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

Present: Shri S.C. Mahapatra, Chairperson
Shri G. Mohapatra, Member
Shri S. K. Ray Mohapatra, Member

Case No. 97/2022

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

In the matter of: Application for for approval of Capital Investment Plan for FY 2023-24 in the licensed area of its operation in compliance to the directions of the Commission in the vesting order passed in Case No. 82 of 2020 as well as the OERC (Terms and Conditions for determination of Wheeling Tariff and Retail Supply Tariff) Regulations, 2022.

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

For Respondents: Shri Lalit Mishra, DGM (Fin.), GRIDCO, Shri B. K. Das, Sr. GM, GRIDCO, Ms. Banishree Pradhan, DGM (RT&C), OPTCL, Shri P.K. Satapathy, Sr. GM SLDC, Shri B.B. Mehta, Director, SLDC and Ms. Sonali Patnaik, ALO I/c, DoE, GoO.

ORDER

Date of Hearing: 30.05.2023 **Date of Order: 21.06.2023**

The TP Western Odisha Distribution Limited (TPWODL), the Petitioner, has submitted an application for approval of Capital Expenditure (Capex) of Rs. 398.84 Cr. for FY 2023-24 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. The petitioner TPWODL has stated that its licensed area is spread over 48,373 sq.km and serves a registered consumer base of around 21 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. The operation area, consumer base, no. of Circles, divisions etc. are as given in the Table below:

Table-1

Sl. No.	Particulars	Unit	Details (as on 31-Mar-22)
1.	Area	Sq. km	48,373
2.	Consumers	No.	20,888,25
3.	Circles	No.	5
4.	Divisions	No.	17
5.	Sub-divisions	No.	57
6.	Sections	No.	202

3. TPWODL has stated that in compliance with the Vesting Order it 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."

2. Further, OERC (Terms and Conditions for Determination of Wheeling Tariff and Retail Supply Tariff) Regulations, 2022 specifies the provisions related to Capital Investment

Plan based on which the CAPEX proposal should be submitted by the DISCOMs. The relevant extracts of the regulations are as follows:

"3.2 Capital Investment:

3.2.1 The Distribution Licensee shall submit detailed capital investment plan, financing plan and physical targets for each year of the Control Period for strengthening and augmentation of distribution network, meeting the requirement of load growth, reduction in distribution losses, improvement in quality of supply, reliability, metering, reduction in congestion, etc., to the Commission for approval, as a part of the Business Plan applicable for the entire control period and annual proposal for each year of the Control Period.

3.2.2 The Distribution Licensee shall file a separate annual Capital Investment Plan comprising of capital investment plan, financing plan and physical targets for each year of the Control Period as per the timelines specified in Annexure-I.

3.2.4 Capital Investment in network expansion in Distribution shall be based on Load Flow studies and in accordance with the requirements of the State Grid Code.

3.2.5 The Distribution licensee shall submit the Capital Investment Plan that shall show separately, on-going projects that will spill over from previous years, and new projects (along with justification) that will commence but may be completed within or beyond the control period. The capital investment plan shall contain the scheme details, justification for the work, scheduled / expected date of commissioning, justification for delay (if any) in commissioning, cost over-run, time over-run, capitalization schedule, capital structure and cost benefit analysis (wherever applicable).

3.2.6 The Distribution Licensee shall submit the Detailed Project Reports (DPRs) for all the schemes (including network strengthening and expansion/augmentation projects based on load flow study) which shall include:

a. Scope and Objective;

b. Purpose of investment;

c. Broad Technical Specifications of the proposed investment and supporting details;

d. Capital Structure;

e. Capitalization Schedule;

f. Financing Plan, including identified sources of investment;

g. Physical targets;

h. Cost-benefit analysis;

i. Approval from Board of Directors (BoD);

j. Prioritization of proposed Investments.

3.2.8 The Capital Investment Plan shall be a least cost plan for undertaking investments and shall cover all capital expenditure projects of proposed investment schemes or such other amount as may be stipulated by the Commission from time to time and shall be in such form as may be stipulated.

3.2.9 The Commission shall consider the Capital Investment Plan taking into consideration the prudence of the proposed expenditure and its estimated

impact. The Capital Expenditure Plan must be accompanied with approval from the Board of Directors (BoD).

3.2.10 Capital investment plan shall incorporate list of schemes in order of priority so as to enable the Commission to approve the schemes in that order and in case lesser amount of capital expenditure is to be approved then the schemes of lower priority could be disallowed.

3.2.11 The Distribution Licensee shall be required to consider the annual capital investment plan as approved by the Commission in its Order, in preparation of the Petition for determination of Aggregate Revenue Requirement (ARR) for each year of the control period. The ARR Petition shall include details showing the progress of capital expenditure projects, together with such other information, particulars or documents as the Commission may require for assessing the progress.

3.2.12 In addition to the approved capital investment plan, the Distribution Licensee can seek provision for additional capital expenditure anytime during the 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."

3. As per the License Conditions No. 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 The relevant extracts of the License Conditions are 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 schemes formulated by the GoO, if TPNODL wishes to avail funding under such scheme, an agreement shall be signed between GoO/ GRIDCO/ OPTCL and TPNODL for utilization 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.

"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 Cr (Indian Rupee Five Cr) 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.

....."

4. The Commission observes that for the earlier years, TPWODL had proposed Capex of Rs.462.42 Cr for FY 2021-22 and Rs.582.18 Crore for FY 2022-23 whereas the Commission had approved Capex of Rs 333.13 Cr for FY 2021-22 and Rs.477.72 Crore for FY 2022-23. The following table summarizes the committed Capex as per vesting order, Capex proposal submitted by the TPWODL, capex approved by the Commission and assets capitalized till FY 2022-23.

Table-2

Rs. in Crore

Sl. No.	Major Category	Capex as per Vesting Order	Capex Approved by Commission	Actual Capex till 31-03-2023
FY 2021-22				
1	Statutory & Safety	306.00	98.48	98.48
2	Loss Reduction		42.48	42.48
3	Reliability		48.91	48.91
4	Load Growth		39.71	39.71
5	Technology & Infrastructure		103.55	103.55
	Total	**306.00**	**333.13**	**333.13**
FY 2022-23				
1	Statutory & Safety	500.00	52.40	43.80
2	Loss Reduction		46.80	38.59
3	Reliability		118.34	102.80
4	Load Growth		145.57	110.40
5	Technology & Infrastructure		114.61	107.66
	Total	**500.00**	**477.72**	**403.25**
Cumulative till 31-03-2023				
1	Statutory & Safety	806.00	150.88	142.28
2	Loss Reduction		89.28	81.07
3	Reliability		167.25	151.71
4	Load Growth		185.28	150.11
5	Technology & Infrastructure		218.16	211.21
	Total	**806.00**	**810.85**	**736.38**

5. It is observed that the TPWODL in its original proposal had submitted a Capex of Rs 516.39Cr for the FY 2023-24 on 22.12.2022. Subsequently as per the approval of Board of Directors, TPWODL has submitted the revised Capex plan of Rs.398.84 for FY 2023-24 on 18.05.2023. The detailed submission of the Capex proposal against various activities for the FY 2023-24 is summarized below:

Table-3

Sl. No	Capex Head	Activity	Original Capex	Capex approved by Board of Director	Revised Capex proposal for the FY 23-24 (Rs. Cr)
1	Statutory, Safety and Security	i) Life enhancement of network and maintaining safe horizontal / vertical clearances	9.02	9.02	9.02
		ii) Provision of Testing Equipment & PPEs to workforce	3.79	3.79	3.79
		iii) Fencing, Boundary Wall and infrastructure works at Primary & Distribution substation	21.31	21.31	21.31
	Sub Total- Statutory, Safety and Security		**34.12**	**34.12**	**34.12**
2	Loss Reduction	i) Energy Audit & Meter related activity	124.59	28.04	28.04
		ii) Replacement of LT Bare conductor with AB cable	41.96	31.96	31.96
	Sub Total-Loss Reduction		**166.55**	**60**	**60**
3	Reliability	i) Replacement/Addition of network component in 33/11KV Primary Substation.	28.38	28.38	28.38
		ii) Replacement/Addition of network component in 33KV & 11KV Line.	37.08	36.08	36.08
		iii) Replacement/ Addition of network component in Distribution Substation.	10.03	10.03	10.03
	Sub Total-Reliability		**75.49**	**74.49**	**74.49**
4	Load Growth	i) Network enhancement / Unforeseen emergency.	77.82	67.82	67.82
	Sub Total- Load Growth		**77.82**	**67.82**	**67.82**
5A	IT Infrastructure	i) Technology Intervention-IT & Technology.	77.7	77.7	77.7
	SubTotal- IT Infrastructure		**77.7**	**77.7**	**77.7**
5B	OT Infrastructure	ii) Technology Intervention- GIS, Communication & Others Implementation.	62.21	62.21	62.21
	Sub-Total- OT Infrastructure		**62.21**	**62.21**	**62.21**
5C	Civil, Admin and Other Infrastructure	iii) Improvement of Civil Infrastructure	16.65	16.65	15.65
		iv) store infrastructure	4.35	4.35	4.35
		v) Ready to Use assets for Offices	1.5	1.5	2.5
	Sub Total- Civil & Admin Infrastructure		**22.5**	**22.5**	**22.5**
	Sub Total-Technology & Infrastructure 5A+5B+5C		**162.41**	**162.41**	**162.41**
	Grand Total		**516.39**	**398.84**	**398.84**

6. TPWODL receives electrical power at 33KV level from 49 numbers of 220/33 kV or 132/33 kV transmission substation (OPTCL) located in the TPWODL's operational area and distributes the power at 33 kV/11 kV/440V/230V depending on the demand of the consumers. HT consumers are connected at 11KV level and other LT customers connected to 11/0.415KV distribution substation either as three phase or single-phase consumers. The snapshot of distribution infrastructure is given in Table below:

Table-4

Sl. No.	Particulars	Unit	Details (as on 31-Mar-22)
1.	33/11 kV sub-stations	No.	300
2.	33 KV feeders	No.	172
3.	11 kV feeder	No.	1134
4.	33/11 kV PTR	No.	668
5.	33/11kV PTR transformation capacity	MVA	3350
6.	11/0.415 kV DTR	No.	72679
7.	11/0.415 kV DTR transformation Capacity	MVA	3488
8.	33 kV OH & UG Line	Ckt. km.	5632
9.	11 kV OH & UG Line	Ckt. km.	52870
10.	LT Bare & ABC Line	Ckt. km.	62858
11.	No. of GSS feeding 220/33 kV & 132/33 kV TPWODL operating area	No.	49

7. TPWODL has submitted that the network conditions in different areas have different challenges related to safety of employees, public and animals and equipment. It needs urgent attention to strengthen network and make network safe, reliable and compliant to safety regulations/guidelines. Most of the network are very old and laid on 8 Mtrs / 9 Mtrs poles with lengthy span. As per construction practice, $1/6^{th}$ of the total pole length is erected below the ground and thus only available length is approx. 7.5 Mtrs above ground. Considering the fittings and accessories installation, there is hardly any room to account for increased sag or rise in road level. To further worsen the problem; the span length varies from 60-120 Mtrs and more span length causes high sag. In WESCO licensed areas, there are many locations, which are not complying with the statutory safety guidelines and hence require huge funds and efforts to make the network safe. At some places, due to re-construction of the roads, vertical clearances of the lines have reduced to the dangerous level causing violation of statutory safety norms. TPWODL proposed to take up installation of mid pole, refurbishment/life enhancement work for lines to rectify all such defects. Since the number of such locations are high, huge investment spread across few years would be required to rectify all the deficiencies.

8. TPWODL has submitted that due to vast widespread network and absence of Capex in past, the existing network has become very weak due to ageing and resulting in repeated tripping. Major element for weak network, includes damaged pole, worn out conductors, and damaged stay wires. At some locations, poles or support structure are damaged, rusted or tilted. Main factors causing damage to the poles include structural deterioration of poles, flood, Kalbaisakhi, 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 many days depending upon the location and severity of damage to the line. To prevent tilting of any pole from its normal position due to abnormal wind pressure, installation of Stay wire is required. At many places egg (stay/guy) insulators are either missing or damaged, which may cause major safety concern for Public and animals. The other reasons, which have resulted into depletion of existing network such as use of under sized conductor in overhead feeders, poor condition of the conductor, multiple joints in a single span in many sections, poor binding wire joints etc. witnessed in the sections causing hotspot and may result into jumper parting.

9. Further TPWODL has submitted that in an electrical installation, according to rule 42, installation with connected load of above 5 kW, and voltage exceeding 250 V shall have a suitable earth leakage protective device to isolate the load in case of earth fault or leakage in the circuit. In case the earthing of any power equipment or network becomes weak or defective due to corroded connections or damaged connection, clearance of fault may take more time and putting stress on the equipment connected in the network. During TPWODL site visits, it was observed that at most of the places, proper earthing was not evident and at some of the 33/11kV primary substation, earthing is not adequate. This situation is dangerous for the stability of power system and there are chances of electric shock to the human beings and animals. TPWODL has proposed capex to strengthen the earthing system by introducing fresh earthing in both DSS and PSS as part of refurbishment activity.

10. TPWODL has stated that at present, most of the network is overhead and there is no provision of guard or cradle wire installed beneath the overhead conductors which pose serious safety threat to the public since the network is in dilapidated condition and

possibility of conductor parting cannot be ruled out. In such a scenario, cradle guard will help in avoiding accidents caused by snapping of conductors of overhead MV feeders.

11. TPWODL has stated that the human beings and animals are exposed to the live power distribution equipment due to the absence of boundary walls and fencing around the Primary Substation and Distribution Substations, due to this the human beings and animals may come in direct contact or in the arching zone of high voltage equipment and there are high chances of entry of unauthorized persons or animals in high voltage switchyards. There are reports regarding electrocution of human beings and animals at substations in the past, therefore, TPWODL has proposed to put up fencing/build boundary wall for DSS and PSS.

12. Further, TPWODL has stated that many PSS do not have adequate protection system as many feeders are running on group breaker, many PTRs and feeders are in use without breaker. Battery and Battery charges are not operational and needs immediate replacement at various PSS.

13. TPWODL has stated that the existing infrastructure are old and needs upgradation to provide hygienic, well-ventilated and spacious work environment to accommodate additional new and old employees. These office locations are touch base points between end consumers and utility. Hence aesthetic along with safety of each stakeholders needs to be focused.

14. TPWODL has stated that the present network consists of 645 Nos of 33 kV tower. Most of these towers are more than 50 years old and crossing rivers, forest & serving critical load requirement of Rourkela, Sambalpur & other areas. Corporate civil design team were engaged to inspect foundation of these towers. It is observed that 30% tower are having poor foundation & structure. In few areas, tower leg members have been stolen.

15. TPWODL has submitted that there is no LT protection for DTs, most of the DSS protection and control are not operating properly. As a result, fault in any one LT circuit resulting into tripping of DT and incoming 11 kV feeder. Also, while carrying out maintenance or replacing the LT circuit blown fuses, the operator have to take hand trip of entire 11kV feeder from PSS.

16. TPWODL has submitted that apart from high number of accidents, other major problems are high number of DT failure and extremely high number of interruptions at 33 kV and 11 kV level due to poor network conditions. This affects the supply system very badly.

17. TPWODL has submitted that the root cause for DTRs failure are as mentioned below;

- Overloading- TPWODL in their field verification & system Reliability inspection observed that many DTRs are overloaded above their capacity & which is the main Cause of DTR failure in Summer Season. In SAUBHAGYA/DDUGY/RGGVY many DTs (16kVA to 25 kVA) are installed. With new connections, there is additional load on already installed DTRs.
- Ageing- Many Distribution Transformers are about 15 to 20 years old back. These Transformers are failing due ageing and frequent faults in the system. These Transformers are either not repairable or if repairable, the cost of repair of this transformer is more than the cost of new Transformer, which is also affecting the reliability of power supply to the Consumers.
- VIJAI MAKE- Many DTRs installed during Wesco time & under govt. initiative of DDUGJY/RGGVY, 12th plan are frequently failing since installation. These transformers are also having high losses and are not repairable by regular vendors. Hence there is difficulty to repair these transformers due to complicated core arrangement and core design.
- Other reasons of DTR's Failure- a) Heavy Lightening: TPWODL is high lightening prone area. Lightening strokes are regularly observed during Kal-baisakhi and normal rainy season. b) Oil Level Low- Many Old Transformers are also failing due to low Oil level. c) Improper Earthing- In several DSS either earthing system in not available or earthing is not proper.

18. TPWODL has submitted that over the period of operations of PTRs, based on the various conditions, there are instances of failures and there is requirement of installing additional PTRs of suitable rating, this will ensure system reliability through the (n-1) philosophy and availability of spare capacity. The factors for failure of PTRs are attributable to multiple reasons as mentioned below;

- **Ageing**-One of the most important reasons for failure of PTR is due to the natural ageing. Many of the PTRs in TPWODL system have been in service for more than 25 years and have served their useful life. Considering the overall cost benefit and incremental losses from these aged transformers, it becomes worthwhile to procure new transformers to replace the aged asset. This will help in improving the reliability and reduction in the losses.

- **Repaired PTRs**- TPWODL during their field verification & system reliability inspection observed that many PTRs are already rewound multiple times after failure in the past. The failure rate in such rewound / repaired PTRs are high. Additionally, rewinding doesn't guarantee the same losses and the overall efficiency of the transformer is also reduced (which is much lesser than a newly designed transformer). Considering the deterioration of winding insulation of these repaired transformers and combined with external factors like overloading and system conditions, such PTRs are more prone to failure.

- **Over loading**- With increase in the load demand, many of the PTRs are reaching or exceeding the rated capacity. This phenomenon is further aggravated with the use of ageing asset leading to an increase in the failure. Multiple schemes proposed by the Government ensures addition of distribution transformers (DTR) across the system. These ultimately is fed through the existing PTRs which would have reached the load limit.

- **Deteriorating** testing parameters-During testing of PTRs, it is observed that some of the PTRs test results indicate deteriorating winding insulation and high core loss. It is recommended to replace such PTRs in a planned and phased manner in order to avoid loss of supply to consumers.

19. TPWODL has submitted that the Capex investment Plan is made on the basis of Load flow studies. TPWODL has completed the load flow studies for 33KV & 11KV network after modelling the existing SLDs received from sites in CYMDIST Software and have prioritized the proposals on the basis of load flow studies. Load flow studies consists of 33KV feeder loading report, PTR Loading Report,11KV feeder loading Report, DT Loading Report, Abnormalities observed in 33KV & 11KV Feeders, sections. Load Flow studies is also used to calculate the technical loss in the 33KV & 11KV network. Load flow studies is done on existing network, Base-2 (Existing network with Approved scheme after considering Load growth).

20. TPWODL has submitted the 5-year Capex plan and left out infrastructure requirement under the heads Operations, Civil work, MMG, IT and OT. TPWODL has submitted that the geography is vast and huge investment is required to make the network fully compliant to safety and statutory standards, reliable and to meet the load growth in the system, huge investment is required which is not possible in a single year. TPWODL has identified the proposals which needs to be executed in order to maintain the reliable

power supply to the consumer. One of the most important reasons for failure of PTR, DTR, 33KV lines, 11KV Lines and various equipment inside PSS is due to the natural ageing. Many of the Lines, PSS and PTRs in TPWODL system have been in service for more than 25 years and have served their useful life. These network equipment and lines have been in service for long and would have experienced many hostile operating conditions during their lifetime. This may be abnormal conditions like heavy fault in line and multiple charging of PTRs and DTRs. Over the years this would lead to gradual degradation of the winding insulation causing PTR and DTR failures. Repairs to these transformers, lines and equipment would not yield the same kind of efficiency and quality leading to future failures. Considering the overall cost benefit and incremental losses from these aged networks, it becomes worthwhile to replace the aged asset. Considering the age factor and load growth requirement of the system. Overall expenditure requirement to meet the load growth and replacement of aged PTRs, DTRs, lines and network equipment is proposed. In addition to network, Civil infrastructure also required huge investment to maintain the existing buildings and construct new building, offices, customer service centre to serve the customer and increasing employee demands.

21. Similar to the methodology adopted in Capex plan for previous years, TPWODL has submitted Capex Plan for FY 2023-24 under five major categories. The details of the matter are described as follows:

Statutory, Safety and Security

a) Life enhancement of network and maintaining safe horizontal / vertical clearances:

TPWODL has proposed for proper upkeep of the feeders, it is important to ensure safety and reliability of power supply. During the site 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. Moreover, over sagged wires in 33 kV or 11 kV feeders are posing major threat to the lives 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 intermediate Pole to increase height for 11 kV and 33 kV sagging line at National Highway, SH & River Crossing crossing with Guarding on 16 Mtr Pole and Replacement of Open Conductor with Covered Conductor inside forest, city and high-density public area.

Accordingly, TPWODL has proposed a sum of Rs 9.02 Cr for Life enhancement of network and maintaining safe horizontal / vertical clearances.

b) Provision of Safety Equipment & Testing PPEs to workforce:

TPWODL has proposed Capex for Safety Equipment &Testing Personal Protection Equipment (PPEs) 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). According to 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. Utilities are moving ahead from electromechanical relays and static relays to the new state of the art numerical relays. These numerical relays provide all the requisite protection and help in timely isolation of faults. The asset life can be enhanced by having prudent maintenance practices including condition-based monitoring of the electrical equipment. One of the critical aspects involve carrying out both on-line and off-line testing of the equipment. To ensure that these tests are carried out in the pre-defined intervals, availability of suitable testing instruments is of utmost importance. With an ageing asset base and addition of new ones to the operational portfolio, it has become challenging to comply to the testing schedule with the existing testing infrastructure. To augment the same, TPWODL has proposed to procure an additional set of testing instruments, which can cater to faster adherence to the testing schedule and prevent pre-mature failures.

Accordingly, TPWODL has proposed a sum of Rs 3.79 Cr for Provision of Safety Equipment & Testing PPEs to workforce.

c) Fencing, Boundary Wall and infrastructure works at Primary & Distribution substation:

TPWODL has additionally proposed capex for Fencing, Boundary Wall and infrastructure works at Primary & Distribution substation. TPWODL has stated that fencing at most of the places are either damaged or not available, posing major safety threat to public and animals. At many 33/11 KV primary substations (Structures or PSS), boundary walls are observed broken and there is no fencing between the substation premises and 33KV outdoor switchyard. This makes the PSS highly unsafe, there are chances of unauthorized entry of persons and animals into the live switchyard and can cause undue accident / incident. TPWODL has submitted that the existing earthing system is in very bad condition and ineffective.

Accordingly, TPWODL has proposed a sum of Rs 21.31 Cr for Fencing, Boundary Wall and infrastructure works at Primary & Distribution substation.

The Capex proposed by TPWODL for FY 2023-24 under Statutory, Safety and Security is summarized as under:

Table-5

Sl. No	Capex Head	Activity	Capex proposed (Cr)
1	Statutory, Safety and Security	i) Life enhancement of network and maintaining safe horizontal / vertical clearances	9.02
		ii) Provision of Testing Equipment & PPEs to workforce	3.79
		iii) Fencing, Boundary Wall and infrastructure works at Primary & Distribution substation	21.31
	Sub Total- Statutory, Safety and Security		**34.12**

Loss Reduction

a) Energy Audit & Meter related activity:

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, and replacement of LT bare conductor with AB cable.

TPWODL has submitted that the service lines are currently connected on pole, directly to a conductor/AB Cable which leads to excessive wear & tear/damage of conductor/cable due to lose connection and increased no. of current complaints. Also, it leads to load unbalancing as more service lines are connected to lower conductor. There is clustering of multiple service lines as many as 15 to 20 on a

pole which also pose safety concern to line man attending complaints and public as well. TPWODL proposes to install LT distribution boxes which can Enhance safety to public as well as operation crew/lineman, balanced load distribution, anti-theft feature at source end, reduction in no of current complaint due to elimination of loose connections, ease in working on live network thus reducing no. of shut downs, network aging/life by avoiding frequent operation on Network, preventing AB cable damage and consumer sanitization.

TPWODL has submitted that the Distribution Substation (DSS) comprises of various equipment, which perform specific task to ensure delivering the power supply at appropriate voltage to the end consumers. Main components are 11kV AB Switch, 11kV HG Fuse, Transformer, LV Protection, Earthing, Fencing and LT Distribution Box. The most expensive equipment in the DSS is Transformer and its life depends upon healthy condition of all other components be it LV Protection, HV Protection, Earthing or fencing. It has observed at many locations the LT side & HT Side protection is bypassed through GI Wires. Due to this bypassed scenario, for any maintenance or corrective work at LT level, due to nonavailability of switching equipment, outage / Hand trip is taken from the 33/11kV PSS resulting into interruption to all the consumers connected on that 11KV feeder even though for a short duration. Similarly, for any fault on LV Side lead to tripping of 11KV Feeder breaker at DSS.

Accordingly, TPWODL has proposed a sum of Rs 28.04 Cr for Energy Audit & Meter related activity.

b) Replacement of LT Bare conductor with AB cable:

TPWODL has further proposed Capex towards replacement of LT bare conductor with AB cable. As per TPWODL, most of the LT feeders are connected radially and have long length by typical standards and having number of joints in the feeder. The long length of the feeders and joints are the potential source of technical losses and causing poor voltage regulation in the network. In addition, bare LT line is prone to connect the electricity supply in unauthorized manner, which increases the commercial losses. Conversion of bare conductor with LT ABC will help reduce the commercial losses. Therefore, it is proposed to replace LT bear with LT ABC in theft prone area. Therefore TPWODL has proposed for replacement of overhead bare conductors with new aerial bundled cables to

improve the safety factor, minimize the safety accident risk, reduce the chances of fault and strengthen existing 415 V network.

Accordingly, TPWODL has proposed a sum of Rs 31.96 Cr for Replacement of LT Bare conductor with AB cable.

The summarized Capex proposed by TPWODL for FY 2023-24 under the head Statutory, Safety and Security is as under;

Table-6

Sl. No	Capex Head	Activity	Capex proposed (Cr)
2	Loss Reduction	i) Energy Audit & Meter related activity	28.04
		ii) Replacement of LT Bare conductor with AB cable	31.96
	Sub Total-Loss Reduction		60

Network Reliability:

TPWODL has submitted that in its geographical area there are large numbers of long overhead lines/feeders which are in operation with an average length of 30 KMs in urban and110KMs in rural areas. The present power distribution network is in extremely dilapidated condition resulting into frequent trippings and as a result, consumers are not getting reliable and quality power supply. Out of 300 numbers of 33/11KV Primary Substations, 259 substations are connected with more than one source of supply and remaining 41 Primary Substations are connected in radial mode. There are 398 PTRs, which are old and 264 Nos of PTRs are recently commissioned vide ODSSP scheme. TPWODL has further submitted that as of today, a total of 662 PTRs of various capacities are installed in the TPWODL system and these installations were covered under the older conventional PSS as well as the various ODSSP phases which have come over the years. The total count of PTRs installed under the ODSSP scheme are 267 and Non ODSSP scheme are 401. To ensure highest reliability, few 33/11KV substations should have more than one source of power supply along with desired protection and equipment. TPWODL intends to implement the following actions to improve the reliability of power supply;

- Identification and replacement of faulty equipment causing frequent tripping's.
- Identification and commissioning of new equipment which are required as per industry standard
- Introduction of technology to ensure faster restoration of supply in case of any tripping.

a) Replacement/Addition of network component in 33/11KV Primary Substation;

TPWODL has submitted that PSS is a vital part of entire distribution network. Generally, the primary voltage to PSS is 33 kV and secondary is 11 kV. In TPWODL, there are 662 numbers of 33/11 kV power transformers with an installed capacity of 3335 MVA.1093 numbers of 11 kV feeders emanates from the 33/11 kV primary substations having cumulative length of approximately 53969 KMs. TPWODL has proposed to refurbish bay equipment's to improve the reliability and has planned for Refurbishment work in PSS (Structure Replacement / Yard Refurbishment),Replacement/ Segregation of Old 11 kV breaker/ Group Breaker with new (O/D CT-) (including civil &control cable),Replacement/ Segregation of Old 33 kV breaker/ Group Breaker with new (O/D CT-) (including civil &control cable),Replacement of Defective Relay, Replacement of Indoor switchgear Protection panel along with associated equipment, Replacement of Substation Transformer -33/0.4KV 100KVA Trf, Replacement of Battery & Battery Charger ,Implementation of Automation /Scada and High Mast/Lighting arrangement for PSS/Store.

TPWODL has stated that they have been upgrading the protection system by replacing the erstwhile electromechanical relays and static relays with the numerical relays. The replacement has and will have the following advantages;

- Efficient Protection (multiple protection into a single relay).
- Increased Reliability (reducing the interruptions caused due to uncoordinated tripping)
- Fault Analysis (inbuilt function of having Fault Disturbance Recorders (FDRs))
- SCADA/Automation with easier integration of the system for remote operation and monitoring.

Accordingly, TPWODL has proposed a sum of Rs 28.38 Cr for Replacement/ Addition of network component in 33/11KV Primary Substation.

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

TPWODL has submitted that in the present network scenario majority of 11KV & 33KV networks are overhead in nature and the average feeder length is more than

80 KMs. Many O/H feeders are passing through forest area and most of the faults that occur are on overhead lines, transient faults are caused mainly by lightning and tree branches touching the live line conductor. TPWODL has proposed different activities to strengthen the 33KV & 11KV line such as Refurbishment/ Augmentation of old 11KV line, Refurbishment/ Augmentation of old 33 KV line, Installation of 11KV & 33 KV FPI, Installation of 11KV & 33 KV 400A/200A AB switches & isolator, Installation of 33KV & 11 KV RMU,33KV & 11kV Auto Recloser & Sectionaliser and Installation of AVR /Capacitor Bank/ Voltage Improvement Equipment.

TPWODL has proposed to introduce communicable type Fault Passage Indicator, Auto-recloser & Sectionaliser, Installation of AVR /Capacitor Bank/ Voltage Improvement Equipment with auto-reclosers and sectionalizers in 11KV feeders, field engineers would have flexibility to isolate the section locally instead of switching off entire feeder. In case of any tripping, maintenance engineer can isolate the faulty section and restore the supply of remaining consumers thereby improving the reliability. Moreover, it is observed that multiple 11KV feeders are controlled through single 11KV breaker or AB switch in some primary substation. TPWODL propose to install AB switches and isolators identified in high tripping feeders. Similarly, in rural section, AB switches are proposed at lengthy 33KV & 11KV Feeders to have provision of isolation of section during any outages. This will help in improving the reliability.

Accordingly, TPWODL has proposed a sum of Rs 36.08 Cr for Replacement/Addition of network component in 33KV & 11KV Line.

c) Replacement/Addition of network component in Distribution Substation;

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

TPWODL has planned to strength the control and protection system at LT side at DSS level. Various initiatives proposed this year is to improve the reliability of power supply in 11KV and downstream network.

Accordingly, TPWODL has proposed a sum of Rs 10.03 Cr for Replacement/Addition of network component in Distribution Substation.

The summarized Capex proposed by TPWODL for FY 2023-24 under the head Network Reliability is as under;

Table-7

Sl. No.	Capex Head	Activity	Capex proposed (Cr)
3	Network Reliability	i) Replacement/Addition of network component in 33/11KV Primary Substation.	28.38
		ii) Replacement/Addition of network component in 33KV & 11KV Line.	36.08
		iii) Replacement/ Addition of network component in Distribution Substation.	10.03
	Sub Total- Network Reliability		74.49

Load Growth:

TPWODL has proposed capex towards strengthening of network infrastructures in order to meet the 5.4% load growth and approximately 90,000 to 1,00,000 new connections applied for FY 2023-24.

Network enhancement / Unforeseen emergency

TPWODL, while conducting site survey, has observed that most of 33/11KV Primary Sub-Stations are having single incoming 33KV source. With failure of single existing 33KV source, entire 33/11KV PSS gets shutdown thereby causing shutdown of all downstream 11KV & LT network connecting consumers.

Further TPWODL has submitted that HT consumers on 33KV and 11KV are being fed through tapping point instead of a dedicated feeder. Multiple HT consumers are fed through single incoming source of 33/11 kV PSS. In case of technical fault at one of the HT consumers leads to tripping of incoming source and other connected HT consumer and to overcome this issue, it is proposed to establish link line from alternative available source. At present 11 kV feeders are radial and do not have ring connectivity with another 11 kV feeder. As per (N-1) philosophy, it is proposed to establish ring connectivity between nearest 11 kV feeder in the vicinity and adjacent PSS 11 kV

feeder. Few such link lines will be established in first phase for some important feeders like Hospitals, town, commercial and key government establishments.

TPWODL has submitted that actual load demand has increased substantially more than the assessed one due to various government approved electrification schemes. To cater to the load growth it is essential to augment the existing infrastructure as per the need. TPWODL has further stated it is essential to have adequate capacity of DTs and PTs in the event of transfer of load from one grid to other. With said addition, there shall be improvement in voltage profile

Accordingly, in order to strengthen the existing infrastructure to address the upcoming load demand, the Petitioner has proposed Capex of Rs. 67.82 Cr. against the various works covered under the Load Growth.

The summarized Capex proposed by TPWODL for FY 2023-24 under the head Load growth is as under;

Table-8

Sl. No	Capex Head	Activity	Capex proposed (Cr)
4	Load Growth	i) Network enhancement / Unforeseen emergency.	67.82
	Sub Total- Load Growth		**67.82**

Technology and Civil Infrastructure:

a) Technology Intervention-IT & Technology;

Under this activity, TPWODL has proposed all expenditure related to technology adoption and strengthening of various offices and establishment of Call centre, data centre, information technology, GIS/SCADA, Civil infrastructures and upgradation of road and offices, store infrastructure and ready to use assets have been considered.

TPWODL has stated that the information technology in TPWODL has commenced its journey in FY 2022, by initiating large scale computerization & digitalization efforts in the Company For year 2021-2022. TPWODL has proposed capex under the technology for Disaster Recovery Centre – hardware & software, Date Centre (DC) hardware, DC software & Licences, front end device and end user, location network, DR setup for other DISCOMs and digitization of legacy documents.

Accordingly, TPWODL has proposed a sum of Rs 77.77 Cr for Technology Intervention-IT & Technology.

b) Technology Intervention- GIS, Communication & Others Implementation;

TPWODL has proposed for technology intervention -GIS/SCADA & other implementation to improve the reliability and reduce the losses and to improve the overall performance, effective implementation of technologies is required. TPWODL is in the midst of technology transformation to provide quality customer services and to deliver highly reliable and improved quality supply in safe manner to its consumers by meeting various standards of operation.

Accordingly, TPWODL has proposed a sum of Rs.62.21 Cr for Technology Intervention- GIS, Communication & Others Implementation.

c) Improvement of Civil Infrastructure;

TPWODL has proposed capex for improvement in civil infrastructure, TPWODL currently have offices in all the five circles and subdivisions. Some of them are owned and about 40% offices are on rented property. TPWODL is facing challenge while accommodating additional new employees in current office buildings and infrastructure. The current existing infrastructure are old and needs modernization to provide hygienic, well-ventilated and spacious work environment and these office locations are touch base points between end consumers and utility. Hence, aesthetic along with safety of each stakeholders needs to be focused.

TPWODL has proposed capex for up gradation of road and offices. TPWODL has submitted that various Grid Sub Stations access road needs repair and strengthening along-with drainage system. In addition, it is required to complete structural rehabilitation and refurbishment of existing Offices/ Control Rooms and the area grading/ leveling, repairs to existing cable trenches and trench covers needs to be done for maintaining safety during operation. TPWODL has planned to improve the civil infrastructure by repairing/ constructing new wash room for substation, additional material storage area, new store building, new Building for Division/ Subdivision Section/Commercial Office and refurbishment of old building for office at various location.

Accordingly, TPWODL has proposed a sum of Rs 15.65 Cr for improvement of civil infrastructures.

d) Store infrastructure;

TPWODL has proposed capex for store infrastructure and has submitted that currently the distribution inventory management is done through four designated central stores located Burla, Rajanpur, Bolangir and Kesinga. 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 and security of the material and personal. TPWODL has stated that the access and internal roads to the store office needs to be constructed.

Accordingly, TPWODL has proposed a sum of Rs 2.5 Cr for Store infrastructures.

e) Ready to Use assets for Offices;

Further TPWODL has proposed capex for ready to use assets for offices, TPWODL has submitted that the office space is currently crowded and haphazardly planned for seating arrangements, moreover, most of the space has been occupied with files, documents etc. In order to provide best in class services to consumers, earn consumer delight and improve satisfaction among other stakeholders and to maintain a clean & safe working environment. TPWODL has proposed air conditioner, water coolers & purifiers, ergonomic office chairs, photo copier machine, vehicles, file cabinets etc. for office and canteen facilities for its employees.

Accordingly, TPWODL has proposed a sum of Rs 2.5 Cr for Ready to Use assets for Offices.

The Capex proposed by TPWODL for FY 2023-24 under the head Technology & Infrastructure is summarized as under;

Table-9

Sl. No	Capex Head	Activity	Capex proposed (Cr)
5A	IT Infrastructure	i) Technology Intervention-IT & Technology.	77.7
	Sub Total- IT Infrastructure		77.7
5B	OT Infrastructure	ii) Technology Intervention- GIS, Communication & Others Implementation.	62.21
	Sub-Total- OT Infrastructure		62.21
5C	Civil, Admin and Other Infrastructure	iii) Improvement of Civil Infrastructure	15.65
		iv) store infrastructure	4.35
		v) Ready to Use assets for Offices	2.5
	Sub Total- Civil & Admin Infrastructure		22.5
	Sub Total-Technology & Infrastructure 5A+5B+5C		162.41

22. The table below summarises the overall Capex plan proposed by TPWODL for the FY 2023-24:

Table-10

Sl. No	Capex Head	Activity	Original Capex proposed	Revised CAPEX Proposed as per Board approval (Rs. Cr)
1	Statutory, Safety and Security	i) Life enhancement of network and maintaining safe horizontal / vertical clearances	9.02	9.02
		ii) Provision of Testing Equipment & PPEs to workforce	3.79	3.79
		iii) Fencing, Boundary Wall and infrastructure works at Primary & Distribution substation	21.31	21.31
	Sub Total- Statutory, Safety and Security		34.12	34.12
2	Loss Reduction	i) Energy Audit & Meter related activity	124.59	28.04
		ii) Replacement of LT Bare conductor with AB cable	41.96	31.96
	Sub Total-Loss Reduction		166.55	60
3	Reliability	i) Replacement/Addition of network component in 33/11KV Primary Substation.	28.38	28.38
		ii) Replacement/Addition of network component in 33KV & 11KV Line.	37.08	36.08
		iii) Replacement/ Addition of network component in Distribution Substation.	10.03	10.03
	Sub Total-Reliability		75.49	74.49
4	Load Growth	i) Network enhancement / Unforeseen emergency.	77.82	67.82
	Sub Total- Load Growth		77.82	67.82
5A	IT Infrastructure	i) Technology Intervention-IT & Technology.	77.7	77.7
	SubTotal- IT Infrastructure		77.7	77.7
5B	OT Infrastructure	ii) Technology Intervention- GIS, Communication & Others Implementation.	62.21	62.21
	SubTotal- OT Infrastructure		62.21	62.21
5C	Civil, Admin and Other Infrastructure	iii) Improvement of Civil Infrastructure	16.65	15.65
		iv) store infrastructure	4.35	4.35
		v) Ready to Use assets for Offices	1.5	2.5
	Sub Total- Civil & Admin Infrastructure		22.5	22.5
	Sub Total-Technology & Infrastructure 5A+5B+5C		162.41	162.41
	Grand Total		516.39	398.84

* Board of Directors approved Rs 16.65 Cr towards Improvement of Civil Infrastructure and Rs 1.5 Cr for ready to use assets for offices under major category head of Civil, Admin and Other Infrastructure

23. The Original Capex proposal was submitted by TPWODL on 22.12.2022. The public hearing was held on 02.05.2023 and it was decided to issue public notice on the proposal. The public notice was issued on 04.05.2023 inviting suggestions/ objections to the CAPEX Plan for FY 2023-24 of the DISCOMs. Subsequently, on approval by BoD, TPWODL on 17.01.2023, TPWODL had submitted the revised proposal with the revised cost on 18.05.2023. The revised CAPEX was uploaded on the Commission's website as well as on the DISCOM's website. The public hearing on the revised CAPEX submission of TPWODL was held on 30.05.2022. The Commission during hearing heard the Petitioner & Respondents who had participated in the hearing. The Commission has received written submission from the stakeholders namely OPTCL and GRIDCO and heard oral submissions of Government of Odisha and SLDC during hearing.

24. The Commission had raised various queries relating to the CAPEX proposal of TPWODL. The response of TPWODL on specific queries are as under:

a) As regards to fixed asset register,

TPWODL has submitted that the Fixed asset register for the period of Apr'21-Mar'23 has already been submitted vide email dated 25.05.2023.

b) Regarding Name and location of the proposed activities and assets to be created during FY 2023-24,

TPWODL has submitted that the details of name and location for proposed activities and assets to be created for FY 2023-24 has been provided to the Commission.

c) As regards to swapping of lower capacity DTRs/ PTRs,

TPWODL has submitted that swapping of transformers to reduce overloading issue is applicable for both Power Transformers (PTRs) and Distribution Transformers (DTRs). Regarding PTR augmentation, TPWODL has submitted that augmentation of 14 nos. overloaded PTRs and replacement of 2 nos. PTRs have been planned. TPWODL has further submitted that the spare DTs after augmentation shall be utilized based on nearby location preferably with Sub-division/Division as per requirement and accordingly very limited requirement of low ratings DTs is considered.

d) Regarding details on accounting treatment and movement of decapitalized assets,

TPWODL submitted that the as per accounts, decapitalization is accounted by reducing the Gross value of Assets as well as accumulated depreciation, the amount remains net value of assets charges off with expenses.

e) Regarding declaration that there is no duplication of work between the activities to be carried out in the proposed CAPEX and the assets created through Govt. schemes/support,

TPWODL has submitted that there is no duplication of work carried out under the proposed Capex and the assets created through Govt. Schemes/Support.

f) Regarding reason for proposed procurement of EV or other vehicles under CAPEX instead of utilizing the vehicles on hiring basis,

TPWODL has submitted that as a part of TPWODL's journey for digitalization and automation, department handed over 115 PSS to PSCC, Burla for control and monitoring. In case of fault/ defect in any of the PSS, automation team needs to provide prompt response/support to PSCC. Currently, TPWODL is hiring vehicles for this purpose (to visit site), which is costing around Rs.70000 per vehicle per month. Presently, TPWODL are using 2 vehicles per day (24 X 7), which costs around Rs.33.6 Lakh per year. Therefore, it is proposed to purchase 2 EV vehicles on self-drive basis, which will be used by respective automation engineers to attend the site issues. These EVs will be used as a pilot to study the feasibility of EV's in the utility sector for day-to-day work. The cost of 2 EVs will be Rs.30 Lakh. The payback period will be 1 year which would be beneficial to TPWODL. Basing upon usage and savings more vehicles has been proposed in the DPR which may please be approved.

g) Regarding why the extended warranty (if proposed) with certain items under IT infrastructure should be a part of Capex and not Opex,

TPWODL has submitted that, only warranty which comes as bundled cost along with items like PC, Server, storage, etc. are taken under Capex. However, any additional procurement of AMC or warranty are covered under Opex.

h) Regarding fencing for DTs and existing primary substations are not capital in nature as per REC and should be covered under opex and not under Capex,

TPWODL has submitted that the standard renovation or periodical maintenance of DT Fencing and primary substations are covered under O&M. However, those location where no such fencing/boundary wall are existing, fencing/boundary wall has been proposed in the DPR. This is required for safety reason also.

i) Regarding proposals to be substantiated with no of unmetered feeders, name and PSS,

TPWODL has submitted that no proposal related to Feeder metering considered in DPR FY 23-24.

j) Regarding why separate expenditure is proposed for SCADA and GSAS implementation which almost similar in nature,

TPWODL has submitted that as there is always the confusion in terminology among the distribution utilities i.e., GSAS (Grid substation automation system), DAS (Distribution Automation System), SCADA etc. So to make more generic SCADA is globally used for Telemetry in distribution utility. In FY 21-22 TPWODL has proposed Rs.9.52Cr. for GSAS which comprises field Automation activities and Rs.15.3 Cr. for MCC and BCC set up. The same has been approved by the Commission under GSAS and SCADA and the same has been completed for monitoring and control of 80 nos. of 33/11 KV PSS. In FY 22-23, TPWODL had requested for Rs.21.9 Cr. under Reliability improvement wherein TPWODL is working for revamping of conventional PSS and Modernization, fire detection system integrated with SCADA system, Health monitoring of Power transformer. The Commission has also approved 80% of the proposed cost under reliability head. Similarly, continuing the journey of PSS modernization Rs.13.5 Cr. has been proposed in CAPEX Plan 23-24, for activity like revamping of conventional PSS and Modernization, fire detection system integrated with SCADA system, health monitoring of Power transformer, Vehicle tracking system for optimize carbon footprint, Safety and security which may be approved.

k) Regarding the replication cost for DR centres proposed for TPCODL, TPNODL & TPSODL,

TPWODL has submitted that for the proposed common Disaster Recovery Centre (DR) at Sambalpur for TPCODL, TPWODL, TPNODL and TPWODL, all the concerned utilities have considered replication of computer, network and storage capacity of their respective Data Centres in the proposed DR. Individual

DISCOMs have accordingly proposed necessary IT equipment needed for replicating its Data Centre capacity at the DR which will be exclusively used by them. Common DR components like Civil infrastructure, Building Management System, Cooling System etc. have been included in the FY 24 CAPEX Proposal by TPWODL only and these infra and facilities are not part of any other DISCOM's proposal.

l) Regarding details for unforeseen emergency,

TPWODL has submitted that for the unforeseen emergency cover LT network strengthening & new DT installations for releasing new connections. It has been considered under load growth, therefore no separate funding requirement.

m) Regarding reason for cost variation of drones between four DISCOMs,

TPWODL has submitted that the cost of drone considered in DPR FY 23-24 is Rs. 20 lakhs per drone. The other cost includes cost of Software License, Pilot training and drone accessories which is one-time cost and amounting to Rs. 40 lakhs. The analytic software is required to assess the images taken by drone and analyse possible defects so as to take remedial action accordingly.

n) Regarding justification for proposal of digitalisation of documents,

TPWODL has submitted that the proposal Rs. 6 Cr. for digitalization of documents is an extension of DWS project which is aimed for digital / paperless office approved by the Commission last year. During FY 23-24 digitization of additional 23 Lakh files containing on an average of 12 pages per file have been proposed. The outcome of this project will create assets having relevance and requirement in future (5-8 years depending upon nature of the record).

o) Regarding non-consideration of the equipment cost approved by the Government of Odisha in their cost estimates,

TPWODL has submitted that estimates are prepared based on approved cost data of FY 18-19 with escalation of 6% per year as allowed by the Commission. In case of non-availability of cost in cost data book, the last actual procurement cost has been considered.

25. The Respondent, Energy Department, Government of Odisha has not submitted any specific observations/comments in respect of various activities covered under CAPEX

proposal for FY 2023-24. However, the representative of Government of Odisha has orally submitted the following during the hearing:

a) It needs to be ensured that there is no duplication of work under the proposed CAPEX and the work already approved under the Government schemes.

b) Proper scrutiny of the CAPEX proposal needs to be carried out by the Commission before approving the CAPEX amount in order to avoid unnecessary burden on the consumers.

26. The Observations/Comments received from the Respondent GRIDCO are summarized as follows:

a) The revised CAPEX Plan for Rs. 398.84 Cr. was approved in the board meeting of TPWODL on 17.01.2023 for consideration and approval of OERC.

b) GRIDCO appreciates the observations of the Commission in various orders and during review meetings based on requisite uniform planning, designing and operation of the distribution network for maintaining uniformity and standardisation of assets across the DISCOMs in order to provide reliable & quality power to consumers with the objective of reduction of T&D losses and to meet the adequate future load growth.

c) The CAPEX Plan should be implemented considering the actual requirement of new/ augmentation/ renovation of the system with proper requisite planning, as can be foreseeable prudently through adequate load flow study and the existing system in place with implementation of the latest technology as well as to cater the future load growth over a relatively longer period of 5 to 10 years period.

d) The expenses earmarked and attributable to O&M and other activities may be excluded from the scope of the Capex Plan and need to be considered under R&M heads.

e) The deferral of expenses may be considered with the priority of expenses allocation vis-a-vis the cost benefit analysis justifying the capex plan with reference to the primary parameters including increase in revenue, load growth requirement, reduction in AT&C loss, etc.

f) The Comprehensive Capex plan needs to be formulated by the DISCOM, requiring approval by the Commission for the Tariff control period with the annual breakup considering the actual requirement vis a vis progress under various heads.

g) The Commission may conduct due diligence and prudence check of the Capex Proposal under various components while approving the CAPEX Plan for the FY 2023-24 so as to meet the end objectives of CAPEX investments so as to be tariff neutral in the greater interest of the consumers of the State.

27. The Observations/Comments received from the Respondent OPTCL are summarized as follows:

a) Under Safety & Statutory, TPWODL has proposed Rs.34.12 Cr. for FY 2023-24 which, inter alia includes Rs. 9.02 Cr for Life enhancement of network and maintaining safe horizontal/vertical clearance whereas TPWODL is yet to capitalise assets with respect to investment proposal for FY 2021-22 amounting to Rs. 14.91 Cr. and total investment of Rs 15.09 Cr. for FY 2022-23 for above work.

b) Under Loss Reduction, TPWODL has proposed Rs. 166.55 Cr. for FY 2023-24 which, inter alia includes Rs. 24.15 Cr. and 72.40 Cr. for Meter Replacement against burnt/Faulty/Obsolete Technology & smart meter installation respectively. As per provision of OERC Distribution (Condition of Supply) Code, 2019, cost of meter is to be recovered through meter rent and hence the Commission may not be inclined to the proposal of the applicant.

c) Under Reliability, TPWODL has proposed Rs. 75.5 Cr. for FY 2023-24. While Government of Odisha have accorded in principle approval for ODSSP phase-V with an estimate outlay of Rs. 1124.70 Cr. under Chief Minister Power Development Program. As per the DPR furnished by TPWODL for the above programme, they have proposed works under different categories with an estimated cost of Rs. 303.05 Cr. The Commission may consider the above and allow necessary CAPEX with diligence.

d) Under Load Growth, TPWODL has proposed Rs. 77.82 Cr. for FY 2023-24 in which Rs. 13.16 Cr. and 8.87 Cr. is proposed for Construction of 11 kV & 33 KV New/Link line. TPWODL should incorporate creation of downstream networks from 33 kV bays created by OPTCL for TPWODL and 11kV feeders under various Govt Funded Schemes. But OPTCL has constructed many new 33/11 kV substations under ODSSP, DDUGJY and IPDS schemes which are yet to be made fully operational by TPWODL. As per Government of Odisha Energy Department Resolution vide No. 12347/EENG-RR-0004-2019, Bhubaneswar dated 24th December 2021 has approved Rs. 1796.73 Cr. for construction of 99 Nos. of 33/11

kV PSS and 64 nos. of independent 33 kV lines under phase–IV. The Commission may consider the above and allow necessary CAPEX in this regard.

e) Under Technology & Infrastructure, TPWODL has proposed Rs. 162.41Cr. for FY 2023-24 which includes Rs. 38.60 Cr. for implementation of GIS. However, TPWODL has capitalised only 0.12% (approximately) investment under above categories in FY 2022-23.

f) TPWODL has not submitted the source of funding which should be integral part of the Capex Plan as the cost of debt services, if higher, will be passed on to the consumers in terms of higher RST.

g) The IDC may be segregated for the entire interest amount considering the debt of capitalization of the asset. Similarly, employee cost is the fixed cost of TPWODL additional employee towards capitalization of the asset may be deducted.

28. The Petitioner, TPWODL in its rejoinder has submitted the following:

(a) The Commission had approved an amount of Rs. 20.54 Cr. and Rs. 15.09 Cr. under Life enhancement of feeder network under Statutory, Safety & Security for FY 21-22 & FY 22-23 respectively. Furthermore, the balance CAPEX remaining for FY 21-22 & FY 22-23 under Life enhancement of feeder network (Statutory, Safety & Security Head) as on 31.03.2023 is placed as under:

Table-11

S. No.	Financial Year	Particulars	OERC Approval (Rs. Cr.)	Actual (Rs. Cr.)	WIP (Rs. Cr.)	Balance (Rs. Cr.)
1	FY 21-22	Life enhancement of feeder network	20.54	17.74	1.39	1.41
2	FY 22-23		15.09	9.81	0.75	4.53

(b) TPWODL have intimated the Commission regarding the actual progress of approved CAPEX in FY 2021-22 & FY 2022-23 as on 31.03.2023, vide letter no. TPWODL/RA&S/2023/035 dated 12.04.2023.

(c) TPWODL have filed a revised submission for approval of Annual Capex Plan for FY 2023-24 dated 18.05.2023 for an amount of Rs 60 Cr under Loss reduction for FY 2023-24. However, as per 15th meeting, Board of Director (BoD) has taken a view not to include meters under CAPEX plan as in both the years (FY 2021-22 &

FY 2022-23) since the Commission is not considering Meters under CAPEX head. Accordingly in the revised submission TPWODL has proposed Capex under loss reduction without any expenditure for meters.

(d) In the revised application for CAPEX Plan FY 2023-24 (submitted on 8.05.2023), the proposed investment under Reliability has been revised to Rs. 74.49 Cr. ODSSP phase-V which is being funded through Chief Minister Power Development Program (CMPDP) for an estimated amount of Rs. 1124.70 Cr, which covers 33/11 kV New PSS & new Lines to connect with GSS. However, improvement of reliability after the PSS has always been a challenge and accordingly TPWODL proposes its CAPEX for improvement of Power Supply Reliability. It may be noted that, there is no such duplicity in the DPR as proposed by TPWODL with projects taken under Govt. funded Schemes.

(e) The Commission had approved an amount of Rs.5 Cr. and Rs.40.10 Cr. under GIS Implementation under Technology & Infrastructure for FY 2021-22 & FY 2022-23 respectively. Furthermore, the balance CAPEX remaining for FY 2021-22 & FY 2022-23 under GIS (Technology & Infrastructure Head) as 31.03.2023 is placed as under:

Table-12

S. No.	Financial Year	Particulars	OERC Approval	Actual	WIP	Balance
			(Rs. Cr.)	(Rs. Cr.)	(Rs. Cr.)	(Rs. Cr.)
1	FY 21-22	GIS Implementation	5	6.38	0.31	0
2	FY 22-23		40.1	11.4	25.47	3.23

(f) TPWODL utilizes a combination of funding sources to support its CAPEX projects as under:

- 30% Equity: Infusion by the stakeholders out of internal accruals & direct funding as well as in terms of kind (by GRIDCO through allocation/transfer of assets).

- 70% Debt: Through loans from financial institutions/Banks. Already availed Rs. 225 Cr. and tied-up with different banks for another 475 Cr.

- The Applicant has already intimated the Commission about the funding mechanism of CAPEX in its performance review meetings.

(g) The Revised DPR as submitted before the Commission for FY 23-24 is excluding Interest During Construction (IDC) & Project employee cost.

(h) The impact on revenue & tariff of any CAPEX of a Licensee is to be determined through Tariff Determination Process. The tariff determination for DISCOM is being done as per OERC (Terms & Conditions for Determination of Wheeling Tariff and RST) Regulation, 2022. Accordingly, TPWODL is filing its ARR wherein details of CAPEX & Capitalization is being provided to take care of revenue & tariff impact.

(i) TPWODL adheres to the direction of the Commission during preparation of its CAPEX plan with a motive to provide reliable & quality power to consumers through reduction of T&D loss as well as to meet future load growth.

(j) Considering load flow studies in accordance with the directions of the Commission, the DPR for Capex investment proposal for FY 2023-24 has been prepared. Furthermore, load flow studies consist of 33KV feeder loading report, PTR Loading Report, 11 KV feeder loading Report, DT Loading Report, abnormalities observed in 33 KV & 11 KV Feeders, sections.

(k) TPWODL has considered expenses attributable to Capital Investment only in the CAPEX Plan with an objective of reliable power supply and for ensuring best customer services to the end consumers. The Applicant during the public hearing held on 30.05.2023 has stated/ submitted that expenses attributable to O&M are not included under scope of CAPEX Plan.

(l) TPWODL has considered the appropriate cost benefit analysis in the DPR for Capex investment proposal for FY 2023-24 along with actual progress in line with the direction of the Commission.

29. Heard the petitioner and respondents at length through Hybrid mode (physical & virtual mode) and considered their written and oral submission during hearing. As per Section 42 of the Electricity Act, 2003 read with Condition 7 of the Licence Conditions and Regulation 4 of the General Conditions of Distribution Licence, and the OERC (Conduct of Business) Regulations, 2004, it shall be the duty of the Distribution Licensee to develop and maintain an efficient, coordinated, economic distribution system in its area

of supply and to supply electricity in accordance with the provisions in the Act, Rules, Regulations and the directions of the Commission. The Commission is guided by Section 61(c) of the Electricity Act, 2003, i.e. "by the factors, which would encourage, competition, efficiency, economical use of the resources, good performance and optimum investments" while determining the tariff.

30. As per the provisions in the OERC Wheeling and Retail Supply Tariff Regulations 2022, TPWODL has submitted the specific details of works i.e. Statutory Safety and Security, Loss reduction, Reliability of network, Load growth and IT Infrastructure, OT Infrastructure and Civil & other Infrastructure. As required, the TPWODL has also submitted approval of its BoD for undertaking such work under Capex. As per the submissions of TPWODL, it is found that TPWODL has been able to utilise almost 100% of the CAPEX approved by the Commission for the FY 2021-22 and more than 84% of the CAPEX approved by the Commission for the FY 2022-23. TPWODL has submitted that the pending works will be completed and will be capitalised during the FY 2023-24.

31. The Commission observes that 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 and the direction of the Commission. While approving the Capex proposal of TPWODL for the FY 2022-23, the Commission had taken into consideration the following points:

- Whether the scheme is meeting the statutory requirement set in the Act, provisions of various Regulations of OERC, order of the Commission etc.
- Whether investment will meet the consumers' expectations in respect of reliability, availability and quality power supply in a cost effective manner.
- Tariff impact on the consumers

The Commission has also considered the above parameters to finalise the Capex plan of TPWODL for FY 2023-24.

32. We have examined the Capex plan submitted by TPWODL in detail. Considering the amount approved by BoD against each activity. The Commission has also examined the as-is-status of the infrastructure, the quantity of equipment proposed, areas covered, and the unit rates assumed by TPWODL for various equipment 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 2023-24.

33. It is relevant to mention here that as per para 39(b) of the Vesting Order, the petitioner's minimum committed capital expenditure for the period FY 2021-22 to FY 2025-26 is Rs.1663 Cr. TPWODL has submitted that as per the Vesting Order, it has to achieve a minimum cumulative CAPEX of Rs.806 Cr upto the FY 2022-23 against which the Commission has approved Rs. 810.85 Cr. As per the vesting order, cumulative Capex commitment by TPWODL upto the FY 2023-24 is Rs 1139 Cr. and accordingly TPWODL has submitted a revised Capex investment plan of Rs 398.84 Cr. in line with approval of BoD.

34. The detailed analysis and the Commission's Observation on proposed CAPEX by TPWODL for FY 2023-24 against various activities are as follows:

A. <u>Statutory, Safety and Security</u>

35. On analysis of fatal/no-fatal accident data submitted by the TPWODL it is observed that fatal accidents relating to humans are more than animals in TPWODL area due to deficiency in their network infrastructure or easy accessibility of the live parts to the public and animals. The Commission therefore is of the view that the proposals submitted by TPWODL under Statutory & Safety considerations are essential to reduce accident cases in future years.

36. The Commission has noted the importance of safety and corresponding Statutory requirement. TPWODL has proposed procurement of tools like Neon tester, discharge rod, FRP Ladders, etc.; testing equipment; Cradle guard at major road crossings; fencing of Distribution substations (DSS) & Boundary wall for Primary substations (PSS) and Intermediate poles to maintain safe ground clearance.

37. Accordingly, the Commission allows the following under various sub-heads towards Statutory, Safety and Security for FY 2023-24:

a) Life enhancement of network and maintaining safe horizontal / vertical clearances.

The Commission observes that TPWODL has identified certain critical areas such as increase of pole height, crossings with guarding on 16 mtr pole and replacement of open conductor with covered conductor. The Commission accordingly allows the following Capex under these sub-heads;

Table-13

Sl. No	Description of Activity	Original Capex Proposed (Rs Cr)	Revised Capex (Rs Cr)	Commission's Approval (Rs Cr)
1	Intermediate Pole Increase of height for 11 kV and 33 kV sagging line.	2	2	2
2	National Highway, SH & River Crossing with Guarding	1.99	1.99	1.99
3	Replacement of Open Conductor with Covered Conductor inside forest city and high-density public area	5.03	5.03	5.03
4	Total	9.02	9.02	9.02

b) Provision of Testing Equipment & PPEs to workforce:

TPWODL has proposed that several accidents occur while carrying out the operation and maintenance activities on network due to lack of safety equipment and PPEs for workforce. The Commission after analysis allows the following under such sub-heads.

Table-14

Sl. No.	Description of Activity	Original Capex Proposed (Rs Cr)	Revised Capex (Rs Cr)	Commission's Approval (Rs Cr)
1	Testing equipment	1	1	1
2	Safety Equipment (Discharge Rod, Man lifter, Neon Tester etc.)	2.79	2.79	2.79
3	Total	3.79	3.79	3.79

c) Fencing, Boundary Wall and infrastructure works at Primary & Distribution substation:

TPWODL has submitted that boundry walls of many 33/11 kV primary substation are either broken or have no fencing making such PSS highly unsafe. The Commission after analysis allow the following to strengthen such infrastructure.

Table-15

Sl. No	Description of Activity	Original Capex Proposed (Rs Cr)	Revised Capex (Rs Cr)	Commission's Approval (Rs Cr)
1	Fencing of Distribution Substation	4.8	4.8	4.8
2	Boundary wall of Primary Substation	10	10	10
3	Gravel filling for Primary substation	1.61	1.61	1.61
4	Access road for inside and outside	1.65	1.65	1.65

Sl. No	Description of Activity	Original Capex Proposed (Rs Cr)	Revised Capex (Rs Cr)	Commission's Approval (Rs Cr)
	PSS.			
5	Civil work for control room/other building in PSS- Repair	2.75	2.75	2.75
6	Provision for water supply for PSS/Offices (Watering for Earth pit)	0.5	0.5	0.5
7	Total	21.31	21.31	21.31

38. Based on the above analysis and considering the importance of safety in the network of DISOCMs, the Commission allows Capex of Rs 34.12 Cr (Rs 9.02 Cr+ Rs 3.79 Cr+Rs 21.31 Cr) under Statutory, Safety and Security for FY 2023-24.

B. Loss Reduction

39. The submission of the Petitioner under the Loss Reduction has been examined. It is observed that TPWODL has utilized to the tune of Rs 38.59 Cr (as against the approved Capex of Rs 46.80 Cr.) which is around 82% of the Capex approved by OERC. On enquiry, TPWODL has submitted that the balance capitalization for FY 2022-23 will be achieved along with the amount to be approved for FY 2023-24. TPWODL has submitted the cost data of various items proposed under the Capex plan.

The various activities covered under Loss Reduction are as follows:

(i) Energy Audit & Meter related activity

40. TPWODL has submitted that at present the service lines from the nearest pole are connected directly to a conductor/AB Cable which leads to excessive wear & tear/damage of conductor/ cable due to loose connection. TPWODL has proposed to install LT distribution boxes which can enhance the safety of public as well as operation crew/lineman. It will also help in balanced load distribution and in arresting network aging by avoiding frequent operation on Network.

TPWODL has submitted that the Distribution Substation (DSS) comprises of various equipment, which perform specific task to ensure reliable power supply at appropriate voltage to the end consumers. Main components are 11 kV AB Switch, 11 kV HG Fuse, Transformer, LV Protection, Earthing, Fencing and LT Distribution Box. The most expensive equipment in the DSS is Transformer and its life depends upon healthy condition of all other components. It has been observed that at many locations, the LT side & HT Side protection is bypassed through GI Wires. Due to this bypassed system, no switching equipment is available for any maintenance or corrective action at LT level. Therefore, hand trip is made from the 33/11 kV PSS resulting into interruption all the consumers connected on that 11 KV feeder even though for a short duration. Similarly,

for any fault on LV Side lead to tripping of 11KV Feeder breaker at DSS. This necessitates provision for LT distribution boxes. We agree for such provision and provision of smart meter at PSS and at DTR level. But we are not inclined to allow Capex proposed by TPWODL for installation of CT, PT, Meters & Modems for high value Industrial consumers as the recovery principle of these meters are similar to the LT consumers the cost of which can be recovered through meter rent. Accordingly, the Commission approves Rs 27.04 Cr under 'Energy Audit & Meter' related activity for FY 2023-24, the details of which is given in the Table below:

Table-16

Sl. No.	Description of activity	Original Capex Proposed (Rs Cr)	Revised Capex (Rs Cr)	Commission's Approval (Rs Cr)
1	LT DB installation on Existing Pole	14.54	14.54	14.54
2	Installation of Metering Unit, Meters and Modems at PSS Boundary Points	2.50	2.50	2.50
3	DTR Smart Metering above 100 KVA above up to 250 kVA	10.00	10.00	10.00
4	Installation of CT, PT, Meters & Modems for High value Industrial Consumers	1.00	1.00	0.00
5	**Total**	**28.04**	**28.04**	**27.04**

(ii) Replacement of LT Bare conductor with AB cable

41. TPWODL has proposed replacement of LT bare conductor with AB cable to reduce tripping due to transient faults, enhance safety and help in reducing theft of electricity in theft prone areas resulting in reduction in commercial losses. In view of above benefit, the Commission allows Rs.31.96 Cr. under above sub-head and total Rs.59 Cr. is allowed under loss reduction for the FY 2023-25 as detailed below:

Table-17

Sl. No	Description of activity	Original Capex Proposed (Rs Cr)	Revised Capex (Rs Cr)	Commission's Approval (Rs Cr)
B	**Loss Reduction**			
1	Energy Audit & Meter related activity	124.59	28.04	27.04
2	Replacement of LT Bare conductor with AB cable	41.96	31.96	31.96
	Sub-total	**166.55**	**60.00**	**59.00**

C . Reliability

42. The Commission has considered the submission of the TPWODL and the challenges in providing reliable power supply to consumers. TPWODL has submitted that large numbers of long overhead lines/feeders (average length of 30 KMs in urban areas and 110 KMs in rural areas) are in operation in its geographical area. The present power distribution network is in extremely dilapidated condition resulting into frequent tripping and as a result, consumers are not getting reliable and quality power supply. TPWODL has submitted that in order to ensure highest reliability, few 33/11 kV substations should have more than one source of supply (i.e. more than one in-comer) along with associated equipment and protection system.

(i) Replacement/Addition of network component in 33/11KV Primary Substation:

TPWODL has submitted that 33/11 kV PSSs are vital in distribution network. The refurbishment of bay equipments of existing PSS is essential to improve the reliability. The refurbishment work in existing PSSs covering replacement of old breakers/Group breakers (33 kV & 11 kV), defective relay, Indoor switchgear, Protection panel along with associated equipment, station Transformer Battery & Battery Charger, implementation of Automation /SCADA, High Mast /Lighting arrangement for PSS, Store are very much necessary. We consider replacement of 33 KV breaker/group breakers, but the replacement of 11 KV breaker can be covered under R&M. Similarly, the replacement of old electrochemical/static relays by numerical relay can be covered under R&M. Accordingly, the Commission has examined the provision and allows Rs.23.37 Cr. under strengthening of 33/11 kV PSS and details are as follows:

Table-18

Sl.no	Description of activity	Original Capex Proposed (Rs Cr)	Revised Capex (Rs Cr)	Commission's Approval (Rs Cr)
1	Refurbishment work in PSS (Structure Replacement / Yard Refurbishment)	1.96	1.96	1.96
2	Replacement/ Segregation of Old 11 kV breaker/ Group Breaker with new (O/D CT-) (including civil & control cable)	4.01	4.01	0.00
3	Replacement/ Segregation of Old 33 kV breaker/ Group Breaker with new (O/D CT-) (including civil & control cable)	2.21	2.21	2.21

Sl.no	Description of activity	Original Capex Proposed (Rs Cr)	Revised Capex (Rs Cr)	Commission's Approval (Rs Cr)
4	Replacement of Defective Relay	1.00	1.00	0.00
5	Replacement of Indoor switchgear Protection Panel along with associated equipment	2.00	2.00	2.00
6	Replacement of Sub-station Transformer -33/0.4KV 100KVA Trf.	0.49	0.49	0.49
7	Replacement of Battery & Battery Charger	1.21	1.21	1.21
8	Implementation of Automation/Scada	13.50	13.50	13.50
9	Roof top for Office/ Building lighting	1.50	1.50	1.50
10	High Mast/Lighting arrangement for PSS/Store	0.50	0.50	0.50
11	**Total**	**28.38**	**28.38**	**23.37**

(ii) Replacement/Addition of network component in 33KV & 11KV Line:

TPWODL has submitted that most of the 11 kV & 33 kV lines are overhead with bare conductor and the average feeder length is more than 80 KMs. Many of O/H lines are passing through forest area and most of the faults on overhead lines are transient in nature which are caused primarily due to lightning and touching of tree branches with the live line conductor. TPWODL has proposed to undertake different measures/initiatives to strengthen the 33 KV & 11 KV line such as refurbishment/ augmentation of old 11 KV and 33 kV line; installation of communicable Fault Passage Indicator (FPI) at 33 kV & 11 kV level; installation of AB switches, isolator, RMU, Auto recloser & sectionaliser at 33 kV & 11 kV level and installation of AVR /Capacitor bank/ Voltage improvement equipment.

At present multiple 11KV feeders are controlled through single 11 KV breaker or AB switch in some primary substation and hence TPWODL has proposed to install AB switches and isolators in some of identified feeders, which are tripping frequently. Similarly, in rural areas, AB switches are proposed at lengthy 33 KV & 11 KV Feeders to isolate the section easily during any fault/outage. This will help in improving the reliability. The Commission observes that such strengthening measures for 33 kV & 11 kV network are required for the system and accordingly allows Rs.36.08 Cr. under above sub-head, details of which are as follows:

Table-19

Sl.no	Description of activity	Original Capex Proposed (Rs Cr)	Revised Capex (Rs Cr)	Commission's Approval (Rs Cr)
1	Refurbishment/Augmentation of old 11KV line along	17.01	17.01	17.01
2	Refurbishment/Augmentation of old 33KV line	6.02	6.02	6.02
3	Installation of 11KV & 33 KV FPI	0.98	0.98	0.98
4	Installation of 11KV & 33 KV AB switches, Isolator & RMU	5.00	5.00	5.00
5	New Tower Addition/Replacement	1.98	0.98	0.98
6	Railway X-ing using U/G Cable	1.03	1.03	1.03
7	33KV & 11kV Auto Recloser & Sectionaliser/ AVR/Capacitor Bank/Voltage Improvement Equipment	5.06	5.06	5.06
8	**Total**	**37.08**	**36.08**	**36.08**

(iii) Replacement/ Addition of network component in Distribution Substation:

TPWODL has stated that most of the Distribution Sub-Station (DSS) protection and control are not operating properly. As a result, fault in any one LT circuit results in tripping of DT incoming 11KV feeder. Again for maintenance of the DSS, the operator needs to take hand trip of entire 11 KV feeder from PSS. Moreover, various equipment associated with the DSS are very old & obsolete, which need to be replaced at the earliest.

The Commission observes that such strengthening measures are required for DSS and accordingly allows Rs.10.03 Cr. for refurbishment of above 100 KVA DTR along with LT Protection, Earthing etc. (Other than Augmentation) and total Capex of Rs.69.48 Cr. is approved under Reliability for the FY 2023-24.

D. <u>Load Growth</u>

43. TPWODL has estimated that according to present trend there would be load growth of 5.14% and expected new connections would be approximately 90,000 to 1,00,000 for FY 2023-24. In order to meet such load growth and associated challenges there is a requirement of strengthening of the network which is proposed as follows;

Network enhancement / Unforeseen emergency:

Regarding network enhancement TPWODL has carried out site survey and found that most of 33/11KV Primary Sub-Stations (PSS) are having single incoming 33KV source. In the event of failure of single existing 33KV source entire 33/11KV PSS goes under forced shutdown thereby causing shutdown to all the downstream 11KV & LT network consumers. Moreover, many HT consumers are being fed through tapping of lines/feeders at 33 kV & 11 kV level instead of a dedicated feeder. Multiple HT consumers are being fed through single incoming source of 33/11KV PSS. The technical fault at one of the HT consumers leads to tripping of incoming source and disruption of power supply to other connected HT consumer.

TPWODL has proposed that there is a requirement of establishing link line from alternative available source in order to overcome this issue. At present 11KV feeders are radial and do not have ring connectivity with other 11 kV feeder(s). TPWODL has proposed to establish ring connectivity between nearest 11KV feeder in the vicinity and 11KV feeder of nearby PSS to provide (N-1) redundancy. Few such link lines will be established in first phase, particularly for some important feeders like Hospitals, water supply system, town, commercial establishment and key government establishments.

TPWODL has submitted that actual load demand has increased substantially due to increase in various government approved electrification schemes. To cater to the load enhancement requirement it is essential to augment the existing infrastructure as per the need. TPWODL has further stated that adequate capacity of DT's and PTs are also essential in event of transfer of load from one grid to other. With said addition, there shall be improvement in voltage profile. TPWODL, in its CAPEX proposal for FY 2022-23 had proposed Rs. 75 Cr. which included Rs.40 Cr. for construction of 5 nos. of new Primary Sub Stations (PSS) and associated lines in urban area within Rourkela and other circles. The Commission had allowed 50% of Capex (i.e. Rs.20 Cr.) against construction on new PSS (in its Order dated 08.07.2022 in Case No. 101/2021) owing to slow pace of implementation of the approved CAPEX for FY 2021-22 & investment by Govt. of Odisha for construction of new PSS. The Licensee (TPWODL) has already issued order amounting to Rs.18 Cr. towards 2 Nos. PSS in FY 2022-23. The Commission further allows additional three (3) new PSS as proposed earlier along renovation of old PSS in TPWODL's areas of operation. After taking into account earlier approval in this regard, the Commission accordingly allows Capex of Rs 67.82

Cr. under load growth covering Network enhancement activity including execution of PSS for FY 2023-24 and the details are as follows:

Table-20

Sl.no	Description of activity	Original Capex Proposed (Rs Cr)	Revised Capex (Rs Cr)	Commission's Approval (Rs Cr)
1	Construction of 33 KV New/Link Line	8.87	8.87	8.87
2	Construction of 11KV New/ Link Line	13.16	8.16	8.16
3	Construction of new PSS/Renovation of Aged PSS.	18.00	18.00	18.00
4	Addition/Augmentation of PTR of various ratings	3.87	3.87	3.87
5	Addition/Augmentation of DTR of various ratings	24.93	19.93	19.93
6	Addition of New LT ABC Network	8.99	8.99	8.99
7	**Total**	**77.82**	**67.82**	**67.82**

E. IT & OT Infrastructure

44. The Commission observed that the proposal under this head related to technology adoption and strengthening of various offices, call centers, data centers, GIS/SCADA, Civil infrastructures and upgradation of road and offices, store infrastructure and ready to use assets. The proposals under this head are analyzed are follows:

(i) <u>IT Infrastructure</u>: Technology Intervention-IT & Technology:

TPWODL has stated that the Commission had approved Rs.42.02 Cr and Rs.48.19 Cr. under IT Infrastructure and associated schemes for the FY 2021-22 and FY 2022-23 and 100% capitalization has been achieved/likely to be achieved. The Commission has verified the unit price and quantity relating to the disaster recovery center and allows Rs 16.12 Cr under this Capex plan as (against of Rs 20.15 Cr.). We are not inclined to approve spending Rs.6.21 Crores towards digitisation of legacy documents as proposed by TPWODL and this can be covered under A&G head of DISCOM. The Commission accordingly allows Rs 67.46 Cr under IT infrastructure (Intervention-IT & Technology) related activity for the FY 2023-24 and details are as given in Table below:

Table-21

Sl. No	Description of activity	Original Capex Proposed (Rs Cr)	Revised Capex (Rs Cr)	Commission's Approval (Rs Cr)
1	Disaster Recovery Center - HW & SW	20.15	20.15	16.14
2	DC Hardware	11.04	11.04	11.04
3	DC Software & Licences	4.75	4.75	4.75
4	Front End Devices and End user	12.18	12.18	12.18
5	Locational Network	5.02	5.02	5.02
6	DR Setup for Other DISCOMs	18.35	18.35	18.35
7	Digitization of legacy documents	6.21	6.21	0.00
8	**Total**	**77.7**	**77.7**	**67.48**

(ii) <u>Operation and Technology Infrastructure</u>: Technology Intervention- GIS, Communication & Others Implementation:

TPWODL has stated that in order to improve the reliability, reduce losses and to improve the overall performance, effective implementation of technologies is required. These measures will provide quality service to customer, deliver highly reliable and improved quality supply in safe manner to its consumers by meeting various standards of operation. The Commission has examined the proposal and accordingly allows Rs 62.21 Cr under above head (Technology Intervention- GIS, Communication & Others Implementation related activity) for FY 2023-24 and details of which are as follows:

Table-22

Sl. No.	Description of activity	Original Capex Proposed (Rs Cr)	Revised Capex (Rs Cr)	Commission's Approval (Rs Cr)
1	Implementation of GIS	38.60	38.60	38.60
2	Communication Infrastructure	11.00	11.00	11.00
3	Smart meter Backend Infra	11.81	11.81	11.81
4	Procurement of Drones	0.80	0.80	0.80
5	**Total**	**62.21**	**62.21**	**62.21**

(iii) Civil, Admin and Other Infrastructure:

(a) Improvement of Civil Infrastructure:

TPWODL has stated that it has become difficult to accommodate additional new employees in current office buildings and infrastructure. The existing infrastructures are old and needs modernization. TPWODL has planned to improve the civil infrastructure by repairing/ constructing new wash room for substation, additional material storage area, new store building, new Building for Division/ Subdivision Section/Commercial Office and refurbishment of old building for office at various location. The Commission has examined the proposal and allows Rs 15.65 Cr under the Improvement of Civil Infrastructure related activity for FY 2023-24.

Table-23

Sl.no	Description of activity	Original Capex Proposed (Rs Cr)	Revised Capex (Rs Cr)	Commission's Approval (Rs Cr)
1	New wash room	2.00	2.00	2.00
2	Additional Material Storage area	2.00	2.00	2.00
3	New store building	0.60	0.60	0.60
4	New Scrap Yard, Pole Storage location	0.30	0.30	0.30
5	New Building for Division/ Subdivision/Section/Commercial Office.	8.00	7.00	7.00
6	Refurbishment of old building for office at various location	3.00	3.00	3.00
7	Infrastructure for fuse call center	0.75	0.75	0.75
8	**Total**	**16.65**	**15.65**	**15.65**

(b) **Store infrastructure**:

TPWODL has submitted that at present the distribution inventory management is being done through four designated central stores located at Burla, Rajgangpur, Bolangir and Kesinga. TPWODL has stated that the store offices are in dilapidated condition thereby compromising with the safety and security of the material and personnel. TPWODL has also stated that the access and internal roads to the store office needs to be constructed. The Commission agrees with the proposal of TPWODL and allows Rs 4.35 Cr for Store infrastructure related activity, security system and fire hydrant system for FY 2023-24.

Table-24

Sl. No.	Description of activity	Original Capex Proposed (Rs Cr)	Revised Capex (Rs Cr)	Commission's Approval (Rs Cr)
1	Store infrastructure, Security System and fire Hydrant System in Store	4.35	4.35	4.35
2	Total	4.35	4.35	4.35

(c) Ready to Use assets for Offices:

In order to provide best in class services to consumers, improve satisfaction among other stakeholders and to maintain a clean & safe working environment, TPWODL has proposed procurement of office air conditioner, water coolers & purifiers, ergonomic office chairs, photo copier machine, vehicles, file cabinets and canteen facilities for its employees. TPWODL has proposed for procurement of two numbers of EV for official use at estimated cost of Rs.0.3 Cr. To promote use of EV and to reduce carbon foot print, the Commission allows Rs.0.3 Cr. on pilot basis. The cost and associated benefit of such investment may be appraised to the Commission. The Commission after analysis of the proposal allows the following Capex towards ready to use assets for office;

Table-25

Sl.no	Description of activity	Original Capex Proposed (Rs Cr)	Revised Capex (Rs Cr)	Commission's Approval (Rs Cr)
1	Purchase of EV vehicles & other vehicles for employees		1.00	0.30
2	Ready to Use assets for Offices	1.50	1.50	1.50
3	Total	1.50	2.50	1.80

The Commission accordingly allows Capex of Rs 1.80 Cr under the head Ready to Use assets for Offices related activity for FY 2023-24.

45. The Commission has observed that TPWODL is not able to spent the Capex approved in previous financial years. It is also observed that almost 100% of Capex is being utilised under IT & OT infrastructure, SCADA/Automation, etc. But Capex covered under other activities like loss reduction, reliability, load growth, etc. which are linked to strengthening/expansion/ augmentation of distribution network, is not being fully utilised by TPWODL.

46. Considering the present dilapidated condition of distribution infrastructure, focus should be on strengthening of existing infrastructure and expansion of distribution network to

meet the projected load growth, addressing issues relating to reduction in losses, low voltage, overloading, metering infrastructure, earthing, etc. Priority should be given to works related to above issues over IT and OT infrastructure development. In view of above consideration and to promote EV under pilot project and due to the necessity of the proposed capital investment plan, the Commission hereby grants in principle approval of Rs.381.91 Cr. for the financial year 2023-24 against the TPWODL's CAPEX proposal of Rs.398.84 Cr. The details are shown in the table below:

Table-26

Sl.no	Description of activity	Original Capex Proposed (Rs Cr)	Revised Capex (Rs Cr)	Commission's Approval (Rs Cr)
A	**Statutory, Safety and Security**			
1	Life enhancement of network and maintaining safe horizontal / vertical clearances	9.02	9.02	9.02
2	Provision of Testing Equipment & PPEs to workforce	3.79	3.79	3.79
3	Fencing, Boundary Wall and infrastructure works at Primary & Distribution substation	21.31	21.31	21.31
	Sub-total	**34.12**	**34.12**	**34.12**
B	**Loss Reduction**			
1	Energy Audit & Meter related activity	124.59	28.04	27.04
2	Replacement of LT Bare conductor with AB cable	41.96	31.96	31.96
	Sub-total	**166.55**	**60.00**	**59.00**
C	**Reliability**			
1	Replacement/Addition of network component in 33/11KV Primary Substation.	28.38	28.38	23.37
2	Replacement/Addition of network component in 33KV & 11KV Line.	37.08	36.08	36.08
3	Replacement/ Addition of network component in Distribution Substation.	10.03	10.03	10.03
	Sub-total	**75.49**	**74.49**	**69.48**
D	**Load Growth**			
1	Network enhancement / Unforeseen emergency.	77.82	67.82	67.82
	Sub-total	**77.82**	**67.82**	**67.82**
E(1)	**IT Infrastructure**			
1	Technology Intervention-IT & Technology.	77.70	77.70	67.48
	Sub-total	**77.70**	**77.70**	**67.48**

Sl.no	Description of activity	Original Capex Proposed (Rs Cr)	Revised Capex (Rs Cr)	Commission's Approval (Rs Cr)
E(2)	**OT Infrastructure**			
1	Technology Intervention- GIS, Communication & Others Implementation.	62.21	62.21	62.21
	Sub-total	**62.21**	**62.21**	**62.21**
E(3)	**Civil, Admin and Other Infrastructure**			
1	Improvement of Civil Infrastructure	16.65	15.65	15.65
2	Store infrastructure	4.35	4.35	4.35
3	Ready to Use assets for Offices	1.50	2.50	1.80
	Sub-total	**22.50**	**22.50**	**21.80**
	Sub-total (E(1)+E(2)+E(3))	**162.41**	**162.41**	**151.49**
	Total	**516.39**	**398.84**	**381.91**

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

48. The supervision charges are imposed on the consumers when he bears the cost of extension of distribution main or its upgradation under remunerative scheme for availing power supply under Regulation 27 of Supply Code, 2019. The supervision charge is received by the DISCOMs for supervising the work meant for a particular consumer under remunerative scheme which becomes the property of DISCOMs once the infrastructure is energized. Therefore, supervision is meant to ensure that the works are done by the consumers as per standard of the DISCOMs which will be the property of DISCOMs afterwards. But in this case the work will be done by the DISCOMs themselves under Capex for their own use to carry out their own business. Supervising their own work is the part of the business of DISCOMs which is being allowed through their ARR under employee cost. Again, claiming supervision charges for their own work under Capex is not justified and hence we advise DISCOMs not to consider supervision charges while capitalising the assets created under Capex proposal approved by the Commission though it is inbuilt in the Capex approval.

49. In addition to the observations stated above, the Commission directs TPWODL to

(i) Prioritize the completion of important works like strengthening/expansion of distribution infrastructure, measures for loss reduction, metering, addressing overloading & low voltage issue etc. over the Capex plan for IT covering procurement of softwares, implementation of SCADA/GSAS & work related to DR & DC etc.

(ii) Submit the Capex proposal along with the approval of Board of Director for FY 2024-25 onwards for consideration by the Commission.

(iii) Submit the Capital Investment Plan strictly adhering to the provisions of Wheeling & Retail Supply Tariff Regulations, Vesting Orders and the License Conditions prioritizing the operation area of TPWODL (indicating the name of Division & activities undertaken) for proposed investment.

(iv) Submit quarterly progress report for the works along with the details of materials utilised vis-à-vis various activities shown in the DPR.

(v) Formulate implementation plan for the approved Capital Investment and take steps for execution accordingly to avoid cost and time overrun.

(vi) Procure the materials/award the contracts only through transparent competitive bidding process. The requirement of materials shall be prepared based on standardisation of distribution elements. The ratings of equipment / material including DTRs & PTRs need to be standardized across the Discoms and standard specifications need to the adopted across the Discoms.

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

(viii) Ensure that there is no duplication of work covered under the CAPEX approved for 2023-24 and the assets created/ to be created through Government Schemes/support.

(ix) Planned new 33/11 kV substations shall have (N-1) contingency provision for incomer & Power Transformers (PTRs), double bus switching scheme/main & transfer bus scheme with Bus coupler and adequate space should be available in PSS for future expansion to avoid additional substations in the nearby areas.

(x) TPWODL should have regular interaction with the OPTCL to ensure that the requirement of additional Grid Sub-stations (220/33 kV or 132/33 kV or 220/132/33 kV) are planned as per need of TPWODL which will help in resolving low voltage issues and at the same time the available 33 kV outlets from existing Grid Sub-stations of OPTCL should be utilised by TPWODL for their distribution system.

(xi) Provide cost benefit analysis and quantification of benefits in terms of percentage of loss reduction, metering & billing, asset mapping, reduction in low voltage areas, reduction in tripping of 33 kV & 11 kV feeders, reduction in failure of equipment/material (PTRs, DTRs, CBs, SAs, etc.), and improvement in safety by reduction in fatal & non-fatal accidents of human being & animals etc. in different divisions of TPWODL's operating area due to addition of distribution infrastructure covered under the capex proposal for the FY 2023-24.

(xii) Provide the financial plan for funding of capex proposal along with rate of interest for the FY 2023-24

(xiii) The details of investment in development/augmentation of distribution infrastructure in various divisions of the TPWODL.

(xiv) Submit details of compliances of the direction given in the Capex Orders of previous years.

(xv) Submit the system study report relating to installation of capacitor banks.

(xvi) TPWODL need to carry out load flow study of the distribution network for a longer time frame (at least 5 year) as directed during the approval of capex for the FY 2022-23.

(xvii) Submit the status (on the date of taking over and as on 31.03.2023) of existing distribution system for each division indicating the achievement (quantification) in respect of following areas by September 2023:

- Reduction in feeder / line / section length at 33kV & 11kV level;
- Reduction in overloading of 33kV & 11kV lines, PTRS, DTRs;
- Reduction in low voltage pockets;
- Repairing of boundary walls for PSSs and fencing of DSSs;
- (N-1) contingency for PTRs and incomer at 33kV level in existing PSS;
- Smart metering of 33kV & 11kV feeders, PTRs, DTRs, Govt & non-Govt. establishments & 3 phase consumers etc;
- Provision of protection for 33kV & 11kV overhead lines & UG cable, PTRs & DTRs (primary & secondary side);
- Improvement in earthing in PSS &DSS;

- Length (in ckt.km.) of overhead line converted and proposed to be converted to ABC in future.
- No supervision charges shall be considered under Capex.

50. Accordingly, the case is disposed of.

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