

**ODISHA ELECTRICITY REGULATORY COMMISSION  
PLOT NO. 4, CHUNUKOLI, SAILESHREE VIHAR,  
CHANDRASEKHARPUR,  
BHUBANESWAR-751021**

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

**Case No. 25/2023**

OPTCL	.....	Petitioner
Vrs.		
TPNODL & others	.....	Respondents

**In the matter of: Application under Condition 10 of its licence Conditions for approval of Investment proposal for construction of 132kV Single Circuit XLPE U/G cable of size 630mm<sup>2</sup> copper from 220/132/33kV Grid S/S at Joda to 132/33kV Grid S/S at Barbil on availing loan assistance from suitable funding agency.**

For the Petitioner: Shri Upendra Kumar Pati, Director (Operation) & Shri Sukanta Panda, Sr. GM (RT&C), OPTCL.

For the Respondents: Shri P.K. Mohanty, Sr. GM, TPNODL.  
None appears on behalf of DoE, GoO.

**Date of hearing: 11.04.2023**

**Date of Order: 03.06.2023**

**ORDER**

1. The petitioner, OPTCL, the State Transmission Utility in this case has submitted an application for approval of investment proposal for construction of 132 kV single circuit UG XLPE cable of 630 mm<sup>2</sup> size (copper) from 220/132/33 kV grid substation at Joda to 132/33 kV grid substation at Barbil along with 132 kV bay extension at both ends on availing loan assistance from suitable funding agency. OPTCL has estimated Rs.57.38 cr. of investment for the execution of this proposed project.
2. As per OPTCL's Licence Condition 7.1 and provision under Section 40 of the Electricity Act, OPTCL, as a Transmission Licensee, is duty bound to make investment to build, maintain & operate an efficient co-ordinated & economic intra-state transmission system. As per OPTCL's Licence Condition 10 read with Condition 23.1, the Petitioner-OPTCL is required to obtain prior approval of the Commission for investment proposal of Rs.10.00 Cr. and above. Accordingly, OPTCL has submitted this investment proposal

of Rs.57.38 Cr. for execution of the aforesaid transmission projects, as per the Licence Condition. As per the Licence Condition, the Commission is to be satisfied about need of such investment and also to examine the economic, techno-commercial & environmental issues attached to such investment proposals. In compliance to the requirements under the License Condition 10.4, OPTCL has submitted the Detailed Project Report (DPR) of the project for investment of Rs.57.38 Cr., along with relevant information and justification pertaining to the above project. OPTCL has proposed the investment primarily to meet the initial power requirement of the upcoming industrial load of around 383 MW in command areas of Barbil.

3. OPTCL has submitted that at present 132/33 kV grid substation at Barbil is availing power supply from 220/132/33 kV s/s at Joda through 132 kV Single Ckt (S/C) line. OPTCL expects higher demand to the tune of 383 MW due to upcoming industrial growth in the command area of Barbil. Since the present 132 kV S/C line will not be able to cater to the expected load growth and in order to avoid the corridor & RoW issues for a 2<sup>nd</sup> overhead line, OPTCL has proposed for laying of 132 kV S/C UG XLPE cable (copper) from Joda to Barbil grid sub-station.
4. OPTCL has submitted that their BoD has accorded the administrative approval for aforesaid project in its 133<sup>rd</sup> meeting held on 04.02.2023. The estimated cost for laying of 132 kV S/C UG XLPE cable of 630 mm<sup>2</sup> size (copper) from Joda to Barbil grid sub-station along with 132 kV bay extension at both ends comes to Rs.57.38 cr. OPTCL further submitted that the completion period of the above UG cabling work shall be 12 months and the work will be executed from own resources (30%-equity, 70%-Loan). Further, Board of OPTCL have already approved for construction of 400/220/132 kV grid substation at Joda /Barbil under TBCB mode with LILO of Kaniha-Bisra 400 kV D/C line at Joda/Barbil. This proposed 400/220/132 kV grid substation will ultimately meet the total load of upcoming industrial growth in Joda and Barbil area. OPTCL has carried out load flow study and as per the study, total reduction in losses of about 1.47 MW is expected after implementation of the aforesaid scheme. OPTCL has also calculated the Cost Benefit Analysis of the project and has submitted benefits to be achieved due to additional sale of energy on account of installation of the said 132 kV single circuit UG XLPE cable from grid s/s at Joda to grid s/s at Barbil.
5. OPTCL has projected reduction of average annual loss to the extent of 1.47 MW, which is equivalent to gain of Rs.151.87 lakhs in monetary term (considering Rs.2.98/ kWh). Considering a transmission loss of 3%, OPTCL expects the availability of additional

energy to the tune of 6627.82 LU/annum, which will bring additional annual revenue of Rs.1855.79 lakhs at the transmission charge of 28 paise/kWh. However, the Commission considering the transmission charge of 24 paise/kWh as approved in ARR & Tariff Order of OPTCL for FY 2023-24 has estimated additional annual revenue of Rs 1590.68 lakhs (instead of Rs 1855.79 lakhs). Thus, OPTCL is expected to receive total annual revenue to the tune of Rs.1742.55 lakhs from this investment. Accordingly, the average annual rate of return and IRR has thus been found to be 30.36% and 300% respectively. OPTCL has submitted that this project is with positive NPV and financially viable.

6. OPTCL has submitted that the System Studies have been conducted in line with the planning criteria considering different load generation scenario under the normal steady state conditions and contingency conditions. OPTCL has submitted that the above investment proposal for construction of 132 kV S/C cable link between Joda & Badbil grid s/s will reinforce the existing transmission network and system will not only meet the immediate requirement but also encourage industrial development in that area with reduction in transmission loss.
7. OPTCL has engaged the consultant M/s. PRDC to conduct a comprehensive system study for the proposal. In this connection, M/s. PRDC has conducted a detailed survey of the existing and proposed system and finalised the proposed cable route. M/s. PRDC has also selected the trench design considering the safety aspect, ease of future maintenance and has prepared the bill of quantity.
8. OPTCL has submitted that UG system is more reliable although initial cost is high. However operational costs will decrease over the life time of the cable alongwith availability of reliable power supply. OPTCL has further submitted that the UG cable system is less prone to damage during severe weather conditions and will support development of a cyclone resilient transmission system and will also reduce the electro-magnetic field effect in surrounding area. Further, this is the most suitable and justifiable solutions for the areas with RoW issues and such system will have less environmental impact and better aesthetics.
9. TPNODL has agreed to the proposal of OPTCL and has submitted that early execution of the project is required to meet the expected load growth in that area.
10. Heard the parties at length through hybrid mode (physical & virtual) and considered their written submissions & argument during hearing. It is observed that:

- a) OPTCL has approached the Commission with the DPR enclosing the relevant information/document along with justification & the cost benefit analysis for approval of their investment proposals for the proposed project.
- b) OPTCL has carried out the system study with the existing network and with the proposed network expansion & strengthening to meet future need. Considering the present power requirement and upcoming industrial growth in command area of Barbil, the expected load will be about 380 MW.
- c) The petitioner-OPTCL has justified that the investments would strengthen power transmission system; reduce loading on certain section of OPTCL's transmission network; reduce the overall transmission losses, ensure better quality of power supply to industrial area of Joda & Barbil under TPNODL and would enable OPTCL to receive economic return.
- d) The Board of Directors (BoD) of OPTCL has accorded administrative approval. The project does not have any adverse environmental impact or resettlement issue and the overall impact of the projects are highly positive. OPTCL has also submitted that 400/220/133 kV gird s/s at Joda/Barbil will be executed under TBCB route to meet the load growth due to upcoming industries in Joda and Barbil area. OPTCL has engaged PFC as consultant for the said assignment.

11. The Commission has studied the technical and commercial viability of the project as submitted by OPTCL, which is summarized below:

Name of the Project	Project Cost (Rs. Cr)	Net Cash flow (Rs. Cr)	Period of Benefits (in Yrs)	Avg. Return estimated by OPTCL (%)	Payback period (in Yrs)	NPV estimated by OPTCL @ 9.86% Dis. Factor (Rs. Cr)	IRR estimated by OPTCL (%)	Viability
The construction of 132kV Single Circuit U/G XLPE cable of 630mm <sup>2</sup> size (copper) from 220/132/33 kV Grid S/S at Joda to 132/33kV Grid S/S at Barbil	57.38	497.21	35	30.36	3.29	115.06	300	Viable

- (a) The above table shows that the project is economically viable.
- (b) The stakeholders have agreed for implementation of projects for extending reliable power supply to the upcoming industries in Barbil area under TPNODL.

- (c) The proposed investment would meet the initial power requirement of upcoming industrial development in the command area of Barbil.
- (d) The underground cable system will reduce environmental impact due to lightening and electromagnetic field effect in the surrounding area.
12. In view of the above considerations, the Commission is inclined to approve the investment proposal of OPTCL for Rs.57.38 crores for construction of 132 kV single circuit UG cable link (XLPE copper cable of 630 mm<sup>2</sup> size) from 220/132/33 kV grid substation at Joda to 132/33 kV grid substation at Barbil alongwith 132 kV bay extension at both ends for development of reliable transmission system to facilitate the industrial development and enable OPTCL to receive economic return.
13. The petitioner, OPTCL is directed to ensure that –
- (a) the project is completed in time to avoid cost and time overrun.
- (b) 132 kV XLPE cable link between the sub-stations at Joda and Barbil shall have three (3) single core cable and one (1) spare cable with adequate length for looping of cable at either end to address failure of any straight through joints.
- (c) Proper bonding/ earthing is done so that sheath voltage under full load condition does not exceed allowable voltage limit for safety of human being.
- (d) Suitable provision has to be made for providing current differential protection (using numerical relay) for the cable link between the substations at Joda & Barbil and for monitoring of hot spots along cable run including joints & terminations using fibre optic cable.
14. With the above directions and observations, the case is disposed of.

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

Sd/-  
**(G. Mohapatra)**  
Member

Sd/-  
**(S. C. Mahapatra)**  
Chairperson