ODISHA ELECTRICITY REGULATORY COMMISSION
BIDYUT NIYAMAK BHAWAN
UNIT-VIII, BHUBANESWAR - 751 012
****

Present : Shri S. P. Nanda, Chairperson
Shri S. P. Swain, Member
Shri A. K. Das, Member

Case No. 79/2012

M/s. OPTCL …… Petitioner

Vrs.

Department of Energy & Others …..... Respondents

In the matter of: **Application under Chapter 3 of Orissa Grid Code (OGC) Regulations 2006 read with Clause 16 of the License Conditions of OPTCL seeking approval of the Hon'ble Commission to the Intra-State Transmission Plan for Odisha upto the end of 12th plan period i.e. 2016-17.**

For Petitioner: Shri C. Rakshit, Sr. General Manager (C.P.),OPTCL
Shri P. K. Dash, CGM (TP&C), OPTCL,
Shri S. K. Hota, CGM (Construction), OPTCL,

For Respondents: Shri P. K. Mohanty, President, M/s CCPPO,
Shri D. Behera, DGM, CESU,
Shri S. K. Harichandan, AGM, CESU
Shri Niladri Khadanga, CSO, WESCO, NESCO & SOU
No body is present on behalf of OHPC, OPGC, GRIDCO,
DoE, GoO, Odisha Thermal Power Corporation Ltd.,
M/s. Sterlite Energy Ltd., CEA, ERPC and PGCIL.

ORDER

Date of Hearing: 22.04.2014 **Date of Order :04.06.2014**

The Petitioner OPTCL (State Transmission Utility) is charged with responsibility of preparing a long-term (10 years) Transmission System expansion plan and submit it to the Commission for approval under various applicable provisions under Electricity Act, 2003 and OGC, 2006. The state transmission proposal including the system strengthening schemes need to be based on planning studies and to be finalised in consultation with CTU, State Govt., Generating Companies, Regional Power Committee, Central Electricity Authority and any person notified by the state govt. on this behalf. The extract of Odisha Grid Code, 2006 depicting the relevant provision is given below:

Extract of Orissa Grid Code Regulations, 2006

3.8 PERSPECTIVE PLAN

(1) The STU is charged with the responsibility to prepare and submit a long-term (10 years) plan to the Commission for Transmission System expansion to meet the future demand in accordance with the Licence Conditions.

(2) For fulfilment of the above requirement the STU shall:

(a) Forecast the demand for power within the State in each of the succeeding five years and provide to the Commission details of the demand forecasts, data, methodology and assumptions on which the forecasts are based.

(b) Prepare a least cost generation plan for the State to meet the ten years load demand as per the forecast, after examining the economic, technical and environmental aspects of all available alternatives taking into account the existing contracted generation resources and effects of demand side management.

(c) Discharge all functions of planning and co-ordination relating to the State Transmission System compatible with the above load forecast and generation plan a long-term (10 years) plan for the Transmission System in accordance with Section-39 (2) (b) of the Act, compatible with the above load forecast and generation plan in consultation with CEA. Central Transmission Utility (CTU) shall have to be consulted in connection with systems to evacuate power from inter-State Transmission System.

(3) The STU shall prepare and submit to the Commission on an annual basis, a statement showing in respect of each of the 5 succeeding financial years forecasts of circuit capacity, power flows and loading on the Transmission System under Transmission Licence General Conditions Clause-15.5 of Appendix 4B to OERC (Conduct of Business) Regulations, 2004.

2. In compliance to the above OPTCL had submitted its initial draft Intra State Transmission Plan (ISTP) report on 30.09.2011. On receipt of the said report, the Commission officers had several rounds of discussion with Planning Department of OPTCL for clarification on matters related to their submission. Thereafter, the Commission had forwarded the observation to OPTCL on 23.11.11 and had asked the STU to submit the final ISTP on or before 15.12.11 along with implementation plan. OPTCL requested for extension of time, which was allowed by the Commission. On receipt of the revised report from OPTCL on 02.02.2012, there was a detailed discussion on the matter on 15.03.2012 at the Conference Hall of the OERC amongst the staff of the Commission, OPTCL & PRDC, Bangalore (Consultant engaged by OPTCL for preparation of the report). After receipt of clarification and compliances related to such report, the Commission asked OPTCL on 05.5.2012 to file a formal petition so that the matter can be disposed of through Public hearing in presence of all

stake holders/person concerned /experts etc. Thereafter, on the request of OPTCL, the Commission has allowed more time for submission of the final report, considering the fact that wide consultation is statutorily required before finalisation of such report. OPTCL filed this ISTP report considering the concern of all stake holders, which was registered as Case No. 79 of 2012.

In compliance to the directive of the commission in its Interim order dated 27.11.2012, OPTCL had filed the final draft report on Intra State Transmission Plan (ISTP) comprising of power system studies for the State of Odisha during June 2013 along with the relevant supporting information /data/study reports for approval of the Commission.

3. As the finalisation of ISTP was under active consideration of the Commission, OPTCL also submitted proposals for investments to be made in transmission sector in phase by phase manner for approval of the Commission. While approving the individual transmission schemes, the Commission desired to view the intra-state transmission strengthening schemes of OPTCL in a holistic manner rather than in a piecemeal manner.

4. The Commission, for this purpose deputed its own officers to cross check the data & verify the power system studies enclosed in the Intra State Transmission Plan upto the end of 12th plan period i.e. upto 2016-17 and 2017-18 (1^{st} year of 13^{th} plan period) to ascertain the year wise transmission element requirement vis-à-vis the implementation programme in the Odisha system. OPTCL was also asked to furnish additional information's with reference to the projects to be undertaken with Govt. funding, capitalisation schedule and the justification of the of Boriguma 132/33 kV S/S. The investment proposal of OPTCL which had been approved by the Commission during the pendency of this case have also found place in the ISTP submitted by OPTCL.

5. No representative from DoE, OPGC, OHPC, OTPC, M/s. Sterlite, CEA, ERPC and PGCIL except OPTCL were available to furnish their views on the matter during the final hearing on 22.04.2014.

6. During the course of hearing on 22.04.2014, the representative of OPTCL submitted that projects such as 400/220 kV S/s at Berhampur, Dhamra and Khuntuni, 220/132/33 kV S/s at Dhenkanal 132/33 kV S/s at Hirakud & Kuakhia are beneficial to the State, except Lohanda and Bamra sub-stations. The construction of sub-station shall improve the voltage profile and would result in reduction of system loss. OPTCL further submitted that some of its projects are envisaged to extend reliable power to

the remote areas as a part of social responsibility. The Commission opined that the S/s and associated lines required as a part of social responsibility may be carried out with Govt. funding.

7. The Commission desired to know the plan of execution and source of funding so that the projects could be completed within the specified time. OPTCL stated that investment would be either from their own resources or from suitable funding agency including State Govt. OPTCL submitted that Govt. of Odisha shall fund Rs.300 Cr. @ Rs.60 Cr. per year for next five years against the total investment of Rs.764.64 cr proposed for the transmission projects envisaged for improvement of power supply situation in the unserved areas of KBK/ Tribal districts in the State. OPTCL has stated that Rs.240 cr. has already been received from GoO in this regard.

8. The Petitioner OPTCL further submitted that the primary beneficiary DISCOMs would get the benefit due to proposed system reinforcement activities. Overloading of existing s/s and feeders will be reduced and quality of power supply shall be ensured. OPTCL stated that the ISTP was prepared taking into consideration of various suggestions of DISCOMs by incorporating provisions of required nos. of 33 kV Bays in different proposed s/s. ERPC has also expressed its consent for the proposal of OPTCL.

9. The Commission through its officers, cross checked the following information submitted by Petitioner by discussion with OPTCL and their Consultant. They are as follows:

   (a) Year-wise demand data on different bus vis-a-vis long term demand forecast approved by the Commission.

   (b) Information on transmission element considered for the study.

   (c) Information under state / Central generators and IPPs considered in the study.

   (d) Load flow analysis, Short-circuit study and Transient Stability Study.

   The information submitted by OPTCL on the above technical study are found to be in order. The requirement of transmission project are found to be inconsonance with demand growth from FY 2013-14 to FY 2017-18. Most of the projects are required for system strengthening purpose as the loading on the existing sub-station have exceeded 75% limit.

10. Accordingly, after hearing all concerned and going through the records, the Commission directs as hereunder:

(i) The main objective of perspective planning is to build an economical, co-ordinated and efficient transmission system so that power from the generating stations flows unhindered to the grid sub-station maintaining specified level of voltage. With this aim in mind an appropriate Intra-State Transmission plan should be in place and STU should have a definite Road Map for commissioning of the elements of transmission system, those are technically feasible and financially viable.

(ii) Since a robust back bone power supply system is required to facilitate the smooth flow of quality and reliable power from Generating Stations to the consumers, the Commission feel that to meet contingency conditions and to extend quality power to upcoming sub-stations under Capex Programme and Odisha Distribution System Strengthening Project (ODSSP) some transmission projects are required by the end of FY 2017-18 although their loadings are not optimum.

(iii) In view of the exigencies of the proposed projects and to put well defined Intra State transmission plan in place, the Commission hereby grants in principle approval to the feasible projects (deferring those, which are found to be not required now due to their technically un-viability at this point of time), the list of which is enclosed as Annexure-A to this order. While approving the ISTP of OPTCL, the Commission have also taken into consideration of the projects which have already been accorded in-principle approval by the Commission earlier.

(iv) Although projected Peak demand of 4589, 4817, 5042, 5228 and 5423 MW have been considered in the study during the corresponding year 2013-14, 2014-15, 2015-16, 2016-17 and 2017-18, the actual maximum demand of the Sate was found to be 3511, 3580 and 3705 MW during 2011-12, 2012-13 and 2013-14 respectively. Since the actual demand has been less than what has been projected in the study, some proposed sub-stations have therefore, become unviable during the planning period. Hence, over reinforcement of the transmission system would result in additional burden to the State consumers.

(v) Even if such high demand projection is considered, the loading of some of the S/S are as follows:

Voltage Level	**Name of the S/S**	**Year**	**Loading(%)**
400/220 KV	Berhampur	2016-17	20%

- do -	Dhamra	2017-18	27%
- do -	Khuntuni	2017-18	35%
220/132/33 KV	Dhenkanal	2015-16	22%
132/33 KV	Hirakud	2017-18	39%
- do -	Kuakhia	2017-18	26%
- do -	Bamra	2017-18	52% (considering expected industrial loads)

Since the loading of the above sub-stations are less than the average, justification for construction the above s/s are not found appropriate at this stage. Therefore, the proposal of setting the above sub-stations may be submitted separately to be implemented during 13th Plan Period.

(vi) OPTCL is required to follow all statutory requirements and obtain clearances for carrying out all the approved projects, and should ensure that there is absolutely no time or cost overrun. The requirement of DISCOMs should be accommodated while executing the projects (if not already incorporated in the ISTP) by making suitable modifications.

(vii) OPTCL should approach the Commission for approval of investment proposal of individual projects which are not approved earlier. While approving the investment proposal of individual projects at appropriate time, the Commission may go through the DPR's in detail and would verify the prudence of the investment.

(viii) OPTCL may execute its proposed s/s at Jayapatna (Kalahandi), Betanati (Baripada), R.Udayagiri (Rayagada), Malkangiri and Umerkote (Nawarangpur) which are not financially viable but required for supplying quality power to inaccessible and remote area through grid extension. But these projects should be undertaken purely from Government grant as a part of social responsibility of the Petitioner and of the Government.

(ix) OPTCL should intimate the DISCOMs beforehand so that they would be ready with their downward evacuation arrangement for passing the ultimate benefit to the consumers. Therefore, no investment should remain idle either on account of downstream evacuation or upstream connectivity.

11. Accordingly the case is disposed of.

Sd/-	**Sd/-**	**Sd/**
(A K. Das)	**(S. P. Swain)**	**(S. P. Nanda)**
Member	**Member**	**Chairperson**

ANNEXURE- A

List of Sub stations approved in Intra State Transmission Plan (Case No. 79 of 2012)

Sl. No	Substation Name	District	Voltage level (kV)	Number of transformer units	Transformer Unit capacity (MVA)	Approval by OERC (Case No.)
1	Duburi New	Jajpur	400/220	2	315	
2	Cuttack	Cuttack	220/132	2	100	22/2010
3	Lapanga	Sambalpur	220/132	2	160	86/2009
			132/33	2	40	
4	Kesinga	Kalahandi	220/132	2	160	27/2011
5	Karadagadia	Khurda	220/132	2	160	31/2008
			132/33	2	40	
6	Nayagarh	Keonjhar	220/132	2	160	
7	Kuanarmunda	Sundargarh	220/132	2	160	22/2010
			132/33	3	40	
8	Bargarh New	Bargarh	220/132	2	100	
			132/33	2	40	
9	Mendhasal	Khurda	220/33	2	40	
10	Gopinathpur	Keonjhar	220/33	2	40	86/2009
11	Lakshmipur	Koratput	220/33	2	20	
12	Bonai	Sundargarh	220/33	2	40	74/2008
13	Infocity II	Khurda	220/33	2	40	
14	Arugul	Khurda	132/33	2	40	
15	Barbil	Keonjhar	132/33	2	20	74/2008
16	Boudh	Boudh	132/33	2	12.5	20/2008
17	Banki	Cuttack	132/33	2	20	24/2008
18	Baliguda	Kandhamal	132/33	2	12.5	113/2012
19	Chandpur	Nayagarh	132/33	2	12.5	15/2008
20	Dabugaon	Nowrangupur	132/33	2	12.5	15/2008
21	Kuchinda	Sambalpur	132/33	2	12.5	19/2008
22	Konark	Puri	132/33	2	20	43/2012
23	Khajuriakata near Hindal Road	Dhenkanal	132/33	2	20	43/2012
24	Marshagai	Kendrapara	132/33	2	40	
25	Nuapara	Nawapara	132/33	2	12.5	15/2008
26	Padampur	Bargarh	132/33	2	12.5	19/2008
27	Olavar	Kendrapara	132/33	2	20	27/2011
28	Pottangi	Koraput	132/33	2	20	113/2012
29	Podagada	Koraput	132/33	2	12.5	113/2012
30	Purushottampur	Ganjam	132/33	3	40	4/2007
31	Shamuka Beach Resort	Puri	132/33	2	20	
32	Jharsuguda/Saras mall	Jharsuguda	132/33	2	40	22/2010
33	Sakhigopal	Puri	132/33	2	20	
34	Udala	Mayurbhanj	132/33	2	40	86/2009
35	Dhamara	Bhadrak	220/132	2	100	78/2010
			132/33	2	40	
36	Narasinghpur	Cuttack	220/33	2	40	113/2012
37	Kasipur	Rayagada	220/33	2	20	2/2013
38	Malkangiri	Malkangiri	220/33	2	20	3/2013
39	Chendipada	Angul	220/33	2	20	
40	Bangiriposi	Mayurbhanj	132/33	2	12.5	113/2012
41	Manewar	Sambalpur	132/33	2	20	
42	Chikiti	Ganjam	132/33	2	20	2/2013
43	Kalunga	Sundargarh	132/33	2	20	74/2008
44	Kantabanjhi	Bolangir	132/33	2	20	3/2013
45	Lapanga	Sambalpur	400/220	2	315	3/2013
46	Pratapsasan near	Khurda	220/132	2	100	

Sl. No	Substation Name	District	Voltage level (kV)	Number of transformer units	Transformer Unit capacity (MVA)	Approval by OERC (Case No.)
	Balakati		132/33	2	40	
47	GoddaChhack	Dhenkanal	220/132	2	100	2/2013
48	Puri	Puri	220/132	2	100	3/2013
49	Aska	Ganjam	220/132	2	100	2/2013
			132/33	2	40	
50	Jaypatna	Kalahandi	220/132	2	100	2/2013
51	Champua	Kendujhar	132/33	2	40	113/2012
52	Umarkote	Nowrangupur	132/33	2	12.5	3/2013
53	Ghatagaon	Kendujhar	132/33	2	20	113/2012
54	Tangi	Cuttack	132/33	2	40	
55	CDA Cuttack	Cuttack	132/33	2	40	113/2012
56	Bhograi	Jaleswar	132/33	2	20	113/2012
57	Dasapalla	Nayagarh	220/33	2	20	
58	Betanoti	Baripada	132/33	2	20	2/2013
59	R.Udayagiri	Rayagada	132/33	2	20	3/2013

Sd/-
Member (D)

Sd/-
Member (S)

Sd/
Chairperson

List of Transmission lines approved in Intra State Transmission Plan (Case No. 79 of 2012)

Sl. No	From Substation	To Substation	Voltage (kV)	No. of ckts	Voltage level (kV)
1	Duburi New	Meramundali	400	2	400 kV
2	Cuttack	Bidanasi	220	2	220 kV D/C
3	Lapanga	Budipadar	220	2	220 kV D/C
		Katapalli	220	2	220 kV D/C
		Budipadar	132	2	132 kV D/C
		Burla	132	2	132 kV D/C
		Shyam DRI	132	2	132 kV D/C
4	Kesinga	Bolangir	220	2	220 kV D/C
5	Karadagadia	Uttara	220	2	220 kV D/C
		Narendrapur	220	1	220 kV S/C
		Mendhasal	220	1	220 kV S/C
		Khurda	132	2	132 kV D/C
		Puri	132		
		Khurda	132	2	132 kV D/C
		Balugaon	132		
6	Naygarh	TTPS	220	2	220 kV D/C
		Joda	220		
7	Kuanurmunda	Budipadar	220	2	220 kV D/C
		Tarkera	220		
		Chhend	132	2	132 kV D/C
8	Baragarh New	Katapalli	220	2	220 kV S/C
		Bolangir	220		
		ACC	132	2	132 kV S/C
		Baragarh	132		
		Katapalli	132	2	132 kV S/C
		Baragarh	132		
		Barpali	132	2	132 kV S/C
		Baragarh	132		
9	Mendhasal	Bidanasi	220	2	220 kV D/C
10	Gopinathpur	JODA	220	2	220 kV D/C
		TTPS	220		
11	Lakshmipur	Jayanagar	220	2	220 kV D/C
		Theruvali	220	2	220 kV D/C
12	Bonai	Rengali	220	2	220 kV D/C
		Tarkera	220		
13	Infocity II	Mendhasal	220	2	220 kV D/C
		Narendrapur	220		
14	Arugul	Karadagadia	132	2	132 kV D/C
15	Barbil	Joda	132	2	132 kV D/C
		Bolani	132		
16	Boudh	Sonepur	132	1	132 kV S/C
17	Banki	Karadagadia	132	1	132 kV S/C
18	Baliguda	Phulbani	132	2	132 kV D/C
		Bhanjanagar	132		
19	Chandpur	Karadagadia	132	2	132 kV D/C
		Balugaon	132		
20	Dabugaon	Tentulikhunti	132	1	132 kV S/C
21	Kuchinda	Aryanispat	132	2	132 kV D/C
		Bamra	132		
22	Konark	Nimapara	132	1	132 kV S/C
23	Khajuriakata near Hindal road	Meramundali	132	2	132 kV D/C
		Nuapatna Tap	132		
24	Marshagai	Kendrapara	132	2	132 kV D/C
		Paradeep	132		
25	Nuapara	Khariar	132	1	132 kV S/C
26	Padampur	Patnagarh	132	1	132 kV S/C
27	Olavar	Pattamundai	132	2	132 kV D/C

Sl. No	From Substation	To Substation	Voltage (kV)	No. of ckts	Voltage level (kV)
		Dhamara	132		
28	Pottangi	Sunabeda	132	1	132 kV S/C
29	Podagada	Rayagada	132	2	132 kV D/C
		Jayanagar	132		
30	Purushottampur	Aska	132	2	132kV D/C
		Chhatrapur	132		
31	Shamuka Beach Resort	Karadagadia	132	2	132 kV D/C
		Puri	132		
32	Sakhigopal	Puri	132	2	132 kV D/C
33	Udala	Balasore	132	2	132 kV D/C
		Baripada	132		
34	Dhamara	Balasore	220	2	220 kV D/C
		Bhadrak	220		
35	Narasinghpur	Bhanjanagar	220	2	220 kV D/C
		Meramundali	220		
36	Kasipur	Indravathi	220	2	220 kV D/C
		Theruvali	220		
37	Chendipada	Rengali	220	2	220 kV D/C
38	Bangiriposi	Kuchei	132	2	132 kV D/C
		Rairangpur	132		
39	Maneswar	Sambalpur	132	1	132 kV S/C
40	Chikiti	Digapahandi	132	1	132 kV S/C
41	Kalunga	Budhipadar	132	2	132 kV D/C
		Tarkera	132		
42	Kantabanjhi	Khariar	132	1	132 kV S/C
43	Lapanga	IBB	400	2	400 kV
		Jharsuguda	400	2	400 kV
44	Uttara	Mendhasal	400	2	400 kV
45	Pratapsasan near Balakati	Cuttack	220	2	220 kV D/C
		Uttara	220	2	220 kV D/C
		Phulnakhara	132	2	132 kV D/C
46	GoddaChhack	Meramundali	220	2	220 kV S/C
		Duburi	220		
		Kalarangi	132	2	132 kV S/C
		Kamakshya Nagar	132		
47	Puri	Uttara	220	2	220 kV D/C
48	Aska	Bhanjanagar	220	1	220 kV S/C
		Aska	132	2	132 kV S/C
		Bhanjanagar	132		
		Aska	132	2	132 kV S/C
		Chhatrapur	132		
49	Champua	Rairangpur	132	1	132 kV S/C
50	Umarkote	Dabugoan	132	1	132 kV S/C
51	Ghatagaon	Karanjia	132	1	132 kV S/C
		Naygarh	132	2	132 kV D/C
52	Tangi	ICCL	132	2	132 kV S/C
		OCL	132		
53	CDA Cuttack	Choudwar	132	2	132 kV S/C
		Bidanasi	132		
54	Bhograi	Baripada	132	2	132 kV S/C
		jaleswar	132		
55	Dasapalla	Nayagarh	220	1	220 kV S/C
56	Betanoti	Udala	132	2	132 kV S/C
		Baripada	132		
57	R.Udayagiri	Mohana	132	2	132 kV S/C
		Digapahandi	132		

Sd/-
Member (D)

Sd/-
Member (S)

Sd/
Chairperson

List of Substations approved for capacity augmentation in Intra State Transmission Plan (Case No. 79 of 2012)

Sl. No	Substation	Voltage Level(kV)	Capacity before Augmentation (MVA)	Additional Augmentation Capacity (MVA)	Capacity after augmentation (MVA)	Remarks
1	Kuchei	220/132	1x160	160	320	(Addition of 1x160)
2	Chandaka	220/132	4x100	60	460	(Replacement of 1x100 with 1x160)
3	Meramundali	220/132	2x100	100	300	(Addition of 1x100)
4	Balasore	220/132	2x100	120	320	(Replacement of 2x100 with 2x160)
5	Bidanasi	220/132	2x100	160	360	(Addition of 1x160)
6	Joda	220/132	2x100	100	300	(Addition of 1x100)
7	Katapali	220/132	2x100	160	360	(Addition of 1x160)
8	Narendrapur	220/132	2x160	100	420	(Addition of 1x100)
9	Angul	132/33	1x40+1x20	20	80	(Addition of 1x20)
10	Aska	132/33	2x40	20	100	(Addition of 1x20)
11	Balugaon	132/33	1x40+1x20+1x 12.5	7.5	80	(Replacement of 1x12.5 with 1x20)
12	Baragarh	220/33	2x40	40	120	(Addition of 1x40)
13	Boinda	132/33	2x12.5	20	45	(Addition of 1x20)
14	Bolangir	132/33	2x40	12.5	92.5	(Addition of 1x12.5)
15	Chandikhole	132/33	2x20	20	60	(Addition of 1x20)
16	Chhatrapur	132/33	2x20	20	60	(Addition of 1x20)
17	Cuttack	132/33	2x40	40	120	(Addition of 1x40)
18	Dhenkanal	132/33	2x40	20	100	(Addition of 1x20)
19	Digapahandi	132/33	2x20+1x12.5	27.5	80	(Addition of 1x20)
20	Jagatsinghpur	132/33	2x20	20	60	(Addition of 1x20)
21	Jajpur Town	132/33	1x40+1x20	40	100	(Addition of 1x40)
22	Junagarh	132/33	1x20+1x12.5	7.5	40	(Replacement of 1X12.5 with 1x20)
23	Kalarangi	132/33	2x12.5	27.5	52.5	(Replacement of 1X12.5 with 1x40)
24	Kamakhyanagar	132/33	2x12.5	40	65	(Addition of 1x40)
25	Kesinga	132/33	1x20+1x40	20	80	(Addition of 1x20)
26	Nuapatna	132/33	1x20+1x40	12.5	72.5	(Addition of 1x12.5)
27	Parlakhemundi	132/33	2x12.5	12.5	37.5	(Addition of 1x12.5)
28	Patnagarh	132/33	1x20+1x12.5	12.5	45	(Addition of 1x12.5)
29	Pattamundai	132/33	1x20+1x12.5	20	52.5	(Addition of 1x20)
30	Puri	132/33	2x31.5	40	103	(Addition of 1x40)
31	Rajgangpur	132/33	2x40	40	120	(Addition of 1x40)
32	Ranasinghpur	132/33	2x40	40	120	(Addition of 1x40)
33	Rayagada	132/33	2x12.5	12.5	37.5	(Addition of 1x12.5)
34	Salipur	132/33	1x20+1x12.5	12.5	45	(Addition of 1x12.5)
35	Sonepur	132/33	2x12.5	20	45	(Addition of 1x20)
36	Soro	132/33	2x20	40	80	(Addition of 1x40)
37	Sundargarh	132/33	2x20	40	80	(Addition of 1x40)
38	Tentulikhunti	132/33	2x12.5	12.5	37.5	(Addition of 1x12.5)
39	Berhampur	132/33	1x40+1x20	40	100	(Addition of 1x40)
40	Brajarajnagar	132/33	3x20	40	100	(Addition of 1x40)
41	Choudwar	132/33	1x40+1x20	40	100	(Addition of 1x40)
42	Sunabeda	132/33	2x12.5	12.5	37.5	(Addition of 1x12.5)
43	Bhanjanagar	132/33	1x40+1x16	12.5	68.5	(Addition of 1x12.5)
44	Chandaka	132/33	2x40	40	120	(Addition of 1x40)
45	Jayanagar	132/33	2x20+1x12.5	20	52.5	(Addition of 1x20)
46	Joda	132/33	3x20+1x12.5	20	92.5	(Replacement of 1x20 with 1x40)
47	Katapali	132/33	2x20	40	80	(Addition of 1x40)
48	Narendrapur	132/33	1x40+1x20	40	100	(Addition of 1x40)

Sl. No	Substation	Voltage Level(kV)	Capacity before Augmentation (MVA)	Additional Augmentation Capacity (MVA)	Capacity after augmentation (MVA)	Remarks
49	Paradeep	132/33	2x20	12.5	52.5	(Addition of 1x12.5)
50	Therubali	132/33	2x12.5	12.5	37.5	(Addition of 1x12.5)
51	Duburi	220/33	1x40	40	80	(Addition of 1x40)
52	Barkote	220/33	2x20	20	60	(Replacement of 1x20 with 1x40)
53	Nayagarh	220/33	3x20	20	80	(Addition of 1x20)
54	Rengali	220/33	2x20	20	60	(Addition of 1x20)
55	Mendhasal	220/33	2x20	20	60	(Addition of 1x20)
56	Jharsuguda	132/33	2x40	_	_	_
57	Mendhasal	400/220	2x315	315	945	(Addition of 1x315)
58	Jayanagar	220/132	2x100	100	300	(Addition of 1x100)
59	Anandapur	132/33	2x12.5	20	45	(Addition of 1x20)
60	Basta	132/33	2x12.5	20	45	(Addition of 1x20)
61	Chhatrapur	132/33	3x20	20	80	(Replacement of 1x20 with 1x40)
62	Ganjam	132/33	2x12.5	20	45	(Addition of 1x20)
63	Rairakhole	132/33	2x12.5	12.5	37.5	(Addition of 1x12.5)
64	Paradeep	132/33	2x20+1x12.5	27.5	80	(Replacement of 1X12.5 with 1x40)
65	Nayagarh	220/33	2x20+1x40	20	100	(Replacement of 1x20 with 1x40)
66	Sonepur	132/33	2x12.5+1x20	20	65	(Addition of 1x20)
67	Duburi	400/220	2x315	315	945	(Addition of 1x315)
68	Nayagarh	220/33	1x20+2x40	20	120	(Replacement of 1x20 with 1x40)
69	Balugaon	132/33	1x40+2x20	20	100	(Replacement of 1x20 with 1x40)
70	Chhatrapur	132/33	1x40+1x20	20	100	(Replacement of 1x20 with 1x40)
71	Karanjia	132/33	3x12.5	7.5	45	(Replacement of 1x12.5 with 1x20)

Sd/-
Member (D)

Sd/-
Member (S)

Sd/
Chairperson

ANNEXURE- B

The following substations should be undertaken in 13th Plan.

Voltage Level	Name of the S/S	Year	Loading(%)
400/220 KV	Berhampur	2016-17	20%
- do -	Dhamra	2017-18	27%
- do -	Khuntuni	2017-18	35%
220/132/33 KV	Dhenkanal	2015-16	22%
132/33 KV	Hirakud	2017-18	39%
- do -	Kuakhia	2017-18	26%
- do -	Bamra	2017-18	52% (considering expected industrial loads)

Sd/-
Member (D)

Sd/-
Member (S)

Sd/
Chairperson