ODISHA ELECTRICITY REGULATORY COMMISSION
BIDYUT NIYAMAK BHAWAN
PLOT NO.4, CHUNOKOLI, SHAILASHREE VIHAR,
BHUBANESWAR - 751021
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Present: Shri G. Mohapatra, Officiating Chairperson
Shri S. K. Ray Mohapatra, Member

Case No. 101/2021

M/s. TPWODL …… Petitioner
Vrs.
GoO & Others …..... Respondents

In the matter of: Application for approval of Capex Plan for the financial year 2022-23, in compliance to the directions of the Commission vide para 39 of the vesting order dated 28.12.2020 in Case No. 82 of 2020.

For Petitioner: Shri K. C. Nanda, GM (RA & Strategy), TPWODL.

For Respondents: Shri Lalit Mishra, DGM (Fin.), GRIDCO, Ms. Sonali Patnaik, ALO, DoE, GoO, Shri B. K. Das, GM (RT&C), OPTCL and Shri R. P. Mahapatra

ORDER

Date of Hearing: 10.05.2022 **Date of Order: 08.07.2022**

The TP Western Odisha Distribution Limited (TPWODL), the Petitioner, has submitted an application for approval of Capital Expenditure (Capex) of Rs. 582.18 Cr. for FY 2022-23 to carry out various system improvement & safety activities in its area of operation. This application has been filed in pursuant to the direction of the Commission at para 39 in the vesting order in Case No.82/2020.

2. TPWODL's licensed area is spread over 48,373 sq.km and serves a registered consumer base of around 22 lakhs. TPWODL procures power from GRIDCO through Odisha Power Transmission Corporation Limited (OPTCL)'s 220/132/33 kV grid sub-stations at sub transmission voltage level of 33 kV and then distributes the power at 33 kV/ 11 kV/ 440 V/ 230V depending on the demand of the consumers. A snapshot of infrastructure available with TPWODL has been provided in the table as follows:

Sl. No.	Particulars	Unit	Details (as on 31-Mar-22)
1.	Area	Sq. km	48,373
2.	Consumers	No.	21,90,159
3.	Circles	No.	5
4.	Divisions	No.	17

Sl. No.	Particulars	Unit	Details (as on 31-Mar-22)
5.	Sub-divisions	No.	57
6.	Sections	No.	202
7.	33/11 kV sub-stations	No.	293
8.	33/11 kV PTR	No.	630
9.	33/11kV PTR capacity	MVA	3,269
10.	11/0.415 kV DTR	No.	71,181
11.	11/0.415 kV DTR Capacity	MVA	3,294
12.	33 kV OH & UG Line	Ckt. km.	4,808
13.	11 kV OH & UG Line	Ckt. km.	49,331
14.	LT Bare & ABC Line	Ckt. km.	52,904

3. TPWODL in compliance with the Vesting Order has to seek the approval of the Capital Expenditure Plan in line with the regulations. The extracts from the Vesting Order are as follows:

"39. Capital investment plan

(b) In its Bid submitted in response to the RFP, TPCL committed capital expenditure of Rs. 1,663 crores (Indian Rupee One Thousand Six Hundred and Sixty Three crore) only for period FY 2022 to FY 2026 as follows:

Table 1: TPCL Capital Expenditure Commitment

FY 2021-22	***FY 2022-23***	***FY 2023-24***	***FY 2024-25***	***FY 2025-26***	***Total***
306	*500*	*333*	*322*	*202*	*1663*

(Value in Rs. crore)

(c) To allow flexibility in the capital expenditure planning, the Commission stipulates that, in the capital expenditure plan to be submitted by TPWODL as per the license conditions, the capital expenditure commitment for each year of the period FY 2022 to FY 2026 must be such that capital expenditure proposed up to a year shall be at least equal to the cumulative capital expenditure committed up to that year in the Bid submitted by TPCL. For avoidance of doubt, the minimum cumulative capital expenditure to be proposed by TPWODL for the period FY 2022 to FY 2026 must be as provided in the table below:

Table 2: TPWODL Cumulative Capital Expenditure for 5 years

(Value in Rs. crore)

Up to 31-Mar-2022	*Up to 31-Mar-2023*	*Up to 31-Mar-2024*	*Up to 31-Mar-2025*	*Up to 31-Mar-2026*
306	*806*	*1,139*	*1,461*	*1,663*

(d) TPWODL would be required to seek the Commission's approval on the detailed capital expenditure plan in line with the regulations. TPWODL shall satisfy the Commission that the capital expenditure plan submitted in line with regulations adheres to the capital expenditure plan submitted as part of the Bid."

4. Further, in line with the Odisha Electricity Regulatory Commission (Terms and Conditions for Determination of Wheeling Tariff and Retail Supply Tariff) Regulations

2014 the licensee is required to take approval from the Commission for undertaking Capex in the licensee served area. The relevant extract of the OERC Tariff Regulations, 2014 is provided as follows:

"Capital Investment

7.33 Capital investment shall cover spending on capital equipment that augments fixed assets and capitalisation of corresponding interest expenses determined as per the applicable accounting policies and guidelines. Capital investments may address a variety of needs such as meeting load growth, refurbishment and replacement of equipment, reduction of losses, improvement of voltage profile, improvement of quality of supply and system reliability, metering, communication, computerisation etc.

7.34 The licensee shall propose in its filing a detailed capital investment plan. The plan must separately show ongoing projects that will spill into the year under review and new projects that will commence but may be completed within or beyond the tariff period. For the new projects, the filing must provide the justification as stipulated under relevant investment guidelines of the Commission.

7.35 In addition to the approved capital investment plan, the licensee can seek provision for additional capital expenditure anytime during the tariff year to meet natural calamities involving substantial investments. The Commission shall examine and if satisfied shall approve the corresponding costs for inclusion in revenue requirement in the next period.

7.38 The Commission shall review the licensees capital investment plan for approval and for this purpose may require the licensee to provide relevant technical and commercial details including corresponding transmission system feasibility. The costs corresponding to the approved capital investment plan of a licensee for a given year will normally be considered for its revenue requirement

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7.41 Licensee could retain financial benefit arising out of savings in financing costs due to faster implementation at lower cost because of better project management or procurement practices. Financial loss on account of time and cost overrun is to be an account of the licensees only."

5. As per the Licence Condition 11 and 32, investment above Rs. 5 Cr. is to be made by the distribution licensee in the licensed business area of operation with the approval of the Commission. The relevant provisions of Licence Condition 11 and 32 are stipulated as follows:

"11. INVESTMENTS

11.1 Unless otherwise directed by the Commission, every licensee shall obtain prior approval of the Commission for making investment in the Licensed Business if such investment is above the limits laid down in Condition 32.

11.2 The Licensee shall duly comply with the Regulations, guidelines, directions and orders the Commission may issue from time to time in regard to the investments to be made in the Distribution Business.

11.3 The Licensee shall submit to the Commission investment plans as a part of the business plan under Condition 10.9 above giving details of investment schemes to be undertaken during the concerned period for the approval of the Commission. For new scheme formulated by the GoO, if TPWODL wishes to avail funding under such scheme, an agreement shall be signed between GoO/ GRIDCO/ OPTCL and TPWODL for utilisation of such grants. The Licensee shall demonstrate to the satisfaction of the Commission that:

(a) there is a need for such investments in the Distribution System;

(b) the Licensee has made techno-economic analysis and environmental aspects of all viable alternatives to the proposal for investing in or acquiring new Distribution System assets to meet such need.

(c) the investment plan is in conformance to the conditions for capital investment specified in the Vesting Order

11.4 In the application for investment approval, the Licensee shall furnish the following information or particulars:

(a) A detailed project report containing techno-economic analysis and environmental aspects of the investment together with the outline of the works to be undertaken the salient features and particulars demonstrating the need for investment;

(b) The project cost together with the cost benefit analysis;

(c) Whether the investment is in a new project or for expansion or up-gradation of an existing system;

(d) Sanctions and statutory clearances required for execution of the project and status of such sanctions and statutory clearances;

(e) Phasing of investment over the financial years and commissioning schedule;

(f) The manner in which investments will be capitalised for the purposes of inclusion in the revenue requirements of the Licensee;

(g) Constraints which the Licensee may face in making the investments or in implementing the project including constraints on information available;

(h) Resource mobilisation and financial plans for meeting the investment;

(i) Process for inviting and finalizing tenders for procurement of equipment, material and /or services relating to investment, in accordance with a transparent tendering procedure as may be approved by the Commission; and

(j) Such other particulars as the Commission may from time to time direct.

11.10 For the purposes of this Condition 11, the term "Major Investment" means any planned investment in or acquisition of Distribution facilities, the cost of which, when aggregated with all other investments or acquisitions (if any) forming part of the same overall transaction, equals or exceeds an amount contained in the Specific Conditions applicable to the Licensee or otherwise decided by the

Commission from time to time by a general or special order (Refer Condition no. 32.1).

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32. INVESTMENT AND TRANSFER OF ASSETS (IN CONTINUATION TO CONDITION 11 AND 12)

32.1 For the purposes of Condition 11.10, the term "major investment" means any planned scheme wise investment in or acquisition of distribution facilities like Rural Electrification, System Improvement, Major Renovation & Modernization works, the cost of which, when aggregated with all other investments or acquisitions (if any) forming part of the same overall transaction/scheme, equals or exceeds Rs. 5 crore (Indian Rupee Five Crore) or otherwise determined by the Commission from time to time by a general or special order. For smaller transactions for which prior approval of the Commission has not been obtained, the proposals will be considered at the time of annual true-up subject to prudence check by the Commission."

6. Accordingly, in line with the above, TPWODL has submitted the current petition for approval of Capital Expenditure Plan for FY 2022-23.

7. The Petitioner had submitted a petition for approval of capital expenditure to the tune of Rs. 462.62 Cr. for the FY 2021-22 to carry out various activities in its area of operation. The Commission, vide its order dt. 18.09.2021 in Case No. 07 of 2021 had disposed off the petition approving a Capex of Rs. 333.13 Cr. for FY 2021-22.

8. TPWODL submitted that during initial review of the distribution infrastructure post takeover, it was observed that compliance to statutory guidelines was not adhered at many locations. Most of the network were laid on 8 meters / 9 meters poles with lengthy span, however, as per construction practice, 1/6th of the total pole length is to be erected below the ground and thus only available length is approx. 7.5 meters above ground. Considering the fittings and accessories in the installation, there is hardly any room to increase the ground clearance to safe level. To further worsen the problem, the higher span length varying between 60 - 120 meters also causes high sag. At some places, due to re-construction of the roads, vertical clearances of the lines have reduced to a dangerous level causing violation of statutory safety guidelines.

9. TPWODL has further submitted that due to vast geography and widespread network and absence of preventive maintenance practices, the reliability of power supply through existing network has been affected. Major elements responsible for such deteriorating condition includes damaged pole, worn out conductors, damaged stay wires and support structures. The factors causing damage to the poles include structural deterioration of poles, flood, cyclone, heavy vegetation etc. Tilting of poles has resulted in increase in

conductor sag and if replacement / refurbishment of the tilted or broken pole is not done, mechanical strength of the line will reduce and may result into falling of line during high-speed winds / storms. Falling of line can cause fatal accident and is also a major concern for ensuring reliable power supply to the consumers as restoration may take days to bring back normalcy depending upon the location and severity of damage to the line.

10. Similarly, in an electrical installation, earthing system plays important role for safe and reliable operation of the power distribution system, and providing protection to human beings & animals against electric shock. Metal frame of all power distribution equipment are required to be connected with the general mass of the earth, which is always at zero potential. During TPWODL site visits, it was observed that at most of the places, proper earthing was not provided and at some of the 33/11kV primary substation, earthing system is not adequate. Further the condition of earthing in old installations is observed to be extremely bad due to depletion/ corrosion of earthing electrodes/spikes and connections. The on ground situation is dangerous for the safe operation of distribution system and there are chances of electric shock to the human beings and animals, if corrective actions are not taken urgently.

11. At present, most of the network is overhead and there is no provision of guard or cradle wire installed below the overhead live conductors at public places / road crossings etc.. This poses serious safety threat to the public since the network is in dilapidated condition and possibility of conductor snapping cannot be ruled out.

12. Similarly, the 33/11 kV Primary sub-station and 11/0.415 kV Distribution sub-stations are in a much deteriorated condition. In Primary Sub-stations (PSS) faulty equipment have been either bypassed or removed and supply is being managed without proper switching devices resulting in frequent faults/ cascade tripping in upstream network thereby impacting the large consumer base. In Distribution Sub-stations (DSS) the Air Break Switch, HG/DO Fuse units, LV Protection devices are absent / not functioning at most of the locations. Apart from this, earthing system at PSS, DSS and lines are in a deteriorated condition. Fuse arrangements at DSS have been installed at lower height and exposed, thereby creating a potential safety hazard for humans & animals.

13. Further, 33/11 kV Primary Substation's (PSS) boundary walls are broken and there is no fencing for the outdoor switch yards. This makes the PSS unsafe for stray animals and

prone to any unauthorized entry. Apart from this, many breakers and CTs have been bypassed resulting in non- availability of basic protection system.

14. TPWODL has submitted that one of the major concerns is the presence of a large number of consumers either with defective meters or without any meter resulting into poor billing efficiency. Additionally, meters installed at consumer premises are of mixed type such as electro-mechanical meters, consumer owned meters, electronic meters etc. Meter sealing is necessary to check revenue pilferage from unauthorized access to electricity which needs to be emphasized upon.

15. In addition, upgradation of civil infrastructure in terms of hygiene, sanitation and additional space at the workplace is required to be strengthened.

16. The present Capex proposal was submitted by TPWODL on 29.11.2021 and registered as Case No.101 of 2021. The public notice was issued on 21.04.2022 inviting suggestions/ objections to the CAPEX Plan for FY 2022-23 of the DISCOMs which were to be filed on or before 04.05.2022. The public hearing in the matter was held on 10.05.2022. The Commission during hearing heard the Applicants who had participated in the hearing. Three Respondents namely GRIDCO, OPTCL and Shri R.P. Mahapatra have made their submissions.

17. As part of the review process, the Commission sought clarifications on the various important aspects considered while proposing the Capex plan for FY 2022-23. Some of the aspects across which justification was sought from TPWODL included:

- System study report for the network and the time frame of completion
- Schemes proposed on the basis of load growth
- Augmentation of lines separately mentioning the proposed lines
- Focus on standardization and status of the actual works undertaken in this regard
- Design aspects for creation of a cyclone resilient power system

18. The discussion was held on 21.05.2021 through video conferencing in which TPWODL has submitted clarifications with respect to the queries of the Commission

19. During the presentation, TPWODL submitted that the proposed strengthening of 33kV network infrastructure is required to avoid any overloading while meeting the growth in demand and therefore is planning to develop the system with N-1 redundancy to minimize the outages. Also, TPWODL has submitted that load flow studies has been

carried out for the entire 33 kV network covering all five circles and the load flow studies for 11kV network are underway. The network diagram is also available for 33kV & 11kV distribution network upto DT at 11kV levels.

20. TPWODL has clarified that load flow study has been carried out based on peak load registered in FY 2021-22 and projected load growth for coming two years using load flow software. As part of submissions, TPWODL mentioned that high technical losses ranging from 5.19% to 10.52% across different circles have been observed owing to overloaded existing lines at 33 kV levels under peak load condition.

21. The following issues/concerns were identified in the 33/11 kV infrastructure based on the study:

- A number of 33 kV sections are experiencing overloading during peak loading condition.
- Significant variation in supply voltage from the nominal range of +6% to -9% is observed
- 30% to 40% of the equipment in field have already crossed their useful life.
- Critical areas like Hospitals, industries, urban areas don't have N-1 redundancy in network
- DTs/PTRs/ Lines (33 kV/11 kV/LT)/ equipment installed inside PSS are having high losses
- No segregation of agricultural/irrigation feeders from residential feeders exist
- Span length of 33 kV/11 kV/LT network is high and safe ground clearance is not maintained creating safety hazard
- Extension of 33 kV/11 kV/LT network is required to distribute existing and new load
- Requirement of new PSS in city areas where load growth is high
- Replacement/augmentation of DTR/ PTR/ Breaker/ CT/PT/ LA/ Charger/ battery/ earthing/ conductor is required for safety and reliability of the distribution network

22. TPWODL has further submitted that the existing 11kV feeders in its license area are operating radial mode and do not have ring main system. As per N-1 philosophy, TPWODL has proposed to establish ring connectivity between nearest 11kV feeder in

the vicinity of PSS. Few such ring connectivity will be established for some important feeders like hospitals, town, commercial and key government establishments.

23. TPWODL has also submitted that the technical specifications are being standardized for the entire licensed area and across all four Discoms in Odisha for material procurement.

24. TPWODL has also submitted that very limited areas in TPWODL are Kal Baisakhi (Mini Cyclone) prone and due care has been taken while framing technical specifications of major materials especially PSC Poles etc. To combat the natural disasters such as cyclones, TPWODL has proposed Capex for purchase of mobile transformer and DTR for emergency restoration of power supply to important places like Hospital/ Collector Office etc. during Cyclones/Kal Baisakhi.

25. During the presentation, the Petitioner also highlighted that several steps are being taken to meet the load growth and provide reliable power. TPWODL in its Capex proposal has included transformer augmentation, DT augmentation, GSS planning for 33kV and 11kV network etc. TPWODL also clarified that it has started working on safety of equipment (earthing of PSS, replacing old relays, strengthening of DC system, etc.) as well as safety of employees / operating personnel by procuring safety equipment for field staff.

26. Similar to the methodology adopted in capital expenditure plan for previous years, TPWODL has submitted Capital Expenditure for FY 2022-23 under five major categories. The details of the matter are described as follows:

a) Statutory, Safety and Security:

TPWODL has proposed strengthening of distribution infrastructure and maintaining safe electrical (horizontal / vertical) clearances. During visits conducted by TPWODL, it was observed that most of the 33kV / 11kV / LT infrastructures are in deteriorating condition and posing safety threat to human beings and animals. Most of the feeders have binding wire / multiple joints. As a result, there are possibility of snapping of conductors and electrocution of human beings / animals since cradle guards have not been provided. Also, at many locations huge number of tripping's were reported on 33 kV and 11 kV feeders in previous years due to touching of tree branches/ creepers with live conductors. Due to inadequate staff and insufficient materials, no structured maintenance planning was being done. TPWODL submitted that with poor condition of

distribution infrastructure and absence of maintenance activity, it is difficult to ensure reliable and quality power supply to the end users.

TPWODL has also observed that conductor of different sizes are being used in different phases resulting in unbalanced power flow in different phases. Moreover, sagged live wires of 33kV or 11kV overhead lines are posing major threat to the life of human beings and animals. At some places, due to re-construction / widening of roads, safe vertical/horizontal clearances of the overhead lines have been reduced. This is not only causing violation of statutory safety guidelines but also increasing the chances of accidents. To ensure safety and reliable power supply to end consumers, TPWODL has proposed refurbishment of 33kV, 11kV and LV lines in a phased manner prioritizing critical areas such as schools, hospitals, markets and other key installations.

TPWODL has proposed a Capex for Safety Equipment & Personal Protection Equipment (PPE) for workforce. According to TPWODL, required PPEs were not available and they have purchased and supplied necessary PPE on urgent basis to all of its field employees, the cost of which was either covered in the Capex or Opex (for BA supplied PPEs). As per TPWODL, the most challenging task is creating awareness among work force for proper utilization of existing PPE. Similarly, the desired testing instruments / tools are not available. The available PPE's and testing instruments are needed to create safe and healthy environment .

TPWODL has additionally proposed a Capex for proper Earthing and fencing to strengthen earthing system in existing primary substation. TPWODL has proposed to commission additional earth pit in areas with high soil resistivity and poor earth mesh connectivity. Therefore, TPWODL has submitted requirement of 10 no. of additional earth pit for each PSS, 3 no. of additional earth pit for each DSS and earthing of every 5^{th} pole.

To improve the civil infrastructure in PSS & DSS, TPWODL has proposed to cover boundary walls for Primary substations at 20 locations and fencings around DSS at 1000 locations. Apart from that, activities such as gravel filling, access to switchyard and creating stores, refurbishment of control room & building, and creating provision of water supply for PSS/Offices etc. shall be undertaken.

The petitioner has proposed a Capex of Rs. 53 Cr. against the various works under the Statutory, Safety and Security head.

b) Loss Reduction:

TPWODL has submitted that current AT&C loss is 28.56%. To reduce the techno-commercial losses, they have planned to take up number of measures like Energy Audit, resolve meter related issues, spot billing, and replacement of LT bare conductor with AB cable.

About 150,000 meters are reported to be defective/ burnt. Many consumers have not been provided with energy meters, their connections are energized in books and electricity is being consumed by these consumers. Considering the past trends, TPWODL is expecting that additional fifty thousand meters are likely to be found defective in FY 2022-23 (2.5% of existing meters population base). All these meters need to be replaced with new meters along with service cable, polycarbonate seals and modems. For installation of meters, meter box will also be installed to protect the meters from energy theft. Keeping this in mind, TPWODL has proposed Capex under meter replacement against burnt / faulty / obsolete technology meters.

TPWODL has proposed Capex towards deploying efficient Spot Billing process throughout its territory. Supply of mobile printers and mobile handsets are required in order to adopt Spot Billing system in more efficient way. The Spot Billing system is a system, in which the meter reader visits the consumer's premises, records the meter reading and issues the bill on the spot using a hand-held computer/device. It would help the company achieve better targets of billing efficiency and collection efficiency.

TPWODL has further proposed Capex towards replacement of LT bare conductor by AB cable. As per TPWODL, most of the LT lines/feeders are long and operating in radial mode with number of joints. The long length of the lines/feeders and no. of joints are responsible for high technical losses and poor voltage regulation in the network. In addition, bare LT line is prone to unauthorized connection, which increases the commercial losses. Conversion of bare conductor with LT ABC will help to reduce the commercial losses. Therefore, TPWODL has proposed to replace LT bare conductor with LT ABC in theft prone areas.

The petitioner has proposed a Capex of Rs. 78.86 Cr. for various works covered under the Loss Reduction.

c) Network Reliability:

In TPWODL's geographical area, large numbers of long overhead lines / feeders are in operation with an average length of 30 km in urban areas and 110 kms in rural areas. The present power distribution infrastructure is in extremely dilapidated condition resulting in frequent trippings. This has severely hampered reliable and quality power supply to consumers. Out of 293 numbers of 33/11kV primary substations, 179 substations are connected with more than one source of supply and remaining 114 Primary Substations are connected in radial mode. TPWODL has identified 172 old PSS and 121 Nos. of PSS that are recently commissioned under the ODSSP scheme.

In the old PSS, absence of incoming line Circuit Breakers (CBs), absence of LA, CT, PT and AB Switches, absence of CB on primary & secondary side of power transformer, absence of protection relays, and non-functional battery & battery chargers have been observed. In absence of such equipment and required protection system, TPWODL has observed multiple tripping's resulting into frequent power outages, which is affecting the consumers.

TPWODL has proposed Capex towards replacement/addition of network component in 33/11kV primary substation where multiple tasks are to be undertaken such as refurbishment of Structure, replacement / segregation of old 11 kV breaker/ group breaker with new ones, replacement / segregation of old 33 kV breaker/ group breaker with new ones, replacement of old 33 kV & 11 kV 1Ph & 3Ph PT/CT at PSS, replacement of defective relays and protection panel along with associated equipment, replacement of substation transformer, replacement of battery & battery charger, installation of capacitor banks, opening of transformer in repair workshop, and providing high mast/ lighting arrangement for PSS/ store.

Under this head, TPWODL has proposed Capex towards replacement/addition of network component in 33kV & 11kV line. As per TPWODL, many of its 11kV & 33kV lines are overhead in nature and have an average feeder length of more than 80 kms. Many of the overhead lines are passing through forest area and most of the faults are transient in nature and caused due to lightning or touching of live line conductor with tree branches. Therefore, TPWODL has planned to refurbish/ augment old 11kV & 33kV lines.

TPWODL has proposed to introduce communicable type Fault Passage Indicator (FPI), auto-recloser & sectionaliser. Moreover, TPWODL has observed that in some of the primary substations, multiple 11kV feeders are controlled through single 11kV CB or AB switch. During the FY 2022-23, TPWODL has proposed to install AB switches and isolators in identified feeders / lines to reduce frequent tripping. Similarly, in rural section, AB switches have been proposed for long 33kV & 11kV feeders/lines for isolation of faulty section. This will help in improving the reliability.

TPWODL has further proposed Capex towards replacement/ addition of network component in Distribution Substation (DSS). According to TPWODL, protection and control system in most of the DSS are not operating properly. As a result, fault in any LT circuit is resulting into tripping of DT and incoming 11kV feeder. Also, while carrying out maintenance or replacing the blown fuses on LT circuit, the operator is required to take a hand trip of entire 11kV feeder from PSS. Thus, under both circumstances supply to all consumers connected to that PSS get affected. In addition, various equipments associated to the DSS are either not maintained or of obsolete technology, which needs to be replaced at the earliest.

TPWODL has planned to strengthen the control and protection system on LT side of DSS. To ensure availability of LV protection system at DSS and ensure positive isolation to maintain safe working condition, TPWODL has proposed to improve the reliability of power supply at 11kV level and in downstream network.

Overall, the Petitioner has proposed Capex of Rs. 144.28 Cr. for various works covered under the Network Reliability.

d) Load Growth:

Under load growth, TPWODL has proposed Capex towards strengthening of Network to meet the expected load growth. About 90,000- 1,00,000 new connections are expected during FY 2022-23.

TPWODL had conducted a site survey and observed that most of the 33/11kV Primary Sub-Stations (PSS) are having single 33kV incoming source. The outage of single 33kV source results in shutdown of 33/11 kV PSS thereby causing no power supply to all downstream 11kV & LT consumers. TPWODL also submitted that multiple HT consumers on 33kV and 11kV are being fed through tapping of lines instead of dedicated/ separate feeder(s). The technical fault at one of the HT

consumers leads to tripping of incoming source and other connected HT consumers. To overcome this problem, TPWODL has proposed to establish link line from alternate available source.

At present, most of the 11kV feeders are operating radial mode and do not have ring main system. As per N-1 philosophy, TPWODL has proposed to establish ring connectivity between nearest 11kV feeder in the vicinity. Few such link lines will be established in first phase to provide reliable power supply to important establishments like hospitals, water supply system, key commercial and government establishments.

TPWODL has further mentioned that actual load demand has increased substantially against projected demand due to various government approved electrification schemes. To cater to the load enhancement/ load growth, there is need for augmentation of the existing infrastructure. In addition to above after establishing the link line it is essential to have adequate capacity Distribution Transformers (DTs) and Power Transformers (PTs) in event of transfer of load from one PSS to other.

Accordingly, in order to strengthen the existing infrastructure to address the upcoming load demand, the Petitioner has proposed Capex of Rs. 176 Cr. against the various works covered under the Load Growth.

e) Technology and Civil Infrastructure:

Under Technology & Civil Infrastructure, TPWODL has proposed expenditure related to adoption of state-of-art technology, strengthening of various offices and establishment of call centre, data centre etc., GIS/SCADA, improvement in civil infrastructure, establishment of EV charging stations and ready to use assets.

TPWODL has proposed Capex towards establishment of call centre and customer care centre at selected locations. As per TPWODL, resolving the consumer grievances as quickly as possible is of utmost importance. Presently, consumers can visit customer care centres and extension counters running at various places. The present call centre and customer care centre facilities need to be further strengthened/ expanded. To ensure basic facilities and hygiene condition at customer care centre / division / sub-division / section, offices the existing set up needs to be renovated.

TPWODL has further proposed to implement the private data centre collaborating with public cloud to facilitate centralized shared IT operations and equipment for the purpose of storing, processing, disseminating data and applications without compromising the IT security . TPWODL plans to implement a robust, reliable, with high availability and stabilized end-to-end secure communication system to achieve mission critical Information Technology (IT) & Operation Technology (OT) applications, data traffic between substations, offices, data centre, private / public network etc.

TPWODL has also proposed Capex under technology intervention in order to improve the overall performance and implement effective technologies which will enhance the reliability and reduce losses. TPWODL is in the midst of technology transformation to provide high quality customer services and to deliver highly reliable and improved quality supply in safe manner to its consumers meeting various standards of operation.

As part of the Capex proposed for upgradation of civil infrastructure, TPWODL plans to modernize the existing infrastructure to provide hygienic, well ventilated, and spacious working environment. Additional civil infrastructure works such as repair or construction of new washroom, construction of new material storage area, refurbishment of old buildings, and creating new building for division/ subdivision section/ commercial Office forms part of the Capex plan.

TPWODL has further proposed Capex towards Store Infrastructure as currently the store offices are in dilapidated condition and do not have adequate lighting, access and internal road, storage platforms and fire protection system which thereby compromises with the safety & security of the material and personnel. TPWODL operates its distribution business' inventory management through four designated central stores located at Burla, Rajgangpur, Bolangir and Kesinga where these works are to be undertaken.

Further Capex has been proposed towards procurement of new furniture, ready to use assets such as air-conditioners, water purifiers, ergonomic office chairs, photocopier machines, file cabinets etc. for its employees.

Accordingly, the petitioner has proposed Capex for Rs. 130.04 Cr. against the various works covered under the Technology and Civil Infrastructure.

27. The table below summarises the overall Capex plan proposed by TPWODL for the FY 2021-22:

Sl. No.	Particulars	Proposed Capex (Rs Cr)
A	**Statutory, Safety and Security**	
1	Life enhancement of network and maintaining safe horizontal / vertical clearances	15.00
2	Provision of Testing Equipment & PPEs to workforce	5.00
3	Earthing, Fencing	15.50
4	Boundary Wall and infrastructure works at Primary sub-station	17.50
	Sub-Total	**53.00**
B	**Loss Reduction**	
1	Energy Audit & Meter related activity	45.66
2	Spot billing	3.20
3	Replacement of LT Bare conductor with AB cable	30.00
	Sub-Total	**78.86**
C	**Network Reliability**	
1	Replacement/Addition of network component in 33/11kV Primary Substation	64.68
2	Replacement/Addition of network component in 33kV & 11kV Line	65.00
3	Replacement/Addition of network component in Distribution Substation	14.60
	Sub-Total	**144.28**
D	**Load Growth**	
1	Network enhancement / Unforeseen emergency	176.00
	Sub-Total	**176.00**
E	**Technology and Civil Infrastructure**	
1	Infrastructure to meet Customer needs	2.78
2	Technology Intervention-IT & Technology	61.61
3	Technology Intervention- GIS, SCADA & Others Implementation	40.10
4	Improvement of Civil Infrastructure	18.00
5	Store infrastructure	9.52
6	Security system in Central stores	4.05
7	Ready to Use assets for Offices	1.50
8	EV Charging in TPWODL Area	2.00
	Sub-Total	**130.40**
	Total	**582.18**

28. OERC vide its order dt. 18.09.2021 in Case No. 07 of 2021 had disposed off the petition approving a Capex of Rs. 333.13 Cr. for FY 2021-22. The following table summarizes the Capex approved by the Commission for FY 2021-22 vis-à-vis progress as on 31.03.2022:

Sl. No.	Particulars	OERC Approved	Actual Capex	Capex for Work-In-Progress (WIP)	Balance Works
A	**Statutory, Safety and Security**				
1	Life enhancement of feeder network in respect of maintaining safe horizontal/ vertical clearances	20.42	3.42	9.59	7.53
2	Provision of Safety Equipment & PPEs to workforce	12.05	2.07	8.85	1.13
3	Earthing, Fencing	55.54	16.76	13.87	24.91
4	Meter Testing Lab	10.35	5.92	0.03	4.40
	Sub-Total	**98.48**	**28.17**	**32.34**	**37.97**
B	**Loss Reduction**				
1	Energy Meter replacement	4.08	0.91	1.84	1.33
2	Refurbishment /augmentation of 33 kV/11 kV/0.415 kV network to reduce Losses	38.40	9.10	12.82	16.48
	Sub-Total	**42.48**	**10.01**	**14.66**	**17.81**
C	**Network Reliability**				
1	Refurbishment/Life enhancement of 33/11 kV Primary Substation /Additional New Substations	20.16	0.02	13.53	6.61
2	Pilot Project for Installation of Fault Passage Indicator (FPI)	2.00	0.00	1.55	0.45
3	Augmentation of LV side protection System along with DT LA	12.45	0.00	2.93	9.52
4	Installation of AB switches/ Isolators/ Insulators on 33 kV and 11 kV Network	14.30	2.54	4.79	6.97
	Sub-Total	**48.91**	**2.56**	**22.80**	**23.55**
D	**Load Growth**				
1	Network enhancement / Unforeseen emergency Capex requirement	39.71	3.65	19.50	16.56
	Sub-Total	**39.71**	**3.65**	**19.50**	**16.56**
E	**Technology and Civil Infrastructure**				
1	Infrastructure for Customer Care, Call Centre, Payment Centre, and Section Offices	2.04	-	2.04	-
2	IT & Technology for process efficiency	42.02	44.22	-	-
3	GIS Implementation	5.00	2.43	2.56	0.01
4	SCADA Implementation	15.30	10.84	4.46	-
5	GSAS Implementation	9.52	0.29	6.18	3.05
6	Security system in Central stores	1.05	0.23	0.36	0.46

Sl. No.	Particulars	OERC Approved	Actual Capex	Capex for Work-In-Progress (WIP)	Balance Works
7	Improvement of Civil Infrastructure	23.62	14.23	7.42	1.97
8	Ready to Use assets for Offices	5.00	0.76	1.60	2.64
	Sub-Total	**103.55**	**73.00**	**24.62**	**8.13**
	Total	**333.13**	**117.39**	**113.92**	**104.02**

29. As against the approved Capex of Rs. 333.13 Cr. for FY 2021-22, the Petitioner has submitted an actual Capex of Rs. 117.39 Cr. From the table above, it can be concluded that the progress of work is slow and not upto mark as the Petitioner has been able to spend only ~35% of the approved Capex during the FY 2021-22. Even work in few areas is yet to be taken up for implementation and is likely to spill over to next FY 2022-23. TPWODL has submitted that the slow pace in execution of works during FY 2021-22 is due to limited time period available for implementation of Capex schemes from the date of approval of the Capex plan by the Commission i.e. only six months.

30. The Commission had sought the approval of Board of TPWODL. In this regard TPWODL has submitted that the Capex proposal of Rs. 582.18 Cr. has been approved by its Board.

31. The Commission had raised various queries relating to the Capex proposal of TPWODL. The specific queries and response of TPWODL are as under:

a) General

i. The unit rates of the majority of the equipment/material have been taken from approved Cost Data Book for FY 2018-19 in respect of electrical equipment to be used in distribution system of Discoms issued by Department of energy, Government of Odisha. Further, an escalation of 10% (5% y-o-y) has been considered to arrive at cost for FY 2022-23. Further, overheads such as Contingency, Tools & Plants, Transportation, Erection Charges, others including supervision charges have been considered in accordance with the OERC (Conditions of Supply) Code, 2019. Additionally, GST has been considered over and above the total cost estimate.

ii. TPWODL has clarified that schemes implemented by Govt. of Odisha are different from that of TPWODL in the petition and there is no duplication of any work.

iii. The availability of materials (DTs. Cables, etc) is not adequate for carrying out regular maintenance for Opex type of job in present condition. The existing stock for capital jobs has been considered as part of the proposed capital investment plan.

b) Safety, Statutory and Security

i. TPWODL has proposed Capex for construction of boundary wall of Primary Substation that will cover 12,000 m of area across the five circles.

ii. Earthing of PSS is proposed at 34 locations, earthing of DSS at 4,900 locations and fencing of DSS is proposed at 1,000 locations.

iii. For provision of water supply for PSS/Offices, five number of borewells are proposed at Rourkela, Sambalpur, Bargarh, Balangir and Kalahandi circles.

c) Loss Reduction

i. The status of burnt/faulty/defective and unmetered connections as on 31.03.2022 as submitted by the Petitioner is provided as follows:

Metering Status	FY 2019-20	FY 2020-21	FY 2021-22
Defective Meter	2,76,416	2,27,027	2,69,593
Unmetered	1,47,313	95,026	69,034
Total	**4,23,729**	**3,22,053**	**3,38,627**

ii. The following table provides the status of DT metering as on 31.03.2022:

Metering Status	FY 2019-20	FY 2020-21	FY 2021-22
Total DTR	62,516	67,247	69,459
Metered	5,993	6,220	7,023

iii. There are 167 no. of incomers and 240 no. 11 kV outgoing feeders in 33 kV PSS where metering units are not installed or defective. New metering unit, meter and modems are to be installed with erection of new Double Pole structure

d) Network Reliability

i. TPWODL has procured SCADA and ADMS software worth Rs.18.5 Cr as an inclusive solution in a three-year road map scheme. From FY 2021-22 onwards, main control center being established at Burla and Back-up control center being established at Bhubaneswar would be functional. The SCADA

solution, FAT and GO Live has been completed in Mar-22 and SAT is expected to be completed in H1 of FY 2022-23.

ii. 55 no of high revenue PSS and 118 no. Rural PSS have been identified for implementation of automation and SCADA compatibility during the FY 2022-23.

iii. The Capex proposal includes development of a Transformer repair workshop in Sambalpur Circle with covered shed, EOT crane, equipment & testing laboratory, sundry, filter machine, oven, winding machine, forklift, paint booth, and inventory of oil and chemicals, etc.

iv. Currently, all 33/11KV PSS do not have adequate fire protection and alarm system. Traditional approach to monitor the system manually on daily basis becomes cumbersome. To provide a proper fire detection and alarm system, TPWODL has proposed to implement the new system with integration to SCADA to report the status immediately to central control room. Hence, a preventive approach has been proposed where in real time status of the system will be available centrally for monitoring.

e) Load Growth

i. HT consumers on 33kV and 11kV system are being fed through tapping of lines instead of dedicated feeder(s). Multiple HT consumers are fed through single source which also serves as incomer of 33/11kV PSS. Technical fault at one of the HT consumers leads to tripping of all connected HT consumers and the outage of incoming source for PSS.

ii. Most of the 11kV feeders currently are operating in radial mode and do not have ring main arrangement. To have N-1 contingency philosophy, TPWODL has proposed to establish ring connectivity with nearest 11kV feeder in the vicinity and/ or adjacent PSS 11kV feeder. Few such ring system will be established for reliable power supply to some important installations like hospitals, water works, key commercial and government establishments.

f) Technology and Civil Infrastructure

i. Location network covers Multi-Protocol Level Switching (MPLS) connectivity to nearly 200 office locations and LAN network additions and enhancements for 100 offices.

ii. Data center facility as provided in OPTCL building under IPDS scheme is dedicated to billing database of 3 DISCOM(S). The approximate consumer base of the three DISCOM(s) is more than 60 Lakhs. The Sambalpur/ Burla Data centre is primarily designed for deployment of Operation technology i.e., SCADA/DMS, OMS and GIS. As per practices, distributed control centre has been designed in each city / town under RAPDRP Scheme of Govt of India. Now, due to lack of robust communication infrastructure and to avoid latency in the network, and for smooth operation by SCADA, TPWODL has taken an initiative for deployment of only one SCADA centre for entire area of operation and develop hybrid model of communication infrastructure so that distributed data centre can be avoided, and one data centre shall serve the purpose of business requirement.

iii. MBC system provided by Fluent Grid is sized for only 40 Lacs consumer for 3 DISCOM(S) viz. TPWODL, TPNODL and TPSODL. Whereas in reality, requirement is for nearly double of the present coverage, and which may increase in future. Hence additional licenses and matching no. of server, storage and network bandwidth are required and cost towards the same is proposed in the Capex plan.

iv. 12 number of locations have been identified for establishment of new call centres and renovation of two existing locations has been proposed.

v. Many Customer Centric initiatives have been taken to ease the customer journey through Mobile Apps and Platforms like MUDRA, Billing App, My Tata Power, etc.

32. The comments received from the respondent OPTCL are summarized as follows:

a) Significant Capex to the tune of Rs 333.13 Cr was approved, vide order dt 18.09.2021, which are yet to be implemented/ capitalised. Hence further application for additional Capex of Rs 582.18 Cr appears unrealistic.

b) For Capex approved in FY 2021-22 against fencing (2500 nos), earthing (10 no. of earth pits per PSS and 3 no per DSS), and Boundary wall (80 nos), the Petitioner should furnish information on the progress and capitalization of above assets with perceived benefits. The Commission may approve additional work in the same category after prudence check of previous work.

c) The proposal of Rs. 34.3 Cr. investment in FY 2022-23 for meter replacement work is quite high as Discom needs capital investment for DTR meters, 33/11 kV feeder meters only while TPWODL has already obtained approval of Rs 4.08 Cr in FY 2021-22. Consumer meters should be beyond the purview of capital investment as the same is recoverable in terms of meter rent.

d) TPWODL has proposed 5% load growth trend which is unrealistic considering the slow industrial growth and COVID-19 pandemic situation. Further, information on actual volume of assets created and capitalisation thereof in FY 2021-22 against approved quantity of Rs. 39.71 Cr may be considered before approval of Rs. 176 Cr Capex proposed for FY 2022-23. The applicant should clarify the reason for raising the investment four times under the Load growth category.

e) Under Load Growth, TPWODL should incorporate creation of downstream networks from 33 kV bays created by OPTCL for TPWODL and 11 kV feeders under various Govt Funded Schemes. OPTCL at previous occasions has already agitated the issue as the benefits of Govt/ OPTCL investment should reach the consumers of the State.

f) Under SCADA and GIS, TPWODL has proposed huge investment of Rs 23.88 Cr and Rs 21.45 Cr respectively. The above expenditure at this stage is not necessary when the system is not in a healthy state and good enough to be incorporated. The investment in this area can be safely delayed without detriment in the interest of the consumers.

g) The Capex in second year of operation should be spent to make the system healthy and robust and to make all assets available for consumer service.

h) TPWODL has sought approval of investment in Capex under replacement of network component and improvement of infrastructure which are allowed in Opex. Hon'ble Commission may approve the investment selectively on case to case basis.

i) The Petitioner has not submitted any cost benefit analysis and the source of funding which should be an integral part of the Capex Plan as the cost of debt servicing, if higher, will be passed on to the consumers in terms of higher RST.

j) TPWODL has also not quantified the perceived benefits, both tangible and non-tangible subsequent to the capital investment proposal.

k) It is a fact that TPWODL has inherited assets which are mix of both old and new assets. Further, all the old assets cannot be replaced in 2 years. However, a logical approach may be followed to replace or renovate the same without supply interruption and without rise of RST.

l) TPWODL has committed capital investment for first five years as recorded in the vesting order. Hon'ble Commission may reduce it prudently as per ground reality and present work progress/ consumer requirement.

m) Hon'ble Commission has not directed the Petitioner for keeping any mechanism in place to cross check the exact quantity of work executed by TPWODL, and amount spent thereon, which is to be capitalized for asset creation and ultimately passed on to the consumer in terms of RoE.

n) The Petitioner has not submitted any cost benefit analysis in terms of AT&C loss reduction which will restrict the tariff hike.

o) As per good practice and standards, the end product of any Capex plan is revenue and tariff forecast which has not been provided by the Petitioner.

33. The comments received from the respondent Sri R.P. Mohapatra are summarized as follows:

a) As per the submissions in para 4 & 5 of DPR of TPWODL, there was no periodic Electrical Inspection of the installations as per Statutory Requirements. Therefore, the EIC (Electricity)-cum-Principal Chief Electrical Inspector, Government of Odisha, may be impleaded as a Respondent in this case.

b) Based on the directions of the BoD in meeting held on 28.01.2022 the Committee has revised the cost of some of the items of the Capex proposal but the overall total remains same being Rs.582.18 Cr. The revisions made are merely for the purpose of show casing. The proposal for conversion of AIS to GIS may be taken up at urban areas with space constraints and also in coastal areas to achieve cyclone resilient system as suggested by CEA.

c) The Capex proposal for FY 2022-23 is for an amount of Rs.582.18 Cr. However, the Capex proposal approved by the Board is for an amount of Rs.682.50 Cr. as an amount of Rs.100.32 Cr. has been added as “GRIDCO Contribution in kind”. No details have been furnished and it has also not been stated whether the approval required from the Commission for Capex during FTY 2022-23 is for an amount of

Rs.582.18 Cr. or Rs.682.50 Cr. In this regard, clarification from TPWODL is required.

d) TPWODL may be directed to submit the anticipated cot of execution f the Capex Scheme for the FY 2021-22, which should be available as per the Order of the Commission while approving the Capex Plan for the FY 2021-22.

34. The comments received from the respondent GRIDCO are summarized as follows:

a) The proposal for conversion of AIS to GIS may be taken up at urban areas with space constraints and also in coastal areas to achieve cyclone resilient system as suggested by CEA.

b) The Capex Plan need to ensure optimum utilization of the existing assets considering the balance residual life of the existing assets, alternative utilization of the equipment/ assets being replaced through Capex expenditure with adequate Repair & Maintenance in order to make the equipment operational.

c) The infrastructure created out of Government funding through ODSSP and other Schemes over the recent years as well as from the upcoming projects need to be optimally utilized. Also, the future projects need to be taken up with proper load flow study justifying the requirement of the system.

d) The Capex plan should envisage the requirement of new/ augmentation/ renovation of the system with proper requisite planning, as can be foreseeable prudently and for implementation of the latest technology in order to cater the future load growth over a relatively longer period.

35. Heard the Petitioner & Respondents at length through video conference (VC). Before going to the merit of the proposal of the licensee we will discuss the background and provisions basing on which the investment plan shall be approved. As per section 42 of the Electricity Act, 2003 read with Condition 7 of the licence condition and Regulation 4 of the General conditions of Distribution License of the OERC (Conduct of Business) Regulation, 2004, it shall be the duty of the distribution licensee to develop and maintain a reliable, efficient, coordinated, economical distribution system in its area of operation and to supply electricity in accordance with the provisions in the Act, Rules, Regulations and the direction of the Commission. The Commission is guided under section 61(c) of the Electricity Act, 2003 for promotion of competition, efficiency, economic use of the resources, good performance and optimum investments while determining the tariff.

36. In the present case as per para 39(b) of the vesting order, the Petitioner committed capital expenditure of Rs. 1,663 Cr. for the period FY 2021-22 to FY 2025-26 as follows:

(Value in Rs. Cr.)

FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	Total
306	500	333	322	202	1663

i. As per para 39(c) of the vesting order:

"To allow flexibility in the capital expenditure planning, the Commission stipulates that, in the capital expenditure plan to be submitted by TPWODL as per the license conditions, the capital expenditure commitment for each year of the period FY 2022 to FY 2026 must be such that capital expenditure proposed up to a year shall be at least equal to the cumulative capital expenditure committed up to that year in the Bid submitted by TPCL. For avoidance of doubt, the minimum cumulative capital expenditure to be proposed by TPWODL for the period FY 2022 to FY 2026 must be as provided in the table below:

Table 2: TPWODL Cumulative Capital Expenditure for 5 years

(Value in Rs. crore)

Up to 31-Mar-2022	*Up to 31-Mar-2023*	*Up to 31-Mar-2024*	*Up to 31-Mar-2025*	*Up to 31-Mar-2026*
306	*806*	*1,139*	*1,461*	*1,663*

ii. As per the Licence Condition 11 and 32, the investment above Rs.5 Cr. is to be made by the distribution licensee in the licensed business area of operation with the approval of the Commission.

37. The main objective of the investment plan is to develop and maintain an efficient, coordinated, and economical distribution system in its area of operation. TPWODL shall supply electricity to consumers in accordance with the provisions of the Act, Rules, Regulations, Orders framed there under and the direction of the Commission. The Commission further considers the following major aspects while finalizing the investment plan proposed by TPWODL.

i. Whether the scheme is required to meet the statutory standards set in the Act, specified under Regulations, standards etc.

ii. Whether it will be helpful to meet the consumer's expectations of economic, quality, and reliable power.

iii. Whether the investment is cost efficient?

iv. Whether the proposal shall have any tariff impact on the consumers?

38. The Commission has also decided to avail services of a third-party consultant to assist in verification of each scheme, assessment of component wise requirements along with the cost. The Commission engaged a third party Consultancy firm for the evaluation of the Capital Expenditure Plan of TPWODL. The Consultants conducted some field visits and had several rounds of discussion with the concerned officials of Licensee and examined various aspects of the proposal including the requirement, investment priority, commercial rationale etc., keeping in mind the concerns raised by different stake holders during the process of hearing. The consultants submitted their report to the Commission.

39. The Commission has examined the Capex plan submitted by TPWODL in detail. The Commission, while examining the investment proposals has considered all the views/ objections/ suggestions expressed by the stakeholders in writing and during the public hearing to the extent they are relevant. One of the respondents, Sri R.P.Mohapatra, has prayed to implead EIC, Government of Odisha as a Respondent in his written note of submission which has been received after the hearing was concluded on 10.05.2022.

40. Board approval against each work /scheme has also been considered while approving the amount proposed in the Capex plan as Board is the ultimate decision-making body on behalf of the company and approval of Board is an integral part in undertaking important business initiatives. Therefore, the approval of Capex for FY 2022-23 has been reviewed considering approval of the Board under each head and sub-head of proposed Capex plan.

41. The Commission for the purpose of approval of Capex has reviewed the as-is-status of the infrastructure, the quantity of equipment proposed, areas covered, and the unit rates assumed by TPWODL for various equipments to be deployed. Further, the actual progress of each category of work/ activity during the previous financial year has also been considered while approving the Capex for FY 2022-23. The scheme wise analysis has been provided in the subsequent paras.

A. Statutory, Safety and Security:

42. The Commission has noted the submissions of the Petitioner under this scheme. The Commission has reviewed the unit rates of the various items proposed under the Capex plan which are found to be in accordance with the Odisha Cost Data Book. In addition, on an average escalation of 10% (5% y-o-y) has been considered for FY 2022-23. The items for which rates are not available in the Cost Data Book, the rates for such items

have been reviewed based on previous Purchase Order, market determined rates, etc. as submitted by the Petitioner.

43. The activity wise analysis of the schemes is as follows:

a) Life enhancement of feeder network in respect of maintaining safe horizontal / vertical clearances

TPWODL has submitted that almost entire MV network is overhead, and nearly 31,114 kms. of LT network is also overhead. During field visits it was observed that most of the 33kV/ 11 kV/ LT feeders are in deteriorated condition and poses safety threat to the human beings and animals. Also, most of the feeders have binding wire / multiple joints resulting in possibility of snapping of conductors and electrocution of human beings/ animals since cradle guards are not provided. TPWODL has further submitted that due to scarcity of staff and materials, no structured maintenance planning is possible. With poor condition of network and in absence of maintenance activity, it is difficult for utility to ensure reliable and quality power supply to the end users. During site visits it was also observed that conductor of different sizes is being used in different phases which results in unbalanced power flow in phases.

Further, sagged wires in 33 kV or 11 kV feeders are posing major threat to the lives of human beings and animals and at some places, due to re-construction / widening of roads, vertical/horizontal safety clearances of the overhead lines have been reduced which is not only causing violation of statutory safety guidelines but also increasing the chances of accidents.

Owing to the imminent need to ensure safety and reliable power supply to end consumers, the Commission approved Capex towards refurbishment of 33 kV, 11 kV and LV lines in a phased manner with prioritization of critical areas such as hospitals, schools, etc.

b) Provision of Testing Equipment & PPEs to workforce

TPWODL has submitted that due to non-availability of required PPE and desired testing tools, several accidents have occurred while carrying out the operation and maintenance activities on network. The most challenging task for TPWODL is creating awareness among work force for proper utilization of existing PPE. Also,

the available PPE's and testing instruments are not up to the standard and well maintained.

The Commission during its scrutiny observed that the rate proposed for arch flash suit for grid substation is Rs. 80,000. However, upon review of the rates, the Petitioner was able to provide supporting documents for estimate of Rs. 62,000 per suit. Hence, the estimated cost under procurement of arch flash suit has been reworked. This has resulted in reduction of Capex from Rs. 3.87 Cr. to Rs. 3.11 Cr. under this head.

Considering the need for developing a safe work environment for all employees, the Commission decides to approve a Capex of Rs. 3.11 Cr. for procurement of safety equipment and Rs. 1.20 Cr for purchase of testing equipment in line with submission of the Petitioner.

c) Earthing, Fencing

To strengthen earthing system in existing primary sub-station, TPWODL has proposed additional earth pit(s) in areas with high soil resistivity, poor earth mesh connectivity. TPWODL has proposed to deploy 10 no. of additional earth pit per PSS and 3 no. additional earth pit per DSS and earthing of structure of overhead lines at every 5^{th} pole.

The Commission found the Petitioner's proposal to strengthen earthing system and providing fencing is desirable and accordingly approves Capex in line with the proposal of the Petitioner for the FY 2022-23.

d) Boundary Wall and infrastructure works at Primary sub-station

TPWODL has proposed for installation/ construction/ renovation of Boundary wall at 20 locations spread across 5 circles. In addition, they have proposed Capex for spreading of gravel in sub-station yard, creation of access roads, control room refurbishment, and provision of water supply at various PSS.

To ensure safety and security, the Commission approves Capex proposal for Boundary Wall and infrastructure works at Primary sub-station.

44. The summary of the analysis is provided as follows:

Sl. No.	Particulars	Proposed Capex (Rs Cr)	Board Approval (Rs Cr)	Capex Approved (Rs Cr)
1	Life enhancement of network and	15.00	15.00	15.09^

Sl. No.	Particulars	Proposed Capex (Rs Cr)	Board Approval (Rs Cr)	Capex Approved (Rs Cr)
	maintaining safe horizontal / vertical clearances			
2	Provision of Testing Equipment & PPEs to workforce	5.00	5.00	4.31
3	Earthing, Fencing	15.50	15.50	15.50
4	Boundary Wall and infrastructure works at Primary sub-station	17.50	17.50	17.50
	Sub-Total	**53.00**	**53.00**	**52.40**

^Minor Variation on account of submission vis-à-vis reconciliation by Commission based on documentary evidence submitted.

45. Based on the above analysis and the Board's approval against each scheme, the Commission allows Capex of Rs. 52.40 Cr. towards Statutory, Safety and Security schemes.

B. Loss Reduction

46. The Commission has noted the submission of the Petitioner under this scheme. The unit rates of the various items proposed under the Capex plan are found to be in accordance with the Odisha Cost Data Book. For items, whose rates are not available in the Cost Data Book, the rates for such items have been reviewed based on the rates as per past Purchase Orders or the rates approved by the Commission in Capex plan of TPWODL for FY 2021-22 against various schemes. Also, on an average escalation of 10% (5% each year) has been considered for computing the cost for FY 2022-23.

47. The activity wise analysis of the schemes is as follows:

a) Energy Audit & Meter related activity

TPWODL submitted that around 1,50,000 number of meters are reported as defective/ burnt. Many consumers have not been provided with energy meters though the connection is energized in books and energy is being consumed by the consumers. From the past trends, TPWODL has estimated that additional 50,000 meters (approx.) are likely to be found defective in FY 2022-23. All these meters need to be replaced with new meters along with Service cable, Polycarbonate seals and Modems. Also, for installation of Meters, Meter box will also be installed to protect the meters from energy theft. Hence, in FY 2022-23, TPWODL has planned to replace / install around 1.5 Lakh meters.

As per the provisions of the OERC (Conditions of Supply) Code, 2019, the cost of the defective/burnt/lost meters shall be only recovered through Meter Rent. The

relevant provisions of the OERC Distribution (Conditions of Supply) Code Regulations, 2019 are as follows:

"Cost of Replacement of Defective/ Burnt/ Lost Meters

113. (i) If, as a result of testing it is established that the meter became defective/burnt due to technical reasons viz. voltage fluctuation, transients etc. attributable to the ***licensee/supplier, the cost of the meter shall be borne by the licensee/supplier. In that case, the licensee/supplier shall recover only the balance meter rent due from the consumer so far.***

(ii) If, as a result of testing, it is established that the meter was rendered defective/burnt due to reasons attributable to the consumer such as defect in consumer installation, connection of unauthorized load by the consumer etc., the cost of the meter shall be borne by the consumer. The licensee/supplier shall inform the consumer to replace the meter and associated equipment as per provisions of this Code within 30 working days. In case the consumer fails to do so, the licensee /supplier shall install a new meter.

Provided that in case the licensee/supplier installs the new meter, they shall recover the cost of the new meter from the consumer as per the meter rent approved by the Commission.

.....

(iv) In case of loss of meter, the cost of new meter and other apparatus shall be borne by the consumer unless the meter was installed in the licensee/supplier's office or substation. Provided that if the licensee/supplier replaces the meter, ***the cost of new meter shall be recovered from the consumer as per the meter rent approved by the Commission."***

From the above provisions it is clarified that the cost of meter is to be recovered through meter rent and hence the Commission is not inclined to allow the proposal for cost of the defective/ burnt/ lost meters, procurement of meter, meter box, metering accessories etc. under Capex approval for FY 2022-23.

Accordingly, the Commission decides to allow the cost claimed only towards replacement of old service cable for FY 2022-23 which amounts to Rs. 2.16 Cr. out of the Rs. 34.30 Cr. proposed by the Petitioner.

Additionally, Commission decides to allow the cost claimed for meter testing equipment for field staff, installation of metering unit, meters and modems at PSS boundary points, installation of CT, PT, meters & modems for defective 11 kV feeder meters, installation of DT meters (above 250 kVA), and installation of CT, PT, meters & modems for high value industrial consumers based on review of the supporting documents submitted.

Overall, the Commission allows a Capex of Rs. 13.52 Cr. for Energy Audit & Meter related activity against the proposed Capex of Rs. 45.66 Cr for FY 2022-23.

b) Spot Billing

TPWODL submitted that it is in the process of deploying efficient Spot Billing processes throughout its territory. The scope of work shall include supply of mobile printers and mobile handsets. According to TPWODL, the Spot Billing system is a system in which the meter reader visits the consumer's premises, records the meter reading and issues the bill on the spot using a hand-held computer/device. Therefore, TPWODL has proposed a requirement of 2,000 units of mobile and bluetooth printers.

To ensure efficient spot billing process, the Commission decides to approve Capex of Rs.3.2 cr. for Spot Billing.

c) Replacement of LT Bare conductor with AB cable

TPWODL has submitted that most of the LT feeders/ lines are operating in radial mode and have long length by typical standards. The numbers of joints/ tapping from the line/ feeder are also on a higher side. As per TPWODL, the long length of the line and no. of tapping points have become the potential source of technical losses and poor voltage regulation in the network. In addition, bare LT overhead lines are subject to theft of electricity, resulting in increased commercial losses. Therefore, TPWODL has proposed to replace LT bare conductors with LT ABC cables in theft prone areas as it will help in reducing the commercial losses.

TPWODL has further submitted that it has conducted the load flow studies of the entire 33 kV network covering all the five circles. Load flow study has been carried out on peak loading registered in FY 2021-22 and considering projected load growth for two years using load flow software. High technical losses ranging from 5.19% to 10.52% across different circles have been observed owing to long lines and inadequate existing network at 33 kV level to meet peak load condition.

The Commission believes that to ensure reduction in commercial losses, replacement of LT Bare conductor with AB cable is required. Hence, the Commission approves the Capex under this head as per the submission of the Petitioner.

48. The summary of the analysis is provided as follows:

Sl. No.	Particulars	Proposed Capex (Rs Cr)	Board Approval (Rs Cr)	Capex Approved (Rs Cr)
1	Energy Audit & Meter related activity	45.66	45.66	13.52

Sl. No.	Particulars	Proposed Capex (Rs Cr)	Board Approval (Rs Cr)	Capex Approved (Rs Cr)
2	Spot Billing	3.20	3.20	3.20
3	Replacement of LT Bare conductor with AB cable	30.00	30.00	30.08^
	Sub-Total	**78.86**	**78.86**	**46.80**

^Minor variation on account of submission vis-à-vis reconciliation by Commission based on documentary evidence submitted

49. Based on the above analysis and considering the importance of Loss Reduction in the Capital Investment Plan, the Commission decides to allow Rs. 46.80 Cr. against the proposed Capex of Rs. 78.86 Cr. claimed under the Loss Reduction schemes.

C. Network Reliability

50. The Commission has noted the submissions of the Petitioner under this scheme. The unit rates of the various items proposed under the Capex plan are in accordance with the Odisha Cost Data Book after applying reasonable escalation rates. . In case of items for which rates are not available in the Cost Data Book, the rates have been considered as per past Purchase Orders or the rates approved by the Commission in Capex plan of TPWODL for FY 2021-22.

51. The activity wise analysis of the schemes is as follows:

a) Replacement/Addition of network component in 33/11 kV PSS

TPWODL has submitted that refurbishment of bay equipments in PSS is essential to improve the reliability. The Petitioner has proposed works like refurbishment work in PSS (structure replacement / yard refurbishment), replacement/ segregation of old 11kV & 33 kV breaker/ Group Breaker with new, replacement of old 33 kV & 11 kV 1Ph & 3Ph PT/CT at PSS, replacement of defective relay, protection panel along with associated equipment, substation transformer, battery & battery charger, installation of capacitor bank, transformer repair workshop at TPWODL, and high mast/ lighting arrangement for PSS/ Store. TPWODL has also proposed a Capex of Rs. 2.50 Cr. for rooftop solar system for PSS battery backup. However, TPWODL has not provided the Cost Benefit Analysis (CBA) against the same. In absence of adequate plan and detailed CBA, the Commission decides not to allow any Capex against the proposed rooftop solar system for PSS. The Petitioner may submit the proposal with proper CBA and estimated cost in the Capex petition for subsequent year. The Commission believes that to ensure quality and reliable power supply to consumers, investments in network

improvement schemes are necessary. It has been observed that there are pending works approved under Capex for the FY 2021-22, which are to be completed. Hence, the Commission decides to allow 80% of the proposed Capex and approves Rs 51.74 Cr. under this head considering the requirement and capability of the Petitioner to complete the proposed works.

b) Replacement/Addition of network component in 33/11 kV Line

TPWODL submitted that majority of 11 kV & 33 kV, networks are overhead in nature with average feeder/ line length of more than 80 kms. TPWODL also submitted that many OH feeders/ lines are passing through forest area and most faults that occur on OH lines are transient in nature and caused by lightning and/ or touching of bare line conductor with tree branches. TPWODL has also proposed to introduce communicable type fault passage indicator, auto-recloser and sectionaliser. TPWODL has further submitted that multiple 11kV feeders/ lines are being controlled through single 11kV breaker or AB switch in some primary substations. For that TPWODL has proposed to install AB switches and isolators in identified feeders/ lines with frequent tripping incidences. To ensure quality and reliable power supply to consumers, the Commission is inclined to approve the Capex for fault passage indicator, AB switches, RMU, auto-recloser and sectionaliser. For refurbishment/augmentation of 11 kV and 33 kV line, TPWODL has proposed Capex of Rs. 30.18 Cr. and Rs. 8 Cr. respectively. Upon review, it was assessed that the proposed area for the entire Capex is very large and could not be covered completely in FY 2022-23. It has been observed that there are pending works approved under Capex for the FY 2021-22, which are to be completed. Therefore, the Commission decides to allow 80% of the proposed Capex and approves Rs 52.00 Cr. under this head considering the requirement and capability of the Petitioner to complete the proposed works.

c) Replacement/Addition of network component in Distribution Substation

TPWODL has submitted that most of DSS protection and control systems are not operating properly and are affecting the supply to all customers connected to such DSS. To overcome this situation, TPWODL has proposed to strengthen the control and protection system on LT side at DSS level which will ensure positive isolation to maintain safe working condition.

Considering the need to improve the reliability of supply to end consumers, the Commission allows Capex of Rs 14.60 Cr. proposed towards replacement/ addition of network component in distribution substation.

52. The summary of the analysis is provided as follows:

Sl. No.	Particulars	Proposed Capex (Rs Cr)	Board Approval (Rs Cr)	Capex Approved (Rs Cr)
1	Replacement/Addition of network component in 33/11 kV PSS	64.68	64.68	51.74
2	Replacement/Addition of network component in 33/11 kV Line	65.00	65.00	52.00
3	Replacement/Addition of network component in Distribution Substation	14.60	14.60	14.60
	Sub-Total	**144.28**	**144.28**	**118.34**

53. To ensure reliable power supply to all the consumers, there is an imminent need to upgrade the existing infrastructure. Therefore, the Commission decides to allow Rs. 118.34 Cr. claimed under the Network Reliability schemes.

D. Load Growth

54. The Commission has noted the submissions of the Petitioner under this scheme. The unit rates of the various items proposed under the Capex plan are found to be in accordance with the Odisha Cost Data Book. Also, on an average escalation of 10% (5% y-o-y) is taken for FY 2022-23.

55. The activity wise analysis of the schemes is as follows:

a) Network enhancement / Unforeseen emergency

TPWODL has submitted that during field visits conducted it was observed that most of 33/ 11 kV primary sub-stations are having single incoming 33 kV source and any fault on incomer leads to outage of entire 33/ 11 kV PSS thereby causing power outage of all downstream 11 kV & LT network consumers. Moreover, HT consumers on 33 kV and 11 kV are being fed through tapping points instead of dedicated feeders and any technical fault at one of the HT consumers leads to tripping of incoming source and other connected HT consumers. To overcome this problem, TPWODL has proposed to establish link line and establish ring main system so that alternate sources will be available to improve the reliability of power supply focusing primarily on voltage profile issues, system redundancy and future demand. It has been observed that there are pending works to be completed

under Capex requirement for the FY 2021-22. Accordingly, the Commission decides to allow 70% of the proposed Capex and approves Rs 24.50 Cr. for construction of new 33 kV New/ link line considering the requirement and capability of the Petitioner to complete the proposed works.

Further, the Petitioner has proposed Capex to separate new agricultural feeders, augmentation of DTR/PTR, addition of new LT ABC network etc. to cater to increase in demand and network strengthening.

TPWODL has further proposed a two-year Capex plan worth Rs. 75 Cr. for construction of new PSS and associated lines in urban area. Under this activity, five PSS along with associated lines are to be constructed within Rourkela and other circles. For FY 2022-23, the Petitioner has proposed Capex of Rs. 40 Cr. towards the 5 PSS under this scheme/activity. Owing to the slow pace of implementation, around 65% of the Capex approved in FY 2021-22 is yet to be capitalized. Further, investment towards construction of new PSS has already been taken up by the Government of Odisha. Therefore, the Commission decides to allow 50% of the proposed Capex and approves Rs 20.00 Cr. for construction of new PSS considering the requirement and capability of the Petitioner to complete the proposed works.

The Commission further decides to allow a Capex of Rs. 5 Cr. on lump sum basis towards proposed network requirement for Hockey World cup in Rourkela Circle based on the suggestion of GRIDCO.

56. The summary of the analysis is provided as follows:

Sl. No.	Particulars	Proposed Capex (Rs Cr)	Board Approval (Rs Cr)	Capex Approved (Rs Cr)
1	Construction of 33 kV New/Link Line	35.00	35.00	24.50
2	Construction of new 11 kV agricultural feeder	15.00	15.00	15.00
3	Construction of 11kV New/ Link Line	35.00	35.00	35.07^
4	Construction of new PSS along with line in urban area (Total Rs.75 Cr for 2 years)	40.00	40.00	20.00
5	Addition/Augmentation of PTR	15.00	15.00	15.00
6	Addition/Augmentation of DTR 63 kVA and above	15.00	15.00	15.00
7	Addition /Augmentation of 1 ph. & 3 Ph. DTR of 16 kVA and 25 kVA in Rural/ Agriculture Area	8.00	8.00	8.00
8	Addition of New LT ABC Network	6.00	6.00	6.00

Sl. No.	Particulars	Proposed Capex (Rs Cr)	Board Approval (Rs Cr)	Capex Approved (Rs Cr)
9	Addition of New 11kV/ 33 kV Bay	2.00	2.00	2.00
10	Network requirement for Hockey World cup in Rourkela Circle	5.00	5.00	5.00
	Sub-Total	**176.00**	**176.00**	**145.57**

^Minor variation on account of submission vis-à-vis reconciliation by Commission based on documentary evidence submitted.

57. With anticipated increase in demand and corresponding requirement to augment the existing infrastructure, the Commission allows Rs. 145.57 Cr. towards the Load Growth scheme.

E. Technology and Civil Infrastructure

58. The Commission has noted the submissions of the Petitioner under this head. The unit rates of the various items proposed under the Capex plan are found to be in accordance with the Odisha Cost Data Book. For items, whose rates are not available in the Cost Data Book, the rates for such items have been considered based on past Purchase Orders, market determined OEM rates, rates approved by the Commission in Capex plan of TPWODL for FY 2021-22.

59. The activity wise analysis of the schemes is as follows:

TPWODL has submitted that their present call center and customer care centre facilities are currently in bad condition. To ensure basic facilities and hygienic conditions the existing set up at customer care center/ division/ sub-division/ section offices needs to be enhanced. The various items proposed for upgradation by TPWODL includes AC, workstation, chairs, partitioning & electrical parts, water coolers, TV, Xerox, TPWODL boards and banners, etc.

TPWODL has also proposed to implement a private data centre collaborating with public cloud to facilitate centralized shared IT operations and equipment for the purposes of storing, processing, disseminating data and applications without compromising IT security. A Capex of Rs 16.31 Cr has been proposed by TPWODL for purchase of front end devices and end user licences. The items to be purchased consist of personal laptops and associated software's and licenses. Upon review, the number was found to be significantly high considering the current employee strength. Therefore, a conservative estimate has been worked out considering the existing status of number of employees and tentative addition. Accordingly, a revised Capex of Rs. 9.09 Cr. has been considered against submission of Rs. 16.31 Cr.

The Petitioner has further proposed Rs. 16.21 Cr. towards setting up of a locational network for connectivity within the various offices of TPWODL. Against the same, the Commission decides to allow a lump sum Capex of Rs. 10 Cr that would be adequate to initiate the Capex works during the year. The same shall be revised based on the as-is status of implementation and any additional requirement shall be considered in the subsequent year.

In the FY 2021-22, TPWODL has initiated pilot of Enterprise GIS in RSED division of Rourkela Circle. IT infra for development & system requirement has been initiated and 25% survey & digitalization of pilot area has been completed. Under this head, a lump sum amount of Rs. 5.00 Cr was approved by the Commission in the FY 2021-22 against the proposed amount of Rs. 74.72 Cr. spread over four years. In the FY 2022-23, TPWODL under GIS has proposed to purchase: (a) high-end systems, printers & plotters for QC and survey purpose; (b) supply, install and commission the production environment with network and storage components; (c) purchase high-resolution image for digitization of rest of the divisions of Rourkela and Bargarh circles; (d) conduct asset sequence generation and painting for remaining Rourkela and Bargarh circles; and (e) purchase analysis and map publishing tools. Considering the need to leverage technology for improving the quality of supply and better consumer experience, the Commission allows the Capex under GIS scheme as per Petitioner's claim.

To establish a communication infrastructure, TPWODL has proposed setting up Multi Protocol Level Switching (MPLS) backbone throughout Western Odisha comprising of approximately 625 site locations, ensure band optimization by virtue of execution of passive network, and install CCTV at high revenue PSS. Owing to the imminent need of the investment, the Commission is inclined to allow Capex proposed towards communication infrastructure by the Petitioner.

TPWODL has submitted that the store offices are in dilapidated condition and do not have adequate lighting, access and internal road, storage platforms and fire protection system thereby compromising with the Safety & Security of the material and personnel. With regards to other civil infrastructure and procurement of ready to use assets, the Petitioner has proposed Capex under this head for the purpose of enhancement of customer experience and provide an amicable working environment for all its employees.

To promote e-mobility/ electric vehicles, TPWODL has additionally proposed Capex to install DC50 kW CCS/CCS Dual Gun Charger and create a Public EV Charging Station. However, the submission with respect to creation of public EV charging stations lack details. Also, the capital expenditure towards such charging station cannot be loaded in tariff and should be recovered from the user of such system. Therefore, in absence adequate details and plan for the proposed expenditure, the Commission decides to disallow the Capex amount of Rs. 2.00 Cr proposed for EV charging station. However, the Commission favors establishment of EV charging station as Pilot project and TPWODL can submit separate proposal for EV charging.

60. The summary of the analysis is provided as follows:

Sl. No.	Particulars	Proposed Capex (Rs Cr)	Board Approval (Rs Cr)	Capex Approved (Rs Cr)
1	Infrastructure to meet Customer needs	2.78	2.78	2.78
2	Technology Intervention-IT & Technology	61.61	61.61	48.19
3	Technology Intervention- GIS, SCADA & Others Implementation	40.10	40.10	40.10
4	Improvement of Civil Infrastructure	18.00	18.00	18.00
5	Store infrastructure	4.04	4.04	4.04
6	Ready to Use assets for Offices	1.50	1.50	1.50
7	EV Charging in TPWODL Area	2.00	2.00	-
	Sub-Total	**130.04**	**130.04**	**114.61**

61. The Commission decides to allow Capex of Rs. 114.61 Cr. towards Technology and Civil Infrastructure against the proposed Capex of Rs. 130.04 Cr. by the petitioner.

62. In view of the necessity of the proposed capital investment plan, the Commission hereby grants in principle approval against various schemes summarised as follows:

Sl. No.	Particulars	Proposed Capex (Rs Cr)	Board Approval (Rs Cr)	Capex approved (Rs Cr)
A	**Statutory, Safety and Security**			
1	Life enhancement of network and maintaining safe horizontal / vertical clearances	15.00	15.00	15.09
2	Provision of Testing Equipment & PPEs to workforce	5.00	5.00	4.31
3	Earthing, Fencing	15.50	15.50	15.50
4	Boundary Wall and infrastructure works at Primary sub-station	17.50	17.50	17.50
	Sub-Total	**53.00**	**53.00**	**52.40**
B	**Loss Reduction**			
1	Energy Audit & Meter related activity	45.66	45.66	13.52

Sl. No.	Particulars	Proposed Capex (Rs Cr)	Board Approval (Rs Cr)	Capex approved (Rs Cr)
2	Spot Billing	3.20	3.20	3.20
3	Replacement of LT Bare conductor with AB cable	30.00	30.00	30.08
	Sub-Total	**78.86**	**78.86**	**46.80**
C	**Network Reliability**			
1	Replacement/Addition of network component in 33/11 kV PSS	64.68	64.68	51.74
2	Replacement/Addition of network component in 33/11 kV Line	65.00	65.00	52.00
3	Replacement/Addition of network component in Distribution Substation	14.60	14.60	14.60
	Sub-Total	**144.28**	**144.28**	**118.34**
D	**Load Growth**			
1	Network enhancement / Unforeseen emergency	176.00	176.00	145.57
	Sub-Total	**176.00**	**176.00**	**145.57**
E	**Technology and Civil Infrastructure**			
1	Infrastructure to meet Customer needs	2.78	2.78	2.78
2	Technology Intervention-IT & Technology	61.61	61.61	48.19
3	Technology Intervention- GIS, SCADA & Others Implementation	40.10	40.10	40.10
4	Improvement of Civil Infrastructure	18.00	18.00	18.00
5	Store infrastructure	4.04	4.04	4.04
6	Ready to Use assets for Offices	1.50	1.50	1.50
7	EV Charging in TPWODL Area	2.00	2.00	-
	Sub-Total	**130.04**	**130.04**	**114.61**
	Total	**582.18**	**582.18**	**477.72**

63. In summary, the year-wise and cumulative Capex approval by the Commission till FY 2022-23 is as under:

Requirement of Minimum Capex as per Vesting Order for the FY 2021-22	**Rs. 306.00 Cr.**
Capex Approved by the Commission for the FY 2021-22	**Rs. 333.13 Cr.**
Requirement of Minimum Capex as per Vesting Order for the FY 2022-23	**Rs. 500.00 Cr.**
Capex Approved by the Commission for the FY 2022-23	**Rs. 477.72 Cr.**
Total Minimum Cumulative Capex as per Vesting Order till FY 2022-23	**Rs. 806.00 Cr.**
Total Cumulative Capex Approved by the Commission till FY 2022-23	**Rs. 810.85 Cr.**

64. The approved cost shall be passed in the ARR as per the norm subject to rational utilization by the Petitioner and prudence check through audit.

65. In addition to the observations stated above, the Commission directs TPWODL to submit the CAPEX DPR for the upcoming years with the following details for each proposed project:

a) Name of the Capital Investment Work

b) Nature of CAPEX Scheme (New/ Resubmitted / revised / modified /extended).

c) Details of the Location including Name of Zone, Circle/Area/Location) along with GPS Co-ordinates

d) Objective of the Capital Investment

e) Timelines of the Project

f) Need Analysis – details of mandatory section under sections of EA 2003 or any mandatory Regulations, Policies if any.

g) Brief Scope and Specifications of Work.

h) Detailed Justification for Quantity of material proposed.

i) List of Identical schemes previously approved by the Commission and their progress report (since the taking over of Licensees) including plan of other utilities to avoid duplication of work.

j) Funding Arrangement for the Scheme along with the estimated cost including details of Hard Cost, IDC and Contingency Cost

k) Time Frame of the expenditure specifically mentioning corresponding years of Capital Expenditure and Capitalization along with the methodology for computing Percentage utilization of Project.

l) Cost Benefit Analysis for the project (% reduction in Loss over a specific period, Load Relief Details, % Voltage Regulation or any other benefit which are quantifiable).

m) Constraints - Technical, Physical and Financial constraints, if any, in execution of the Scheme may be highlighted, Risk Mitigation plan, Right of Way (RoW) Issues/Land availability/ Forest Area/ Delay in other clearances, etc.

n) Statutory Clearances and Project Layout.

o) Works intended for adaptation of latest Technology/ Improvement/ Upgradation of Existing Infrastructure.

66. The Commission further suggests that due care on the following aspects shall be taken by the DISCOM while submitting the Capex proposals for subsequent years:

a) Planning of distribution network (at least considering downstream network upto 11/0.4 kV transformers) has to be based on load flow study for different time frames (short term: for one year and long term for five years) considering the projected load growth including industrial load, (n-1) contingency criteria for 33 kV lines & 33/11 kV transformers and permissible range of operating voltage. The summary of study report for different time frame shall bring out:

   i. List of existing lines getting over loaded at 33 kV & 11 kV level
   ii. List of existing 33/11 kV, 11/0.4 kV sub-stations with over loaded transformers
   iii. Requirement of additional lines & sub-stations
   iv. Low voltage pockets
   v. Technical loss etc.

   The implementation plan in stages has to be formulated accordingly. The distribution planning study shall taking to account the capital investment by Govt. in form of transmission and distribution assets.

b) DPR is to be prepared based on above studies covering required augmentation/strengthening of existing distribution infrastructure and requirement of additional infrastructure (new sub-station and lines at 33 kV & 11 kV level) to meet the projected demand in different time frame.

c) The projected peak demand &energy requirement in area of operation of the DISCOM is to be indicated (for current FY 2022-23 and subsequent financial year upto the end of FY 2026-27).The projected load and energy requirement for each circle and divisions (for current FY 2022-23 and subsequent financial years upto the end of FY 2026-27) is also to be indicated.

d) Details of Distribution infrastructure, load & energy requirement are to be submitted in format provided in Annexure- 1.

e) Details of existing & proposed new lines and sub-station (considered for distribution network load flow study) are to be submitted. A suggested format with typical example is enclosed as Annexure-2, 3, 4, 5.

f) The DPR shall be prepared based on Standardization of (a) maximum MVA capacity of sub-station (33/11 kV, 11/.4 kV) for Urban & Rural area, (b) rating of Distribution Transformer (DT) & Power Transformer (PT), (c) (n-1) contingency Criteria for PT (d) maximum line length and the power flow in 11 kV & 33 kV

lines, (e) span length of 33 kV & 11 kV overhead lines, (f) type (ACSR/AAAC/High Tempt & low Sag/any other) & size (Dia & Area)of conductor for 33kV & 11kV overhead lines, (g) Rating of 33kV,& 11kV Switchgear/Air break switch/Air Circuit Breaker(A, kA & duration, Type : SF/ Vacuum/ MCCB/ ACB/ Air break switch), (h) rating of RMU, Auto-recloser & sectionaliser, etc.

g) The specification for Distribution Transformer (DT) & Power Transformer (PT), switchgear, conductor, insulator, overhead structure (pole/Lattice structure/joist/ PCC, etc. underground cable, transformer foundation, foundation for LT & HT poles, lightening protection, fire fighting system, lighting system, AC/DC system, auto-recloser and RMU etc. need to be standardized across the DISCOMs keeping in view the development of cyclone resilient Distribution infrastructure, wherever required. This would facilitate interchangeability of equipment / material and spares across the DISCOMs and would also facilitate the common pooling of spares.

h) Planning of new Sub-station shall have adequate provision for future expansion (additional bays for future lines & transformers) to avoid creation of another sub-station in nearby area.

i) The present status and identification of area &planning for conversion of radial system to ring main and time frame for implementation need to be indicated in the DPR.

j) The present status and the future planning of underground cable system or conversion of overhead to underground system indicating the area and the time frame for implementation are to be mentioned in the DPR.

k) Planning for establishment of fibre optic communication network and identification of area (indicating the lines with voltage level) for implementation of AB cable or covered conductor need to be brought out clearly.

67. The Petitioner is also directed to :

a) Expedite the execution of pending works (approved for the FY 2021-22) and submit the report on execution of the activities approved in CAPEX Plan for FY 2021-22 along with actual Capital Expenditure and actual Capitalisation along with the ARR & Tariff Petition.

b) Submit the Capital investment plan strictly adhering to the provisions of the Tariff Regulations, Vesting Order and the license conditions from FY 2023-24 onwards.

c) More focus should be on the Safety aspects such as proper earthing, utilisation of proper testing equipment and other measures to ensure safety of human & animals as well as assets of distribution system;

d) Standard specification is to be followed for development of cyclone resilient Distribution infrastructure, wherever required for Distribution Transformer (DT) & Power Transformer (PT), switchgear, conductor, insulator, overhead structure (pole/Lattice structure/joist/ PCC, etc. underground cable, transformer foundation, foundation for LT & HT poles, lightening protection, fire fighting system, lighting system, AC/DC system, auto-recloser and RMU etc.

e) Planning of new Sub-station shall be done having adequate provision for future expansion (additional bays for future lines & transformers) to avoid creation of another sub-station in nearby area.

f) Proper utilisation of the feeders available in the OPTCL substations is desired.

g) Submit the System study report along with details of Augmentation works and establishment of new infrastructure mentioning the name of lines & sub-stations in the format suggested at Annexure- 2, 3, 4, 5;

h) Provide Cost Benefits analysis including ROI from Beneficiary/ Consumer Point of View (Comparison for impact on tariff with and without the proposed investment), Target (Year wise Projection), Year wise Tariff impact due to Investment in terms of % of ARR and Rs./kWh, Payback Period, NPV, IRR and other Financial Parameters for project assessment.

i) Provide justification for cost increment (if any) due to proposal for any specific quality product or increased no. of quantity than normally required. Further justification is also desired on why alternatives cannot be possible.

j) Submit the details of compliances of the directions given in the CAPEX Order of previous years.

k) Submit quarterly progress report of the works along with the details of materials utilized vis-à-vis various activities shown in the DPR.

l) Take stock of the inventory available in the stores and make its effective utilization.

m) Procure the material/award the Contracts only through transparent open competitive bidding process;

n) Approach the Commission for prior approval if the awarded cost of any work is exceeding the cost approved by the Commission;

o) Effort should be made to optimize project cost with efficient project management and leveraging various technology options so that the benefit can be passed on to consumers.

68. Accordingly the case is disposed of.

Sd/-	**Sd/-**
(S. K. Ray Mohapatra)	**(G. Mohapatra)**
Member	**Officiating Chairperson**

Annexure-1

Name of Circle : _____
Area (Sq. Km.) : _____

Sl. No.	Description	Existing	Expected addition at the end of				
			FY 22-23	FY 23-24	FY 24-25	FY 25-26	FY 26-27
1	No. of Consumers						
2	Total Geographical area covered						
3	Total No. of Consumer base						
4	Load demand (MW)						
5	Energy Requirement (MU)						
6	AT&C loss						
7	Total No. of 33 kV Feeders						
8	Total Circuit length of 33 kV Lines						
9	Total No. of 33/11 kV Primary Substation						
10	Total No. of 33/11 kV Power Transformer (PT)						
11	Total No. of 33/0.4 kV PT						
12	Total Installed capacity of primary S/s						
13	Total No. of 11 kV outgoing Feeder						
14	Total Circuit length of 11 kV Lines						
15	Total No. of 11/0.4, 11/0.23 kV Distribution Transformer (DT)						
16	Total Installed Capacity of Distribution S/s						
17	Total Circuit length of LT Network (Bare Conductor)						
18	Total Circuit length of LT Network (AB Cable)						

Name of Circle	Division Name	Sub-Division Name	Load in MW	Energy requirement in MU
CIRCLE-1 (Name)	Division-1 (Name)			
	Division-2 (Name)			
	Division-3 (Name)			
CIRCLE-2 (Name)	Division-1 (Name)			
	Division-2 (Name)			
	Division-3 (Name)			

Annexure- 2

Basic information of existing Sub-stations (the SLD & Power map to be enclosed covering 33 kV & 11 kV system upto 11/0.4 kV Transformers)

Sl. No.	Name of Circle / District, Division & Sub-station	33/11 kV or 11/0.4 kV or 33/0.4 kV	Present load (MW)	No. Of Bays [line bays & transformer bays (33 kV & 11 kV), etc.]	N-1 contingency for 33 kV incommer available or not (Y/N)	Transformation capacity (MVA) with voltage ratio (e.g. 33/11 kV, 2x5 MVA + 11/0.4 kV, 2x100 KVA)	Transformer pole mounted/plinth mounted (for 11/0.4 kV transformer)	N-1 contingency for Power Transformer (33/11 kV) available or not (Y/N)	Augmentation of Transformation capacity required or not (Y/N) (Based on load flow study/based on operation feed back)	Switchgear rating (Normal -A & short time rating with duration -A, kA & sec.) adequate or not (Y/N)	Lightning Protection for Transformer (PT/DT) provided as required on HV and/or LV side	Protection system (as per CEA Regulation) in place or not for lines, cables, transformers (HV & LV side) (Y/N)	Status of implementation of SCADA/ Automatic in substation (Existing/to be implemented)	Metering of all feeders & Transformer (HV/LV) side in place or not (Y/N)	Adequate battery Capacity (AH) & associated chargers available with standby battery (Y/N)	Earthing system is healthy or not (Y/N) & Required gravel thickness (if provided) mainteained or not (Y/N)	Required Fire Fighting System provided or not (Y/N)	Lighting system adequate or not (Y/N)	Action Required/ Action being taken
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	A	33/11 kV	7 MW	33 kV: line bay-3 T/F bay -1 11 kV : line bay-5 T/F bay -1	N	33/11 kV, 8 MVA	-	N	N	Y	Y	Line – Y T/F HV side-Y T/F LV side-Y	To be implemented	Y	Y	N, N	N	Y`	

Annexure- 3

Basic information of proposed new substation (based on load flow study of Distribution network)

Sl.No.	Name of Circle/ District, Division & Sub-station	33/11 kV or 11/0.4 kV or 33/0.4 kV	Expected load (MW)	No. Of Bays [line bays & transformer bays (33 kV & 11 kV), etc.]	Transformation capacity (MVA) with voltage ration (e.g. 33/11 kV, 2x5 MVA+11/0.4 kV, 2x100 KVA)	N-1 contingency provided or not for incommer and Power Transformer (Y/N)	Protection provided for lines, transfromers (on HV & LV side) in line with CEA Reg.	Adequate switchgear Rating (A, kA with duration) considered or not (Y/N)	Required Battery Capacity (AH) and associated charger provided with standby battery (Y/N)	Required lightning protection for Transformer (PT/DT), fire fighting system, earthing system, AC/DC system, lighting system provided or not (Y/N)	Target for completion				
											2022-23	2023-24	2024-25	2025-26	2026-27
1	2	3	4	5	6	7	8	9	10	11	12				
	A	33/0.4 kV	4 MW	33 kV: Line bays-4 T/F bays-1 11 kV: Line bays-5 T/F bays-2	33/11 kV, 2x5 MVA+11/0.4 kV, 500 KVA	Y	Y	Y	Y	Y					

Annexure- 4

Basic information of existing overhead lines (33 kV & 11 kV)

Sl.No.	Name of Circle/ District & Division	From	To	Voltage level (kV)	Single circuit or Double circuit or more no. of circuit & Length of line (KM)	Type & size (dia & area) of conductor	Line over loaded or not (based on load flow study/based on operation feedback)	Design span (m)	Type of support structure (Pole/ Joist/ Lattice/PCC/Steel pole/ other type)	Adequate safety clearance maintained for over head line (Y/N)	Cradle guards provided below the line (wherever required)	Foundation healthy or not (Y/N)	Status of mapping of line Asset [completed/in progress(% of progress)/to be taken up]	Action Required/Action being taken
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	X	A	B	33	single circuit, 10 km	ACSR (DOG), Dia: 14.15 mm, Area: 117.69 sqmm	Based on load flow study & operation feedback	60 M	MS Joist	Y		Y	To be taken up	

Annexure- 5

Basic information of proposed new lines at 33 kV & 11 kV level (based on load flow study of Distribution network)

Sl.No.	Name of Circle/ District & Division	From	To	Voltage level (kV)	Single circuit or Double circuit or more no. of circuits & Length of line (kM)	Type & size (dia & area) of conductor	Design span (m)	Type of support structure (Pole/ Joist/ Lattice/ PCC/ Steel pole/ other types, etc.)	Status of mapping of line Asset [completed/in progress(% of progress)/to be taken up]	Action Required/ Action being taken	Target for completion				
											2022-23	2023-24	2024-25	2025-26	2026-27
1	2	3	4	5	6	7	8	9	10	11	12				
1	Name	A	B	33 kV	D/C, 15 KM	ACSR (DOG), Dia: 14.15 mm, Area: 117.69 sqmm	60 M	Lattice Structure	To be taken up						