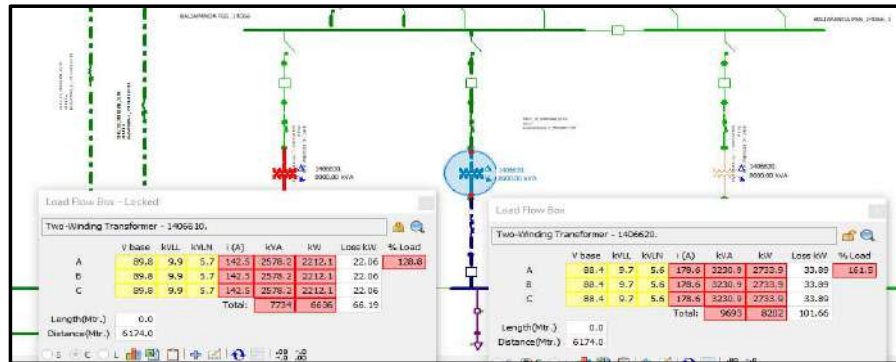
Existing Summer'22 Loading and projected load at Baliapanda PTRs:

Sl. No.	Name of 33/11kV PSS	PTR No.	PTR Rating AS IS (in MVA)	AS IS			Projected Load (2yrs. Load Growth)		
				Peak Load (in MVA)	% Loading (As-Is)	% Loading (As-Is)	% Loading (As-Is)	% Loading (After 2Yrs. LG)	%Loading Range after 2yrs. LG
1	BALIAPANDA	PTR-1	8	6.23	78%	75%-90%	7.54	94%	90%-100%
2	BALIAPANDA	PTR-2	8	7.83	98%	90%-100%	9.47	118%	>100%
3	BALIAPANDA	PTR-3	8	4.37	55%	50%-75%	5.29	66%	50%-75%

Existing SLD of BALIAPANDA 33/11kV PSS:



Load Flow Study of existing scenario in Cyme Software:

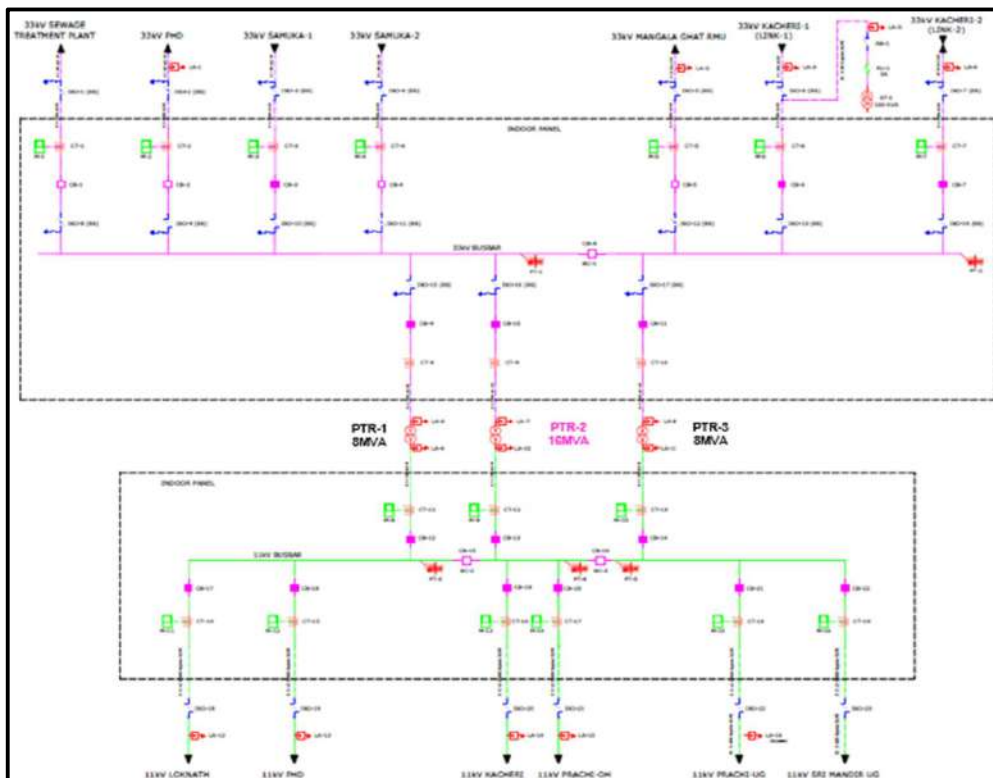


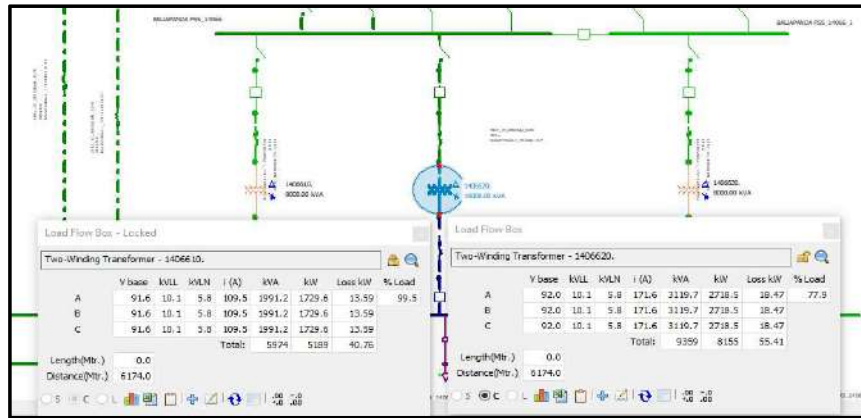
Proposed Scenario:

- Augmentation of PTR-2 from 8 MVA to 16MVA at Baliapanda PSS is proposed to meet the full load of Baliapanda PSS along with PTR-1 and PTR-3 at peak load condition after 2years load growth.
- Subsequently, 11kV feeder load diversion of 11kV Baliapanda feeder (1.5MVA), PTR-1 to 11kV Swargadwar feeder, PTR-1 of Kacheri PSS is proposed in order to mitigate the overloading of PTR-1 at Summer'24.

Sl. No.	Name of 33/11kV PSS	PTR No.	PTR Rating (in MVA)	Projected Load (2yrs. Load Growth) (after implementation of Proposal) (in MVA)	% Loading (After 2Yrs.)	%Loading Range
1	BALIAPANDA	PTR-1	8	5.72	72%	50%-75%
2	BALIAPANDA	PTR-2	16	9.47	59%	50%-75%
3	BALIAPANDA	PTR-3	8	5.29	66%	50%-75%

Proposed SLD of BALIAPANDA 33/11kV PSS:



Load Flow Study of proposed scenario in Cyme Software:**BoQ for PTR Augmentation (PTR-2):**

Name of the Division :-	PED		
Name of the Sub-Division :-	Puri-1		
Name of the Work :-	Mitigation of 33/11kV PTR Overloading		
Scope:-	Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Baliapanda 33/11kV PSS with other civil works.		
Names of Schemes: -	TPCODL CAPEX (FY 23-24)		
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Baliapanda 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 2.73cr. (For detailed BoQ refer Annexure-13.7).

Benefits:

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To ensure reliable power supply to the consumers.

8.0 Augmentation of Power Transformer at MAHANADI VIHAR Substation

Proposal:

Augmentation of existing 1no. 33/11kV, 8MVA Power Transformer (PTR-1) to 16MVA at Mahanadi Vihar 33/11kV Substation in CDD-2 division of CUTTACK circle to mitigate overloading condition.

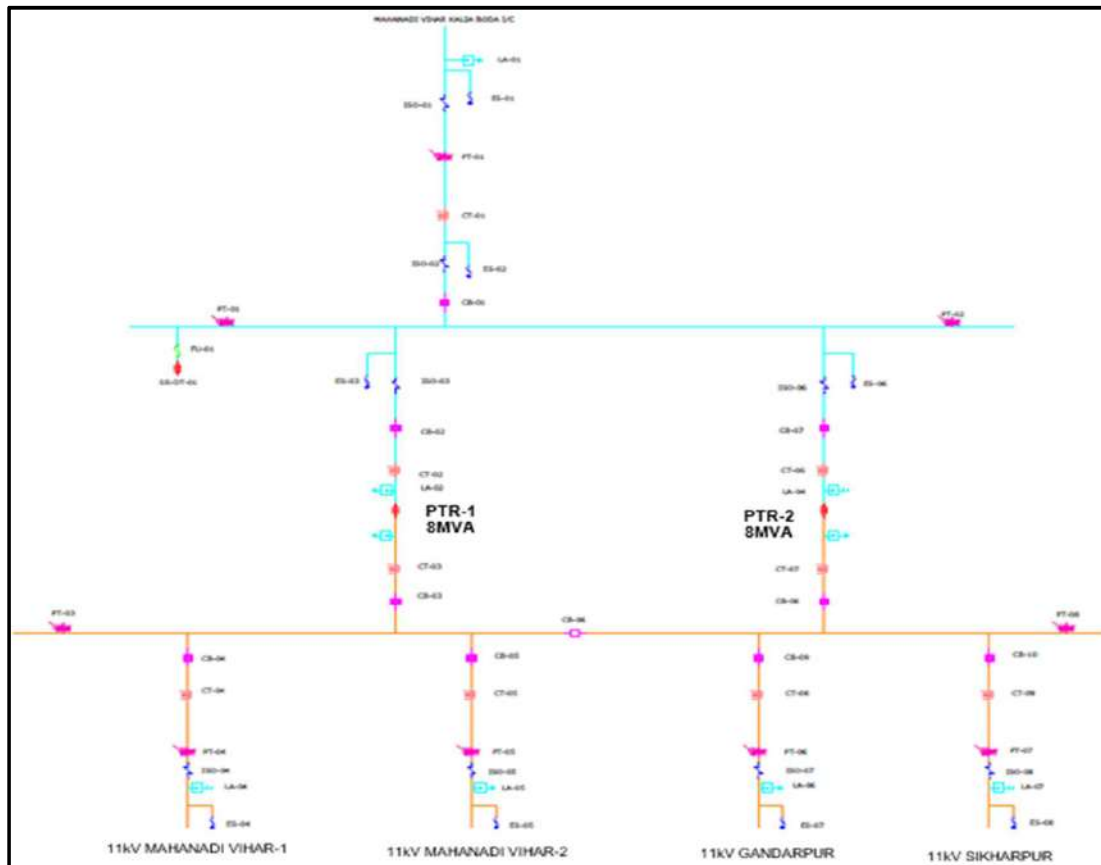
Existing Scenario:

- Loading of 33/11kV Mahanadi Vihar PTR-1 and 2 are 6.67MVA and 3.81MVA respectively at peak load condition of Summer'22. Considering load growth for 2years (9% load growth per year for 2years), the projected loading of Summer'24 for PTR-1 and 2 would be 7.92MVA and 4.53MVA respectively.
- PTR-1 will be loaded up to 99%, w.r.t, the existing transformer capacity of 8MVA in Summer'24 which is greater than the permissible limit of 75% loading resulting in overloading of the PTR.

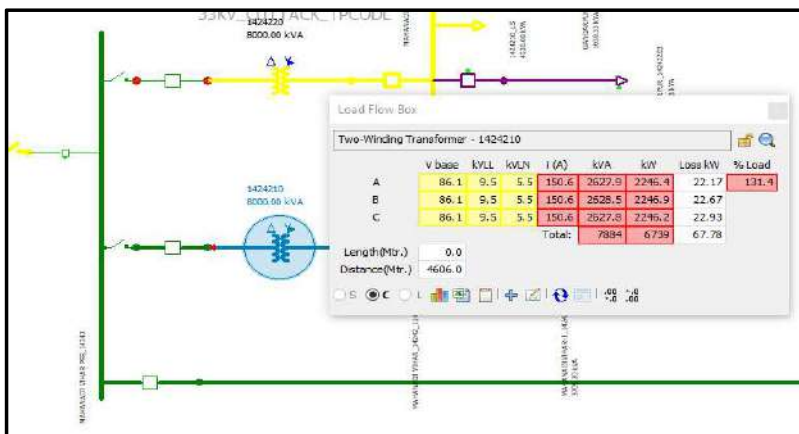
Existing Summer'22 Loading and projected load at Mahanadi Vihar PTRs:

Sl. No.	Name of 33/11kV PSS	PTR No.	PTR Rating AS IS (in MVA)	AS IS			Projected Load (2yrs. Load Growth)		
				Peak Load (in MVA)	% Loading (As-Is)	% Loading (As-Is)	% Loading (As-Is)	% Loading (After 2Yrs. LG)	%Loading Range after 2yrs. LG
1	MAHANADI VIHAR	PTR-1	8	6.67	83%	75%-90%	7.92	99%	90%-100%
2	MAHANADI VIHAR	PTR-2	8	3.81	48%	0-50%	4.53	57%	50%-75%

Existing SLD of MAHANADI VIHAR 33/11kV PSS:



Load Flow Study of existing scenario in Cyme Software:

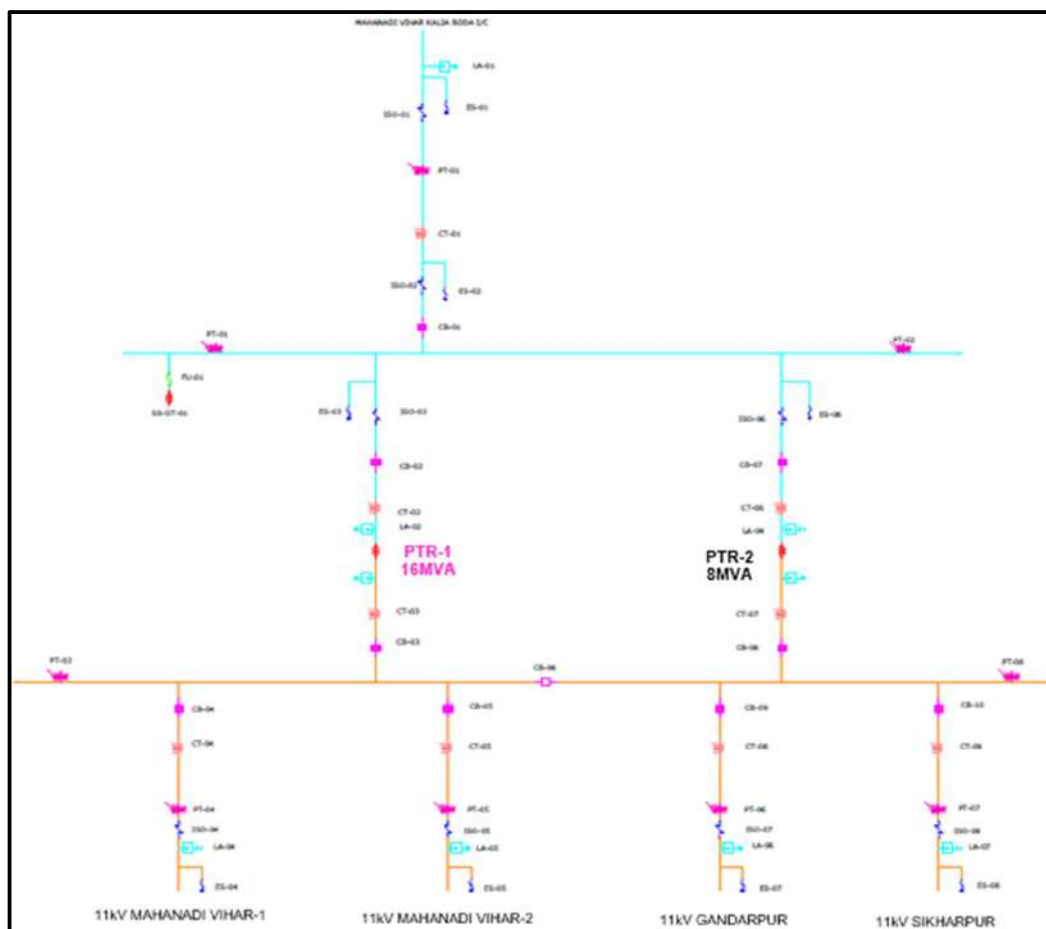


Proposed Scenario:

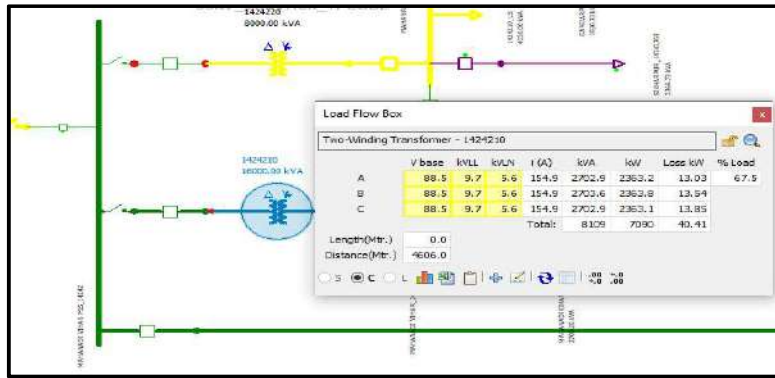
- Augmentation of PTR-1 from 8 MVA to 16MVA at Mahanadi Vihar PSS is proposed to meet the full load of Mahanadi Vihar PSS along with PTR-2 at peak load condition after 2years load growth.

Sl. No.	Name of 33/11kV PSS	PTR No.	PTR Rating (in MVA)	Projected Load (2yrs. Load Growth) (after implementation of Proposal) (in MVA)	% Loading (After 2Yrs.)	%Loading Range
1	MAHANADI VIHAR	PTR-1	16	7.92	50%	0-50%
2	MAHANADI VIHAR	PTR-2	8	4.53	57%	50%-75%

Proposed SLD of MAHANADI VIHAR 33/11kV PSS:



Load Flow Study of proposed scenario in Cyme Software:



BoQ for PTR Augmentation (PTR-1):

Name of the Division :-	CDD-2		
Name of the Sub-Division :-	Mahanadi Vihar		
Name of the Work :-	Mitigation of 33/11kV PTR Overloading		
Scope:-	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mahanadi Vihar 33/11kV PSS with other civil works.		
Names of Schemes: -	TPCODL CAPEX (FY 23-24)		
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mahanadi Vihar 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 2.73cr. (For detailed BoQ refer Annexure-13.8).

Benefits:

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To ensure reliable power supply to the consumers.

9.0 Augmentation of Power Transformer at SECTOR-6 (CDA) Substation

Proposal:

Augmentation of existing 1no. 33/11kV, 8MVA Power Transformer (PTR-2) to 16MVA at Sector-6 (CDA) 33/11kV Substation in CDD-1 division of CUTTACK circle to mitigate overloading condition.

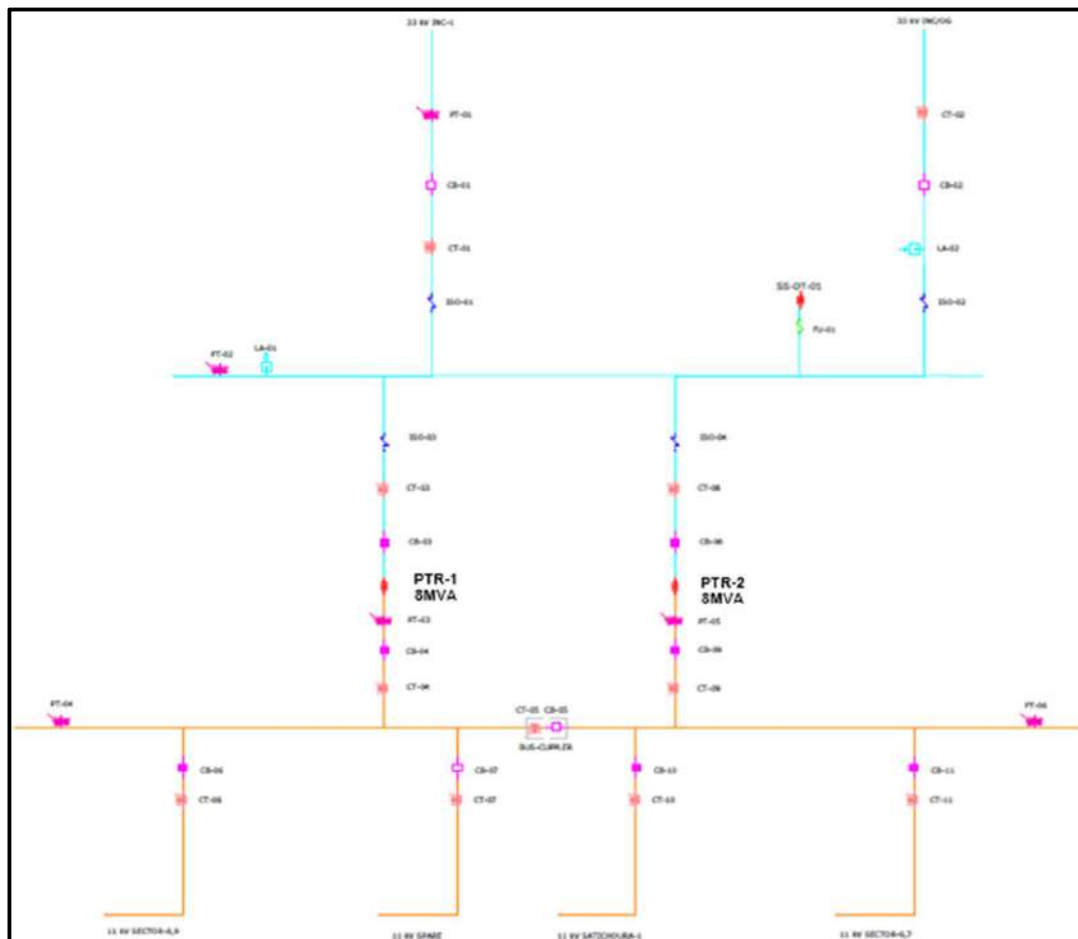
Existing Scenario:

- Loading of 33/11kV Sector-6 (CDA) PTR-1 and 2 are 4.61MVA and 6.27MVA respectively at peak load condition of Summer'22. Considering load growth for 2years (7% load growth per year for 2years), the projected loading of Summer'24 for PTR-1 and 2 would be 5.28MVA and 7.17MVA.
- PTR-2 will be loaded up to 90%, w.r.t, the existing transformer capacity of 8MVA in Summer'24 which is greater than the permissible limit of 75% loading resulting in overloading of the PTR.

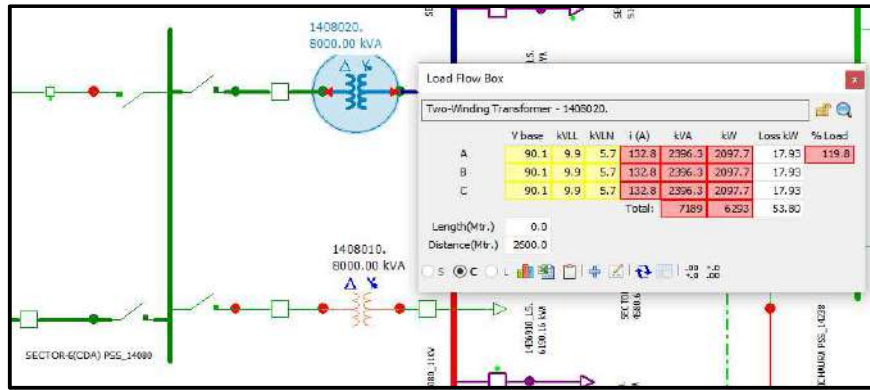
Existing Summer'22 Loading and projected load at Sector-6 (CDA) PTRs:

Sl. No.	Name of 33/11kV PSS	PTR No.	PTR Rating AS IS (in MVA)	AS IS			Projected Load (2yrs. Load Growth)		
				Peak Load (in MVA)	% Loading (As-Is)	% Loading (As-Is)	% Loading (As-Is)	% Loading (After 2Yrs. LG)	%Loading Range after 2yrs. LG
1	SECTOR-6 (CDA)	PTR-1	8	4.61	58%	50%-75%	5.28	66%	50%-75%
2	SECTOR-6 (CDA)	PTR-2	8	6.27	78%	75%-90%	7.17	90%	75%-90%

Existing SLD of SECTOR-6 (CDA) 33/11kV PSS:



Load Flow Study of existing scenario in Cyme Software:

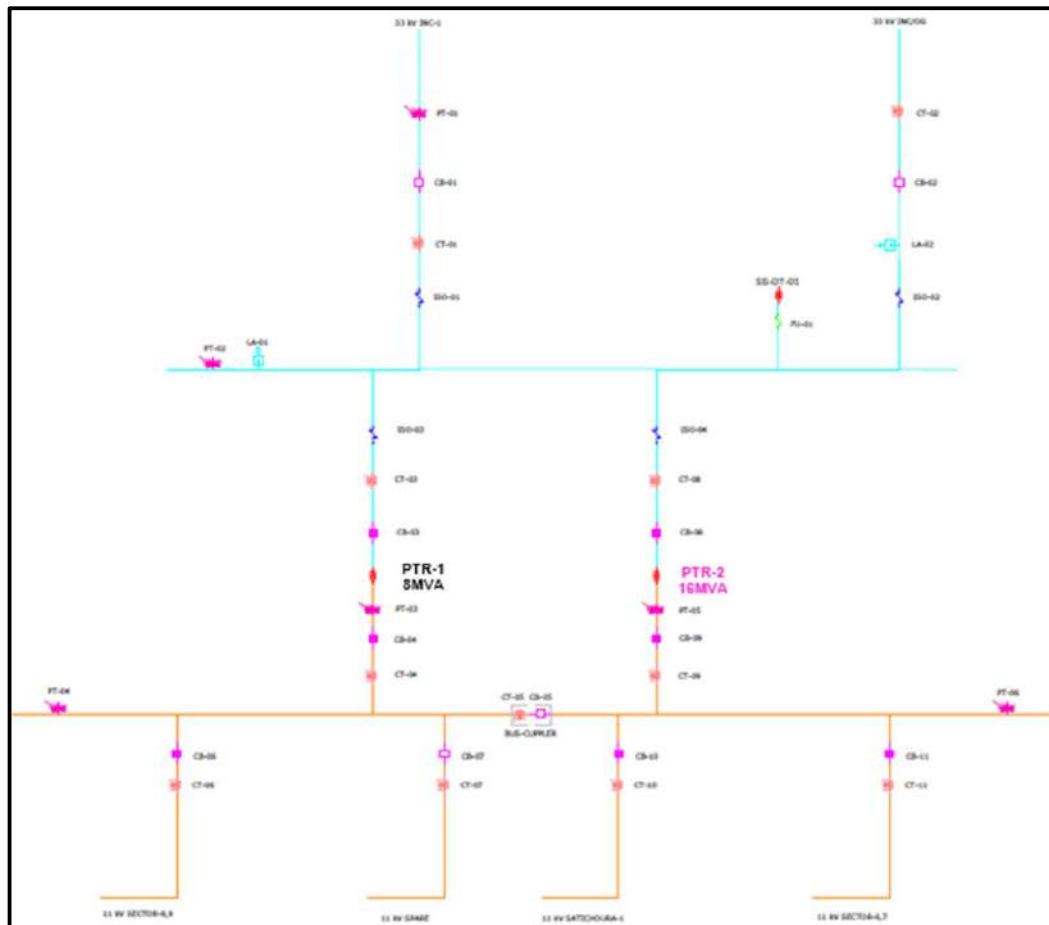


Proposed Scenario:

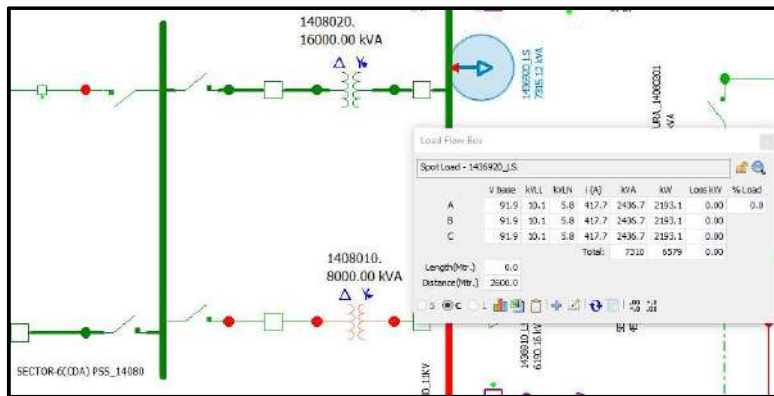
- Augmentation of PTR-2 from 8 MVA to 16MVA at Sector-6 (CDA) PSS is proposed to meet the full load of Sector-6 (CDA) PSS along with PTR-1 at peak load condition after 2years load growth.

Sl. No.	Name of 33/11kV PSS	PTR No.	PTR Rating (in MVA)	Projected Load (2yrs. Load Growth) (after implementation of Proposal) (in MVA)	% Loading (After 2Yrs.)	%Loading Range
1	SECTOR-6 (CDA)	PTR-1	8	5.28	66%	50%-75%
2	SECTOR-6 (CDA)	PTR-2	16	7.17	44.8%	0-50%

Proposed SLD of SECTOR-6 (CDA) 33/11kV PSS:



Load Flow Study of proposed scenario in Cyme Software:



BoQ for PTR Augmentation (PTR-2):

Name of the Division :-	CDD-1		
Name of the Sub-Division :-	Sector-6 SDO		
Name of the Work :-	Mitigation of 33/11kV PTR Overloading		
Scope:-	Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Sector-6 (CDA) 33/11kV PSS with other civil works.		
Names of Schemes: -	TPCODL CAPEX (FY 23-24)		
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Sector-6 (CDA) 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 2.73cr. (For detailed BoQ refer Annexure-13.9).

Benefits:

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To ensure reliable power supply to the consumers.

10.0 Augmentation of Power Transformer at HEMSURPADA Substation

Proposal:

Augmentation of existing 1no. 33/11kV, 8MVA Power Transformer (PTR-1) to 16MVA at Hemsurpada 33/11kV Substation in ANED division of DHENKANAL circle to mitigate overloading condition.

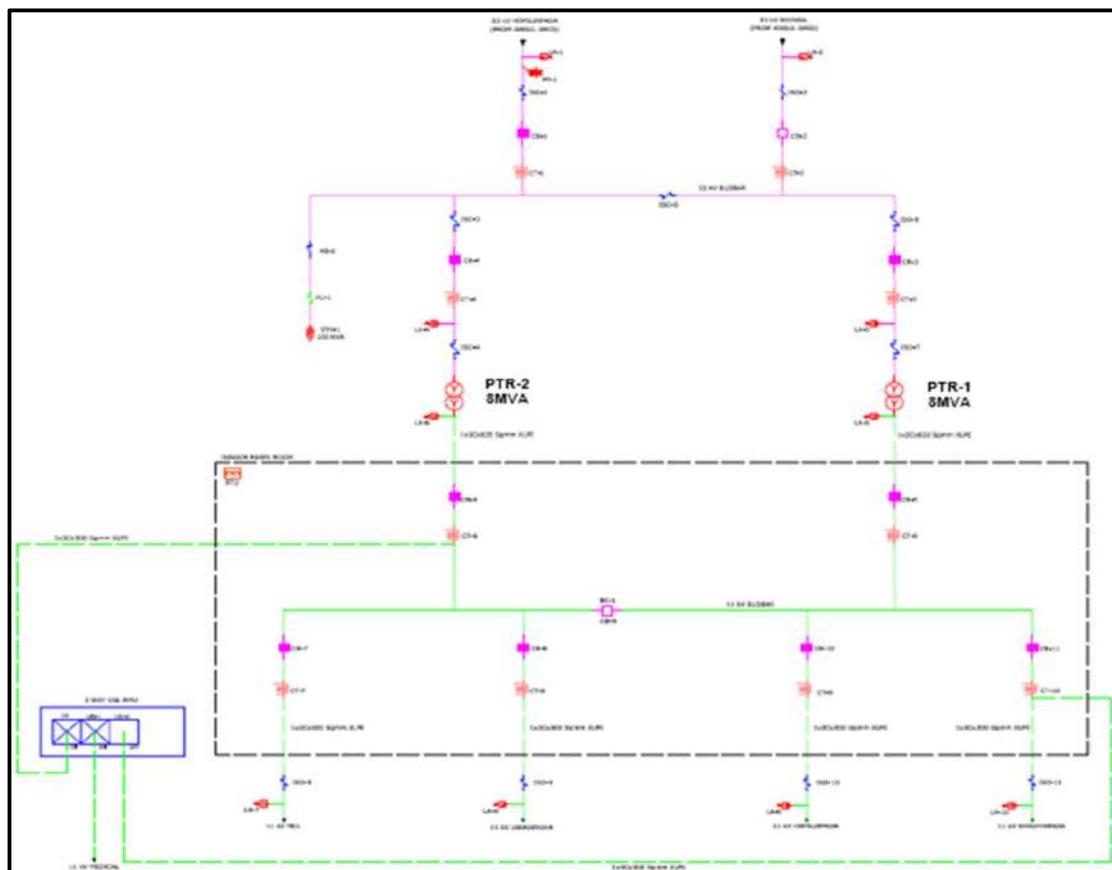
Existing Scenario:

- Loading of 33/11kV Hemsurpada PTR-1 and 2 are 5.30MVA and 5.70MVA respectively at peak load condition of Summer'22. Considering load growth for 2years (8% load growth per year for 2years), the projected loading of Summer'24 for PTR-1 and 2 would be 6.18MVA and 6.65MVA respectively.
- PTR-1 and PTR-2 will be loaded 77% and 83% respectively, w.r.t, the existing transformer capacity of 8MVA each in Summer'24 which is greater than the permissible limit of 75% loading resulting in overloading of the PTR.

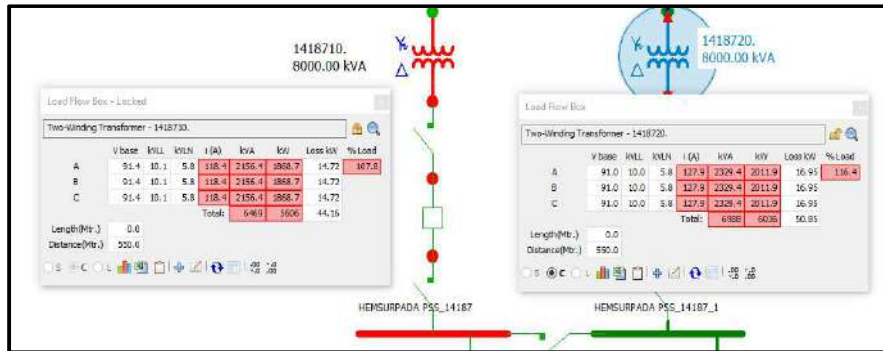
Existing Summer'22 Loading and projected load at Hemsurpada PTRs:

Sl. No.	Name of 33/11kV PSS	PTR No.	PTR Rating AS IS (in MVA)	AS IS			Projected Load (2yrs. Load Growth)		
				Peak Load (in MVA)	% Loading (As-Is)	% Loading (As-Is)	% Loading (As-Is)	% Loading (After 2Yrs. LG)	%Loading Range after 2yrs. LG
1	HEMSURPADA	PTR-1	8	5.30	66%	50%-75%	6.18	77%	75%-90%
2	HEMSURPADA	PTR-2	8	5.70	71%	50%-75%	6.65	83%	75%-90%

Existing SLD of HEMSURPADA 33/11kV PSS:



Load Flow Study of existing scenario in Cyme Software:

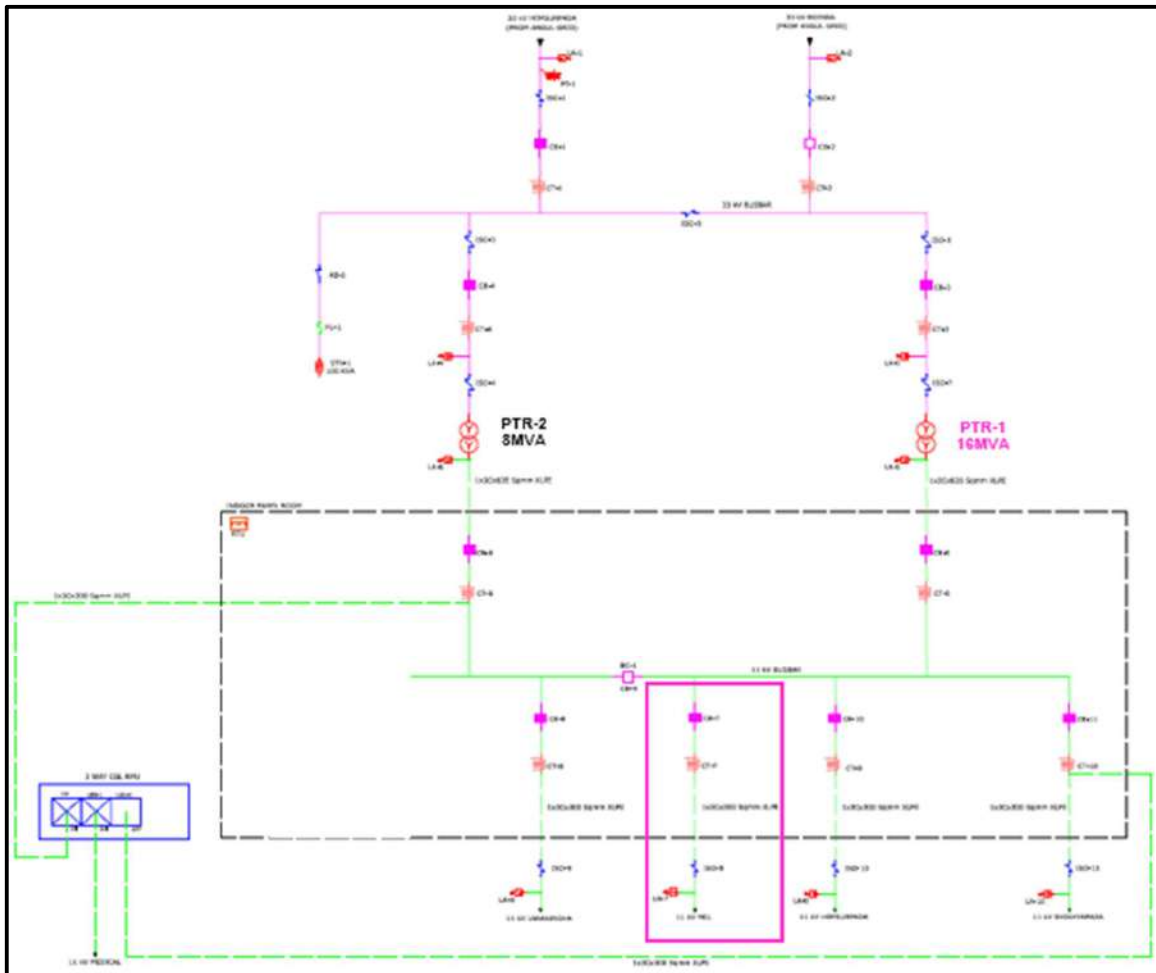


Proposed Scenario:

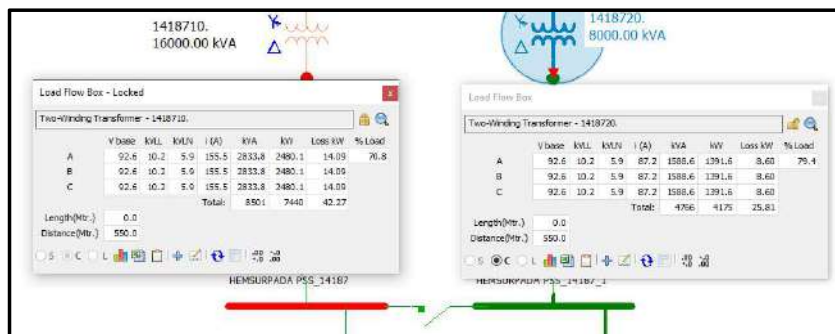
- Augmentation of PTR-1 from 8 MVA to 16MVA at Hemsurpada PSS is proposed to meet the full load of Hemsurpada PSS alongwith PTR-2 at peak load condition after 2years load growth.
- Subsequently, 11kV feeder shifting of MCL feeder (1.75MVA) from PTR-2 to PTR-1 is proposed in order to mitigate the overloading of PTR-2 at Summer'24.

Sl. No.	Name of 33/11kV PSS	PTR No.	PTR Rating (in MVA)	Projected Load (2yrs. Load Growth) (after implementation of Proposal) (in MVA)	% Loading (After 2Yrs.)	%Loading Range
1	HEMSURPADA	PTR-1	16	8.22	51%	50%-75%
2	HEMSURPADA	PTR-2	8	4.61	58%	50%-75%

Proposed SLD of HEMSURPADA 33/11kV PSS:



Load Flow Study of proposed scenario in Cyme Software:



BoQ for PTR Augmentation (PTR-1):

Name of the Division :-	ANED		
Name of the Sub-Division :-	Angul		
Name of the Work :-	Mitigation of 33/11kV PTR Overloading		
Scope:-	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Hemsurpada 33/11kV PSS with other civil works.		
Names of Schemes: -	TPCODL CAPEX (FY 23-24)		
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Hemsurpada 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)			

Cost Estimate: ₹ 2.73cr. (For detailed BoQ refer Annexure-13.10).

Benefits:

- To mitigate overloading condition on power transformer.
- To cater future load growth of the consumer.
- To ensure reliable power supply to the consumers.

PTR Swapping is proposed for 29nos. Power Transformers for PTR overloading condition. The replaced PTRs are proposed with lower capacity PTRs wherever overloading is observed in TPCODL jurisdiction. Since the priority of PTR overloading is very high we have prioritized & considered wherein PTR loading is greater than 75% in 2years timeline. This proposal facilitates the utilization of assets to maximum extent without any extra cost addition in CAPEX.

Annexure-13 PTR Augmentation							
Sl. No.	Name of Circle	Name of Division	Name of 33/11kV PSS	PTR No.	Proposal Details	Amount (in cr.)	Annexure
1	BBSR-1	BCDD-2	INFOCITY	PTR-2	Augmentation of 01no. Power Transformer (PTR-2) from 7.5MVA to 16MVA at Infocity 33/11kV PSS with other civil works.	2.73	Annexure-13.1
2	BBSR-1	BED	NAHARKANTA	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Naharkanta 33/11kV PSS with other civil works.	2.73	Annexure-13.3
3	BBSR-1	BCDD-2	SAINIK SCHOOL	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Sainik School 33/11kV PSS with other civil works.	2.73	Annexure-13.3
4	BBSR-1	BED	MULAPADIA	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mulapadia 33/11kV PSS with other civil works.	2.73	Annexure-13.4
5	BBSR-1	BCDD-2	KALINGA NAGAR	PTR-3	Augmentation of 01no. Power Transformer (PTR-3) from 8MVA to 16MVA at Kalinga Nagar 33/11kV PSS with other civil works.	2.73	Annexure-13.5
6	BBSR-2	PED	KACHERI	PTR-1 & PTR-2	Augmentation of 02nos. Power Transformers (PTR-1 & PTR-2) from 8MVA to 16MVA each at Kacheri 33/11kV PSS with other civil works.	5.47	Annexure-13.6
7	BBSR-2	PED	BALIAPANDA	PTR-2	Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Baliapanda 33/11kV PSS with other civil works.	2.73	Annexure-13.7
8	CUTTACK	CDD-2	MAHANADI VIHAR	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mahanadi Vihar 33/11kV PSS with other civil works.	2.73	Annexure-13.8
9	CUTTACK	CDD-1	SECTOR-6 (CDA)	PTR-2	Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Sector-6 (CDA) 33/11kV PSS with other civil works.	2.73	Annexure-13.9
10	DHENKANAL	ANED	HEMSURPADA	PTR-1	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Hemsurpada 33/11kV PSS with other civil works.	2.73	Annexure-13.10
TOTAL						30.06	

ANNEXURE-13.1			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		BCDD-2	
Name of the Sub-Division : -		Periphery	
Name of the Work :-		Mitigation of 33/11kV PTR Overloading	
Scope:-		Augmentation of 1no. Power Transformer (PTR-2) from 7.5MVA to 16MVA at Infocity 33/11kV PSS with other civil works.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 01no. Power Transformer (PTR-2) from 7.5MVA to 16MVA at Infocity 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-13.1					
Augmentation of 1no. 7.5 MVA PTR with 16 MVA Without Switchgear Panel PTR-2 (Infocity PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)					
1	12.5/16 MVA, 33/11 KV Power Transformer with OLTC	Nos.	1,65,67,796.00	1	1,65,67,796.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr.	KG	93.00	150.00	13,950.00
3	40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long	No	1,289.60	5	6,448.00
4	GI Nuts & Bolts of Assorted size	Kg	96.72	50.00	4,836.00
5	Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable	km	10,22,940.00	0.072	73,651.68
6	Supply of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, HT UG cable	EA	5,014.00	6	30,084.00
7	Supply of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, HT UG cable	EA	4,901.00	6	29,406.00
8	Channel 100X50X6mm, 9.56 KG/Mtr.	KG	93.00	250	23,250.00
9	SWITCH GEAR PANEL BOARD 11kV I/D VCB	No.	-		-
A	Total Cost of materials				1,67,49,421.68
B	Stock, Storage & Insurance i.e 3% of A				5,02,482.65
C	Sub Total (A+B)				1,72,51,904.33
D	Contingency @ 3% of C				5,17,557.13
E	Tools & Plants @ 2% of C				3,32,196.64
F	Transportation @ 7.5% of C				12,93,892.82
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				8,53,241.49
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)				4,329.71
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kV				-
J	Sum of (C to I)				2,02,53,122.13
Civil and Services Works (As per Technical Specification)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method .	km	94,500.00	0.072	6,804.00
2	Erection of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation ,soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No	3,700.00	5	18,500.00
	Demolition Work for Existing PTR				-
5	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
6	Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading of same PTR if Required. Insurance during transportation shall be in TPCODL scope.	EA	75,900.00	1	75,900.00
7	Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane , charges for crane will be paid separately.	EA	4,217.00	1	4,217.00
	Civil Work for New PTR				-
8	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.	Cum	482.00	20	9,640.00

Augmentation of 1no. 7.5 MVA PTR with 16 MVA Without Switchgear Panel PTR-2 (Infocity PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including getting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth , including consolidating each deposited layers by ramming ,watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil .	Cum	1,305.00	40	52,200.00
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	200.00	10	2,000.00
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	40	7,200.00
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	4	20,520.00
13	Centring and shuttering including strutting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	53	15,953.00
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1750	1,90,750.00
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	800	1,00,800.00
16	BA has to do the installation,welding & fabrication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm,75X40X4.6mm etc) as per size requirement	Kg	27.00	400	10,800.00
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	33	9,306.00
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foundations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	2	12,079.22
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specifcation. Scope includes supply of all material	Cum	6,747.00	12	80,964.00
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	7,316.00	25	1,82,900.00
22	Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	17	17,000.00

Augmentation of 1no. 7.5 MVA PTR with 16 MVA Without Switchgear Panel PTR-2 (Infocity PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
23	Supplying, Laying, spreading and compacting stone aggregate of specified sizes: 63 mm to 45 mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of work also includes of jungle such as grass, small tree, plant etc.	Cum	2,235.00	47	1,05,045.00
24	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.	Cum	482.00	12	5,784.00
25	Excavating trenches of required width and depth for pipe, cables etc including Excavation for sockets including getting out the excavated materials, returning (refill) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	48	62,640.00
26	BA will Back fill the cable excvaton site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	15	3,000.00
27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	24	4,320.00
28	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	2	10,260.00
29	Centring and shuttering including strutting, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	89	26,789.00
30	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1503	1,63,827.00
31	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	53	14,946.00
32	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foundations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	1	6,039.61
33	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the	Cum	7,316.00	19	1,39,004.00
34	Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	2	2,000.00
K	Total Civil & Services				14,14,057.43
L	Total (J+K)				2,16,67,179.56
M	Other overheads (Including 6% supervision charges) of L				13,00,030.77
N	Sub Total (L+M)				2,29,67,210.33
O	Total GST @ 18% of (N)				41,34,097.86
P	CESS 1% of N				2,29,672.10
Q	Gross Total Material +Services (N+O+P)				2,73,30,980.29
R	Gross Total Material +Services (in cr.)				2.73

ANNEXURE-13.2			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		BED	
Name of the Sub-Division :-		Rasulgarh	
Name of the Work :-		Mitigation of 33/11kV PTR Overloading	
Scope:-		Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Naharkanta 33/11kV PSS with other civil works.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Naharkanta 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-13.2					
Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Naharkanta PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)					
1	12.5/16 MVA, 33/11 KV Power Transformer with OLTC	Nos.	1,65,67,796.00	1	1,65,67,796.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr.	KG	93.00	150.00	13,950.00
3	40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long	No	1,289.60	5	6,448.00
4	GI Nuts & Bolts of Assorted size	Kg	96.72	50.00	4,836.00
5	Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable	km	10,22,940.00	0.072	73,651.68
6	Supply of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, HT UG cable	EA	5,014.00	6	30,084.00
7	Supply of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, HT UG cable	EA	4,901.00	6	29,406.00
8	Channel 100X50X6mm, 9.56 KG/Mtr.	KG	93.00	250	23,250.00
9	SWITCH GEAR PANEL BOARD 11kV I/D VCB	No.	-		-
A	Total Cost of materials				1,67,49,421.68
B	Stock, Storage & Insurance i.e 3% of A				5,02,482.65
C	Sub Total (A+B)				1,72,51,904.33
D	Contingency @ 3% of C				5,17,557.13
E	Tools & Plants @ 2% of C				3,32,196.64
F	Transportation @ 7.5% of C				12,93,892.82
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				8,53,241.49
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)				4,329.71
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kV				-
J	Sum of (C to I)				2,02,53,122.13
Civil and Services Works (As per Technical Specification)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method .	km	94,500.00	0.072	6,804.00
2	Erection of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation ,soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No	3,700.00	5	18,500.00
	Demolition Work for Existing PTR				-
5	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
6	Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading of same PTR if Required. Insurance during transportation shall be in TPCODL scope.	EA	75,900.00	1	75,900.00
7	Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane , charges for crane will be paid separately.	EA	4,217.00	1	4,217.00
	Civil Work for New PTR				-
8	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinerv for excavation of cable trench & other civil works.	Cum	482.00	20	9,640.00

Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Naharkanta PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including getting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth , including consolidating each deposited layers by ramming ,watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil .	Cum	1,305.00	40	52,200.00
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	200.00	10	2,000.00
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	40	7,200.00
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	4	20,520.00
13	Centring and shuttering including strutting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	53	15,953.00
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1750	1,90,750.00
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	800	1,00,800.00
16	BA has to do the installation,welding & fabication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm,75X40X4.6mm etc) as per size requirement	Kg	27.00	400	10,800.00
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	33	9,306.00
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	2	12,079.22
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material	Cum	6,747.00	12	80,964.00
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work etc., as directed by Engineer-in-Charge.	Cum	7,316.00	25	1,82,900.00
22	Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	17	17,000.00

Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Naharkanta PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
23	Supplying, Laying, spreading and compacting stone aggregate of specified sizes: 63 mm to 45 mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of work also includes of jungle such as grass,small tree,plant etc.	Cum	2,235.00	47	1,05,045.00
24	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.	Cum	482.00	12	5,784.00
25	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including getting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	48	62,640.00
26	BA will Back fill the cable excvation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	15	3,000.00
27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	24	4,320.00
28	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	2	10,260.00
29	Centring and shuttering including strutting, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	89	26,789.00
30	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1503	1,63,827.00
31	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	53	14,946.00
32	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	1	6,039.61
33	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work	Cum	7,316.00	19	1,39,004.00
34	Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	2	2,000.00
K	Total Civil & Services				14,14,057.43
L	Total (J+K)				2,16,67,179.56
M	Other overheads (Including 6% supervision charges) of L				13,00,030.77
N	Sub Total (L+M)				2,29,67,210.33
O	Total GST @ 18% of (N)				41,34,097.86
P	CESS 1% of N				2,29,672.10
Q	Gross Total Material +Services (N+O+P)				2,73,30,980.29
R	Gross Total Material +Services (in cr.)				2.73

ANNEXURE-13.3			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		BCDD-2	
Name of the Sub-Division : -		Nayapalli	
Name of the Work :-		Mitigation of 33/11kV PTR Overloading	
Scope:-		Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Sainik School 33/11kV PSS with other civil works.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
<u>ABSTRACT OF ESTIMATE</u>			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Sainik School 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-13.3					
Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Sainik School PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)					
1	12.5/16 MVA, 33/11 KV Power Transformer with OLTC	Nos.	1,65,67,796.00	1	1,65,67,796.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr.	KG	93.00	150.00	13,950.00
3	40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long	No	1,289.60	5	6,448.00
4	GI Nuts & Bolts of Assorted size	Kg	96.72	50.00	4,836.00
5	Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable	km	10,22,940.00	0.072	73,651.68
6	Supply of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, HT UG cable	EA	5,014.00	6	30,084.00
7	Supply of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, HT UG cable	EA	4,901.00	6	29,406.00
8	Channel 100X50X6mm, 9.56 KG/Mtr.	KG	93.00	250	23,250.00
9	SWITCH GEAR PANEL BOARD 11kV I/D VCB	No.	-		-
A	Total Cost of materials				1,67,49,421.68
B	Stock, Storage & Insurance i.e 3% of A				5,02,482.65
C	Sub Total (A+B)				1,72,51,904.33
D	Contingency @ 3% of C				5,17,557.13
E	Tools & Plants @ 2% of C				3,32,196.64
F	Transportation @ 7.5% of C				12,93,892.82
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				8,53,241.49
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)				4,329.71
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kV				-
J	Sum of (C to I)				2,02,53,122.13
Civil and Services Works (As per Technical Specification)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method .	km	94,500.00	0.072	6,804.00
2	Erection of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation ,soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No	3,700.00	5	18,500.00
	Demolition Work for Existing PTR				-
5	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
6	Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading of same PTR if Required. Insurance during transportation shall be in TPCODL scope.	EA	75,900.00	1	75,900.00
7	Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane , charges for crane will be paid separately.	EA	4,217.00	1	4,217.00
	Civil Work for New PTR				-
8	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinerv for excavation of cable trench & other civil works.	Cum	482.00	20	9,640.00

Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Sainik School PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including getting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth , including consolidating each deposited layers by ramming ,watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil .	Cum	1,305.00	40	52,200.00
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	200.00	10	2,000.00
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	40	7,200.00
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	4	20,520.00
13	Centring and shuttering including strutting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	53	15,953.00
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1750	1,90,750.00
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	800	1,00,800.00
16	BA has to do the installation,welding & fabication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm,75X40X4.6mm etc) as per size requirement	Kg	27.00	400	10,800.00
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	33	9,306.00
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foundations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	2	12,079.22
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material	Cum	6,747.00	12	80,964.00
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work etc., as directed by Engineer-in-Charge.	Cum	7,316.00	25	1,82,900.00
22	Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	17	17,000.00

Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Sainik School PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
23	Supplying, Laying, spreading and compacting stone aggregate of specified sizes: 63 mm to 45 mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of work also includes of jungle such as grass,small tree,plant etc.	Cum	2,235.00	47	1,05,045.00
24	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.	Cum	482.00	12	5,784.00
25	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including getting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	48	62,640.00
26	BA will Back fill the cable excvaton site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	15	3,000.00
27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	24	4,320.00
28	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	2	10,260.00
29	Centring and shuttering including struttting, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	89	26,789.00
30	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1503	1,63,827.00
31	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	53	14,946.00
32	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	1	6,039.61
33	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work	Cum	7,316.00	19	1,39,004.00
34	Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	2	2,000.00
K	Total Civil & Services				14,14,057.43
L	Total (J+K)				2,16,67,179.56
M	Other overheads (Including 6% supervision charges) of L				13,00,030.77
N	Sub Total (L+M)				2,29,67,210.33
O	Total GST @ 18% of (N)				41,34,097.86
P	CESS 1% of N				2,29,672.10
Q	Gross Total Material +Services (N+O+P)				2,73,30,980.29
R	Gross Total Material +Services (in cr.)				2.73

ANNEXURE-13.4			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		BED	
Name of the Sub-Division : -		Temple	
Name of the Work :-		Mitigation of 33/11kV PTR Overloading	
Scope:-		Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mulapadia 33/11kV PSS with other civil works.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mulapadia 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-13.4					
Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Mulapadia PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)					
1	12.5/16 MVA, 33/11 KV Power Transformer with OLTC	Nos.	1,65,67,796.00	1	1,65,67,796.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr.	KG	93.00	150.00	13,950.00
3	40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long	No	1,289.60	5	6,448.00
4	GI Nuts & Bolts of Assorted size	Kg	96.72	50.00	4,836.00
5	Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable	km	10,22,940.00	0.072	73,651.68
6	Supply of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, HT UG cable	EA	5,014.00	6	30,084.00
7	Supply of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, HT UG cable	EA	4,901.00	6	29,406.00
8	Channel 100X50X6mm, 9.56 KG/Mtr.	KG	93.00	250	23,250.00
9	SWITCH GEAR PANEL BOARD 11kV I/D VCB	No.	-		-
A	Total Cost of materials				1,67,49,421.68
B	Stock, Storage & Insurance i.e 3% of A				5,02,482.65
C	Sub Total (A+B)				1,72,51,904.33
D	Contingency @ 3% of C				5,17,557.13
E	Tools & Plants @ 2% of C				3,32,196.64
F	Transportation @ 7.5% of C				12,93,892.82
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				8,53,241.49
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)				4,329.71
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kV				-
J	Sum of (C to I)				2,02,53,122.13
Civil and Services Works (As per Technical Specification)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method .	km	94,500.00	0.072	6,804.00
2	Erection of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation ,soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No	3,700.00	5	18,500.00
	Demolition Work for Existing PTR				-
5	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
6	Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading of same PTR if Required. Insurance during transportation shall be in TPCODL scope.	EA	75,900.00	1	75,900.00
7	Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane , charges for crane will be paid separately.	EA	4,217.00	1	4,217.00
	Civil Work for New PTR				-
8	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.	Cum	482.00	20	9,640.00

Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Mulapadia PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including getting out the excavated materials,returning(refilling) the soil as required in layers not exceeding 200 mm depth , including consolidating each deposited layers by ramming ,watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil .	Cum	1,305.00	40	52,200.00
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	200.00	10	2,000.00
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	40	7,200.00
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	4	20,520.00
13	Centring and shuttering including strutting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	53	15,953.00
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1750	1,90,750.00
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	800	1,00,800.00
16	BA has to do the installation,welding & fabication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm,75X40X4.6mm etc) as per size requirement	Kg	27.00	400	10,800.00
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	33	9,306.00
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foundations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	2	12,079.22
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material	Cum	6,747.00	12	80,964.00
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work etc., as directed by Engineer-in-Charge.	Cum	7,316.00	25	1,82,900.00
22	Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	17	17,000.00

Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Mulapadia PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
23	Supplying, Laying, spreading and compacting stone aggregate of specified sizes: 63 mm to 45 mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of work also includes of jungle such as grass,small tree,plant etc.	Cum	2,235.00	47	1,05,045.00
24	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.	Cum	482.00	12	5,784.00
25	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including getting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	48	62,640.00
26	BA will Back fill the cable excvation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	15	3,000.00
27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	24	4,320.00
28	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	2	10,260.00
29	Centring and shuttering including struttting, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	89	26,789.00
30	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1503	1,63,827.00
31	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	53	14,946.00
32	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	1	6,039.61
33	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work	Cum	7,316.00	19	1,39,004.00
34	Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	2	2,000.00
K	Total Civil & Services				14,14,057.43
L	Total (J+K)				2,16,67,179.56
M	Other overheads (Including 6% supervision charges) of L				13,00,030.77
N	Sub Total (L+M)				2,29,67,210.33
O	Total GST @ 18% of (N)				41,34,097.86
P	CESS 1% of N				2,29,672.10
Q	Gross Total Material +Services (N+O+P)				2,73,30,980.29
R	Gross Total Material +Services (in cr.)				2.73

ANNEXURE-13.5			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		BCDD-2	
Name of the Sub-Division : -		Khandagiri	
Name of the Work :-		Mitigation of 33/11kV PTR Overloading	
Scope:-		Augmentation of 01no. Power Transformer (PTR-3) from 8MVA to 16MVA at Kalinga Nagar 33/11kV PSS with other civil works.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 01no. Power Transformer (PTR-3) from 8MVA to 16MVA at Kalinga Nagar 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-13.5					
Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-3 (Kalinga Nagar PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)					
1	12.5/16 MVA, 33/11 KV Power Transformer with OLTC	Nos.	1,65,67,796.00	1	1,65,67,796.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr.	KG	93.00	150.00	13,950.00
3	40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long	No	1,289.60	5	6,448.00
4	GI Nuts & Bolts of Assorted size	Kg	96.72	50.00	4,836.00
5	Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable	km	10,22,940.00	0.072	73,651.68
6	Supply of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, HT UG cable	EA	5,014.00	6	30,084.00
7	Supply of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, HT UG cable	EA	4,901.00	6	29,406.00
8	Channel 100X50X6mm, 9.56 KG/Mtr.	KG	93.00	250	23,250.00
9	SWITCH GEAR PANEL BOARD 11kV I/D VCB	No.	-		-
A	Total Cost of materials				1,67,49,421.68
B	Stock, Storage & Insurance i.e 3% of A				5,02,482.65
C	Sub Total (A+B)				1,72,51,904.33
D	Contingency @ 3% of C				5,17,557.13
E	Tools & Plants @ 2% of C				3,32,196.64
F	Transportation @ 7.5% of C				12,93,892.82
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				8,53,241.49
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)				4,329.71
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kV				-
J	Sum of (C to I)				2,02,53,122.13
Civil and Services Works (As per Technical Specification)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method .	km	94,500.00	0.072	6,804.00
2	Erection of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation ,soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No	3,700.00	5	18,500.00
	Demolition Work for Existing PTR				-
5	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
6	Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading of same PTR if Required. Insurance during transportation shall be in TPCODL scope.	EA	75,900.00	1	75,900.00
7	Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane , charges for crane will be paid separately.	EA	4,217.00	1	4,217.00
	Civil Work for New PTR				-
8	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinerv for excavation of cable trench & other civil works.	Cum	482.00	20	9,640.00

Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-3 (Kalinga Nagar PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including getting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth , including consolidating each deposited layers by ramming ,watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil .	Cum	1,305.00	40	52,200.00
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	200.00	10	2,000.00
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	40	7,200.00
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	4	20,520.00
13	Centring and shuttering including struttting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	53	15,953.00
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1750	1,90,750.00
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	800	1,00,800.00
16	BA has to do the installation,welding & fabication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm,75X40X4.6mm etc) as per size requirement	Kg	27.00	400	10,800.00
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	33	9,306.00
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	2	12,079.22
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material	Cum	6,747.00	12	80,964.00
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work etc., as directed by Engineer-in-Charge.	Cum	7,316.00	25	1,82,900.00
22	Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	17	17,000.00

Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-3 (Kalinga Nagar PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
23	Supplying, Laying, spreading and compacting stone aggregate of specified sizes: 63 mm to 45 mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of work also includes of jungle such as grass,small tree,plant etc.	Cum	2,235.00	47	1,05,045.00
24	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.	Cum	482.00	12	5,784.00
25	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including getting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	48	62,640.00
26	BA will Back fill the cable excvation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	15	3,000.00
27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	24	4,320.00
28	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	2	10,260.00
29	Centring and shuttering including struttting, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	89	26,789.00
30	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1503	1,63,827.00
31	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	53	14,946.00
32	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	1	6,039.61
33	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work	Cum	7,316.00	19	1,39,004.00
34	Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	2	2,000.00
K	Total Civil & Services				14,14,057.43
L	Total (J+K)				2,16,67,179.56
M	Other overheads (Including 6% supervision charges) of L				13,00,030.77
N	Sub Total (L+M)				2,29,67,210.33
O	Total GST @ 18% of (N)				41,34,097.86
P	CESS 1% of N				2,29,672.10
Q	Gross Total Material +Services (N+O+P)				2,73,30,980.29
R	Gross Total Material +Services (in cr.)				2.73

ANNEXURE-13.6			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		PED	
Name of the Sub-Division : -		Puri-1	
Name of the Work :-		Mitigation of 33/11kV PTR Overloading	
Scope:-		Augmentation of 02nos. Power Transformers (PTR-1 & PTR-2) from 8MVA to 16MVA each at Kacheri 33/11kV PSS with other civil works.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 02nos. Power Transformers (PTR-1 & PTR-2) from 8MVA to 16MVA each at Kacheri 33/11kV PSS with other civil works.	₹ 5,46,61,960.59
		Total Amount	₹ 5,46,61,960.59
		Total Amount (In Cr)	5.47
Total estimated cost is Rs. 5.47 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-13.6					
Augmentation of 2nos. 8 MVA PTR with 16 MVA each Without Switchgear Panel PTR-1 and PTR-2 (Kacheri PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)					
1	12.5/16 MVA, 33/11 KV Power Transformer with OLTC	Nos.	1,65,67,796.00	2	3,31,35,592.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr.	KG	93.00	300.00	27,900.00
3	40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long	No	1,289.60	10	12,896.00
4	GI Nuts & Bolts of Assorted size	Kg	96.72	100.00	9,672.00
5	Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable	km	10,22,940.00	0.144	1,47,303.36
6	Supply of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, HT UG cable	EA	5,014.00	12	60,168.00
7	Supply of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, HT UG cable	EA	4,901.00	12	58,812.00
8	Channel 100X50X6mm, 9.56 KG/Mtr.	KG	93.00	500	46,500.00
9	SWITCH GEAR PANEL BOARD 11kV I/D VCB	No.	-		-
A	Total Cost of materials				3,34,98,843.36
B	Stock, Storage & Insurance i.e 3% of A				10,04,965.30
C	Sub Total (A+B)				3,45,03,808.66
D	Contingency @ 3% of C				10,35,114.26
E	Tools & Plants @ 2% of C				6,64,393.28
F	Transportation @ 7.5% of C				25,87,785.65
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				17,06,482.99
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)				8,659.42
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kV				-
J	Sum of (C to I)				4,05,06,244.25
Civil and Services Works (As per Technical Specification)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method .	km	94,500.00	0.144	13,608.00
2	Erection of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	12	22,809.60
3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	12	22,809.60
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation ,soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No	3,700.00	10	37,000.00
	Demolition Work for Existing PTR				-
5	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	40	30,060.00
6	Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading of same PTR if Required. Insurance during transportation shall be in TPCODL scope.	EA	75,900.00	2	1,51,800.00
7	Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane , charges for crane will be paid separately.	EA	4,217.00	2	8,434.00
	Civil Work for New PTR				

Augmentation of 2nos. 8 MVA PTR with 16 MVA each Without Switchgear Panel PTR-1 and PTR-2 (Kacheri PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
8	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.	Cum	482.00	40	19,280.00
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including getting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth , including consolidating each deposited layers by ramming ,watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil .	Cum	1,305.00	80	1,04,400.00
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	200.00	20	4,000.00
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	80	14,400.00
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	8	41,040.00
13	Centring and shuttering including strutting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	106	31,906.00
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	3500	3,81,500.00
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	1600	2,01,600.00
16	BA has to do the installation,welding & fabication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm,75X40X4.6mm etc) as per size requirement	Kg	27.00	800	21,600.00
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	66	18,612.00
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foundations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	4	24,158.44
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material	Cum	6,747.00	24	1,61,928.00
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	40	30,060.00
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc. as directed by Engineer in Charge	Cum	7,316.00	50	3,65,800.00
22	Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	34	34,000.00

Augmentation of 2nos. 8 MVA PTR with 16 MVA each Without Switchgear Panel PTR-1 and PTR-2 (Kacheri PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
23	Supplying, Laying, spreading and compacting stone aggregate of specified sizes: 63 mm to 45 mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of work also includes of jungle such as grass, small tree, plant etc.	Cum	2,235.00	94	2,10,090.00
24	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.	Cum	482.00	24	11,568.00
25	Excavating trenches of required width and depth for pipe, cables etc including Excavation for sockets including getting out the excavated materials, returning (refill) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	96	1,25,280.00
26	BA will Back fill the cable excvaton site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	30	6,000.00
27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	48	8,640.00
28	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	4	20,520.00
29	Centring and shuttering including strutting, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	178	53,578.00
30	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	3006	3,27,654.00
31	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	106	29,892.00
32	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foundations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	2	12,079.22
33	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work	Cum	7,316.00	38	2,78,008.00
34	Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	4	4,000.00
K	Total Civil & Services				28,28,114.86
L	Total (J+K)				4,33,34,359.11
M	Other overheads (Including 6% supervision charges) of L				26,00,061.55
N	Sub Total (L+M)				4,59,34,420.66
O	Total GST @ 18% of (N)				82,68,195.72
P	CESS 1% of N				4,59,344.21
Q	Gross Total Material +Services (N+O+P)				5,46,61,960.59
R	Gross Total Material +Services (in cr.)				5.47

ANNEXURE-13.7			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		PED	
Name of the Sub-Division : -		Puri-1	
Name of the Work :-		Mitigation of 33/11kV PTR Overloading	
Scope:-		Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Baliapanda 33/11kV PSS with other civil works.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Baliapanda 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-13.7					
Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-2 (Baliapanda PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)					
1	12.5/16 MVA, 33/11 KV Power Transformer with OLTC	Nos.	1,65,67,796.00	1	1,65,67,796.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr.	KG	93.00	150.00	13,950.00
3	40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long	No	1,289.60	5	6,448.00
4	GI Nuts & Bolts of Assorted size	Kg	96.72	50.00	4,836.00
5	Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable	km	10,22,940.00	0.072	73,651.68
6	Supply of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, HT UG cable	EA	5,014.00	6	30,084.00
7	Supply of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, HT UG cable	EA	4,901.00	6	29,406.00
8	Channel 100X50X6mm, 9.56 KG/Mtr.	KG	93.00	250	23,250.00
9	SWITCH GEAR PANEL BOARD 11kV I/D VCB	No.	-		-
A	Total Cost of materials				1,67,49,421.68
B	Stock, Storage & Insurance i.e 3% of A				5,02,482.65
C	Sub Total (A+B)				1,72,51,904.33
D	Contingency @ 3% of C				5,17,557.13
E	Tools & Plants @ 2% of C				3,32,196.64
F	Transportation @ 7.5% of C				12,93,892.82
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				8,53,241.49
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)				4,329.71
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kV				-
J	Sum of (C to I)				2,02,53,122.13
Civil and Services Works (As per Technical Specification)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method .	km	94,500.00	0.072	6,804.00
2	Erection of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation ,soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No	3,700.00	5	18,500.00
	Demolition Work for Existing PTR				-
5	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
6	Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading of same PTR if Required. Insurance during transportation shall be in TPCODL scope.	EA	75,900.00	1	75,900.00
7	Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane , charges for crane will be paid separately.	EA	4,217.00	1	4,217.00
	Civil Work for New PTR				-
8	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinerv for excavation of cable trench & other civil works.	Cum	482.00	20	9,640.00

Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-2 (Baliapanda PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including getting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth , including consolidating each deposited layers by ramming ,watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil .	Cum	1,305.00	40	52,200.00
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	200.00	10	2,000.00
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	40	7,200.00
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	4	20,520.00
13	Centring and shuttering including struttting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	53	15,953.00
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1750	1,90,750.00
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	800	1,00,800.00
16	BA has to do the installation,welding & fabication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm,75X40X4.6mm etc) as per size requirement	Kg	27.00	400	10,800.00
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	33	9,306.00
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	2	12,079.22
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material	Cum	6,747.00	12	80,964.00
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work etc., as directed by Engineer-in-Charge.	Cum	7,316.00	25	1,82,900.00
22	Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	17	17,000.00

Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-2 (Baliapanda PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
23	Supplying, Laying, spreading and compacting stone aggregate of specified sizes: 63 mm to 45 mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of work also includes of jungle such as grass,small tree,plant etc.	Cum	2,235.00	47	1,05,045.00
24	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.	Cum	482.00	12	5,784.00
25	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including getting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	48	62,640.00
26	BA will Back fill the cable excvation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	15	3,000.00
27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	24	4,320.00
28	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	2	10,260.00
29	Centring and shuttering including struttting, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	89	26,789.00
30	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1503	1,63,827.00
31	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	53	14,946.00
32	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	1	6,039.61
33	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work	Cum	7,316.00	19	1,39,004.00
34	Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	2	2,000.00
K	Total Civil & Services				14,14,057.43
L	Total (J+K)				2,16,67,179.56
M	Other overheads (Including 6% supervision charges) of L				13,00,030.77
N	Sub Total (L+M)				2,29,67,210.33
O	Total GST @ 18% of (N)				41,34,097.86
P	CESS 1% of N				2,29,672.10
Q	Gross Total Material +Services (N+O+P)				2,73,30,980.29
R	Gross Total Material +Services (in cr.)				2.73

ANNEXURE-13.8			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		CDD-2	
Name of the Sub-Division : -		Mahanadi Vihar	
Name of the Work :-		Mitigation of 33/11kV PTR Overloading	
Scope:-		Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mahanadi Vihar 33/11kV PSS with other civil works.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Mahanadi Vihar 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-13.8					
Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Mahanadi Vihar PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)					
1	12.5/16 MVA, 33/11 KV Power Transformer with OLTC	Nos.	1,65,67,796.00	1	1,65,67,796.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr.	KG	93.00	150.00	13,950.00
3	40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long	No	1,289.60	5	6,448.00
4	GI Nuts & Bolts of Assorted size	Kg	96.72	50.00	4,836.00
5	Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable	km	10,22,940.00	0.072	73,651.68
6	Supply of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, HT UG cable	EA	5,014.00	6	30,084.00
7	Supply of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, HT UG cable	EA	4,901.00	6	29,406.00
8	Channel 100X50X6mm, 9.56 KG/Mtr.	KG	93.00	250	23,250.00
9	SWITCH GEAR PANEL BOARD 11kV I/D VCB	No.	-		-
A	Total Cost of materials				1,67,49,421.68
B	Stock, Storage & Insurance i.e 3% of A				5,02,482.65
C	Sub Total (A+B)				1,72,51,904.33
D	Contingency @ 3% of C				5,17,557.13
E	Tools & Plants @ 2% of C				3,32,196.64
F	Transportation @ 7.5% of C				12,93,892.82
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				8,53,241.49
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)				4,329.71
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kV				-
J	Sum of (C to I)				2,02,53,122.13
Civil and Services Works (As per Technical Specification)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method .	km	94,500.00	0.072	6,804.00
2	Erection of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation ,soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No	3,700.00	5	18,500.00
	Demolition Work for Existing PTR				-
5	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
6	Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading of same PTR if Required. Insurance during transportation shall be in TPCODL scope.	EA	75,900.00	1	75,900.00
7	Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane , charges for crane will be paid separately.	EA	4,217.00	1	4,217.00
	Civil Work for New PTR				-
8	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.	Cum	482.00	20	9,640.00

Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Mahanadi Vihar PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including getting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth , including consolidating each deposited layers by ramming ,watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil .	Cum	1,305.00	40	52,200.00
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	200.00	10	2,000.00
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	40	7,200.00
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	4	20,520.00
13	Centring and shuttering including strutting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	53	15,953.00
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1750	1,90,750.00
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	800	1,00,800.00
16	BA has to do the installation,welding & fabrication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm,75X40X4.6mm etc) as per size requirement	Kg	27.00	400	10,800.00
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	33	9,306.00
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	2	12,079.22
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material	Cum	6,747.00	12	80,964.00
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work etc., as directed by Engineer-in-Charge.	Cum	7,316.00	25	1,82,900.00
22	Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	17	17,000.00

Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Mahanadi Vihar PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
23	Supplying, Laying, spreading and compacting stone aggregate of specified sizes: 63 mm to 45 mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of work also includes of jungle such as grass, small tree, plant etc.	Cum	2,235.00	47	1,05,045.00
24	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.	Cum	482.00	12	5,784.00
25	Excavating trenches of required width and depth for pipe, cables etc including Excavation for sockets including getting out the excavated materials, returning (refill) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	48	62,640.00
26	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	15	3,000.00
27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	24	4,320.00
28	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	2	10,260.00
29	Centring and shuttering including strutting, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	89	26,789.00
30	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1503	1,63,827.00
31	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	53	14,946.00
32	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foundations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	1	6,039.61
33	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work	Cum	7,316.00	19	1,39,004.00
34	Supplying and spreading, filling other works with fine sand under floors, ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	2	2,000.00
K	Total Civil & Services				14,14,057.43
L	Total (J+K)				2,16,67,179.56
M	Other overheads (Including 6% supervision charges) of L				13,00,030.77
N	Sub Total (L+M)				2,29,67,210.33
O	Total GST @ 18% of (N)				41,34,097.86
P	CESS 1% of N				2,29,672.10
Q	Gross Total Material +Services (N+O+P)				2,73,30,980.29
R	Gross Total Material +Services (in cr.)				2.73

ANNEXURE-13.9			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		CDD-1	
Name of the Sub-Division : -		Sector-6 SDO	
Name of the Work :-		Mitigation of 33/11kV PTR Overloading	
Scope:-		Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Sector-6 (CDA) 33/11kV PSS with other civil works.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 01no. Power Transformer (PTR-2) from 8MVA to 16MVA at Sector-6 (CDA) 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-13.9					
Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-2 (Sector-6 CDA PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)					
1	12.5/16 MVA, 33/11 KV Power Transformer with OLTC	Nos.	1,65,67,796.00	1	1,65,67,796.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr.	KG	93.00	150.00	13,950.00
3	40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long	No	1,289.60	5	6,448.00
4	GI Nuts & Bolts of Assorted size	Kg	96.72	50.00	4,836.00
5	Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable	km	10,22,940.00	0.072	73,651.68
6	Supply of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, HT UG cable	EA	5,014.00	6	30,084.00
7	Supply of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, HT UG cable	EA	4,901.00	6	29,406.00
8	Channel 100X50X6mm, 9.56 KG/Mtr.	KG	93.00	250	23,250.00
9	SWITCH GEAR PANEL BOARD 11kV I/D VCB	No.	-		-
A	Total Cost of materials				1,67,49,421.68
B	Stock, Storage & Insurance i.e 3% of A				5,02,482.65
C	Sub Total (A+B)				1,72,51,904.33
D	Contingency @ 3% of C				5,17,557.13
E	Tools & Plants @ 2% of C				3,32,196.64
F	Transportation @ 7.5% of C				12,93,892.82
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				8,53,241.49
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)				4,329.71
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kV				-
J	Sum of (C to I)				2,02,53,122.13
Civil and Services Works (As per Technical Specification)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method .	km	94,500.00	0.072	6,804.00
2	Erection of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation ,soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No	3,700.00	5	18,500.00
	Demolition Work for Existing PTR				-
5	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
6	Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading of same PTR if Required. Insurance during transportation shall be in TPCODL scope.	EA	75,900.00	1	75,900.00
7	Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane , charges for crane will be paid separately.	EA	4,217.00	1	4,217.00
	Civil Work for New PTR				-
8	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinerv for excavation of cable trench & other civil works.	Cum	482.00	20	9,640.00

Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-2 (Sector-6 CDA PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including getting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth , including consolidating each deposited layers by ramming ,watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil .	Cum	1,305.00	40	52,200.00
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	200.00	10	2,000.00
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	40	7,200.00
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	4	20,520.00
13	Centring and shuttering including struttting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	53	15,953.00
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1750	1,90,750.00
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	800	1,00,800.00
16	BA has to do the installation,welding & fabication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm,75X40X4.6mm etc) as per size requirement	Kg	27.00	400	10,800.00
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	33	9,306.00
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	2	12,079.22
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material	Cum	6,747.00	12	80,964.00
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work etc., as directed by Engineer-in-Charge.	Cum	7,316.00	25	1,82,900.00
22	Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	17	17,000.00

Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-2 (Sector-6 CDA PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
23	Supplying, Laying, spreading and compacting stone aggregate of specified sizes: 63 mm to 45 mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of work also includes of jungle such as grass,small tree,plant etc.	Cum	2,235.00	47	1,05,045.00
24	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.	Cum	482.00	12	5,784.00
25	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including getting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	48	62,640.00
26	BA will Back fill the cable excvation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	15	3,000.00
27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	24	4,320.00
28	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	2	10,260.00
29	Centring and shuttering including struttting, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	89	26,789.00
30	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1503	1,63,827.00
31	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	53	14,946.00
32	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	1	6,039.61
33	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work	Cum	7,316.00	19	1,39,004.00
34	Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	2	2,000.00
K	Total Civil & Services				14,14,057.43
L	Total (J+K)				2,16,67,179.56
M	Other overheads (Including 6% supervision charges) of L				13,00,030.77
N	Sub Total (L+M)				2,29,67,210.33
O	Total GST @ 18% of (N)				41,34,097.86
P	CESS 1% of N				2,29,672.10
Q	Gross Total Material +Services (N+O+P)				2,73,30,980.29
R	Gross Total Material +Services (in cr.)				2.73

ANNEXURE-13.10			
TP CENTRAL ODISHA DISTRIBUTION LIMITED			
Name of the Division :-		ANED	
Name of the Sub-Division : -		Angul	
Name of the Work :-		Mitigation of 33/11kV PTR Overloading	
Scope:-		Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Hemsurpada 33/11kV PSS with other civil works.	
Names of Schemes: -		TPCODL CAPEX (FY 23-24)	
ABSTRACT OF ESTIMATE			
Sl. No.	Part	Description	Amount
1	A	Augmentation of 01no. Power Transformer (PTR-1) from 8MVA to 16MVA at Hemsurpada 33/11kV PSS with other civil works.	₹ 2,73,30,980.29
		Total Amount	₹ 2,73,30,980.29
		Total Amount (In Cr)	2.73
Total estimated cost is Rs. 2.73 Crore. (On TPCODL Capex Scheme)			

ANNEXURE-13.10					
Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Hemsurpada PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS (As per Technical Specification)					
1	12.5/16 MVA, 33/11 KV Power Transformer with OLTC	Nos.	1,65,67,796.00	1	1,65,67,796.00
2	50x6mm GI Flat for earthing, 2.36kg/mtr.	KG	93.00	150.00	13,950.00
3	40mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr. long	No	1,289.60	5	6,448.00
4	GI Nuts & Bolts of Assorted size	Kg	96.72	50.00	4,836.00
5	Supply of 11kV, 1Core, 630sqmm, XLPE insulation armoured UG cable	km	10,22,940.00	0.072	73,651.68
6	Supply of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1Core, 630 sqmm, HT UG cable	EA	5,014.00	6	30,084.00
7	Supply of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, HT UG cable	EA	4,901.00	6	29,406.00
8	Channel 100X50X6mm, 9.56 KG/Mtr.	KG	93.00	250	23,250.00
9	SWITCH GEAR PANEL BOARD 11kV I/D VCB	No.	-		-
A	Total Cost of materials				1,67,49,421.68
B	Stock, Storage & Insurance i.e 3% of A				5,02,482.65
C	Sub Total (A+B)				1,72,51,904.33
D	Contingency @ 3% of C				5,17,557.13
E	Tools & Plants @ 2% of C				3,32,196.64
F	Transportation @ 7.5% of C				12,93,892.82
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				8,53,241.49
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)				4,329.71
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kV				-
J	Sum of (C to I)				2,02,53,122.13
Civil and Services Works (As per Technical Specification)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Laying, Commissioning, Testing of 11kV, 1 core, 630sqmm, aluminium, XLPE insulation armoured (extruded type) UG cable by open trench method .	km	94,500.00	0.072	6,804.00
2	Erection of Indoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
3	Erection of Outdoor termination kits Heat Shrinkable type suitable for 11kV, 1 Core, 630 sqmm, aluminium UG cable kits for 3core (set)	Set	1,900.80	6	11,404.80
4	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation ,soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No	3,700.00	5	18,500.00
	Demolition Work for Existing PTR				-
5	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
6	Dismantling of 12.5/8MVA 33/11kV PTR, Loading, Transportation within 30 Kms, Unloading of same PTR if Required. Insurance during transportation shall be in TPCODL scope.	EA	75,900.00	1	75,900.00
7	Transportation of various items from TPCODL store/site to other site or vice versa in TPCODL operational area - Tractor with labours as required (price per trip). Scope of work also include loading and unloading of materials heavy items like, Rail Pole, PCC Pole, HT Panel, Transformer, Cable Drum, LT Board . Item whose loading& unloading is to be done with crane , charges for crane will be paid separately.	EA	4,217.00	1	4,217.00
	Civil Work for New PTR				-
8	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinerv for excavation of cable trench & other civil works.	Cum	482.00	20	9,640.00

Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Hemsurpada PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
9	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including getting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth , including consolidating each deposited layers by ramming ,watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil .	Cum	1,305.00	40	52,200.00
10	BA will Back fill the cable excavation site with same earth. BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	200.00	10	2,000.00
11	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	40	7,200.00
12	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	4	20,520.00
13	Centring and shuttering including struttting , propping etc.and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	53	15,953.00
14	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1750	1,90,750.00
15	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete. (Scope also include supply of material)	Kg	126.00	800	1,00,800.00
16	BA has to do the installation,welding & fabication work of different size GI Channel (100x50x6mm, 75x75x6mm, 50x50x6mm,75X40X4.6mm etc) as per size requirement	Kg	27.00	400	10,800.00
17	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine :50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	33	9,306.00
18	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	2	12,079.22
19	Brick work with F.P.S. bricks of class designation 75 in foundation and plinth in Cement mortar 1:4 (1 Cement : 4 Coarse sand) as per TPCODL specification. Scope includes supply of all material	Cum	6,747.00	12	80,964.00
20	BA will demolish PCC & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.BA will provide necessary Tools,Machinery & Manpower for the activity.	Cum	751.50	20	15,030.00
21	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machineries required for the work etc., as directed by Engineer-in-Charge.	Cum	7,316.00	25	1,82,900.00
22	Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	17	17,000.00

Augmentation of 1no. 8 MVA PTR with 16 MVA Without Switchgear Panel PTR-1 (Hemsurpada PSS)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount (in Rs.)
23	Supplying, Laying, spreading and compacting stone aggregate of specified sizes: 63 mm to 45 mm size stone aggregate to WBM specifications in uniform thickness, hand picking to proper grade and camber, applying and brooming requisite type of screening / binding material to fill up interstices of coarse aggregate, watering and compacting to the required density. Scope of work also includes of jungle such as grass,small tree,plant etc.	Cum	2,235.00	47	1,05,045.00
24	BA will excavate the cable trench depth upto 2.5 MTR & remove the debris using necessary tools & machinery for excavation of cable trench & other civil works.	Cum	482.00	12	5,784.00
25	Excavating trenches of required width and depth for pipe,cables etc including Excavation for sockets including getting out the excavated materials,returning(refillig) the soil as required in layers not exceeding 200 mm depth, including consolidating each deposited layers by ramming, watering etc, stacking servicable materials for measurements and disposal of unservicable materials as direct by EIC for laying of different size of cable/pipes laying. Scope of work excludes laying of HUME/PVC Pipes as per TPCODL drawing in Rocky soil.	Cum	1,305.00	48	62,640.00
26	BA will Back fill the cable excvation site with same earth. BA will provide necessary Tools, Machinery & Manpower for the activity.	Cum	200.00	15	3,000.00
27	BA will provide hard Barricading with zebra strip one use for cable excavation site for safety of the employees & pedestrians	Mtr	180.00	24	4,320.00
28	Providing and laying Plain Cement Concrete (PCC) of proportion (1:3:6) in foundations, Trench and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	5,130.00	2	10,260.00
29	Centring and shuttering including struttting, propping etc. and removal of form for Foundations, footings, bases of columns etc. for mass concrete	Sqm	301.00	89	26,789.00
30	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all copmplete, cold twisted bars/TMT as per TPCODL specification (Scope also include supply of material)	Kg	109.00	1503	1,63,827.00
31	12 mm Cement Plaster of mix - 1:4 (1 Cement : 4 Fine sand (50 % fine : 50% coarse) as per as per TPCODL specification. Scope includes supply of all material.	Sqm	282.00	53	14,946.00
32	Providing and laying Plain Cement Concrete (PCC) of proportion (1:2:4) in foudations and plinths using approved quality of cement, 20mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work etc., as directed by Engineer-in-Charge.	Cum	6,039.61	1	6,039.61
33	Providing and laying Reinforced Cement Concrete (RCC) of proportion M25 (as per design mix) from RMC Batching Plant, using approved quality of cement, 20mm & 10mm size hard crusher broken granite stone metal and screened, washed sharp sand for mortar of approved quality and from approved quarry, including hoisting, lowering, laying concrete, ramming, watering and curing etc. complete to required levels in layers not exceeding 15cm thick in each layer including cost, conveyance, loading, unloading, royalties and taxes, cess, of all materials & cost of all labours, sundries, T&P and all other machinaries required for the work	Cum	7,316.00	19	1,39,004.00
34	Supplying and spreading, filling other works with fine sand under floors,ground etc as per EIC instruction. Scope of work also includes watering, ramming, consolidating and dressing complete and other works if required at site.	Cum	1,000.00	2	2,000.00
K	Total Civil & Services				14,14,057.43
L	Total (J+K)				2,16,67,179.56
M	Other overheads (Including 6% supervision charges) of L				13,00,030.77
N	Sub Total (L+M)				2,29,67,210.33
O	Total GST @ 18% of (N)				41,34,097.86
P	CESS 1% of N				2,29,672.10
Q	Gross Total Material +Services (N+O+P)				2,73,30,980.29
R	Gross Total Material +Services (in cr.)				2.73

Annexure-14 DT Augmentation			
Sl. No.	Description	Quantity (in nos.)	Amount (in cr.)
1	100kVA to 250kVA	43	5.51
2	250kVA to 500kVA	20	4.49
Total			10.00

100kVA to 250kVA (DT Augmentation)					
	No. of DP Mounted DSS (Ref. Drawing No.- TPCODL-.....)	1			
	<u>MATERIALS FOR DP Mounted DSS</u>				
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS					
1	250 KVA , 11/ 0.4 KV (Cu) Transformer with Tap Changer BIS Energy level II	Nos.	5,73,210.00	1	5,73,210.00
2	LT Distribution Box with MCCB, Aluminium Busbar for 3 Bay with kit kat fuse for 250 KVA S/S	Nos.	1,30,000.00	1	1,30,000.00
3	Lightning Arrester(12KV,10KA) Station Class 2	Nos.	4,402.00	3	13,206.00
4	1 Cx 400 mm2 LT XLPE Cable(Un-Armoured)	Mtr.	359.66	120	43,159.20
5	40 mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr .Long	No	1,302.00	7	9,114.00
6	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5x7 mtr. For mesh formation, 12 Mtr. For LA and 2.5 mtr. For raising, 11 mtr for AB switch, 2.8 mtr for DD Fuse, 5x2 mtr. for DTR Nutral, (1.3+4.5) mtr. For DTR Body, 0.500 mtr for LTDB & AB Switch operating handle, 3 mtr. for Fencing) (Each 65.6x 2.36= 154.82 Kg)	KG	93.00	154.82	14,397.89
A	Total Cost of materials				7,83,087.09
B	Stock, Storage & Insurance i.e 3% of A				23,492.61
C	Sub Total (A+B)				8,06,579.70
D	Contigency @ 3% of C				24,197.39
E	Tools & Plants @ 2% of C				16,131.59
F	Transportation @ 7.5% of C				60,493.48
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				29,520.32
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)				20,678.60
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				9,57,601.08

Civil and Services Works (As per Technical Specification)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation ,soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No	3,700.00	7	25,900.00
2	LTDB Plinth	NO	3,000.00	1	3,000.00
3	DTR Plinth	No.	25,000.00	1	25,000.00
4	Dismantling				-
i	Dismantling of 100kVA transformer	EA	3,189.60	1	3,189.60
ii	Dismantling of Channel	kg	7.92	100	792.00
iii	Dismantling of LA	EA	50.00	3	150.00
iv	Dismantling of LTDB	EA	550.00	1	550.00
K	Total Civil & Services				58,581.60
L	Total (J+K)				10,16,182.68
M	Other overheads (Including 6% supervision charges) of L				60,970.96
N	Sub Total (L+M)				10,77,153.64
O	Total GST @ 18% of (N)				1,93,887.65
P	Total CESS @ 1%of (N)				10,771.54
Q	Gross Total Material +Services (N+O+P)				12,81,812.83

250kVA to 500kVA (DT Augmentation)					
	No. of DP Mounted DSS (Ref. Drawing No.- TPCODL-.....)		1		
	MATERIALS FOR DP Mounted DSS				
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
SUPPLY OF FOLLOWING EQUIPMENT & MATERIALS					
1	500 KVA , 11/ 0.4 KV (Cu) Transformer with Tap Changer BIS Energy level II	Nos.	11,62,260.00	1	11,62,260.00
2	LT Distribution Box with MCCB, Aluminium Busbar for 3 Bay with kit kat fuse for 500 KVA S/S	Nos.	1,70,000.00	1	1,70,000.00
3	Lightning Arrester(12KV,10KA) Station Class 2	Nos.	4,402.00	3	13,206.00
4	1 Cx 400 mm2 LT XLPE Cable(Un-Armoured)	Mtr.	359.66	180	64,738.80
5	40 mm Nominal bore GI pipe (medium gauge) earthing device with 3 mtr .Long	No	1,302.00	7	9,114.00
6	50x6mm GI Flat for earthing, 2.36kg/mtr., (2.5x7 mtr. For mesh formation, 12 Mtr. For LA and 2.5 mtr. For raising, 11 mtr for AB switch, 2.8 mtr for DD Fuse, 5x2 mtr. for DTR Nutral, (1.3+4.5) mtr. For DTR Body, 0.500 mtr for LTDB & AB Switch operating handle, 3 mtr. for Fencing) (Each 65.6x 2.36= 154.82 Kg)	KG	93.00	154.82	14,397.89
A	Total Cost of materials				14,33,716.69
B	Stock, Storage & Insurance i.e 3% of A				43,011.50
C	Sub Total (A+B)				14,76,728.19
D	Contingency @ 3% of C				44,301.85
E	Tools & Plants @ 2% of C				29,534.56
F	Transportation @ 7.5% of C				1,10,754.61
G	Erection Charges @ 5% on Trf/Breaker/WPB/ H-Pole				59,856.39
H	Erection Charges @ 10% of C (except Trf/Breaker/WPB/ H-Pole/HT stay set/PSC Pole)				27,021.30
I	Erection Charges @ 20% of PSC pole- Not to be used for 33kv				-
J	Sum of (C to I)				17,48,196.90

Civil and Services Works (As per Technical Specification)					
Sl. No.	Description of Materials	Unit	Unit Rate	Total Quantity	Total Amount
1	Construction Earthing chamber including installation of earthing pipe.Making earthing chamber including excavation ,soil treatment with bentonide powder , calculation of earth resistance, including Installation of 3Mtr GI Pipe 40mm/50mm including welding of GI flat around pipe . BA has to supply of charcoal.etc with brick masanory (1:5), PCC (1:4:8) d with cast iron cover. size of the pit 450mmx450mmx600mm depth as per direction of engineer in charge. Supply of GI Pipe 40mm dia 3Mtr long is in scope of TPCODL.The installation will be done as per TPCODL drawing	No	3,700.00	7	25,900.00
2	Dismantling				-
i	Dismantling of 250kVA transformer	EA	4,794.30	1	4,794.30
ii	Dismantling of LTDB	EA	550.00	1	550.00
K	Total Civil & Services				31,244.30
L	Total (J+K)				17,79,441.20
M	Other overheads (Including 6% supervision charges) of L				1,06,766.47
N	Sub Total (L+M)				18,86,207.67
O	Total GST @ 18% of (N)				3,39,517.38
P	Total CESS @ 1%of (N)				18,862.08
Q	Gross Total Material +Services (N+O+P)				22,44,587.13

Teseting Equipment	Make	Model	Mfg year	Defective since	Type of defect	Quantity	Circle
Transformer Turn Ratio meter	Sivananda	ATRM-1(μp)			NOT known		BBSR2
Insulation Tester	SONEL	MIC 5010			NOT known		BBSR2
	SONEL	MIC 5010			NOT known		BBSR2
	WACO				NOT known		BBSR2
Earth Tester	Motwane	DET-20			NOT known		BBSR2
Clamp on meter	Metrix	1250 AC			NOT known		BBSR2
	Metrix	1250 AC			NOT known		BBSR2
	Metrix	1250 AC			NOT known		BBSR2
	Metrix	1250 AC			NOT known		BBSR2
	Fluke	302+			NOT known		BBSR2
	TES	3010			NOT known		BBSR2
	Rishabh instrument pvt. Ltd.	1000A			NOT known		BBSR2
Oil Testing Kit	NTPL				NOT known		BBSR2
Digital clamp meter	Metrix	DT-1250	N/A	2019	NOT known	2	CTC
Analog multimeter	Motwane	N/A	N/A	2007	NOT known	1	CTC
Transformer ratio meter	LTEL Industrie	TRM-100	12.01.2007	2016	NOT known	1	CTC
Motorised megger(2.5 KV)	Riken	MV5250 XT	N/A	2007	NOT known	2	CTC
Motorised megger(5 KV)	MEGGER	model serie	N/A	2013	NOT known	1	CTC
Digital earth tester	CIE	DET-2000	N/A	2007	NOT known	1	CTC
Digital earth tester	MOTWANE	DET-20	N/A	2013	NOT known	1	CTC
Analog earth tester	CIE	N/A	N/A	2007	NOT known	1	CTC
Secondary injection kit	PCI ltd	SVERKER 750	N/A	2015	NOT known	1	CTC
Field transformer oil testing kit	N/A	N/A	N/A	N/A	NOT known	1	CTC
Insulation tester(megger 5 KV)	Sonel	MIC 5010	Jul-13	2020	Battery defective	1	CTC
Digital earth tester	gabras labora	MTD20KWe	N/A	2019	NOT known	1	CTC
Insulation tester(megger 5 KV)	MEGGER	MIT520/2	24.11.2017	2017	NOT known	1	CTC
Winding resistance meter	SCOPE pvt ltd	TRM 104	N/A	N/A	NOT known	1	CTC
Secondary injection kit	ISA	T1000 Plus	NA	NA	Manfunctioning	1	DKL
IR Tester	Sonel	MIC-5010	2013	2019	1.No Battery Back up. 2.One no.Testing terminal damaged.	1	BBSR1
IR Tester	MEGGER	MIT-520/2	NA	2019	1. No Battery Back up. 2. One no.Testing terminal damaged.	1	BBSR1
IR Tester	CIE(1KV)	CIF/444	NA	2015	Abnormal Reading	1	BBSR1
IR Tester	WACO(5 KV)	SH Model,Serie s-1	1998	2010	Abnormal Reading	1	BBSR1
IR Tester	WACO(1KV)	NA	NA	2010	Abnormal Reading	1	BBSR1
BDV Kit	Sivananda	OTS-100M	2013	2018	Abnormal Reading	1	BBSR1
BDV Kit	Motwane	IS-6792	1992	2012	Abnormal Reading	1	BBSR1
BDV Kit(ODSSP-Vanivihar)	Motwane		2016	2020	Variac Problem	1	BBSR1
Turns Ratio Meter	Eltel	TRM-200	2003	2013	Abnormal Reading	1	BBSR1
Winding Resistance Meter	Eltel	TWRM-10	2003	2011	Display Fluctuating & Abnormal reading.	1	BBSR1
Earth Resistance Tester	AVO	DT-3/2	NA	NA	Abnormal Reading	1	BBSR1
Single Phase Wattmeter	WNP	NA	NA	2011	Damaged	1	BBSR1
Single Phase Wattmeter	WNP	NA	NA	2011	Damaged	1	BBSR1
Cable Fault Locator	WNP	NA	NA	2011	Damaged	1	BBSR1
Clamp Meter	Motwane	-----	NA	2015	Damaged	1	BBSR1
Clamp Meter	Metravi	-----	NA	2015	Damaged	3	BBSR1
Clamp Meter	WACO	-----	NA	2015	Damaged	1	BBSR1
Clamp Meter	Metrix	1250A	NA	2018	Damaged	2	BBSR1
Clamp Meter	TES	TES-3010	NA	2015	Damaged	3	BBSR1