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

**Present: Shri G. Mohapatra, Officiating Chairperson**
**Shri S K Ray Mohapatra, Member**

**Case No. 51/2022**

M/s TP Central Odisha Distribution Ltd. (TPCODL) …… Petitioner
Vrs.
M/s GRIDCO Ltd. & Others …… Respondents

**In the matter of:** **Application for approval of capital Investment Plan for the FY 2022-23 (Supplementary) in the licensed area.**

**For Petitioner:** Shri Puneet Munjal, Chief (Regulatory & Govt. Affairs), TPCODL.

**For Respondents:** Ms. Sonali Patnaik, ALO I/c., DoE, GoO, Shri Lalit Mishra, DGM (PP), GRIDCO Ltd.; Shri Sukanta Panda, Sr. GM (RT&C), OPTCL; and Shri R. P. Mahapatra are present. Nobody is present on behalf of SLDC.

**ORDER**

**Date of Hearing: 22.11.2022** **Date of Order: 16.12.2022**

1. This petition has been filed by M/s TPCODL seeking approval for Capital Investment Plan for the FY 2022-23 (Supplementary) in its licensed area of operation. The petitioner, M/s TPCODL, has proposed for approval of additional Capital Expenditure (CAPEX) of Rs.137.25 cr. under the two broad heads of 'Reliability' and 'Load Growth' for 11 kV Feeder Overloading Mitigation (28 nos.), 33 kV Feeder Overloading Mitigation (04 nos.), Augmentation of 33/11 kV Power Transformers for mitigating the issues of overloading (05 nos.), and construction of 33/11 kV PSS to mitigate low voltage issues (02 nos.), which are required to be executed before summer 2023 to maintain the reliability and cater to the high load growth during summer.

2. The petitioner has submitted the following:

| Sl. No | Major Category | Activity | Required Capex (Rs Cr) |
|---|---|---|---|
| 1 | Load Growth | 11 kV Feeder Overloading Mitigation – 28 nos. | 46.74 |
| 2 | Load Growth | 33 kV Feeder Overloading Mitigation – 4 nos. | 22.71 |
| 3 | Load Growth | Augmentation of 33/11 kV Power Transformers for mitigating the issues of Overloading – 5 nos. | 23.94 |
| 4 | Reliability | Construction of 2 nos of 33/11 kV PSS to mitigate low voltage issues | 43.86 |
| **5** | **Total** | | **137.25** |

Detailed description of each activity is as under:

**(a) 11 kV Feeder Overloading Mitigation:**

TPCODL has submitted that it has studied the 11 kV Network of all circles using peak load data in the summer period of FY 2022-23 and studied for AS IS network and for load growth in subsequent years down the line considering load growth of that area. Accordingly, proposed the following for mitigation of overloading at 11 kV level.

| Sl. No | Division | Proposal Details | Mitigation Type | Cost (Rs. Cr.) |
|---|---|---|---|---|
| 1 | BCDD-II | Refurbishment of 11 kV Bharatpur Feeder for mitigation of Overload | Overloading | 0.99 |
| 2 | BCDD-II | Refurbishment of 11 kV K-2 Feeder for mitigation of Overload | Overloading | 0.33 |
| 3 | BCDD-II | Bifurcation of 11 kV Shree Vihar Feeder for mitigation of Overload | Overloading | 5.64 |
| 4 | BCDD-II | Refurbishment of 11 kV Cs Pur-1 Housing Board Feeder for mitigation of Overload | Overloading | 0.8 |
| 5 | BCDD-II | Refurbishment of 11 kV Cs Pur-2 Industry Feeder for mitigation of Overload | Overloading | 1.18 |
| 6 | BCDD-II | Refurbishment of 11 kV Cs Pur-2 BDA-2 Feeder for mitigation of Overload | Overloading | 0.21 |
| 7 | BCDD-II | Bifurcation of 11 kV Panchasakha Nagar Feeder for mitigation of Overload | Overloading | 0.73 |
| 8 | BCDD-II | Refurbishment of 11 kV New Industry Feeder for mitigation of Overload | Overloading | 0.62 |
| 9 | BCDD-II | Refurbishment of 11 kV Polymer Complex Feeder for mitigation of Overload | Overloading | 0.68 |
| 10 | BCDD-II | Refurbishment of 11 kV Sikharchandi Feeder for mitigation of Overload | Overloading | 0.29 |
| 11 | BCDD-II | Bifurcation of 11 kV K-5 Feeder for mitigation of Overload | Overloading | 1.47 |
| 12 | BCDD-II | Bifurcation of 11 kV KIIT Feeder for mitigation of Overload | Overloading | 5.21 |
| 13 | BCDD-II | Bifurcation of 11 kV Kalarahanga Feeder for mitigation of Overload | Overloading | 3.58 |
| 14 | BCDD-II | Bifurcation of 11 kV Patia Feeder for mitigation of Overload | Overloading | 5.13 |
| 15 | BCDD-II | Bifurcation of 11 kV Kolathia Feeder for mitigation of Overload | Overloading | 1.99 |
| 16 | BCDD-II | Refurbishment of 11 kV IRC-3 Feeder for mitigation of Overload | Overloading | 0.21 |
| 17 | BCDD-II | Refurbishment of 11 kV No.2, Sriram Bazar Feeder for mitigation of Overload | Overloading | 0.93 |
| 18 | BCDD-II | Swapping of 11 kV NALCO feeder from PTR-1 to PTR-3 mitigate PTR overloading issue | Overloading | 0.3 |
| 19 | BED | Mitigation of overloading issue of 11 kV Laxmisagar Feeder | Overload Mitigation | 4.66 |
| 20 | BED | Mitigation of overloading issue of 11 kV Jharapada Feeder | Overload Mitigation | 3.85 |

| | | | | |
|---|---|---|---|---|
| 21 | BED | Mitigation of overloading issue of 11 kV PAHAL Feeder | Overload Mitigation | 0.23 |
| 22 | BED | Mitigation of overloading issue of 11 kV Badagada Feeder | Overload and N-1 Mitigation | 1.83 |
| 23 | BED | Mitigation of overloading issue of 11 kV WATER WORKS Feeder | Overload Mitigation | 2.2 |
| 24 | BED | Mitigation of overloading issue of 11 kV BADAGADA LINGARAJ Feeder | Overload Mitigation | 0.72 |
| 25 | BED | Mitigation of overloading issue of 11 kV Mancheswar Feeder No.3 | Overload and N-1Mitigation | 0.22 |
| 26 | BED | Mitigation of overloading issue of 11 kV Mancheswar Feeder No.2 | Overload Mitigation | 0.66 |
| 27 | CED | Refurbishment of 11 kV OTM feeder and Manguli feeder for Mitigation of Overloading of Manguli feeder | Overloading | 1 |
| 28 | CDD-II | Bifurcation of existing 11 kV Old Industry Feeder emanating from 33/11 kV Jagatpur PSS by constructing 1 no of new feeder from 33/1 1kV Jagatpur PSS through RMU. | Overloading | 1.08 |
| | | | **TOTAL** | **46.74** |

TPCODL has stated that by strengthening the line, there would be mitigation of overloading issue and urban consumers will get reliable power supply. The above arrangement will also help to release power supply to upcoming potential consumers. Other benefits include better voltage regulation, annual reduction in energy losses, isolation of faulty feeders, and improved safety to the public & working personnel.

**(b) 33 kV Feeder Overloading Mitigation:**

| Sl. No. | Division | Proposal Details | Mitigation Type | Cost (Rs. Cr.) |
|---|---|---|---|---|
| 1 | BCDD-II | Proposal for laying of 1CX630 sqmm UG cable from Godisahi GSS to proposed RMU at 33 kV Naraj feeder, conductor augmentation of Barang and Naraj feeder for providing reliable power supply and improving N-1 contingency condition of both Naraj and Barang 33 kV feeders. | Overloading, Low Voltage and N-1 | 11.20 |
| 2 | BED | Proposal for conductor augmentation of Kesura-Laxmisagar feeder – I & II from 148 sq.mm OH conductor to 232 sqmm conductor to mitigate overloading issue and improving N-1 contingency condition. | Overloading and N-1 | 2.96 |
| 3 | BED | Proposals to mitigate overloading issue of 33 kV Bhimtangi, Badagada and Lingipur feeders (since there is a delay in commissioning of proposed Badagada OPTCL GSS)<br>a) Porposal for conductor augmentation of Balakati feeder – 0.5 km, interlinking of Badagada PSS to Uttara PSS with 232 sqmm OH conductor – 7 km and 4 km interlinking feeder from Balakati 4 pole to Uttara PSS. | Overloading and N-1 | 7.77 |

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|---|---|---|---|---|
| | | b) Proposal for construction of new 33 kV feeder from Pratapasashan grid to Siula PSS.<br>c) Installation of 2 nos 33 kV RMU at Uttara & Lingipur<br>d) Proposal for augmentation of interlinking 400 sqmm cable with 630 sqmm near T-off to Lingipur PSS. | | |
| 4 | BED | Proposal for replacement of existing lower size 33 kV (300 sqmm/400 sqmm) HT cable inside Mancheswar-B GSS to mitigate overloading issue. | Overloading | 0.78 |
| | | | **TOTAL** | **22.71** |

**(i) Providing reliable power supply and improving N-1 contingency and mitigate overloading issue of Naraj and Barang 33 kV feeders:**

At present, Naraj and Barang 33 kV feeders are emanating from Chandaka –A grid, having mixed type of conductors (55/100) with a length of 19 km and 17 km respectively. Present peak load of Barang 33 kV feeder is 14.1 MVA and Naraj 33 kV feeder is 4.23 MVA. Considering present scenario, there is no N-1 reliability at both the feeders. In addition both the feeders are not capable to meet the future load demand in the area. After linking new feeder from Godisahi GSS and augmentation of Naraj and Barang 33 kV feeders, the feeders will deliver reliable power supply to the consumers. This will mitigate Overloading low voltage and N-1 issue of network. Considering 68% load growth, the feeder will be capable to feed the load demand for next 7 to 8 years. This will benefit in power evacuation from upcoming Godisahi to present and future loads to 33 kV Naraj feeder and ensure reliable power supply, mitigate overloading/ low voltage issue and improve reliability in N-1 contingency condition.

**(ii) Mitigation of overloading of 33 kV Laxmisagar feeder I & II emanating from Kesura grid and improving network reliability at N-1 contingency condition:**

At present, both 33 kV Laxmisagar feeder I & II are emanating from Kesura grid. Present peak load of Laxmisagar-I 33 kV feeder is 19.88 MVA and Laxmisagar – II 33 kV feeder is 22.85 MVA. Considering present scenario, there is overloading and no N-1 reliability at both the feeders. In addition, both the feeders are not capable to meet the future load demand in the area. After augmentation of Laxmisagar – I &II 33 kV feeders, the feeders will deliver reliable power supply to the consumers. Overloading of 33 kV

feeders will be mitigated. Considering 33% load growth, the feeders will be capable to feed the load demand for next 2 to 3 years. TPCODL has stated that the reliability in power supply will be enhanced including the mitigation of over loading after such augmentation.

**(iii) Mitigation of overloading of 33 kV Bhimtangi and Badagada and mitigation of overloading and N-1 connectivity of 33 kV Lingipur feeder:**

At present, both 33 kV Bhimtangi and Badagada feeders are emanating from Ransinghpur grid. Present peak load of Bhimtangi 33 kV feeder is 27.43 MVA and Badagada 33 kV feeder is 22.85 MVA. Considering the present scenario, there is overloading of the 33 kV feeder alongwith no N-1 reliability at both the feeders. In addition, both the feeders are not capable to meet the future load demand in that area. At present, 33 kV Lingipur feeder is emanating from Kesura grid having connectivity with Badagada and Uttara PSS with lower size of conductor/ cable. Present peak load of Lingipur 33 kV feeder is 15.65 MVA. Considering present scenario, there is overloading of the 33 kV feeder along with N-1 reliability issue of the feeder. After augmentation of Balakati 33 kV feeder and interlinking to Uttara PSS along with proposed new feeder form Pratapsasan grid to Siula PSS, the feeders can able to deliver reliable power supply to the consumers. There will also be mitigation of overloading issue of network. Considering 321% load growth, the feeder will capable to feed the load demand for next 2 to 3 years. After augmentation of interlinking line of Badagada T-off to Lingipur PSS, the feeder's N-1 connectivity issue will improve. Overloading and N-1 issue of network will be mitigated. Considering 50% load growth, the feeder will be capable to feed the load demand for next 4 to 5 years. By such augmentation, the consumers will get reliable power supply. Further, there will be mitigation of overloading issue and ensure reliable power supply at N-1 contingency condition.

**(iv) Proposal for mitigation of overloading of 33 kV feeder emanating from Mancheswar-B grid:**

TPCODL has submitted that the primary objective of this proposal is to maintain reliability of power supply, improve N-1 connectivity and mitigate overloading issue of existing network. At present, outgoing 33 kV feeders of Mancheswar-B GSS are laid with lower size cables (1Cx300 sq.mm),

however their connectivity is with higher capacity of network (1Cx630 sq.mm. 232 sqmm and 400 sqmm cables) which restrict the complete utilization of network capacity and cause overloading of 33 kV feeders and non-reliable network. After augmentation of all outgoing feeders, reliability will improve and feeder can be operated at peak capacity. Further, there will be mitigation of overloading and N-1 issue of network. Considering 41% of load growth, the feeder will be capable to feed the load demand for next 4 to 5 years. This will ensure extension of reliable power supply, mitigation of overloading and meet connectivity at N-1 contingency condition.

**(c) Power Transformer (PTR) Augmentation:**

TPCODL has stated that the overloading of PTR is an alarming issue and need immediate attention for implementing mitigation proposals. TPCODL has further submitted that PTR overloading issue can be mitigated by replacement of existing PTR with higher rating of PTR. Since, the overloading is very high in many PTRs, it has been prioritized & considered wherein PTR loading is reaching near to 80% in AS IS condition and will be overloaded in 5 years timeline since lot of unprecedented load growth has been experienced during summer 2022.

| Sl. No | Division | Proposal Details | Mitigation Type | Cost (Rs. Cr.) |
|---|---|---|---|---|
| 1 | BCDD-II | Augmentation of 01 no Power Transformer (PTR-1) from 12.5 MVA to 20/25 MVA at Khandagiri 33/11 kV PSS, supply and installation of switchgear Panel Board 11 kV/I/D VCB ( 8 nos panels – 1 incomer and 7 outgoing) along with modification and extension of control room with other civil works. | PTR Augmentation | 5.82 |
| 2 | BCDD-II | Supply and installation of Switchgear Panel Board 11 kV I/D VCB (8 nos Panels -1 incomer and 7 outgoing) at Infocity alongwith modification and extension of control room with other civil works. | Switchgear Panel Board 11 kV | 1.97 |
| 3 | BED | Augmentation of 02 nos Power Transformer (PTR-2 & 3) from 12.5 MVA to 20/25 MVA at Laxmisagar 33/11 kV PSS, supply and installation of Switchgear Panel Board 11 kV I/D/VC (19 nos panels-2 incomer, 1 bus coupler and 14 outgoing, 2 bus PT) alongwith modification and extension of control room with other civil works. | PTR Augmentation | 11.01 |
| 4 | PED | Augmentation of 01 no Power Transformer (PTR-10 from 8 MVA to 12.5/16 MVA at Talabania 33/11 kV PSS supply and installation of switchgear panel board 11 kV I/D VCB ( 5 | PTR Augmentation 5 | 2.87 |

| | | | | |
|---|---|---|---|---|
| | | nos panels – 1 incomer and 4 outgoing) | | |
| 5 | DED | Augmentation of 01 no power transformer (PTR-1) from 8 MVA to 12.5/16 MVA at College 33/11 kV PSS. | | 2.27 |
| | | | **TOTAL** | **23.94** |

**(i) Augmentation of existing 1 no of 33/11 kV 12.5 MVA power transformer to 20/25 MVA alongwith new switchgear panel at Khandagiri 33/11 kV S/s:**

TPCODL has submitted that the loading of 33/11 Khandagiri PTR-1 is 9.1 MVA at peak load condition of FY 2022-23 shows that the PTR is approximately 76% of loaded. Considering load growth for next 5 years (10% load growth per year for 3 years, thereafter 6% load growth per year for next 2 years), the projected loading of FY 2027-28 would be 13.67 MVA. The PTR -1 will be loaded upto 109% in FY 2027-28. Therefore, TPCODL has proposed for augmentation of PTR-1 from 12.5 MVA to 20/25 MVA at Khandagiri PSS to meet the full load of PTR-1 at peak load condition after 5 years. TPCODL has also proposed to install new 11 kV switchgear panel to meet design requirements to evacuate additional power on 11 kV from Khandagiri PSS to feed the loads in nearby area. They have proposed for extension of existing control room to accommodate the switchgear, since existing control room cannot accommodate new switchgear. This will help mitigation of overloading condition on power transformer.

**(ii) Installation of 11 kV switchgear panel board at Infosys 33/11 kV S/s:**

TPCODL has submitted that 2 nos 11 kV feeders (KIIT, Patia) emanating from Kanan Vihar 33/11 kV PSS and 1 no 11 kV feeder (Sri Vihar) emanating from C.S. Pur -1 33/11kV PSS are overloaded in peak load condition. The 11 kV feeders are namely KIIT, Patia and Sri Vihar having loading of 5.8 MVA and 5.7 MVA and 5.2 MVA respectively during peak load condition. In order to mitigate the overloading of 11 kV existing feeders, TPCODL has proposed for construction of 3 nos of new 11 kV feeders from Infocity 33/11 kV substation namely KIIT new, Patia new and Sri Vihar new to bifurcate the load of existing feeders and mitigate overloading issues. In the existing scenario, there is no spare 11 kV bay is available at Infocity PSS for power evacuation, hence, 11 kV switchgear panel board is required to be installed at Infocity PSS to

facilitate power evacuation through proposed 11 kV outgoing feeders from the 33/11 kV substation. This will resolve the overloading of feeders thereby improving reliability of power supply in the area. Since, existing control room cannot accommodate new switchgear, TPCODL has proposed for extension of existing control room to accommodate the switchgear. This will mitigate the overloading of the existing 11 kV KIIT, Srivihar & Patia feeders. Low voltage issue will be resolved at Srivihar, Patia & KIIT area. Loading will be optimized at Kanan vihar PSS & Infocity PSS.

**(iii) Augmentation of existing 2 nos 33/11 kV 12.5 MVA Power Transformer to 20/25 MVA at Laxmisagar 33/11 kV S/s:**

TPCODL has submitted the loading of 33/11 kV Laxmisagar PTR-2 is 9.6 MVA at peak load condition of FY 2022-23. Considering load growth for next 5 years (10% load growth per year for 3 years, thereafter 6% load growth per year for next 2 years), the projected loading of FY 2027-28 would be 13.83 MVA. PTR -2 will be loaded 115% in FY 2027-28 and PTR-3 will be loaded 111% in FY 2027-28. Also in the existing scenario, the 11 kV Laxmisagar feeder is overloaded upto 5.67 MVA. TPCODL has therefore, proposed for augmentation of existing PTR-2 & PTR-3 from 12.5 MV to 20/25 MVA at Laxmisagar PSS to meet the full load of both PTR-2 and PTR-3 at peak load condition after 5 years of load growth. It is also proposed to install new 11 kV switchgear panel to meet design requirements for evacuation of additional power on 11 kV from Laxmisagar PSS to feed the load of nearby area. Since, existing control room cannot accommodate new switchgear, TPCODL has proposed for extension of existing control room to accommodate the switchgear.

**(iv) Augmentation of existing 1 no 33/11 kV Power Transformer to 12.5/16 MVA at Talabania 33/11 kV S/s:**

As Puri Ratha Yatra is the most important festival of the state and the provision of reliable power supply to the area is of utmost importance, TPCODL has proposed the PTR augmentation proposal at Talabania 33/11 kV substation from 8 MVA to 12.5/16 MVA to mitigate N-1 contingency condition and provide quality and reliable power supply. Loading of 33/11 kV Talabania PTR-1 is 2.9 MVA at peak load

condition of FY 2022-23 and would be 4.6 MVA in the year 2027-28. During N-1 contingency condition, the PTR-2 and PTR-3 will be loaded upto 11.12 MVA and 11.26 MVA respectively. Considering load growth for 2 years (10% load growth per year for 2 years), the projected loading of FY 24-25 would be 13.46 MVA, w.r.t. PTR-2 and 13.62 MVA, w.r.t. PTR-3. During N-1 contingency condition, PTR-1 will be loaded upto 169%, w.r.t. PTR-2 and 170% w.r.t. PTR-3. Therefore, TPCODL has proposed augmentation of PTR-1 from 8 MVA to 12.5/16 MVA at Talabania PSS to mitigate the N-1 contingency overloading condition of both PTRs after 2 years load growth. This proposed augmentation will be helpful in mitigating overloading condition on power transformer during N-1 contingency condition and will extend reliable power during Ratha Yatra.

**(v) Augmentation of existing 1 no 33/11 kV 8 MVA power transformers to 12.5/16 MVA at College 33/11 kV S/s:**

The loading of 33/11 kV college PTR-1 is 7.6 MVA at peak load condition of FY 2022-23. Considering load growth for next 5 years (10% load growth per year for 5 years), the projected loading of FY 2027-28 would be 12.24 MVA. PTR -1 will be loaded to 153% in FY 2027-28. TPCODL therefore proposed for augmentation of PTR-1 from 8 MVA to 12.5/16 MVA at College PSS to mitigate the overloading & meet the expected load growth for next 5 years.

**(d) Construction of 33/11 kV PSS:**

TPCODL in the supplementary CAPEX has proposed the addition of 2 new substation as detailed below:

| Sl. No | Name of Circle | Name of Division | Name of Site | Substation Capacity | Load Category | Cost (Rs. Cr.) |
|---|---|---|---|---|---|---|
| 1 | Dhenkanal | AnED | Panchamahala | 2X8 MVA | Semi Urban | 26.35 |
| 2 | Cuttack | CED | Manguli | 2X8 MVA | Semi Urban | 17.51 |
| | | | | | **TOTAL** | **43.86** |

**(i) 2X8 MVA S/s at Panchamahal:**

TPCODL has proposed the installation of 33/11 kV substation at Panchamahal after conducting a detailed Load Flow Analysis with the existing loads. The power supply to the proposed Panchmahal S/s is planned from 132/33 kV Angul grid s/s which is at a distance of 9.5 km. The proposed Panchmahal substation will also be connected to Meramundali grid which is at a distance of 22.5 km to

meet the N-1 contingency condition. Four associated 11 kV feeders from Panchmahala S/s with a total 11 kV linking of 10.5 km (approx) will divert loads from RCMS 33/11 kV S/s thereby ensure uniform power distribution. The proposed substation with an installed capacity of 2X8 MVA will cater loads of about 2200 consumers of Panchamahal, Saradhapur, Karadagadia, Rantelai, Hulurisingha, Panchamahala, Saradhapur, Gadataila, Talabahal, Badabahal, Kumursingh, Sabalabhanga, Balakata, Shyamasunderpur, Kariabani with an anticipated load of 6 MVA. The Panchamahal GIS Indoor type S/s will be SCADA enabled for smart operation with minimal human intervention in future. The total estimated cost for the proposed substation is about Rs 26.34 Crs.

Installation of 2x8 MVA 33 /11 kV substation at Panchamahal with associated 11 kV lines is required to supply reliable power in the area as well as to meet the increasing load demand in the coming years. The primary reason for this proposal is for improvement of voltage profile, to minimize interruption of power supply to the consumer, availability of alternate power supply and socio-economic development of the inhabitants.

At present, the area is getting power supply from existing 33/11kV RCMS substation through 11 kV feeder Town-1 from RCMS PSS and Sabalbhanga feeder from Bantala PSS. Consumers in these areas are facing low voltage problem and frequent break downs due to snapping of conductors.

The project is needed to eradicate the low voltage problem, improvement of supply system and to cater the future load growth. It is proposed to install 1 33/11 kV substation at Panchamahala with four numbers outgoing 11 kV feeders named Panchamahala, Adarsh, Agriculture and Govt. Polytechnic feeder. The benefit includes technical loss saving of about 11.4 kW on 33 kV and 91 kW on 11 kV level, N-1 redundancy for all important installations, minimization of interruption and strengthening of distribution network.

**(ii) 2X8 MVA S/s at Manguli:**

The proposal for installation of 33/11 kV substation at Manguli has been proposed by TPCODL basing upon a detailed Load flow Analysis with existing loads in that area. The power supply to Manguli s/s is planned from existing City Feeder from 132/33 kV Choudwar grid S/s at a distance of 3.5 Km. The existing 33 kV Tangi feeder will be tapped for a distance of 1 km upto proposed S/s to meet N-1 contingency condition. Three associated 11 kV feeders from

Manguli s/s with a total 11 kV linking of 5 km (approx) will divert loads from Tangi 33/11 kV s/s thereby ensuring uniform power distribution. The proposed substation with an installed capacity of 2X8 MVA will cater loads of about 5550 consumers of Manguli, Nakhara & Kujibar, Napanga & Kesharpur, Sardola & Harianta area with an anticipated load of 4 MVA. The Manguli GIS Indoor S/s will be SCADA enabled for smart operation with minimal human intervention in future. The total estimated cost for the proposed substation of Rs 17.51 Crs.

Installation of 2X8 MVA 33/11 kV substation at Manguli with associated 11 kV lines is required in order to supply reliable power in the area as well as to meet the increasing load demand due to upcoming loads. The primary reason of the proposed sub-station is to improve the voltage profile, minimize interruption of power supply to the consumers, availability of alternate power supply. This will also help in socio-economic development of the inhabitants of that area.

At present the area is getting power supply from existing 33/11kV Tangi substation through 11 kV feeders. There are Five outgoing 11 kV feeder emanating from Tangi substation namely Manguli, Haripur, Bhatimunda, NH-5 and Local. Out of these, existing Manguli 11 kV feeder having length of 7 Kms (trunk and spur lines) carries 4 MVA at its peak load. It caters power supply to Manguli (Ind.), Nakhara & Kujibar, Napanga & Kesharpur, Sardola & Harianta area. Consumers in these areas are facing low voltage problem and frequent interruptions due to snapping of conductors.

The proposed sub-station at Manguli with three numbers outgoing 11 kV feeders namely Manguli, Kashipur and Kaktara is needed to eradicate low voltage problem, improvement of supply system and to cater the future load growth. Proposed Manguli 11 kV feeder will cater loads to the villages mainly Manguli (Ind.) bus stand etc. Proposed Nakhara 11 kV feeder will cater load to Nakhara & Kujibar area. The benefits include technical loss saving of 114 kW on 33 KV and 91 kW on 11 kV levels and to meet contingency conditions, steady supply to N-1 for all important installations, minimization of interruption and strengthening of distribution network.

TPCODL has considered the cost for those projects in line with the approved rates and CAPEX rates. Rates of some of the items which are not available in approved rates and CAPEX rates are considered from Competitive Market prices, SCRIPS. Accordingly, the BoQ and Cost estimate of 33/11 kV S/s (GIS

Indoor), 33 kV line and 11 kV line are finalized in consultation with different wing to TPCODL.

3. The Respondent OPTCL has submitted as follows:

(a) The total CAPEX of Rs 887.58 Cr. allowed by the Commission to TPCODL during the FY 20-21 to 22-23 is almost at par with that of Total Minimum Cumulative CAPEX of Rs.904.00 cr. as per vesting order till FY 2022-23. Further, during the FY 20-21 & 21-22, TPCODL was able to spend only 24.66% & 35.44% of their approved total CAPEX, at the year end of the respective financial year.

(b) The Commission under the head 'Reliability', has approved CAPEX of Rs.274.67 cr. for FY 2020-21 to 2022-23 against their proposal of Rs.346.03 cr. which is around 80% of their requirement. However, they were able to spend only 29.55% & 51.95% of their approved CAPEX under the head 'Reliability' at the end of the FY 20-21 & 21-22.

(c) The Commission has approved Rs. 64.19 Cr. under the head 'Load growth' for the FY 2020-21 and 2021-22 against their proposal of Rs. 117.15 Cr, only disallowing meter installation cost for new connections amounting to Rs.24.43 cr., & Rs. 23.47 cr., for the FY 20-21 & 21-22 respectively. Further, the Commission has approved 100% CAPEX as per TPCODL's proposal under the sub-heads 'Network Extension to release new connection', 'Addition/ Augmentation of PT' & 'Network augmentation/addition to meet load growth' of head 'Load growth'. However, TPCODL was able to spend only Rs.0.16 Cr (1.77%) and Rs. 17.35 Cr (56.84%) of the approved amount for FY 20-21 & 21-22.

(d) It can very well be concluded from the trend of expenditure of TPCODL during the FY 2020-21 & 2021-22 that they have hardly started spending any amount from the CAPEX of Rs.243.31 Cr. approved for FY 2022-23. In the present application, they have not indicated whether they have utilized 100% of the CAPEX amount approved against the heads 'Reliability' & 'Load Growth', for the FY 2020-21 & 2021-22 and capitalization of such assets thereof. TPCODL may be advised to expedite the works for utilization of CAPEX already approved by the Commission in a timely manner and capitalize such assets at the earliest.

(e) TPCODL may be directed to include the schemes of the present petition if so necessary, in the Capital Investment Plan for the FY 2023-24, for approval of Commission.

4. The Respondent GRIDCO has submitted as follows:

(a) GRIDCO agrees with the proposals as they are intended to maintain the reliability of the system and to cater higher load growth.

(b) During the submissions of proposal for CAPEX plan for FY 23 similar proposals were placed for Rs.150 cr. for approval under head 'Bhubaneswar reliability plan' and 'Low voltage in Urban Area", wherein the Commission was not inclined to approve such proposal by citing various reasons as ordered in Case No. 14 of 2022 like need of load flow analysis, need analysis, tariff impact and cost benefit analysis. This proposal covers urban and semi urban areas under Cuttack, Puri & Dhenkanal unlike the earlier proposal which was only targeted the geographical area of BED, BCDD-I & II Divisions. The Commission may carry out necessary prudence check of the proposals submitted by the TPCODL.

5. Heard the Petitioner and Respondents through virtual mode and considered their written submissions. The Commission observes the following:-

(a) The Commission, vide Order dated 19.07.2022 in Case No.14/2022, had earlier approved total CAPEX for Rs.243.31 Cr. While giving go ahead permission to above mentioned proposal, the Commission did not approve another theme based proposal of Rs.150 Cr. relating to 'Bhubaneswar Reliability Plan' and 'Low Voltage in Urban Area' because of non-submission of load flow analysis, tariff impact assessment and cost benefit analysis.

(b) Accordingly, TPCODL has modified their theme based proposal which was targeting only 3 divisions and has submitted the present supplementary Capex proposal based on load flow studies which covers urban & semi urban areas under Cuttack, Puri & Dhenkanal Districts including Capital city Bhubaneswar to address future load growth which will alleviate the issues of over loading of lines & transformers and eradicate issue of low voltage problem. The work will be executed for strengthening of distribution network in form of replacement of overhead conductor & underground cable with higher size, augmentation of transformation capacity & creation of two new substations. After system studies of distribution network, TPCODL has proposed creation of only two new sub-stations against 11 nos. of sub-stations proposed earlier. This will reduce the

investment requirement and will ultimately benefit the end consumers of the State by providing reliable supply by minimising interruptions and improving voltage profile resulting in socio-economic development.

(c) During the proceeding, the Commission had also sought the Board's approval from TPCODL in respect of the present supplementary Capex plan which will be implemented in the FY 2022-23. Accordingly, the petitioner has submitted the Board's approval for present Capex proposal of Rs.137.25 Cr. on 8th December, 2022. TPCODL intend to execute the above Capex work before commencement of next summer of 2023 so that the expected increase in demand during that period can be met and load shedding can be avoided on account of over loading during summer.

(d) The supplementary CAPEX (Rs.137.25 Cr.) has been proposed under the head 'Reliability' and 'Load Growth' for mitigation of overloading of 11 kV & 33 kV feeders, augmentation of 33/11 kV substations at Khandagiri (BCDD-II), Infocity (BCDD-II), Lakshmisagar (BED), Talabania (PED), College (DED, Dhenkanal) for mitigating the overloading of power transformers and construction of two (2) new 33/11 kV PSS at Panchamahala & Manguli to address overloading & low voltage issues.

(e) Each activity proposed by TPCODL under the Category "load growth" and "reliability improvement" are discussed as under:

- **Mitigation of overloading of 11 kV feeder:** The proposal covers 28 nos. of 11 kV feeders which are expected to be overloaded by the FY 2023-24. This may result in frequent breakdown and low voltage on the 11 kV feeders in the summer months of 2023. The strengthening of the line will be carried out at an estimated cost of Rs. 46.74 Cr. and will provide reliable power supply to urban consumers and meet expected load growth. This will result in other benefits like better voltage regulation, reduction in technical losses, isolation of faulty feeders and improved safety.

- **Mitigation of overloading of 33 kV feeder:** The proposal covers 4 nos. of 33 kV feeders to provide N-1 contingency (i.e. availability of alternate source of supply) and address the expected overloading by the FY 2023-24. The strengthening would be carried out at an estimated cost of Rs.

22.71 Cr. and will help in providing reliable power supply by resolving overloading, low voltage issue, and providing N-1 contingency.

- **PTR Augmentation:** The proposal covers augmentation of transformation capacity with higher MVA capacity at existing PSS to address overloading of 5 nos. of power transformers at an estimated cost of Rs.23.94 Cr. This will cater to future load growth in the next 5 years.
- **Construction of 33/11 kV new PSS:** The proposal covers installation of 2 nos. of new 33/11 kV substations at Panchmahal & Manguli each with 2x8 MVA, 33/11 kV power transformers at an estimated cost of Rs. 43.86 Cr. The installation of substations at Panchamahal & Manguli with associated 11 kV lines are required to supply reliable power in the area as well as to meet the increasing load demand. The implementation of this proposal would improve voltage at 11 kV level to 10.76 kV (from 9.4 kV) at Panchamahal and to 10.43 kV (from 9.2 kV) at Manguli.

The cost estimates for above proposals are based on the approved cost data of Government or rates of SCRIPS.

(f) The utilisation of following assets has not been given by TPCODL in their submission.

i. 1x12.5 MVA, 33/11 kV transformer, which is being replaced by 1x25 MVA, 33/11 kV transformer at 33/11 kV Khandagiri sub-station.
ii. 2x12.5 MVA, 33/11 kV transformer, which is being replaced by 2x25 MVA, 33/11 kV transformer at 33/11 kV Laxmisagar substation
iii. 1x8 MVA, 33/11 kV transformer, which is being replaced by 1x16 MVA, 33/11 kV transformer at 33/11 kV Talabania PSS
iv. 1x8 MVA, 33/11 kV transformer, which is being replaced by 1x16 MVA, 33/11 kV transformer at 33/11 kV College PSS.

(g) The load growth in the feeders has been projected ranging from 30% to 321% which appears to be unrealistic and points out to the fact of incorrect assessment of upcoming load and improper sharing of load with other feeders. Therefore, holistic planning of distribution network of TPCODL is required on long term basis.

(h) The transformers, which are being replaced by higher MVA capacity could have been swapped across the substations so that the assets could have been optimally

utilised e.g. 12.5 MVA & 8 MVA transformer, which would be available after replacement by new higher capacity transformer, could have been utilized in the proposed new sub-stations or old existing sub-station.

(i) Justification for 14 nos. & 7 nos. of additional outgoing feeders at existing BED & BCDD-II PSS respectively has not been provided.

6. The Commission is of the view that considering the past performance, it would be difficult for TPCODL for utilisation of Capex approved earlier and proposed additional supplementary Capex for the FY 2022-23. However, considering the projected load growth by TPCODL in next five (5) years, overloading of lines & transformers and low voltage problem, particularly in Bhubaneswar, Cuttack, Puri & Dhenkanal, the Commission approves additional/ supplementary Capex proposal of TPCODL for Rs.137.25 Cr for the FY 2022-23 under the Scheme "Reliability" and "Load growth". A list of the proposals approved by the Commission is available at Annexure-A of this order. The summary of investment proposal is given below:

| Sl. No. | Major Category | Activity | Proposed Capex (Rs Cr) | Approved Capex (Rs Cr) |
|---|---|---|---|---|
| 1 | Load Growth | 11 kV Feeder Overloading Mitigation | 46.74 | 46.74 |
| 2 | Load Growth | 33 kV Feeder Overloading Mitigation | 22.71 | 22.71 |
| 3 | Load Growth | Augmentation of 33/11 kV Power Transformers for mitigating the issues of Overloading | 23.94 | 23.94 |
| 4 | Reliability | Construction of 2 nos. of 33/11 kV PSS to mitigate low voltage issues | 43.86 | 43.86 |
| **5** | **Total** | | **137.25** | **137.25** |

7. The gross Capex approval for FY 2022-23 including above supplementary Capex in the present Case No. 51/2022 becomes as follows:

| Sl. No. | Particulars | Proposed Capex (Rs Cr) | Board Approval (Rs Cr) | Approved Capex by OERC (Rs Cr) |
|---|---|---|---|---|
| **A** | **Statutory, Safety and Security** | **20.19** | **20.19** | **17.66** |
| **B** | **Loss Reduction** | **74.12** | **74.12** | **52.85** |
| **C** | Reliability (Earlier Proposal Case No. 14/2022) | 112.80 | 112.80 | 87.77 |
| | Reliability (Supplementary Proposal Case No. 51/2022) | 43.86 | 43.86 | 43.86 |
| | **Reliability (Total)** | **156.66** | **156.66** | **131.63** |
| **D** | Load Growth (Earlier Proposal Case No. 14/2022) | 25.00 | 25.00 | 24.87 |
| | Load Growth (Supplementary Proposal Case No. 51/2022) | 93.39 | 93.39 | 93.39 |
| | **Load Growth (Total)** | **118.39** | **118.39** | **118.26** |
| **E** | **Infrastructure** | **78.65** | **78.65** | **60.16** |
| | **Total (Earlier Proposal Case No. 14/2022)** | **480.76** | **480.76** | **243.31** |
| | **Total (Supplementary Proposal Case No. 51/2022)** | **137.25** | **137.25** | **137.25** |

| Sl. No. | Particulars | Proposed Capex (Rs Cr) | Board Approval (Rs Cr) | Approved Capex by OERC (Rs Cr) |
|---|---|---|---|---|
| | **Gross Capex approval for FY 2022-23** | | | |
| | **Total (Earlier Proposal Case No. 14/2022)** | **480.76** | **480.76** | **243.31** |
| | **Total (Supplementary Proposal Case No. 51/2022)** | **137.25** | **137.25** | **137.25** |
| | **Total Capex for FY 2022-23** | **618.01** | **618.01** | **380.56** |

8. The year-wise and cumulative Capex proposal approved by the Commission upto the FY 2022-23 including supplementary Capex approved now is as under:-

| | |
|---|---|
| Requirement of Minimum Capex as per Vesting Order for FY 2020-21 | **Rs. 201.00 Cr.** |
| Capex Approved by the Commission for FY 2020-21 | **Rs. 280.63 Cr.** |
| Requirement of Minimum Capex as per Vesting Order for FY 2021-22 | **Rs. 393.00 Cr.** |
| Capex Approved by the Commission for FY 2021-22 | **Rs. 298.73 Cr.** |
| Requirement of Minimum Capex as per Vesting Order for FY 2022-23 | **Rs. 310.00 Cr.** |
| Capex Approved by the Commission for FY 2022-23 | **Rs. 380.56 Cr.** |
| Total Minimum Cumulative Capex as per Vesting Order till FY 2022-23 | **Rs. 904.00 Cr.** |
| Total Cumulative Capex Approved by the Commission till FY 2022-23 | **Rs. 959.92 Cr.** |

9. The approved cost shall be passed in the ARR as per the norms subject to capitalization of the same by the Petitioner and prudence check through audit.

10. The following directions are issued by the Commission to the TPCODL:

(a) TPCODL shall submit single Capex proposal for a financial year instead of submitting supplementary Capex proposals time and again.

(b) The system studies for distribution network need to be carried out properly by TPCODL considering overall load growth in next five years and Capex proposal need to be submitted accordingly for each year.

(c) TPCODL need to co-ordinate & consult with OPTCL while strengthening their distribution network for optimum utilization of 33 kV out going feeders from OPTCL's EHV substations and discuss about requirement for creation of new EHV substation matching with development of distribution network of TPCODL.

(d) For optimum utilisation of assets, swapping of transformers of different rating across the substation shall be properly planned while replacing the existing transformers with high capacity transformers.

(e) Future expansion provision in existing substation need to be judiciously planned instead of creating more unutilised assets which has financial implication and will increase tariff burden on consumer. Rather, adequate space provision may be kept in PSS for future expansion.

(f) In future, TPCODL shall submit Capex proposal with proper justification for utilisation of replaced assets like Power transformers and justification for future expansion plan in existing substation.

11. The case is accordingly disposed of.

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

Sd/-
**(G. Mohapatra)**
**Officiating Chairperson**

**Annexure- A**

**List of proposals approved by the Commission in Case No. 51 of 2022**

**A. Proposals under 11 kV Feeder Overloading Mitigation**

| Sl. No | Division | Proposal Details | Approximate Cost (Rs. Cr.) |
|---|---|---|---|
| 1 | BCDD-II | Refurbishment of 11 kV Bharatpur Feeder | 0.99 |
| 2 | | Refurbishment of 11 kV K-2 Feeder | 0.33 |
| 3 | | Bifurcation of 11 kV Shree Vihar Feeder | 5.64 |
| 4 | | Refurbishment of 11 kV Cs Pur-1 Housing Board Feeder | 0.8 |
| 5 | | Refurbishment of 11 kV Cs Pur-2 Industry Feeder | 1.18 |
| 6 | | Refurbishment of 11 kV Cs Pur-2 BDA-2 Feeder | 0.21 |
| 7 | | Bifurcation of 11 kV Panchasakha Nagar Feeder | 0.73 |
| 8 | | Refurbishment of 11 kV New Industry Feeder | 0.62 |
| 9 | | Refurbishment of 11 kV Polymer Complex Feeder | 0.68 |
| 10 | | Refurbishment of 11 kV Sikharchandi Feeder | 0.29 |
| 11 | | Bifurcation of 11 kV K-5 Feeder | 1.47 |
| 12 | | Bifurcation of 11 kV KIIT Feeder | 5.21 |
| 13 | | Bifurcation of 11 kV Kalarahanga Feeder | 3.58 |
| 14 | | Bifurcation of 11 kV Patia Feeder | 5.13 |
| 15 | | Bifurcation of 11 kV Kolathia Feeder | 1.99 |
| 16 | | Refurbishment of 11 kV IRC-3 Feeder | 0.21 |
| 17 | | Refurbishment of 11 kV No.2, Sriram Bazar Feeder | 0.93 |
| 18 | | Swapping of 11 kV NALCO feeder from PTR-1 to PTR-3 | 0.3 |
| 19 | BED | Refurbishment of 11 kV Laxmisagar Feeder | 4.66 |
| 20 | | Refurbishment of 11 kV Jharapada Feeder | 3.85 |
| 21 | | Refurbishment of 11 kV Pahal Feeder | 0.23 |
| 22 | | Refurbishment of 11 kV Badagada Feeder | 1.83 |
| 23 | | Refurbishment of 11 kV Water Works Feeder | 2.2 |
| 24 | | Refurbishment of 11 kV Badagada Lingaraj Feeder | 0.72 |
| 25 | | Refurbishment of 11 kV Mancheswar Feeder No.3 | 0.22 |
| 26 | | Refurbishment of 11 kV Mancheswar Feeder No.2 | 0.66 |
| 27 | CED | Refurbishment of 11 kV OTM feeder and Manguli feeder | 1 |
| 28 | CDD-II | Bifurcation of existing 11 kV Old Industry Feeder emanating from 33/11 kV Jagatpur PSS by constructing 1 new feeder from 33/1 1kV Jagatpur PSS through RMU. | 1.08 |
| | | **Total** | **46.74** |

**B. Proposals under 33 kV Feeder Overloading Mitigation**

| Sl. No | Division | Proposal Details | Approximate Cost (Rs. Cr.) |
|---|---|---|---|
| 1 | BCDD-II | Proposal for laying of 1CX630 sqmm UG cable from Godisahi GSS to proposed RMU at 33 kV Naraj feeder, conductor augmentation of Barang and Naraj feeder | 11.20 |
| 2 | BED | Proposal for conductor augmentation of Kesura-Laxmisagar feeder – I & II from 148 sq.mm OH conductor to 232 sqmm conductor | 2.96 |
| 3 | BED | Proposals to mitigate overloading issue of 33 kV | 7.77 |

| | | | |
|---|---|---|---|
| | | Bhimtangi, Badagada and Lingipur feeders<br>a) Porposal for conductor augmentation of Balakati feeder – 0.5 km, interlinking of Badagada PSS to Uttara PSS with 232 sqmm OH conductor – 7 km and 4 km interlinking feeder from Balakati 4 pole to Uttara PSS.<br>b) Proposal for construction of new 33 kV feeder from Pratapasashan grid to Siula PSS.<br>c) Installation of 2 nos 33 kV RMU at Uttara & Lingipur<br>d) Proposal for augmentation of interlinking 400 sqmm cable with 630 sqmm near T-off to Lingipur PSS. | |
| 4 | BED | Proposal for replacement of existing lower size 33 kV (300 sqmm/400 sqmm) HT cable inside Mancheswar-B GSS | 0.78 |
| | | **Total** | **22.71** |

**C. Proposals for augmentation of 33/11 kV Power Transformers**

| Sl. No | Division | Proposal Details | Approximate Cost (Rs. Cr.) |
|---|---|---|---|
| 1 | BCDD-II | Augmentation of 01 no Power Transformer (PTR-1) from 12.5 MVA to 20/25 MVA at Khandagiri 33/11 kV PSS, supply and installation of switchgear Panel Board 11 kV/I/D VCB ( 8 nos panels – 1 incomer and 7 outgoing) along with modification and extension of control room with other civil works. | 5.82 |
| 2 | | Supply and installation of Switchgear Panel Board 11 kV I/D VCB (8 nos Panels -1 incomer and 7 outgoing) at Infocity alongwith modification and extension of control room with other civil works. | 1.97 |
| 3 | BED | Augmentation of 02 nos Power Transformer (PTR-2 & 3) from 12.5 MVA to 20/25 MVA at Laxmisagar 33/11 kV PSS, supply and installation of Switchgear Panel Board 11 kV I/D/VC (19 nos panels-2 incomer, 1 bus coupler and 14 outgoing, 2 bus PT) alongwith modification and extension of control room with other civil works. | 11.01 |
| 4 | PED | Augmentation of 01 no Power Transformer (PTR-10 from 8 MVA to 12.5/16 MVA at Talabania 33/11 kV PSS supply and installation of switchgear panel board 11 kV I/D VCB ( 5 nos panels – 1 incomer and 4 outgoing) | 2.87 |
| 5 | DED | Augmentation of 01 no power transformer (PTR-1) from 8 MVA to 12.5/16 MVA at College 33/11 kV PSS. | 2.27 |
| | | **Total** | **23.94** |

**D. Proposals for construction of 33/11 kV Sub-stations**

| Sl. No | Name of Division | Proposal Details | Approximate Cost (Rs. Cr.) |
|---|---|---|---|
| 1 | AnED | Construction of 2X8 MVA 33/11 kV S/s at Panchamahala | 26.35 |
| 2 | CED | Construction of 2X8 MVA 33/11 kV S/s at Manguli | 17.51 |
| | | **Total** | **43.86** |