



# Annual Business Plan

For

**FY 2021-22**

Submitted By

**TP Northern Odisha Distribution Ltd**



S. No.	Particulars	Page No.
	<b>Glossary</b>	<b>4</b>
<b>1</b>	<b>Executive Summary</b>	<b>7</b>
<b>2</b>	<b>Existing System - Key Challenges</b>	<b>10</b>
2.1	Statutory & Safety	17
2.2	Dilapidated Network	19
2.3	Operational Inefficiencies	20
2.4	AT&C Loss	23
2.5	Outdated Technology	25
2.6	Customer Services	26
2.7	Human Resource	27
2.8	Poor Civil Infrastructure	28
<b>3</b>	<b>Initiatives Proposed in FY 20-21</b>	<b>30</b>
3.1	Network Refurbishment	30
3.2	Structured Maintenance	31
3.3	AT&C Loss reduction	35
3.4	Technology adoption	38
3.5	Customer services	40
3.6	Human Resource Plan	43
3.7	Strengthening Civil Infrastructure	53
<b>4</b>	<b>Capital Expenditure Plan</b>	<b>56</b>
4.1	Statutory & Safety Compliance	58
4.2	Loss Reduction	64
4.3	Network Reliability	68
4.4	Load Growth	79
4.5	Technology & Infrastructure	82

<b>S. No.</b>	<b>Particulars</b>	<b>Page No.</b>
4.6	Project Execution Plan	101
<b>5</b>	<b>Operation and Maintenance Expenses</b>	<b>105</b>
5.1	Employee Cost	106
5.2	R&M Expenses	107
5.3	A&G Expenses	117
<b>6</b>	<b>Procurement Plan</b>	<b>125</b>
<b>7</b>	<b>Power Purchase Plan</b>	<b>127</b>
<b>8</b>	<b>Financial Plan</b>	<b>128</b>
<b>9</b>	<b>Human Resource Plan</b>	<b>Separate Booklet</b>
<b>10</b>	<b>Submission</b>	

Glossary		Glossary	
<b>AB SWITCH</b>	Air Break Switch	<b>MBC</b>	Metering Billing and Collection
<b>AC</b>	Alternating Current	<b>MCC</b>	Master Control Centre
<b>ADMS</b>	Advanced Distribution Management System	<b>MCCB</b>	Moulded Case Circuit breaker
<b>AMC</b>	Annual Maintenance Contract	<b>MM</b>	Material Management
<b>AMI</b>	Automatic Meter Infrastructure	<b>MMG</b>	Meter Management Group
<b>AMR</b>	Automated Meter Reading	<b>MPG</b>	Maintenance Planning Group
<b>APS</b>	Area Power System	<b>MPLS</b>	Multi-Protocol Label Switching
<b>AT&amp;C</b>	Aggregate Technical and Commercial	<b>MRT</b>	Meter Reading & Testing
<b>BA</b>	Business Associate	<b>MS</b>	Microsoft
<b>BCC</b>	Backup Control Centre	<b>MTTR</b>	Mean Time to Repair
<b>BO</b>	Business Output	<b>MU</b>	Million Unit
<b>BPL</b>	Below Poverty Limit	<b>MV</b>	Medium Voltage
<b>BW</b>	Business Warehouse	<b>MVA</b>	Mega Volt Ampere
<b>CAIDI</b>	Customer Average Interruption Duration Index	<b>MW</b>	Mega Watt
<b>CAPA</b>	Corrective Action and Preventive Action	<b>NABL</b>	National Accreditation Board for Testing and Calibration Laboratories
<b>CAPEX</b>	Capital Expenditure	<b>NCC</b>	No Current Complaint
<b>CC</b>	Control Centre	<b>NESCO</b>	North Eastern Electricity supply Company of Odisha Ltd.
<b>CIS</b>	Customer Information System	<b>O&amp;M</b>	Operation & Maintenance
<b>Ckt.KM</b>	Circuit Kilo meters	<b>ODSSP</b>	Odisha Distribution System Strengthening Project
<b>COTS</b>	Commercial of the shelf	<b>OEM</b>	Original Equipment Manufacturer
<b>COVID</b>	Corona Virus Disease	<b>OERC</b>	Odisha Electricity Regulatory Commission
<b>CPSCC</b>	Central Power System Control Centre	<b>OSOR</b>	Odisha Schedule of Rate
<b>CRM</b>	Customer Relationship Management	<b>O/H</b>	Over head
<b>CSR</b>	Corporate Social Responsibility	<b>OMS</b>	Outage Management System
<b>CT</b>	Current Transformer	<b>OPEX</b>	Operational Expenditure

<b>CWIP</b>	Current Work In Progress	<b>OPGW</b>	Optical Ground Wire
<b>CYMDIST</b>	Distribution System Analysis Package of CYME	<b>OPTCL</b>	Odisha Power Transmission Corporation Limited
<b>DC</b>	Direct Current	<b>OS</b>	Operating System
<b>DCP</b>	Data Collection Point	<b>OT</b>	Operational Technology
<b>DD</b>	Drop Down	<b>PBMC</b>	Performance Based Maintenance Contracts
<b>DMS</b>	Distribution Management System	<b>PC</b>	Personal Computer
<b>DPR</b>	Detailed Project Report	<b>PGCIL</b>	Power Grid Corporation of India Limited
<b>DSS</b>	Distribution Sub-Station	<b>PoC</b>	Proofing of Concept
<b>DT</b>	Distribution Transformer	<b>POSH</b>	Policy on Sexual Harassment
<b>EHT</b>	Extra High Tension	<b>PP</b>	Production Planning
<b>ELCB</b>	Earth Leakage Circuit Breaker	<b>PSC</b>	Power System Control
<b>EPC</b>	Engineering Procurement and Construction	<b>PT</b>	Potential Transformer
<b>ERP</b>	Enterprise Resource Planning	<b>PTR</b>	Power Transformer
<b>FCC</b>	Fuse Call Centre	<b>PTW</b>	Permit To Work
<b>FPI</b>	Fault Passage Indicator	<b>RoW</b>	Right of Way
<b>FY</b>	Financial Year	<b>R&amp;R</b>	Reward & Recognition
<b>GIGO</b>	Garbage in, garbage out	<b>RCA</b>	Root Cause Analysis
<b>GIS</b>	Geographical Information System	<b>RMU</b>	Ring Main Unit
<b>Gol</b>	Government of India	<b>SAIDI</b>	System Average Interruption Duration Index
<b>GoO</b>	Government of Odisha	<b>SAIFI</b>	System Average Interruption Frequency Index
<b>GRIDCO</b>	Grid Corporation of Odisha	<b>SAP</b>	System Application and Products
<b>GSAS</b>	Grid Station Automation System	<b>SBM</b>	Spot Billing Module
<b>GSS</b>	Grid Sub Station	<b>SCADA</b>	Supervisory Control and Data Acquisition
<b>HMC</b>	Hub Maintenance Crew	<b>SD</b>	Sales and Distribution
<b>HT</b>	High Tension	<b>SDO</b>	Sub Divisional Officer
<b>HTCT</b>	High Tension Current Transformer	<b>SHG</b>	Self help Group
<b>HVAC</b>	Heating, Ventilation and Air Conditioning	<b>SITC</b>	Supply Installation Testing and Commissioning
<b>HVDS</b>	High Voltage Distribution System	<b>SLA</b>	Service Level Agreement

<b>IEC</b>	International Electro technical Commission	<b>SLDC</b>	State Load Dispatch Centre
<b>IED</b>	Intelligent Electronic Devices	<b>SLMC</b>	System Line Maintenance Crew
<b>IEMS</b>	Input Energy Monitoring System	<b>SMC</b>	Substation Maintenance Crew
<b>IMS</b>	Integrated Management System	<b>SMS</b>	Short Message Service
<b>IPDS</b>	Integrated Power development scheme	<b>SOP</b>	Standard Operating Procedure
<b>ISU</b>	Industry Specific Solution Utility	<b>SSL</b>	Secure Sockets Layer
<b>IT</b>	Information Technology	<b>STS</b>	Sub Transmission System
<b>ITIA</b>	IT Implementation Agency	<b>STS</b>	Sub transmission system
<b>JE</b>	Junior Engineer	<b>T&amp;D</b>	Training & Development
<b>KM</b>	Kilo meter	<b>TBEM</b>	TATA Business Excellence Model
<b>KV</b>	Kilo Volt	<b>TCOC</b>	TATA Code of Conduct
<b>KVA</b>	Kilo Volt Ampere	<b>TPCODL</b>	TP Central Odisha Distribution Limited
<b>LDMS</b>	Local Data Monitoring System	<b>TPWODL</b>	Tata Power western Odisha Ltd.
<b>LT</b>	Low Tension	<b>U/G</b>	Under Ground
<b>LTCT</b>	Low Tension Current Transformer	<b>UPS</b>	Uninterrupted Power Supply
<b>LV</b>	Low Voltage	<b>VPN</b>	Virtual Private Network

## 1. Executive Summary

TP Northern Odisha Distribution Limited (TPNODL) is a joint venture of Tata Power (51%) and Govt of Odisha (49%) on the Public-Private Partnership (PPP) model. Govt. of Odisha (GoO)'s share is held by it through its 100% owned company GRIDCO. TPNODL was vested the Utility of NESCO for distributing and retail supply of electricity in the northern part of Odisha, through a Vesting Order issued by the Hon'ble Odisha Electricity Regulatory Commission (OERC). As per the Vesting Order, while TPNODL shall be issued a separate License, presently, the license issued to NESCO has been transferred to TPNODL. The Hon'ble OERC regulates the working of the entire power sector of Odisha state, including determination of tariff chargeable to end consumers and establishing performance norms (mainly related to Loss reduction, Safety, Reliability of power supply and Consumer service delivery).

TPNODL procures power from GRIDCO which is a state owned company, engaged in the business of purchase of electricity in bulk from various generators located inside Odisha and the state share of power from Central generators. GRIDCO supplies power to all power distribution utilities, including TPNODL under the existing Bulk Supply Agreement between TPNODL and the GRIDCO. The power procurement price is the Bulk Supply Price at which GRIDCO supplies power to Distribution utilities which is determined by Hon'ble OERC and apportioned based on the ability of each Discom to pay the energy charges to GRIDCO.

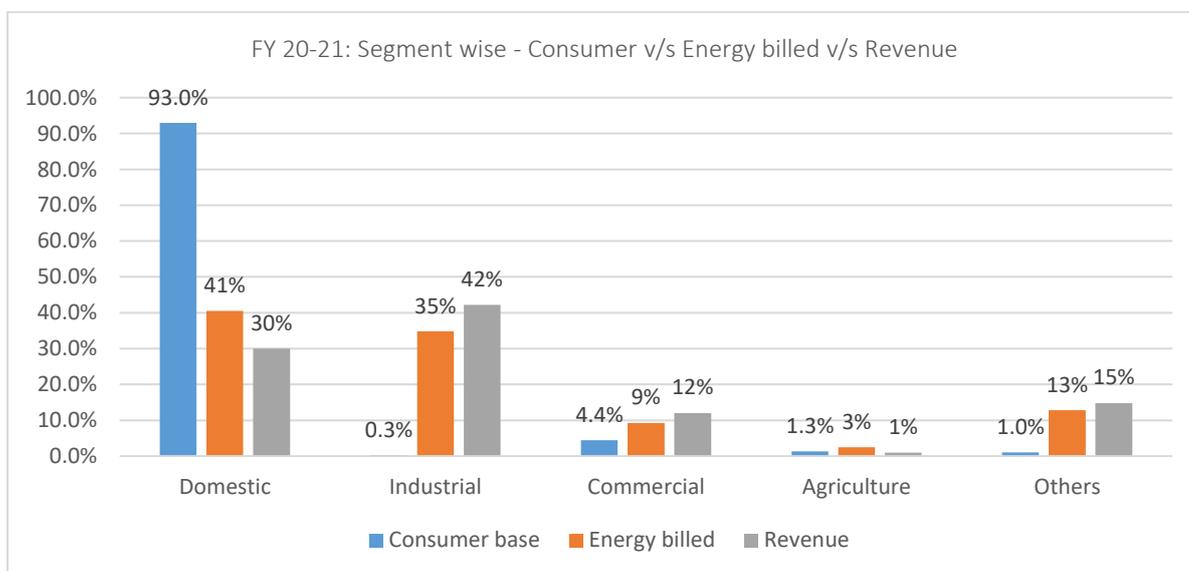
The 100% Government owned Odisha Power Transmission Company Limited (OPTCL) transmits power to TPNODL for which the Transmission Tariff is also determined by the Hon'ble OERC.

TPNODL licensed area is spread over a geography of 27857 Sq.Km and serve the registered consumer base of 1.9 million with a peak load of around 1263 MW. It receives electrical power at a sub transmission voltage of 33KV from OPTCL 220/132/33 kV Grid Substations and then distributes the power at 33KV / 11KV / 440V / 230V depending on the demand of the consumers. For effective operations, the license area is divided into 5 circles which is further sub divided into 16 Divisions, 50 Sub-divisions & 159 Sections which manage the commercial and O&M activities in order to serve its consumers.

In FY 20-21, against the total input energy of 4941 MUs, billed energy was 3921 MUs resulting into billing efficiency of around 79%. Out of this 3921MUs billed energy,

Approximately, 41% of the energy billed in a particular year is supplied to Domestic Consumers with Commercial and Industrial Consumers contributing to 9% and 35% of the total billing (in terms of units) respectively. Balance 15% energy is billed to Railways/Public Street Lighting/Public Water Work/Irrigation and Agriculture etc. In terms of Revenues, Domestic Consumers contribute to around 30% with Commercial 12%, Industrial 42% and others 16% respectively.

The graph below represents the share of customer base, their energy consumption and contribution in revenue based on FY 20-21 data.



From network perspective, there are 91 numbers of 33KV feeders with a combined route length of approximately 2,788 KMs supplying power to 215 numbers of 33/11KV Primary Substation (Structures). The 33KV supply is stepped down to 11KV level through 484 numbers of 33/11KV power transformers at these primary substations with an installed capacity of 2,191 MVA. Nearly 720 numbers of 11KV feeders radiates from the 33/11KV primary substations having length of approximately 36,865 KMs and supply power to HT consumers connected at 11KV level and LT customers connected to 11/0.415KV distribution substation. Approximately 69,646 numbers of distribution transformers are installed in all five circles with an installed capacity of 2,458 MVA. The length of the LT feeders is 66,000 KMs approximately. These LT feeders supply power to three phase and single-phase consumers, right from large Industrial to BPL.

Overall snapshot of TPNODL network is given in the below table:

Name of Circle	Balasore	Bhadrak	Jajpur	Keonjhar	Baripada	TPNODL Total
Area(sq.KM)	3806	2505	2888	8240	10418	27857
No. of Consumers	524783	294588	314604	315515	531892	1981382
NO. OF GSS	6	3	5	6	6	26
TOTAL NO. OF 33 KV FEEDER	26	7	18	22	18	91
NO. OF 33/11KV SUB STATION	58	33	34	40	50	215
NO OF POWER TRANSFORMER	125	71	77	89	122	484
Transformation Capacity 33/11(MVA)	560.4	350.6	364.35	428.6	487.5	2191.45
NO. OF 11 KV FEEDER	189	110	100	138	183	720
NO. OF DTR	20003	11809	13165	11312	13357	69646
Transformation Capacity 33/0.415 kV, 11/.415/0.230 kV ( MVA)	784	408	491	349	423	2457
33KV LINE IN KM	630	361	394	607	795	2788
11KV LINE IN KM	8841	4997	5156	7141	10729	36865
LT LINE WITH BARE CONDUCTOR IN KM	7545	1961	5070	3458	4179	22215
LT LINE WITH AB CABLE IN KM	7685	5742	5100	6558	18959	44047
TOTAL LT LINE IN KM	15231	7704	10171	10016	23139	66262

### Key Challenges:

1. Dilapidated and unsafe Network
2. Network frequently damaged by natural calamities like KalaBaishaki and other cyclones like FANI, AMPHAN which happen almost every year
3. Low Billing efficiency and low consumer coverage for collection leading to high AT&C losses – 40% provisional billing and only 35% consumer coverage
4. 2.6 Lakh meters lying defective pending replacement
5. Lack of Enforcement activities resulting in rampant theft of energy all across
6. No concept of consumer care – limited customer touch points and inefficient processes
7. Outdated IT infrastructure – Absence of advanced technologies like SCADA, GIS, DMS, limited use of computers and digital technology, absence of data integration and security
8. No concept of Network Planning, Engineering, Preventive maintenance, Network Protection, Energy Audit, power system control
9. Acute human resources bandwidth gap – sharp 29% decline in manpower in last 7 years due to superannuation whereas consumer growth was 54%, network growth has been 40%

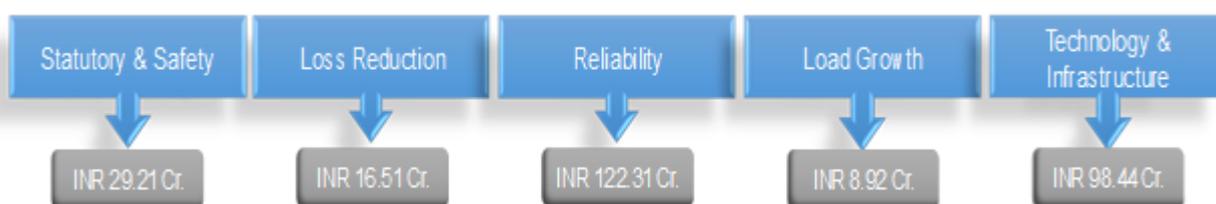
and Input energy growth is 8%. This has resulted in total neglect to maintenance of network – trippings have gone up by 41% and AT&C has gone up by 5%

10. Poor condition of civil infrastructure missing basic hygiene and fire safety

11. Governance challenges – inconsistency of material reconciliation including Government schemes

### Capex Plan:

To address these challenges TPNODL proposed to take up a detailed Capex investment plan of Rs 275.40 Crs under the following heads which has been further elaborated in this document as well as in the separately submitted Capex Plan:



As per Vesting Order No 9/2021 dated 25<sup>th</sup> March, 2021 issued by the Hon'ble OERC in favour of TPNODL, an investment of Rs 246 Crs towards Capital works has been mandated.

### O&M Expenditure Plan:

In the Vesting Order No 9/2021 dated 25<sup>th</sup> March, 2021, the Hon'ble OERC has directed TPNODL to submit a detailed O&M Plan within 45 days of Effective date along with justifications of deviations from the Tariff Order vide Case No 75, 76,77 and 78 of 2020 dated 26<sup>th</sup> March, 2021 approved by the Commission.

### Employee Cost:

To address the resource bandwidth gap, TPNODL has carried out detailed study of the existing manpower gaps across various Departments and geographies of TPNODL. Also requirement of new expert manpower to fill up various resource gap areas like Network Planning & Engineering, Sub Transmission System management, Enforcement, Energy Audit, Safety, Projects, Civil, IT & OT and has identified. An overall need of 1266 employees at various levels has been identified which is proposed to be filled up over a period of 3 years. In the first year, a proposal of staggered recruitment of 636 employees is proposed to meet the immediate gaps and support the improvement plans of TPNODL. A separate Detailed Manpower Structure and Staff Deployment Plan is being submitted.

In the Tariff Order dated 26<sup>th</sup> March, 2021, Hon'ble OERC had approved Employee Cost of Rs 357.24 Crs for TPNODL for the year FY 2021-22. This included Rs 45.7 Crs towards outsourced

and contractual employee cost. Since this cost is of the nature of A&G cost, this has been assumed under A&G cost. Hence the adjusted approved Employee Expenses is Rs 311.54 Crs. Against this TPNODL proposes to incur Rs 339.89 Crs towards Employee Cost. Out of this, Rs 42.91 Crs has been envisaged as the cost towards additional employees which includes Tata Power group transfer of Senior management and experts, as against Rs 24 Crs approved by the Hon'ble Commission.

**R&M Expenditure:**

Hon'ble OERC has approved Rs 114.23 Crs in the Tariff Order towards R&M expenditure. Considering the dilapidated condition of the 33 kV network and the 33/11 kV primary substations, TPNODL has considered additional Rs 34.75 Crs specifically towards implementation of Maintenance of 33 kV Primary Substations and 33 kV network which is the backbone of the Distribution system. This was neither proposed by erstwhile NESCO Utility nor considered by Hon'ble Commission. The total R&M expenditure proposed is Rs 147.49 Crs.

**A&G Expenditure:**

As regards the A&G Expenses, Hon'ble Commission has approved Rs 49.2 Crs in the tariff Order. Considering the expenses towards Outsources and contractual staff from the Employee Cost, which is A&G cost in nature, as a part of the A&G Cost, the total adjusted A&G cost approved is Rs 94.9 Crs.

TPNODL has felt the need for providing comprehensive Insurance coverage for all its Substation assets considering the repeated damages due to natural calamities. This would incur additional Rs 5.07 Crs which.

Hon'ble OERC has considered cost of Rs 17 Crs towards Spot Billing. However TPNODL proposes to launch a comprehensive Meter Reading, Billing and Collection Contract which is estimated to cost Rs 44.23 Crs. The additional amount of Rs 27.23 Crs is considered to be incurred.

Further, TPNODL has considered additional Rs 3 Crs towards Enforcement expenses which is a critical requirement to conduct mass disconnections and booking of theft to curb use of unauthorised energy.

Rs 7.45 Crs towards building a comprehensive AMR set up has been considered additionally. This would provide the facility of continuous download of all EHT, HT and LT 3 Phase connections and continuous system based analysis to find out any anomaly of consumption pattern to detect misuse of theft.

Lastly Rs 2.18 Crs has been considered additionally towards Creation of 50 seater Consumer Call Center and Consumer care center for walk in consumers at every Division level.

Considering these additional expenses, the total proposed A&G expenditure is Rs 139.43 Crs which is Rs 44.93 Crs additional over the A&G cost approved by the Hon'ble OERC in the Tariff Order.

Considering the above the total O&M Expenditure proposed by TPNODL is Rs 627.22 Crs as against Rs 520.67 Crs approved by the Hon'ble OERC in the Tariff Order. The detailed breakup of the additional costs proposed is shown in table below:

Employee Cost	OERC approved (Rs. Cr)	Proposed (Rs. Cr)	Request for increase (Rs. Cr)
Employee Cost	357.24		
Outsourced employee regrouped to A&G Cost	45.7		
Additional manpower considered for Safety, enforcement, network planning & Engineering, Projects, Civil, IT etc	311.54	339.89	28.35
New recruit and group transfer			28.35
Particulars	OERC approved (Rs. Cr)	Proposed (Rs. Cr)	Request for increase (Rs. Cr)
R&M Expenses	114.23	147.49	33.26
Expenditure for new initiatives			
Cost considered for Maintenance of PSS,33KV Network			34.75
Particulars	OERC approved (Rs. Cr)	Proposed (Rs. Cr)	Request for increase (Rs. Cr)
A&G Expenses	49.2		
Outsourced employee regrouped from Employee Cost	45.7		
<b>Total</b>	<b>94.9</b>	<b>139.83</b>	<b>44.93</b>
<b>Expenditure for new initiatives/additional for improvements</b>			
Insurance			5.07
Billing & collection			27.23
Enforcement activities			3.00
AMR			7.45
Consumer Care Center & Call Center Exp			2.18
<b>Total</b>			<b>44.93</b>
<b>Grand Total</b>	<b>520.67</b>	<b>627.22</b>	<b>106.55</b>



## 2. Existing System - Key Challenges

The brief inspection of the network reveals that the network in TPNODL is in very poor state and seriously lacks compliance with respect to the statutory guidelines. While this affects the system reliability due to frequent breakdowns, it may pose threat to safety of employees, public at large and animals

The major issues associated which are inherited from erstwhile NESCO and are mentioned below:

### **A. Dilapidated network and Safety:**

TPNODL has taken over the assets of erstwhile NESCO on “as is where is” basis. These assets are not in good operating condition and in a large number of cases, the required safety equipments are not in place. Further the network is in dilapidated condition and not compliant to statutory guidelines and poses threat to safety of employees, public at large and animals.

One of the major reasons is absence of structured preventive maintenance and systematic investment for past many years. The 11 kV circuits are radial and very long ranging from an average length of 50 kms to 90-100 kms in rural areas. 11 kV circuits have underrated, uneven sized & worn out bare conductors with extremely long span lengths. The LV circuits are also very long and radial. Both HV & LV circuits have many damaged /bent/tilted poles, poor workmanship in jointing & jumpers, compromised safety clearances and are devoid of guard wires on road crossing. 11/0.415 kV Distribution Substations (DSS) have no fencing, the LT side fuse box/MCCB box are missing, earthing system is in very bad condition, most of the AB switches are bypassed, DD fuse are bypassed/broken.

As a result of above, the interruption at 11 kV feeder level is too high with respect to present Indian utility standards. In one-year, total tripping is at a staggering 4.66 lacs in FY 19-20

Further, due to lack of maintenance, failure rate of Distribution Transformer is also very high at 4% of total Volume. In FY 20-21, 2312 Distribution Transformers have been failed with a total failure rate of 4%. Due to such high DT failure rate and 11 kV feeder interruptions, availability of supply in the different areas of TPNODL varies from 12 hrs to 20 hrs per day. In City area the availability of supply ranges from 18-20 hrs while in Towns it ranges from 16-18 hrs and in rural area it ranges from 12-16 hrs.

The Scarce resources and lack of preventive maintenance has led to delay in response on Safety Hazards reported by Public and employees. This has resulted in consistently high number of accidents (Fatal/Non-Fatal including Human and Animal) in FY18-19(92), FY19-20(80) and FY 20-21 (51).

### **B. Disaster Management - Natural Calamities:**

Apart from the vast geographical area, Odisha being a coastal State, it repeatedly encounters devastating storms / Cyclones. The loss due to these storms / cyclones are huge which is a major challenge for a distribution utility. The main concern related to these natural calamities are that not only it results in disruption of power supply to consumers over extended period but also it damages the power distribution infrastructure resulting into requirement of huge funds to refix the network infrastructure. A permanent solution to address the issue of virtually annual disruption of supply and repeated infusion of CAPEX to restore/replace damaged infrastructure need to be developed.

Name	Lowest Pressure(mbar)	Year	Winds(km/hr)
Odisha Cyclone	912	1999	276
Phailin	940	2013	215
Hudhud	950	2014	185
Titli	978	2018	110
Fani	932	2019	250
Amphan	920	2020	260

Source: [https://en.wikipedia.org/wiki/List\\_of\\_tropical\\_cyclones\\_that\\_affected\\_India](https://en.wikipedia.org/wiki/List_of_tropical_cyclones_that_affected_India)

So, it can be seen from the history that Odisha is prone to the natural disastrous cyclones which effected erstwhile NESCO in a very bad manner and will surely be a major natural challenge for TPNODL. Apart from this there are other natural challenges like

1. Saline Coastal weather which deteriorates the electrical assets
2. Different forest ranges through which rural lines are running prone to unsafe situations

### **C. High Aggregate Technical and Commercial (AT&C) Losses:**

The AT&C Losses for FY 2020-21 is estimated to be 25.17% with Billing Efficiency of around 79.36% and Collection Efficiency as 94.28%. The AT&C losses for FY

2020-21 on account of LT consumers is as high as 41.02%. The problem is compounded with tariff is not cost reflective as it is based on 19.17% which is lower than the actual AT&C losses. It is consequently required that the actual AT&C losses be expeditiously reduced to ensure a commercially viable Distribution Utility.

One of the major reason for low Billing Efficiency is leakages in meter reading process clubbed with inaccurate or no recording of reading in meter due to faulty/no meter in approximately 3.85 lakh (*2.79 lakh – Defective + 1.06 lakh No Meter*) customers and 0.24 Lakh Mechanical meters in the network.

Non-availability of new meters has resulted into high number of faulty/defective meters in the network as meters are not replaced timely leading to high level of provisional billing coupled with dissatisfaction to consumers. Further, it has also resulted into un-accounted energy loss due to no-meter cases where connections are energized without meters.

#### **D. Limited Customer Touch Points and Inefficient Processes:**

Limited customer touch point and non-availability of dedicated manpower for timely customer service delivery lead to customer dissatisfaction as Customer has to spend time, money and effort in visiting the office for registering basic complaints. Further, insufficient avenues for payment of electricity bill has compelled the company to do the door to door collection.

The process related with New Connection, Complaint Processing, Bill Correction, Attribute Change are currently being processed manually. This practice leads to undue delay in processing of customer request, updation of customer payment/record, and reconciliation of material and inconsistency of data in system.

Customers need to do follow up visits for processing or query about the status leading to customer dissatisfaction. Therefore, in line with the motto of “Mo Sarkar” initiative of GoO needs to be dovetailed with existing regulatory guideline aiming to ease out the process value chain related with Time, Cost and Procedures as new connection is the beginning of customer life cycle and prime reflection of service delivery by DISCOM. Further, processes also need to be reviewed for enhancing the service delivery during customer life cycle.

Delay in assessment, rectification of in-correct bills, and inordinate delay in replacement of defective meters is resulting in provisional billing for long period. Further, defined recovery process was not followed judicially and connections are not disconnected in time on account of non-payment has led to accumulation of Significant Arrears.

#### **E. Outdated IT infrastructures:**

IT infrastructure being used are bespoke applications on an obsolete technology i.e. FoxPro for billing and Java/.Net based applications for new connection and complaints management. These customized solutions are not designed as Enterprise Level Solutions to fully cater the needs of Discom like Customer Contact Centre, Revenue Cycle Management, Material Management, Network Management, Project Management etc.

In addition to above, these systems are very fragile and prone to intrusion/sabotage by external system. Further, the landscape of the system is Standalone, disintegrated and decentralized. Thus, data integration and security of data is one of biggest challenge in addition to outdated network which are disrupting the process on frequent manner.

Further the IT infrastructure being used in franchisee area is separate without any on-line data exchange options. Thus, building common IT infrastructure with Enterprise Level Solution with due data security is need of the hour.

#### **F. Human Resource:**

The most significant challenge at TPNODL related to Human Resource are

- i) Aging workforce,
- ii) Lack of required skill set,
- iii) Shortage of Competent Manpower,
- iv) Rising employee grievances
- v) Pending legal cases and non-compliances
- vi) Poor Gender Diversity,

#### **i) Aging workforce**

TPNODL has inherited all existing manpower of erstwhile NESCO in line with license agreement. Presently, there are 406 executives and 1744 non-executives

as on 1<sup>st</sup> May 2021 who were on regular rolls of erstwhile NESCO and now part of TPNODL. Average age of this group of employees is around 41 years. There is no induction of Manpower since about last ten years. Representations of women employees are very less at about 4%. In executive cadre, more than 8.1 % employees are in age range of 54-60 yrs while for non-executives it is about 16.2 %. These employees are working in areas of O&M, Commercial, Finance, Legal, IT and HR & Administration etc.

ii) Lack of required skill set

In absence of structured Training and Development program, employees have limited option to enhance their competency level in this fast-changing business environment. Competency enhancement in terms of internal job rotation either horizontal or vertical movement is also not visible. Fresh competency also did not enter to workforce during last one decade and this has destabilized the workforce demography at NESCO including technical competency. For example, in technical cadre (Non-Executive), about 10% employees are less than 10<sup>th</sup> qualified. There are around 1280 ITI technical employees (Non-Executives) but out of such number only a negligible number (approx. 40-50) may have supervisory licence. This indicates poor state of technical competency. More so, in order to enhance network reliability, network safety, fast resolution of operational and commercial complaints, many new functions like Power System Control Centre (PSCC), Quality, Engineering, Consumer services, safety, security, CSR, Training & Development etc needs to be started. In addition to this, many new technologies are to be adopted for better control and faster resolution of issues, like SAP, SCADA, ADMS, Mobile Apps, and GIS etc. for which appropriate competencies are required. Hence, it is essential to upgrade competency level of existing employees to work in new functions and on new technology platforms.

iii) Shortage of Competent Manpower

On manpower front, acute shortage of manpower is very much visible and also a reason of massive employee dissatisfaction. At Section level only one single officer is working as SM looking after operational as well as commercial activities simultaneously. There are only two people available in each circle to take care of HT maintenance, that makes only 10 people in total for maintenance of 220 HT primary substations (PSS). NESCO was not allowed to induct fresh manpower during last ten years. Total approved manpower in NESCO is 5859 while presently

there are only 2150 manpower on erstwhile NESCO rolls. This establish the massive shortage of manpower at NESCO and real challenge for seamless operation.

Further it has been analysed that there is a need for creating missing bandwidths in Project Monitoring, Civil Engineering, Network Engineering & Planning, Sub-Transmission System, N/W Protection, Preventive Maintenance, Consumer care, Enforcement, Meter Management. The commercial organisation has to be redefined upto the section level to bring in more focus on commercial activities. The Section Level which is the foundation for all Commercial and Technical activities, need to be strengthened. IT&OT – Competencies need to be enhanced to take care of advent of new technologies like SCADA, GIS, ADMS, Data Center, IT applications, ERP, Infrastructure Management & control.

iv) Rising employee grievances

Employees at NESCO had to witness few major transitions during last 25 years. It started from OSEB to GRIDCO to NESCO (under BSES) to NESCO (under RELIANCE INFRA) to NESCO Utility before takeover by TPNODL. During these transitions, employees' issues piled up. Slow resolution of sensitive issues has been impacting employee morale and productivity apart from overall deterioration in industrial relations situation.

v) Pending legal cases and non-compliances

It has been reported that several employees related legal cases are pending at Supreme Court, High Court and other lower Courts. Total number of legal cases/disputes that are pending in various courts for resolution counts to about 2000, out of which there are about 163 HR related cases. While high impact cases are related to revenue & commerce and civil suits, HR cases are mostly related to Provident Fund, employee compensation, pension, promotion and MACP etc. Absence of right number of employees in legal function has further posed serious threats to NESCO.

It is crucial to analyse all such human resource related challenges and strategize for short term and long-term resolution with an objective of converting weakness into opportunities.

vi) Poor Gender Diversity

On Gender diversity, overall ratio is at about 4% which is very low. It is essential to ensure adequate representation of women employees in the workforce across all cadre.

**G. Poor Civil Infrastructure:**

TPNODL have offices in all the five circles, Divisions, Subdivisions and Sections. Some of them are owned and others are on rented property. The office space is currently crowded and haphazardly planned for seating arrangements, moreover, most of the circulation area has been occupied with files, documents etc. It is also observed that at many locations basic hygiene such as availability of Washrooms, discharge of sewage, drainage system are not available. Many of the section office and Control room structures needs Structural rehabilitation.

The furniture available at offices are nearly 10- 15 years old and are in non-serviceable condition. New furniture are to be procured for various offices, Customer Care Centres, Call Centres, etc. and also to cater to new employees.

Currently the stores is located centrally at Gudipada, Balasore & Sub-Stores in Jajpur, Baripada & Keonjhar with no systematic procedure for material upkeep & storage. Usable Materials & Scrap Materials are kept at the same location side by side. Also, these stores have either no shed or shed in dilapidated condition which is insufficient for storage especially in the aftermath of Cyclone. These sheds remain unutilised since long and require urgent roofing and civil repairs.

**H. Governance challenges:**

Currently process related with Material Management, Maintenance Management, Meter Installation, Complaint Management, Customer services are being practiced without standardization and do not have focus on customer satisfaction. These practices leads to undue delay in processing of customer request, updation of customer payment / record, reconciliation of material and inconsistency of data capturing. Further, reconciliation of materials among different government funded schemes, O&M materials, deposit works across various stores/depot has not been carried out since long. It is proposed to carryout extensive Business Process Re-engineering in all areas of the distribution business along with automation to meet the multiple objectives of enhancing efficiency, productivity, consumer delight and governance practices.

We will now discuss about challenges related to the processes in a detailed manner

## 2.1 Statutory & Safety

One of the major challenges for TPNODL is the public and employee safety. Present network condition is such that it is directly posing a threat to the safety of employees, public at large and animals and it is also pertinent to mention that at most of the places the network is not compliant to the statutory and regulatory guidelines.

All the lines irrespective of voltage levels (33 KV, 11 KV and LT lines) are very long to cater extreme points in rural areas. There are multiple T-off connections on single feeder without any predefined number. Very few lines are parallel. At most of the places the property of undersize of the conductor observed making it a big threat for safety. The conductors also are worn out at most of the places. They not only have joints in between with various other size of conductors but also having kinks in them. The poles carrying the lines are bent, tilted having joints and somewhere innovation observed by passing through the line over wooden support. Regardless to mention that guard wire observed at very few places, in some places guard wires are not just below the live conductors defeating the purpose what they are for.

11/0.415 kV Distribution Substations (DSS) don't have fencing at most of the places, posing major safety threat to public at large and animals. Most of the AB switches and DD fuse are bypassed/damaged. The LT protection is visibly there with fuse wires, but they are largely bypassed technically since they are either oversized or bypassed at secondary side of most Distribution Transformers. In place of LT Fuse box/MCCB box; aluminium wire are used as fuses on the secondary side of the distribution transformers at almost all substations. These fuse units are installed at very low height in all the places; it is a potential safety threat to general public and animals. Earthing system is in very bad condition in almost all feeders and substations. All these factors contribute to the unsafe working condition and unsafe condition for any trace passer and other living animal.

It is observed that almost all 33/11 KV primary substations (Structures or GSS) except those built in ODSSP schemes are practically having boundary walls broken and there is no fencing between the substation premises and 33KV outdoor switchyard. Due to this fact the GSS is highly unsafe and may initiate any accident/ incident by intrusion of unauthorised person and animal. The existing earthing system is in very bad condition and ineffective. Many circuit breakers and CTs are lying bypassed since long for want of spares. Automobile batteries and underrated battery chargers are used at many substations due to

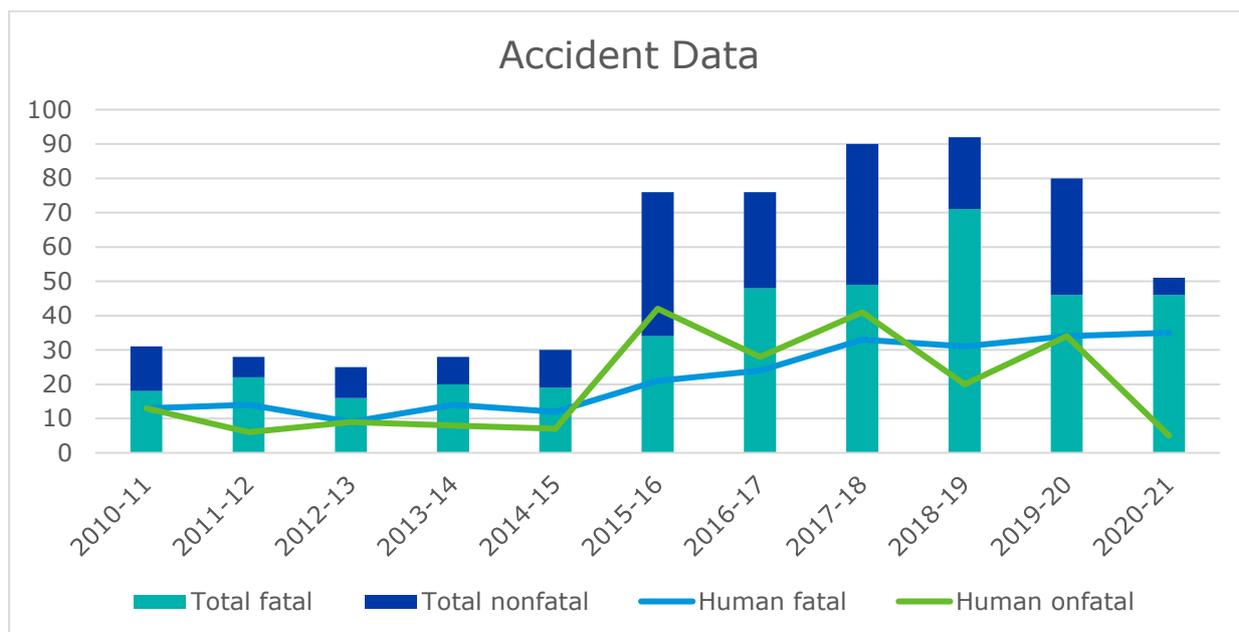
non-availability of standard equipment in stores. This may lead to loss of DC system resulting basic protection system inoperative in case of any fault which may not get isolate due to absence of DC. This puts the basic protection system at bay and there are chances of major damage to substation capital intensive equipment if the defects are not attended / addressed urgently.

Having done analysis of last ten years accident data, it is observed that major reasons of accidents includes earth leakage in metal structures used in overhead networks, non-availability of fences, and Low Ground clearances and snapping of conductors.

Table below shows Year wise details of Fatal / Non-fatal Electrical accidents occurred under erstwhile NESCO's operational area during Calendar Year 2010-2020.

Sl no	Financial Year	Human			Animal			Total
		Fatal	Non-fatal	Total	Fatal	Non-fatal	Total	
1	2010-11	13	13	26	5	0	5	31
2	2011-12	14	6	20	8	0	8	28
3	2012-13	9	9	18	7	0	7	25
4	2013-14	14	8	22	6	0	6	28
5	2014-15	12	7	19	7	4	11	30
6	2015-16	21	42	63	13	0	13	76
7	2016-17	24	28	52	24	0	24	76
8	2017-18	33	41	74	16	0	16	90
9	2018-19	31	20	51	40	1	41	92
10	2019-20	34	34	68	12	0	12	80
11	2020-21	35	5	40	11	0	11	51

Below figure shows the detailed analysis of Humans accident.



It is pertinent to mention here that the number of fatal accidents outgo the number of non-fatal accident, for both Human and Animals. Further, almost 62% of fatal accident involved humans, which is very serious.

## 2.2 Dilapidated Network

The operational area is spread over 27857 Sq.km. TPNODL receives power from 26 numbers of OPTCL transmission substations through 91 numbers of 33KV feeders. TPNODL has huge asset base to deliver power supply to over 1.9 million customers. One of the major challenges for TPNODL is dilapidated network inherited from erstwhile NESCO. The 33 kV and 11 kV feeders are mostly overhead, radial, and lengthy with an average length of 30-50 KMs in urban / peri-urban areas to 90-100 KMs in rural areas. These feeders have undersize, uneven sized and worn out conductors. The LV circuits are also very long and radial. Both MV & LV circuits have large number of damaged / bent / tilted poles, poor joints, compromised safety clearances and are devoid of guard wires on road crossing.

Trees are interfering with live conductor in overhead feeders at multiple location. Present maintenance practices are reactive. There is no / inadequate maintenance setup resulting into large number of interruptions on 33 and 11KV feeders. The records show that there are nearly 74 tripping / per 33KV feeder per annum and similarly 689 tripping per 11KV feeder per annum. The large number of tripping have caused adverse effect on the health of network equipment.

Due to absence of structured maintenance, failure rate of Distribution Transformers is also very high at 3.2% of total population. In FY20-21; 2220 no. of Distribution Transformers reported failed.

Due to large number of feeder interruptions and DT failures, availability of supply in the different areas of TPNODL varies from 12 hours to 20 hours per day. In City area the availability of supply ranges from 18-20hours, in Towns it ranges from 16-18 hours and in rural area it ranges from 12-16 hours.

Presently entire network right from 33KV feeders to LT consumers are owned and maintained by Junior Manager (O&M) along with his team comprising of Lineman A/B/C, Helper, and Jr. Technician posted in respective sections. E&MR section extend support to section staff for maintenance of 33/11KV primary substations. As sufficient manpower is not available in E&MR section, currently only corrective maintenance is in place.

In the absence of sufficient support staff at sub-divisions/sections level, the MTTR for 33 kV & 11 kV breakdown is quite high. Due to scarce manpower, breakdowns in many sub-divisions / sections are attended during daytime only. The maintenance practices are reactive, and the distribution assets are rarely maintained. Faulty equipment / distribution transformers are not replaced even for months' in rural areas.

Due to excessive tripping on 11KV feeders, the switchgear installed at 33/11KV substations are subjected to great stress and requires frequent maintenance. Since the 33KV system is backbone of power distribution network, the same needs proper attention in ensuring quality and reliable supply.

## **2.3 Operational Inefficiencies**

In operational inefficiencies we shall discuss the existing processes of operations in maintaining the huge asset base with scarce manpower and inefficient processes resulting in operational inefficiencies.

### **2.3.1 No Current Complaints:**

At present customers of TPNODL are visiting to their respective Division / Sub Division / Section office for registering supply related complaints. However, while visiting to these offices, Customers have to spend time, money and effort in registering basic complaint like No Power Supply, Billing issues etc. Considering the vast geographical area, it is difficult to attend the complaints during night hours and even this becomes terrible in rural area.

This leads to increase in restoration time and customer dissatisfaction as well. Moreover, In Division/Sub-Division/Section Office, no dedicated official is available for customer interaction. At section office, limited manpower available to attend these complaints and therefore customers have to rely on private electricians which resulted into unsafe act from customer part.

Apart from the consumer footfall to these offices, Customer can also register their complaints through Call center. However, due to limited lines, customers are not able to connect to the call center for registering the complaints.

### 2.3.2 Poor Maintenance Management:

There is acute shortage of manpower for operation and maintenance of the network. There is no structured, and documented maintenance system in place for feeders and substation equipment. There is no preventive or condition-based maintenance program for timely identification and removal of defects to maintain the efficiency of the equipment and for planning the replacement actions. Likewise, 33KV feeders, there is no dedicated 24X7 breakdown crew to attend breakdowns and preventive maintenance crew for upkeep of substations. As a result, the sub-division officer has to assemble manpower both from E&MR and sections (sometimes from OEMs and contractors) to attend breakdowns. At times, it becomes difficult to restore power supply if the breakdown happened during odd hours resulting into delays and customer dissatisfaction.

Since there is no structured maintenance system, and testing of equipment is not done, the internal health of various power distribution equipment is not known. Many of the equipment especially power transformers are more than 25 years old. The physical condition of some equipment is also reported to be bad.

As a result of above, the interruption at 11 kV feeder level is too high wrt present Indian Utility standards. The table below gives a snapshot of 33 KV & 11 kV feeder tripping recorded in the last 3 years.

Category of Feeder	In FY - 18-19		In FY -19-20		In FY -20-21	
	No. of tripping	Duration of tripping	No. of tripping	Duration of tripping	No. of tripping	Duration of tripping
	No.	Min	No.	Min	No.	Min
ALL 33 kV Incoming Feeders	5260	838	5968	872	3359	614

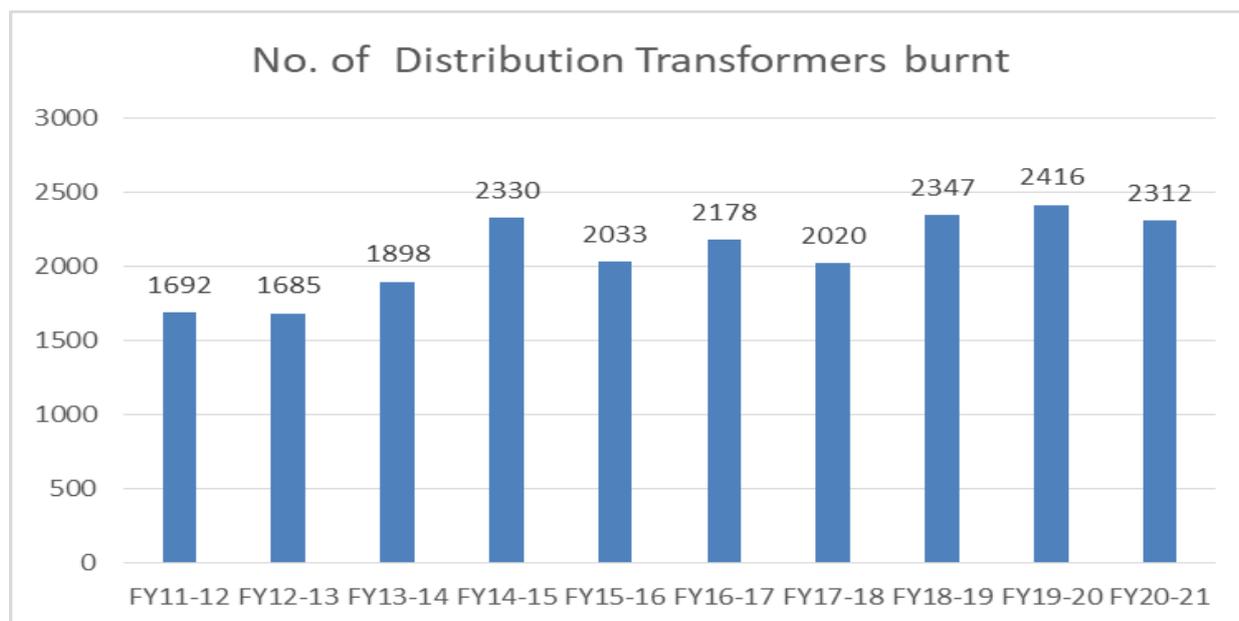
ALL 11 kV outgoing Feeders	350582	88397	466528	95962	247894	45448
-------------------------------	--------	-------	--------	-------	--------	-------

### 2.3.3 Poor Health / upkeep of Transformers

Many of the transformers are more than 25 years old and have extremely low insulation resistance values. Due to non-availability of Capacitance and Tan Delta measurement equipment, it is not known if the transformers are on the verge of abrupt failure. Similarly there is no dissolved gas analysis or furan analysis being done on power transformers which can help to check incipient faults.

The failure rate of distribution transformers is 4% as of date. Failure of DTs cause power outage to all customers fed from the DT. It also takes time to replace faulty DT thus increasing the equipment downtime.

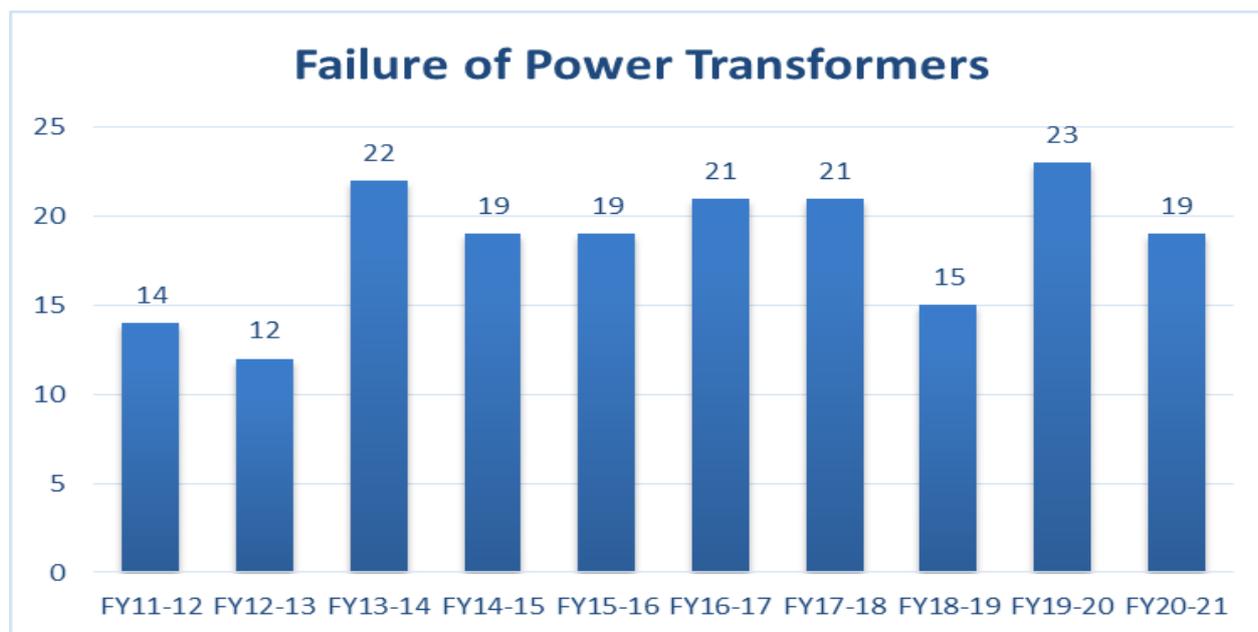
Below given table shows us the DT failure trend in NESCO from FY11-12 to FY20-21.



A total of 2312 DTs got burnt during FY20-21 with a total capacity of 115 MVA.

Due to lack of proper maintenance and timely augmentation of overloaded power transformers a total 19 nos. of PTRs got burnt across NESCO during FY20-21 with a total capacity of 85.5MVA

The table given below shows us the PTR failure trend of NESCO from FY11-12 to FY20-21



Failure of power transformer results huge area outage along with major drawback in customer satisfaction. The failure rate of power transformer is also significantly high. It should be taken care of that the failures of DT and PTR results in huge OPEX which is again burden on and utility and ultimately on the stakeholders.

## 2.4 AT&C Loss

Major reason for high AT&C losses are listed below:

A) Defective, No Meter, Mechanical Meter in network lead to inaccurate or no recording of meter reading. Currently, 8.4 Lakhs meter need to be replaced in phased manners. Currently customer bought meter are installed during energization of connection leading to non-standardization of meters and lack of Anti tamper features.

### B) Meter Reading and Spot Billing:

Meter reading is assigned to Meter reading agencies across Division /Subdivision on fixed cost basis per reading in TPNODL area and franchise has deployed their manpower for reading. Meter reader visit consumer site for a period of 15 days i.e. from 7<sup>th</sup> to 22<sup>nd</sup> of every month, based on reading route sequence allotted to him. Meter reader takes and punch the reading in spot billing application, which delivers the spot bill to the consumer during the same visit.

In this process the gaps are listed below:

- Existing billing engine allows to complete the billing cycle within 15 days beginning from 7<sup>th</sup> to 22<sup>nd</sup> of the month. Since Meter reading to be completed

in 15 days, meter reader is engaged limited to 15 days in each month leading to non-adherence of Minimum wages to meter reading staff.

- No Quality check parameters are available in spot billing system prone to wrong readings/bills.
- High no of pending assessment cases leading to non-payment of bills and customer disputes.

In addition to above, customer indexing is not available leading to variety of problems like non availability of proper location of consumer as well as details about the Poles, Transformer etc.

#### C) Collection Process:

Payment collection counters are provided at Division/Sub-Division level for customers to deposit the bills. At these counters, the cashier collect the payment in cash and cheque, thereafter issue manual cash receipt to customers. Currently, the due dates are schedule in short window of 7 days duration due to which long queue at payment counters during month end is visible. This lead to customer dissatisfaction as customer has to spend time, energy for bill payment.

Beside above avenues, Business Associates (BAs) have been deployed for door to door collection by visiting the customer premise and issue manual receipt.

Following are the challenges in this process:

- i. Door to Door collection has become the norms of payment collection over a period. Under such scenario, customer are not inclined/encouraged to make regular payment by visiting office/using online payment avenues which otherwise is the norm of payment in utility sector. This practice lead to accumulation of arrear.
- ii. Cash receipt updation process in system is prone to error as multiple entries at different level are being done manually. Further, it also delays the posting of credit in customer's account.
- iii. Manual reconciliation of payment prone to error leading to customer dispute.
- iv. Retention and Storage of Hard Copy Receipt occupies considerable space in Division Office.

#### D) Meter Testing:

At present in TPNODL area, there are no Meter testing labs. Sufficient field testing equipment are not available with TPNODL to perform testing at site for EHT/HT and LTCT meters against statutory compliance and against consumer complaints of fast/slow meters.

Meter Reading and Testing group is responsible for performing the following testing activities on day to day basis:

- i. Sample meters are to be tested in NABL accredited lab prior to installation, so as to ensure high quality of the meters is maintained.
- ii. As per Requirement of Statutory testing, meters installed at Grids, HT & LT customers' needs to be tested in pre-defined time, based on voltage level, on which meter is serving. Officials have to undertake testing of these meters at site as per IS 15707, with calibrated standard meters, specific for defined voltage levels. In order to perform these testing, sufficient equipment are not available with TPNODL.
- iii. Consumer complaints regarding fast / slow meters after meter installation / during life cycle of meters need to be addressed by testing meters at site as per IS 15707. In order to perform these testing, sufficient equipment are not available with TPNODL.

#### E) DT Metering:

It has been observed that, meters are not installed at all Distribution Transformers. Even the ones on which meters are installed, most of them are having meters which are old, faulty or are not working properly. As a result, it is not possible to determine the correct level of energy input and hence the AT&C losses at DT level. We are planning to install new smart DT meters on 726 nos. of distribution transformers with rating more than or equal to 250KVA in first phase which will help us to Identify high loss pockets, collect and analyse data regarding DT loading remotely, & prepare a plan to mitigate over loading and load unbalancing of the DT.

## 2.5 Outdated Technology

Operational efficiencies when matched with Technological applications, results into great face change for a utility. As far as technology is concerned erstwhile NESCO had not done investment in technology till start of MBC & ERP implementation Govt. funded IPDS schemes but could not managed to roll out resulting into defeating the very purpose of the

scheme. There is no investment done on Operational technologies like SCADA/DMS/OMS, GIS etc.

In this part SCADA and IT related services will be largely discussed along with existing challenges.

#### **SCADA:**

Currently there are total 215 Nos. of 33/11 substations in TPNODL areas out of which 92 no. of substations are developed/being developed under ODSSP scheme. Any old or ODSSP PSS is not integrated to SCADA Control Center. Actually, there is no system available for SCADA enablement.

Apart from this, 33/11KV Primary substations constructed under ODSSP scheme are SCADA enabled and having RTUs, IEDs and Communication equipment. The IEDs are integrated and communicating to RTUs over IEC61850 communication protocols. However, these stations are not communicating with Independent Control centres and thus no control and monitoring is being done for these Substations from centralized location.

#### **IT system**

We carried out a detailed study of IT applications of NESCO to evaluate the as - Is condition and found following major issues. Current IT landscape is using multiple Decentralized Legacy Billing system for single phase and three phase and Decentralized TALLY system for Accounts payable, Receivable, Asset Accounting. This software is very basic and most of processes and its activities are managed manually outside the system. Also, system is not upgradable due to outdated technology. There is only one Oracle database using Oracle 8 version, which is not supported by OEM anymore. Many of the mission critical application like call center applications, Cash Collection application, SBM applications are managed by multiple agencies which have a lot of integration issues resulting in data inconsistencies across various systems. Legacy AMR system currently installed is not communicating.

### **2.6 Customer Services**

TPNODL has a customer base of around 19 Lakh spread across approx. 27857 square kilometre having geographical diversity as well as economic diversity of residents ranging from the industries to Below Poverty line customers. TPNODL's customers are visiting various offices and interacting for following:

- 1 Registration of request like New Connection, Attribute Change etc (*Approx. 1.25 Lakh per annum*),
- 2 Bill Payment and Query Resolution
- 3 Complaint registration for commercial or supply related issue

Following avenues are currently available for customer interaction:

1. Division (16) /Subdivision (50) /Section Office (151): Customers are normally visiting the mentioned office for registering complaint/request, Query resolution, Follow up and payment.
2. Call Centre: Customers are calling at call centre for query resolution, registration of commercial and supply related complaint.

Limited customer touch points are leading to following customer dissatisfaction:

1. Customer has to spend time, money and effort in visiting the office for registering basic complaint like No Power Supply, Billing or asking queries like new connection document, attribute change etc. Most of these queries/complaints can be easily responded with satisfaction at Call Centre by improving the connectivity.
2. Customers are not able to connect to Call Centre as limited lines are available.
3. In Division/Sub-Division/Section Office, no dedicated official is available for customer interaction. Therefore, customer has to visit from one desk to another as complaint required processing at multiple steps before resolution.
4. No proactive communication to customer like Bill Generation, Bill amount, Due Date, Demand Note Generation, Demand not Payment etc. leading to increase in customer footfall for basic queries. Further, this at times lead to disruption in normal working as well as undesirable arguments between customer and officials at Division/Sub-division office.

In addition to above, the process related with New Connection, Complaint Processing, Bill Correction, Attribute Change are currently being processed without system. This practice leads to undue delay in processing of customer request, updation of customer payment/record, and reconciliation of material and inconsistency of data in system.

Customers need to do the follow up visits for processing or query about the status leading to customer dissatisfaction. Therefore, in line with the motto of “Mo Sarkar” initiative of GoO needs to be dovetailed with existing regulatory guideline aiming to ease out the process

value chain related with Time, Cost and Procedures as new connection is the beginning of customer life cycle and prime reflection of service delivery by DISCOM. Further, other processes also need to be reviewed for enhancing the service delivery during customer life cycle.

Delay in assessment, rectification of in-correct bills, and inordinate delay in replacement of defective meters leading to provisional billing for long period. Further, defined recovery process was not followed judicially, and connections are not disconnected in time on account of non-payment has led to accumulation of arrears.

## 2.7 Human Resource

TPNODL has inherited all existing manpower of erstwhile NESCO in line with license agreement. Presently, there are 406 executives and 1744 non-executives as on 1<sup>st</sup> May 2021 who were on regular rolls of erstwhile NESCO and now part of TPNODL. Average age of this group of employees is around 41 years. There is no induction of Manpower since about last ten years. Representations of women employees are very less at about 4%. In executive cadre, more than 8.1 % employees are in age range of 54-60 yrs while for non-executives it is about 16.2 %. These employees are working in areas of O&M, Commercial, Finance, Legal, IT and HR & Administration etc.

Category	Type of Employee	Number	Service Rules / HR Policy
C2	Executive	406	Officers Service Regulations
C3	Non-Executive -Ministerial	307	OSC (Orissa Service Code)
C4	Non-Executive Technical	1437	Standing Order
	Executive On deputation at TPNODL	Nil	

However, in order to enhance network reliability, network safety, fast resolution of operational and commercial complaints, many new functions like PSCC, Quality, Engineering, Consumer Services, Safety, Security, CSR, Training & Development etc. to be started. In addition to this, many new technologies also to be implemented for better control and fast resolution of issues like SAP module, SCADA, Mobile Apps, GIS etc.

Hence, it is essential to upgrade competency level of existing employees of erstwhile NESCO to work in new function and in new technology platforms. However, due to absence of fresh recruitment for last few years, option must be explored to induct competency through new recruitment or transfer from internal divisions. Moreover, there is a gap in skill set among the existing workforce to meet future business needs of TPNODL. There was

no formal process for projecting manpower requirement based on erstwhile NESCO's objectives and deliverables.

## **2.8 Poor Civil Infrastructure**

TPNODL currently have offices in all the five circles, Divisions, Subdivisions and Sections few of them are rented and Majority of the buildings are really in very bad shape and requiring maintenance / major refurbishment. Currently the Corporate Office in Balasore is accommodating office and associated services staff. Most of the area is occupied due to storage of Old Documents. Similar is the case with Circle office. The challenges exist in TPNODL using current buildings and infrastructure is to accommodate more employees and providing a hygienic, well ventilated and ergonomically suitable working environment with minimum expenditure by Remodelling and Rearrangement of existing office spaces. It may also be noted that no annual repairs or refurbishment in all office buildings have been made in recent years, hence, immediate rehabilitation of the said buildings is required. Apart from Office, Old Control room buildings for Substations (excluding ODSSP / IPDS) are also in very dilapidated conditions and needs urgent Structural repairs or construction of New Building. At many substation locations Boundary walls are not available (including few locations built under ODSSP / IPDS). It is required to construct / raise the height of the boundary wall to prevent entry of Public / Stray animals in live area. Stores are also in very bad shape. Water loggings observed. It was also learnt that theft of material is also an issue in the store. Store function is far from the world class practice of inventory management.

TPNODL has identified the most critical issues across the spectrum through in-depth study and has worked diligently to propose the most suitable and feasible action plan to address the issues. It has also prioritized the list of measures with the most impactful measures taking the highest priority for implementation.

### **3. Initiative proposed in FY 21 - 22**

#### **3.1 Network Refurbishment**

As discussed in executive summary and existing challenges section that major drawback is the dilapidated network which if not attended will not only impacted the reliability of power supply but also continue the accidents to happen. Therefore, a systematic network refurbishment activity would be required to initiate immediately after taking over.

##### **i. Refurbishment / life extension of 33 & 11 KV feeders**

The network will be modelled in planning tool such as CYMDIST to identify the overloading and losses so that the remedial / refurbishment actions can be planned.

The feeders design, conductor type, size and other accessories will be standardised to optimize the inventory.

Since 33KV system is backbone of TPNODL operations and a large area is affected in case of a 33KV outage, it is proposed to carry out technical audit of the 33KV feeders to identify defects and carry out refurbishment of the selected feeders to improve the outage and reliability performance. Similarly 11 KV feeders will be planned for maintenance based on the priority decided for the FY 21-22.

The refurbishment of feeders will comprise of replacement of dangerous towers/poles, provision of intermediate towers/poles, replacement of worn out / undersize conductor, replacement of other defective accessories, and strengthening of earthing of towers/poles. The refurbishment will also involve restoration of vertical and lateral clearances in line with existing regulations.

Refurbishment of 33KV feeders will help to improve the safety of workforce, public and animals. Besides, it will help to reduce number of outages, outage duration, unserved energy, and technical losses.

Along with this poles/ structures wherever defective to be replaced on priority basis.

##### **ii. Refurbishment / life extension of PSS & DSS**

Nearly 30 numbers of 33/11KV substations are planned to be controlled and monitored through SCADA in current FY. Action plan has been prepared to install required equipment at these substations to operate these substations through SCADA in the order of priority.

In order to operate and monitor the substations through SCADA, detailed technical audit of substation and all power distribution equipment will be carried out in current FY to identify the defects in civil structures, and electrical plant.

Loading parameters of power transformers and other equipment will be done to identify overloaded equipment if any to align/realign augmentation plan. Testing of equipment will also be arranged to identify the major/minor defects. This will help to prepare and prioritize equipment replacement plan.

Operation of equipment through SCADA will help to improve the reliability of power supply, reduce equipment downtime, reduce unserved energy, optimization of network, reduction in losses, reduce operational expenditure, and improve the safety of workforce.

For 11 KV substations first priority will be eliminating joints in LV and HV connections. Proper rating of fuses to be installed. Plinth of the transformer to be made proper wherever required. Boundary to be ascertained and to be made safe for public as well as from the aesthetic point of view.

#### **iv. Repair / Servicing of circuit breakers**

Existing manpower can carry out minor repair but for major repairs, OEM service engineer is required. Until now many of the circuit breakers were under warranty but the same is now over and it is difficult to avail the services of OEMs during exigency. Many of the circuit breakers are reported bypassed due to defects.

TPNODL therefore intends to establish rate contract with the OEMs for deputation of service engineer on call basis and procurement of circuit breaker spares for a period of three years.

### **3.2 Structured Maintenance**

The most modern organisations now-a-days implement centralize maintenance planning and decentralize maintenance execution for optimization of cost, efforts, reducing reworks, and maximizing the assets life. In order to improve the maintenance management, TPNODL is planning to form centralize Maintenance Planning Group (MPG) under Sub-Transmission System with the responsibility of establishing a process driven approach for planning, scheduling, monitoring, and analysing maintenance program. The Maintenance Planning Group will be centrally located, and work based on outage data captured by power system control. MPG will have the following roles & responsibilities

- Planning, Scheduling and Monitoring of Maintenance Activities
- Material and Services Management
- Reliability Analysis
- Technology adoption for system improvement

Maintenance planning group will establish the documented procedures for operation, maintenance and breakdown management. Also, they will ensure the availability of annual maintenance plan for sub-transmission and distribution system (preventive and condition based) and to carry out maintenance in structured manner, they will prepare and implement the maintenance checklists for all power distribution equipment to guide maintenance activities. They will also analyse each tripping and identify the root cause analysis so that either SOPs can be revised, or training can be provided depending on the action point derived from the RCA.

This arrangement will help transformation of maintenance management system in TPNODL.

TPNODL will gradually implement condition-based maintenance system to optimize maintenance costs and efforts. Condition Monitoring Tools such as infrared cameras for hot spot detection, Ultrasonic Equipment to detect incipient faults in indoor switchgear, Dissolved Gas Analyser to detect problems in power transformers and Partial Discharge Measurement equipment to detect problems in cable system, will help to ensure highest equipment availability.

Maintenance Planning Group will also monitor the network availability, reliability parameters such as SAIDI, SAIFI, CAIDI, by capturing and analysing outage data and plan corrective actions to improve the system reliability. MPG will also monitor health of power transformers in STS and shall plan actions to extend the life of this capital-intensive equipment.

Apart from Systematic Maintenance Group, bare minimal manpower for 165 Breakdowns teams and 711 Fuse Call center teams works out to be 1367, 3929 and 3422 respectively which makes the overall manpower requirement to 8718.

In TPNODL, currently there are close to 1700 manpower available for operations activity after leaving aside some manpower for commercial works. We shall utilize the services and experience of the existing employees of TPNODL in their area of expertise especially FCC and Breakdown Maintenance.

For balance manpower we need to place Annual maintenance contracts with provision of vehicles.

### **3.2.1 Asset Maintenance:**

While maintenance of 100% assets would be the best, however it is not possible to ensure preventive maintenance of 100% assets in first year itself. But maintenance of almost 50% of asset base would be required as bare minimum. We have estimated resources required

for maintaining 50% asset base. Based on this estimation, a minimum of 1113 people are required for working on 300 days in the year as shown below.

Description of Asset	Unit	Population as on 30.09.20 A	Considered in Refurbishment/Conversion B	Balance C	% of Balance considered for Maintenance in Year D
DT 250 KVA and above	No	726	181	545	100%
DT <250 but >=63 KVA	No	14300	61	14239	50%
DT < 63 KVA	No	54620	0	54620	20%
11 kV O/H Line	Ckt Km	36865	222	36643	50%
LT Bare 3 Phase Bare O/H Line	Ckt Km	22215	220	21995	50%
LT ABC	Ckt Km	44047	0	44047	10%

### 3.2.2 Performance Based Maintenance Contracts for feeders and substations

Annual Maintenance Plan along with standard check list for inspection of 33KV feeders and substations will be prepared and rolled out in the current FY. Condition based maintenance systems such as dissolved gas analysis, thermography and ultrasonic detection system will be used to identify the maintenance requirements. As there is acute shortage of manpower in TPNODL and since expert manpower is not available, annual maintenance contracts will be established with expert market agencies for all 5 circles. The network shall be inspected regularly to identify the defects and attend breakdowns in quick time and perform maintenance activities to enhance system reliability.

The Performance Based Maintenance Contract will also include 24X7 Breakdowns Crews for restoration of 33KV feeders and substation equipment. Besides, preventive maintenance activities will be performed as per the maintenance plan and schedule prepared by TPNODL.

#### a. Maintenance of DC system at 33/11KV substations

Maintenance and upkeep of substation DC system is highly specialized job. Separate maintenance contract shall be established for substation DC system comprising of battery bank and battery chargers as the same requires higher knowledge and competency. The contractor will maintain the substation DC system once in a month and attend the breakdowns on 24X7 basis. Like Substations and Feeders, TPNODL will establish performance-based maintenance contract for DC system.

This arrangement will also help to reduce number of breakdowns, reduce equipment downtime, reduce unserved energy, increase in the life of assets, reduce/eliminate accidents, and improve customer satisfaction.

#### **b. Testing, Overhauling, and Reconditioning of Transformers**

There are 65 numbers of power transformers including burnt & good condition and nearly 3000 numbers of distribution transformers in burnt & good condition at Balasore Central stores & other Sub-Stores. There are many transformers lying at site. The condition of these transformers is also not known. These transformers are stored for many years and can't be used unless tested/overhauled/reconditioned. TPNODL is planning to procure the services of expert market agency for testing, overhauling, and reconditioning of power and distribution transformers at transformer repair workshop and sites. The activities are planned to be performed by manpower supply by the service contractor.

Through this arrangement, TPNODL intends to use available transformers in stores, and overhaul / recondition power transformers at various site in the year 2021-22.

#### **c. Repair / servicing of Load Tap Changers & LV – HV protection systems of Power Transformers**

TPNODL intends to establish rate contract for maintenance and upkeep of load tap changers & LV – HV protection systems through the original equipment manufacturer (OEM). The rate contract would include the hiring charges of services of competent engineer on per day basis for overhauling of tap changer to make them operational through mechanical and electrical (both local, and remote).

#### **d. Procurement of Materials / Spares for upkeep of Network**

TPNODL is making arrangements for periodic inspection and maintenance of 33KV feeders, 33/11KV substations, Spares for primary equipment such as Power Transformers and Circuit Breakers etc., and Secondary Equipment such as relays, battery chargers, batteries, AC distribution boards etc. to improve safety and reliability of power supply. Most of the maintenance materials are not available in stores as a result equipment downtime is high. In emergency the material is taken from business associates at higher cost for low quality materials.

Maintenance of feeders and substation equipment will also help to reduce the numbers of accidents / incidents.

Availability of materials in stores will help to reduce numbers of breakdowns, reduce equipment downtime, reduce unserved energy, and reduction in accidents.

### 3.3 AT&C Loss Reduction

#### **Proposed Initiatives for accurate and timely Meter Reading:**

Meter reading, billing and collection being a monthly activity with reflection to customer service delivery, it demands highest priority with respect to Quality and accurate service delivery. The same will not be feasible without adoption of technology in whole value chain of reading, billing and collection.

In order to improve meter reading, billing, collection cycle, the present reading cycle is planned to be staggered across full month in place of 15 days prevailing practice with due changes in the billing system.

To improve the quality of meter reading, reduction in provisional billing and timely generation of bills, performance-based contract is proposed with following conditions in place of giving flat rate contract:

- Meter Readers will be engaged in Meter reading activity for full Month. This shall in turn ensure the entitlement of minimum wages to the reading staff.
- Additional information related to Theft and other Premises conditions will be captured from site.
- All Spot Bill and Non-Spot Bill customers meter reading will be catered along with bill distribution to Non-Spot billing customers.
- To reduce the provisional billing, multiple follow up reading will be ensured.
- This contract will encompass the Door to door Collection and Bill distribution along with Meter reading Spot Billing.

In addition to above, following initiatives are planned to be rolled out to enhance Meter Reader productivity.

- Incentive scheme & Monthly R&R awards to each Meter reader for Exceptional/Good Performance based on high productivity, less number of customer complaints.
- Monitoring of Time Stamp Data of Meter Readers so that per day productivity of meter reader can be increased and gaps can be identified.

- Safety Equipment's will be provided to BA Staff such Tester, Gum for Notices pasting, Duster raincoats Boots in Water logging areas, Ladder for Meter at height cases to ensure 100 % safety.

### **Self Help Group**

Govt. of Odisha (GoO) has approved Self Help Groups in Energy Franchise Agreement (SEFA) for collection of Energy Revenue and allied activities in Rural Area. In-line with GoO direction, SHG are being engaged in Meter Reading, Billing and Collection process in rural area of Baripada (Mayurbhanj) & Keonjhar district.

Productivity and Quality of meter reading brought by SHG along with Collection activity will be reviewed to identify the impediments which comes in the way of completing the process in a timely manner. Accordingly, necessary interventions will be planned to roll out in a systematic for effective compliance to the process and evaluating possibility of enhancing the scale of SHG engagement in near future.

### **Consumer Indexing**

Consumer Indexing (CI) is proposed for identifying exact location of the consumer through which feeder, or transformer, or circuit number and or pole consumer is being supplied or what is the consumption pattern of a particular segment of a consumer. Accordingly, database of Consumers to be developed based on the outcome of door-to-door survey and the consumers related records available.

With the Help of Consumer Indexing, walk Route planning/ walking Sequence of meter readers can be planned which will help in more productivity of meter readers in same working hours and Collection management. Further, CI will help in proper tracking and updating of unauthorised and non-registered connections into current database. This will provide vital inputs towards carrying out Energy audit & implementation of GIS.

The information about physical condition of meter, Operational status of meter, Sealing Status/theft/ Anomalies can be identified which will result in AT&C loss Reduction.

### **Proposed Initiatives for enhancing Collection and motivating customers to make payment at counter or online**

Payment process is a monthly activity, it demands highest priority with respect to timely and accurate updation of customer payment. The same will not be feasible without digitization of complete process.

Maintaining a high cash flow in the business is one of the top priority and to ensure regular and timely collection of electricity bills through cost effective mechanism, following initiatives have been identified:

**i. Regular Door to Door Collection:**

Customers are habitual to make the payment after knocking by collector. Thus, door to door collections process will be continue. However, instead of issuing the manual receipt to customer, which is prone to errors, receipt will be issued through cash collection application for ensuring accurate and timely updation of payment.

**ii. Introduction of New Payment Channels/Avenues**

Tie up with Bank and Post Office for accepting payment will be done to provide multiple avenues for timely payment by customers. Website with option for online payment will be proposed in addition to UPI interface in Bill Format (SBM/Non-SBM) for payment.

**iii. Motivational Schemes for Counter and On-line payment**

To reduce Door to Door collection and improve the collection at counter and enhance the online payment following motivational schemes will be introduced:

- a. Introduction of Pay and Win scheme for Online Payment to motivate the consumers for Digital Mode.
- b. Tie up with wallets will be explored for providing exclusive discounts to our customers for increasing the collection through online mode.

**iv. Creating Awareness about usage of Existing Online/Wallets/Card options**

To enhance the payment through online mode, awareness program in following ways will be introduced:

- a. Display of existing Online/Wallets/Card options at Division, Sub-Division and Section Offices through Video, Banners, and Posters will be initiated.
- b. Information will be placed on website and mobile application.
- c. Offer details will be printed on bill & SMSs will be sent to customers.

### **Proposed Initiatives for Meter Testing Lab and Field Testing**

As per the clause no. 102 (d) of OERC Supply code 2019 “The licensee/supplier shall set up appropriate number of accredited testing laboratories or utilize the services of other accredited testing laboratories. The licensee/supplier shall take immediate action to get the accreditations of their existing meter testing laboratories from NABL, if not already done”

Presently there is no meter testing laboratory facility at TPNODL. New meter testing labs are to be developed in TPNODL at 2 locations (Balasore & Jajpur) to cater to meter testing requirements.

Meter testing group is responsible for performing the following testing activities on day to day basis:

Sample meters are to be tested in NABL accredited lab prior to installation, to ensure high quality of the meters.

As per Requirement of Statutory testing, meters installed at Grids, HT & LT customers’ needs to be tested in pre-defined time, based on voltage level, on which meter is serving. Officials have to undertake testing of these meters at site as per IS 15707, with calibrated standard meters, specific for defined voltage levels. To perform these testing, sufficient equipment is not available with TPNODL.

Consumer complaints regarding fast / slow meters after meter installation / during life cycle of meters need to be addressed by testing meters at site as per IS 15707.

To perform these testing, sufficient equipment is not available with TPNODL.

### **3.4 Technology Adoption**

In the “Existing Challenges” section and “Outdated Technology” sub section OT technologies (SCADA, GIS) and IT system will gear up for technology adoption in phased manner for enhancing the efficiencies and effectiveness for improved services to the consumers.

#### **Information Technology (IT) landscape**

IPDS scheme Fluent Grid is implementing Customer Care Solution, Meter, Billing & Collection, New Connection and other Commercial Process, Energy Audit, MIS, Various ERP Modules. Apart from this, TPNODL is planning to rollout Smart Metering MDM and

HES system for consumers above 5 KW along with various mobility landscape. IT-OT landscape shall be proposed as follows

### **Key considerations for IT Landscape Transformation**

1. Development of back end IT Infrastructure for Smart Metering
2. Augmentation of IPDS Software licenses pan TPNODL
3. NON-SAP or Bespoke Applications & Mobile Apps

Following In-House Applications are planned to be implemented at TPNODL

- a. Payment Gateway – A centralized proprietary payment gateway is planned to be established which would seamlessly integrate with all collection touch points like website, mobile app, counters, partner agencies, mobile wallets into a single repository where verification and validation of payments would be done and would be posted to the billing system
- b. Website - Content management System with dynamic website would be placed with integrations to payment gateway and other key systems
- c. TPNODL Connect – Mobile app which would run on all devices and with ease of use features and enablement's for customer satisfaction
- d. Suraksha Portal & Behaviour based Safety app – As safety is a key aspect and needs to be woven in the company culture, best practices followed at Tata Power DDL will be implemented
- e. BIRD (Invoice Management) – Bill Inward Recipient Desk is an application for submission, approval and processing of vendors invoices online, check status of the invoice and track the same
- f. e-PSC Application - Platform to capture and evaluate reliability indices and a backbone to power system control team
- g. Complaint management system & Anubhav Portal which is end to end feedback capture and CAPA closure with information dissemination to all stakeholders is planned to be implemented to bring transparency and effective response to customer needs
- h. Mobile Apps
  - i. SMRD – Smart Meter Reading Devices - Mobile App for Meter Reading, Bill Distribution & follow up. Integration with SAP and Real time Reading uploading to SAP for Billing, OCR based meter reading to be in place
  - ii. TPNODL Connect - Bill Payment , Employee Verification ,Outage Information ,My Account enabled with Billing ,Consumption & Payment History ,Register &

track Complaints ,Smart Meter Data ,Offer & Schemes ,Report Safety issues ,  
Apply New Connection, Streetlight Complaints & Energy Conservation Tips

iii. Collection Mobile app will be integrated with the Payment Gateway application  
and billing system for up-to-date information

4. Communication Network Infra

5. Operational Technology Landscape-SCADA Implementation

6. GIS Implementation:

### 3.5 Customer services

#### Customer Touch Points

To improve the customer experience, customer touch points need to be augmented for providing ease of connectivity and single touch point at offices. Accordingly, following initiatives are proposed:

##### a) Establishing 50 seat Call Centre:

Call Centre is a convenient mode for providing service on 24X7 basis thereby customer is not required to go through the hardship of visiting the office. This demands the overhauling of existing infrastructure of 1 seat call centre in order to improve the Call Centre connectivity. Keeping in mind to provide ease in customer experience, a call centre of 10 seating capacity is being set up at Bhubaneshwar on an OPEX model and will be operational on an immediate basis. This call centre at Bhubaneshwar is on a temporary basis for an initial period of 6-9 months and will subsequently cease to exist after a new call centre will be set up at Balasore on CAPEX model within 9 months.

Considering the customer base of 19 Lakh consumers and providing service at call is the preferred mode of service in utility sector, initially, infrastructure of existing 1 seat call centre is proposed to enhance to 30 seats Call Centre at Balasore. To encourage the customer to connect with unified Call Centre, its number will be advertised through Bill, Website and other medium for enhancing the call inflow.

Initially, Call Centre at Balasore will have 10 agents per eight-hour shift (average 25 agents per day). With the gradual increase in customer calls, number of agents will be

enhanced to 30 agents in a shift to ensure connectivity at all time. It is pertinent to mentioned here that, similar experience happened whereby different industries like Telecom, Travel, and E-Commerce etc. are serving their consumers satisfactory by service delivery through Call Centre for most of customer's requirements.

It has been experienced that with the passage of time, call centre will become preferred mode of communication. Every year the call volumes will be reviewed along with process improvements made and accordingly a plan for 2<sup>nd</sup> call centre location will be planned and prepared. This will also serve the purpose of Business Continuity during disaster situation at Balasore or vice-versa.

To establish the one of the state of art call center, it is required to commission call center telephony equipment for inbound and outbound, interfaced with multiple option to connect and further integration with business system to auto response and feedback from consumers.

**b) Opening of Payment cum Customer Care Centre at Circle, Division & Sub-Division:**

Currently, customers visit the office and stand in long queue for making electricity bill payment during due dates. Also, lack of basic amenities for the visiting customers like Seating space, water dispenser etc. at Section, Sub-Division and Division Level is experienced.

Bill cum Customer Care Centre is proposed at every Circle, Division & Sub-Division with amenities (*based on location*) like Demarcated area for Customers with Queue Management System, Seating Space, water dispenser etc. for improving the customer experience.

Customer experience single window service in similar industries like Telecom, Bank etc. resulting in timely resolution with high customer satisfaction. It is imperative to depute designated customer care officials at customer care centre instead of current practice whereby customer visits one desk to another for complaint processing.

As the intensity of our initiatives pertaining to faulty meter replacement, Billing, Payment and Recovery may in-turn increase the customer queries, seeking clarification. Section being the nearest office for rural and town customers, some customer would still prefer to visit the office in-person for communicating related to any query/complaint. In line with

this, footfall analysis will be done, and manpower deputation will be reviewed in next financial year.

**c) Proactive communication through SMS & Email:**

Currently, SMSs are being send to limited customer that too at the time of Bill Generation only. It has been proposed that the communication through SMS and Email need to be enhanced by introducing SMS/Email at following stages:

- a) Bill Generation
- b) Bill Payment
- c) No Power Complaint Registration
- d) Commercial complaint registration and Closure
- e) Due date reminder

In addition to above, communication to customer in following scenario will also contribute to enhancing collection efficiency.

- a) Bill Default
- b) Disconnection Notice
- c) Disconnection Order Generation

**d) Customer Centric Process (Process re-engineering):**

In addition to above customer touch point, the organization structure and processes will be reviewed and revised to enhance the customer centricity, efficient and effective process execution and control leading to enhancement in customer experience during the life cycle from New Connection to consumer initiated disconnection.

Accordingly, the process will be mapped/designed in Fluent Grid CIS system for 16 divisions for ensuring efficient processing, effective monitoring, proactive communication and timely reporting. In the system based process following initiative will be incorporated:

- a. Performance Assurance System with Green, Yellow and Red indicator at executor level for prioritization of execution.
- b. Escalation mechanism: Auto escalation of complaint wherever defined timeline is expired for the activity of the process.
- c. Quality Check mechanism: Quality check parameter will be incorporated in the process for ensuring defect free service to customer.
- d. Proactive communication at different stage of process will be send to customer.

- e. Pilferage reduction through process related with material management, and meter installation.

**Benefits:**

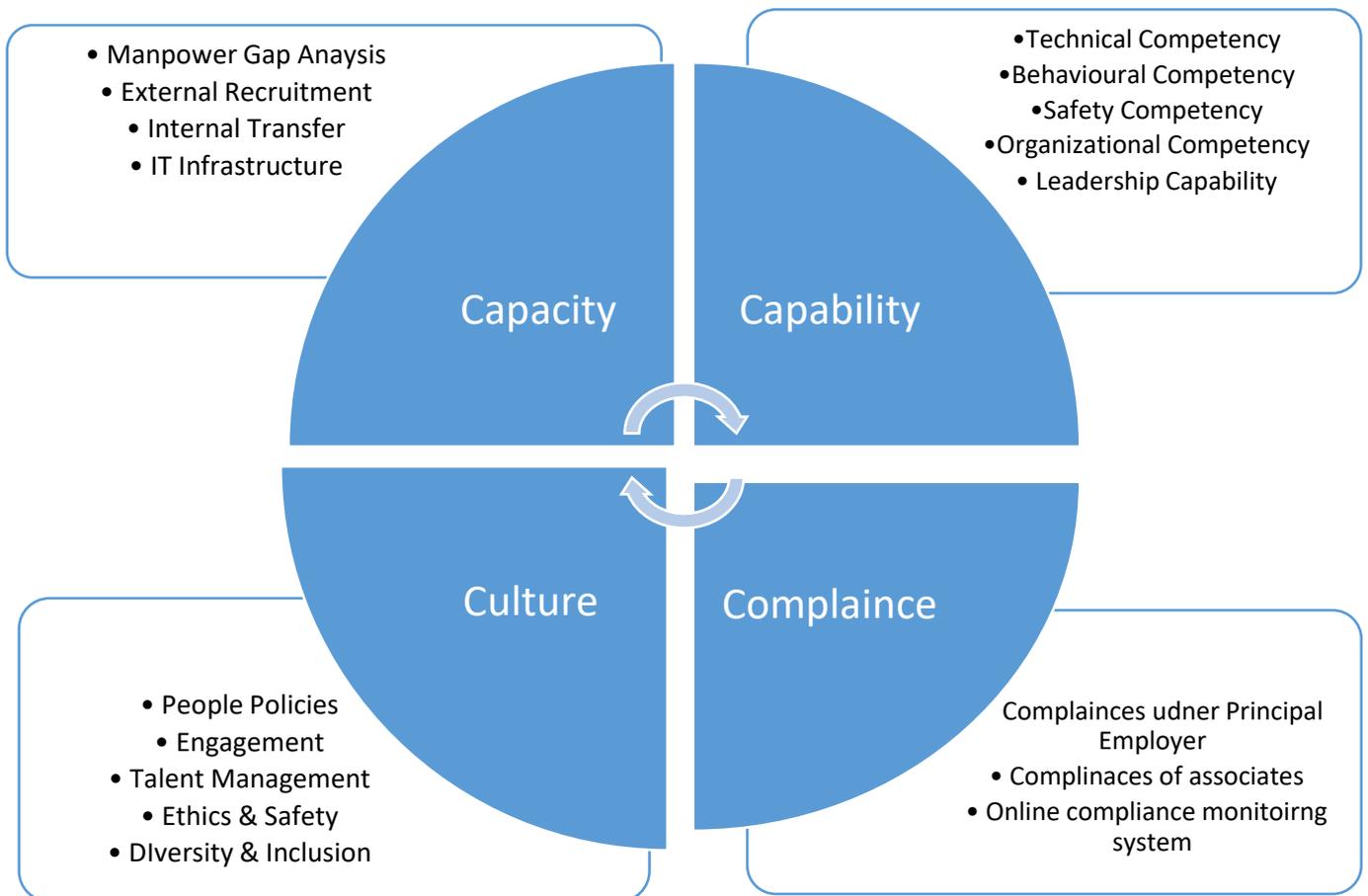
Establishing Call Centre and Payment Cum Customer Care Centre will have following benefits:

- Improved customer connectivity at Call Centre by enhancing the capacity from existing 10 to 30 seats.
- Enhanced customer convenience during new connection request, bill payment, complaint registration at Bill cum Customer Care Centre at Division offices.

**3.6 Human Resource Plan****Human Resources**

People strategy of TPNODL has been prepared keeping in mind various challenges, employee grievances, risk involved and also aspiration to convert this loss-making organization into an engaged, high performing organization. TPNODL has prepared a booklet on Human Resource plan and can be referred for complete manpower planning. All strategic objectives have been bucketed under four broad categories with 4C theme.

**1. Approach of People Management at TPNODL.**



## 2. Capacity & Infrastructure

### Strategic Workforce Planning

TPNODL has inherited all existing manpower of erstwhile NESCO in line with license agreement. In order to enhance network reliability, network safety, fast resolution of operational and commercial complaints, many new functions like PSCC, Quality, Engineering, Consumer Services, Safety, Security, CSR, Training & Development etc to be started. In addition to this, many new technologies also to be implemented for better control and fast resolution of issues like SAP module, SCADA, Mobile Apps, GIS etc.

Hence, it is essential to upgrade competency level of existing employees of erstwhile NESCO to work in new function and in new technology platforms. However, due to absence of fresh recruitment for last few years, option must be explored to induct competency through new recruitment or transfer from internal divisions.

Hence, while planning for manpower, TPNODL shall evaluate following aspects.

- Formation of new organization structure & Manpower requirements
- Assessment of existing manpower and their competency level
- Annual separation trend, attrition analysis & age distribution in each function / work level
- Critical competency requirement due to new technology adoption
- Transfer of competent employees from other division of Tata Power
- List of activities can be outsourced to competent third-party agencies.

Based on detail analysis of above-mentioned factors, TPNODL has developed its short term and long-term manpower plan. It is estimated that about 1268 officers need to be recruited to meet the requirement and out of which 497 to be recruited immediately in FY22.

#### **Infrastructure Planning:**

In order to successfully manage large workforce of around 3500 employees on rolls and about 4000 business associates' employees, TPNODL must implement appropriate technology to manage recruitment, payroll administration, statutory compliances, trust management, reward & recognition etc. SAP HR Module apart from few other online platforms like Legatrix (to monitor compliances) and employee portal for internal communication, performance management system, travel management, guest house management to be installed in phases at TPNODL. Employees shall be equipped with Laptop / smart phone etc. wherever applicable. Some of the major activities planned for the year is mentioned below.

- Issuing laptop and smart phone to executives with SAP user license as per business need
- Implementation of SAP HR (Payroll) module to ensure centralized payroll system for all employees
- Launching of E-learning platform with help of reputed e-learning partner to impart behavioural training
- Launching of Web Portals to facilitate various employee services like payroll, leave management, reimbursements, Performance management , Travel and Guest house management etc.
- Renovation of all existing office buildings (Circle offices during the first year and Division and Sub Division Offices in subsequent years) to at least 3S standard.

- Development of a few important locations like Corporate Office, Customer Care Centre, Laboratory, SCADA centre etc to 5S standard
- Providing adequate training to newly inducted employees / associates and creating suitable infrastructure/ training centre in each of the Circle offices and at Corporate office.

### Capability Development

Continuous up-gradation of competency is the key success factor in this continuously changing business environment and technological revolution. Same is also applicable to TPNODL considering changes in business philosophy, new technology adoption and changing organizational structure.

Competency mapping shall be conducted across all positions and training program shall be designed and delivered through in-house development of training centre or sending executives to Tata Power (Delhi or Mumbai). Use of online e-learning training module shall be encouraged across all category of employees. Online e-learning module shall initially cover mostly Behavioural training, Safety, Ethics etc while technical training shall be imparted through training centres.

Considering diverse employee demography, capability development strategy at TPNODL needs to be customized keeping in mind changing business demands. Various types of training shall be finalized based on leadership discussion as presented through schematic diagram.



**Safety Capability:**

Each employee / associate at TPNODL shall be imparted basic safety induction training at the time of joining. E-learning module for safety induction shall be rolled out subsequently to cover 100% employees.

In addition to this for long term training strategy, safety related training needs shall be identified for all employees based on job profile and in coordination with Safety department at the beginning of the year. Based on Training needs identification (TNI), annual training calendar shall be prepared for both employees and associates. Endeavour would be to cover maximum safety training through online while specific trainings can be conducted through training centre. Ownership of 100% compliance will be with divisional safety function while HR team will provide adequate support in conducting these training.

**Technical Competency Development**

Technical competencies are backbone for TPNODL operation since entire value proposition is linked with safe power distribution across 28000 sq. km of the distribution area. Hence, training needs for technical operation shall be finalized during finalization of annual goal setting process for all employees. At least one such need on safety must be identified for each employee. Based on TNI, annual training plan shall be made, and faculties would be identified internally within TPNODL or from T&D cluster in Tata Power (Mumbai & Delhi). External faculties also can be invited based on critical requirement.

**Behavioural Competency development**

TPNODL being consumer driven business, behavioural competencies are also equally important for TPNODL employees. Depending on job profile and goal for the year, one or two behavioural training needs shall be identified for each employee during annual goal setting process. Tata Power competency framework could be used as a reference to assess behavioural competency gaps among executives, basis which training needs could be finalised.

Divisional HR Team shall ensure completion of maximum behavioural training by assigning courses to executives on e-learning platform. The online training platform will have complete flexibility for the learner to learn at his convenience irrespective of time and location.

Only in case of specific behavioural training and/or OD interventions, services of external trainer of repute may be utilised.

### Organizational Training Needs & Focus Group Training (FGT)

TPNODL being part of Tata Group, is also responsible to uphold Tata values and implement various Tata management philosophies towards making it a consumer driven and performance-oriented organization apart from maintaining governance standard of Tata Group. In this context, various organizational capabilities are required to be developed for its managers and employees in areas like TCOC / POSH / SAP / IMS / Risk Management System / TBEM etc. Apart from this, various groups and departments in TPNODL may require certain training specific to their group/ department for which focus group training would be imparted for the group depending on group's need.

### Leadership Competency Development:

Leadership in pipeline is always critical agenda keeping in mind growth aspect of TPNODL and to take care of superannuation & separation of experienced employees and also creation of various new functions. Hence, keeping in mind broad manpower plan, opportunity for junior employees and to ensure manpower cost within desired limit, TPNODL must strategize in developing successors for critical positions to meet future requirements. Succession Planning Process would comprise of identification of critical positions and prospective successors at the beginning of each year, identifying gaps in competencies and intervention for effective training program.

### Training Plan FY 22

Type of Training	Target Group	Population Target	Training Method
Safety Induction	All employees	100%	Online / Classroom
Tata Code of Conduct / POSH	All employees	100%	Online / Classroom
Consumer Delight	Front Executives	100%	Class Room
SAP Modules	All SAP users – All Executives	100%	Class Room
Best Practices	Key Executives	Circle Heads / Division Heads	Visit to Delhi / Mumbai
SACRED – Tata Values	All Executives	100%	Class Room

### Culture Building

Building desired culture is the most crucial agenda for leadership team in a newly formed organization like TPNODL. Culture is a set of rules, regulations which evolve through trial

and error and shared meaning among key stakeholders. In this context, there are many cultural elements which TPNODL must focus while a few specific elements are core to the organization. Considering business objective, consumer expectation and employee productivity, TPNODL has identified following six elements as core cultural elements and wish to build on these elements towards making TPNODL a performance oriented & consumer centric utility across power sector.



### Value System:

TPNODL has adopted SACRED value system of Tata Power, that stands for Safety, Agility, Care, Respect, Ethics & Diligence. Every employees / associate of TPNODL shall be aligned with this value system. Appropriate communication, training on value system shall be imparted to each employee on regular basis apart from joining induction. Those values shall be reinforced through every possible intervention like Town hall, sharing stories, leadership interaction etc. Demonstration of such values must be recognized while monitoring system shall be strengthened to ensure that such values are not deviated by any member.

Specific to Ethics, all employees must sign and acknowledge Tata Code of Conduct (TCoC) at the time of joining. Regular training and reinforcement on TCoC shall be conducted to uphold ethical standard of Tata Group. All employees / associates must be trained on Prevention of Sexual Harassment (POSH) module to ensure free and safe workplace for women colleagues.

Safety is also one of the core values of Tata Power and Tata Power has adopted ZERO tolerance policy for workplace safety including at TPNODL. All employees / associates shall be trained in various safety modules as applicable based on job requirement before actual deployment. Regular reinforcement in safety competency must be ensured through various training or workshop. Demonstration of good safety practices must be recognized while ignorance in safety won't be tolerated.

### **People Policies**

People policies shall be backbone of TPNODL towards ensuring highly engaged and high performing workplace. Though, existing service rules / standing order are applicable to erstwhile NESCO employees, TPNODL will explore and adopt best practices & policies from its other divisions in T&D business like Delhi and Mumbai distribution, as per need. Some of the important policies are proposed to be implemented at TPNODL includes:

1. Tata Code of Conduct (TCoC)
2. Tata Power Health & Safety policy
3. Prevention of Sexual Harassment at Workplace (POSH)
4. Rewards & Recognition policy and Fun at Workplace
5. Higher Education Policy
6. Diversity & Inclusion
7. Whistle Blower Policy
8. Training & Development through e-learning
9. Employee volunteering programmes under CSR

These are some policies which would be implemented in phases with an objective of creating a safe & highly engaged workplace. TPNODL also would like to focus more on women representation in its workforce and women empowerment through various policy guidelines. Taking benefits of digital world, TPNODL shall implement various IT & IT enabled services (like web-based services, mobile app, SAP, GIS, SCADA etc) for better consumer services. Accordingly, TPNODL shall formulate IT and Laptop orientated policies for its employees (specifically for executives). Keeping in mind continuous learning and acquiring of niche skills, TPNODL shall implement training & development policy for continuous competency enhancement of existing workforce. Use of online e-learning module shall be encouraged to ensure maximum participation of its employees.

### **High Performance & Talent Management**

Building a culture of high performance is a need of survival in this competitive business world. Financial model of TPNODL has further necessitated higher productivity level and increasing bar of performance. Hence, performance management at TPNODL shall be conducted through online and annual increment / promotion of employees shall be affected through annual assessment of Key result areas and Key Behaviour Attributes. Regular monitoring of performance shall be conducted for feedback to help improved performance. High performers shall be recognized during annual increment or career progression. Identification and nurturing of high potential employees is key to leadership development in TPNODL. Potential of every employee shall be assessed, and training needs shall be identified through gap analysis. Training plan shall be prepared and executed during the year. Effort shall also be made to nurture talent of such identified potential employees. Employees shall be exposed to different job profile through internal job rotation policy.

### **Business Excellence**

Tata Power always believe in excellence in its every operation. TPNODL shall adopt Tata Business Excellence Model (TBEM) at an appropriate time once the business processes are established and stabilised. TPNODL will review all its processes and execute towards ensuring a higher level of consumer delight and achieving other business results

### **Volunteering**

Care for community is one of the core values of Tata Power and TPNODL also wish to initiate various community service-related initiatives in areas of education, health, livelihood, women empowerment etc. These initiatives will give opportunity to employees to contribute to society.

### **Engagement**

Creating an enabling workplace environment and facilitating full utilization of employee potential are key strategic advantage of Tata Power. Hence, TPNODL also wish to create such working environment so that employees / associates' engagement level reach to benchmark level. TPNODL wish to implement an engagement model and drive various engagement initiatives. with a view to ensure all its employees work at highest level of engagement.

## Culture Building Initiatives are tabled below:

Initiatives	Short Term Activities
Employee Engagement	Structured Leadership communication (Town hall, Digital Communication, Meet your CEO)
	Rewards & Recognition to employees
	Social Engagement, Sports , Celebrations & Cultural Clubs, Ladies Club,
	Grievance Redressal
Values	Implementing Tata Value System (SACRED) and reinforcing at every level of hierarchy
	Ethics Structure & Committee formation, Local Ethics Councillor, POSH internal committee
	Communication / awareness on Ethics / POSH and visual display
People Policies	Mentioned earlier
Talent Management	Competency mapping for Executives
	Competency Mapping for non-executives (Long term)
	Competency mapping of Grid Operators (Outsource)
	Job Description, KRA for all Executives; Non-Executives planned for long term
	Succession Plan for employees retiring during next 3 years
Business Excellence	L3 level process finalization – Only key processes; Balance processes planed for long term
	Participate in Tata Business Excellence Model (TBEM) in long term
	Quality Circle, Innovation council formation
Employee Volunteering	One blood donation camp to be conducted
	Tree Plantation in each circle to be organized
	School Education through volunteering – One school during FY 22 and at least one school in each subdivision planned in long term.

## **Compliance**

TPNODL, a new legal entity with large workforce of around 3500 employees on rolls and about 4000 business associates' employees, will be required to comply various statutory requirements as per applicable labour laws. TPNODL, will adopt two interlinked approaches to manage its statutory requirements as below.

Part 1: TPNODL as Independent legal entity and those applicable to TPNODL as a Principal Employer TPNODL plans to monitor all compliances through Legatrix software for timely compliance, as applicable Being a new entity, TPNODL will also ensure registrations under various labour legislations as applicable and comply with the same.

Part 2: TPNODL will engage many business associates for who a separate cell shall be set up to monitor compliances under various laws. Strict monitoring measures would be ensured through technology enabled system not only for compliances & governance but also to avoid any exploitation of workers

A separate booklet on Human Resource Plan has been enclosed along with this document.

## **3.7 Strengthening Civil Structure**

### **Renovation of various office buildings**

Office building including the corporate office & all field offices upto the section level which are in dilapidated conditions will be completely renovated to increase their usable life. Further the existing furniture which are in poor condition will be replaced by modern workstations, cabins, etc.

### **Remodelling & Creation of Additional Workspaces in various office buildings.**

The office buildings upto Division offices need to be remodelled to create additional space for accommodating the new recruits, provisions for conference rooms, canteens, visitors lounge, etc.

### **Record rooms**

Record rooms of Structural Steel and covered with Precoated Sheets will be set at each circle with “State of the Art” provision of storage, protection, fire proofing, mass scanning, bar coding of all records & files for easy access to employees.

### **OPCENEX (Operation Center of Excellence)**

It is proposed to create a centralized Operation center and PSC in newly constructed Sub Station at Vivekanand Marg near Kalimandir at Balasore. This substation is constructed under IPDS Scheme and can accommodate 25 Employees and a Centralized PSCC.

### **Civil Work for Meter Test Bench**

In order to create updated Meter Testing Bay new building is to be constructed admeasuring about 160 sq.m. at convenient location at Balasore & Jajpur along with refurbishment of area with all basic amenities required for setting up the Meter testing laboratory. This will have all modern testing benches and equipment's along with storage facility in covered storage shed.

### **Civil Infrastructure for Call Center & Customer Care Centers**

50-seater, 24 x 7 call center to be set at Balasore to cater all consumer calls related to No-current complaints, billing complaints, new Service connections, requests & queries. Customer care centers would be set up at each division to cater to walk-in consumers to register No-current complaints, billing complaints, new Service connections, requests & queries. These centers would also provision for bill collection

### **Security System of Stores: - High Mast lighting System**

High mast lighting is commonly used to illuminate large areas from a very high mounting height for storage, It is an efficient lighting solution & most preferred way of illumination because it can achieve a high space to height ratio. As stores & scrap stores are vulnerable to theft it is important to have optimum illumination to safeguard the materials kept in the premise. Balasore Store has a very big area of 70000 sqr mtr and Jajpur Store has an area of 60000 sqr mtrs. Also, from operational point of view appropriate & efficient lighting arrangement is required to support loading, unloading & movement of materials inside the premises.

**Boundary Wall & Fencing**

There is no boundary wall at four store locations. The boundary wall at the Balasore Store has no Concertina wire thereby allowing easy access inside store. All the stores will be provided with 3-meter height boundary wall with 600 mm concertina wiring protection.

**Storage of E-waste and Hazardous Scrap Material**

As per the guidelines of the NGT, the disposal of E-Waste and Hazardous Scrap like used Oil, Computer accessories etc has to be as per the OHSAS guidelines for occupational health and safety management system.

**Civil Upgradation of DT workshop:**

TPNODL has its own Distribution Transformer Workshop at Balasore which is very old and ill maintained. Hence it is proposed to renovate the DT workshop for its better utilization and expenditure of an amount of 1 crore is proposed.

#### 4 Capital Expenditure Plan

Detailed Capex Plan is filed to Hon'ble Commission separately for a total value of approx. 275.4 Cr which includes detailed plan and cost estimation for each activity proposed in the plan. Brief details of the Capex Plan is mentioned below.

#### CAPEX/OPEX requirement

##### A. CAPEX Plan

TPNODL has come up with a capital investment plan under the major heads. These heads are detailed in subsequent sections along with fund requirement and activities to be performed.

- 1) Statutory Compliance/Safety
- 2) Loss Reduction
- 3) Reliability Improvement
- 4) Load Growth
- 5) Technology & Civil Infrastructure

TPNODL proposes Capital Expenditure of INR 275.4 Crores. for FY 21-22 to carry out various activities under 5 major categories.

S. No.	Major Category	Activity	DPR TPNODL(In Crores.) **	Cost
1	Statutory Safety &	Safety & Testing equipments	8.51	
		Cradle guard at major road crossings	2.46	
		Fencing of Distribution substations	9.8	
		Boundary wall for Primary substations	6.84	
		Establishment of Meter Testing Lab	2.2	
		<b>Total (1)</b>	<b>29.81</b>	
2	Loss Reduction	Equipment for Meter data downloading	0.28	
		AMR enabled equipment	1.37	
		Conversion of LT Bare conductor to AB Cable	13.56	
		Field Testing equipment - Metering and enforcement	1.76	
		<b>Total (2)</b>	<b>16.97</b>	

3	Reliability	33 KV Network refurbishment & AB switch	22.96
		Refurbishment of 33KV/11KV Primary Substation (PSS)	17.5
		11 KV Network refurbishment & AB switch	26.13
		Refurbishment of 11KV/0.415 KV Distribution Substation (DSS)	8.99
		Installation of LV protection at DSS	6.74
		Installation of Auto reclosure / Sectionalizers ,RMUs, &FPIs	6.77
		Trolley Mounted Pad Substations	2.34
		Underground cable Fault Locating Van and oil filtration machine	3
		Testing equipment for PSS	6.48
		Earthing of Power Transformers and Distribution Transformers	0.91
		33KV & 11 KV Lightning Arrestor	1.69
		<b>Total (3)</b>	<b>103.51</b>
4	Load Growth	Augmentation from 5 MVA to 8 MVA Power Transformer	8.96
		Augmentation from 200/250 to 315 KVA Distribution Transformer	5.19
		Augmentation 63/25 to 100 KVA Distribution Transformer	4.11
		Addition of 11 kV Overhead Line	1.68
		Addition of 33 kV Overhead Line	2.06
		<b>Total</b>	<b>22</b>
5	Technology & Civil Infrastructure	Data Center (DC) Development Cost	5.39
		IT Infrastructure Hardware Cost	5.31
		End user Devices i.e. Laptop, desktop, Printer, scanner	16.34
		Software Licenses	15
		Communication Network Infrastructure at DC and office locations	4.98
		Mini SCADA Implementation (20 nos ODSSP & 10 nos Old PSS)	2.55
		GIS Implementation for One Division	7.91
		Smart Metering Infrastructure (HES & MDM on 4G/ NBIOT Communication)	10.5

	Call Center Implementation (System & Infrastructure)	5
	Civil Infrastructure (Office Buildings, Meter Test Lab, Customer Care center, Records Rooms, Power System Control)	17.3
	Establishment of DT workshop	3.6
	High mast light in the Center store	0.75
	Assets for Offices	5.23
	Building shed for material storage with racking system	3.25
	<b>Total (5)</b>	<b>103.11</b>
<b>Grand Total (1+2+3+4+5)</b>		<b>275.4</b>

\*\* Hard cost

## 4.1 Statutory & safety

### 4.1.1 Safety PPEs & Equipment:

It is proposed to implement Tata Safety & Health Management System (TSHMS) at TPNO DL to prevent work-related injuries & ill-health to the workers and to provide a safe & healthy workplace to the employees.

The implementation of TSHMS will also help in improving the safety of all stakeholders (consumers, Business Associate employees & public).

Personal protective equipment, or PPE protects its user against any physical harm or hazards that the workplace environment may present. It is important because it exists as a preventative measure for industries that are known to be more hazardous, like manufacturing, mining, and Electricity Distribution. It is important that PPEs and safety equipment provided to staff to carryout construction and maintenance activities should meet safety regulations and guidelines. Availability of correct type and size of PPE's for different activities ensures safety of workforce against injuries, incidents, and accidents. Reduction in injuries, incidents and accidents helps to improve the productivity.

Any power distribution utility is bound to comply with all statutory requirements. Non-compliance results in enforcement action, penalties, harassment, and loss of brand image. In view of above, below mentioned PPE need to be procured for Metering Team for carrying out activities in safe manner.

## Tree Trimming

State of Odisha being a coastal state leads to growth of heavy vegetation. Tree branches usually grow fast and come in close proximity with our electrical lines, which may cause transient faults and harm to general public and stray animals. To prevent this, we carry out patrolling as a part of our feeder maintenance activities and schedule branch cutting activities for parts of the tree which enters beyond the given electrical clearance limits. To carry out smooth and faster tree cutting, we have proposed for tree pruning machines.

## Expenses for procurement of Personal Protective Equipment (PPEs):

PPEs will be required to be provided to the workforce for the safe execution of work. PPE such as Safety Shoes, Safety Helmet with induction tester, Full body safety harness, safety hand gloves, and reflective jacket will be provided to each employee.

## Expenses for procurement of Safety Equipment:

- a) **Aerial Tower Wagon:** It is proposed to bring the technological interventions in the safety to reduce the risk of fall from height while carrying out the work on the poles of trimming the trees. It is proposed to procure two nos. Aerial Tower Wagon to carry out the height work.
- b) **Neon Tester & Discharge Rod:** It is proposed to provide the set of neon tester & discharge rod with each fuse call center & sections so that the linemen can easily carry it at the working site to carry out the testing & discharging of the high voltage lines.
- c) **FRP ladders:** FRP ladders will be required to be given to each fuse call center, substations & section offices to carry out the maintenance work on the poles. Fiber glass ladders of 9 meters & 12 meters will be provided to access the height so that workmen will not require to climb without following safety norms.

- d) **Fire extinguisher:** A fire extinguisher is an active fire protection device used to extinguish or control small fires, often in emergency situations. We required these to install in the different offices of the TPNODL to quench the fire.
- e) **DISCHARGE ROD FOR 11-33-66KV :** It is required to discharge the line during the maintenance / breakdown to discharge dead system having limited fault levels and also to discharge the static & induced charges in the dead system or equipment, particularly in transmission lines, cables, transformers, reactors, large bus bar systems, switch-gears etc.
- f) **GROUNDING SET FOR O/H LINE PORTABLE:** Portable Earthing and short-circuiting equipment is temporarily installed on isolated power circuits to provide a controlled path for short-circuit current.
- g) **Non-Contact Electric Voltage Power Detector/Sensor:** A non-contact voltage tester is the safest way to make sure the power is off without touching any wires. The tester will light up and/or make noise when it comes close to a hot (live) wire, even one that's covered in plastic insulation. It is required to test the line whether it is charged or dead for the safety of the workman.
- h) **Water Hydrant System against Major fire protection** - Fire breakout is a major risk for stores leading to loss of public assets & property. There had been occurrences of fire incidence in past where high value material had been destroyed in Store. Accordingly, there is need for establishment of Water Hydrant System for safety & avoid any eventuality of fire in and around.

The objective of this report is to design a Fire Fighting system that shall provide:

- Life safety of occupants.
- Property protection.
- Compliance with all relevant statutory requirements.
- Minimum disruption during emergency to the store function and power distribution system.
- Necessity of project is for fire risk mitigation plan.

**Benefits of the Project:**

- Personal protective equipment and Safety and Testing Tools protects its user against any physical harm or hazards that the workplace environment may present.
- It is important because it exists as a preventative measure for industries that are known to be more hazardous, like manufacturing, mining and Electricity.
- An employee will be aware on which equipment is required of which tasks, and what it is meant to protect will help employee use of PPE that are provided to employee by the employer, which is the best way to ensure no or less injury or illness.
- Use of PPE also increases the quality of your workday and reduce the Man-hour lost due to any kind of injuries or illness

**4.1.2 Cradle Guard at major road crossings**

Cradle guards are provided in overhead MV/HV/LV feeders, by which a live conductor, when accidentally gets broken, is prevented to encounter public or animals and vehicles. By having cradle guards in place, immediately after a live conductor breaks, it first touches the cradle guard thus completing the electrical circuits necessary for the operation of the protection relays installed at substations. This in-turn trips the circuit breaker and danger to any living object is averted. At present, most of the network is overhead and there is no provision of guard or cradle wire installed beneath the overhead conductors. This poses serious safety threat to the public and possibility of conductor parting cannot be ruled out. In such a scenario, cradle guard will help in avoiding accidents caused by snapping of conductors of overhead MV feeders. TPNODL proposes to put in place the cradle wire/guard wire.

**4.1.3 Installation / Construction of Plinth fencing for DSS and Boundary wall for PSS:**

Distribution Substation are located at various locations catering the power supply requirement to the consumers. Since these are installed at various scattered locations along the Road, public places, near the commercial areas etc. During the survey, it is observed that boundary walls or fencing are either damaged or do not exist thus posing a safety threat to stray animals and public at large.

At many of the places it was found that the condition of the Fencing of DSS and Boundary wall for PSS is in a very bad condition. Ensuring safety of People & equipment is very much needed for safe operation. Hence it is proposed for Construction of fencing for DSS and Boundary wall of PSS, wherever required.

Distribution Substation (DSS) comprises of various equipment which perform specific task to ensure delivery of power supply at appropriate voltage to the end consumers. Main components are 11 kV Switching device, 11 kV Protection, Transformer, LV Protection, Earthing, fencing and O/G LV feeders. The most expensive equipment in the DSS is the Transformer and its life depends upon healthy condition of all other components be it LV Protection, HV Protection, Earthing or fencing. Thus, fencing is one of the most important part which ensures overall first-hand protection of the transformer. Therefore, installation of fencing and boundary wall to safeguard the DSS and PSS equipment and to maintain safety clearances is one of the major needs.

It will benefit by improving the safety of people and the equipment DSS failure will be reduced, hence power cuts will decrease.

### Safety of public and stray animals

In this proposal, TPNODL intends to carry out new fencings in phase manner. In this year around 1000 numbers of locations are being proposed for carrying out Fencing of DSS & 2593 meters of Boundary wall at PSS.

Detailed cost estimates for Boundary Wall & Fencing are attached in annexure No.4.

### Circle wise Requirement of Fencing of DSS:

Circle Name	No of Divisions	Total no of 3 phase DT >100 KVA	1 <sup>st</sup> year no of DSS Fencing to be considered in FY21-22(Nos.)	Unit Cost for each DSS Fencing (in Crore)	Total Cost for DSS Fencing (in Crore)
Balasore	5	3157	200	.0098	1.96
Bhadrak	2	1185	200		1.96
Baripada	3	1051	200		1.96
Jajpur	3	1726	200		1.96
Keonjhar	3	850	200		1.96
<b>Total</b>	<b>16</b>	<b>7969</b>	<b>1000</b>		

**Circle wise Requirement of Boundary wall for PSS:**

Circle Name	No of Divisions	Total Boundary wall required	Total quantity considered in FY21-22 (in meters)	Unit Cost for per meter Boundary wall for PSS (in Crore)	Total Cost for PSS Boundary wall (in Crore)
		(in mtrs)			
Balasore	5	9120	954	0.0026	2.51
Bhadrak	2	4155	70		0.18
Baripada	3	2385	250		0.66
Jajpur	3	3811	768		2.02
Keonjhar	3	2441	551		1.45
<b>Total</b>	<b>16</b>	<b>21912</b>	<b>2593</b>		<b>6.84</b>

**4.1.4 Establishment of Meter Testing Lab:**

As per the clause no. 102 (d) of OERC Supply code 2019 “The licensee/supplier shall set up appropriate number of accredited testing laboratories or utilize the services of other accredited testing laboratories. The licensee/supplier shall take immediate action to get the accreditations of their existing meter testing laboratories from NABL, if not already done”

Presently there is no meter testing laboratory facility at TPNODL. New meter testing labs are to be developed in TPNODL at 2 locations (Balasore & Jajpur) to cater to meter testing requirements.

Meter testing group is responsible for performing the following testing activities on day to day basis:

Sample meters are to be tested in NABL accredited lab prior to installation, to ensure high quality of the meters.

As per Requirement of Statutory testing, meters installed at Grids, HT & LT customers’ needs to be tested in pre-defined time, based on voltage level, on which meter is serving. Officials have to undertake testing of these meters at site as per IS 15707, with calibrated standard meters, specific for defined voltage levels. In order to perform these testing, sufficient equipment are not available with TPNODL. Consumer complaints regarding fast / slow meters after meter installation / during life cycle of meters need to be addressed by testing meters at site as per IS 15707.

In order to perform these testing, sufficient equipment are not available with TPNODL.

There is requirement of new meter testing bench and details of CAPEX required is mentioned below.

These labs will ensure the statutory requirement of meter testing across TPNODL.

<b>REQUIREMENT OF METER TESTING BENCH</b>	
Material	Qty. (No.)
SINGLE PHASE 20 POSITION BENCH	2
THREE PHASE 20 POSITION BENCH	2
SINGLE PHASE/ THREE PHASE PHANTOM LOAD TEST BENCH	2

#### 4.1.5 CAPEX requirement for Statutory & Safety:

Since the geography is vast and huge investment is required to make the network fully compliant to safety and statutory standards, and since this huge investment is not possible in a single year, TPNODL shall address network deficiencies at critical locations. Table below suggest the activities to be performed along with funds required under Statutory and Safety Head.

S. No.	Major Category	Activity	DPR TPNODL(In Crores.)	Cost
1	Statutory & Safety	Safety & Testing equipments	8.51	
		Cradle guard at major road crossings	2.46	
		Fencing of Distribution substations	9.8	
		Boundary wall for Primary substations	6.84	
		Establishment of Meter Testing Lab	2.2	
		<b>Total (1)</b>	<b>29.81</b>	

#### 4.2 Loss Reduction:

During limited site inspections, energy meters were not found at consumer's premises which were energized under Saubhagya scheme, an initiative of GoI. Further, at number of places where energy meters are installed and available at site, the same are not functioning properly. The above issues are resulting into reduction

in billing efficiency, high AT&C losses, increased provisional billing, defective bills, and increased consumer complaints leading to customer dissatisfaction. Errors in bills leads to non-payment of bills and thus hampers the collection efficiency. It is required to test meters on-site to detect any abnormality/theft thereby reducing AT&C losses. The Electronics meters have capacity for recording data in its memory. This meter data is required to be analysed for detecting any metering abnormality.

Therefore, in this head, following activities are planned for execution:

- Data collection & analysis for detecting problematic meters.
- Energy Monitoring System (AMR)
- LT bare to ABC Conversion
- On-site testing of meters to detect any metering abnormalities/theft.

#### 4.2.1 CMRI for Meter data downloading - Metering and enforcement

At present in TPNODL there is no practice of collecting data from the meters installed at site. It is proposed to procure CMRI's for data collection & analysis. This will help in identification of any problematic meters & take corrective action. The cost estimate is mentioned in annexure 6.

Description	Qty
CMRI for Meter data downloading	82

#### 4.2.2 GSM Modem for AMR Communication

The proposed AMR will offer multiple benefits to the DISCOM as well as consumers. It is proposed to install 2500 nos for consumers having load above 20 KW. This will improve revenue cycle of the DISCOM. TPNODL will be able to control the billing and collection for these consumers effectively. Less billing disputes as 100% correct bills issued on actual meter readings. The cost estimate is mentioned in annexure 6.

Description	Qty.
	(No.)
GSM MODEM for AMR Communication	2500

### 4.2.3 LT Bare Line to AB cable conversion:

In TPNODL, LT network plays important role of the Power supply distribution system and spread across TPNODL licensed area for power distribution. The bare overhead used is more prone to transient fault due to tree branch touching or any foreign particle fall on the line. Due to this, consumer's experiences frequent fault however, this can be reduced by structured maintenance. Moreover, Bare conductor is easier to maintain and faster to restore during any fault but at the same time, it requires more clearances. These bare conductor lines are more subject to electricity theft through direct hooking and thus causing revenue leakage in the system. LT AB cables exists in the system and constitute approx. 66 % of the total LT network across TPNODL.

To improve the safety factor, minimize the safety accident risk, reduce the chances of fault & 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.

Moreover, during the survey, it is observed that LT bare conductor are more prone to hooking result into direct theft of the electricity. 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.

The same resulted in reduced direct 'hooking' done on bare LT conductor lines thereby reducing commercial losses drastically in theft prone areas. LT Bare Line to ABC conversion would encompass following scope:

1. LT Bare shall be replaced with LT ABC.
2. Erection of mid span pole.
3. Earthing of every 5th Pole and poles which are installed across the road.
4. Erection of Mid span pole wherever the span length is more than 40 Mtrs to reduce the Sag.
5. Installation of Distribution Box and removing of jumbling of service line cables

### **Benefit to customer:**

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 get converted into insulated cable.
2. Comparatively safer than the LT Bare conductor and eliminate the element of risk if comes in proximity.
3. Simpler installation, as crossbars and insulators are not required.
4. Suitable for congested lanes as well.
5. Electricity theft is becoming hard as hooking would not be possible.
6. Less required maintenance and necessary inspections of lines.

#### 4.2.4 Field Testing Equipment

As per Requirement of Statutory testing, meters installed at Grids, HT & LT customers' needs to be tested in pre-defined time, based on voltage level, on which meter is serving. Officials have to undertake testing of these meters at site as per IS 15707, with calibrated standard meters, specific for defined voltage levels. In order to perform these testing, sufficient equipments are not available with TPNODL. This will also help in identifying faulty meters at site & take required corrective action. Consumer complaints regarding fast / slow meters after meter installation / during life cycle of meters need to be addressed by testing meters at site as per IS 15707. In order to perform these testing, sufficient equipments are not available with TPNODL.

Requirement of testing equipment for LT & HT meters at site is given below:

Testing equipment	Qty. (No.)
LT meter 3 phase meter- testing equipment (onsite testing)	12
HT meter- testing equipment (onsite testing)	16
HT-CTPT testing equipment	6
12 V Battery (for AC power supply to CT-PT error testing equipment at site)	5
Portable Calibrated load box	35

Single phase meter testing equipment (onsite testing)	60
TRMS Value Measuring Clamp on Meter With high Accuracy and High Insulation Class	60
CMRI with Bluetooth, Memory 500 MB	82
IR+PI Value Measurement in Step of 500V to 5kV (Megger)	65

#### 4.2.5 CAPEX requirement for AT&C Loss Reduction

S. No.	Major Category	Activity	DPR TPNODL(In Crores.)	Cost
2	Loss Reduction	Equipment for Meter data downloading	0.28	
		Equipment for AMR enabled equipment	1.37	
		Conversion of LT Bare conductor to AB Cable	13.56	
		Field Testing equipment - Metering and enforcement	1.76	
		<b>Total (2)</b>	<b>16.97</b>	

#### 4.3 Network Reliability

TPNODL have many long overhead feeders. The present power distribution network is in bad condition resulting into frequent tripping's and as a result consumer are not getting reliable and quality power supply. There are total 215 numbers of 33/11kV Primary Substations.

Table below shows tripping occurred in 1st six months of FY 20-21 and in FY 19-20 and FY 18-19. From the below table there is increasing trend in the Tripping. The number of tripping's are extremely high when compared to best in class utilities.

Category of Feeder	In FY - 18-19		In FY -19-20		In FY -20-21	
	No. of tripping	Duration of tripping	No. of tripping	Duration of tripping	No. of tripping	Duration of tripping
	No.	Min	No.	Min	No.	Min
ALL 33 kV Incoming Feeders	5260	838	5968	872	3359	614
ALL 11 kV outgoing Feeders	350582	88397	466528	95962	247894	45448

TPNODL intends to implement the following actions to improve the reliability of power supply

- Identification and replacement of faulty / sick equipment causing frequent tripping.
- Introduction of technology to ensure faster restoration of supply in case of any tripping.

Most faults that occur on overhead lines are transient faults caused by lightning and tree branches touching the live line conductor. The transient fault caused by lightning results in damage to insulators if lightning arresters are not provided or not working. Transient faults caused by tree branches interfering with line conductor are removed immediately by operation of a protection relay.

Regular inspection of feeders followed by tree trimming regularly helps to minimize transient faults and in most cases trial recloser are found to be successful in feeder with higher transient fault. However, each time the feeders are tripped due to transient fault, all customers connected to the feeder experience outage. Utilities at times finds it difficult to identify the exact reason of the fault. In a long distribution feeder with many unprotected branches, it becomes difficult to identify the faulty and healthy sections of the feeder. TPNODL intends to use auto reclosers, sectionalizers, and fault passage indicators to improve the reliability of overhead feeders. Apart from installing the above stated equipment, it is also planned to introduce AB switches at 33kV & 11kV long feeders so as to sectionalize at the appropriate location for any planned / unplanned shutdown thereby reducing the no. of affected consumers.

As discussed earlier, most of the LT feeders emanating from 11/0.415/0.230kV distribution substations don't have protection and control as a result, fault in any one LT circuit is likely to affect the supply of all customers connected on the same DT. Same is true with maintenance outages. To overcome this situation, TPNODL is planning to provide circuit breakers on LT feeders for control and protection of the feeder. Various initiatives proposed to improve the reliability of power supply in 11kV and downstream network are given below

1. 33 kV & 11 kV Network refurbishment to ensure Horizontal / Vertical clearances and as per Load flow distribution planning done by GRIDCO.
2. Primary Substation (PSS) Distribution Substation (DSS) Refurbishment.

3. Installation of Auto Reclosure & Sectionalizers in important and critical feeders.
4. Installation of Communicable overhead FPIs for faster identification of faults.
5. Installation of LV protection at Distribution substation to arrest the LT faults at LT level itself instead escalating to the 11kV feeder level.
6. Replacement of Battery & Battery Charger to strengthen the DC protection system in 33/11kV Grid Substations.
7. Installation of AB switches at 33kV & 11kV lengthy feeders for improving Reliability during planned / unplanned outages.
8. Proposal for Trolley mounted pad substations.
9. Installation of Lightning arrestors.

#### **4.3.1 33 kV & 11 kV Network Refurbishment:**

33kV or 11kV feeders are important asset for a distribution utility which connects various substations and provide power to end consumers. TPNODL has 2788 Ckt.KMs of 33kV and 36865 Ckt.KMs of 11kV feeders under its operational area. Besides, 66262 Ckt.KMs of LT feeders provides power to the end customers.

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 / LV lines are in very poor 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 or animals since cradle guards are not provided. Due to scarcity of staff and materials, there is no structured maintenance program. Tree branches / creepers are interfering with live conductor at many locations. Huge number of tripping's are reported on 33 and 11kV feeders in previous years. With poor condition of network and absence of maintenance program, it is difficult for utility to ensure delivery of reliable and quality power supply to the end users. During site visits, it has been observed that conductor of different sizes is used in different phases which restricts the circuit capacity limiting to the lowest size of the conductor used in the circuit. 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 clearances of the

feeders have reduced to the dangerous level. This is not only causing violation of statutory guidelines but also enhancing chances of fatal accidents.

There are few lines in TPNODL area which are crossing the river. During heavy rains, the rivers get flooded. The riverbed height increases & comes close to sag of 11 KV & 33 KV lines. The clearance between the lines & water reduces. Even at some places the lines got submerged in water. As a result, the supply to the customers get affected. To overcome this issue height of the line is required to be raised by installing the towers at both the ends of river crossing.

To ensure safety of equipment and human beings / animals, refurbishment of 33kV, 11kV and LV lines is urgently required in phase manner starting from critical area where movement of public / animals is high. Refurbishment job would encompass following scope.

1. Straightening of tilted poles.
2. Replacement of damaged poles, insulators, and accessories.
3. Earthing of every 5th Pole and poles which are installed across the road.
4. Erection of Mid span pole wherever the span length is more than 50 Mtrs to reduce the Sag.
5. Restringing of conductor to increase the vertical clearance by reducing the sag.
6. Replacement of the conductor in the sections having multiple joints.
7. Installation of cradle guard wire in the feeder crossing the roads. While installing the cradle guard wire, pole across the road shall be converted into double pole structure to increase the height and provide mechanical support to the section. All conductor in the section crossing the road shall be replaced if found to have even single joint.
8. Replacement of weak Jumpers and connections.
9. Replacement of binding wire joints with wedge connector to remove hotspots.
10. Installation of Danger boards, Anti climbing devices, stay sets etc. to ensure safety & statutory compliance.

### 4.3.2 Refurbishment of Primary Substations (PSS)

The Power distribution network & its equipment health is a critical factor for ensuring reliable & quality power supply to the end consumers. Although field teams are committed to upkeep the equipment by doing preventive maintenance, but still some of the equipment gets faulty and may result into 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, all equipment needs to operate properly at all the time.

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.

Budget is proposed for Sick equipment replacement to improve reliability of Power supply. Also, this will ensure better operation & control of the network & faster restoration of supply in case of interruptions.

1. Replacement of the sick equipment (VCB,CT/PT,CRP,Isolator,etc) in PSS.
2. Replacement / provision of AB switches.
3. Provision of new / additional earthing as per site requirement.
4. Carry out civil works as per site requirement.
5. Replacement of damaged support structure at PSS. This includes MS / GI structure, channels etc. Dismantling of existing structure and erection of new structure at same location has been considered in scope of the work.
6. Replacement of Battery and Charger.
7. Replacement of all undersize bus bars with standard size to remove hotspot.
8. Carry out civil works as per site requirement.
9. Detailed technical inspection and testing of the equipment.

### **Battery & Battery Charger:**

During the field visits, it has been observed that some of the Battery and Battery charges are not operational and needs immediate replacement. Replacement of Battery & Battery Charger is essential to strengthen the DC protection system in 33/11kV Grid Substations to improve reliability. Installation of Battery & Battery charges have been proposed to strengthen the DC system in the 33/11kV Grid Substations. In this year, 50 sets of Battery & Battery chargers are proposed to be replaced.

#### **4.3.3 Refurbishment of Distribution Substation (DSS):**

Distribution Substation (DSS) comprises of various equipment which perform specific task to ensure delivery of power supply at appropriate voltage to the end consumers. Main components are 11 kV Switching device, 11 kV Protection, Distribution Transformer, LV Protection, Earthing, fencing and O/G LV feeders. The most expensive equipment in the DSS is Distribution Transformer and its life depends upon healthy condition of all other components be it LV Protection, HV Protection, Earthing or fencing. The age of Distribution Transformer can be enhanced by ensuring healthiness of all other components. Generally, in power distribution utility, most of the transformers are either approaching or have outlived their operational life. TPNODL, however, is of opinion that replacement of power distribution equipment merely on the basis of ageing is not advisable and other factors such as health of the assets & their associated components, loading conditions, and other operational criticalities also needs to be considered. The above exercise is necessary as replacement of equipment is capital intensive and has direct impact on tariff.

In our preliminary site visits, it is observed that existing DSS are in shabby condition with damaged or ill-maintained HT & LT protection equipment. All connections at pole mounted or plinth mounted substations are in very bad condition which not only cause high technical loss but also give rise to undue interruptions. The Aluminum lug / sockets used in DTs and other equipment in the substations are observed to be of inadequate size and proper crimping of lugs with the help of crimping tools found missing at almost all places. This is resulting into generation of hotspots and failure of connections.

At all location, fuse cut-out arrangement found with oversize fuse wire. Most of the fuse cut-outs are installed at a lower height accessible to public and animals thus

creating safety hazard. Analysis of distribution transformer's failure data for the last few years also suggest that effective HV & LV protection might have reduced the transformer failure. For example, if there is no effective protection on LV side and any fault occur on the load side, the fault current will pass through the transformer for a longer duration till such time the fault is isolated by upstream network. Since the magnitude of the fault current is high, it is likely to produce mechanical and thermal stresses in the transformer causing pre-mature failure of the transformer.

During the survey, it is observed that boundary walls and fencing are either damaged or do not exists thus poses safety threat to stray animal and public at large. At many of the places it was found that the condition of the Fencing of DSS was in a very bad condition.

Ensuring safety of People & equipment is very much needed for safe operation. Hence it is proposed for Construction of fencing for DSS wherever required. Refurbishment/Life Enhancement of DSS helps in addressing the above-mentioned issues, improve the reliability of power system and above all ensures safety. TPNODL proposes for activities under Refurbishment of Distribution Substation:

- Detailed technical inspection and testing of the equipment.
- Replacement of damaged support structure at DSS. This includes MS / GI structure, channels etc. Dismantling of existing structure and erection of new structure at same location has been considered in scope of the work.
- Installation of palm connectors at HT and LT side of Distribution Transformers and ensuring that all connections are through palm connectors.
- Replacement of all undersize conductors with standard size to remove hotspot.
- Replacement / provision of AB switch, DD Fuse units, LT ACB or MCCB (depending on Transformer ratings) and all associated cables / conductors.
- Provision of new / additional earthing in all DSS as per site requirement.
- Installation of fencing to safeguard the DSS equipment and to maintain safety clearances.
- Installation of danger boards, anti-climbing devices, stay-sets etc. to ensure safety & statutory compliance.
- Carry out civil works as per site requirement.

#### 4.3.4 Installation of Auto reclosure / Sectionalizers, FPI, RMU AB switches:

Auto-reclosures are very efficient in minimizing outages from transient faults on overhead feeders. When installed along with Sectionalizers, they can isolate the faulty sections of the feeder while re-energizing the rest of the feeders. In case of very long circuits, the sectionalizers can also be connected in series.

TPNODL currently has many very long overhead feeders. Moreover, it is observed that multiple 11kV feeders are controlled through single 11kV breaker or AB switch in some primary substation. Fault in any 11kV feeder or maintenance activity in 11kV breaker at primary substation affects the supply of consumers connected on all 11kV feeders controlled from that breaker. To improve reliability of power supply at such substations, installation of auto-recloser, sectionalizers and Ring Main Units (RMU) is being proposed in phase manner. In first year, a total of 10 numbers of autoreclosers and 30 numbers of sectionaliser have been proposed for installation.

TPNODL is also planning to install 10 numbers of RMUs to improve reliability. AB switches are proposed at lengthy 33kV & 11kV Feeders to have provision of isolation of section during any planned / unplanned outages. This will help in improving the reliability since currently entire feeder is forced tripped for such outages.

Installation of overhead Fault Passage Indicators (O/H FPIs) is proposed for faster identification and restoration of faults on long 11kV feeders with multiple sections. In first year, 30 sets of communicable FPIs are proposed for installation on pilot basis.

S.No.	Description	UO M	Quantity Considered in 1st Phase (Nos.)	Amount in Crore
1	Supply and Installation of Auto-reclosers	EA	10	1.34
2	Supply and Installation of Sectionalizers	EA	30	3.91
3	Supply and Installation of FPIs	SET	30	0.2
4	Supply and Installation of 4 Way RMUs	EA	10	1.32

5	Installation of AB Switch on 33KV Feeders	EA	58	1.84
6	Installation of AB Switch on 11KV Feeders	EA	190	5.31
	<b>Total</b>			<b>13.92</b>

Circle	Auto-recloser	Sectionalizer	FPI	RMU	33 kV AB Switches	11 kV AB Switches
Balasore	2	6	6	2	12	65
Baripada	2	6	6	2	10	46
Bhadrak	2	6	6	2	12	25
Jajpur	2	6	6	2	10	32
Keonjhar	2	6	6	2	14	22
<b>Total</b>	<b>10</b>	<b>30</b>	<b>30</b>	<b>10</b>	<b>58</b>	<b>190</b>

## Benefits

### FPI - Benefits

1. Easy fault identification.
2. Easy to install, even on live network.
3. Detects both short circuit and low current earth faults.
4. Indicates both permanent and transient faults.
5. Highly visible red flashlight.
6. Reduction in supply restoration time by 1-2 hrs.
7. Reduction in unserved Energy
8. Enhancing customer satisfaction

### Auto-Recloser and Sectionalizer-Benefits

Continuity of power supply for the consumers resulting in less complaints from citizens.

1. Reduce the time of power supply disconnection in cases of transient faults.
2. Reduce the unsold energy due to faults.
3. Reduce the cost of manpower operating in managing disconnected lines.
4. Maximum utilization of the network components.
5. Event Log and Remote control.
6. Reduce cost of fault finding.

### RMU- Benefits:

1. 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.
2. Working with IEDs allows remote operation. SCADA implementation is easy with smart Ring main units.
3. The space occupied by RMUs is less as they are Gas Insulated Switchgear.
4. The time taken for installation and commissioning of RMUs is very less. RMUs require less maintenance.
5. Beautification in the network

#### **AB Switch - Benefits:**

1. The major advantage of installing AB switches in 33kV and 11kV feeders is that field engineers would have flexibility to isolate the section locally instead of switching off entire feeder.
2. In case of any tripping, maintenance engineer can isolate the faulty section and restore the supply of remaining consumers thereby improving the reliability.

#### **4.3.5. Installation of LV protection at DSS**

During site visit it was observed that there are no LT Protection at DT secondary side, so any fault occurred during in LT shifts to 11kV System due to which 11kV feeders trips most of the time. The Tripping on 11kV feeders has impact of SAIFI and SAIDI and more and more consumers are being affected by the fault, which in turn reduces the reliability of the system.

To reduce the effect of LT fault on 11kV System, it is recommended to install the MCCB on Pole Mounting substation for 100 kVA and 250 KVA Distribution Substations and ACB on 500 KVA Substations.

S.No.	Description	UOM	LT Protection requirement in DSS (Nos.)	Quantity Considered in 1st Phase (Nos.)	Amount (in Crores)
1	Supply and Installation of MCCB-100 KVA	EA	6966	447	1.96

2	Supply and Installation of MCCB-250 KVA	EA	498	180	2.08
3	Supply and Installation of ACB-500 KVA	EA	159	72	2.70
<b>Total</b>			<b>7623</b>	<b>699</b>	<b>6.74</b>

#### **4.3.6. Proposal for Trolley Mounted Pad Substation and Package Distribution Substations:**

In case of Refurbishment of a DSS or Distribution Transformer failure, about 10-12 hrs. are required to complete the total job of DSS refurbishment or change of DT for which the supply remains off for whole durations leads to customer dissatisfaction and loss of revenue.

Mobile trolley mounted Pad substations can rapidly restore electrical service. Compact and easy mobility for emergency Service, forced outage repairs, temporary service restoration and regularly scheduled maintenance. Mobile substations are designed to withstand the road travel requirements and maximum stability and protection for safe movement over uneven pavement. Supply interruption for this considerable amount of time leads to customer dissatisfaction apart from loss of MUs that would have been consumed. Inclusion of some Trolley mounted Pad substations will lead to Flexible and faster temporary restoration. Total time for restoration is equal to that required to move the trolley at the location and to connect the HT and LT jumpers

In this proposal, TPNODL intends to procure 10 Nos. 500 kVA new trolley mounted Pad Substations on priority basis.

In this scheme, TPNODL proposes use of trolley mounted Pad substations to make the process of immediate power restoration at the time of natural calamities like storms and cyclones more flexible.

1. This will reduce the restoration time, apart from lowering the requirement of man-hours.
2. Faster power restoration at time of DT failure
3. Public Safety
4. Lesser Road Congestion

## 4.3.7. CAPEX requirement for Network Reliability:

S. No.	Major Category	Activity	DPR TPNODL(In Crores.)	Cost
3	Reliability	33 KV Network refurbishment & AB switch	22.96	
		Refurbishment of 33KV/11KV Primary Substation (PSS)	17.5	
		11 KV Network refurbishment & AB switch	26.13	
		Refurbishment of 11KV/0.415 KV Distribution Substation (DSS)	8.99	
		Installation of LV protection at DSS	6.74	
		Installation of Auto reclosure / Sectionalizers ,RMUs, &FPIs	6.77	
		Trolley Mounted Pad Substations	2.34	
		Underground cable Fault Locating Van and oil filtration machine	3	
		Testing equipment for PSS	6.48	
		Earthing of Power Transformers and Distribution Transformers	0.91	
		33KV & 11 KV Lightning Arrestor	1.69	
		<b>Total (3)</b>		<b>103.51</b>

## 4.4 Load Growth

Every year DISCOM have to release applied new connection. To meet this consumer growth, both network infrastructure needs to be extended, strengthened, or augmented 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.

The following tables represent the data for consumer base in FY 19-20 & FY 20-21.

	Mar-20	Mar-21	Consumer Growth
Consumer Base	1906556	2009292	5%

Also, with the increase in consumer base there is load on DTR. Few DTR's get overloaded & get burnt. Below table shows the details of Burnt transformers in previous year.

Circle	PTR burnt		DTR Burnt	
	No.	Capacity ( MVA)	No.	Capacity (MVA)
Balasore	5	17.6	766	35.98
Bhadrak	5	22.45	310	17.98
Baripada	0	0	476	18.15
Jajpur road	4	21.15	342	16.60

Keonjhar	2	13	326	12.37
Total	16	74.2	2220	101.10

Hence for carrying out network extension/ augmentation/addition, we propose expenditure under this head to consider load growth, network extension / augmentation / addition is expected to be carried out to cater the new demand.

**Benefit to customer:** Better the availability of materials, faster will be process of providing new connection hence more will be the customer satisfaction.

#### 4.4.1. Augmentation of 33kV& 11Kv line, Power Transformers & DT

##### Augmentation of 11kV new line:

During site survey it is observed that most of 33/11kV Primary Sub-Stations are having single incoming 33kV source. With failure of single existing 33kV source entire 33/11kV PSS gets shutdown thereby causing shutdown to all the downstream 11kV & LT network consumers.

It is also observed that HT consumers on 33kV and 11kV are being fed through tapping point instead of a dedicated feeder. There are multiple HT consumers source also mixed with incoming source of 33/11kV PSS. In case of technical fault at one of the HT consumers leads to tripping of incoming source and another connected HT consumer.

To overcome this issue, it is proposed to study to establish link line from alternative available source.

At present 11kV feeders are radial and do not have ring connectivity with another 11kV feeder as per N-1 philosophy. It is proposed to study ring connectivity between nearest 11kV feeder in the vicinity and adjacent PSS 11kV feeders like Hospitals, town, commercial and key government establishments.

##### Addition/ Augmentation of Power Transformers

To cater the increasing load demand, PTR augmentation is required to avoid any overloading and N-1 fail situations. Also, 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.

To avoid any overloading issues especially in urban areas where the load growth is high, it is required to augment some of the power transformers in city area which are over loaded /may get overloaded considering load growth for the next two years.

It will give benefit to consumers as follows:

1. Reliable power supply by ensuring N-1 reliability at PTR level.
2. Reduce over-burdening of existing PTRs thereby reducing power cuts.

### **Augmentation of Distribution Transformer**

To cater the increasing load demand, 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 need to be kept at optimum loading to avoid any mechanical stress on the transformers due to overloading.

When a distribution transformer loading exceeds 80% of the rated capacity of the transformer, then it is “overloaded”.

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 to mitigate the overloading issue. It will provide benefit to consumers as follows:

1. Reliable power supply by reducing chances of fault in network, thereby reducing power interruptions
2. Reduce over-burdening of existing Distribution transformers thereby reducing power cuts.

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 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 rated value.

In this proposal, TPNODL intends to carry out Distribution Transformer's augmentation for those DTs which are identified as overloaded at various locations. 50 nos. of Transformers are proposed for Augmentation of 200/250 kVA

to 315 kVA DTs and 60 nos of DTs proposed for augmentation from 63/25 kVA to 100 kVA at different locations.

In this proposal, TPNODL intends to carry out PTR augmentation for those PTRs which are identified as overloaded at various locations. Total 9 nos PTR are proposed for Augmentation from 5 MVA to 8 MVA at different locations.

#### 4.4.2 CAPEX Summary for Network Load Growth

S. No.	Major Category	Activity	DPR TPNODL(In Crores.)	Cost
4	Load Growth	Augmentation from 5 MVA to 8 MVA Power Transformer	8.96	
		Augmentation from 200/250 to 315 KVA Distribution Transformer	5.19	
		Augmentation 63/25 to 100 KVA Distribution Transformer	4.11	
		Addition of 11 kV Overhead Line	1.68	
		Addition of 33 kV Overhead Line	2.06	
		<b>Total</b>	<b>22</b>	

## 4.5 Technology & Civil Infrastructure

### 4.5.1 Proposed Technology Transformation

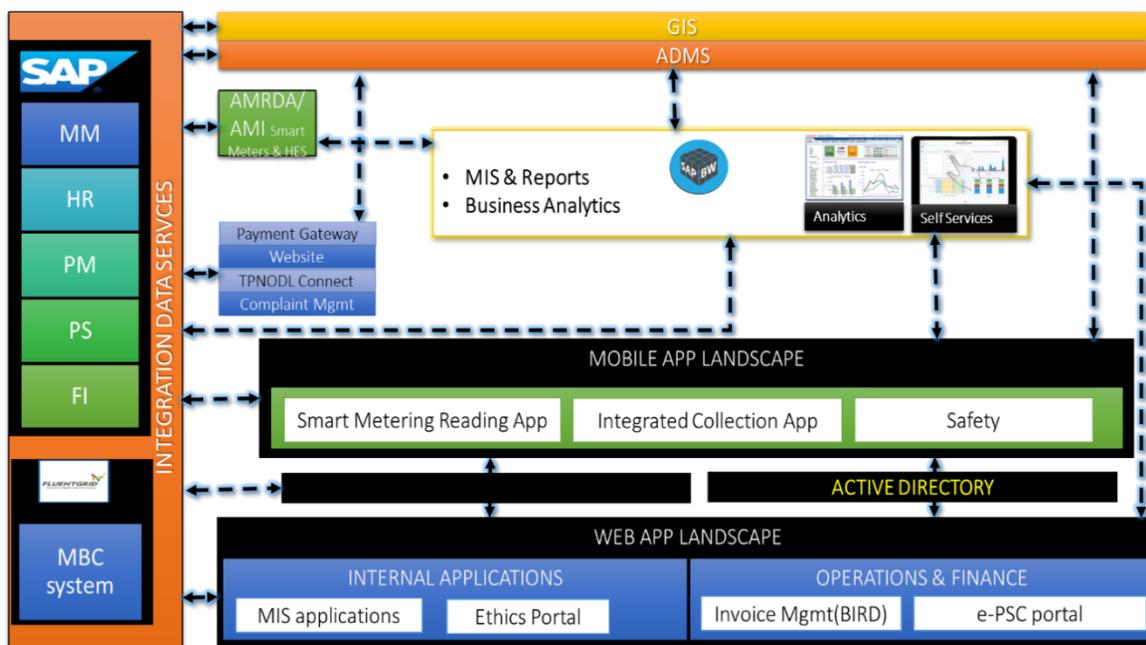
#### Information technology (IT) Landscape

Operational efficiencies when matched with Technological applications, results into great face change for a utility. As far as technology is concerned erstwhile NESCO had not done investment in technology till start of MBC & ERP implementation Govt. funded IPDS schemes but could not managed to roll out resulting into defeating the very purpose of the scheme. There is no investment done on Operational technologies like SCADA/DMS/OMS, GIS etc

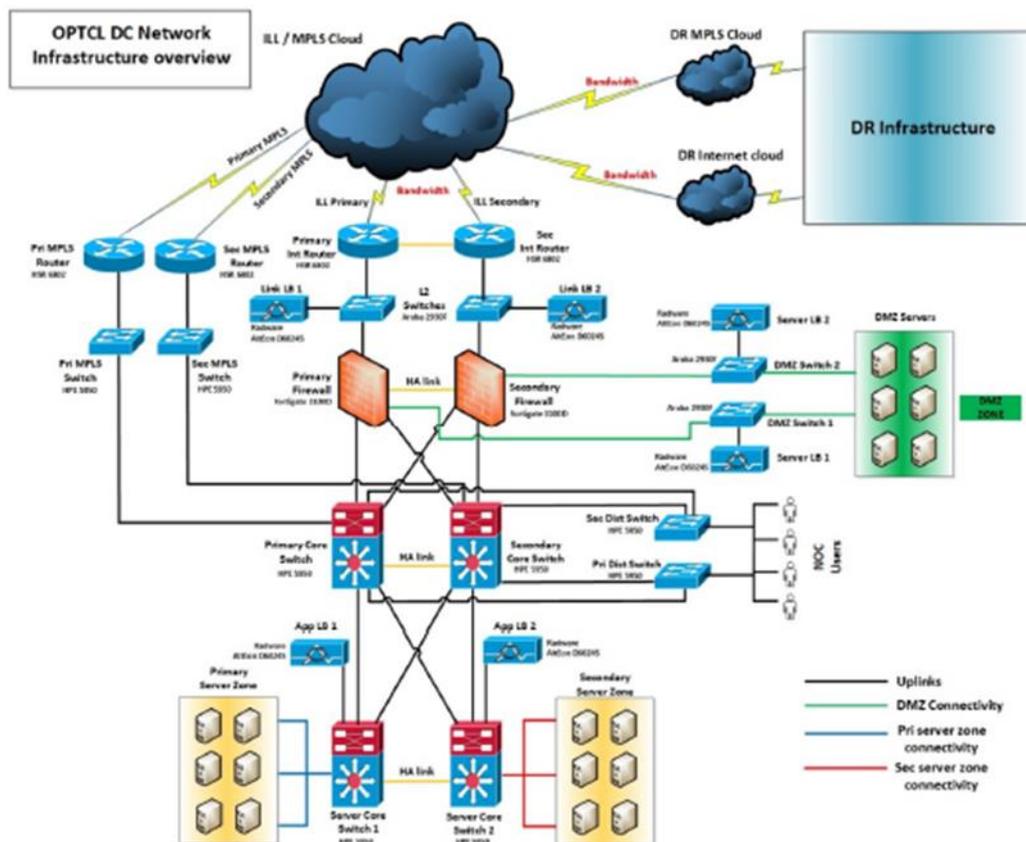
Key technological interventions like Fluent Grid's MBC (Meter Reading, billing, and collection), ERP on SAP platform (Procure to pay module. Plant Maintenance, HR Module etc.), GIS, and SCADA are planned to be implemented in phased manner. Similarly, other interventions like Smart metering, Analytics, Smartphone based spot billing are being considered to unleash full potential of technology and reap the consequent benefits. TPNODL is also planning on establishing reliable communication network that will act as a backbone for other technological

initiatives. This will help in improving the process efficiency and ensure better services to our end users.

IPDS scheme Fluent Grid is implementing Customer Care Solution, Meter, Billing & Collection, New Connection and other Commercial Process, Energy Audit, MIS, Various ERP Modules. Apart from this, TPNODL is planning to rollout Smart Metering MDM and HES system for consumers above 5 KW along with various mobility landscape. IT-OT landscape shall be proposed as follows.



IT-OT Connectivity Design



## Key considerations for IT Landscape Transformation

### 1. Development of back end IT Infrastructure for Smart Metering

Smart Meters and metering system are the technology that is currently available in the market and is a preferred solution to adopt for consumer metering. GoI has also given mandate to replace all 25 Crores meters by smart meters in next 3 years.

In line with the national mission and as a pilot project, TPNODL intends to roll out Smart Meter (SM) project under Advance Metering Infrastructure (AMI).

The proposed Smart Metering AMI will offer multiple benefits to the DISCOM as well as consumers.

The benefits are as follows:

1. TPNODL will be able to control the entire billing and collection very effectively
2. Less billing disputes as 100% correct bills issued on actual meter readings

3. The revenue cycle can be managed much better by spreading the meter reading dates

Description	Activity	DPR Cost (In Crores.)
Smart Metering (AMI)	Installation of Smart Meters IT infrastructure, software like HES & MDM for 1 Lakh consumers (Phase-1)	10.5

## 2. Augmentation of IPDS Software licenses pan TPNODL

Fluent Grid is a COTS solution with suitable for enterprise wide operation. As per existing scenario, around 14 Lakh consumer licenses and 340 ERP User licenses are already available under IPDS. Additional consumer (8 lakh) and initially SAP ERP 500 user licenses would be procured to enable PAN area implementation of Fluent Grid CIS/MBC and SAP ERP.

An integrated contact centre for entire TPNODL area shall be dealt through the Aspect Contact Centre Solution (under IPDS implementation). This solution shall be scaled up to 50-seater call centre against current provisioning of 5 seater call center. The Core IT applications would include the following business critical modules / functionalities:

### a. MBC and CIS

- New Connection
- Connection Management
- Disconnection & Reconnection
- Customer Move Out
- Metering and Material Process – Issue, Installation, Replacement, Removal and Reconciliation
- Billing – Scheduled, Unscheduled, Assessment, complaint handling
- Collection
- SMRD – Smart Meter Reading Devices - Mobile App for Meter Reading, Bill Distribution & follow up. This application is part of IPDS project and would be implemented by Fluent Grid.
- Customer Relationship Management
- Centralized Call Centre
- Energy Audit

- Customer Web Self Service

**b. SAP ERP**

- Material Management
- Finance and Controlling
- Plant Maintenance
- Human Capital Management
- Web Self Service
- Automation of approval hierarchy process which is not part of finance & Controlling. This is required for system generated approval for faster action. So, TPNODL would like to implement through purchase of Adobe/ documentum licenses to implement this.

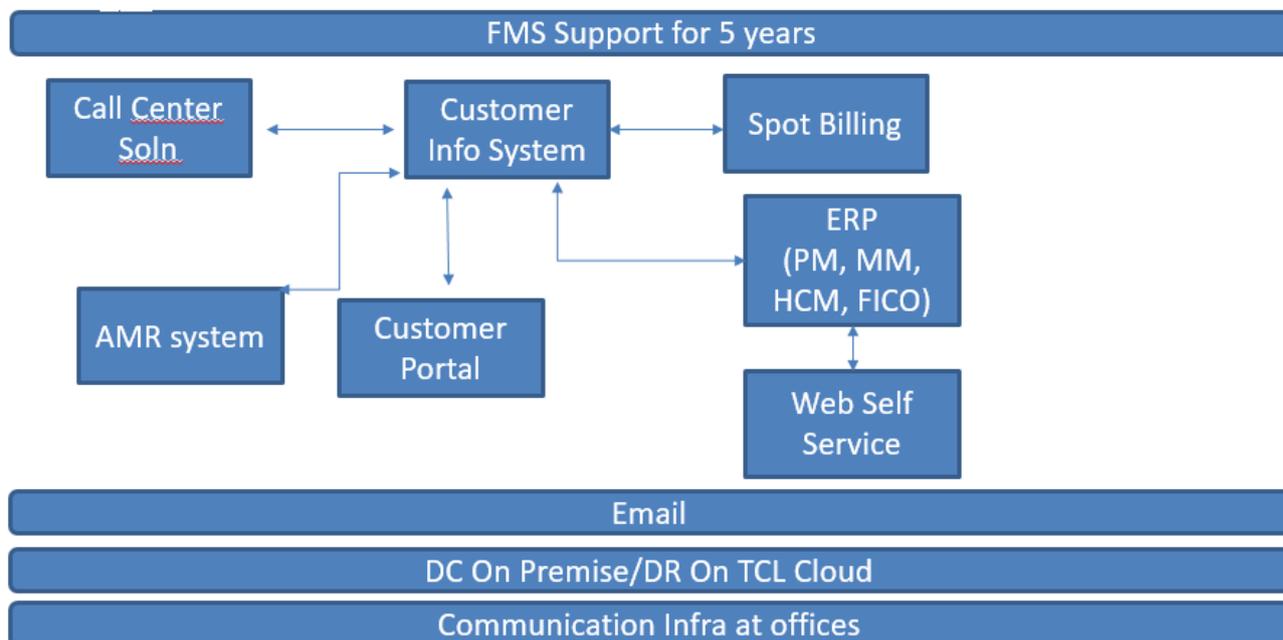
**c. Business Intelligence – SAP BW & BO**

- Data Warehousing
- Management Information System
- Dashboards

**d. Mobility and additional digital platform**

- TPNODL connect
- Invoice Management

## IPDS Software Landscape



As current IPDS system is only planned for IPDS towns, following matrix lists the additional requirement of licenses for rolling it out across TPNODL

Sl. No.	Application	Total Licenses for TPSODL, TPWODL, TPNODL	TPNODL	
			Allotment for TPNODL	Delta Requirement
1	CIS (MBC) Application (Consumers)	4000000	1400000	800000
2	SAP Full use ERP Application users	1072	366	500
3	SAP Self-service users (employees)	868	280	1000
4	SAP – Payroll users	8500	3500	0
5	MS Exchange Email	1145	410	500
6	MS Active Directory	1145	410	1200

### 3. Non-SAP or Bespoke Applications & Mobile Apps

Following In-House Applications are planned to be implemented at TPNODL

- a. **Payment Gateway** – A centralized proprietary payment gateway is planned to be established which would seamlessly integrate with all collection touch points like website, mobile app, counters, partner agencies, mobile wallets into a single repository where verification and validation of payments would be done and would be posted to the billing system
- b. **Website** - Content management System with dynamic website would be placed with integrations to payment gateway and other key systems
- c. **TPNODL Connect** – Mobile app which would run on all devices and with ease of use features and enablement's for customer satisfaction
- d. **Suraksha Portal & Behaviour based Safety app** – As safety is a key aspect and needs to be woven in the company culture, best practices followed at Tata Power DDL will be implemented
- e. **BIRD (Invoice Management)** – Bill Inward Recipient Desk is an application for submission, approval and processing of vendors invoices online, check status of the invoice and track the same
- f. **e-PSC Application** - Platform to capture and evaluate reliability indices and a backbone to power system control team
- g. **Complaint management system & Anubhav Portal** which is end to end feedback capture and CAPA closure with information dissemination to all stakeholders is planned to be implemented to bring transparency and effective response to customer needs
- h. **Mobile Apps**
  - i. **SMRD** – Smart Meter Reading Devices - Mobile App for Meter Reading, Bill Distribution & follow up. Integration with SAP and Real time Reading uploading to SAP for Billing, OCR based meter reading to be in place
  - ii. **TPNODL Connect** - Bill Payment , Employee Verification ,Outage Information ,My Account enabled with Billing ,Consumption & Payment History ,Register & track Complaints ,Smart Meter Data ,Offer & Schemes ,Report Safety issues , Apply New Connection, Streetlight Complaints & Energy Conservation Tips
  - iii. **Collection Mobile app** will be integrated with the Payment Gateway application and billing system for up-to-date information

Capital expenditure of INR 15 Crores is proposed for implementing IPDS licensing in terms of buying additional licenses and procuring additional hardware to cater to entire TPNODL area consumers and load growth is as below

S. No.	Description	FY22
3	DC software & Licenses (ERP, MBC,DB, OS etc.)	15
	<b>Total</b>	<b>15</b>

#### 4. IT Infrastructure (H/W & Field office infra for augmentation of IPDS application licenses)

##### a. Proposed IT/OT Infrastructure

Current Data Center developed under IPDS scheme by OPTCL is combined data center for TPNODL, TPSODL and TPWODL and only includes IPDS town's consumers which are approximately 60% of total consumer coverage. Also many other Smart Grid applications like SCADA, GIS, Meter Data Management/Head End System for Smart Metering, Mobility platform and other consumer facing applications are yet to be implemented along with many niche applications like mobile app for consumers, collection agencies and other web portal for safety management, Permit to Work, Outage Management etc. Current Data Center developed by OPTCL is requires scaling up to include non IPDS consumers and implementation of other Smart Grid Applications. Hence, we have proposed our new/extension of Data Center Setup in FY 22 for hosting additional Smart Grid applications like SCADA, GIS, Smart Metering, and various bespoke applications. As Technology transformation would also require huge focus on reliability of IT systems, having DR for TPNODL, is also planned in Year FY23 & FY24.

Along with this, TPNODL is also focused on digitization till section level as well as substations. Accordingly, new laptops, additional desktops and mobile devices are planned to be made available to each person in TPNODL and mobile devices for people engaged in field work.

Description	FY22
	Amt. (INR Crores.)

Data Center Cost	5.39
Frontend devices (Laptops, desktops, printers/scanners)	16.34
DC Hardware equipment Cost	5.31
<b>Total</b>	<b>27.04</b>

### b. Communication Network Infra

While existing TPNODL connectivity is serving through internet bandwidth that too till subdivision level. There are lot of inconsistencies at subdivision and especially at sections level where employees are connecting through mobile hot spots. While connectivity is provisioned till section level under IPDS, we have found that bandwidth asked in IPDS is far less than requirement and also there needs to be a different approach for sustainable connectivity solution at subdivision and section level. Accordingly TPNODL is planning to have IP-MPLS connectivity at major locations i.e. Data Center, Head Office, Central Store, Circle Offices and Division offices. Also Co-locations offices like circle, division, subdivision, section, customer care, cash collection on same/nearby locations will be connected to single link to optimise bandwidth cost. Also, TPNODL has planned to connect nearby and major locations with optical fiber to increase reliability of network and optimise bandwidth cost. For bandwidth at Subdivision and Section Level, TPNODL will currently provide good local internet connectivity till we try other sustainable solution like microwave RF etc.

Bandwidth provisioned for different locations are as follows:

Category	Link Type	Bandwidth ~ upgradable (MBPS)
Data Centre	MPLS	100 ~ 150 ~ 200
Data Centre	Internet/RF	100 ~ 150 ~ 200
TPNODL's Head Office	MPLS	50 ~ 100
Customer Call Centre	MPLS	20 ~ 40
TPNODL's Circle Office	MPLS	10 ~ 50
TPNODL's Division Office	MPLS	20 ~ 30
TPNODL's Collocated Sub Division/Section Offices	MPLS	6 ~ 10

Subdivisions & Sections	Internet	Good Internet bandwidth till permanent sustainable solution is explored.
Substations (except colocations/optical fibre connected locations)	MPLS	MPLS data Sims bandwidth till permanent sustainable solution is explored

Expenditure in Network Infrastructure: While in IPDS scheme, there is a provision to connect most of the office through Network Infrastructure, additional expenditure is planned to ensure network reliability till last mile.

Description	FY22
Network Infra	4.98

### 5. Operational Technology Landscape-SCADA Implementation

Currently there are total 215 numbers of 33/11 kV substations in TPNODL areas out of which 99 no. of substations are developed/being developed under ODSSP scheme and at present 64 ODSSP are taken into service.

Name of Circle	BALASORE	BHADRAK	JAJPUR ROAD	KEONJHAR	BARIPADA	Total
<b>Total Substations</b>	58	33	34	40	50	215
<b>ODSSP S/Stns (64 taken in service out of 99)</b>	23	14	18	27	17	99

While Non ODSSP/Old Substations would take some time for modernization/revamping for making it SCADA ready, substations under ODSSP (being SCADA ready) can be very quickly integrated to centralized Control Center. These substations are equipped with capabilities of being remotely managed with help of communicable devices viz. relays, IED, RTUs, etc. These new substations shall bring in higher levels of operational efficiency and system performance. TPNODL area is prone to frequent disaster situations such as cyclone, etc. and these substations shall not only help in managing the load efficiently but also reduce

system downtime. Further, to harness the remote management capabilities of these substations it is must that these substations are integrated to Supervisory Control and Data Acquisition (SCADA) System. Through this system, all these substations shall be connected to a centralized control centre for the purpose remote monitoring, control & operations.

As a Phase wise approach, it is considered that in FY22 20 nos. ODSSP substations & 10 nos old PSS would be connected to SCADA.

However, it is very pertinent to mention that SCADA is very effective for load management and effective and efficient operational execution. Over the period of time to convert old PSS into SCADA enabled PSS, it is required to scale up SCADA infrastructure at Power System Control level and Data center equipment level with DR enablement along with proven SCADA software. Also, installing the devices/new equipment in field to make them SCADA compatible is also must. Overall. This system requires investment which will be justified by the operational excellence in power management and efficient restoration. In FY22, we have kept limited Capex to make the data compatibility with ODSSP substations.

Description	FY22
Mini SCADA	2.55 Cr.

## 6. GIS Implementation:

TPNODL is also planning to implement GIS system to have better asset management and its topology which will further facilitate to implement OT technologies by integrating with GIS. System once implemented will strengthen various other business processes viz. energy audit process, technical feasibility, dues verification, network planning. GIS will be backbone for Electrical linear and nonlinear asset repository as well as its connectivity topology. Being a large geography, GIS will be implemented in two parts:

- 1) GIS Software & its integration
- 2) GIS Data Creation PAN TPNODL.

In FY 21-22, it is proposed to implement the GIS software and its implementation with limited IT infrastructure and user's licenses which will be subsequently added with data for all divisions with scalability of infrastructure and user's licenses. CAPEX proposed for implementation of GIS in FY 21-22 is

Description	FY22
GIS Implementation	7.91 Cr.

### **Benefits of Proposed IT Landscape**

Following are the key benefits of the Proposed Solution:

- Adoption of very strong integrated application landscape for enterprise wide implementation
- Ensure secured services to customers to safe guard the confidentiality, integrity and availability of IT systems
- Integrated processes with strong access control
- Drive the culture of safety and ethics among the workforce and all stakeholders
- Ensure customer delight and effective solutions for addressing needs
- Stringent data integrity to avoid any revenue leakage
- Increased Billing and collection efficiency
- Enhanced user experience with extensive standard features & functionalities
- Standardized process workflow across organization
- Centralized data base for synchronized data.
- Enhanced integration and automation capabilities with Non-SAP applications
- Using SAP standard capabilities combined with customer presentment platforms for a delightful customer experience

### **7. Customer services:**

#### **Customer Touch Points:**

To improve the customer experience, customer touch points need to be augmented for providing ease of connectivity and single touch point at offices. Accordingly, following initiatives are proposed:

**Establishing 50 seat Call Centre:**

Call Centre is a convenient mode for providing service on 24X7 basis thereby customer is not required to go through the hardship of visiting the office. This demands the overhauling of existing infrastructure of call centre to improve the Call Centre connectivity. Keeping in mind to provide ease in customer experience, a unified Call Centre (one no. for TPNODL/franchise customers) is imperative to be made operational.

Considering the customer base of 19 Lakh consumers and providing service at call is the preferred mode of service in utility sector, initially, infrastructure of existing 4 seats call centre is proposed to enhance to 50 seats Call Centre at Balasore. To encourage the customer to connect with unified Call Centre, its number will be advertised through Bill, Website and other medium for enhancing the call inflow.

Initially, Call Centre will have 15-20 agents per eight-hour shift (*average 50 agents per day*). With the gradual increase in customer calls at unified call centre, number of agents will be enhanced to 50 agents in a shift to ensure connectivity at all time. It is pertinent to mentioned here that, similar experience happened whereby different industries like Telecom, Travel, and E-Commerce etc. are serving their consumers satisfactory by service delivery through Call Centre for most of customer's requirements.

It has been experienced that with the passage of time, call centre will become preferred mode of communication. Thus, increase call inflow is expected thereby it is imperative to have 2<sup>nd</sup> Call Centre location at some other location (*after reviewing the call inflow*) in next financial year for catering the increased call inflow. Further, it will also serve the purpose of Business Continuity during disaster situation at Balasore or vice-versa.

To establish the one of the state of art call center, it is required to commission call center telephony equipment for inbound and outbound, interfaced with multiple option to connect and further integration with business system to auto response and feedback from consumers

CAPEX proposed for implementation of call center in FY 21-22 is

Description	FY22
Call center Implementation	5 Cr.

#### 4.5.2. Civil Infrastructure

TPNODL currently have offices in all the five circles, divisions, subdivisions & section office. Some of them are owned and others are on rented property. Currently the Offices in Balasore City, Circle Office Balasore are accommodating office and associated services staff.

The challenges exist in TPNODL using current buildings and infrastructure is to accommodate more employees and providing a hygienic, well ventilated and spacious

working environment with minimum expenditure. It may also be noted that no annual repairs or refurbishment in all office buildings have been made in recent years, hence, immediate rehabilitation of the said buildings is required.

#### Existing Infrastructure

TPNODL currently have offices in all the five circles, divisions, subdivisions & section office. Some of them are owned and others are on rented property. Currently the Offices in Balasore City, Circle Office Balasore are accommodating office and associated services staff.

#### Corporate Office at Balasore,

The office space is currently crowded and haphazardly planned for seating arrangements, moreover, most of the circulation area has been occupied with files, documents etc. In view of more people joining the office it will be difficult to accommodate the extra manpower in the same arrangement.

#### Circle Office at Balasore

The existing building is a single-story building and needs upgradation and repairs. Currently building accommodates Circle Head and Division Head (BED) and their supporting staff. Most of the space is utilized for record keeping / storage of Cupboards etc. The roof of building is having leakage and damaged at many places and needs rehabilitation. Water leakage & seepage is observed from roof, walls and floors. The existing building requires urgent replacement of rehabilitation of existing structure to enhance its structural strength and internal modification to accommodate seating space for 60 employees. It is also required to make existing washrooms functional along with new washrooms and dining space to cater the increased strength of Staff.

### **Old Store Office at Balasore**

The existing building is single story building, located at Balia - Balasore. This building remained underutilized and require urgent rehabilitation of walls and roof. This office after rehabilitation and renovation can create space of 21 employees. It is also required to make existing washrooms functional along with new washrooms and dining space to cater the increased strength of Staff.

### **The Store at Jajpur**

Roofs of existing sheds at Jajpur store are badly damaged and beyond repairs due to cyclone effect. Also, due to zero maintenance of the sheds, these sheds needs rehabilitation including replacement of doors and windows. To increase the utility of badly damaged roofs of sheds and make them serviceable. Currently, they are lying abandoned & can be used for indoor material and the height of compound wall shall be increased by providing two layers of concertina coil to prevent entry of miscreants

### **Civil work proposed:**

#### **Renovation of various office buildings**

Office building including the corporate office & all field offices upto the section level which are in dilapidated conditions will be completely renovated to increase their

usable life. Further the existing furniture which are in poor condition will be replaced by modern workstations, cabins, etc.

### **Remodelling & Creation of Additional Workspaces in various office buildings.**

The office buildings upto Division offices need to be remodelled to create additional space for accommodating the new recruits, provisions for conference rooms, canteens, visitors lounge, etc.

### **Record rooms**

Record rooms of Structural Steel and covered with Precoated Sheets will be set at each circle with "State of the Art" provision of storage, protection, fire proofing, mass scanning, bar coding of all records & files for easy access to employees.

### **OPCENEX (Operation Center of Excellence)**

It is proposed to create an centralized Operation center and PSC in newly constructed Sub Station at Vivekanand Marg near Kalimandir at Balasore. This substation is constructed under IPDS Scheme and can accommodate 25 Employees and a Centralized PSCC.

### **Civil Work for Meter Test Bench**

In order to create updated Meter Testing Bay new building is to be constructed admeasuring about 160 sq.m. at convenient location at Balasore & Jajpur along with refurbishment of area with all basic amenities required for setting up the Meter testing laboratory. This will have all modern testing benches and equipment's along with storage facility in covered storage shed.

### **Civil Infrastructure for Call Center & Customer Care Centers**

50-seater, 24 x 7 call center to be set at Balasore to cater all consumer calls related to No-current complaints, billing complaints, new Service connections, requests & queries. Customer care centers would be set up at each division to cater to walk-in consumers to register No-current complaints, billing complaints, new Service

connections, requests & queries. These centers would also provision for bill collection

### **Security System of Stores: - High Mast lighting System**

High mast lighting are commonly used to illuminate large areas from a very high mounting height for storage, It is an efficient lighting solution & most preferred way of illumination because it can achieve a high space to height ratio. As stores & scrap stores are vulnerable to theft it is important to have optimum illumination to safeguard the materials kept in the premise. Balasore Store has a very big area of 70000 sqr mtr and Jajpur Store has an area of 60000 sqr mtrs. Also, from operational point of view appropriate & efficient lighting arrangement is required to support loading, unloading & movement of materials inside the premises. Accordingly, the requirement of High Mast Lighting System is given below.

- i. Balasore Store part-1- 05 Nos.
- ii. Balasore Store Part -2 – 05 Nos.
- iii. Jajpur Store – 05 Nos.

### **Boundary Wall & Fencing**

There is no boundary wall at four store locations. The boundary wall at the Balasore Store has no Concertina wire thereby allowing easy access inside store. All the stores will be provided with 3 meter height boundary wall with 600 mm concertina wiring protection.

### **Storage of E-waste and Hazardous Scrap Material**

As per the guidelines of the NGT, the disposal of E-Waste and Hazardous Scrap like used Oil, Computer accessories etc has to be as per the OHSAS guidelines for occupational health and safety management system.

### **Civil Upgradation of DT workshop:**

TPNODL has its own Distribution Transformer Workshop at Balasore which is very old and ill maintained. Hence it is proposed to renovate the DT workshop for its better utilization and expenditure of an amount of 1 crore is proposed.

### 4.5.3. Administration

In TPNODL, the office space is currently crowded and haphazardly planned for seating arrangements, moreover, most of the circulation area has been occupied with files, documents etc. Some of offices are owned and others are on rented property.

The challenges exist in TPNODL using current buildings and infrastructure is to accommodate more employees and providing a hygienic, well ventilated, and spacious working environment to them.

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 above stated workplace.

- ❖ **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.
- ❖ **Water cooler & Purifiers** are required for proper hydration employees and to ensure good health and improve overall efficiency. An employee should drink at least eight glasses of water a day to be properly hydrated as Water increases the amount of blood flow and oxygen to the brain and other body parts which in turn increases brain activity and attentiveness
- ❖ **Ergonomic office chairs** 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.
- ❖ **Photocopier machines** to offer a fast and easy way of getting single or multiple copies of documents & Improves Functionality of businesses.
- ❖ **Vehicles** to provide carpool facility to the company staff as well as car facility to the sr. management team.
- ❖ **File cabinets** are basic requirements to keep office space organized and tip top. It helps store important papers, documents, photographs, magazines, and training materials in one single place for easy and immediate access besides offering secure storage, it offers instant access to files of thousands of customers

and employees.

- ❖ **Canteen facilities** are the necessity of satisfying employees with a better range of foods and healthy options.

To ensure safe, hygienic, well ventilated, and spacious working environment for employees as well as consumers, a capital expenditure is proposed, break up of which is mentioned in annexure 16.

#### 4.5.4. CAPEX Summary for Technology and Civil Infrastructure

S. No.	Major Category	Activity	DPR TPNODL(In Crores.)	Cost
5	Technology & Civil Infrastructure	Data Center (DC) Development Cost	5.39	
		IT Infrastructure Hardware Cost	5.31	
		End user Devices i.e. Laptop, desktop, Printer, scanner	16.34	
		Software Licenses	15	
		Communication Network Infrastructure at DC and office locations	4.98	
		Mini SCADA Implementation (20 nos ODSSP & 10 nos Old PSS)	2.55	
		GIS Implementation for One Division	7.91	
		Smart Metering Infrastructure (HES & MDM on 4G/ NBIOT Communication)	10.5	
		Call Center Implementation (System & Infrastructure)	5	
		Civil Infrastructure (Office Buildings, Meter Test Lab, Customer Care center, Records Rooms, Power System Control)	17.3	
		Establishment of DT workshop	3.6	
		High mast light in the Center store	0.75	
		Assets for Offices	5.23	
		Building shed for material storage with racking system	3.25	
	<b>Total (5)</b>	<b>103.11</b>		
<b>Grand Total (1+2+3+4+5)</b>			<b>275.4</b>	

#### Benefits of Proposal:

S.No	CAPEX Description	Objective
1	Civil Infrastructure	To rehabilitate & renovation of office premises, customer care center, cash collection centers etc. to create additional seating space with modular furniture for employees.
2	Civil Work for Meter Test Bench	To construct the space for meter testing bay along with refurbishment of area with all basic amenities required for setting up the Meter testing laboratory including storage shed.
3	Call Center, PSCC & Data Center Infrastructure	To rehabilitate the space for accommodating three bays for Call Center, IT Hub and PSCC along with refurbishment of area with all basic amenities required for setting up the above three bays
4	Store Shed	To increase the utility of badly damaged roofs of sheds and make them serviceable, Currently, they are lying abandoned & can be used for indoor material. Increase the height of compound wall by providing two layers of concertina coil to prevent entry of miscreants.
5	Administration	It will provide comfortable working environment, healthy eating & refreshments for employees and stakeholders and Helps to store important papers, documents, photographs, magazines and training materials in one single place. Vehicles will provide car pool facility to the company staff And water cooler is required for proper hydration employees

#### 4.6 Project Execution Plan.

As per the present Practice of erstwhile NESCO, majority of the GOI and GoO funded Projects, such as IPDS, RGGVY, ODSSP, ODAFF, DDUGJY, etc. are being coordinated and executed by OPTCL and erstwhile NESCO Project Monitoring Team. Divisional O & M Team is simply facilitating charging of new Installations and Handing Over and Taking Over of these Projects from OPTCL/REC/NTPC due to which the much essential aspects of Project such as Quality Assurance of Execution as well as that of Materials, directly linked to reliability of Power Supply and longevity of life of the newly created assets, somehow, are getting compromised due to the fact that the adequate diligence/involvement of the erstwhile NESCO Team during execution stage is very low owing to the fact that erstwhile NESCO doesn't have dedicated Team to oversee the Projects execution works. Few more small Projects of shifting and strengthening of Line and Equipment, such as Elephant Corridor Project, Development project for Energy System Improvement (DESI), Dedicated Agriculture and Fishery Feeder, Biju Gram Jyoti Yojna, Biju Saharanchal Vidyut Yojna, NH expansion, School Anganwadi etc. are being executed by the Divisional Team of the O & M Wing of the erstwhile NESCO i.e. JE and SDO are being engaged to supervise these Projects. That is, in the present scenario, erstwhile NESCO doesn't have dedicated and structured CAPEX Planning, Coordination, Execution and Monitoring Team and same is made part of the O & M Team who are not

able to pay due attention to supervise Project execution works as they are mainly loaded with O & M works and collection, the focused and mainstream job of erstwhile NESCO, thus, somehow, this type of working philosophy is, certainly, resulting in deviation from the desired value of quality, safety, delivery timeline, customer satisfaction and cost of the Project works as well. Thus, responsibility of adherence to meet desired level of standard performance parameters of the Project works is solely left in the hand of the Contractor/Business Associate/Consultant/external executing Agency.

In view of the above, having felt the necessity to infuse efficiency and effectiveness both into O & M as well as CAPEX Planning, Monitoring and Execution front, it is planned to have dedicated and separate Team for CAPEX and OPEX to have focused approach in the respective area of Operation/Execution and therefore a Dedicated CAPEX/Project Team is being formed to oversee the overall CAPEX functionality of the entire TPNODL to take care of Concept to Commissioning of all CAPEX as well as GOI, GoO and External Agency/Private Party Funded Projects to ensure better Safety, Quality, Timeline, Cost, Customer Satisfaction, Fastest Release of New Connection and enhanced Operational Efficiency too.

### **Focused Responsibility of the CAPEX/Project Management Team:**

#### **Action Planning**

- ✓ Formation of Dedicated Project Team in Circle/Division Level based on volume/quantum of CWIP and upcoming CAPEX approval.
- ✓ Formulation and aligning of Existing and New Process for efficient and effective execution and monitoring.
- ✓ Network Analysis and Identification of Area of Improvement in Network.
- ✓ Follow up for CAPEX approval from OERC approval.
- ✓ Planning, Monitoring, Quality Assurance, HOTO Process formalities of all existing Projects executed by OPTCL/Other Agency and Divisional Team.
- ✓ Execution Planning for Rs 275.4 Cr. CAPEX works scheduled for FY21-22.
- ✓ Proactive Engineering, Tendering and Material planning for CAPEX work.
- ✓ Liaising with Land owning authorities for ROW (Right of Way) and Electrical Inspector/Energy Department for evolving into a flexible Electrical Inspector Clearance Process for fastest clearance of NOC (No Objection Certificated by Electrical Inspector) which will certainly ensure the fastest release of new connection, Maximisation of Capitalisation and add feather to EODB (Ease of Doing Business).

**Action after CAPEX Approval by OERC**

- ✓ Dedicated Project Team will take charge of execution of New CAPEX approved by OERC
- ✓ **Focused area would be:**
  - Safety – Meticulous Safety Adherence Process
  - Quality – Execution as well as Materials Quality Assurance
  - Transparent Bill Certification/Verification Process and Timely Cash Flow to BA
  - Planning, Tracking, Monitoring and Controlling Timeline and Cost of the Project.
  - Commissioning of Projects, Creating Asset and finally Capitalisation.
- ✓ Continual Improvement of CAPEX Management Process

**Priority of Execution:**

Our main focused is to ensure Quality Power Supply to the Society/Consumers taking into consideration of Safety, Quality and Ethics at the Top of our Journey towards Excellence: Hence we will give Priority of execution as given below:

- ✓ **Enhancing Safety of Human and Animal** through the strengthening as well raising the height of the existing network/Equipment specially on Road Crossing, fencing of substation, Elephant Corridor, School and Anganwadi works
- ✓ **Enhancing Reliability of Power through** strengthening the existing networks and equipment specially focusing to strengthening of Grid Substation (GSS) and Distribution Substation (DSS) and Over Head Line and integration of GSS and introduction of FPI, RMU, Sectionalizer and Auto-reclosure for fastest fault identification, Isolation and Power restoration.

**Expected Gain Out of the Dedicated CAPEX/Project Management Process:**

The Dedicated Project/CAPEX Team will be focused and responsible for Safe and Quality execution of all Projects in a time bound manner in coordination with all stakeholders such as Planning, Engineering, Contract & Store, Regulatory, Business Associates and Electrical Inspector etc. for seamless operation to ensure the following benefits for the Organisation, Consumer and Society:

- ✓ Safe Execution ensuring minimisation of Incident/Accident i.e. Journey towards “ZERO-TOLERANCE”.
- ✓ Enhancing Quality of Execution and Materials leading to enhanced life of asset and lowering the cost of re-work and OPEX.

- ✓ Faster Delivery of Projects leading to enhanced Reliability of Supply
- ✓ Faster Release of New Connection which will add feather to EODB

All the above outcome ultimately brings customer delight/satisfaction and Enhance Brand Value of Organisation.

## 5. Operation and Maintenance Expenses

### OPEX Plan:

Particulars	Proposed (FY 2021-22)	Plan	OERC (FY 21-22)	Approved
<b>Employee Cost approved*</b>			<b>357.24</b>	
Less outsourced cost regrouped under A&G			45.70	
Adjusted Employee cost	<b>339.89</b>		<b>311.54</b>	
Salaries , Wages, Allowances & Benefits	150.17			
Contribution to / Provision for P.F, Pension	117.41			
Arrears of 7th Pay Commission	29.40			
New Employees including Deputation	42.91			
<b>R &amp; M Cost</b>	<b>147.49</b>		<b>114.23</b>	
Normative / STS AMC & other services	90.00			
STS Material	10.69			
Distribution AMC	33.68			
Distribution Material	4.13			
PSCC	3.00			
Civil	2.93			
Automation	2.25			
Administration AMCs	0.82			
<b>A &amp; G Cost approved**</b>			<b>49.20</b>	
Add outsourced employee cost regrouped from Employee Cost			45.70	
Total A&G cost	<b>139.83</b>		<b>94.90</b>	
Rent Rate & Taxes (including Lease Rentals)	3.39			
Watch & Ward Expenses	2.76			
Communication	3.42			
Legal, Consultancy & Professional Charges	15.70			
Conveyance & Travelling	5.48			
License & Related Fees	2.24			
Advertisement Expenses (Public relation)	3.28			
Franchisee & Spot billing	45.49			
Printing & Stationery	4.36			
Enforcement Activities	3.00			
IT -Computer Consumables	8.55			
Safety & Ethics	3.63			
Training	5.00			
Insurance	5.07			
ARM installation & Management expenses	7.45			
House Keeping	10.55			
Covid / Employee Welfare Expenses	3.78			
Other Expenses / Customer Care Call Center	6.68			
<b>Total OPEX</b>	<b>627.21</b>		<b>520.67</b>	

\*Employee cost is Gross of Capitalisation. \*\*Contract employee cost has been regrouped.under A&G

1. It is acknowledged that the proposed expenditure or variance (higher) to the norm specified by the Hon'ble Commission in its regulations.
2. It is submitted that the estimated OPEX cost has been worked out based on Zero based budgeting approach and the details of the same is provided in the relevant section.
3. It is submitted that O&M expenditure, at-least in the initial years, need to be allowed at actuals considering that significant expenditure is required to be incurred under each of the three heads (Establishment Costs, R&M and A&G) considering the years of neglect of network, grossly inadequate since the expenditure is proposed to be incurred with due prudence and through the norm formulated by the Commission for allowance of R&M cost.

The cost do not factor in various cost currently being incurred (e.g. DF share of incremental unit input, Rebate offered to customer, etc) in addition to estimated and legitimated cost that are required to be incurred by any efficient and compliant utility including cost of insurance, Security, AMC for Software/Hardware, Preventive maintenance etc.

### **5.1 Employee Cost: OPEX Requirement (Human Resources)**

TPNODL has taken over all existing manpower of erstwhile NESCO in line with license agreement. 13 number of contractual employees of erstwhile NESCO have also been transferred to TPNODL through vesting order. Presently, there are 404 executives and 1752 non-executives as on 1st April 2021 who were on regular rolls of erstwhile NESCO and now part of TPNODL.

There has been a sharp decline in manpower over last 7 years clubbed with significant increase in consumer base and Input energy. Over last 5 years 891 number of employees (29% of total base) have superannuated with no single recruitment. During this same period the number of consumers have grown from 13 Lakh to 20 Lakhs (54% growth). Consequentially the input energy has grown by 8%. Over the same period, 73 nos of new 33/11 kV substations have been added, 604 kms of 33 kV and 10628 kms of 11 kV network has been added. This bandwidth crunch has resulted in overall neglect to network operation, maintenance and improvisation, Commercial management, theft control and governance. As a result the network trippings & failures have increased by 41 %, AT&C loss has gone up by 5 % (over last 3 years not considering one time Govt arrear payment

of Rs 85 Cr last year). If this is not restricted at this point with appropriate resource infusion, it will go into a freefall which will be beyond control.

Tata Power has already deployed around 25 executives including Senior Management team who are experts in different fields of distribution functions. This team has assessed the existing processes and resource capabilities. Based on detail analysis and subsequent organisation design, TPNODL wish to reinforce existing team with additional 1266 manpower (all are in executive cadre) over a period of three years. However, considering the significant bandwidth deficit created by superannuation over last decade, the huge increase in consumer count, network equipment & input MUs and also considering the expert resources required to infuse new & advanced technologies, we earnestly request the Hon'ble commission to kindly consider the recruitment of 636 persons having diverse background & expertise in the year FY 2021-22. Total Cost of manpower including erstwhile 2156 NESCO employees, 13 contractual employees and 25 newly recruited employees shall be Rs 339.89 for the period April 2021 to March 2022. The detailed manpower mapping, evaluation of additional requirements and justification of the manpower plan are provided separately in the Detailed Management Structure and Staff Deployment Plan being submitted along with this document.

Hon'ble Commission is requested to approve the said employee cost for FY 2021-22 as per details provided in the following table. TPNODL will provide requisite documents to Hon'ble Commission for undertaking a prudence check of the aforesaid expenses as and when directed.

Particulars	Proposed Plan (FY 2021-22)	OERC Approved (FY 21-22)
<b>Employee Cost *</b>		<b>357.24</b>
Less outsourced cost regrouped under A&G		45.70
Employee cost	<b>339.89</b>	<b>311.54</b>
Salaries , Wages, Allowances & Benefits	150.17	
Contribution to / Provision for P.F, Pension	117.41	
Arrears of 7th Pay Commission	29.40	
New Employees including Deputation	42.91	

\*Employee cost is Gross of Capitalisation. Contract employee cost has been regrouped.

## 5.2 Repair & Maintenance (R&M) Expenses

As explained earlier the existing network of TPNODL area is deprived of maintenance due to lack of manpower, material and other support processes resulting in huge number of tripping, fatal non-fatal accidents of outsiders and insiders, transformer failure and high AT&C loss. All the four factors mentioned above are based on our analysis of whatever data is available from the verified sources. Currently any data on the reliability indices is not captured. The tripping data is also not complete as neither all the tripping related data are properly captured in the record nor there is a centralised approach to calculate reliability indices feeder wise, area wise, voltage level wise and as per many other combinations. It is also seen from the interactions that number of transformer failure is very high. This not only affects reliability but also produces unhappy customers and huge expense towards rectification of faulty transformers. It is also mentioned earlier that safety of the working person to general public is at stake, this is indicated by a significant number of fatal and non-fatal accidents of all living creatures.

Presently entire network right from 33KV feeders to LT consumers are owned and maintained by Junior Engineer (O&M) along with his team comprising of Lineman A/B/C, Helper, and Jr. Technician posted in respective sections. E&MR section extend support to section staff for maintenance of 33/11KV primary substations. As sufficient manpower is not available in E&MR section, only breakdown maintenance is effected.

The Junior Engineers are responsible for attending breakdowns occurring in 33 kV and 11 kV systems with the limited manpower available at each section. For major breakdowns, contract manpower is hired on need basis as per the available OSOR's. SDO's and divisional manager also extend their support as per the requirements.

The scarce resources and lack of maintenance has resulted in large number of accidents in previous years. In last FY; 35 human fatal accidents have been reported.

In the absence of sufficient support staff at sub-divisions/sections level, the MTTR for 33 kV & 11 kV breakdown is quite high. Due to scarce manpower, breakdowns in many sub-divisions / sections are attended during daytime only. The maintenance practices are reactive, and the distribution assets are rarely maintained. Faulty equipment / distribution transformers are not replaced even for months' in rural areas.

This poor condition of the network may be extrapolated to the conditions of the buildings of TPNODL. Some buildings are in so much depleted condition that lack of maintenance in this field cannot be ignored. A small input is except new ODSSP sub-stations none the switchyard is free of long grasses. Sooner or later these ODSSP sub-stations will also take shape like other sub-stations due to lack of maintenance

activities. To make the scenario worse natural calamities always prevalently effect the TPNODL distribution area largely being the coastal area.

### Our Plan towards systematic maintenance:

The TPNODL licensed area is spread across approximately 28,000 sq km area with forests and hills making it very difficult to maintain the network with existing manpower, leaving them in the mode of run and repair. There is no approach of preventive maintenance as mentioned in earlier sections making the network weaker with each passing year. The network conditions are also mentioned along with evidence in photographs in earlier part of the document.

In light of the above facts mentioned, our planning to address these burning issues is through discrete approach, i.e. focussing each problem separately and addressing them separately so that cumulative effect be huge in terms of enhanced safety, sustained reliability, minimised failure rate and happy customers.

In order to achieve above quality in supply and to ensure performance assurance according to power supply code we envisage to form following functions whose working, and budget is given below

#### A. Safety:

Safety being the integral and foremost part in any industry, a major allocation should be there to ensure safety in largely spreading geographical area. Number of safety incidents and existing safety T&Ps indicate that there is a huge scope of improvement along with the mechanism in which existing workforce work at every site. Accordingly seeing the present practices building safety practices should be geared up. TPNODL is also planning to strengthen the safety by providing PPEs, FFEs, T&P, and testing equipment to the maintenance crews. By strengthening of safety system, the accident rate is expected to be reduced significantly. The allocated tentative budget for safety department is given below

<b>Operations Expenses for Safety FY 21 .</b>			
<b>Sr. No.</b>	<b>Particulars</b>	<b>Amount in INR</b>	<b>Remark</b>
1	Procurement of PPE( Helmet,Shoes, jackets, FBH)	1,30,59,620	Initial approval obtained for immediate need of PPE
2	Safety Capability Building	10,00,000	
a	Competency Training recommended by Corp Safety - External (for Safety Advisors)	100,000	
b	Provision for fees to attend Safety Seminar / Conferences , when advised by Corporate safety, HR	3,00,000	

c	Safety Capability building based on learnings of Incident investigations / Safety observations / Audit points etc	600,000	
3	Resources for Emergency preparedness( rescue stick, Emergency light, Mechanical foam AFFF, BA set, first aid box, etc)	57,79,430	
4	Public Safety initiatives	10,00,000	
5	AMC for fire safety assets	3,00,000	Applicable after approval of Capex plan & installation of firefighting equipment
6	Electrical safety gadgets( Arc flash suite, electrical hand gloves, rubber mat, Traffic cone, caution tape,	1,32,63,000	
7	Preparation of Safety posters, training materials, hand-outs etc, Lesson Learned short animation Clip for LTI	9,25,000	
8	New Initiatives / Misc. expenses	10,00,000	
	Total Yearly OPEX in Rs.	3,63,27,050	
	Total Yearly OPEX in Rs Cr	3.63	

## Benefits

1. Self-driven attitude of workforce
2. Minimised safety incidents of the workforce
3. Care/ drive for public safety
4. Joint effort with other associated organisation/ Government for safety of wild life
5. Theme based safety drive throughout the year will ensure motivated stakeholders for ensuring safety
6. Minimising safety incidents in the building or prevent any occurrences.
7. Training will further diversify safety amongst all stakeholders.

### B. Area Power System (STS):

In erstwhile NESCO working system there is no dedicated preventive maintenance structure in any form except breakdown maintenance. Divisional officer, Sub Divisional officer and associated JEs are responsible for entire sub-transmission (33 KV) and distribution system (11 & 0.44 KV) with their associated workforce. While higher voltage always requires specialised task force at the same time the availability of this network is utmost important to cater EHT and HT customers along with provision of strong backbone of network for distribution network.

So, we propose a dedicated team for sub-transmission system which will take care for the entire 33 KV network circle wise so that utmost focus can be given to this network for

optimised availability. The maintenance team shall be divided into following structure under each circle maintenance team (Area Power System). This major team will be assisted by another group Maintenance Planning Group (MPG) which will take care of entire asset mapping of electrical network. This group will also play major role in providing feedback to APS regarding condition-based maintenance and will centrally plan outages for entire voltage level (33 & 11 KV) of electrical network.

1. HMC – Round the clock availability for any kind of breakdown and helping other teams
2. SLMC – This team will work only for 33 KV network since it is largely radial so major focus to be given for 33 KV line networks
3. SMC – This team will look after only 33/11 KV sub-stations.

In this way by discrete team management and maintenance management we will be able to ensure availability of network to a large extent, which is at a stack in present scenario.

In this head of operation of maintenance, we will be doing following activities as mentioned below with following associated budgets mentioned.

Category	Material/Resource/Services Required	Justification	Cost (Cr.)
STS	33KV AMC	Maintenance of PSS,33KV Network	28.5
	Repairing of Conductors, Insulators, Poles, Jumpers etc.	Material for Maintenance of 33KV O/H Network	4
	PTR Repair & Overhauling	Repairing of PTR through External Vendor	3.5
	Other Grid Material + Maintenance (Swicthgear)	Repairing of Switchgears/VCB used in PSS	2.75
	Total		38.75

### Benefits

1. Increased reliability both in terms of number of tripping and tripping duration
2. Reduction in operational technical loss
3. Reduction in number of incidents
4. Reduction in failure of the equipment
5. Quality supply to the consumer with better voltage regulation

### C. Distribution System & Distribution Services:

The 11 kV circuits are radial and very long ranging from an average length of 50 KMs to 90-100 KMs in rural areas. 11 kV circuits have underrated, uneven sized & worn out bare conductors with extremely long span lengths. The LV circuits are also very long and radial. Both HV & LV circuits have a large number of damaged /bent/tilted poles, poor workmanship in jointing & jumpers, compromised safety clearances and are devoid of guard wires on road crossing.

11/0.415 kV Distribution Substations (DSS) have no fencing, the LT side fuse box/MCCB box are missing, earthing system is in very bad condition, most of the AB switches are bypassed, DD fuse are bypassed/broken. In place of LT Fuse box/MCCB box; open aluminium wire wound fuse are seen at every substation at very low height. All of the above makes the DSS prone to interruption and safety hazard for public specially kids, animals and employees.

As a result of above the interruption at 11 kV feeder level is too high wrt present Indian utility standards. The table below gives a snapshot of 11 kV feeder tripping recorded at the 33/11 kV Substations in different Circles. In one year total tripping are at a staggering 4.66 lacs. Total count of 11 kV feeder in FY 19-20 was 720 Nos.; so on an average basis each of the 11 kV feeder tripped 648 times annually.

11 kV Feeder Interruption:

Category of Feeder	In FY - 18-19		In FY -19-20		In FY -20-21	
	No. of tripping	Duration of tripping	No. of tripping	Duration of tripping	No. of tripping	Duration of tripping
	No.	Min	No.	Min	No.	Min
ALL 11 kV outgoing Feeders	350582	88397	466528	95962	247894	45448

Another major contribution of the existing dilapidated and unsafe network is scarce resources and weak Operation Structure. Presently entire network right from 33KV feeders to LT consumers are owned by Junior Engineer (O&M) heading Sections along with his team comprising of Lineman A/B/C, Helper, Jr Technician. E&MR section extend support to Section staff for maintenance of 33/11KV primary substations.

The Junior Engineers are responsible for attending all the B D/n occurring at 33 kV & 11 kV level in all the three Shifts with the limited manpower available at the Section. For

attending Major B D/ns at 33 kV and 11 kV level, contract Manpower is hired on need basis as per the available OSOR's. SDO's and Divisional Manager also extend their support as per the requirements.

In absence of sufficient Support staff round the clock at the Subdivisions/Sections the MTTR for 33 kV & 11 kV B D/ns is quite high and the DT's installed are rarely maintained. Faulty DT replacement is usually delayed and are not replaced even in month time in rural areas.

The Scarcity of resources has resulted in almost Zero Maintenance of the Network, although maintenance is done for few 33 kV / 11 kV feeders feeding to VIP areas.

In such a condition, focused preventive maintenance is mandatorily required to improve the reliability of supply and ensure safety of employees and public at large. While maintenance shall help in improving the reliability by reducing the interruptions; at the same time there is a need to put in place a structure which shall ensure promptly attends to the breakdowns and Fuse calls.

In view of above and in order to ensure proper Asset Maintenance and upkeep of Distribution system and to ensure Reliable, Quality & Safe Power to consumers living in Urban & Rural Areas, focused approach is required. As there is acute shortage of manpower in TPNODL and since expert manpower is not available, performance based annual maintenance contracts will be established with expert market agencies for all 16 Divisions. The network shall be inspected regularly to identify the defects and attend breakdowns in quick time and perform maintenance activities to enhance system reliability.

The Performance Based Maintenance Contract will also include 24X7 Breakdowns Crews for restoration of 11KV Lines and substation equipment. Besides, preventive maintenance activities will be performed as per the maintenance plan and schedule prepared by TPNODL. Annual Maintenance Plan along with standard check list for inspection of 11KV Lines and substations will be prepared and rolled out in the current FY. Condition based maintenance systems shall also be introduced to identify the maintenance requirements.

Major benefit of Annual Maintenance Contract is that trained, and expert's technicians would get immediately deployed in the field to start delivering the objective. In this Annual Maintenance Contract (AMC), Business Associate (BA) shall undertake full responsibility of safety and assigned works which includes attending to emergency breakdowns, carrying out preventive maintenance of these equipment in various Subdivisions. He will also undertake any work pertaining to above LT Distribution System as may be necessary for the maintenance of equipment for smooth working of LT Distribution system.

The Business Associate should carry out regular surveillance in his operational area for timely detection of abnormal operating conditions of the equipment as per the checklist provided by TP Northern Odisha Distribution Limited and report the findings to respective Area-in-Charge in structured format so that corrective/preventive actions can be initiated, implemented and monitored to prevent failures.

The Sub Divisional Manager for the respective Sub division would be the Engineer In-charge for the contract for the respective Sub division. The Divisional Managers will be overall in charge of the Contract for their respective Divisions.

Total opex requirement for Distribution system is as under:

S. No.	Broad Category	Description	Budget ( Rs Cr)
1	Distribution	Distribution AMC Contract	95.5
2		Distribution Material(O/H)	3.5
3		Distribution Material(U/G)	0.2
4		Distribution Transformer Repairing	4.7
	Total		103.9

### Benefits

1. Significant achievement in the availability of the network.
2. Immediate availability of skilled manpower for maintenance activity
3. Better voltage at the furthest due to transformed maintenance approach
4. Quality supply availability to the consumer doorstep
5. Better customer grievance handling due to operational issues
6. Less incidents due to improved and vigilante maintenance

### D. Power System Control (PSC):

It is proposed to establish a Power System Control (PSC) on takeover of the operations of NESCO. The intent of establishment of PSC is Real Time Control & Monitoring of 33 kV and 11 kV network operations of the license area. This will always give an overall control of the HT network and ensure availability of network and thereby ensure uninterrupted Power Supply to the consumers of the License area. In the process a robust communication channel with OPTCL will be established through PSC. Also, all the

operations will be carried out as per the laid down Standards Operating Procedures through pre-established Operating Instructions so as to ensure Safe Operations & institutionalize the process of Permit to Work uniformly across the license area. Various Operational Expenses will be incurred to ensure smooth functioning of PSC. The budgetary details are mentioned as under

Particulars	Qty	Price	Amt(Rs)	Further Details
Mobile Charges per year	10	1000	120000	Data & Voice pack of this value (Rs.1000 /month) is envisaged since in the inception lot of handholding and exchange of information will take place before a confidence level is attained.
Hired Vehicle per year	12	20000	240000	P2P testing of stations for establishing SCADA controls, substation visits for feasibility for migration to remote operations.
Software Licenses/AMC	1	100000	100000	SLD Updation for network operations is planned to be carried out in Auto CAD, further as we migrate to SAP PM -all outages and permits would be through the system thus requiring licenses.
Travel Cost	1	200000	200000	Approximately four visits of Rs.50000 / each in a year including travel and stay as required.
Domestic Vehicle Hire Charges per year	12	10000	120000	Movement of shift personnel at odd hours would require Hired vehicle services. In Mumbai each employee is allowed Rs.2000 /per month. Provision for five employees is made.
Training Expenses per year	12	10000	120000	External training expenses are Rs.10000 per program. Provision for 12 such trainings is made.
Printing & Stationary	12	10000	120000	Permit books, Operating Instructions, SOP will be required during operations
Subscriptions	12	1000	12000	Yearly subscriptions like Power line, T&D for keeping us abreast technologically @Rs.1000 /month as the prevailing rates.
Sundries	1	100000	100000	
VHF Fees	12	10000	120000	
Total Yearly Opex in Rs.			1252000	
Total Yearly Opex (in Cr)			0.1252	

## Benefits

1. First ever real time reliability indices calculation in every possible aspect
2. Centralised channel for outside agency like OPTCL for any TPNODL related work. Firstly 33 KV will be covered. Then in subsequent years 11 KV and LT level will be covered up.
3. Lesser number of incidents due to flexible yet effective work instructions of PTW.
4. Faster management of network with the help of APS staff for any major problem
5. Centralised control centre during any disaster

#### E. Civil:

In entire TPNODL area there are very few buildings except new sub-stations which are in very good condition. Majorly all the building offices and sub-station buildings are in very bad condition and requires urgent attention. There is a huge scope for civil work to be done in all the buildings starting from corporate office. Stores are also in very bad condition. Somewhere it is real threat to work in the depleted building. The toilets are maintained in a very bad fashion and not state of the art. Civil team will work on this basic issues first to provide every employee the hygiene in the toilets and adequate in numbers so that everyone may work in congenial environment. On the other hand in majority of the sub-stations are boundary less and plinth of the transformers are real bad shape which needs immediate attention. The budgetary requirement goes as below:

S. No.	Description of Civil Maintenance work	Expenditure (in Crs)
		Opex
1	Painting for Corporate Office, Circle Office (4 nos), Division Offices (16 nos), SDO (10 nos) Sec Off (60 nos)	0.47
2	Repairs and Renovations to Toilets for Corporate Office, Circle Office (4 nos), Division Offices (16 nos), SDO (10 nos) Sec Off(60 nos)	0.69
3	Water Proofing of existing Structures and Buildings (8100 Sqm of Roof and associate Wall)	2.74
	Total cost	3.90

#### Benefits

1. State of the art presentation of aesthetics including building
2. Better hygiene provision for all the stakeholders
3. Safe workplace for everyone

4. Face improvement of TPNODL.
5. World class work centre development

Total R&M cost required for operations is 147.49 Cr. and category wise distribution is as under:

S. No.	Broad Category	Description	Budget (Rs Cr)
1	STS	Annual maintenance contract for Primary Substations & Feeders	28.5
2		Sundry Material Required for Maintenance of 33KV Network	4
3		Testing/Overhauling/Reconditioning of Transformers	3.5
5		Material for Repairing / Servicing of Circuit Breakers/CT &PT	2.75
12	Distribution	Distribution AMC Contract	95.5
13		Distribution Material (O/H)	3.5
14		Distribution Material (U/G)	0.20
15		Material & Services for Distribution Transformer Repairing	4.70
18	Others	PSC	0.12
19		Admin. AMC of Grids (Furniture & Fixtures)	0.82
20		Civil Works	3.90
<b>Total</b>			147.49

#### Justification:

The benefits to be accrued on the aforesaid Repair and Maintenance expenses on Sub-Transmission System (STS), Distribution, Safety, IT and Automation etc has been described in the aforesaid para. This will result in improving quality, reliability and safe supply of power with lesser interruptions, which will enhance customer satisfaction to a greater extent. As is evident from the above zero based budgeting of expenditure, It is submitted that the existing norm of allowing 5.4% of Opening GFA as the R&M Expenditure is inadequate, Pending revision of the norm, it is prayed to allow the additional expenditure of Rs. 33.26 Crore (Rs. 147.49 Cr. (proposed) – Rs. 114.13 Cr. (OERC approved) treating as special measures for improving safety, quality and reliability of the network meeting its bid commitments. This is primarily due to consideration of Rs 34.75 Crs of AMC for 33 kV network which was neither proposed by NESCO Utility nor considered by Hon'ble OERC in the tariff order.

### 5.3 Administrative & General (A&G) Expenses:

#### A. Meter Reading, Billing and Collection Expenses

Currently, meter reading is assigned to Meter reading agencies across Division /Subdivision on fixed cost basis per reading. Meter reader visit consumer site based on reading route sequence allotted to him in a period of 15 days i.e. from 7<sup>th</sup> to 22<sup>nd</sup> of every month. Meter reader after taking punching the reading in spot billing application and deliver the spot bill to the consumer during the same visit. In some divisions, meter reading & collection is done partially with support of Self-Help Group as part of Govt. of Odisha has approved Self Help Groups in Energy Franchise Agreement (SEFA) of Energy in Rural Areas.

Payment collection counters are provided at Division/Sub-Division level for customers to deposit the bills. Currently, the due dates are schedule in short window of 7 days duration due to which long queue at payment counters during month end is visible. This lead to customer dissatisfaction as customer has to spend time and energy for bill payment.

In addition to payment collection counter, on-line payment options through Website, Payment Wallets like Paytm, Google pay, etc. is available.

Beside above avenues, Business Associates (BAs) have been deployed for visiting the customer premise for collecting the payment from customer mostly by issuing manual receipt. Knocking at all customers doors during the month is a herculean task with multiple visits to the customers residences, with eventual result of non-payment of bills. Therefore, performance-based contract for Door to Door collection is proposed for ensuring timely recovery of payment. Further, promotional schemes for online payment and counter payment is also proposed.

The Estimated cost is based on recently discovered price through open tenders

#### Revenue collection management

Sr. No	Name of Activity	Total Expenses Exc. tax (FY-21-22)	Total expenses inc. 18% GST
1	Total Reading and spot billing cost(@ Avg. Rs. 9)	1834.40	2164.59
2	Total payment collection cost(@ Rs. 6 per transaction)	1036.43	1222.98
3	SMS services (Reading Intimation, Bill Information, Recovery etc.) @ 11 p (Rs.)	54.27	64.04

4	Total cost for Disconnection Notice printing & Distribution (3 phase)(@ Rs. 6	3.60	4.25
5	Total cost of supply disconnection (1- phase)(@ Rs. 50	344.10	406.04
6	Total cost for hiring outsourced employee for extended payment counters @ Rs. 14,000	109.20	128.86
7	Billing (M/s Crest Logistics) @ Rs.1.50 per consumer (Live + PDC) (Rs.)	98.55	116.29
8	RCS Collection System (Tech Mahindra) (Rs.)	12.40	14.63
9	Total Cost of bill printing of 3 phase consumers(@ Rs.	23.38	27.58
10	Manpower Cost of Outsourced Cashiers	38.40	45.31
11	Bill collection Expenses including Cash Pick up Charges and other coll cost	300.00	354.00
	Grand Total (In Rs.)	3625.33	4549
	Total in Rs Crs		45.49

## B. Customer Services and Communication Expenses

To improve the customer experience, customer touch points need to be augmented for providing ease of connectivity and single touch point at offices.

Currently, customers visit the office and stand in long queue for making electricity bill payment during due dates. Also, lack of basic amenities for the visiting customers like Seating space, water dispenser etc. at Section, Sub-Division and Division Level is experienced. For better experience at Customer care, operational expenditure of 0.6 Cr. is allocated to provide better logistics at existing Customer care centres.

S.NO.	Category	NATURE / TYPE OF ACTIVITY	QUANTITY	YEARLY TOTAL AMOUNT Incl Taxes (In Rs. Lacs)
1	Customer Care Executive 1 per Div	Mobile phones and Simcards for KCG Members CUG Numbers.	16	45.31
2	Promotion Cost, like Banners, posters etc	Stationary (files, forms etc)	Lumsum	10
3	Miscellaneous	Miscellaneous	Lumsum	5
		Total		60
		Total in Rs Crs		0.60

Special counselling & follow-up for high value consumers has been proposed under a new set up named Key consumer group (KCG). The group will be the nodal point between TPNODL & the key consumers. To facilitate their billings & payment a regular follow up

with those consumers are designed. This requires expenses on SIM cards, data package, mobile phones, etc. A yearly meeting with these consumers are planned where senior management of TPNODL meets those consumer & based on their yearly performance gifts of appreciations are planned which will entail an expenditure of 0.23 Crs.

S.NO.	Category	NATURE / TYPE OF ACTIVITY	QUANTITY	RATE/ UNIT (In Rs. Lacs)	YEARLY TOTAL AMOUNT W/o Taxes (In Rs. Lacs)
1	Communication	Mobile phones and Simcards for KCG Members CUG Numbers.	13	0.2	2.6
2	Expenses on Consumer	Consumer meet	2	5	10
3		Corporate Gift items for EHT and HT consumer	Lumsum	3	3
4		Consumer visit expenses	Lumsum	3	3
5		Consumer Hand book	Lumsum	1.5	1.5
6	Stationary	Stationary (files, Stamp papers etc)	Lumsum	1	1
7	Miscellaneous	Miscellaneous	Lumsum	2	2
		Total			23
		Total Rs Crs			0.23

While the Call Centre Cost is as per discovered prices, the other are estimated based on prevailing prices.

S.no	Cost Component	Proposed Cost (In Crs)
1	Contract for Call Center executive (20 seater)	1.44
2	Call telephony equipment	0.12
3	SMS/Whatts app communication	0,015
Total Cost		1.58

### C. Meter Management Expenses

To ensure smooth operation of Meter Management and establish a robust supply chain of meters and accessories, meter testing labs need to be developed in 02 locations i.e. Balasore & Jajpur with new test bench facility. Further NABL accreditation to be obtained for the same. Necessary charges for the same is required to be considered.

Further, to ensure high communication percentage of meters installed with Modem already in field, there will be need for rectification / Trouble Shooting of modems and allied

accessories like SIMS cards, Antennas etc. It is expected that a certain percentage of modems and accessories will need rectification per month, so a budget has been considered for same. This activity of modem rectification will be handled through performance contract under guidance of MMG TPNODL. Every month SIM card rentals are required to be paid to keep smooth functioning of AMR. Vehicles will be required at 16 nos divisions for activities as meter testing, attending consumer complaints, CMRI data collection from meters, etc. Inspection services at meter OEMs will be required to be carried out. Hands on Technical Training (HOTT) facilities are to be developed for meter installation teams to ensure safe operations at site. Teams which perform high standards of safety will be suitably recognised & rewarded. For service orders uploading at Data Centre for activities like Meter testing, MRO, AMI, Cancelled Protocols, RBG JE etc. outsourced manpower is required. Site metering teams are required to be provided with mobile phones & data plans for official communications. It is required to regularly maintain the test benches, on-site meter testing equipments, etc to ensure their smooth functioning. Mass awareness communication for public is required to be carried out.

To operate these meters testing facilities and troubleshooting funds are required under operational expenditure and same is mentioned below. These costs are on estimated basis.

S.NO.	Category	NATURE / TYPE OF ACTIVITY	YEARLY TOTAL AMOUNT W/o Taxes (In Rs. Lacs)
1	Consumable items*	Consumable items for CSO like Water bottles, Driving Helmet, Jacket/ coat, Rain Coat, Bag pack, Visiting Card, hand gloves, mobile device holder, tester, torch, sugar pack in Summers, pollution masks, 1st aid kit, Safety shoes, inch tape.	25
2	Mass scale scanning	Protocol uploading at Data Centre for OPEX activities like Meter testing, MRO, AMI, Cancelled Protocols, RBG JE etc. Manpower requirement for Record Room; 2 Supervisor (Graduate), 2 KPO (Semi Skilled) and 7 Labor (Un-skilled)	60
3	Mobile Telephone Expenses – FBT*	For 200 engineers and inspectors	20
4	Postages Printing & Stationaries	Printing & Stationaries for metering activities	45

5	Admin Expenses	Expenses of admin materials like water, electricity, safaiwalas, Security gaurds	100
6	New Connection Field Process Expenses	Salary of Inspectors for new connections ( CMG related)	50
7	Safety Related Exp.	For meeting Safety initiatives like HOTT development, R&R	15
8	Trouble shooting	Modem trouble shooting	10
9	Meter Reading	AMR	125
10	Vehicle hire charges	Vehicles for Meter replacement and in Meter Testing	70
11	Travelling expenses	Outstation travelling for inspections / trainings	50
12	Audits	For MMG Lab Calibration	10
13	Conveyance Expenses – FBT*	150 engineers @ Rs 5000 per month ( motorbike fuel reimbursement )	90
14	Maintenance and repair	Maintenance of Different machines	10
15	Advertisement	Advertisement for public awareness	20
16	Manpower	Manpower Cost of Connection Management Execs	45
		Total	745
		Total in Rs Crs	7.45

#### D. Admin & General Expenses: Other Costs

Expenses on the other Heads have been carefully examined vis-à-vis the costs being currently incurred. A comparison of the same is provided in the Table in the earlier Sections. The increase over the previous year is generally on account of enhanced level of activity, increase in no. of employees resulting in higher A&G Expenses, inflation and incurrence of expenditure on certain activities which were hitherto either non-existent or minimal, such as Insurance, various Company related mandatory expenses relating to requirement of various statutory Audits and compliances, which would entail appointment of various Auditors as well as consultants to facilitate statutory compliances.

**Insurances:** As per good Risk mitigation practice, and as required by Lenders, the Company is proposing to take various insurances to ensure coverage of its Fixed Assets, Inventories, Moneys & Employees, etc. The significant insurance covers would include amongst others, Industrial All Risk Insurance for Fixed Assets, Transportation of Goods, Fire & Allied Perils, Burglary, Money Insurance, Directors & Officers Liability, Cyber Security against Data Breach, Loss due to fraud, etc.,

**Rents, Rates and Taxes :** With increased no. of employees and to ensure proper seating, etc. for the same, additional space is required to be hired till such time that the Company is able to construct/renew its own offices.

**Legal, Consultancy & Professional Charges:** With vesting of NESCO's Utility in TPNODL, a Company incorporated under the Companies Act, 2013, statutory compliance requirements are going up multi-fold, which would entail additional expenditure on Audit, Consultancy and Professional Fee. In addition to the Annual Statutory Audit including ICFR (Internal Control over Financial Reporting) Audit, the Company is subject to Quarterly Reviews by the Statutory Auditors, Tax Audit, Secretarial Audit, Cost Audit, etc. NESCO was hitherto subject to only the Annual Statutory Audit, and that too at significantly discounted fee.

Further, extensive Data cleaning, data – base creation/ reconciliation etc. is required for migration from the basic Tally Accounting System to the SAP ERP entailing additional costs.

With the Company now being a private company, legal expenses are envisaged to increase with the Company becoming more vulnerable to litigation as well as the requirement to more vigorously protect its and its stakeholders interests.

**IT Consumables:** With extensive IT infrastructure being built, the corresponding IT Consumable requirement is expected to increase significantly.

**House Keeping Expenses:** The offices of the company are in extremely decrepit and shabby condition with virtually no housekeeping. In-order to provide a decent working environment to the employees which is a pre-requisite for ensuring productivity, retention of talent, building employee morale and pride in the Organisation, as well as for Consumers and other stakeholders, a separate budget for House Keeping has been proposed.

Particulars	Proposed (FY 2021-22)	Plan	OERC Approved (FY 21-22)
<b>A &amp; G Cost *</b>			<b>49.20</b>
Add outsourced employee cost			45.70
Total A&G cost	<b>139.83</b>		<b>94.90</b>
Rent Rate & Taxes (including Lease Rentals)	3.39		
Watch & Ward Expenses	2.76		
Communication	3.42		

Legal, Consultancy & Professional Charges	15.70	
Conveyance & Travelling	5.48	
License & Related Fees	2.24	
Advertisement Expenses (Public relation)	3.28	
Franchisee & Spot billing	45.49	
Printing & Stationery	4.36	
Enforcement Activities	3.00	
IT -Computer Consumables	8.55	
Safety & Ethics	3.63	
Training	5.00	
Insurance	5.07	
ARM installation & Management expenses	7.45	
House Keeping	10.55	
Covid / Employee Welfare Expenses	3.78	
Other Expenses / Customer Care Call Center	6.68	

\*Employee cost is Gross of Capitalisation.

Contract employee cost has been regrouped under A&G

### **Justification:**

The benefits to be accrued on the aforesaid Administrative & General (A&G) Expenses has been described in the aforesaid paras.

The norms specified by the Hon'ble Commission is a 7% increase over previous year's allowed normative expenditure together with certain expenditure for specific activities. It is submitted that the norm is grossly inadequate as the base (previous year's allowed expenditure), is insufficient considering the requirements as detailed above, including new expenses (such as Insurance, Audit / Professional Charges), which were hitherto either not or insignificantly being incurred. Further, the Hon'ble Commission has not been factoring the Incremental Revenue Share (IRS) being paid by NESCO to the Distribution Franchisees, thereby reducing the base expenditure.

The increase in A&G Expenses over and above the approval by Hon'ble OERC in tariff order is due to the following critical new items considered:

### **Insurance:**

In NESCO, there was no coverage for insurance on the assets as well as for Business Interruption (BI). As per good Risk mitigation practice, and as required by Lenders, the Company is proposing to take various insurances to ensure coverage of its Fixed Assets, Inventories, Moneys & Employees, etc. The significant insurance covers would include

amongst others, Industrial All Risk Insurance for Fixed Assets, Transportation of Goods, Fire & Allied Perils, Burglary, Money Insurance, Directors & Officers Liability, Cyber Security against Data Breach, Loss due to fraud, etc.

### **Billing & collection**

As far as technology is concerned erstwhile NESCO had not done investment in technology for Meter, Reading and Billing. This has resulted in high T&D loss. Payment collection counters are provided at Division/Sub-Division level for customers to deposit the bills. Currently, the due dates are schedule in short window of 7 days duration due to which long queue at payment counters during month end is visible. This lead to customer dissatisfaction as customer has to spend time and energy for bill payment. TPNODL is now planning on establishing reliable metering, billing and collection system to address the high T&D loss and customer dissatisfaction. Therefore, performance-based contract for Door to Door collection is proposed for ensuring timely recovery of payment This will help in improving the process efficiency and ensure better services to our end users.

### **Enforcement activities**

Presently, there is missing bandwidth the area of enforcements. In erstwhile NESCO there is no presence of enforcement, leading to leakage or theft of power. TPNODL needs to introduce enforcement to arrest leakage, unauthorised hooking etc.

### **AMR:**

To ensure smooth operation of Meter Management and establish a robust supply chain of meters and accessories, meter testing labs need to be developed. Further, to ensure high communication percentage of meters installed with modem already in field, there will be need for rectification / Trouble Shooting of modems and allied accessories like SIMS cards, Antennas etc. Inspection services at meter OEMs will be required to be carried out. Hands on Technical Training (HOTT) facilities are to be developed for meter installation teams to ensure safe operations at site

### **Consumer Care Center & Call Center Exp**

Presently there is limited customer touch points which leads to customer dissatisfaction. Customer has to spend time, money and effort in visiting the office for registering basic complaint like No Power Supply, Billing or asking queries like new connection document,

attribute change etc. Most of these queries/complaints can be easily responded with satisfaction at Call Centre by improving the connectivity.

Particulars	OERC approved (Rs. Cr)	Proposed (Rs. Cr)	Request for increase (Rs. Cr)
A&G Expenses	49.2		
Outsourced employee regrouped from Employee Cost	45.7		
<b>Total</b>	<b>94.9</b>	<b>139.83</b>	<b>44.93</b>
<b>Expenditure for new initiatives/additional for improvements</b>			
Insurance			5.07
Billing & collection			27.23
Enforcement activities			3.00
AMR			7.45
Consumer Care Center & Call Center Exp			2.18
<b>Total</b>			<b>44.93</b>

The above expenditure has been carefully estimated and planned, and it will result in reducing AT&C losses, enhancing productivity and enhancing customer satisfaction to a greater extent. Pending revision of the norms, it is prayed to allow the additional expenditure of Rs. 44.93 crore (Rs.139.83 Cr. proposed minus Rs.94.9 crore (adjusted) allowed by Hon'ble Commission for FY 2021-22) beyond the amount currently allowed for reduction of AT&C Loss, improving collection efficiency, improving consumer satisfaction and meeting the bid commitments.

## **6. Procurement Plan**

Procurement plan and policies shall be the backbone of TPNODL towards ensuring highly transparent, competitive, fair and reasonable procedure with ensuring quality. TPNODL will explore and adopt best practices & policies from its other division like Delhi and Mumbai. TPNODL will plan for Centralised procurement of high value services and items and local procurement for low value and emergency works. More focus on annual rate contracts for supply items and three years contract for services.

TPNODL shall focus more on optimizing costs, excelling in managing customer satisfaction, building strong suppliers performance management framework, digitisation of vendor life cycle management, bringing better safety culture and enhancing capability and competency.

The processes include methodology to select Business Associates based on credentials and past service and / or material quality. All services and materials are evaluated for quality and performance by users. Incentive and penalty clauses in the contracts support better quality of delivery. Certain Business Associates are identified based on areas of their core-competency such as call-centre, CRC manning and attending low voltage faults in the distribution business. The SLAs with these Business Associates are made with an emphasis on higher performance than standards to enhance customer satisfaction. The quality of customer interaction of front-end staff is monitored and used as a feedback for improvement. Relevant training, based on these feedbacks, are also imparted to them to improve customer experience. The Business Associates who do not perform up to the expectation, are blacklisted. Feedback is also sought from Business Associates through a satisfaction survey and BA meets and actions are taken based on the findings.

Challenges on Procurement/Contracting after lockdown period.

- 1) The Demand and supply gap will increase as, there will be huge demand.
- 2) There will be challenged to retain the existing Supplier and Contractor due to demand in market other than regulated business, where higher price can be accepted without tendering procurement process.
- 3) Manufacturing capacities remain unchanged as such higher profit margin will be expected by supplier, which will prompt them to choose alternate buyers.
- 4) The market will be towards supplier/Contractor- Buyer will not have any choice

- 5) There will be cash crunch in the market, as such Supplier/Contractor will not agree for EMD against tenders.
- 6) Conditions like EMD/Tender fee need to be reviewed.
- 7) As labours have already moved to their native places, contractor will have problems with labours.
- 8) Advance payment and Advance payment BG terms need to be reviewed, as supplier will not accept orders without advance payment.

## **7. Power Purchase Plan**

Sales growth for FY 21-22 projected to grow from 4941 MUs in FY 20-21 to 5737 Mus.

### **Sales Projection**

<b>Financial Year</b>	<b>In MU</b>
2019-20	5439
2020-21	4941
2021-22(With Railway)	5737
2021-22(Without Railway)	5353

### **Power purchase**

<b>Financial Year</b>	<b>In MU</b>	<b>Distribution loss %</b>	<b>unit price Rs/kWh</b>	<b>Rs.in Crore</b>
2019-20	6265	13.19%	2.98	1621
2020-21	6226	20.64%	3.16	1561
2021-22(With Railway)	7087	19.05%	3.20	1836
2021-22(Without Railway)	6727	20.42%	3.20	1713

Source: ARR filed by NESCO for FY 2021.

BSP: Rs. 3.20/unit and OPTCL Charges: Rs. 0.28/unit

The requirement of power shall be met through GRIDCO at Bulk Supply Price (BSP) determined by OERC.

## **8. Financing Plan**

Based on above investment plan master, TPNODL proposes Capital Expenditure of INR 275.40 Cr. for FY 2021-22. Debt-Equity ratio has been specified as 70:30 by OERC (Terms and Condition for Determination of Wheeling Tariff and Retail Supply Tariff) Regulations.

*“7.43 In case of all new projects, debt-equity ratio shall be 70:30 for determination of tariff. When equity employed is more than 30%, the amount of equity for the purpose of tariff shall be limited to 30% and the balance amount shall be considered as the normative loan:*

*Provided that in case of the projects where actual equity employed is less than 30%, the actual debt and equity shall be considered for determination of tariff.”*

Accordingly, 70% of the CAPEX shall be funded through Debt and remaining 30% through Equity, with GRIDCO contributing its share of Equity in form of Distribution Assets in the Books of Govt. of Odisha.

### **Proposed Capital Expenditure (Rs. Cr) FY 2021-22**

Proposed Capex	Rs. 275.40 Cr.
GRIDCO Contribution of Assets	Rs. 47.46 Cr.
<b>TOTAL</b>	<b>Rs. 322.86 Cr.</b>
Debt: Equity Ratio	70%:30%
Debt	Rs. 226.00 Cr.
Equity	Rs. 96.85 Cr.
-TPC (In Cash)	-Rs.49.40 Cr.
-GRIDCO (In Kind)	-Rs. 47.45 Cr.

The Debt part amounting to Rs. 226 Cr. shall be funded through Long Term loans for which the Company is in discussions with various Banks and Financial Institutions.

The equity part shall be funded by Tata Power (51%) and GRIDCO (49%). GRIDCO shall subscribe to the equity in kind. As per the Shareholders Agreement, it shall be of such nature that it is allowed by the Commission to be included in the fixed asset base for consideration in Aggregate Revenue Requirement.

**PRAYER:**

Pursuant to the direction of Hon'ble Commission, OERC at Para 53 and 39 of its Order dated 25.03.2021 in Case No.9/2021, TPNODL has prayed that the Hon'ble Commission may kindly pleased to;

1. Admit the Annual Business Plan of FY 2021-22.
2. Approve the Capital Investment Plan (CAPEX) of Rs.275.40 Crore for the Financial Year 2021-22 as proposed by TPNODL as per para 39 of OERC Vesting Order dates 25.03.2021 in Case No. 9/2020 (separate detailed CAPEX Investment plan is submitted)
3. Approve the Operation and Maintenance expenses towards Employee Cost, Repair & Maintenance and Administration & General expenses of Rs. 627.22 Crore for the period April 21 to March 22 as proposed by TPNODL as per para 53 of the Hon'ble Commission's Vesting Order dated 25<sup>th</sup> March 2021 in Case No. 9/2021.
4. These Business Plan is being submitted in compliance with directions of the Honourable Commission as Para 53 of the Vesting Order wherein the petitioner has been directed to provide detailed justification of the expenditures: -
  - i. Salaries, wages, pension contribution and other employee costs
  - ii. Administrative and General (A&G) expenses
  - iii. Repair and Maintenance (R&M) expenses

that may be incurred in the first year of operation. It is submitted that these expenses are estimates based on current understanding of the conditions and the petitioner is in the process of placing various orders for carrying out various initiatives whose cost may turn out to be in variance to the Budgeted estimates. Further these expenditures and initial year expenditures are likely to be staggered especially for Employee Costs. The estimated cost is based on first year level of activities which the Honourable Commission shall appreciate, shall be ramped up steadily and shall reach a stable level of activity only in the next couple of years. In view of the above, it is prayed that the initial year estimates or actual expenditure may not be considered as a representative figure or base figure for determination of subsequent years costs.

Grant any other relief as deemed fit & proper in the facts and circumstances of this submission.

Chief Executive Officer

\*\*\*