

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

*** **

**Present : Shri U. N. Behera, Chairperson
Shri G. Mahapatra, Member**

Case No. 45/2021

OPTCL	Petitioner
Vrs.		
TPCODL & Others	Respondents

In the matter of: Application for Investment proposal of OPTCL to be taken up from the current FY 2021-22 for construction of 220/33 kV and 132/33 kV sub-stations along with associated transmission lines on availing loan assistance from suitable funding agency.

For the Petitioner: Shri Samir Swain, Director (Fin.), OPTCL, Shri Rajiv Lochan Panda, Director (Projects), OPTCL, Shri Sudipta Kumar Sengupta, CGM (Const.), OPTCL, Shri Tapas Patnaik, GM, OPTCL

For the Respondents: Shri Vidyadhar Wagle, the representative of TPCODL, Shri K. C. Nanda, DGM (Fin.), TPWODL, Shri Binod Nayak, Asst. GM (Comm.), TPSODL, Ms. Malancha Ghose, Asst. GM (RA), TPNODL, Shri R. P. Mahapatra and Ms. Sonali Pattnaik, ALO, DoE, GoO.

Date of hearing: 23.11.2021

Date of Order: 27.12.2021

ORDER

OPTCL, the State Transmission Utility, the petitioner in this case has submitted an application for approval for setting up of Grid substations at Telkoi, Balichandrapur, Hirakud, Nabarangpur, Lamataput and Birmaharajpur. As per the Licence Condition 10 read with Condition 23.1 of OPTCL, the petitioner is required to take approval of the Commission, if the proposed investment is Rs.10.00 Cr. or beyond that level. The present investment proposal exceeds the said limit. As per the Licence Condition, the Commission is to be satisfied about need of such investment and is also to examine the economic, technical system and environmental issues attached to such investment. The details of investments are as follows:

2. OPTCL has proposed the construction of new 2X20MVA, 220/33kV Sub-Station at Telkoi (Keonjhar district) along with 14.618 KMs of 220 kV LILO line from One Ckt of 220 kV TTPS-Joda Line with an estimated cost of Rs.55.71 crores. The funding for the same shall be with 30% equity support from the Government and balance by availing 15 years term loan from banks/financial institutions including 3 years

moratorium. OPTCL has submitted that at present the 33/11kV Telkoi Distribution Sub-Station is availing power from 2x20MVA, 220/33kV GIS Grid Sub-Station, Ranki, Keonjhar through a lengthy 33kV Telkoi feeder of about 60 Kms. The voltage profile is very low near Telkoi due to lengthy feeder and more numbers of connected Distribution Sub-Stations. The areas under these Distribution Sub-Stations are also facing frequent power interruption due to the single feeder. OPTCL, in order to eradicate the low voltage problem, frequent power interruption at Telkoi and nearby areas, to meet N-1 contingency condition and to have more stable connectivity at 200 kV level has proposed the Grid Sub-station at Telkoi. The proposed Grid Sub-station at Telkoi will feed 33/11KV Substations at Telkoi (11 Kms), Jagamohanpur (4 Kms) and RWSS Mega Water Project (12.00Kms). The proposed substation is basically required for the quality, stability & reliability of the power supply and to improve the voltage profile. Additionally there is a vast scope of load growth because of the surrounding mining area, expected industrial growth, tourist spots, upcoming Mega lift irrigation projects etc. With this project, OPTCL has projected the reduction of average annual loss to the extent of 0.36 MW, which with consideration of price of Rs.2.78/ kWh, comes to Rs.34.76 lakh in monetary term. Expectation of 70% utilization of 2x20 MVA capacity at the proposed grid S/S and with 3% transmission loss it shall make available additional 1284.78 LU, which shall cause OPTCL to earn additional annual revenue of Rs.321.19 lakhs at the transmission cost of 25 paise (pre-revised price). Thus, OPTCL expects total annual revenue from this investment to the tune of Rs. 355.95 lakhs. The average rate of return has thus been found to be 6.39%.

3. OPTCL has proposed the construction of new 2X40MVA, 220/33kV Sub-Station at Balichandrapur (Jajpur) along with 1.5 KMs of 220 kV LILO line from the existing 220 kV New Duburi-Paradeep Ckt-II line with an estimated cost of Rs. 47.28 crores. The funding for the same shall be with 30% equity support from the Government and balance by availing 15 years term loan from banks/financial institutions including 3 years moratorium. OPTCL has submitted that 33/11kV Balichandrapur Distribution Sub-Station at present is availing power from 2x20 + 1x12.5 MVA, 132/33kV Grid Sub-Station, Salipur through 33kV Mahanga Feeder. The length of the feeder is around 32Kms from Salipur Grid Sub-Station. Also, Salipur, Mahanga and Kothapada 33/11kV Distribution Sub-Stations are connected to the same feeder, therefore, due to higher length of line and more numbers of connected Distribution Sub-Station, the voltage profile is very low near Balichandrapur. The areas under these Distribution Sub-

Stations are also facing frequent power interruption due to the operation of single feeder. Further, upcoming Raisunguda and Erkana 33/11kV Distribution Sub-Stations are planned to be connected with the 33kV Mahanga Feeder. This would again deteriorate voltage profile of the areas connected to this feeder. Also, the proposed Grid Sub-station at Balichandrapur will act as an alternative supply to the distribution sub-stations making the Distribution system stable and more reliable. Further, the load in that area will grow in future because of the presence of tourist places Lalitagiri, Udayagiri and Ratnagiri called “Diamond Triangle” of Odisha & upcoming Mega lift irrigation projects. The proposed 220/33kV Grid Sub-station at Balichandrapur will feed to the existing 33/11 kV substations at Balichandrapur, Chhata, Erkana, Mahanga & Kundal. This substation is also required to share the load of Kendrapara to avoid transformer overloading during normal and N-1 contingency condition and will improve the voltage profile of the area. With this project, OPTCL has projected the reduction of average annual loss to the extent of 1.43 MW, which with consideration of price of Rs.2.78/ kWh, comes to Rs.138.13 lakh in monetary term. Expectation of 70% utilization of 2x40 MVA capacity at the proposed grid S/S and with 3% transmission loss it shall make available additional 2569.55 LU, which shall cause OPTCL to earn additional annual revenue of Rs 642.39 lakhs at the transmission cost of 25 paise (pre-revised rate). Thus, OPTCL expects total annual revenue from this investment to the tune of Rs. 780.52 lakhs. The average rate of annual return and IRR has thus been found to be 16.51% and 40.44% respectively.

4. OPTCL has proposed the construction of new 2X40MVA, 132/33kV Gas (SF6) Insulated Sub-Station at Hirakud (Sambalpur) along with 0.209 KMs of DC LILO from 132KV Burla to Hirakud D.C line with an estimated cost of Rs.48.41 crores. The funding for the same shall be with 30% equity support from the Government and balance by availing 15 years term loan from banks/financial institutions including 3 years moratorium. OPTCL has submitted that the project will improve the Socio-economic status of western part of Odisha and also meet the expected load growth in Hirakud area due to urbanization and Industrial development. At present, large and important areas like Medical College & Hospital are getting power supply through a single 33kV feeder. As the 33kV feeder passes through Hirakud catchment area, sometimes during break down of the feeder the area remains without power. Considering the future load growth of around 25MW, which could not be catered by a single 33kV feeder, OPTCL has proposed this 132/33kV Grid Sub-Station to meet the

future expected load as well as for stable and reliable power supply. OPTCL stated that the new project will reduce the loading at 33kV from Burla Grid Sub-station and will also feed the upcoming load of 2x8MVA, Remed, Primary Sub-Station to be commissioned by TPWODL under ODSSP. OPTCL has justified the project submitting that the project will improve the quality and reliability of power supply at Hirakud and its adjacent areas namely Gandhi Nagar, Medical, Sambalpur, HPCL etc., as well as minimize the losses. OPTCL has proposed to construct 132/33kV GIS substation at Hirakud instead of AIS because of land constraint, ease of operation and less maintenance cost. OPTCL has projected the reduction of average annual loss to the extent of 0.49MW, which with consideration of Rs.2.78/ kWh, comes to Rs.47.31lakh in monetary term per year. Expecting of 70% utilization of 2x40 MVA capacity at the proposed grid S/S and with 3% transmission loss it shall make available additional 2569.55 LU, which shall cause OPTCL to earn additional annual revenue of Rs 642.39 lakhs at the transmission cost of 25 paise per unit (pre-revised rate). Thus, OPTCL expects total annual revenue from this investment to the tune of Rs. 689.70 lakhs. The average rate of annual return and IRR has thus been found to be 14.25% and 26.48% respectively.

5. OPTCL has proposed the construction of new 2X20MVA, 132/33kV Sub-Station at Nabrangpur along with associated 25 Kms (Approx) 132kV LILO line from existing 132KV Jaynagar-Tentulikhunti Ckt-II line with an estimated cost of Rs. 39.17 crores. The funding for the same shall be with 30% equity support from the Government and balance by availing 15 years term loan from banks/financial institutions including 3 years moratorium. At present, 33/11kV Nabrangpur Distribution Sub-Station is getting power supply from 2x20 + 1x12.5 MVA, 132/33kV Grid Sub-Station, Tentulikhunti through 33KV Nabrangpur feeder having a length of around 28kms. Further, 33/11kV Boriguma Distribution Sub-Station, which is located at a distance of 21.7kms from 33/11kV Nabrangpur Distribution Sub-Station, is getting supply from the Nabrangpur Distribution Sub-Station. Additionally primary 33kV substations namely Sanamaisingapur, Chatiguda and Papdahandi are coming up in this area. The voltage profile is very low near Nabrangpur due to lengthy feeder and more numbers of connected Distribution Sub-Station. The areas under these Distribution Sub-Stations are also facing frequent power interruption and low voltage due to the single feeder. OPTCL to eradicate the low voltage and frequent power interruption in Nabrangpur being the District Head Quarter and its nearby areas has proposed 2x20 MVA,

132/33kV Grid Sub-station at Nabrangpur. Also the proposed 2x20 MVA, 132/33kV Grid Sub-station at Nabrangpur will share the load of Tentulikhunti, and will also act as an alternative supply to the distribution sub-stations making the Distribution system stable and more reliable. OPTCL has included the proposed Sub-Station in its 14th Transmission Plan and submitted to OERC for approval. Hence OPTCL has proposed to construct the 2x20 MVA, 132/33kV sub-station at Nabarangpur. With this project, OPTCL has projected the reduction of average annual loss to the extent of 0.32MW, which with consideration of Rs.2.78/ kWh, comes to Rs.30.93 lakh in monetary term. Expecting 70% utilization of 2x20 MVA capacity at the proposed grid S/S and with 3.8% transmission loss it shall make available additional 1284.78 LU, which shall cause OPTCL to earn additional annual revenue of Rs 321.19 lakhs at the transmission cost of 25 paise per unit (pre-revised rate). Thus, OPTCL expects total annual revenue from this investment to the tune of Rs. 352.12 lakhs. The average rate of annual return and IRR has thus been found to be 8.99% and 6.03% respectively. OPTCL has submitted that this project is not economically viable but is required for the stability of 132 KV system and improvement of socio economic condition of the people of the area along with stability in power supply to the District Head Quarter.

6. OPTCL has proposed the construction of new 2x20MVA, 132/33kV Sub-Station at Lamataput (Koraput) along with associated 0.65 Kms LILO line of 132 kV DC line from 132 kV Machhakund Power House – RTSS Line with an estimated cost of Rs.30.06 cr. The funding for the same shall be with 30% equity support from the Government and balance by availing 15 years term loan from banks/financial institutions including 3 years moratorium. At present, Nandapur, Lamataput, Padwa areas are getting power from Sunabedha S/s, which is at a distance of more than 60 KMs. The area is a back ward tribal area of Koraput district. OPTCL has submitted that 33kV lines from the EHV S/s are too long due to which the voltage profile of these areas is very low. To provide quality and reliable power there is a need of one 132/33kV S/s at Lamataput and will be connected through 132kV line from Machhakund Power House. OPTCL in order to reduce the 33kV feeder length and to extend quality and reliable power to the Lamataput, Nandapur, Padwa & Peta area and to draw the Odisha share of Machhkund generation has proposed for establishment of 132/33kV Sub-Station at Lamataput. OPTCL has included the proposed Sub-Station in its 14th Transmission Plan and has submitted to OERC for approval. With this project, OPTCL has projected the reduction of average annual loss to the extent of 0.32MW,

which with consideration of Rs.2.78/ kWh, comes to Rs.30.51 lakh in monetary term. Expecting 70% utilization of 2x20 MVA capacity at the proposed grid S/S and with 3% transmission loss it shall make available additional 1284.78 LU, which shall cause OPTCL to earn additional annual revenue of Rs 321.19 lakhs at the transmission cost of 25 paise per unit (pre-revised rate). Thus, OPTCL expects total annual revenue from this investment to the tune of Rs. 351.70 lakhs. The average rate of annual return and IRR has thus been found to be 11.70% and 15.11% respectively.

7. OPTCL has proposed Construction of new 2x20MVA, 132/33kV Sub-Station at Birmaharajpur (Sonepur) along with associated 132 kV DC line of 20 Kms (Approx.) from 132/33KV Grid S/s Sonepur to 132/33 kV Grid S/s, Birmaharajpur with an estimated cost of Rs. 28.59 crores. OPTCL has submitted that the State Government has agreed to extend 100% equity support for execution of the project. However, OPTCL has calculated the NPV and IRR considering the debt:equity ratio of 70:30. At present, 33/11kV Birmaharajpur Distribution Sub-Station is availing power from 2x40+1x20 MVA, 132/33kV Grid Sub-Station, Sonepur through 33 kV Birmaharajpur feeder of around 19 Kms length and feeding the areas of Champapur, Birmaharajpur Town, Jaloi, Dharmasala & Telipalli. OPTCL has submitted that the voltage profile is very low/unstable near Birmaharajpur and the aforesaid areas due to lengthy feeder, more numbers of connected Distribution Sub-Stations and overloaded OLIC points. Further, the critical loads of spinning mill, Sonepur, PHD Sonepur etc. are being fed from Sonepur s/s. The areas under these Distribution Sub-Stations are also facing frequent power interruption. So, in order to eradicate the low voltage profile, frequent power interruption of Birmaharajpur and nearby areas, OPTCL has proposed for construction of 2x20 MVA, 132/33kV Grid Sub-station at Birmaharajpur. Additionally, 2x20 MVA, 132/33kV Grid Sub-station at Birmaharajpur will act as an alternative supply to the distribution sub-stations making the Distribution system stable and more reliable. TPWODL will also be able to meet the consumers expectation of Birmaharajpur, Ulunda, Subalaya, Champapur Jaloi, Dharmasala and Telipalli area including future load growth in that area. Hence, OPTCL has proposed to construct the 2x20 MVA, 132/33kV sub-station at Birmaharajpur. With this project, OPTCL has projected the reduction of average annual loss to the extent of 0.19MW, which with consideration of Rs.2.78/ kWh, comes to Rs.17.98 lakh in monetary term. Expecting 70% utilization of 2x20 MVA capacity at the proposed grid S/S and with 3% transmission loss it shall make available additional 1284.78 LU, which shall cause OPTCL to earn additional

annual revenue of Rs 321.19 lakhs at the transmission cost of 25 paise per unit (pre-revised rate). Thus, OPTCL expects total annual revenue from this investment to the tune of Rs. 339.17 lakhs. The average rate of annual return and IRR has thus been found to be 11.86% and 14.63% respectively.

8. OPTCL has estimated an investment of Rs. 249.22 Cr. for execution of the above projects. The investment proposal in brief is mentioned below:

Sl. No.	Brief Description of the Project	Estimated Cost (Rs in Cr.)
(i)	2X20 MVA, 220/33 kV Sub-Station at Telkoi along with associated transmission line.	55.71
(ii)	2X40 MVA, 220/33 kV Sub-Station at Balichandrapur along with associated transmission line	47.28
(iii)	2X40MVA, 132/33kV GIS Sub-Station at Hirakud along with associated transmission line.	48.41
(iv)	2X20MVA, 132/33kV Sub-Station at Nabrangpur along with associated transmission line.	39.17
(v)	2x20MVA, 132/33kV Sub-Station at Lamataput along with associated transmission line.	30.06
(vi)	2x20MVA, 132/33kV Sub-Station at Birmaharajpur along with associated transmission line.	28.59
	Total	249.22

9. OPTCL has submitted that prior discussion has been made with the concerned DISCOMs as regards to the proposal in their respective area. As stated by OPTCL, no major environmental or resettlement issues are envisaged for these projects. OPTCL has also submitted the Environmental Impact Assessment (EIA) Study for the six projects. OPTCL has stated that the procurement of materials and services shall be taken up through National Competitive Bidding. The entire work for these proposed projects shall be treated as single packages separately and the award would be made on Turn-key basis for the individual proposals.
10. From the submission of OPTCL, it is understood that OPTCL has already started the execution of the aforesaid projects for improvement of power supply system, reduction in loading on certain line section of OPTCL's network and reduction of the overall/ transmission losses and improvement of voltage profile. OPTCL has submitted the technical and economic justification as regards to the requirement for the proposed projects to meet the system need for the future years. All the projects except the substations at Telkoi and Nabrangpur are economically viable. The status of the

projects and the anticipated load on these substation as submitted by OPTCL is as follows:

Sl. No.	Name	Date of LOA issued	Scheduled completion	Expected completion	Anticipated Load(MW)
1	Telkoi	20.08.2018	August, 2020	Charged on June' 2021	25 to 30
2	Balichandrapur	27.02.2019	February'2021	August' 2022	20 to 25
3	Hirakud(GIS)	23.08.2018	February'2020	October' 2021	18 to 20
4	Nabarangpur	01.03.2019	February'2021	October' 21	30 to 35
5	Lamtaput	28.11.2018	November'2020	March'2022	25 to 30
6	Birmaharajapur	08.03.2019	March' 2020	December'2021	25 to 30

11. One of the respondents, Sri R. P. Mohapatra has raised queries about the anticipated load, additional quantum of energy expected to be handled in the proposed substations, validity of the cost estimates, operating cost & reliability of GIS substation etc. Sri Mohapatra has also stated that the submission of approval of investment after the issuance of LOA is a gross violation of the licence condition. The approval of BoD of OPTCL should not by-pass the statutory requirement of the approval of the Commission. Government of Odisha has to provide grants for all the projects and the expenditure incurred should not be considered while determining the ARR of OPTCL. A procedure of Joint Construction Schedule should be adopted so that DISCOMs will be ready with their downstream evacuation arrangement to draw load at the time of commissioning of grid s/s. Further, indiscriminate construction of GIS substation with high capital cost in comparison to AIS should be avoided otherwise there will be unnecessary increase of transmission charge of OPTCL.
12. OPTCL in its reply has submitted that around 25 to 30 MW of additional load is anticipated in each of these substations. Exact loading may be known after commissioning of the s/s, however the growth in demand has been observed only after commissioning of substations. In this regard, OPTCL has submitted that there is a significant load growth in the s/s like Barapalli, Dabugaon, Umerkote, Konark and Bhawanipatna after the commissioning. OPTCL is awarding the projects to the L₁ bidder through the open tendering process, which is within the limit of the estimated cost considering the price variation at that point of time with due approval of BoD of OPTCL. Further, the project cost of GIS s/s is about 30% higher than the AIS s/s of same capacity. However, OPTCL has not yet experienced any major expenditure on O&M in its existing GIS s/s. On the other hand the operation will be easier and

maintenance will be less in these type of s/s. OPTCL has submitted that constraint in availability of land is the primary reason for construction of GIS.

13. Other respondents in this case i.e. all the four distribution licensees of the State have supported the submission and views of OPTCL and have prayed for speedy execution of the projects.
14. On examination of the application of OPTCL, it is found that earlier the Commission in the Business Plan of OPTCL for the period from 2014-15 to 2018-19 had accorded in-principle approval of the substations at Telkoi, Hirakud and Birmaharajpur vide its order dated 30.07.2016 in case no 05 of 2016. OPTCL has now approached the Commission with the DPR along with the cost benefit analysis for approval of the investment proposals for those substations. However, OPTCL has submitted three new proposals i.e. substations at Balichandrapur, Nabarangpur and Lamtaput along with the above for consideration by the Commission. It is found that the investments have been justified for improvement of power supply system, reducing loading on certain line section of OPTCL's network, reducing the overall transmission losses and improvement of voltage profile. OPTCL has made the system study with the existing arrangement and the proposed arrangement for the six investment proposals. As submitted, the BoD of OPTCL has accorded administrative approval for the aforesaid projects. OPTCL has submitted that investment has been made taking into account the fundamental requirement to (i) ensure quality of supply, minimize interruption of power supply, enhance security / reliability of power system, strengthening of transmission system, availability alternative power supply and (ii) enable OPTCL to receive an economic return.
15. The Commission studied the technical and commercial viability of the projects as submitted by OPTCL. These are summarized below:

Sl No	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
1	2X20 MVA, 220/33 kV Sub-Station at Telkoi.	55.71	(125.09)	25	6.39	15.65	-17.44	(-)ve	Not Viable
2	2X40 MVA,	47.28	120.21	25	16.51	6.06	23.14	40.44	Viable

Sl No	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
	220/33 kV Sub-Station at Balichandrapur								
3	2X40 MVA, 132/33 kV GIS Sub-Station at Hirakud	48.41	95.74	25	14.25	7.02	16.93	26.48	Viable
4	2X20MVA, 132/33kV Sub-Station at Nabrangpur	39.17	24.58	25	8.99	11.12	-4.50	6.03	Not Viable
5	2x20MVA, 132/33kV Sub-Station at Lamataput	30.06	40.27	25	11.70	8.54	4.09	15.11	Viable
6	2x20MVA, 132/33kV Sub-Station at Birmaharajpur	28.59	39.01	25	11.86	8.43	3.45	14.63	Viable

16. The above table shows that apart from 2X20MVA, 220/33kV Sub-Station at Telkoi and 132/33 kV s/s at Nabarangpur, all other projects are economically viable. We observe that OPTCL has started the execution of the projects prior to the approval of the investment proposal by the Commission. This violates the provisions of the licence condition and is improper. OPTCL should therefore stop such practices in future. Henceforth, non-adherence of the statutory provisions will be viewed seriously. However, since most of the projects are required in the larger interest of the society for improvement in socio-economic conditions of the people of that area and the stake holders have given their consent to implement these projects, and OPTCL has started executing the projects, therefore, in line with the prayer made by OPTCL, the Commission in the instant cases is inclined to give in principle approval of the projects.
17. The Commission further observe from the submission of OPTCL that the State Government wants to support the projects coming up in the remote areas for the larger interest of the people of the state and to cater the additional demand requirement by the upcoming industries, mega lift points etc. However, in this type of funding arrangement, OPTCL may pay more in terms of return on equity, which will ultimately burden the consumers of the State. In the above back drop, we are of the opinion that State Government may give grant instead equity support for taking up those projects.

18. The Commission hereby directs OPTCL to take up the matter with Govt. of Odisha to fund the economically unviable projects that are required for the larger interest of the State through grants.
19. OPTCL should ensure that the projects are completed in time. In case the projects go beyond their schedule as given by them, the Commission may not allow the cost overrun of the same in the ARR of the Petitioner. OPTCL is also directed to delegate adequate technical, administrative and financial power to those officers entrusted with timely completion of the proposed projects. A committee may be constituted with the concerned officials of OPTCL and DISCOMs for each project to prepare and subsequent adherence to the Joint Construction Schedule. OPTCL is required to submit a report on the progress of the execution of the above projects to the DISCOMs with a copy to the Commission so that adequate downstream infrastructure can be built up for evacuation of power by DISCOMs to avoid asset being stranded and under utilization of assets created by OPTCL. In no case, the investment should remain idle because of deficit in downstream evacuation arrangement.
20. With the above directions, the case is disposed of.

Sd/-
(G Mahapatra)
Member

Sd/-
(U.N.Behera)
Chairperson