Creation and maintaining a Web based Protection Database and Desktop based Protection setting calculation tool for Eastern Regional Grid

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OPERATIONAL LOAD FLOW STUDIES UNDER WINTER OFF PEAK LOADING CONDITIONS

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EXECUTIVE SUMMARY

ERPC secretariat has taken up a project of "**Creation and maintaining a Web based Protection Database and a Desktop based Protection Setting Calculation Tool for Eastern Regional Grid**".

M/s PRDC has been awarded with the order by ERPC to implement the project in its entirety including creation of database and supply of software and hardware along with necessary power system analysis relevant for the project.

Eastern Regional Grid comprises of the electrical system of the states of Bihar, Jharkhand, West Bengal, Odisha, Sikkim under different transmission utilities. The major constituents of ER grid are the Transmission and Distribution Utilities of States and UT, Central Transmission Utility, State and Central sector Generating Companies, DVC, CESC, DPL, IPP's and Private sector Transmission and Distribution Utilities. The ER covers a geographical area of 425432 sq km with an installed capacity of 36575 MW. In addition to this the region has an installed capacity of 7840 MW in the form of CPP's.

Eastern Regional Power Committee (ERPC) formed by Ministry of Power is entrusted for facilitating the integrated operation of the power system in the region.

As a prerequisite of building the protection management system the first step as envisaged is the electrical modeling of the entire network data under ER system from 765 kV to 132 kV and 66 kV for Sikkim and carrying out the base case operational load flow analysis and short circuit studies for peak and off peak load conditions.

The Load flow and Short Circuit studies of Eastern Grid was carried out for peak and off peak loading conditions of ER. The network was updated till 31st May 2016 and 31st August 2016 for peak and off peak loading condition respectively and report was submitted with study results on 27th July 2016 for peak loading and 6th January 2017 for off peak loading case.

As a next phase of the power system studies, the winter off peak scenario of ER grid is studied for Load flow and Short Circuit analysis. The data and electrical parameters of the EHV network elements as updated till 31st December 2016 by collecting data from the respective constituents of ER grid and updated network is modeled in power system analysis software MiP-PSCT.

It was decided in the 127th OCC meeting that the operational Load Flow study for ER grid is carried out for a load generation condition during winter off peak condition on an updated network data till December 2016. The load generation condition was

selected for two time steps are collected for 28th & 29th December 2016 at 13:00 hours and 02:00 hours respectively.

In 130th OCC meeting, it was decided that the winter off peak load flow study will be carried out with load generation scenario of 29th December 2016 at 02:00 hrs as per the load generation scenario data given by ERLDC.

A comparison of loading details of 26th May 2016 peak hours, 27th August 2016 off peak hours and 29th December 2106 off peak hours of ER grid is presented below.

Sl. No.	Constituents	Load (MW)		
		29th Dec-16 02:00 hrs	**27th Aug-16 13:00 hrs**	**26th May-16, 20:00 hrs**
1	Bihar	2321	2716	3044
2	Jharkhand	914	799	991
3	Odisha	2236	2872	3354
4	Sikkim	36	43	75
5	W. Bengal	3176	4858	5460
6	DVC	2330	2426	2621
7	CESC	558	1507	1441
8	DPL	181	217	217
Total Load		11753	15438	17203
loss		389	671	762
Total Demand		12142	16109	17965

Load flow analysis and short circuit studies are conducted under winter off peak loading scenario and the observations on the results are detailed in subsequent sections of the report. Constituent's wise demand for ER grid id presented below.

Sl. No.	Constituents	Demand MW)
1	Bihar	2321
2	Jharkhand	914
3	Odisha	2236
4	Sikkim	36
5	W. Bengal	3176
6	DVC	2330
7	CESC	558
8	DPL	181

Summarized particulars of network data for ER as on 31st December 2016 collected during the studies are given below:

EHV Transmission Grid Substations: The total count is 501 with a voltage grade wise population mix as,

- 765 kV: Number of substations is 5 with installed capacity of 18000 MVA

- 400 kV: Number of substation is 44 with an installed capacity of 32570 MVA
- 220 kV: Number of substation is 96 with an installed capacity of 36530 MVA
- 132 kV: Number of substation is 337 with an installed capacity of 35516 MVA
- 66 kV: Number of substation is 19 with an installed capacity of 213 MVA

ER generating units under state, central sector and integrated utilities: Aggregated generation capacity of 27107.5 MW with a hydro thermal mix of 15.9 : 84.1.The break up is given as,

- Total number of hydro generating units is 83 with an installed capacity of 4302.5 MW
- Total number of thermal generating units is 105 with an installed capacity of 22805 MW

ER generating units under IPPs: Aggregated generation capacity of 9468 MW with a hydro thermal mix of 2.17: 97.82.The break up is given as,

- Total no. of hydro generating units is 4 with an installed capacity of 206 MW
- Total number of thermal generating units 31 with an installed capacity of 9262 MW

CPP generation capacity: 7840 MW.

ER EHV and HV Transmission Lines (132 kV and above and 66 kV in Sikkim): 78693 ckm

The node wise load and generation data, recorded are collected from the respective system owners and are matched with the demand, generation and exchange recorded by ERLDC, SCADA for the selected time instant.

The consolidated observations from load flow analysis are:

Load Generation Balance Off-Peak Scenario:

- System input (Generation & Import): 18057 MW
- System Demand including losses in ER network : 12142 MW
- Consolidated Export from ER bus : 5915 MW

Generation Scheduling: Generators are scheduled as per SCADA records of ERLDC.

Voltage Profile: Busbar voltages at all voltage levels are within the stipulated range of grid code of CEA

Transformer loading: In the entire population no overloading is observed. 3 number of transformers are loaded beyond 80% and 638 numbers are loaded below 20%.

Line loading: No overloading is observed in any of the voltage grades. Number of lines loaded between 80 to 100% of thermal capacity is 7 predominantly in 132 kV level. Number of lines loaded below 5% thermal capacity is 136 and the percentage is predominant at 132 kV level.

Short Circuit studies are conducted on the network topology and generation scheduling of the load flow modeling for both three phase symmetrical faults and single line to ground fault conditions at every bus up to 66 kV level by considering sub transient reactance's of the generators and closed bus operation at all 765,400 and 220 kV bus.

It is observed that short circuit levels are critical at some of the substations but within the breaker rated capacity.

Due to High fault level at 220 kV bus of Meramundali S/S under short circuit study for peak scenario bus splitting was suggested. From short circuit study under off peak scenario with split bus of Meramundali S/S at 220 kV level fault level is well within the breaker capacity.

Detailed analysis of data and study results under winter off peak condition for load flow and short circuit studies are elaborated in subsequent sections of the report.

From the off peak load flow analysis results it is observed that the 400 & 220 kV bus voltages of the ER grid are on the higher side of the stipulated grid code and also in some cases violating the same. There is quantum reactive power flow between the constituent at high voltage conditions leading the penalty charges. Hence appropriate reactive power compensation needs to be planned at identified substations on an urgent basis.

ABBREVIATIONS AND ACRONYMS

Acronym	Full form
CEA	Central Electricity Authority
CGP/CPP	Captive generating plant
CTU	Central Transmission Utility
DB	Data Base
DPR	Detailed Project Report
DTR	Distribution Transformer
EHV	Extra High Voltage
ER	Eastern Region
ERLDC	Eastern Regional Load Dispatch Centre
ERPC	Eastern Regional Power Committee
GoI	Government of India
GS	Generating Station
GUI	Graphical User interface
HV	High Voltage
IPP	Independent Power Producer
MiP-PSCT	Protection Setting Calculation Tool
NR	Northern region
PRDC	Power Research & Development Consultants Pvt. Ltd.
PSS	Power System Study
SCADA	Supervisory control and data acquisition
SLD	Single Line Diagram
SLDC	State Load Dispatch Centre
SS	Substation
STU	State Transmission Utility

1 INTRODUCTION

Eastern Regional Grid comprises of the electrical transmission system of the states of Bihar, Jharkhand, West Bengal, Odisha, Sikkim and supply area under DVC. The major constituents of ER grid are the State/UT Transmission and Distribution Utilities, Central Transmission Utility, State and Central sector Generating Companies, DVC, CESC, DPL, IPP's and Private sector Transmission and Distribution Utilities. The ER covers a geographical area of 425,432 sq. km which is about 13% of the total area of the country with an installed capacity of **44415 MW**. Keeping in view the criticality of safe and reliable operation of this vast and complex system of ER, M/s. ERPC has awarded the project for implementation of a software based protection management system that includes building up a comprehensive web based protection database for the ER grid to M/s PRDC, a pioneer consultant in the field of power engineering on 31st March 2016.

As a fundamental prerequisite of building the protection management system and as base work for protection system simulation and studies the entire existing network data under ER system is modeled from 765 kV level to 33 kV buses of 132/33 kV substations for all states other than Sikkim where the network is modeled up to 11 kV buses of 66/11 kV substations. The network model in its entirety encompasses each of the individual power system elements including generators (hydro, thermal, pump storage), substations/switching station equipment, transmission lines, HVDC system, reactors, capacitors and load.

This report presents the results of the base case load flow studies for the modeled EHV transmission network of the ER grid for a selected scenario of winter off peak load condition. With reference to the discussions with M/s ERPC and its constituents, 29th December 2016 is identified as a typical day with off peak load at 02:00 hours. The load flow analysis is carried out with the load generation scenario for the selected instant and the parameters are crosschecked with the SCADA results to authenticate the correctness of the modeling.

Between the two selected time step, ER network is modeled for 29th December 2016 02:00 hours, wherein power handling is less and over voltage criteria is predominant (demand recorded 12142MW) for the ER grid. This volume of the report presents the details of existing Eastern region transmission network data, load generation balance along with operational load flow and short circuit study results under winter off peak scenario.

2 PROJECT SCOPE

The scope of work envisaged in tender document is elaborated in detailed here.

As per scope M/s PRDC should supply Protection Analysis Software Package with following requirements but not limited to the following modules for the supply of Software and Database building activities,

M/s PRDC should develop and maintain a hardware setup and software package capable of meeting the following objectives; but not limited to:

- Classified database of all bay equipment and the protection system details of all bays 132 kV and above, for Eastern Regional power system.
- A user friendly interface for browsing and editing the contents of the database.
- Tool for simulating the performance/ behavior of the protection system under all possible normal and abnormal operating conditions of the power system, including effect of changing one or more parameter setting of the relays.
- Diagnostics for verifying proper coordination among various protective relays.
- Generation of useful reports.

The detailed scope of work is elaborated in Volume-1 of the DPR and submitted on 27.04.2016. A consolidated view on Network Modeling and database building activity for operational load flow involve “Creation and maintaining a Web based Protection Database and Desktop based Protection setting calculation tool for Eastern Regional Grid” is presented below.

2.1 Database Building Activities for Operational Studies

- One time power system network model building for the Load flow, Short circuit and dynamic simulations of entire Eastern region with Indian national grid transmission network model.
- Data collected from respective substations to be validated before populating the same in the database.
- Complete modeling of ER transmission network for 132 kV and above including HVDC systems connected with ER, with relevant system parameters of transmission lines, generators, transformers, reactors for all existing substations. However, for Sikkim 66 kV system along with 66 kV interconnections are to be considered.
- Prepared network is made ready for base case load flow analysis and the same has to be verified with field engineers of ER constituents. Both MW and MVAr flow are computed and Voltage Level at different Buses is ascertained along with suggestive conditions to reduce or enhance Bus voltage.
- Short circuit, studies to be simulated and the results to be demonstrated to the ER constituents for approval.

This report includes operational load flow and short circuit study of existing ER grid under winter off peak loading condition.

3 SYSTEM OPERATIONAL DATA

As increasing electricity demand, electrical transmission and distribution system is expanding at very fast pace. To meet future expected demand with reliable manner there is a need of great integration among electricity generating, transmission and distribution agencies.

With an objective to facilitate integrated operation of power system in Eastern Region, Govt. of India had established Eastern Regional Power Committee comprising the states of Bihar, Jharkhand, Orissa, West Bengal and Sikkim along with area under DVC. The major constituents of ER grid are the State/UT Transmission and Distribution Utilities, Central Transmission Utility, State and Central sector Generating Companies, DVC, CESC, DPL, IPP's and Private sector Transmission and Distribution Utilities. Figure 3.1 depicts constituents of Eastern Regional grid.

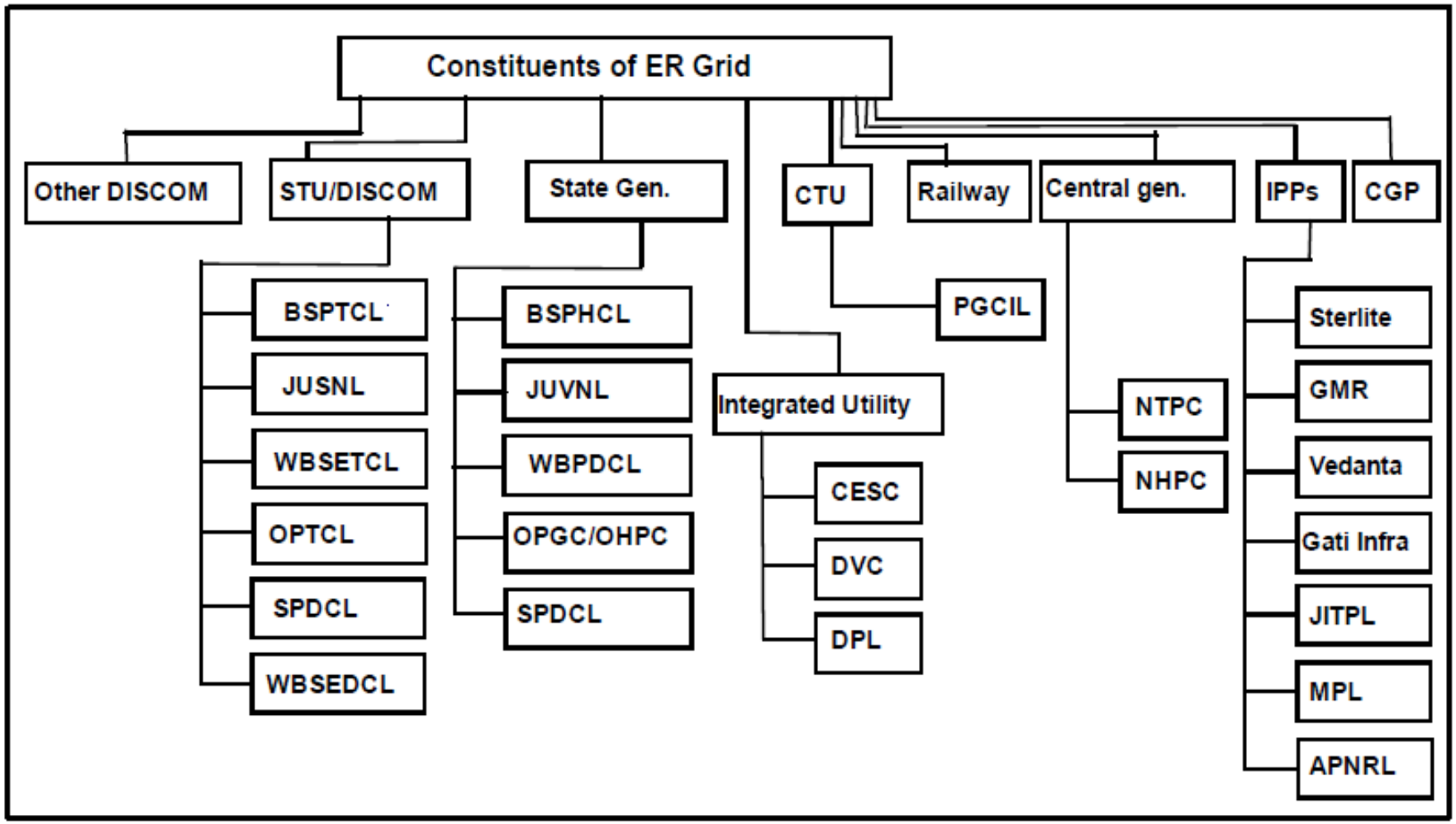


Figure 3.1: Constituents of Eastern Regional grid

3.1 Methodology adopted for performing the load flow analysis

3.1.1 Data Collection Procedure

- In 128th OCC meeting, it was decided that operational load flow study under winter off peak loading scenario will be carried out for load conditions of 28.12.2016 and 29.12.2016 at 13.00 hrs and 02.00 hrs respectively.
- To collect the Eastern grid network data for operational load flow under off peak scenario a standard data collection format was prepared and forwarded to ERPC.
- Load generation data collection format was finalized by M/s PRDC and uploaded in ERPC portal.
- M/s PRDC has received the network data from most of the constituents in agreed format and remaining is collected from field survey in coordination with ERLDC and SLDC's.

Network data for all the utilities under Eastern region were collected in co-ordination with ERPC and its constituents. The complete Eastern Region Network from 765 kV level to 33 kV buses of 132/33 kV S/S (with the exception where generator is connected to a lower voltage network) is considered in the studies. However, for Sikkim 66 kV system along with 66 kV interconnections are considered. Inter-regional 765 kV, 400 kV, 220 kV and 132 kV transmission lines with Northern, Western, Southern and North-Eastern region is also considered in the studies.

Network update data as collected from ER constituent has been also verified with monthly status report of CEA and OCC meeting summary.

Table 3.1 present the collected/received data status from ERPC and its constituents.

Table 3.1: Data availability status

Constituent of ERPC	State wise Data received*	
	Load data (%)	Network augmentation Data (%)
Bihar	94	0
Jharkhand	89	0
Odisha	83	0
Sikkim	8	0
West Bengal	97	0

Note: Network data includes CTU and STU network details as per state wise location while DVC network details are allocated in Jharkhand and West Bengal as per physical location.

**Utility owners have furnished network data for all elements but the line and transformer parameter data is furnished for 70% elements.*

** SCADA record of 765 & 400 kV line flow and Generation schedule from ERLDC is collected.*

The methodology adopted by the study team for performing the load flow analysis is as given below.

- Configuring the entire Eastern Regional Grid electrical network down to 33 kV (up to 11 kV bus of 66/11 kV S/S in Sikkim) banks of the transmission substations. i.e. transmission system comprising of 765 kV, 400 kV, 220 kV and 132 kV (66 kV S/S in Sikkim) substation buses up to the 33 kV buses at the substations.
- Represented the collective load of the substations at 33 kV buses for Bihar, Jharkhand, Odisha and West Bengal and at 11 kV buses in Sikkim.
- Import form generation located outside the region is considered as a bulk import.
- Railway loads are modeled by considering radially link with grid.
- Slack bus is considered outside the region at the point having a maximum power exchange from eastern grid.
- Generation scheduling is matched with ERLDC's SCADA record.
- Allocation of load to the substations is finally done to match the state wise system demand as per ERLDC's SCADA record.
- Simulation of load flow analysis under off peak scenario is done on the integrated Grid transmission network of Eastern Region.
- Geographical drawings for entire Eastern Regional Grid transmission network along with separate maps of eastern grid constituent states.
- Eastern regional transmission network is simulated under winter off peak scenario by taking load demand of 29.12.2016 at 02.00 hrs. Currently, the modeled Eastern grid network has been simulated for the loading conditions which are given in Table 3.2.

Table 3.2: ER loading details

Date & Time	**29th December 2016, 02:00 hrs.**
System Demand Met	12142 MW
Total Load	11753 MW
System Loss	389 MW
Percentage Loss	2.16%

- Software used : MiP-PSCT

3.2 December 29, 2016 Off-peak system demand condition

The study team has received substation wise load data and SCADA records from the ERLDC and SLDC's of eastern region. The data considered for modeling the transmission network and its sources are given in Table 3.3.

Table 3.3: Source of the data considered for the study

Sl No	Data	Source
1	Transformers	Field data and CEA planning criteria
2	Transmission lines / UG cable types	Field data and network data received from CTU, STU and other constituents
3	Lines / UG cable parameters	Data received from CTU, STU and other constituents and CEA planning criteria
4	Loads and Generation	SCADA recordings and Load data received from SLDC's

Note: Transmission lines and Transformers parameters, which are not furnished by CTU's and STU's, is considered as per CEA transmissions planning criteria.

This section of the report presents the basic data considered for the system studies.

3.3 Salient points of CEA planning criteria referred for network modelling and analysis of study results

3.3.1 Transmission line parameters

Table 3.4 provides the transmission line parameters and the thermal loading limit of the transmission lines at various voltage levels considered for the studies.

Table 3.4: Details of transmission line parameters

Conductor Type	Voltage (kV)	Positive Sequence Resistance (ohm/km/ckt)	Positive Sequence Reactance (ohm/km/ckt)	Positive Sequence Suseptance, B/2 (mho/km/ckt)	Zero Sequence Resistance (ohm/km/ckt)	Zero Sequence Reactance (ohm/km/ckt)	Zero Sequence Suseptance, B/2 (mho/km/ckt)	Thermal Rating (MVA)
ACSR Quad Bersimis	765	0.0114	0.2856	2.01E-06	0.2634	1.0534	1.20E-06	3880
ACSR Hexa Zebra	765	0.0123	0.2552	2.27E-06	0.2247	0.9223	1.38E-06	4452
ACSR Quad Moose	400	0.0147	0.2528	2.29E-06	0.2480	1.0000	1.32E-06	1749
ACSR Twin Moose	400	0.0298	0.3320	1.73E-06	0.1619	1.2400	1.12E-06	874
AAAC Twin Moose	400	0.0309	0.3304	1.77E-06	0.1682	1.2368	1.14E-06	840
ACSR Zebra	220	0.0697	0.3978	1.46E-06	0.2048	1.3344	9.14E-07	213
ACSR MOOSE	220	0.0749	0.3993	1.47E-06	0.2200	1.3392	9.20E-07	240
AAAC Zebra	220	0.0749	0.3993	1.47E-06	0.2200	1.3392	9.20E-07	212
800sqmm XLPE Cable	220	0.0321	0.1260	3.23E-05	0.1400	0.0680	3.00E-05	266
ACSR Panther	132	0.1622	0.3861	1.46E-06	0.4056	1.6222	8.99E-07	83
LARK	132	0.1622	0.3861	1.46E-06	0.4056	1.6222	8.99E-07	94
T Snowbird	132	0.0223	0.2900	1.96E-06	0.2840	0.9784	1.36E-06	432
161 sqmm G.F Cable	132	0.1400	0.1873	4.25E-05	0.2700	0.0519	4.25E-05	50
260 sqmm G.F Cable	132	0.0876	0.2167	4.55E-05	0.1695	0.0600	4.55E-05	70
400 sqmm XLPE Cable	220	0.0617	0.1360	2.20E-05	0.2040	0.0830	2.19E-05	100
630 sqmm XLPE Cable	132	0.0391	0.1267	2.27E-05	0.1120	0.0840	2.24E-05	130
800 Sqmm XLPE Cable	132	0.0321	0.1260	3.23E-05	0.1300	0.0680	3.00E-05	160
ACSR DOG	66	0.3274	0.4267	1.36E-06	0.5578	1.3688	9.84E-07	50

Note: Transmission lines parameters, which are not furnished by CTU and STU's, is consider as per CEA transmissions planning criteria.

3.4 Transformer parameters

Actual transformer parameters wherever provided by CTU and STU's is used. In cases where data is not furnished standard data as per CEA transmissions planning criteria given in Table 3.5 is considered.

Table 3.5: Details of transformer parameters

Type of Transformer	Transformer reactance Xt (at its own base MVA)
Generator transformer (GT)	14 – 15 %
Inter-Connecting Transformer (ICT)	12.50%

3.4.1 Voltage limits

The steady-state voltage limits prescribed in CEA's "Transmission Planning Criteria" at different voltage levels are presented in Table 3.6.

Table 3.6: Voltage limits at different voltage levels prescribed in CEA's "Transmission Planning Criteria"

Nominal Voltage (kV)	Normal rating				Emergency rating			
	Maximum		Minimum		Maximum		Minimum	
	kV	pu	kV	pu	kV	pu	kV	pu
765	800	1.05	728	0.95	800	1.05	713	0.93
400	420	1.05	380	0.95	420	1.05	372	0.93
220	245	1.11	198	0.90	245	1.11	194	0.88
132	145	1.10	122	0.92	145	1.10	119	0.90
66	72.5	1.10	60	0.91	72.5	1.10	59	0.89

3.5 Network element statistics for ER Grid

3.5.1 Substation details

The summary of the number of substations present in the Eastern region state wise is presented in Table 3.7 and the complete list of substations along with load considered at each substation is given in Table A of Annexure-I.

Table 3.7: Existing number of sub-station in the ER

Sl. No.	Substation*	State				
		Bihar	Jharkhand	Odisha	Sikkim	W. Bengal
1	765 kV	2	1	2	-	-
2	400 kV	11	7	13	1	12

Sl. No.	Substation*	State				
		Bihar	Jharkhand	Odisha	Sikkim	W. Bengal
3	220 kV	18	15	25	-	38
4	132 kV	92	47	86	4	108
5	66 kV	-	-	-	19	-
Total No. of S/S in ER				**501**		

Note: If 765/400/220 kV substation has 400/220 kV transformation level also, in that case 765/400/230 kV substation is counted as single 765 kV substation.

**Above listed substation number excludes switching stations and generating stations.*

3.5.2 Transmission line details

The summary of Transmission line data present in the Eastern region is presented in Table 3.8 and the complete list of transmission lines state wise is given in Table B of Annexure-I.

Table 3.8: Summary of transmission line data in the ER

Sl. No.	Voltage (kV)	Line Length (ckm)
1	765	2592
2	400	30858
3	220	17740
4	132	27208
5	66	295

3.5.3 Transformer details

The summary of Transformer data present in the Eastern region is presented below in Table 3.9 and the complete list of substation and their transformation capacity for each constituent state of ER Grid is given in Table A of Annexure-I.

Table 3.9: Summary of transformers capacity in the ER

Sl. No	Voltage Ratio (kV)	Installed Capacity (MVA)
1	765	18000
2	400	32570
3	220	36530
4	132	35516
5	66	213

3.5.4 Generation details

The summary of generator installed capacity present in the Eastern region state wise is presented in Table 3.10 and the complete list of generators is given in Table C of Annexure-I.

Table 3.10: Summary of Generator installed capacity in the ER

Sl. No.	State	Installed capacity (MW)*	
		Thermal	Hydro
1	Bihar	4545	35
2	Jharkhand	5251	289
3	Odisha	15956	2143
4	Sikkim	0	776
5	West Bengal	14155	1265
Total ER		**39907**	**4508**
		44415	

**Note: Installed capacity includes central, state, IPP and CPP generations*

3.5.5 HVDC details

The details of the existing converter stations used for HVDC transmission and HVDC Back to Back, considered in the studies are given in Table 3.11 and Table 3.12.

Table 3.11: HVDC Back to Back in the ER

Sl. No.	Parameter	Sasaram B2B	Gazuwaka B2B	
1	Power Rating	1 X 500 MW	1 X 500 MW	1 X 500 MW
2	Number of blocks	1	Block 1	Block 2
3	AC voltage	400 kV	400 kV	400 kV
4	DC voltage	205 kV	205 kV	177 kV
5	Converter transformer (Inverter/Rectifier)	6 X 234 MVA	6 X 234 MVA	6 X 201.2 MVA

Table 3.12: HVDC Link in the ER

Sl. No.	Parameter	Talcher to Kolar
1	Power Rating	2000 MW
2	Number of Poles	2
3	AC voltage	400 kV
4	DC voltage	± 500 kV
5	Converter transformer (Inverter)	6 X 398 MVA
6	Converter transformer (Rectifier)	6 X 398 MVA

3.5.6 Reactor details

The complete list of state wise Series and shunt reactors installed in the Eastern region is presented in Table D and E of Annexure-I respectively.

3.5.7 Load details

The state wise summary of load data considered for the study is given in Table 3.13. Substation wise loading details considered for operational load flow is presented in Table F of Annexure-I.

Table 3.13: Load Details of ER

Sl. No.	Constituents	Load*
1	Bihar	2321
2	Jharkhand	914
3	Odisha	2236
4	Sikkim	36
5	West Bengal	3176
6	DVC	2330
7	CESC	558
8	DPL	181

**Note: 11753 MW (summation of recorded loads in S/S) on 29.12.2016 at 02:00 hrs in ER grid*

3.6 Generation schedule details for operational load flow

The generation schedule considered was based on the information obtained from the ERLDC and other constituents of ER grid. Power plant wise generation allocation is given in Table 3.14 and graphically represented in figure 3.2.

Table 3.14: Generation schedule Details of ER

Sl.No.	State	Station Name	Owned By	Scheduled Generation (MW)
1	Bihar	Muzaffarpur	Joint venture of NTPC & BSEB	94.0
2		Barauni TPS	BSEB	37.0
3		Kahalgaon	NTPC	1540.0
4		Barh		955.0
5	Jharkhand	Patratu Thermal	JVNL	48.0
6		Tenughat Thermal		171.0
7		Sikidiri Gen		56.0
8		Kodarma Thermal	DVC	394.0
9		Chandrapura Thermal		436.0
10		Mithon Dam		0.0
11		Bokaro Thermal		146.0

Sl.No.	State	Station Name	Owned By	Scheduled Generation (MW)
12		Adhunik Thermal	APNRL	243.0
13		Mithon RB Thermal	MPL	767.0
14		Upper Kolab		0.0
15		Indravati		0.0
16		Rengali	OHPC	0.0
17		Hirakud		0.0
18		Chiplima		14.7
19		Talcher Thermal	NTPC	298.3
20		IB Thermal	OPGC	393.0
21	Odisha	Balimela	OHPC	4.7
22		Machkund		85.0
23		Talcher Super Thermal	NTPC	2631.0
24		Meenakshi Power		6.6
25		GMR	GMR Kamalanga Energy	479.0
26		Jindal Thermal	JITPL	358.0
27		Sterlite Energy	Vedanta Ltd.	289.0
28		Net CPP Injection to Grid		515.0
29		Rangit Hydro	NHPC	19.0
30		Teesta 5 Hydro		201.0
31		Lagit Hydro		0.0
32	Sikkim	Meyong Hydro	Sikkim Gov.	0.0
33		Rongli Hydro		0.0
34		Chuzachen	Gati Infrastructure Pvt. Ltd	0.0
35		Jorthang	DANS Energy Pvt. Ltd.	0.0
36		Bandel Thermal		197.0
37		Santaldih Thermal		321.0
38		Kolaghat Thermal	WBPDCL	445.2
39		Bakreswar Thermal		413.0
40		Sagardighi Thermal		714.8
41		Purulia Pump Storage Hydro		-480.0
42		Jaldhaka Hydro	WBSEDCL	13.4
43		Rammam Hydro		16.1
44	West Bengal	Tista Load Dam Hydro	NHPC	39.0
45		Farakka Super Thermal	NTPC	1291.0
46		Mejia		1460.2
47		DTPS	DVC	155.0
48		Durgapur Steel Thermal		745.0
49		DPL Thermal	DPL	218.0
50		Budge Budge		471.0
51		SRS	CESC	0.0
52		TRS		0.0
53		Haldia Thermal		149.2
54		Net CPP Injection to Grid		121.8

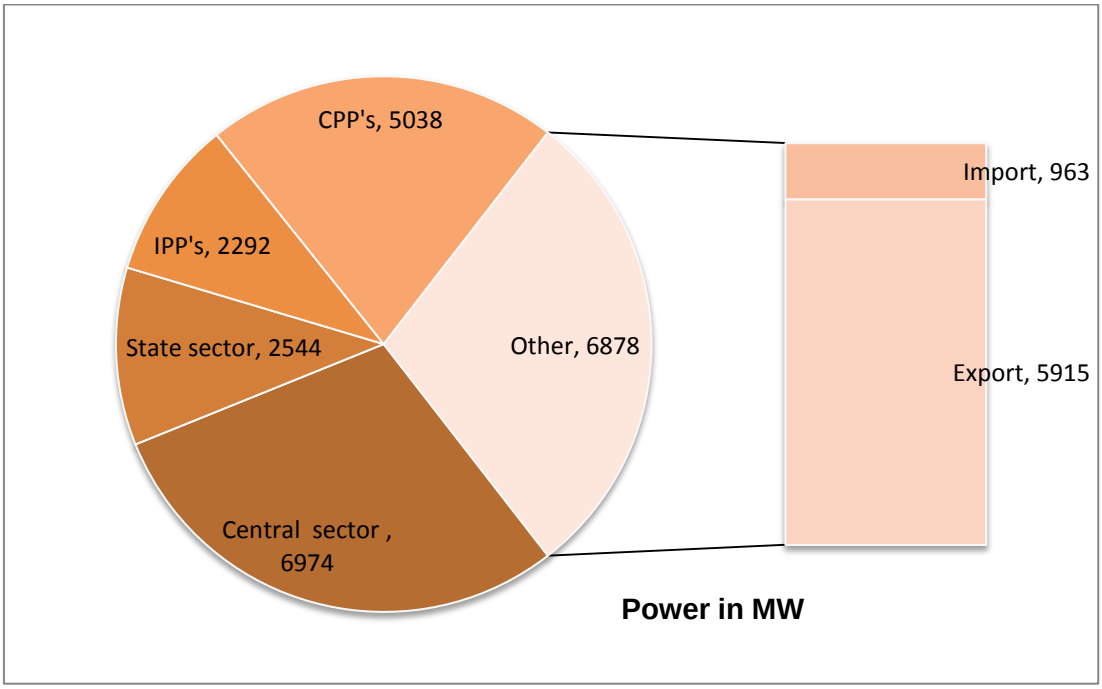


Figure 3.2: Scheduled generation, Import and Export of Eastern Regional grid

4 OPERATIONAL LOAD FLOW STUDY

4.1 Introduction to Load flow analysis

One of the most common computational procedures used in power system analysis is the load flow calculation. The planning, design and operation of power systems require such calculations to analyze the steady state performance of power system under various operating conditions and to study the effects of changes in network configuration. These load flow solutions are performed using computer programs designed specifically for this purpose.

The basic question in the load flow analysis is: “Given the demand at all buses of a known electric power system configuration and the power production at each generator, find the power flow in each line and transformer of the interconnecting network and the voltage magnitude with phase angle at each bus.“

Analyzing the solution of load flow analysis for numerous conditions helps ensure that the power system is designed to satisfy its performance criteria while incurring the most favorable investment and operation costs. Some examples of the uses of load flow studies are to determine,

- Component or circuit loading.
- Steady state bus voltages.
- Active and Reactive power flows.
- Transformers tap settings.
- System losses.
- Performance under emergency conditions.

Modern systems are complex and have many paths or branches over which power can flow. Such systems form networks of series and parallel paths. Electric power flow in these networks divides among the branches until a balance is reached in accordance with established circuit theory.

Computer programs to solve load flows are divided into two type’s static (offline) and dynamic (real time). Most load flow studies for system analysis are based on static network models. Real time load flows (online) that incorporate data input from the actual networks are typically used by utilities in Supervisory Control and Data Acquisition (SCADA) systems. Such systems are used primarily as operating tools for optimization of generation, VAr control, dispatch, losses, and tie line flow control. This discussion is concerned with only static network models and their analysis.

A load flow calculation determines the state of the power system with respect to a given load and generation schedule. It represents a steady state condition which is assumed to remain fixed for some time. In reality, line flows and bus voltages fluctuate in small amounts because load changes due to lights, motors, and other loads being turned on or off in the system. However, these small fluctuations are ignored in calculating the steady state effects on system equipment. As the load distribution, and hence power flow in the network vary considerably during different time periods, it may be necessary to obtain load flow solutions representing different system conditions such as peak load, average load or light load. Generally, these solutions provide,

- Optimum operating modes for normal conditions, such as proper setting of voltage control devices, or how the system will respond to abnormal conditions, such as outage of transformers or lines.
- When the new equipment additions are needed.
- Effectiveness of new alternatives to solve present deficiencies and meet future requirements.

The load flow model is also the basis for several other types of studies such as short circuit, stability, motor starting, and harmonic studies. The load flow model supplies the network data and an initial steady state condition for these studies.

The present study is carried out to determine the power flows at different lines/transformers and to compute the voltage profile at different buses of the existing system. The system configuration considered for the study and simulation results are explained in the subsequent sections.

4.2 Load Generation Balance from the results of operational load flow analysis

The detail of load generation balance of ER is given in Table 4.1 and state wise load generation balance is presented in Table 4.2, 4.3, 4.4, 4.5, 4.6, 4.7 and 4.8. The detailed load and generation data is given in Annexure-I.

Table 4.1: Load generation balance Details of ER

Sl. No.	Description	Quantity (MW)
1	Generation	17094
2	Import	963
Total (Generation + Import)		**18057**
3	Loss	389*(2.16%)
4	Load	11753
Demand Met (Load + Loss)		**12142**
5	Export	5915
Total System (Load + Export + Loss)		**18057**

**Note: Only for 765 kV, 400 kV, 220 kV, 132 kV and 66 kV transmission network.*

Table 4.2: Load generation balance details of Bihar

Sl. No.	Description	Quantity (MW)
1	Generation	2647
2	Import	2930
Total Total(Generation + Import)		**5577**
3	Loss	77* (1.38%)
4	Load	2321
Demand Met (Load + Loss)		**2398**
5	Export	3179
Total (Load + Export + Loss)		**5577**

**Note: Only for 765 kV, 400 kV, 220 kV and 132 kV transmission network*

Table 4.3: Load generation balance details of Jharkhand

Sl. No.	Description	Quantity (MW)
1	Generation	1301
2	Import	2167
Total (Generation + Import)		**3468**
3	Loss	24*(0.68%)
4	Load	914
Demand Met (Load + Loss)		**938**

Sl. No.	Description	Quantity (MW)
5	Export	2530
Total (Load + Export + Loss)		**3468**

**Note: Only for 765 kV, 400 kV, 220 kV and 132 kV transmission network*

Table 4.4: Load generation balance details of Odisha

Sl. No.	Description	Quantity (MW)
1	Generation	5074
2	Import	243
Total (Generation + Import)		**5317**
3	Loss	120*(2.26%)
4	Load	2236
Demand Met (Load + Loss)		**2356**
5	Export	2961
Total (Load + Export + Loss)		**5317**

**Note: Only for 765 kV, 400 kV, 220 kV and 132 kV transmission network*

Table 4.5: Load generation balance details of Sikkim

Sl. No.	Description	Quantity (MW)
1	Generation	220
2	Import	0
Total (Generation + Import)		**220**
3	Loss	1*(0.45%)
4	Load	36
Demand Met (Load + Loss)		**37**
5	Export	183
Total (Load + Export + Loss)		**220**

**Note: Only for 400 kV, 132 kV and 66 kV transmission network*

Table 4.6: Load generation balance details of West Bengal

Sl. No.	Description	Quantity (MW)
1	Generation	3722
2	Import	1696
Total (Generation + Import)		**5417**
3	Loss	138*(2.55%)
4	Load	3176
Demand Met (Load + Loss)		**3314**
5	Export	2103
Total (Load + Export + Loss)		**5417**

Note: Only for 400 kV, 220 kV and 132 kV transmission network

Table 4.7: Load generation balance details of DVC

Sl. No.	Description	Quantity (MW)
1	Generation	3441
2	Import	808
Total (Generation + Import)		**4249**
3	Loss	23*(0.55%)
4	Load	2330
Demand Met (Load + Loss)		**2353**
5	Export	1896
Total (Load + Export + Loss)		**4249**

Note: Only for 400 kV, 220 kV and 132 kV transmission network

Table 4.8: Load generation balance details of CESC

Sl. No.	Description	Quantity (MW)
1	Generation	471
2	Import	143
Total (Generation + Import)		**614**
3	Loss	4.58*(0.75%)
4	Load	558.42
Demand Met (Load + Loss)		**563**
5	Export	51
Total (Load + Export + Loss)		**614**

Note: Only for 220 kV and 132 kV transmission network

Table 4.9: Load generation balance details of DPL

Sl. No.	Description	Quantity (MW)
1	Generation	218
2	Import	21
Total (Generation + Import)		**239**
3	Loss	1.58*(0.66%)
4	Load	181.42
Demand Met (Load + Loss)		**183**
5	Export	56
Total (Load + Export + Loss)		**239**

Note: Only for 220 kV and 132 kV transmission network.

A block diagram illustrating the interstate and inter regional power exchange of ER is presented in figure 4.1

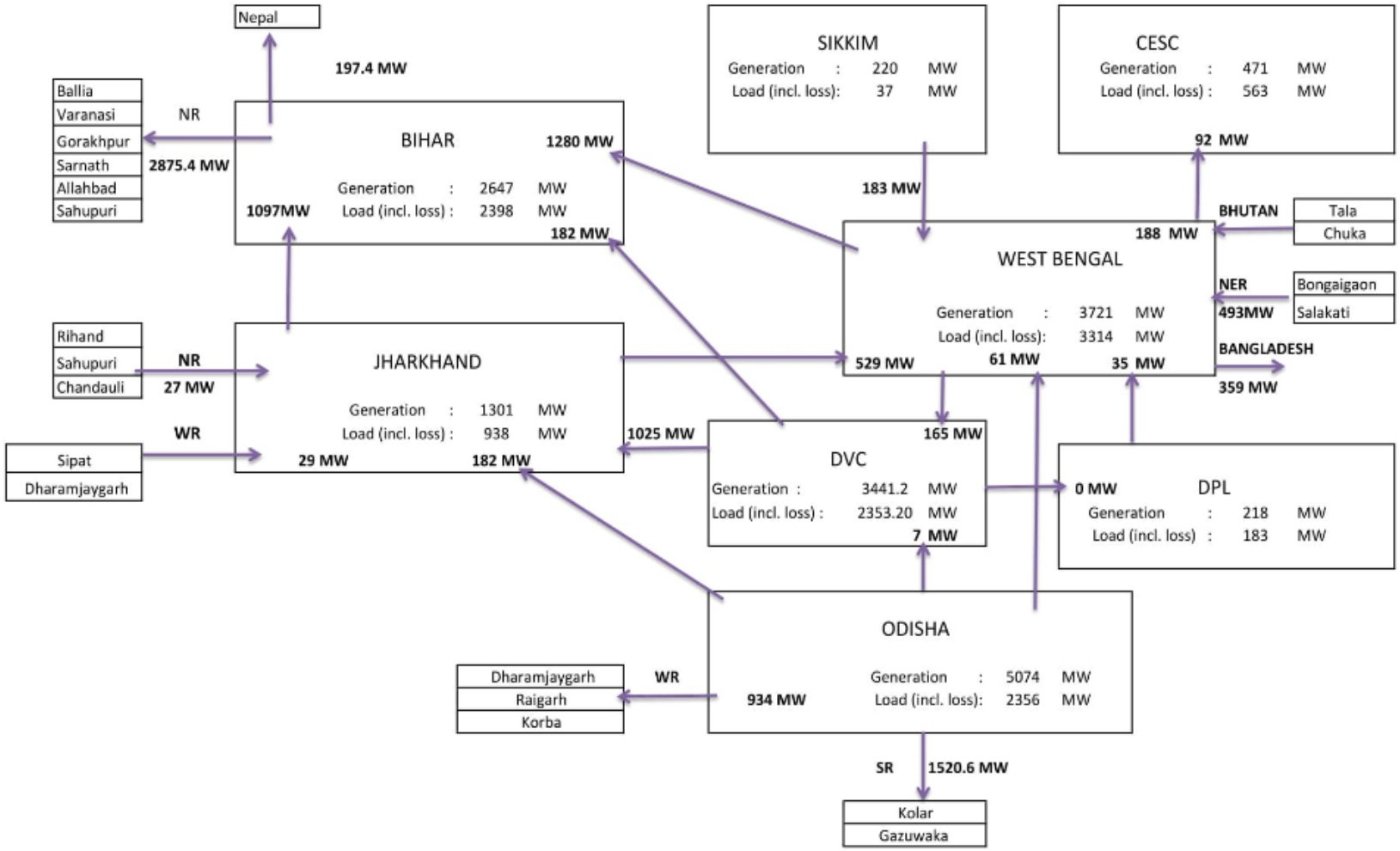


Figure 4.1: Block diagram of load generation balance of ER

Note: Inter regional exchange is shown as net exchange

4.3 Line loading conditions

Under operational load flow study, number of lines whose loading is below 5% and above 80% is presented in Table 4.10 for complete ER grid and Table 4.11 to 4.18 for constituent state of ER grid.

Table 4.10: Percentage loading details of lines of Eastern Region

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of lines loaded 80% and above	No of Lines loaded 5% and below
1	765	17.20	5.80	9.78	0	0
2	400	37.90	4.20	15.11	0	2
3	220	83.60	0.30	25.77	2	21
4	132	140.30	0.10	21.67	5	98
5	66	21.80	0.10	8.92	0	15

Table 4.11: Percentage loading details of lines of Bihar

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of lines loaded 80% and above	No of Lines loaded 5% and below
1	765	17.20	8.00	11.88	0	0
2	400	31.20	7.50	15.87	0	0
3	220	83.60	10.60	34.98	2	0
4	132	78.70	0.50	25.15	0	14

Table 4.12: Percentage loading details of lines of Jharkhand

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of lines loaded 80% and above	No of Lines loaded 5% and below
1	765	5.80	5.80	5.80	0	0
2	400	30.20	5.40	13.52	0	0
3	220	51.20	2.10	21.70	0	2
4	132	68.10	2.50	20.75	0	11

Table 4.13: Percentage loading details of lines of Odisha

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of lines loaded 80% and above	No of Lines loaded 5% and below
1	765	14.80	8.50	11.65	0	0
2	400	37.90	5.40	17.67	0	0
3	220	64.10	0.30	20.56	0	15
4	132	97.90	0.10	20.29	2	31

Table 4.14: Percentage loading details of lines of Sikkim

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of lines loaded 80% and above	No of Lines loaded 5% and below
1	400	12.20	12.20	12.20	0	0
2	220	12.70	7.50	10.10	0	0
3	132	19.5	2.7	9.36	0	2
4	66	21.80	0.10	5.54	0	15

Table 4.15: Percentage loading details of lines of West Bengal

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of lines loaded 80% and above	No of Lines loaded 5% and below
1	400	34.60	4.20	16.17	0	2
2	220	52.00	3.50	20.30	0	2
3	132	70.90	0.50	21.05	0	21

Table 4.16: Percentage loading details of lines of DVC

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of lines loaded 80% and above	No of Lines loaded 5% and below
1	400	22.5	20.6	21.87	0	0
2	220	62.9	1.2	28.48	0	2
3	132	140.3	1	26.25	2	14

Table 4.17: Percentage loading details of lines of CESC

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of lines loaded 80% and above	No of Lines loaded 5% and below
1	400	8.5	8.5	8.5	0	0
2	220	45.5	43	44.25	0	0
3	132	80.5	1.8	26.77	1	5

Table 4.18: Percentage loading details of lines of DPL

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of lines loaded 80% and above	No of Lines loaded 5% and below
1	132	35.70	11.60	23.72	0	0

Note: As observed in operational load flow that no line is loaded 100% and above.

4.4 Transformer loading conditions

Under operational load flow study, number of transformers whose loading is below 20% and above 80% is presented in Table 4.19 for complete ER grid and Table 4.20 to 4.27 for constituent state of ER grid.

Table 4.19: Percentage loading details of Transformers of Eastern Region

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of Transformers loaded 80% and above	No of Transformers loaded 20% and below
1	765	17.7	1.4	7.84	0	13
2	400	71.5	1.4	30.02	0	49
3	220	80.2	1.8	28.44	1	153
4	132	83.4	1	26.15	2	391
5	66	31.4	11.8	16.11	0	32

Table 4.20: Percentage loading details of Transformers of Bihar

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of Transformers loaded 80% and above	No of Transformers loaded 20% and below
1	765	17.7	5.1	9.30	0	5
2	400	61.7	9.7	36.16	0	6

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of Transformers loaded 80% and above	No of Transformers loaded 20% and below
3	220	61.9	7.8	32.61	0	14
4	132	83.4	2.2	31.67	2	57

Table 4.21: Percentage loading details of Transformers of Jharkhand

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of Transformers loaded 80% and above	No of Transformers loaded 20% and below
1	765	1.4	1.4	1.40	0	2
2	400	64	1.4	37.27	0	2
3	220	66.8	2.9	35.23	0	4
4	132	79.7	7.6	30.58	0	18

Table 4.22: Percentage loading details of Transformers of Odisha

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of Transformers loaded 80% and above	No of Transformers loaded 20% and below
1	765	10.5	8.1	9.54	0	6
2	400	71.5	9.4	36.92	0	6
3	220	80.2	1.8	27.75	2	46
4	132	78.9	1	23.02	0	139

Table 4.23: Percentage loading details of Transformers of Sikkim

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of Transformers loaded 80% and above	No of Transformers loaded 20% and below
1	400	35.5	2.2	18.85	0	5
2	220	12.4	2.2	7.30	0	8
3	132	59.4	6.4	22.14	0	4
4	66	31.8	11.4	15.95	0	30

Table 4.24: Percentage loading details of Transformers of West Bengal

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of Transformers loaded 80% and above	No of Transformers loaded 20% and below
1	400	60.6	6.3	27.83	0	18
2	220	76.4	3.5	21.59	0	65
3	132	99.7	3	23.08	1	111
4	66	17.9	17.9	17.90	0	2

Table 4.25: Percentage loading details of Transformers of DVC

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of Transformers loaded 80% and above	No of Transformers loaded 20% and below
1	400	62.4	62.4	62.4	0	0
2	220	74.1	14.7	44.26	0	3
3	132	71.2	2.8	38.76	6	13

Table 4.26: Percentage loading details of Transformers of CESC

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of Transformers loaded 80% and above	No of Transformers loaded 20% and below
1	220	71.8	9.1	31.42	0	7
2	132	71.3	3.8	21.61	0	33

Table 4.27: Percentage loading details of Transformers of DPL

Sl.No	Voltage Grade (kV)	Loading Percentage				
		Max	Min	Avg	No of Transformers loaded 80% and above	No of Transformers loaded 20% and below
1	220	67.3	37.2	44.72	0	0
2	132	37.2	5.3	17.31	0	17

4.5 Voltage profile

Bus Voltage Profile for Eastern Region grid is presented in Table 4.28

Table 4.28: Bus Voltage Profile for Eastern Region

Sl.No	Voltage Grade (kV)	Bus Voltage In pu			
		Max	Max_ Bus	Min	Average
1	765	1.044	Ranchi New	0.995	1.020
2	400	1.097	Haldia	1.00	1.055
3	220	1.120	Budge Budge Gen	0.980	1.053
4	132	1.124	Balmikinagar	0.941	1.038
5	66	1.086	Jaldhaka	1.014	1.052

Note: As observed in operational load flow study that bus voltage of ER grid is within the acceptable limit (as per CEA grid code).

Comparison of SCADA record with simulated result for 765 kV and 400 kV Bus Voltage of Eastern Region grid is presented in Table 4.29

Table 4.29: 765 kV and 400 kV Bus Voltage of Eastern Region grid

Sl.No	Name of the Substation	Voltage level (kV)	Voltage in pu		Difference	% Difference
		Nominal	Recorded	Simulated		
Bihar						
1	Sasaram	765	0.995	1.000	0.005	0.526%
		400	1.015	1.000	-0.015	-1.478%
2	Gaya	765	1.029	1.019	-0.010	-0.978%
		400	1.038	1.028	-0.010	-0.935%
3	Banka	400	1.055	1.046	-0.009	-0.882%
4	**Barh**	**400**	**1.065**	**1.062**	-0.003	-0.254%
5	Biharsharif	400	1.045	1.053	0.008	0.766%
6	Kahalgaon	400	1.053	1.050	-0.003	-0.247%
7	Muzaffarpur	400	1.035	1.045	0.010	0.918%
8	**New Purnea**	**400**	**1.053**	**1.062**	0.009	0.893%
9	**Patna**	**400**	**1.053**	**1.062**	0.009	0.893%
10	Lakhisarai	400	**1.053**	**1.046**	-0.007	-0.627%
11	Kishanganj	400	1.030	1.063	0.033	3.204%
Jharkhand						
1	Ranchi New	765	1.029	1.044	0.015	1.482%
		400	1.038	1.043	0.005	0.530%
2	**Jamshedpur**	**400**	**1.080**	**1.065**	-0.015	-1.389%
3	Maithon	400	1.055	1.053	-0.002	-0.190%
4	Ranchi	400	1.040	1.049	0.009	0.865%
5	**Chaibasa**	**400**	**1.068**	**1.063**	-0.004	-0.422%
6	Koderma (KTPS)	400	1.055	1.045	-0.011	-0.995%
7	BTPS-A (Bokaro)	400	1.055	1.049	-0.006	-0.569%
8	**TISCO**	**400**	**1.053**	**1.067**	0.015	1.378%
Odisha						
1	Jharsuguda	765	1.047	1.025	-0.022	-2.097%

Sl.No	Name of the Substation	Voltage level (kV)	Voltage in pu		Difference	% Difference
		Nominal	Recorded	Simulated		
		400	1.045	1.035	-0.010	-0.986%
2	Angul	765	1.038	1.035	-0.003	-0.319%
		400	1.040	1.040	0.000	0.000%
3	Bisra	400	1.043	1.052	0.010	0.911%
4	Bolangir	400	1.035	1.031	-0.004	-0.435%
5	Indravati	400	0.998	1.020	0.023	2.256%
6	Jaypore	400	1.015	1.018	0.003	0.246%
7	Kaniha	400	1.028	1.040	0.013	1.217%
8	**Keonjhar**	**400**	**1.060**	**1.053**	-0.007	-0.670%
9	**Kuchei/Baripada**	**400**	**1.068**	**1.071**	0.004	0.328%
10	Mendhasal	400	1.058	1.058	0.000	0.019%
11	Meramundali	400	1.048	1.047	-0.001	-0.076%
12	Rengali	400	1.023	1.042	0.020	1.907%
13	New Duburi	400	1.045	1.052	0.007	0.679%
14	Sterlite	400	1.033	1.055	0.023	2.179%
15	**Pandiabil**	**400**	**1.060**	**1.056**	-0.004	-0.377%
16	JITPL	400	1.023	1.040	0.018	1.711%
17	GMR	400	1.040	1.040	0.000	0.000%
18	JSPL	400	1.035	1.045	0.010	0.966%
Sikkim						
1	Rangpo	400		1.220	1.220	
2	Teesta V	400	1.040	1.051	0.011	1.058%
West Bengal						
1	**Arambag**	**400**	**1.088**	**1.071**	-0.017	-1.517%
2	**Jeerat**	**400**	**1.070**	**1.084**	0.014	1.308%
3	Bidhannagar (WBSETCL)	400	1.043	1.057	0.014	1.362%
4	**Kharagpur**	**400**	**1.068**	**1.074**	0.007	0.609%
5	Bakreswar	400	1.033	1.052	0.020	1.889%

Sl.No	Name of the Substation	Voltage level (kV)	Voltage in pu		Difference	% Difference
		Nominal	Recorded	Simulated		
6	**Kolaghat TPS**	**400**	**1.070**	**1.074**	0.004	0.374%
7	Sagardighi	400	1.058	1.068	0.011	0.993%
8	**Binaguri**	**400**	**1.063**	**1.071**	0.008	0.800%
9	**Malda**	**400**	**1.068**	**1.063**	-0.005	-0.440%
10	Parulia (Durgapur PG)	400	1.045	1.056	0.011	1.053%
11	**Farakka**	**400**	**1.060**	**1.060**	0.000	0.000%
12	**Subhashgram**	**400**	**1.080**	**1.095**	0.015	1.389%
13	**Raghunathpur**	**400**	**1.058**	**1.061**	0.003	0.331%
14	Mejia	400	1.055	1.054	-0.001	-0.057%
15	**PPSP**	**400**	**1.060**	**1.068**	0.008	0.755%

From analysis of voltage profile of ER grid it is observed that at some of the 400 kV S/S, the bus bar voltages are violating the grid code stipulations. So a compressive reactive power assessment is required to maintain the voltage profile as per grid code regulations.

4.6 Analysis of the load flow study results

- Power map of ER grid along with separate power map of constituent states (Bihar, Jharkhand, Odisha, Sikkim and West Bengal) for operational load flow study is presented in Annexure-II.
- Line loading details are presented in Table G of Annexure-II.
- Due to under loading of transmission lines, over voltage is experienced at many buses (765 kV, 400 kV, 220 kV, 132 kV and 66 kV)
- The line /Transformers were loaded within the rated capacity under winter off-peak operating condition of 29th December 2016 at 02.00 hrs.
- Maximum inter regional power exchange is 2848.4 MW to NR.
- From the off peak load flow analysis results it is observed that the 400 & 220 kV bus voltages of the ER grid are on the higher side of the stipulated grid code and also in some cases violating the same. There is quantum reactive power flow between the constituent at high voltage conditions leading the penalty charges. Hence appropriate reactive power compensation needs to be planned at identified substations on an urgent basis.

5 SHORT CIRCUIT STUDIES

Even the most carefully designed power systems may be subjected to damaging arc blast or overheating and the explosive magnetic forces associated with high magnitude currents flowing during a short circuit. To ensure that circuit's protective equipment can isolate faults quickly and minimize system component damage, personal hazard and outage severity, it is essential that a short circuit study be included in the electrical design of new industrial and commercial power systems, and for modifications to existing system. There are five possibilities for a short circuit in three-phase system.

- 3-phase to ground fault.
- Single line to ground fault.
- Line to line fault.
- Double line to ground fault.
- Open conductor fault.

If a short circuit of one type is not interrupted promptly, it often progresses to another type, which generally results in more severe damage. For example in a solidly grounded system, a single line to ground fault, if not interrupted, can quickly escalate to a double line to ground or a three phase to ground fault. The choice of study that is required for a particular system is a matter of engineering judgment based on an analysis of the basic single line diagram and determination of the specific purpose of the study.

For the three-phase industrial and commercial power systems, the most common study is the calculation of three-phase (balanced) short circuit current which is more severe compared to other faults, specifically for comparison with switching equipment capability. The short circuit current determined from this type of study generally represents the highest value at a particular location in the system. It is important to realize that single line to ground or double line to ground short circuit current magnitude can exceed three-phase short circuit current under certain conditions. This condition may arise near,

- Solidly grounded synchronous machines.
- Solidly grounded star connection of a delta-star transformer of the three-phase core design.
- Grounded star-delta tertiary autotransformers.

- Grounded star-delta tertiary three winding transformers.

In system where any of these machines or transformer connections exists, it may be necessary to conduct a single line to ground short circuit study. Medium and high voltage circuit breakers have 15% higher interrupting capability for single line to ground short circuits than for phase to phase or three phase short circuits. This difference must be taken into account when comparing short circuit duty with equipment ratings. Further, future network growth (about 20% increases in result obtained through study) has to be accounted while considering the fault levels for equipment ratings.

5.1 Short circuit study result analysis

The detailed results of the Short circuit study for the three phases to ground fault and single line to ground faults are tabulated in Table H and presented in Annexure-III.

Based on the detailed analysis, it is observed that

- For 400 kV and 220 kV voltages, 3-phase fault level & SLG fault level at some of the substations are at the critical level. Fault levels which are more than 80% of breaker rating are listed in Table 5.1 and Table 5.2.
- For 765 kV, 132 kV & 66 kV voltage level, there are no violation in the fault level.

Table 5.1: 3-Ph fault levels > 80% of breaker rating

Sl.No.	Substation Name	Rated Voltage (kV)	3-Phase fault (MVA)	Fault Current (kA)
1	Meramundali	400	26844.588	38.747
2	TTPS	220	12383.667	32.499
3	Budhipadar	220	13968.626	36.658
4	NALCO	220	12871.504	33.779
5	BSSL	220	14259.951	37.423
6	Parulia	400	25044.32	36.148
		400	25043.79	36.148

Table 5.2: SLG fault levels > 80% of breaker rating

Sl.No.	Substation Name	Rated Voltage (kV)	SLG fault (MVA)	Fault Current (kA)
1	Meramundali	220	15851.088	41.598
		220	15855.051	41.609
2	Budhipadar	220	13787.209	36.182
3	Vedanta	220	12580.027	33.014
4	NALCO	220	13436.155	35.261
5	BSSL	220	13558.097	35.581
6	Bidhannagar	220	12354.549	32.422
7	Kasba	132	6170.516	26.989

Note: In some of the Generating stations the SLG fault rating is exceeding 80% while the three phase fault rating is within 80% of breaker capacity.

6 CONCLUSION

Based on the operational load flow studies carried out for aforesaid condition following observation are made,

- Due to less power demand in ER, overvoltage is observed in many (765 kV, 400 kV, 220 kV, 132 kV and 66 kV) buses.
- The line /Transformers were loaded within the rated capacity under winter off-peak operating condition of 29th December 2016 at 02.00 hrs.
- Maximum inter regional power exchange is 2848.4 MW to NR.
- From the off peak load flow analysis results it is observed that the 400 & 220 kV bus voltages of the ER grid are on the higher side of the stipulated grid code and also in some cases violating the same. There is quantum reactive power flow between the constituent at high voltage conditions leading the penalty charges. Hence appropriate reactive power compensation needs to be planned at identified substations on an urgent basis.
- It is observed that short circuit levels are critical at some of the substations but within the breaker rated capacity. Such cases are listed above in section 5.1.

The network modeling for operational load flow and short circuit study and the results will provide the base for the subsequent protection system analysis and calculation. This will also provide the base for reactive power compensation of ER grid.

ANNEXURE I – EXISTING EASTERN REGION TRANSMISSION NETWORK AND LOAD DETAILS

Table A: State wise list of substations present in the Eastern region grid

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
Bihar						
765kV Level						
1	Sasaram	765/400	1	1500	1500	PGCIL
		400/220	1	315	315	
			1	500	500	
		132/33	2	10	20	
2	Gaya	765/400	3	1500	4500	PGCIL
		400/220	1	315	315	
			1	500	500	
400kV Level						
1	Banka	400/132	2	200	400	PGCIL
2	Barh	400/132	2	200	400	NTPC
3	Biharsharif	400/220	3	315	945	PGCIL
4	Kahalgaon	400/132	2	200	400	NTPC
5	Muzaffarpur	400/220	2	315	630	PGCIL
			1	500	500	
		220/132	1	100	100	
6	New Purnea	400/220	1	500	500	
			1	500	500	
7	Patna	400/220	1	315	315	
			1	500	500	
8	Lakhisarai	400/132	2	200	400	
9	Sasaram B2B	400/(93/√3)/93	3	234/117/117		
10	Kishanganj	400/220	2	500	1000	
11	Nabinagar RLY	400/132	2	200	400	Railway
220kV Level						
1	Purnea	220/132	3	160	480	PGCIL
2	Arrah	220/132	1	160	160	
			2	100	200	
3	Biharshariff	220/132	3	150	450	BSPTCL
		132/33	1	20	20	
4	Bodhgaya	220/132	4	150	600	
		220/132	1	160	160	
		132/33	3	50	150	
5	Darbhanga new	220/132	2	160	320	
6	Dehri	220/132	4	100	400	
		132/33	2	50	100	
7	Fatuha	220/132	5	100	500	
		132/33	3	50	150	

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
8	Gopalganj	220/132	3	100	300	
		132/33	3	50	150	
9	Khagaul	220/132	4	100	400	
		132/33	5	50	250	
10	Begusarai	220/132	4	100	400	
		132/33	3	50	150	
11	Sipara	220/132	2	150	300	
		220/132	1	160	160	
		132/33	2	50	100	
12	Hazipur New	220/132	2	100	200	
13	Madhepura	220/132	3	100	300	
		132/33	2	20	40	
14	Pusauli New	220/132	2	150	300	
		132/33	2	50	100	
15	Sonenagar	220/132	2	160	320	
		132/33	2	50	100	
16	Muzaffarpur (MTPS)	220/132	3	100	300	
17	Kishanganj New	220/132	2	160	320	
18	New Samastipur	220/132	2	160	320	PGCIL
132kV Level						
1	Arrah	132/33	1	20	20	BSPTCL
			3	50	150	
2	Ataula (Arwal)	132/33	2	20	40	
3	Aurangabad	132/33	2	20	40	
4	Banjari	132/33	3	20	60	
5	Banka	132/33	3	20	60	
6	Barauni TPS	132/33	1	50	50	
			2	20	40	
7	Barh	132/33	1	20	20	
			1	50	50	
8	Baripahari	132/33	2	50	100	
9	Belaganj	132/33	2	20	40	
10	Bettiah	132/33	2	20	40	
			1	50	50	
11	Bihta	132/33	3	50	150	
12	Bikramganj	132/33	2	20	40	
			1	50	50	
13	Buxar	132/33	2	20	40	
			1	50	50	
14	Chandauti (Gaya)	132/33	2	50	100	
		132/25	2	13.35	26.7	
15	Chhapra	132/33	2	20	40	

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
			1	50	50	
16	Darbhanga (old)	132/33	2	50	100	
17	Dhaka	132/33	3	20	60	
18	Dalsingsarai	132/33	2	20	40	
19	Digha	132/33	3	50	150	
20	Dumraon	132/33	1	20	20	
			1	50	50	
21	Ekma	132/33	1	20	20	
22	Ekanga Sarai (Ekanagar)	132/33	3	20	60	
23	Forbeshganj	132/33	1	20	20	
			1	50	50	
24	Goh	132/33	2	20	40	
25	Gangwara	132/33	2	50	100	
26	Gaighat	132/33	2	50	100	
27	Hazipur	132/33	3	50	150	
28	Hulasganj	132/33	2	20	40	
29	Harnaut	132/33	2	20	40	
30	Hathidah	132/33	3	20	60	
31	Imamganj	132/33	2	20	40	
32	Jagdishpur	132/33	2	20	40	
33	Jandaha	132/33	2	20	40	
34	Jainagar	132/33	3	20	60	
35	Jakkanpur	132/33	4	50	200	
			1	20	20	
36	Jamalpur	132/33	2	50	100	
37	Jamui	132/33	2	20	40	
38	Jehanabad	132/33	2	20	40	
39	Kahalgaon	132/33	2	20	40	
			2	50	100	
40	Karmnasa	132/33	2	50	100	
			1	20	20	
		132/25	1	21.6	21.6	
			1	20	20	
41	Kataiya	132/33	3	20	60	
42	Katihar	132/33	3	20	60	
			1	50	50	
43	Katra	132/33	3	50	150	
44	Kusheshwarsthan	132/33	2	20	40	
45	Kochas	132/33	2	20	40	
46	Karbigahiya	132/33	4	50	200	
47	Kudra	132/33	2	20	40	

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
48	Khagaria	132/33	2	20	40	
			1	50	50	
49	Kishanganj	132/33	1	50	50	
			1	20	20	
50	Lakhisarai	132/33	3	20	60	
51	Madhubani	132/33	2	20	40	
52	Masaurhi	132/33	2	20	40	
53	Mithapur	132/33	2	50	100	
54	Mohania	132/33	1	50	50	
			1	20	20	
55	Motihari	132/33	1	20	20	
			2	50	100	
56	Masrakh	132/33	2	20	40	
57	Muzaffarpur	132/33	3	50	150	
58	Nalanda	132/33	2	20	40	
59	Naugachhia	132/33	3	20	60	
60	Nawada	132/33	1	20	20	
			3	50	150	
61	Pandaul	132/33	2	20	40	
			1	50	50	
62	Phulparas	132/33	2	20	40	
63	Purnea	132/33	1	20	20	
			2	50	100	
64	Rafiganj	132/33	1	50	50	
			1	20	20	
65	Rajgir	132/33	2	20	40	
66	Ramnagar	132/33	2	20	40	
67	Raxaul	132/33	2	20	40	
68	Remi nagar (Runni Saidpur)	132/33	2	20	40	
69	Sherghati	132/33	2	20	40	
70	SKMCH	132/33	2	50	100	
71	Sonebarsa	132/33	2	20	40	
72	Sabour	132/33	3	50	150	
73	Saharsa	132/33	1	20	20	
74	Samastipur	132/33	2	20	40	
75	Sasaram	132/33	2	50	100	
76	Shekhpura	132/33	2	20	40	
77	Sheetalpur	132/33	2	20	40	
78	Sitamarhi	132/33	3	50	150	
79	Siwan	132/33	1	20	20	
			2	50	100	

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
80	Sonenagar	132/33	1	50	50	
			1	20	20	
		132/25	1	21.6	21.6	
			1	20	20	
81	Sultanganj	132/33	2	20	40	
			2	50	100	
82	Supaul	132/33	3	20	60	
83	Tehta	132/33	2	20	40	
84	Tekari	132/33	2	20	40	
85	Udaikishanganj	132/33	2	20	40	
86	Vaishali	132/33	2	20	40	
87	Valmikinagar	132/33	1	10	10	
88	Wazirganj	132/33	2	20	40	
89	New Mahnar	132/33	2	20	40	
90	New Sheohar	132/33	1	50	50	
91	New Belsund	132/33	1	10	10	
92	New Benipatti	132/33	2	20	40	
Jharkhand						
765kV Level						
1	Ranchi New	765/400	2	1500	3000	PGCIL
400kV Level						
1	Jamshedpur	400/220	2	315	630	PGCIL
2	Maithon	400/220	1	315	815	
			1	500		
3	Ranchi	400/220	2	315	630	
4	Chaibasa	400/220	2	315	630	
5	Koderma (KTPS)	400/220	2	315	630	DVC
		220/132	2	150	300	
6	BTPS-A (Bokaro)	400/220/33	2	315	630	
7	TISCO	400/220	2	315	630	
220kV Level						
1	Chandil	220/132	4	100	400	JUSNL
2	Chaibasa	220/132	2	150	300	
		132/33	2	50	100	
3	Hatia New	220/132	3	150	450	
4	Lalmatiya	220/132	1	100	100	
		132/33	1	20	20	
			2	50	100	
5	PTPS	220/132	2	150	300	
6	Ramachandrapur	220/132	3	150	450	
7	TTPS	220/132	2	250	500	

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
8	Dumka (New)	220/132	2	150	300	
9	BTPS-B (Bokaro)	220/132	2	150	300	DVC
		132/33	2	50	100	
10	CTPS	220/132/11	3	150	450	
		132/33	2	80	160	
11	Giridhi	220/132/33	2	150	300	
		220/33	2	80	160	
		132/33	3	80	240	
12	Jamshedpur	220/132/33	2	150	300	
		132/33	3	50	150	
13	Ramgarh	220/132	2	150	300	
		132/33	2	80	160	
			1	50	50	
14	Dhanbad	220/33	2	80	160	
		220/132				
15	Kalyanswari	220/132/33	2	150	300	
		220/132/33	1	160	160	
		132/33	2	50	100	
132kV Level						
1	Maniqui	132/33	2	50	100	JUSNL
2	Adityapur	132/33	4	50	200	
3	Chakradharpur	132/33	1	50	50	
4	Dalbhumgarh	132/33	2	50	100	
5	Chaibasa	132/33	1	25	25	
6	Manoharpur	132/33	2	50	100	
7	Deogarh	132/33	3	50	150	
8	Dumka	132/33	2	50	100	
9	Garhwa Road	132/33	1	50	50	
			1	20	20	
10	Goielkara	132/33	1	20	20	
11	Golmuri	132/33	2	50	100	
12	Gumla	132/33	2	20	40	
13	Hatia old	132/33	4	50	200	
14	Tamar	132/33	2	50	100	
15	Madhupur	132/33	2	50	100	
16	Sikidri	132/33	2	20	40	
17	Jadugoda	132/33	2	20	40	
			1	50	50	
18	Jamtara	132/33	1	50	50	
			1	20	20	
19	Japla	132/33	2	20	40	
20	Kamdara	132/33	2	20	40	

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
			1	20	20	
21	Kanke	132/33	2	50	100	
22	Kendposi	132/33	2	20	40	
			1	50	50	
23	Latehar	132/33	2	50	100	
24	Lohardaga	132/33	2	50	100	
25	Namkum	132/33	4	50	200	
26	Nowamundi	132/33	1	50	50	
27	Pakur	132/33	2	50	100	
28	Rajkharsawan	132/33	1	20	20	
			1	50	50	
29	Sahebgunj	132/33	2	50	100	
30	Daltonganj	132/33	2	50	100	
31	Koderma	132/33	1	80	80	DVC
			1	50	50	
		132/25	1	25	25	
32	Nimiaghat	132/33	2	31.5	63	
		132/25	2	25	50	
33	North Karnapura	132/33	2	50	100	
34	Pradhankanta	132/33	No Load			
35	Patherdhi	132/33	2	80	160	
		132/33	1	50	50	
		132/25	2	12.5	25	
36	Patratu (DVC)	132/33	1	31.5	31.5	
37	Putki	132/33	3	80	240	
38	Barhi	132/33	1	50	50	
		132/33	1	31.5	31.5	
39	Gola	132/33	1	31.5	31.5	
		132/33	1	20	20	
40	Hazaribag Road	132/33	No load			
41	Hazaribagh	132/33	2	50	100	
42	Kumardhubi	132/33	2	50	100	
			1	80	80	
		132/25	2	25	50	
43	Konar	132/33	1	20	20	
44	Mosabani	132/33	1	31.5	31.5	
		132/33	1	20	20	
45	Biada	132/33	2	80	160	
46	MHS-Right bank	132/33	2	50	100	
47	Panchet	132/33	1	50	50	
Odisha						

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
765 kV Level						
1	Jharsuguda	765/400/33	2	1500	3000	PGCIL
2	Angul	765/400	4	1500	6000	
400 kV Level						
1	Bisra	400/220	2	315	630	PGCIL
2	Bolangir	400/220/33	2	315	630	
3	Indravati	400/220/33	2	315	630	
4	Jaypore	400/220/33	2	315	630	
5	Kaniha	400/220	2	315	630	
6	Keonjhar	400/220/33	2	315	630	
7	Kuchei/Baripada	400/220	2	315	630	
		220/132	2	160	320	
8	Mendhasal	400/220	2	315	630	OPTCL
		220/33	1	20	20	
9	Meramundali	400/220	2	315	630	PGCIL
		220/132	3	100	300	OPTCL
		132/33	1	12.5	12.5	
10	Rengali	400/220	2	315	630	PGCIL
11	New Duburi	400/220	2	315	630	OPTCL
12	Sterlite	400/220	2	315	630	SEL
13	Pandiabil	400/220	2	500	1000	PGCIL
220 kV Level						
1	Atri	220/132	2	160	320	OPTCL
2	Balasore	220/132	2	160	320	
		132/33	2	63	126	
		132/33	1	40	40	
3	Bhadrak	220/132	3	100	300	
		132/33	2	63	126	
		132/33	1	40	40	
4	Bidanasi	220/132	1	160	160	
		220/132	2	100	200	
		132/33	2	63	126	
		132/33	1	40	40	
5	Bolangir new	220/132	2	160	320	
		132/33	1	12.5	12.5	
6	Budhipadar	220/132	2	160	320	
		132/33	1	20	20	
		132/33	1	12.5	12.5	
7	Chandaka	220/132	2	100	200	
		220/132	2	160	320	
		132/33	2	63	126	

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
		132/33	1	40	40	
8	Duburi	220/132	3	100	300	
		220/33	2	40	80	
		132/33	1	5	5	
9	Jayanagar	220/132	2	160	320	
		132/33	2	20	40	
		132/33	1	12.5	12.5	
10	Joda	220/132	3	100	300	
		132/33	3	20	60	
		132/33	1	40	40	
11	Katapalli	220/132	1	160	160	
		220/132	2	100	200	
		132/33	1	40	40	
		132/33	2	20	40	
12	Lapanga	220/132	2	160	320	
13	Mendhasal	220/132	2	100	200	
14	Narendrapur	220/132	1	100	100	
		220/132	2	160	320	
		132/33	2	40	80	
		132/33	1	20	20	
15	Paradip	220/132	1	160	160	
		220/132	1	50	50	
		220/132	1	100	100	
		132/33	2	20	40	
		132/33	1	12.5	12.5	
16	Talcher (TTPS)	220/132	2	160	320	
17	Tarkera	220/132	4	100	400	
18	Theruvali	220/132	2	100	200	
		132/33	2	12.5	25	
19	Bhanjanagar	220/132	2	160	320	
20	Puri (Samangara)	220/132	2	160	320	
21	Balimela	220/33	1	20	20	
		220/33	1	40	40	
22	Barkote	220/33	2	40	80	
23	Nayagarh	220/33	1	40	40	
		220/33	2	20	40	
24	Laxmipur	220/33	1	20	20	
25	Rengali	220/33	2	20	40	
132 kV Level						
1	Akhusingh	132/33	2	12.5	25	OPTCL

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
2	Anandapur	132/33	2	12.5	25	
		132/33	1	20	20	
3	Angul	132/33	2	40	80	
		132/33	1	20	20	
4	Argul	132/33	1	40	40	
		132/33	1	20	20	
5	Atri	132/33	1	20	20	
6	Aska	132/33	3	40	120	
7	Balugaon	132/33	1	40	40	
		132/33	1	20	20	
		132/33	1	12.5	12.5	
8	Banki	132/33	2	20	40	
9	Barbil	132/33	2	12.5	25	
10	Baragarh	132/33	3	40	120	
11	Baripada	132/33	3	40	120	
12	Barpalli	132/33	1	20	20	
		132/33	1	40	40	
13	Berhampore	132/33	2	40	80	
		132/33	1	20	20	
14	Basta	132/33	1	12.5	12.5	
		132/33	1	20	20	
15	Bhanjanagar	132/33	2	40	80	
		132/33	1	16	16	
16	Bhawanipatna	132/33	2	12.5	25	
17	Bhubaneswar	132/33	3	63	189	
18	Boinda	132/33	1	20	20	
		132/33	2	12.5	25	
19	Boudh	132/33	1	20	20	
20	Bolangir	132/33	2	40	80	
		132/33	1	12.5	12.5	
21	Brajrajnagar	132/33	1	40	40	
		132/33	3	20	60	
22	Chainpal	132/33	2	40	80	
		132/33	1	20	20	
23	Chandikhole	132/33	3	20	60	
24	Chhandpur	132/33	2	12.5	25	
25	Chhatrapur	132/33	3	20	60	
26	Chhend	132/33	3	40	120	
27	Choudwar	132/33	1	20	20	
		132/33	2	40	80	

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
28	Cuttack	132/33	3	40	120	
29	Dabugaon	132/33	2	12.5	25	
30	Dhenkanal	132/33	3	40	120	
31	Digapahandi	132/33	2	20	40	
		132/33	1	12.5	12.5	
32	Ganjam	132/33	2	12.5	25	
33	Jagatsinghpur	132/33	2	20	40	
		132/33	1	40	40	
34	Jajpur road	132/33	2	40	80	
		132/33	1	20	20	
35	Jajpur town	132/33	2	40	80	
		132/33	1	20	20	
36	Jaleswar	132/33	2	31.5	63	
		132/33	1	12.5	12.5	
37	Jharsuguda	132/33	1	40	40	
38	Junagarh	132/33	3	20	60	
39	Kalarangi	132/33	2	12.5	25	
		132/33	1	20	20	
40	Kalugaon	132/33	2	40	80	
41	Kamakshyanagar	132/33	1	20	20	
		132/33	2	12.5	25	
42	Karanjia	132/33	2	12.5	25	
		132/33	1	20	20	
43	Kendrapara	132/33	2	40	80	
		132/33	1	12.5	12.5	
44	Kesinga	132/33	1	40	40	
		132/33	2	20	40	
45	Kesura/Badagada	132/33	1	63	63	
		132/33	1	40	40	
46	Khariar	132/33	2	40	80	
47	Khurda	132/33	3	40	120	
48	Konark	132/33	2	20	40	
49	Kuchinda	132/33	2	20	40	
50	Lapanaga	132/33	1	20	20	
51	Mania	132/33	1	12.5	12.5	
52	Marshaghai	132/33	2	20	40	
53	Mohana	132/33	2	12.5	25	
54	Nimapara	132/33	2	40	80	
			1	12.5		
55	Nuapara	132/33	2	20	40	

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
56	Nuapatna	132/33	1	40	40	
		132/33	1	20	20	
		132/33	1	12.5	12.5	
57	Padampur	132/33	1	20	20	
58	Parlakhemundi	132/33	3	12.5	37.5	
59	Patnagarh	132/33	1	40	40	
		132/33	2	20	40	
60	Pattamundai	132/33	2	20	40	
		132/33	1	12.5	12.5	
61	Phulbani	132/33	2	12.5	25	
		132/33	1	40	40	
62	Phulnakhara	132/33	2	20	40	
63	Polasapanga	132/33	1	40	40	
		132/33	2	20	40	
64	Puri	132/33	3	40	120	
65	Purusottampur	132/33	2	12.5	25	
66	Rairakhole	132/33	2	12.5	25	
67	Rairangpur	132/33	2	20	40	
		132/33	1	12.5	12.5	
68	Rajgangpur	132/33	3	40	120	
69	Ranasinghpur	132/33	2	63	126	
		132/33	1	40	40	
70	Rayagada	132/33	2	12.5	25	
71	Rourkela	132/33	4	35	140	
72	Saintala	132/33	1	10	10	
		132/33	1	12.5	12.5	
73	Salipur	132/33	2	20	40	
		132/33	1	12.5	12.5	
74	Sambalpur	132/33	2	31.5	63	
		132/33	1	40	40	
75	Shamuka	132/33	2	31.5	63	
76	Somnathpur	132/33	1	12.5	12.5	
77	Sonepur	132/33	3	20	60	
		132/33			0	
78	Soro	132/33	1	40	40	
		132/33	2	20	40	
79	Sunabeda	132/33	3	12.5	37.5	
80	Sundargarh	132/33	1	40	40	
		132/33	1	20	20	
81	Tentulikhunti	132/33	1	20	20	

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
		132/33	2	12.5	25	
82	Tarkera	132/33	1	12.5	12.5	
83	Umerkote	132/33	2	20	40	
84	Bolani	132/11	2	10	20	
85	Brajrajnagar	132/11	1	12.5	12.5	
86	Jharsuguda	132/11	1	20	20	
		132/11	1	12.5	12.5	
Sikkim						
400kV Level						
1	Rangpo	440/220	5	315	1575	PGCIL
		220/132	3	100	300	
132kV Level						
1	Gangtok	132/66	2	50	100	PGCIL
2	Melli	132/66	2	50	100	Sikkim Gov
3	Geyzing	132/66	1	20	20	
4	Rangit	132/66	1	20	20	
66kV Level						
1	Phodong	66/11	1	5	5	Sikkim Gov
			1	2.5	2.5	
2	Bulbuley	66/11	2	10	20	
3	Sichey	66/11	2	10	20	
			1	5	5	
4	Tadong	66/11	3	5	15	
5	Rongly	66/11	2	2.5	5	
6	Mamring	66/11	1	10	10	
			1	7.5	7.5	
			1	15	15	
7	Melli	66/11	2	5	10	
8	Namchi	66/11	2	2.5	5	
9	Rabangla	66/11	1	5	5	
10	Rothak	66/11	2	2.5	5	
11	Soreng	66/11	2	2.5	5	
12	Geyzing	66/11	2	2.5	5	
13	Purano Namchi	66/11	2	7.5	15	
14	Pakyong	66/11	1	10	10	
15	Pelling	66/11	1	5	5	
16	Rhenock	66/11	1	5	5	
17	Mangan	66/11	2	5	10	
18	Ranipool	66/11	2	7.5	15	
19	Topakhani	66/11	1	7.5	7.5	
		66/11	1	5	5	

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
West Bengal						
400 kV Level						
1	Arambagh	400/220	4	315	1260	WBSETCL
		220/132	3	160	480	
		132/33	3	50	150	
2	Jeerat	400/220	4	315	1260	
		220/132/33	3	160	480	
3	Bidhannagar (Durgapur WBSETCL)	400/220	2	315	630	
4	Kharagpur	400/220	2	315	630	
		220/132	2	160	320	
5	Bakreswar	400/220	2	315	630	WBPDCL
		220/33	1	50	50	WBSETCL
6	Kolaghat TPS	400/220	2	315	630	WBPDCL
7	Sagardighi	400/220	2	315	630	
8	Binaguri	400/220	2	315	630	PGCIL
9	Malda	400/220	2	315	630	
10	Parulia (Durgapur PG)	400/220	2	315	630	
11	Farakka	400/220	2	315	630	NTPC
12	Subhashgram	400/220	4	315	1260	PGCIL
			1	500	500	
220 kV Level						
1	Asansol	220/132	1	160	160	WBSETCL
			1	160	160	
		132/33	3	50	150	
2	New Bishnupur	220/132	3	160	480	
		132/33	2	31.5	63	
3	Dalkhola	220/132	2	160	320	
		132/33	3	20	60	
4	Dharampur	220/132	2	160	320	
		132/33	2	50	100	
5	Domjur	220/132	1	160	160	
			1	100	100	
		132/33	3	50	150	
6	Gokarna	220/132	4	160	640	
		132/33	3	50	150	
7	Howrah	220/132	3	160	480	
			1	150	150	
		132/25	2	20	40	
8	Kasba	220/132	2	150	300	
			2	160	320	

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
9	Krishnagar	220/132/33	2	160	320	
		132/33	2	50	100	
			1	31.5	31.5	
10	Laxmikantpur	220/132	3	160	480	
		132/33	2	31.5	63	
			1	50	50	
		132/25	2	12.5	25	
11	New Haldia	220/132	2	160	320	
		132/33	1	31.5	31.5	
		132/33	1	50	50	
12	New Jalpaiguri	220/132	2	160	320	
		132/33	2	50	100	
13	New town action area-III	220/132	2	160	320	
		220/33	2	50	100	
14	Rishra	220/132	3	160	480	
		132/33	3	50	150	
15	Satgachia	220/132	2	160	320	
		132/33	2	50	100	
			1	31.5	31.5	
16	Subhashgram	220/132	2	160	320	
		132/33	2	31.5	63	
17	KTPS 400 kV	220/132	1	160	160	WBPDCL
			2	150	300	
18	STPS (Santhaldih)	220/132	1	130	130	WBPDCL
			1	100	100	
19	Birpara	220/132	2	160	320	PGCIL
20	Malda	220/132	1	50	370	
			2	160	640	
21	Siliguri	220/132	2	160	320	
22	DPL	220/132	2	160	320	DPL
			1	100	100	
23	Bidhannagar (Durgapur)	220/132	1	160	160	WBSETCL
		220/132	2	200	400	
24	Hura	220/132	2	160	320	
		132/33	2	50	100	
25	Foundry park	220/132/33	2	160	320	
		132/33	2	50	100	
26	Midnapur	220/132	3	160	480	
		132/33	2	50	100	
27	Kolkata leather complex	220/132	2	160	320	
		132/33	3	50	150	
28	Vidyasagar Park	220/132	2	160	320	

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
29	Egra	200/132	2	160	320	
30	EMSS	220/132 /33	5	160	800	CESC
31	BBGS	220/132 /33	2	160	320	
32	NCGS	220/132 /33	2	160	320	
33	Waria (DTPS)	220/132/33	3	150	450	DVC
		132/33	3	50	150	
		132/25	2	25	50	
34	Durgapur/Muchipara	220/33	2	80	160	
			1	50	50	
35	Parulia	220/33	2	80	160	
		132/33	1	50	50	
36	Barjora	220/132	2	150	300	
		220/33	1	100	100	
			1	80	80	
			1	50	50	
37	Mejia	220/33	2	35	70	
38	Burnpur	220/33	2	50	100	
132 kV Level						
1	Adisapthagram	132/33	2	50	100	WBSETCL
			1	31.5	31.5	
		132/25	2	20	40	
2	Alipurduar	132/66	2	16	32	
			1	20	20	
		132/33	1	31.5	31.5	
3	Amtala	132/33	1	31.5	31.5	
			1	50	50	
4	Asoknagar	132/33	2	50	100	
		132/25	2	7.5	15	
5	Bagnan GIS	132/33	2	50	100	
6	Bagmundi	132/33	1	20	20	
7	Balurghat	132/33	4	12.5	50	
8	Bankura	132/33	2	50	100	
9	Barasat	132/33	3	50	150	
10	Behala/Joka	132/33	3	50	150	
11	Basirhat	132/33	2	50	100	
12	Belmuri	132/33	2	31.5	63	
13	Berhampore	132/33	3	50	150	
14	Bighati	132/33	2	50	100	
15	Birsingha	132/33	2	50	100	
16	Bishnupur (Old)	132/33	1	50	50	
		132/33	1	31.5	31.5	
17	Bolpur	132/33	3	50	150	

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
18	Bongaon	132/33	3	31.5	94.5	
19	Barjora	132/33	2	31.5	63	
20	Chanditala	132/33	2	50	100	
21	Chandrakora road	132/33	1	50	50	
			1	31.5	31.5	
22	Contai	132/33	2	50	100	
23	Coochbehar	132/33	3	50	150	
24	Darjeeling	132/33	3	10	30	
25	Debogram	132/33	1	20	20	
			1	31.5	31.5	
			1	50	50	
26	Dhulian	132/33	2	31.5	63	
27	Egra	132/33	3	50	150	
28	Falta	132/33	2	31.5	63	
			1	50	50	
29	Gangarampur	132/33	3	20	60	
			1	12.5	12.5	
30	Haldia	132/33	1	50	50	
			1	31.5	31.5	
		132/25	1	10	10	
			1	12.5	12.5	
31	Haldia NIZ	132/33	2	31.5	63	
32	Hizli	132/33	1	31.5	31.5	
			1	50	50	
		132/25	2	10	20	
33	Jangipara	132/33	2	31.5	63	
34	Jhargram	132/33	1	31.5	31.5	
			1	50	50	
35	Kurseong	132/33	3	10	30	
36	Kakdwip	132/33	2	31.5	63	
37	Kalan	132/33	2	31.5	63	
38	Kalyani	132/33	1	31.5	81.5	
			1	50	150	
39	Khatra	132/33	2	50	100	
40	Katwa	132/33	2	31.5	63	
			1	50	50	
41	Khanyan	132/33	2	31.5	63	
42	Kharagpur	132/33	2	31.5	63	
43	Khejuria GIS	132/33	2	50	100	
44	Kolaghat	132/33	3	50	150	
		132/25	2	12.5	25	
45	Lalgola	132/33	2	31.5	63	

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
46	Lilooah	132/33	3	50	150	
		132/25	2	20	40	
47	Mahachanda	132/33	2	31.5	63	
			1	50	50	
48	Mathabhanga	132/33	1	50	50	
			1	31.5	31.5	
49	Malda	132/33	3	50	150	
50	Mankar	132/33	3	31.5	94.5	
51	Maynaguri	132/33	1	31.5	31.5	
			1	50	50	
			2	30	60	
52	North Bengal university (NBU)	132/33	2	31.5	63	
			1	50	50	
53	New town AA 1	132/33	2	50	100	
54	Pingla	132/33	3	50	150	
55	Purulia (WB)	132/33	2	31.5	63	
			1	20	20	
		132/25	2	12.5	25	
56	Raghunathganj	132/33	1	31.5	31.5	
			1	20	20	
			1	50	50	
57	Raghunathpur	132/33	2	31.5	63	
58	Raigunj	132/33	1	31.5	31.5	
			2	20	40	
			2	12.5	25	
59	Raina	132/33	1	50	50	
60	Rampurhat	132/33	2	50	100	
61	Ranaghat	132/33	2	50	100	
		132/66	2	31.5	63	
		132/25	1	12.5	12.5	
			1	10	10	
62	Sainthia	132/33	2	50	100	
63	Salt lake	132/33	3	50	150	
64	Salt lake GIS	132/33	2	50	100	
65	Samsi	132/33	3	31.5	94.5	
66	Siliguri	132/33	2	50	100	
67	Sonarpur	132/33	3	31.5	94.5	
		132/25	2	20	40	
68	Tamluk	132/33	2	50	100	
69	Tarakeswar	132/33	1	31.5	31.5	
			1	50	50	
70	Titagarh	132/33	3	50	150	

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
		132/25	2	20	40	
71	Ukhra	132/33	2	50	100	
72	Uluberia	132/33	3	50	150	
73	Kuli	132/33	2	50	100	
74	Birpara	132/66	3	20	60	
75	Chalsa	132/66	1	20	20	
			1	10	10	
		132/33	2	20	40	
76	Serakol	132/33	2	50	100	
77	Bajkula	132/33	1	50	**50**	
78	Vidyasagar Park	132/33	2	50	**100**	
79	Food Park	132/33	2	50	100	
80	Belur	132/33	3	50	150	CESC
81	BT Road	132/33	2	75	150	
82	B.Garden	132/33	2	50	150	
83	Titagarh (TRS)	132/33	5	50	250	
84	Dum Dum	132/33	2	75	150	
85	Park lane	132/33	2	75	150	
86	Jadavpore	132/33	2	50	100	
87	Chakmir	132/33	2	55	110	
88	Majerhat	132/33	2	75	150	
89	BBD Bag	132/33	1	68	136	
90	PRS	132/33	3	50	150	
91	East Calcutta	132/33	2	50	100	
92	NCGS	132/33	2	50	100	
			1	75	75	
93	SRS	132/33	2	55	110	
			1	75	75	
94	Patuli	132/33	2	75	150	
95	Park Circus	132/33	2	75	150	
96	A Zone	132/11	1	20	20	DPL
		132/11	2	31.5	63	
		132/33	1	50	50	
97	B Zone	132/11	6	31.5	189	
		132/33	1	50	50	
98	AB Zone	132/33	1	50	50	
99	C Zone	132/11	3	31.5	94.5	
		132/33	1	50	50	
100	C1 Zone	132/11	2	31.5	63	
		132/33	2	50	100	
101	Bamunara SS	132/34	2	50	100	
102	Kalipahari	132/33	1	50	50	DVC

Sl.No	Name of the SubStation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
		132/33	2	80	160	
103	Kharagpur	132/11	1	7.5	7.5	
104	Burdwan	132/33	2	50	100	
			1	80	80	
105	Belmuri	132/33	1	50	50	
			1	31.5	31.5	
		132/25	2	25	50	
106	Purulia	132/33/11	1	50	50	
107	ASP	132/33/11	2	50	100	
		132/33	2	50	100	
108	Jamuria	132/33	2	50	100	

Table B: State wise list of transmission lines present in the Eastern region grid

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
Bihar					
765 kV					
1	Gaya to Varanasi	D/C	341.0	Quad-Bersimis	PGCIL
2	Sasaram to Fatehpur line I	S/C	61.3	Quad-Bersimis	
3	Gaya to Ballia	S/C	228.0	Quad-Bersimis	
400 kV					
1	Gaya to Koderma	D/C	126.0	Twin-Moose	PGCIL
2	Gaya to Maithon	D/C	272.0	Quad-Moose	
3	Sasaram to Sarnath	S/C	76.0	Twin-Moose	
4	Sasaram to Allahbad	S/C	215.0	Twin-Moose	
5	Sasaram to Nabinagar	D/C	81.0	Twin-Moose	
6	Biharshariff to Sasaram	S/C	192.0	Twin-Moose	
7	Biharshariff to Sasaram	S/C	203.5	Twin-Moose	
8	Kahalgaon to Farakka I & II	D/C	95.0	Twin-Moose	
9	Kahalgaon to Farakka III & IV	D/C	95.0	Twin-Moose	
10	Kahalgaon to Maithon	D/C	172.0	Twin-Moose	
11	Biharshariff to Lakhisarai	S/C	89.0	Twin-Moose	
12	Biharshariff to Lakhisarai	S/C	102.5	Twin-Moose	
13	Lakhisarai to Kahalgaon	D/C	145.0	Twin-Moose	
14	Kahalgaon to Banka	D/C	48.0	Twin-Moose	
15	Kahalgaon to Barh	D/C	217.0	Quad-Moose	
16	Biharshariff to Koderma	D/C	111.0	Quad-Moose	
17	Biharshariff to Banka	D/C	184.0	Twin-Moose	
18	Biharshariff to Balia	D/C	242.0	Quad-Moose	
19	Biharshariff to Muzaffarpur	D/C	132.0	Twin-Moose	
20	Biharshariff to Varanasi	D/C	321.0	Quad-Moose	
21	Biharshariff to Purnea	D/C	232.0	Quad-Moose	
22	Barh to Patna I & II	D/C	93.0	Quad-Moose	
23	Barh to Patna III &IV	D/C	69.0	Quad-Moose	
24	Patna to Balia	D/C	195.0	Quad-Moose	
25	Patna to Balia	D/C	180.0	Quad-Moose	
26	Patna to Kishanganj	D/C	347.0	Quad-Moose	
27	Muzaffarpur to Gorakhpur	D/C	261.0	Quad-Moose	Power Links
28	Purnea to Muzaffarpur	D/C	240.0	Quad-Moose	
29	Malda to Purnea	D/C	167.0	Twin-Moose	PGCIL
30	Purnea to Binaguri I & II	D/C	168.0	Twin-Moose	
31	Purnea to Kishanganj	D/C	72.0	Quad-Moose	
32	Kishanganj to Binaguri	D/C	98.0	Quad-Moose	
33	Barh II to Gorakhpur	D/C	349.0	Quad-Moose	
34	Rangpo to Kishanganj	D/C	148.0	Quad-Moose	PGCIL

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
220 kV					
1	Patna PG to Sipara	D/C	0.5	Zebra	BSPHCL
2	Dehri to Pusauli	S/C	65.0	Zebra	BSPHCL & PG
3	Pusauli to Sahupuri (UP)	S/C	71.0	Zebra	PGCIL
4	Arrah to Khagaul	D/C	50.0	Zebra	
5	Patratu to Bodhgaya	T/C	136.0	Zebra	BSPHCL & JSEB
6	Patna PG to Khagaul	S/C	30.5	Zebra	BSPHCL
7	Tenughat to Biharshariff	S/C	182.0	Twin-Moose	BSPHCL & JSEB
8	Biharshariff (PG) to Biharhariff (BSPHCL)	T/C	1.7	Zebra	BSPTCL
9	Muzaffarpur to MTPS (Kanti)	D/C	24.0	Zebra	POWER LINKS
10	Dehri to Gaya (PG)	D/C	95.0	Zebra	BSPHCL & PG
11	Bodhgaya to Gaya (PG)	D/C	17.0	Zebra	
12	Muzaffarpur to Hazipur - I & II	D/C	53.0	Zebra	BSPTCL
13	Biharshariff to Fatua	D/C	40.0	Zebra	
14	Biharshariff to Bodhgaya	D/C	80.0	Zebra	
15	Purnea to Dalkhola (WB)	D/C	41.0	Zebra	PGCIL
16	Sipara to Khagaul	S/C	39.0	Zebra	BSPTCL
17	MTPS (Kanti) to Gopalganj	S/C	101.4	Zebra	
18	MTPS (kanti) to Darbhanga	S/C	68.5	Zebra	
19	Purnea (PG) to Madhepura	D/C	100.1	Zebra	
20	Biharsariff to Begusarai	D/C	75.0	Zebra	
21	MTPS to Begusarai	D/C	152.0	Zebra	
22	Patna (PG) to Fatuha	S/C	27.6	Zebra	
23	Sipara to Fatuha	S/C	26.0	Zebra	
24	Pusauli (PG) to Pusauli new	S/C	1.7	Zebra	PGCIL
25	Pusauli new to Ara (PG)	S/C	116.0	Zebra	
26	Pusauli (PG) to Ara (PG)	S/C	112.0	Zebra	
27	Purnea (PG) to Purnea old	D/C	2.0	Zebra	
28	Kishanganj to Siliguri	D/C	108.0	Zebra	
29	Kishanganj to Dalkhola PG	D/C	31.0	Zebra	
30	Gaya to Sonenagar	S/C	88.0	Zebra	BSPTCL
31	Gaya to Sonenagar New	D/C	91.0	Zebra	
32	Kishanganj-BSPTCL to Kishanganj-PG	4	16.0	Zebra	
33	MTPS (Muzaffarpur) to Samastipur	S/C	70.0	Zebra	
34	Samastipur to Begusarai	S/C	60.0	Zebra	
132 kV					
1	Kahalgao to KhSTPP	S/C	6.0	Panther	PGCIL
2	KhSTPP to lalmatya	S/C	47.0	Panther	BSPTCL
3	Arrah (PG) to Arrah BS	S/C	2.1	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
4	Arrah (PG) to Dumraon	S/C	61.5	Panther	
5	Purnea (PG) to Purnea (BS)	T/C	1.3	Panther	
6	Purnea (OLD) to Kishanganj	S/C	70.0	Panther	
7	Karmansa to Sahupuri	S/C	131.0	Panther	BSPHCL & UPPCL
8	Karmansa to Chandauli	S/C	25.0	Panther	
9	Sonenagar to Rihand	S/C	188.0	Panther	
10	Japla to Sonenagar	S/C	56.0	Panther	BSPTCL
11	Kahalgao to Sabour	S/C	19.0	Panther	PGCIL
12	Kahalgao to Lalmatia	S/C	60.0	Panther	NTPC
13	Banka to Sabour	S/C	40.7	Panther	BSPTCL
14	Banka (PG) to Banka (New)	S/C	12.5	Panther	
15	Chandauti to Sipara	S/C	90.0	Panther	
16	Chandauti to Belaganj	S/C	20.0	Panther	
17	Belaganj to Jehanabad	S/C	30.0	Panther	
18	Jehanabad to Masaudhi	S/C	30.0	Panther	
19	Masaudhi to Sipara	S/C	24.0	Panther	
20	Jehanabad to Ataula	S/C	28.0	Panther	
22	Chandauti to Sonenagar (L - 30)	S/C	76.0	Panther	
23	Chandauti to Rafiganj (L - 31)	S/C	41.0	Panther	
24	Rafiganj to Sonenagar (L - 31)	S/C	35.0	Panther	
25	Chandauti to Tekari	S/C	28.9	Panther	
26	Bodhgaya to Chandauti (Gaya)(Line - I)	D/C	16.0	Panther	
27	Bodhgaya to Chandauti (Gaya) (Line - II)	D/C	14.0	Panther	
28	Tekari to Goh	S/C	22.0	Panther	
29	Bodhgaya to Wazirganj	S/C	30.0	Panther	
30	Wazirganj to Nawada	S/C	26.0	Panther	
31	Bodhgaya to Sherghati	S/C	27.0	Panther	
32	Bodhgaya to Imamganj	S/C	56.0	Panther	
33	Dehri to Banjari	S/C	38.0	Panther	
34	Dehri to Sasaram Ckt. - I	S/C	20.0	Panther	
35	Sasaram to Kudra Ckt. - I	S/C	13.0	Panther	
36	Kudra to Karamnasa Ckt.- I	S/C	10.0	Panther	
37	Dehri to Pusauli PG Ckt - II	S/C	26.0	Panther	
38	Pusouli PG to Mohania Ckt. - II	S/C	10.0	Panther	
39	Mohania to Karmnasa Ckt. - II	S/C	11.0	Panther	
40	Dehri to Bikramganj Ckt. - II	S/C	45.0	Panther	
41	Bikramganj to Dumroan Ckt. - II	S/C	35.0	Panther	
43	Dumroan to Buxar	S/C	16.1	Panther	
44	Ara (PG) to Jagdishpur	S/C	26.3	Panther	
45	Fatuha to Sipara	S/C	26.0	Panther	
46	Sipara to Mithapur	S/C	16.0	Panther	
47	Mithapur to Jakkanpur	S/C	1.0	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
48	Gaighat to Mithapur	S/C	5.0	Panther	
49	Fatuha to Gaighat	S/C	23.0	Panther	
50	Fatuha to Katra	S/C	17.0	Panther	
52	Biharsarif (SG) to Barh Ckt. - I	S/C	25.0	Panther	
53	Barh to Hathidah Ckt. - I	S/C	20.0	Panther	
54	Biharsarif (SG) to Hathidah Ckt. - II	S/C	32.5	Panther	
55	Biharsarif (SG) to Ekangarsarai	S/C	30.0	Panther	
56	Ekangarsarai to Hulasgarh	S/C	14.5	Panther	
57	Baripahari to Harnaut	S/C	26.0	Panther	
58	Harnaut to Fatuha	S/C	45.0	Panther	
59	Biharsarif (SG) to Barhi (DVC) (L - 28)	S/C	142.0	Panther	BSPTCL & DVC
60	Barhi (DVC) to Rajgir (L - 29)	S/C	16.0	Panther	BSPTCL
61	Rajgir to Biharsarif (L - 29)	S/C	126.0	Panther	
62	Biharsarif (SG) to Nawada	S/C	41.0	Panther	
63	Hathidah to Lakhisarai	S/C	28.0	Panther	
64	Hathidah to Shekhpura	S/C	28.0	Panther	
65	Lakhisarai to Jamui	S/C	35.0	Panther	
66	Biharsarif (SG) to Shekhpura	S/C	39.5	Panther	
67	Shekhpura to Jamui	S/C	49.0	Panther	
68	Lakhisarai to Jamalpur	S/C	45.0	Panther	
69	Sultanganj to Jamalpur	S/C	38.0	Panther	
70	Sabour to Sultanganj Ckt I	S/C	30.0	Panther	
71	Sabour to Sultanganj Ckt II	S/C	31.0	Panther	
72	Sultanganj to Deoghar	S/C	105.0	Panther	
73	KhSTPP to Sabour	S/C	25.0	Panther	
74	Purnia(bs) to Naugachia (L - 16)	S/C	70.0	Panther	
75	Naugachia to BTPS (L- 16)	S/C	136.0	Panther	
76	Purnia(bs) to Khagaria (L - 23)	S/C	150.0	Panther	
77	Khagaria to BTPS (L - 23)	S/C	60.0	Panther	
78	Purnia(BS) to Katihar	S/C	29.0	Panther	
79	Purnia(BS) to Saharsa	S/C	101.2	Panther	
80	Purnia (BS) to Farbisganj	S/C	85.0	Panther	
81	Kishanganj to Dalkola (WB)	S/C	26.0	Panther	
82	Kishanganj to Farbisganj	S/C	88.6	Panther	
83	Farbisganj to Kataya (Kosi) Ckt. - II (Old)	S/C	50.9	Panther	
84	Madhepura to Saharsa	S/C	50.0	Panther	
85	Madhepura to Sonebarsa	S/C	50.0	Panther	
86	Saharsa to UdaKishanganj	S/C	50.4	Panther	
87	Begusarai to Samastipur (L - 9)	S/C	57.0	Panther	
88	Begusarai to Dalsingsarai (L - 10)	S/C	34.0	Panther	
89	Dalsingsarai to Samastipur (L - 10)	S/C	23.0	Panther	
90	KBUNL to Muzaffarpur Ckt - I	S/C	15.5	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
91	KBUNL to Muzaffarpur Ckt - II	S/C	16.7	Panther	
92	KBUNL to SKMSH	S/C	14.1	Panther	
93	Samastipur to Darbhanga	S/C	40.0	Panther	
94	Samastipur to Hazipur LILO at Jandaha	S/C	92.0	Panther	
95	Hazipur to Sheetalpur	S/C	30.0	Panther	
96	Chapra to Sheetalpur	S/C	40.0	Panther	
97	Muzaffarpur to Vaishali	D/C	30.1	Panther	
98	Chapra to Siwan	S/C	70.0	Panther	
99	Chapra/Siwan to Ekma	S/C	0.6	Panther	
100	Gopalganj to Siwan	S/C	40.0	Panther	
101	Gopalganj to Masrakh to Siwan	S/C	74.9	Panther	
102	Gopalganj to Bettia	D/C	60.8	Panther	
	Gopalganj/Bettia Ckt- I LILO at Sidhwalia SM	S/C	12.0	Panther	
103	MTPS to Motihari	S/C	70.0	Panther	
104	Bettia to Motihari	S/C	45.0	Panther	
105	Bettia to Ramnagar	S/C	41.5	Panther	
106	Bettia to Raxaul	S/C	37.1	Panther	
107	Ramnagar to BHPC, Valmikinagar	S/C	77.8	Panther	
108	BHPC, Valmikinagar to Nepal (Surajpura)	S/C	7.2	Panther	
109	Motihari to Dhaka	S/C	24.0	Panther	
110	Dhaka to Sitamarhi	S/C	52.0	Panther	
111	Sitamarhi to Runisaidpur(Reminagar)	S/C	21.0	Panther	
112	Runisaidpur to SKMCH	S/C	35.0	Panther	
113	SKMCH to Muzaffarpur	S/C	15.0	Panther	
114	Darbhanga (220 kV) to Darbhanga (132 kV)	S/C	1.0	Panther	
115	Darbhanga to Phoolparas	S/C	71.8	Panther	
116	Pandaul to Madhubani	S/C	16.0	Panther	
117	Madhubani to Jainagar	S/C	40.0	Panther	
118	Jainagar to Phoolparas	S/C	55.0	Panther	
119	Barauni TPS to Begusarai (L - 9 & L - 10)	D/C	10.0	Panther	
120	BHPC Kosi (Kataiya) to Duhabi (Nepal)	D/C	3.5	Panther	
121	Biharshariff (BSEB) to Baripahari	D/C	5.0	Panther	
122	Dehri to Sonenagar	D/C	14.5	Panther	
123	Khagaul to Bihta	D/C	14.5	Panther	
124	Khagaul to Digha	D/C	16.0	Panther	
125	Samastipur to MTPS (Kanti)	D/C	85.2	Panther	
126	Sheetalpur to Vaishali	D/C	30.2	Panther	
127	Sonenagar to Aurangabad	D/C	21.0	Panther	
128	Supaul to Phulparas	D/C	31.9	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
129	Madhepura to Supaul	D/C	30.0	Panther	
130	Biharshariff to Hullasgarh	S/C	40.0	Panther	
131	Ara to Ara TSS	S/C	4.0	Panther	
132	Dumroan to Dumroan TSS	S/C	2.0	Panther	
133	Rafiganj to Rafiganj TSS	S/C	4.6	Panther	
134	Barh/Hathidah line to Mokama TSS	S/C	6.0	Panther	
135	Lakhisaai to Lakhisarai TSS	S/C	6.0	Panther	
136	Khagaul to Khagaul TSS	S/C	1.0	Panther	
137	Fatuha to Khusrupur TSS	S/C	7.2	Panther	
138	Chapra to Chapra TSS	S/C	1.0	Panther	
139	Hazipur to Hazipur TSS	S/C	2.0	Panther	
140	Lakhisari PG to Lakhisarai BSPTCL	D/C	15.3	Panther	
141	Chandauti to Tehta	D/C	15.0	Panther	
142	Tehta to Jehanabad	D/C	40.0	Panther	
143	Sipara to Jakkanpur	D/C	18.0	Panther	
144	Farbisganj to Kataya Ckt. - I (New)	D/C	39.7	Panther	
145	Supaul to Kataya	D/C	59.6	Panther	
146	Samastipur to Hazipur (220 kV)	D/C	70.0	Panther	
147	Bodhgaya to Paharpur TSS	D/C	35.0	Panther	
148	Jamui to Jhajha TSS	D/C	31.0	Panther	
149	Lakhisari PG to Jamui	D/C	25.3	Panther	
150	Dehri to Kudra	S/C	46.0	Panther	
151	kudra to Pusauli	S/C	25.0	Panther	
152	Kudra to kochas	S/C	27.0	Panther	
153	Banjari to KCL	S/C	1.0	Panther	
154	Khagaul to Fatuha	S/C	35.0	Panther	
155	Begusarai to Khusweshthan	S/C	65.5	Panther	
156	Fatuha to Birpahari	S/C	42.0	Panther	
157	Nalanda to (L - 28) LILO Point	D/C	2.0	Panther	
158	(L - 28) Line to Rajgir grid (T - Connection)	S/C	6.0	Panther	
159	Muzaffarpur to SKMCH	S/C	16.7	Panther	
160	Sasaram to Banjari	S/C	47.5	Panther	
161	Tehata to Belaganj	S/C	22.0	Panther	
162	Aurangabad to Shree Cement	S/C	0.8	Panther	
163	Kahalgaon (BSPTCL) to Sultangunj	D/C	63.5	Panther	
164	Darbhanga to Gangwara GSS	D/C	7.3	Panther	
165	Gangwara GSS to Pandaul			Panther	
166	Kisanganj to Forbesganj Circuit- 2	S/C	88.4	Panther	
167	Forbesganj to Kataiya Circuit- 3	S/C	39.8	Panther	
168	Mithapur to Karbighaia	S/C	2.5	Panther	
169	Dehri to Kochas	S/C	31.6	Panther	
170	Kochas to Dumraon Circuit- 1	S/C		Panther	
171	Banka (PG) to Sultanganj	D/C	46.0	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
172	Madhubani to Phoolparas	S/C	38.0	Panther	
173	Phoolparas to Pandaul	S/C	47.0	Panther	
174	Darbhanga to Pandaul	S/C	27.0	Panther	
175	New Dhaka to Sheohar	S/C	25.0	Panther	
176	Sitamardi to Sheohar	S/C	26.0	Panther	
177	New Madhubani to T-point Benipatti	S/C	27.0	Panther	
178	T-point Benipatti to Benipatti	S/C	3.0	Panther	
179	T-point Benipatti to Jainagar	S/C	13.0	Panther	
180	Dalsingsarai to Kuseshwarsthan	D/C	55.0	Panther	
181	Goelkera to Manoharpur	S/C	27.0	Panther	
Jharkhand					
765 kV					
1	Ranchi (New) to Dharamjaygarh	S/C	301.0	Qd Bermis	PGCIL
2	Ranchi (New) to Dharamjaygarh	S/C	344.6	Qd Bermis	
400 kV					
1	Chaibasa to Bisra (Rourkela)	S/C	131.0	Twin-Moose	
2	Jamshedpur to Chaibasa	S/C	46.0	Twin-Moose	
3	Jamshedpur to Bisra	S/C	182.0	Twin-Moose	
4	Jamshedpur to Mejia B	S/C	168.0	Twin-Moose	PGCIL
5	Jamshedpur to Maithon	S/C	153.0	Twin-Moose	
6	Maithon to Mejia B	S/C	97.0	Twin-Moose	
7	Jamshedpur to DTPS	D/C	156.0	Twin-Moose	
8	Jamshedpur to Adhunik	D/C	0.3	Quad-Moose	APNRL
9	Jamshedpur to Parulia	S/C	177.0	Twin-Moose	
10	Jamshedpur to Baripada	S/C	141.0	Twin-Moose	
11	Jamshedpur to TISCO	S/C	39.0	Twin-Moose	
12	TISCO to Baripada	S/C	116.0	Twin-Moose	
13	Maithon to Maithon RB	D/C	31.0	Twin-Moose	
14	Maithon to Kahalgaon	D/C	172.0	Twin-Moose	
15	Maithon to Mejia B	D/C	84.0	Twin-Moose	
16	Maithon to Gaya	D/C	277.0	Quad-Moose	
17	Maithon to Durgapur	D/C		Lapwing	
18	Ranchi to Maithon RB	D/C	188.0	Twin-Moose	PGCIL
19	Ranchi to Maithon	S/C	200.0	Twin-Moose	
20	Ragunathpur to Maithon	S/C	52.9	Twin-Moose	
21	Ranchi to Raghunathpur	S/C	169.2	Twin-Moose	
22	Ranchi to Sipat	D/C	405.0	Twin-Moose	
23	Ranchi to Rourkela	D/C	145.0	Twin-Moose	
24	Ranchi to Ranchi (New)	2XD/C	78.6	Quad-Moose	
25	Ranchi (New) to Chandwa (JK Pool)	D/C	69.0	Quad-Moose	
26	Koderma to Gaya	D/C	82.0	Quad-Moose	
27	Koderma to Biharshariff	D/C	111.0	Quad-Moose	
28	Koderma to BTPS	D/C	100.0	Twin-Moose	
29	Jharkhand pooling station (Chandwa)	D/C	117.0	Quad-Moose	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
	to Gaya				
		220 kV			
1	Farakka to Lalmatia	S/C	79.0	Zebra	PGCIL
2	Ramchandrapur to Joda	S/C	130.0	Zebra	OPTCL & JSEB
3	Chandil to Santadih (STPS)	S/C	98.0	Zebra	WBSETCL & JSEB
4	Jamshedpur PG to Ramchandrapur	D/C	0.1	Zebra	JUSNL
5	Ramchandrapur to Chandil	S/C	30.0	Zebra	
6	Chandil to Ranchi PG	S/C	78.4	Zebra	
7	Tenughat to Patratu	S/C	64.0	Double Moose	
8	Tenughat to Biharsharif	S/C	180.0	Double Moose	
9	Ranchi PG to Hatia new	D/C	35.0	Zebra	
10	PTPS to Hatia new	D/C	42.0	Zebra	
11	Dumka to Rupnarayanpur PG (Maithon PG)	D/C	74.0	Zebra	
12	Chaibasa PG to Chaibasa	D/C	0.7	Zebra	
13	PTPS to Bodhgaya	T/C	136.0	Zebra	BSPHCL & JSEB
14	BTPS (DVC) to Ramgarh	D/C	54.6	Zebra	DVC
15	BTPS to CTPS Old	D/C	31.8	Zebra	
16	CTPS B (New) to Dhanbad	D/C	45.6	AAAC Zebra	
17	Jamshedpur DVC to BTPS	D/C	150.0	Zebra	
18	Dhanbad to Kalyanaswari	D/C	79.2	Zebra	
19	CTPS A (Old) to Kalyanaswari	D/C	141.8	Zebra	
20	Dhanbad to Giridih	D/C	44.4	AAAC Zebra	
21	Jamshedpur DVC to Jindal (Joda)	S/C	135.0	Zebra	
22	CTPS A (Old) to CTPS B (New)	D/C	2.6	AAAC Zebra	
23	Giridhi to Koderma	D/C	100.9	AAAC Zebra	
24	Dhanbad to Electro Steel	D/C	58.6	AAAC Zebra	PGCIL
25	BSL to CTPS A	D/C	9.0	AAAC Zebra	DVC
		132 kV			
1	ABCIL to Garhwa	S/C	2.0	Panther	JUSNL
2	Adityapur to Ramchandrapur	D/C	8.3	Panther	
3	Chakradharpur to Rajkharsawan	D/C	22.0	Panther	
4	Chandil 220 kV to Rajkharsawan	S/C	34.5	Panther	
5	Rajkharsawan to Chaibasa 132 kV	S/C	20.0	Panther	
6	Chandil 220 kV to Adityapur	S/C	16.0	Panther	
7	Chandil 220 kV to Golmuri	D/C	30.0	Panther	
8	Chandil 220 kV to Chandil 132 kV	S/C	1.0	Panther	
9	Deoghar to Sultanganj	S/C	92.0	Panther	
10	Deogarh to Jamtara	D/C	75.0	Panther	
11	Jamtara to Madupur	D/C	54.0	Panther	
12	Deoghar to Shankarpur Rly	S/C	11.0	Panther	
13	Deoghar to Dumka 220 kV	D/C	68.0	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
14	Dumka 132 kV to Lalmatiya	D/C	96.0	Panther	
15	Goielkera to Goielkera Rly	S/C	0.5	Panther	
16	Goielkera to Rajkharsawan	S/C	55.0	Panther	
17	Gumla to Kamdara	S/C	62.0	Panther	
18	Kamdara to Hatia Old	S/C	61.0	Panther	
19	Garhwa to Japla	S/C	50.0	Panther	
20	Hatia old to Sikadari	S/C	46.0	Panther	
21	Hatia old to HEC	D/C	8.0	Panther	
22	Hatia New to Lohardanga	D/C	62.0	Zebra	
23	Chaibasa 132 kV to Kendposi	S/C	30.0	Panther	
24	Jadugoda to Golmuri	S/C	22.0	Panther	
25	Lalmatia to Kahalgaon TPP	S/C	47.0	Panther	POWERGRID
26	Kendposi to Noamndi	S/C	28.0	Panther	JSEB
27	Kendposi to Joda	S/C	42.0	Panther	JUSNL & OPTCL
28	Lalmatia to Sahebgunj	S/C	49.0	Panther	JUSNL
29	Lohardanga to Latehar	D/C	56.0	Zebra	
30	Latehar to Daltonganj	D/C	64.0	Zebra	
31	Maithon DVC 132 kV to Jamtara	S/C	25.0	Panther	DVC & JSEB
32	PTPS to Hatia Old	S/C	44.0	Zebra	JUSNL
33	Hatia old to Kanke	S/C	28.0	Zebra	
34	Kanke to PTPS	S/C	28.0	Zebra	
35	Rajkharsawan to Adityapur	S/C	36.0	Panther	
36	Saljhagiri Rly to Golmuri	S/C	4.0	Panther	
37	Sikkidri (pooling point of SHPS) to Namkum	S/C	34.0	Panther	
38	Namkum to Hatia new	S/C	27.0	Panther	
39	Sonenagar to Japla	S/C	49.6	Panther	
40	Tolra Rly to Garhwa	S/C	8.0	Panther	
41	UMI to Adityapur	D/C	3.5	Panther	
42	Gumla to Lohardaga	D/C	71.0	Zebra	
43	Dumka to Pakur	S/C	85.0	Panther	
44	Ramchanderpur to APL (Odisha minerals)	S/C	4.0	Panther	
45	DVM to DVM Railway	D/C	0.5	Panther	
46	PTPS to Patratu DVC	D/C	6.4	Panther	JSEB & DVC
47	Chandil 220 kV to Tamar	S/C	50.0	Panther	JUSNL
48	Garwa to Rihand	S/C	106.0	Panther	JSEB & UPPCL
49	Hatia New to Hatia Old	D/C	0.5	Panther	JUSNL
50	Kamdara to Bakaspur Rly	S/C	15.0	Panther	
51	Kamdara to Bano Rly	S/C	35.0	Panther	
52	Kendiposi FD Stn to Kendiposi	D/C	-	Panther	
53	Lodhma Rly to Hatia Old	D/C	15.0	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
54	Namkum to Tatisiloi Rly	D/C	15.0	Panther	
55	Noamundi to Kendiposi FD STN	S/C	-	Panther	
56	Goelkera to Manoharpur	S/C	10.0	Panther	
57	Sikkidri (Pooling point of SHPS) to SHPS - 1	S/C	1.0	Panther	
58	Sikkidri (pooling point of SHPS) to SHPS - 2	S/C	7.0	Panther	
59	Dumka 220 kV to Dumka 132 kV	D/C	2.0	Panther	
60	Lalmatia to Sabour	S/C	46.6	Panther	BSPHCL & JSEB
61	Chandil to Manique (JSEB)	D/C	1.0	Panther	JSEB/DVC
62	Chandil to JUSCO	No details available			
63	Maithon (MHS) to Jamtara	S/C	30.0	Lark	DVC/JSEB
64	Barhi to Rajgir	S/C	149.0	Lark	DVC
65	Barhi to Nalanda	S/C	138.0	Lark	
66	PTPS to Patratu DVC	D/C	12.5	Lark	
67	Patratu to JSPL		No details available		
68	Barhi to Hazaribhag	D/C	36.5	Lark	DVC
69	Barhi to KTPP	D/C	20.1	Lark	
70	BTPS B to ECR Gomia	D/C	6.9	AAAC Panther	
71	BTPS B to Barhi	D/C	82.0	Panther	
72	BTPS B to Konar	S/C	23.0	Lark	
73	Barhi to Konar	S/C	61.0	Panther	
74	CTPS A to Gola	D/C	36.0	Lark	
75	CTPS B to Putki	D/C	29.0	Lark	
		D/C	30.0	Lark	
76	CTPS A to Purulia DVC	D/C	59.6	Lark	
77	CTPS A to Ramkanali	S/C	60.0	Lark	
78	Ramkanali to DTPS	S/C	73.0	AAAC Panther	
79	BSL to CTPS A	D/C	10.0	Lark	
80	BSL (MSDS) to CTPS A	D/C	10.0	Lark	
81	Gola to Manique (DVC)	D/C	86.1	Lark	
82	Jamshedpur to Chandil	D/C	43.7	Lark	
83	Jamshedpur (DVC) to Mosabani	D/C	39.6	Lark	DVC
84	Jamshedpur to TISCO		No details available		
85	KTPP to Koderma	D/C	18.3	Lark	DVC
86	Koderma JSEB to Koderma DVC	D/C	18.3	ACSR Panther	
87	Konar to Hazaribhag Road	D/C	35.0	Lark	
88	Nimiaghat to Putki	D/C	45.0	AAAC Panther	
89	Nimiaghat to Giridhi (New)	D/C	43.6	AAAC Panther	
90	Giiridhi (New) to Giridhi (Old)		No proper data available		
91	Patherdhi to Putki	D/C	22.6	Lark	DVC
92	Patherdhi to Sindri	D/C	3.2	Lark	
93	Pradhankhanda to Sindri	D/C	20.0	Lark	
94	Patherdhi to Maithon (MHS)	D/C	41.0	AAAC Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
95	Ramgarh to Gola	D/C	25.3	Lark	
96	Gola to SER Muri	D/C	30.3	Lark	
97	Ramkanali to Panchet	D/C	14.5	Lark	
98	Jamshedpur (DVC) to Purulia DVC	D/C	87.0	Lark	
99	Kalipahari to Kalyanswari	D/C	28.8	Lark	
100	Kalyanswari to MAL IMPEX FERRO	S/C	1.5	AAAC Panther	
101	Mosabani to JSEB (Dhalbhumgarh)	D/C	10.7	Lark	
102	Maithon (MHS) to Kumardubi	S/C	4.9	Lark	
103	Kumardubi to Panchet	S/C	9.6	Lark	
104	Ramgarh to ECR Barkakana	S/C	10.0	Panther	
105	Dhanbad to Govindpur	D/C	24.0	AAAC Panther	
106	Ramgarh to Patratu	S/C	30.4	Lark	
107	Ramgarh to Patratu	S/C	28.0	Lark	
108	North Karnpura to Patratu	D/C	32.0	Lark	
109	North Karnpura to E.C.Rly	D/C	4.5	Lark	
110	Putki to Balihari 132 kV	S/C	0.5	Lark	
111	Patherdih to Balihari	S/C	24.0	Lark	
112	CTPS B to Biada R/S	D/C	12.1	AAAC Panther	
113	CTPS A to Rajabera	D/C	4.9	Lark	
114	CTPS B to Jamuria	S/C	119.2	Lark	
115	Maithon (MHS) to Panchet	S/C	14.5	Lark	
116	Maithon (MHS) to Kalyanaswari	D/C	1.6	Lark	
Odisha					
765 kV					
1	Jharsuguda pooling station to Dharamjaygarh	D/C	151.0	ACSR Hexa-ZEBRA	PGCIL
2	Angul to Jharsuguda pooling station	D/C	272.0	ACSR Quad Bersimis	
3	Angul to Srikakulam	D/C	276.0	ACSR Quad Bersimis	
400 kV					
1	Jaypore to Bolangir PGCIL	S/C	287.7	ACSR Moose	PGCIL
2	Bolangir PGCIL to Angul	S/C	198.0	Twin Moose	
3	Angul to Meramundali - I	S/C	25.0	Twin Moose	
4	JITPL to Angul	D/C	68.0	Twin Moose	Jindal
5	TSTPS to Angul	S/C	68.0	Twin Moose	PGCIL
6	Angul to Meramundali - II	S/C	18.0	Twin Moose	
7	TSTPS to Meramundali	S/C	52.3	Twin Moose	
8	GMR to Angul	D/C	30.0	Quad Moose	GMR
9	Meramundali to JSPL	D/C	37.9	Twin Moose	OPTCL
10	Meramundali to Vedanta (Sterlite)	D/C	222.0	Twin Moose	PGCIL
11	GMR to Meramundali	S/C	8.5	Twin Moose	OPTCL
12	Meramundali to Mendhasal	S/C	106.0	Twin Moose	
13	Meramundali to New Duburi	D/C	97.0	Twin Moose	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
14	TSTPS to Rengali	D/C	24.0	Twin Moose	PGCIL
15	Baripada to Keonjhar	S/C	156.3	ACSR Moose	OPTCL
16	Keonjhar PGCIL to Rengali	S/C	100.3	Twin Moose	OPTCL
17	Baripada to Kharagpur	S/C	100.3	ACSR Moose	WBSETCL & OPTCL
18	Baripada to Jamshedpur	S/C	141.0	ACSR Moose	PGCIL
19	Baripada to TISCO (DVC)	S/C	115.0	ACSR Moose	
20	Baripada to Pandiabil	S/C	295.0	ACSR Moose	
	Pandiabil to Mendhasal		25.0		
21	Baripada to Duburi	S/C	190.3	ACSR Moose	OPTCL
22	Dubri to Pandiabil	S/C	130.0	Twin Moose	
	Pandiabil to Mendhasal		25.0		
23	Bisra to TSTPS	D/C	171.0	Twin Moose	PGCIL
24	Bisra to Ranchi	D/C	145.0	ACSR Moose	
25	Bisra to Chaibasa	D/C	131.5	ACSR Moose	
26	Bisra to Sterlite	S/C	135.0	ACSR Moose	PGCIL& Sterlite
27	Sterlite to Raigarh	S/C	147.0	Twin Moose	
28	Bisra to Raigarh	S/C	230.4	ACSR Moose	PGCIL
29	Bisra to Jharsuguda	D/C	145.3	ACSR Twin Moose	
30	Jharsuguda to Raigarh	S/C	110.0	ACSR Twin Moose	
31	Jharsugud to Indbarath	S/C	62.6	ACSR Twin Moose	
32	Ind Bharath to Raigarh	S/C	91.0	Twin Moose	
33	Indravati PG to Rengali	S/C	356.0	ACSR Moose	
34	Indravati PG to Jaypore	S/C	72.0	ACSR Moose	
35	Indravati PG to Indravati OHPC	S/C	4.0	ACSR Moose	OPTCL
36	Jaypore to Gazuwaka	D/C	225.0	AAAC	PGCIL
37	TSTPS to Kolar	Double pole	1450.0	HVDC	
38	Bishra to Jamshedpur	S/C	181.4	ACSR Moose	
220 kV					
1	LILO of Balasore to Duburi new S/C line at Bhadrak		1.4	Zebra	OPTCL
	Balasore to Bhadrak	S/C	70.0		
	Bhadrak to New Duburi	S/C	70.0		
2	Balasore to Baripada	D/C	77.0	Zebra	
3	Budhipadar to Raigarh	S/C	81.0	Zebra	
4	Budhipadar to Korba	D/C	183.0	Zebra	
5	Budhipadar to ITPS	D/C	25.3	AAAC MOOSE	
6	Budhipadar to ITPS	D/C	25.3	AAAC MOOSE	
7	Budhipadar to Vedanta	D/C	16.8	ACSR MOOSE	Vedanta
8	Budhipadar to Bhusan	D/C	14.9	Zebra	OPTCL
9	Budhipadar to SPS	D/C	7.1	Zebra	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
10	Budhipadar to Basundhara	S/C	35.8		
11	Budhipadar to Lapanga	D/C	25.0	Zebra	
	Lapanga to Katapalli		51.0		
12	Budhipadar to Tarkera	D/C	102.0	Zebra	
13	Budhipadar to Aditya Aluminum	D/C	20.5	Zebra	
14	Balimela to Upper Silleru	S/C	24.7	Zebra	
15	Balimela to Balimela SC	S/C	0.2	Zebra	
16	Duburi to New Duburi	D/C	6.4	Zebra	
17	Duburi to NINL (Nilachal)	S/C	5.5	Zebra	
18	New Duburi to Paradeep	D/C	113.3	ACSR+AAAC	
19	New Duburi to JSL	D/C	4.8	Zebra	JSL
20	New Duburi to Maithan Ispat Nigam Limited	S/C	4.8	Zebra	MINL
21	New Duburi to Rohit	S/C	4.8	Zebra	Rohit
22	New Duburi to Balasore	S/C	137.9	Zebra	OPTCL
23	New Duburi to Visa	S/C	10.5	Zebra	Visa
24	New Duburi to Tata steel	D/C	4.0	Zebra	
25	Meramundali to Dubri	D/C	95.6	ACSR Zebra	
26	Meramundali to TSTPS	D/C	42.0	ACSR Zebra	
27	Meramundali to TTPS	D/C	11.2	ACSR Zebra	
28	Meramundali to NALCO	D/C	11.5	ACSR Zebra	
29	Meramundali to Bhusan steel	D/C	2.4	ACSR Zebra	
30	Meramundali to Bhanja nagar	D/C	139.0	ACSR Zebra	
31	Mendhasal to Bhanja nagar	S/C	135.0	Zebra	
	Mendhasal to Nayagarh		69.0		
	Nayagarh to Bhanja nagar		68.6		
32	Mendhasal to Chandaka	4	6.04 & 7.26	ACSR Zebra	
33	Meramundali to Bidanasi	S/C	92.3	Twin Moose	
34	Bidanasi to Mendhasal	S/C	31.1		
35	Mendhasal to Atri	D/C	16.0	Zebra	
	Atri to Narendrapur	S/C	120.0	Zebra	
36	Theruvali to Bhanja nagar	D/C	171.5	Zebra	
37	Theruvali to Narendrapur	D/C	196.0	Zebra	
38	Theruvali to Indravati	D/C	86.0	AAAC Zebra	
39	Theruvali to Indravati	D/C	91.0	AAAC Zebra	
40	Theruvali to Upper Kolab	S/C	123.0	Zebra	
41	Jaynagar to Laxmi pur	S/C	53.5	Zebra	
	Laxmi pur to Theruvali		70.0		
	Theruvali to Jaynagar		123.0		
42	Jaya nagar to Upper Kolab	D/C	6.0	Zebra	
43	Jaya nagar to Jaya nagar PGCIL (Jaypore)	D/C	7.7	Zebra	
44	Jaya nagar to Balimela	S/C	92.0	Zebra	
45	Jaya nagar to Balimela	D/C	93.0	Zebra	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
46	Joda to TTPS	D/C	154.0	Zebra	
47	Joda to chaibasa	S/C	90.0	Zebra	
48	Joda to JSPL	S/C	12.0	Zebra	
	JSPL to Jamshedpur (DVC)		126.0		
49	Joda to TSIL	S/C	7.3	Zebra	
50	Joda to Ramchandrapur	S/C	130.0	Zebra	
51	Katapalli to Bolangir	D/C	117.8	Zebra	
	Bolangir to Bolangir PG	D/C	3.0		
52	Laxmi pur to Aditya Alumina	D/C	16.9	Zebra	
53	Laxmi pur to Utkal Alumina	D/C	14.1	Zebra	
54	Paradeep to Essar steel	D/C	9.0	Zebra	
55	Paradeep to IOCL	S/C	6.2	Zebra	
56	Rengali PH to TSTPS	S/C	29.5	Zebra	
57	TSTPS to TTPS	S/C	34.5	Zebra	
58	Rengali PH to TTPS	S/C	70.0	Zebra	
	Rengali PH to NALCO		62.7		
	NALCO to TTPS		8.6		
59	Rengali Switching Station to Rengali PG	D/C	1.0	Zebra	
60	Rengali Switching Station to Rengali PH	D/C	5.0	Zebra	
61	Rengali Switching Station to Barkot	S/C	34.7	Zebra	
	Barkot to Tarkera		115.0		
62	Rengali Switching Station to Chandiposh	S/C	102.0	Zebra	
	Chandiposh to Tarkera		30.0		
63	Tarkera to Bisra PG	D/C	15.0	Zebra	
64	Tarkera to RSP	D/C	10.0	Zebra	
65	Vedanta to SEL	D/C	6.0	Zebra	
66	Atri to Pandiabil (Uttara)	D/C	22.0	Zebra	
	Pandiabil (Uttara) to Samangara		45.9	Zebra	
132 kV					
1	Angul to MCL Nandira	D/C	10.8	Panther	OPTCL
2	Angul to Boinda	S/C	38.5	Panther	
3	Angul to Chainpal	S/C	14.9	Panther	
4	Angul to TTPS	S/C	16.0	Panther	
5	LILO of TTPS to Duburi S/C line at Jambay Ferro Alloys		0.7	Panther	
	TTPS to Jambay Ferro Alloys	S/C	45.0		
	Jambay Ferro Alloys Duburi		8.0		
6	LILO of ICCL to Salipur S/C line at OCL		25.8	Panther	
	ICCL to Mania	S/C	22.0		
	Mania to OCL		5.0		
	OCL to Salipur		35.0		
7	LILO at Kamakhyanagar		1.0	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
	LILO at Kalarangi		13.0		
	LILO at OPCL		23.0		
	TTPS to OPCL	S/C	24.0		
	Kamakshya Nagar to OPCL		40.0		
	Kalarangi to Kamakhyanagar		36.0		
	Duburi to Kalarangi		20.0		
8	Chainpal to FCI	D/C	7.0	Panther	
9	Chainpal to Meramundali	D/C	7.8	Panther	
10	Chainpal to TTPS	3	3.0	Panther	
11	LILO of Chandaka to Choudwar S/C line at Bidanasi		6.8	Panther	
	Choudwar to Bidanasi	S/C	8.6		
	Bidanasi to BPPL		35.0		
	BPPL to Chandaka		10.0		
12	Choudwar to Kendrapara Road (Traction)	S/C	4.6	Panther	
13	LILO at Rawmeet		8.8	Panther	
	LILO at Nuapatna Tap		-		
	LILO at Arati steel		11.0		
	Meramundali to Arati steel	S/C	66.0		
	Nuapatna Tap Arti Steel		20.0		
	Arti Steel to Rawmet		22.3		
	Choudwar to Rawmet		27.5		
14	LILO at Maheswari		4.9	Panther	
	LILO at ICCL		-		
	Dhenkanal to Maheswari	S/C	28.0		
	Maheswari to ICCL		23.5		
	ICCL to Grid Steel (GSAL)		2.0		
	Grid Steel (GSAL) to Choudwar		1.9		
15	Dhenkanal to Meramundali	S/C	43.8	Panther	
16	Dhenkanal to Joranda traction	S/C	19.4	Panther	
17	LILO at Ranasinghpur		1.3	Panther	
	LILO at Kesura		-		
	Chandaka to Ranasinghpur	S/C	23.6		
	Ranasinghpur to Kesura		26.4		
	Kesura to Nimpara		43.2		
18	Chandaka to Nimpara	S/C	62.0	Panther	
19	Chandaka to Mendhasal	S/C	36.5	Panther	
	Mendhasal to Khurda	S/C	36.5	Panther	
20	Chandaka to Bhubaneswar	D/C	5.5	Panther	
21	LILO of Bhubaneswar to Cuttack S/C line at Phulnakhara		-	Panther	
	Bhubaneswar to Phulnakhara	S/C	23.5		
	Phulnakhara to Cuttack		20.0		
22	Cuttack to Jagatsinghpur	S/C	35.2	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
23	Jagatsingpur to Paradeep	S/C	56.1	Panther	
24	Jagatsingpur to Gorakhnath (Traction)	S/C	16.2	Panther	
25	Nimpara to Konark	S/C	20.3	Panther	
26	Puri to Nimpara	S/C	30.0	Panther	
27	Puri to Samangara	S/C	15.0	Panther	
	Samangara to Nimpara	S/C	20.0		
28	Khurda to Arugul Tap	S/C	15.0	Panther	
	Arugul Tap to Arugul	S/C	3.9		
	Arugul Tap to Shamukh	S/C	35.6		
	Shamukh to Puri	S/C	18.6		
29	Khurda to Kaipadar traction	S/C	11.5	Panther	
30	LILO at Balugaon		9.1	Panther	
	LILO at Chandpur		2.3		
	Khurda to Balugaon T	S/C	68.6		
	Balugaon T to Chandapur		5.0		
	Chandapur to Balugaon		30.0		
	Balugaon to Chatrapur		54.2		
	Balugaon T to Atri		18.0		
	Argul to Atri		19.4		
	Atri to Baki		19.6		
31	Balugaon T to Narendrapur	S/C	86.0	Panther	
32	Balugaon to Solari Rly	S/C	15.0	Panther	
33	Chatrapur to Ganjam	S/C	12.0	Panther	
34	Chatrapur to IRE	D/C	5.8	Panther	
35	Chatrapur to Narendrapur	D/C	13.9	Panther	
36	Chatrapur to Rambha Traction	S/C	28.9	Panther	
37	Chatrapur to Aska	S/C	43.8	Panther	
38	LILO of Aska to Chatrapur S/C line at Purusottampur		2.5	Panther	
	Chatrapur to Purusottampur	S/C	22.0		
	Purusottampur to Aska		24.0		
39	Aska to Bhanja nagar	D/C	33.0	Panther	
40	Bhanja nagar to Phulbani	S/C	86.6	Panther	
41	Aska to Berhampur	S/C	34.0	Panther	
42	Berhampur to Narendrapur	D/C	11.0	Panther	
43	LILO of Berhampur to Mohanan S/C at Digapahandi		1.9	Panther	
	Berhampur to Digapahandi	S/C	39.0		
	Digapahandi to Mohanan		19.0		
44	Narendrapur to Jagannathpur traction	S/C	0.5	Panther	
45	LILO of Rayagada to Mohana S/C line at Akhusinghi		-	Panther	
	Rayagada to Akhusinghi	S/C	65.0		
	Akhusinghi to Mohana		55.0		
46	Akhusinghi to Parlakemundi	S/C	76.9	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
47	Rayagada to VVC Ferro (JESCO)	S/C	0.3	Panther	
48	Rayagada to Jayanagar	S/C	108.0	Panther	
49	Rayagada to Theruvali	S/C	20.0	Panther	
50	Theruvali to IMFA	S/C	2.0	Panther	
51	Theruvali to J.K. paper	S/C	9.7	Panther	
52	LILO of Kesingh to Theruvali S/C line at Vedanta Aluminum		12.4	Panther	
	Theruvali to Vedanta Aluminum	S/C	63.7		
	Vedanta Aluminum to Kesingh		59.4		
53	Jayanagar to Tentulikhunti	S/C	54.6	Panther	
54	Jayanagar to Meenakshi	S/C	53.2	Panther	
55	Jayanagar to Machukhand	S/C	43.0	Panther	
56	Jayanagar to Machukhand (RE line)	S/C	148.0	Panther	
	Jayanagar to Jayanagar Traction		0.5		
	Jayanagar Traction to Maliguda traction		12.0		
	Maliguda traction to Manbar traction		17.7		
	Manbar traction to Machukhand road		37.0		
	Machukhand road to Machukhand		50.0		
57	Jayanagar to Damanjodi	S/C	45.0	Panther	
	Damanjodi to Sundarbeda		13.0		
58	Jayanagar to Sunabeda	S/C	40.0	Panther	
59	Jayanagar Traction to Ch Kusumi Traction	S/C	20.0	Panther	
60	Sunabeda to HAL	S/C	0.7	Panther	
61	Machukhand to Vizag	D/C	45(160)	Lark	
62	Machukhand road to Padwa Traction	S/C	20.0	Panther	
63	Dabugaon to Tentulikhunti	S/C	43.2	Panther	
64	Dabugaon to Umerkote	S/C	45.9		
65	LILO of Kesinga to Junagarh S/C line at Bhawanipatna		6.6	Panther	
	Kesinga to Bhawanipatna	S/C	43.0		
	Bhawanipatna to Junagarh		37.4		
66	Kesinga to Khariar	S/C	58.5	Panther	
67	Kesinga to Powmax (Turla)	S/C	14.5	Panther	
68	Kesinga to Saintala	S/C	40.0	Panther	
	Saintala to Bloangir Old	S/C	33.0	Panther	
69	Khariara to Naupara	S/C	77.2		
70	LILO of Bolangir to Patnagarh S/C line at New Bolangir		0.5	Panther	
	Bolangir to New Bolangir	S/C	3.0		
	New Bolangir to Patnagarh		39.8		
71	Bolangir to Bolangir New	S/C	3.0	Panther	
72	LILO of New Bolangir to Bargarh S/C line at Barpali				

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
	Barpali to Bargarh	S/C	26.0	Panther	
	New Bolangir to Barpali		60.0	Panther	
73	Bolangir to Sonepur	S/C	54.0	Panther	
74	Sonepur to Boudh	S/C	51.1	Panther	
75	Patnagarh to Padampur	S/C	44.6	Panther	
76	Baragarh to ACC	S/C	3.0	Panther	
77	LILO of Chiplima to Bargarh S/C line at Katapali		12.7	Panther	
	Chiplima to Katapali	S/C	16.4		
	Katapali to Bargarh		38.5		
78	Burla to Chiplima	D/C	20.0	Panther	
79	LILO at Katapali		8.5	Panther	
	LILO at Rairakhole		0.5		
	Burla to Katapali	S/C	11.1		
	Katapali to Rairakhole Tap		85.2		
	Rairakhole Tap to Sambalpur		0.4		
	Rairakhole Tap to Rairakhole		65.3		
	Rairakhole to Boinda		89.9		
80	Burla to Hindalco	D/C	8.3	Panther	
81	LILO at Sambhalpur		0.5	Panther	
	LILO at Shyam DRI		29.4		
	LILO at Aryan ispat		6.9		
	Burla to Sambalpur	S/C	19.9		
	Sambalpur to Shyam DRI		33.0		
	Shyam DRI to Aryan Steel		10.0		
82	Aryan Steel to Lapanga	S/C	5.0		
83	Lapanga to SMC	S/C	12.0	Panther	
	SMC to Kuchinda		53.3	Panther	
	Kuchinda to Rajgangpur		100.7	Panther	
	Burla to Rajganpur Tap to Bamra traction		5.0	Panther	
	Rajgangpur to Trakera		28.4	Panther	
	Trakera to Raurkela		3.0	Panther	
84	Lapanga to Burla	D/C	57.3	Panther	
	Bhudipadar to Lapanga	D/C	16.4	Panther	OPTCL
85	Bhudipadar to Sundargarh	D/C	29.9	Panther	
86	Bhudipadar to Brajaraj Nagar	S/C	11.7	Panther	
87	Bhudipadar to MSP	S/C	0.6	Panther	
88	Bhudipadar to Jharsuguda	S/C	7.0	Panther	
89	LILO of Bhudipadar to Tarkera S/C Line at Rajgangpur		1.2	Panther	
	Bhudipadar to Rajgangpur	S/C	81.0		
	Rajgangpur to Tarkera		29.0		
90	Bhudipadar to Kalugaon	S/C	95.0	Panther	
	Kalugaon to Tarkera	S/C	15.0		

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
91	Bhudipadar to MCL	D/C	23.0	Panther	
92	Jharsuguda to Jharsuguda Traction	S/C	0.2	Panther	
93	Jharsuguda to Action ispat	S/C	1.6	Panther	
94	Jharsuguda to L&T	D/C	15.7	Panther	
95	Rajgangpur to OCL	S/C	0.5	Panther	
96	Rajgangpur to Rajgangpur Traction	D/C	2.1	Panther	
97	Tarkera to Rourkela	D/C	3.0	Panther	
98	Tarkera to RSP	3	11.0	Panther	
99	Tarkera to Chhend	D/C	6.2	Panther	
100	Chhend to NugaonTraction	S/C	36.0	Panther	
101	Chhend to Adhunik	S/C	21.0	Panther	
102	Adhunik to Sriganesh	S/C	2.0	Panther	
103	LILO at Barbil		1.4	Panther	OPTCL
	LILO at Arya		0.5		
	LILO at Beekey		2.4		
	LILO at Bolain		7.9		
	Rourkela to Bhalulata Tap	S/C	27.0		
	Bhalulata Tap to Beekay Steels		14.0		
	Beekay Steels to Nalda		14.0		
	Nalda to Nalda Traction				
	Nalda to Barbil		8.0		
	Barbil to Arya Iron		10.0		
	Arya Iron to Bolani		12.0		
	Bolani to Joda		25.0		
	Bhalulata top to Bhalulata traction		3.7		
104	Joda to Kenduposi	S/C	50.0	Panther	
105	Joda to Bansapani	S/C	3.0	Panther	
106	Joda to FAP Joda	S/C	1.0	Panther	
107	Arya iron to BRPL	S/C	9.0		
108	LILO at Karanjia		23.5	Panther	
	LILO at Polasapanga		18.0		
	Karenjia to Rairangpur	S/C	72.5		
	Polasapanga to Karenjia		90.0		
	Joda to Polasapanga		55.0		
109	Polasapanga to Keonjhargarh	S/C	19.4	Panther	
110	Rairangpur to Kuchei	S/C	66.1	Panther	
111	Kuchei to Baripada	S/C	11.0	Panther	
112	Baripada to Balasore	S/C	57.3	Panther	
113	Balasore to Birla Tyre	S/C	3.0	Panther	
114	Balasore to Somanthpur	S/C	3.0	Panther	
	Somanthpur to Emami	S/C	1.5	Panther	
115	Balasore to Balasore Traction	S/C	3.6	Panther	
116	Balasore to Balasore Alloys	S/C	6.0	Panther	
117	LILO of Balasore to Jaleswar S/C line at Basta		0.5	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
	Balasore to Basta	S/C	24.5		
	Basta to Jaleswar		32.5		
118	LILO of Balasore to Bhadrak S/C line at Soro		1.0	Panther	
	Balasore to Soro	S/C	34.8		
	Soro to Bhadrak		40.3		
119	Jaleswar to Jaleswar Traction	S/C	2.0	Panther	
120	Bhadrak to Dhamara Traction	S/C	36.0	Panther	
121	Bhadrak to Dhamara Port	S/C	65.0	Panther	
122	Bhadrak to FACOR	S/C	4.6	Panther	
123	Bhadrak to Bhadrak Traction	S/C	8.5	Panther	
124	LILO of Bhadrak to Jajpur road S/C at Jajpur Town		10.5	Panther	
	Jajpur road to Jajpur Town	S/C	28.0		
	Jajpur Town to Bhadrak		38.0		
125	Jajpur Road to Anadapur	S/C	29.4	Panther	
126	Jajpur Road to Kendrapara	S/C	63.0	Panther	
127	LILO of Jajpur Road to Kendrapara S/C line at Chandikhole		1.6	Panther	
	Jajpur Road to Chandikhole	S/C	32.0		
	Chandikhole to Kendrapara		34.1		
128	Jajpur Road to Duburi	D/C	13.0	Panther	
129	Kendrapara to Pattamundai	S/C	19.5	Panther	
130	Kendrapara to Paradeep	S/C	34.8	Panther	
131	Kendrapara to Marshghai	S/C	12.0	Panther	
	Marshghai to Paradeep		31.5	Panther	
132	Paradip to IFFCO	D/C	7.2	Panther	
133	Paradip to PPT	D/C	7.7	Panther	
134	Paradip to PPL	D/C	6.2	Panther	
135	Duburi to MISRILAL (MSL)	S/C	9.0	Panther	
136	Duburi to MESCO	S/C	5.0	Panther	
137	LILO of Duburi to MESCO S/C line at BRPL		2.8	Panther	
	Duburi to BRPL	S/C	4.0		
	BRPL to MESCO		6.5		
138	Duburi to Jakhpur Traction	S/C	13.2	Panther	
139	LILO of Duburi -TISCO (Bamanipal) S/C Line at B.C.Mohanty			Panther	
	Duburi to B.C. Mohanty	S/C	8.0		
	B.C. Mohanty to TISCO (Bamanipal)		13.0		
140	B.C. Mohanty to Tomaka traction	S/C	11.9	Panther	
141	Meramundali to ML Rungta	S/C	7.5	Panther	
142	Meramundali to BRG	S/C	3.6	Panther	
143	Nuapatna Tap to Nuapatna	S/C	37.1	Panther	
144	Nuapatna Tap to Dhenkanal	S/C	37.1	Panther	
145	Kharagprasad to Meramundali	D/C	5.5	Panther	
146	Kharagprasad to Nabbharat	D/C	0.6	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
147	Kharagprasad to Salibahan	S/C	7.0	Panther	
148	Kharagprasad to Hind Metal	S/C	0.5	Panther	
149	Kharagprasad to Samal Metal	S/C	1.0	Panther	
150	Kharagprasad to Traction	S/C	1.2	Panther	
151	Baripada to Bangiriposi	S/C	37.0	Panther	
152	Bangiriposi to Rairangpur	S/C	35.5	Panther	
Sikkim					
400 kV					
1	Lilo of Teesta to V to Binaguri D/C line (115km) at Rangpo		-	Twin Moose	PGCIL
	Teesta to V to Rangpo	D/C	12.3		
	Rangpo to Binaguri		110.0		
2	Teesta to III to Rangpo	D/C+M/C	56.0	Quard Moose	
220kV					
1	Jorethang loop to Rangpo	S/C	**25.0**	Zebra	**PGCIL**
2	LILO of one circuit of 220kV D/C from Jorethang loop to new melli at Rangpo			Zebra	
	Jorethang loop to New Melli	S/C	10.0	Zebra	
	Rangpo to new melli		26.0	Zebra	
3	New melli to Jorthang	D/C	11.5	Zebra	
132 kV					
1	Rangit to Rammam	S/C	27.0	Panther	PGCIL
2	Rangit to Rangpo	S/C	54.2	Panther	PGCIL
3	Rangeet HEP to Sagbari	S/C	0.3	Panther	NHPC
4	Sagbari to Melli	S/C	32.0	Panther	-
5	Sagbari to Geyzing	S/C	15.5	Panther	
7	LILO of Gangtok to Melli at Rangpo and Chuzachen		-	-	-
	Rangpo to Gangtok	S/C	26.0	-	-
	Rangpo to Chuzachen		21.0	Panther	Gati infra
	Gangtok to Chuzachen		48.6	Panther+Zebra	Sikkim
8	Melli to NJP	S/C	90.0	Panther	PGCIL
9	Melli to Rangpo	S/C	16.6	Panther	
10	Rangit to Kurseong	S/C	68.0	Panther	
66 kV					
1	LLHP G/T to Ranipool	D/C	0.2	Dog	Sikkim Gov
2	Ranipool to Gangtok PGCIL	S/C	0.7	Dog	
3	Ranipool to Pakyong	S/C	12.0	Dog	
4	Pakyong to Rongli	S/C	21.0	Dog	
5	Ranipool to Topakhani	S/C	15.0	Dog	
6	Tadong to Gangatok PGCIL	S/C	8.0	Dog	
7	Tadong to Sichey	S/C	5.0	Dog	
8	Tadong to Phudong	S/C	18.0	Dog	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
9	Sichey to Bulbuley	S/C	4.0	Dog	
10	Bulbuley to Gangatok PGCIL	S/C	10.0	Dog	
11	Mangan to Meyong HEP	S/C	12.0	Dog	
12	Mangan to Phudong	S/C	20.0	Dog	
13	Rongli HEP to Rongli	S/C	4.9	Dog	
14	Rongali to Rhenock	S/C	12.0	Dog	
15	Geyzing 132kV to Geyzing 66kV	S/C	0.2	Dog	
16	Geyzing 132kV to Pelling	S/C	2.1	Dog	
17	Geyzing to Namchi	S/C	25.0	Dog	
18	Melli 132kV to Melli 66kV	S/C	0.1	Dog	
19	Melli 66kV to Purano Namchi	S/C	22.0	Dog	
20	Melli 66kV to Namchi	S/C	22.0	Dog	
21	Melli 66kV to Mamring	S/C	18.0	Dog	
22	Melli 66kV To Kalingpong	D/C	15.0	Dog	
23	Rangit HEP to Ravangla	S/C	13.0	Dog	
24	Purno Namchi to Rohatak	S/C	9.0	Dog	
25	Rohtak to Soreng	S/C	11.0	Dog	
West Bengal					
400 kV					
1	Jeerat to KTPS	S/C	136.0	Twin Moose	WBSETCL
2	Jeerat to Bakreswar	S/C	163.0	Twin Moose	
3	Jeerat to Behrampur	S/C	200.0	Twin Moose	PGCIL
4	Jeerat to Subhashgram	S/C	80.0	Twin Moose	
5	Farakka (NTPC) to Behrampur	S/C	73.0	Twin Moose	
6	Sagardighi to Behrampur	D/C	26.0	HTLS	
7	Behrampur to Behramara (Bangladesh)	D/C	71*	Twin Moose	
8	Subhashgram to Haldia	D/C	90.0	Twin Moose	CESC
9	Sagardighi to Subhashgram	S/C	246.0	Twin Moose	PGCIL
10	Farakka (NTPC) to Sagardighi	S/C	67.0	Twin Moose	PGCIL
11	Farakka (NTPC) to Kahalgaon I, II, III & IV	4	95.0	Twin Moose	
12	Farakka (NTPC) to Malda	D/C	40.0	Twin Moose	
13	Sagardighi to Parulia (PGCIL)	D/C	171.0	Twin Moose	WBSETCL
14	Arambag to KTPS	S/C	78.0	Twin Moose	
15	KTPS to Kharagpur	S/C	95.0	Twin Moose	
16	KTPS to Kharagpur	S/C	91.0	Twin Moose	
17	Kharagpur to Baripada	S/C	98.0	Twin Moose	WBSETCL & OPTCL
18	PPSP to Arambag	D/C	210.0	Twin Moose	WBSETCL
19	PPSP to Bidhanagar	D/C	183.5	Twin Moose	
20	Parulia (PGCIL) to Bidhanagar (Durgapur)	D/C	11.0	Twin Moose	
21	Parulia (PGCIL) to Jamshedpur	S/C	177.0	Twin Moose	PGCIL

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
22	Durgapur (DSTPS) to Raghunathpur (RTPS)	D/C	70.5	Twin Moose	DVC
23	Maithon to Raghunathpur (RTPS)	S/C	52.9	Twin Moose	DVC & PGCIL
	Raghunathpur (RTPS) to Ranchi		169.0		
24	Raghunathpur (RTPS) to Ranchi	D/C	155.0	Quard Moose	DVC
25	Durgapur (DSTPS) to Jamshedpur PG	D/C	161.0	Twin Moose	DVC & PGCIL
26	Maithon to Mejia B	S/C	84.0	Twin Moose	PGCIL
	Mejia B to Jamshedpur		168.0		
26	Maithon to Mejia B	D/C	59.0	Twin Moose	
26	Malda (PGCIL) to Purnea	D/C	167.0	Twin Moose	
27	Binaguri (PGCIL) to Purnia I & II	D/C	168.0	Twin Moose	
28	Binaguri (PGCIL) to Purnia III & IV	D/C	160.0	Quad Moose	
29	Binaguri (PGCIL) to Malbase	S/C	121*	Twin Moose	
30	Binaguri (PGCIL) to Rangpo - I	S/C	110.0	Twin Moose	
31	Binaguri (PGCIL) to Rangpo - II	S/C	110.0	Twin Moose	
32	Binaguri (PGCIL) to Bongaigaon	D/C	217.0	Twin Moose	
33	Binaguri (PGCIL) to Alipurduar	D/C	114.0	Quad Moose	
	Alipurduar to Bongaigaon		114.0		
34	Binaguri (PGCIL) to Tala IV	S/C	98*	Twin Moose	
35	Binaguri (PGCIL) to Tala I & II	D/C	115*	Twin Moose	
36	Farakka (NTPC) to Parulia (PGCIL)	D/C	150.0	Twin Moose	
37	Arambag to Bakreswar	S/C	130.0	Twin Moose	WBSETCL
38	Maithon to Parulia (PGCIL)	D/C	70.7	Twin Moose	PGCIL
39	Bidhannagar to Arambag	S/C	115.0	Twin Moose	
40	KTPS to Chaibasa	S/C	70.0	Twin Moose	
41	Kharagpur to Chaibasa	D/C	161.0	Twin Moose	
42	PPSP to New Ranchi	D/C	85.0	Twin Moose	
220 kV					
1	Bakreswar to Bidhanagar	D/C	40.0	Zebra	WBSETCL
2	Bidhanagar to Waria (DTPS)	D/C	17.2	ACSR DEER	DVC
3	Bidhanagar to DPL	D/C	10.0	Zebra	WBSETCL
4	Gokarna to Bakreswar	D/C	81.0	Zebra	
5	Jeerat to New Town	D/C	40.0	Zebra	
6	KTPS to Howrah	D/C	71.0	Zebra	
7	NJP (WB) to Binaguri	D/C	6.0	Zebra	PGCIL
8	J K nagar to Bidhanagar	S/C	40.5	Deer+Zebra	WBSETCL/IPCL
9	J K Nagar to STPS	S/C	89.9	Deer+Zebra	
10	STPS to New Bishnupur	S/C	145.5	Zebra	WBSETCL
11	Subhasgram (WB) to Subhasgram (PG)	D/C	0.6	Moose	
12	Kharagpur to Midnapur	D/C	45.6	Zebra	
13	Dalkhola to Dalkhola (PG)	D/C	1.0	Zebra	PGCIL
14	Dalkhola PG to Kishanganj	D/C	31.0	Zebra	
	Kishanganj to Siliguri (PG)	D/C	108.0	Zebra	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
15	Dalkhola PG to Purnea	D/C	41.0	Zebra	
16	Dalkhola PG to Malda	D/C	116.0	Zebra	
17	Binaguri to Siliguri (PG)	D/C	6.0	Zebra	
18	Binaguri to Birpara	D/C	80.0	Zebra	
19	Birpara to Salakati (NER)	D/C	160.0	Zebra	
20	Birpara to Malbase	S/C	40.0	Zebra	
21	Birpara to Chukha	D/C	38.0	Zebra	PGCIL
22	Gokarna to Sagardighi	D/C	40.0	Zebra	WBSETCL
23	Farakka to Lalmatia	S/C	79.0	Zebra	PGCIL
24	STPS to Chandil	S/C	98.0	Zebra	WBSETCL & JSEB
25	Subhashgram (PG) to Newtown (WBSETCL)	S/C	24.0	Zebra	WBSETCL
26	Kasba to EMSS	S/C	1.0	Single Core XLPE	CESC
27	Subhasgram (PG) to EMSS (CESC)	D/C	23.2	ACSR Moose	
28	EMSS to Budge Budge G.S (BBGS)	D/C	85.0	Moose	
		D/C	2.5	800 sqmm, XLPE	
29	NCGS to EMSS	D/C	19.0	800 sqmm, XLPE	
30	Arambagh to Midnapore	D/C	71.0	Zebra	WBSETCL
31	Arambagh to Rishra	S/C	73.0	Zebra	
32	Arambag to New Bishnupur	D/C	49.0	Zebra	
33	Bakreswar to Satgachia	D/C	132.0	Zebra	
34	Domjur to Arambagh	D/C	58.0	Zebra	
35	Howrah to Foundry Park	D/C	34.0	Zebra	
36	Foundry Park to Domjur	D/C	14.5	Zebra	
37	Jeerat to Satgachia	D/C	78.0	Zebra	
38	Kasba to Jeerat	D/C	55.0	Zebra	
39	Kasba to Subhasgram (WB)	D/C	22.0	Zebra	
40	Krishnanagar to Satgachia	D/C	52.0	Zebra	
41	NJP (WB) to TLDP-III	S/C	80.8	Zebra	
42	NJP (WB) to TLDP-IV	D/C	145.0	Zebra	
43	New Haldia to KTPS	D/C	56.0	Zebra	
44	Bidhanagar to Asansol	S/C	114.0	Zebra	
45	STPS to Asansol	S/C	62.0	Zebra	
46	STPS to Hura	S/C	45.3	Zebra	
47	Hura to New Bishnupur	S/C	131.8	Zebra	
48	Subhasgram (WB) to Lakshmikantapur	D/C	43.0	Zebra	
49	Jeerat to Rishra	S/C	70.0	Zebra	
50	Jeerat to Dharampur	S/C	32.5	Zebra	
51	Dharampur to Rishra	S/C	32.5	Zebra	
52	Malbase to Chukha	S/C	36.0	Zebra	PGCIL

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
53	Subhasgram (PG) to Bantala - CLC (WB)	S/C	20.7	Zebra	WBSETCL
54	Bantala (CLC) to New town	S/C	20.0	Zebra	
55	Kalyanisweri to Maithon (Pithakari) PGCIL	D/C	7.6	Zebra	PGCIL
56	Maithon(Pithakari) to Dhanbad	D/C	52.0	Zebra	
57	Mejia to Borjora	D/C	8.5	ACSR Zebra	DVC
58	Mejia to Muchipara (Durgapur)	D/C	31.5	Zebra	
59	Muchipara (Durgapur) to Parulia (DVC)	D/C	14.8	Zebra	
60	Parulia (DVC) to Tumla	3	6.0	Zebra	
61	Burnpur to IISCO	D/C	1.2	AAAC ZEBRA	
62	Mejia (DVC) to Waria DTPS (DVC)	D/C	42.0	Zebra	
63	Waria (DTPS) to Parulia (DVC)	D/C	22.0	Zebra	
64	Parulia (DVC) to Parulia (PG)	D/C	1.0	Zebra	
65	Mejia to Kalyanswari	S/C	54.9	Zebra	
66	Mejia to Burnpur	S/C	58.2	Zebra	
67	Burnpur to Kalyanswari	S/C	22.0	Zebra	DVC
68	Gokarna to Krishnanagar	D/C	105.0	Zebra	WBSETCL
69	Kharagpur to Vidyasagar Park	D/C	100.0	Zebra	
132 kV					
1	Adisaptagram to Belmuri	D/C	32.0	Panther	WBSETCL
2	Adisaptagram to BTPS	D/C	10.0	Panther	
3	Alipurduar to Coochbehar	S/C	19.0	Panther	
4	Amtala to Debagram	D/C	40.5	Panther	
5	Arambag to Birsingha	D/C	24.0	Panther	
6	Arambag to Raina	D/C	32.0	Panther	
7	Arambag to Tarakeswar	D/C	34.0	Panther	
8	Ashoknagar to Basirhat	D/C	39.0	Panther	
9	Bagmundi to Purulia (WB)	S/C	69.0	Panther	
10	Balichak TSS to Pingla	S/C	18.0	Panther	
11	Bankura to Bankura TSS	S/C	0.6	Panther	
12	Bankura to Bishnupur New	D/C	36.2	Panther	
13	Bankura to Bengal Concast	S/C	3.8	Panther	
14	Bankura to Raghunathpur	D/C	59.6	Panther	
15	Barasat to New Town AA-III	D/C	35.0	Panther	
16	Barasat to Barasat TSS	S/C	3.0	Panther	
17	Berhampore to Amtala	D/C	47.3	Panther	
18	Berhampore to Cossimbazar traction	S/C	13.0	Panther	
19	Bighati to Rishra	D/C	10.0	Panther	
20	Birpara to Alipurduar	S/C	54.0	Panther	
21	Birpara to Coochbehar	S/C	67.0	Panther	
22	Birpara to Birpara (PG)	D/C	0.5	Panther	
23	Bishnupur to (Chandrakonaroad) CK Road	S/C	48.0	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
24	Bishnupur to Midnapur	S/C	88.0	Panther	
25	Bishnupur to Modern/ Gaytri (load)	S/C	4.0	Panther	
26	Bishnupur to New Bishnupur	D/C	5.5	Panther	
27	Bishnupur to New Bishnupur	S/C	3.0	Panther	
28	Bishnupur to Rohit Ferro	S/C	2.8	Panther	
29	New Bishnupur to Borjora	D/C	44.5	Panther	
30	Borjora to Durgapur (Bidhanagar)	D/C	27.0	Panther	
31	Bolpur to Durgapur (Bidhanagar)	D/C	71.0	Panther	
32	Bolpur to Sainthia	D/C	40.0	Panther	
33	BTPS to Dharampur	3	26.0	Panther	
34	BTPS to Bighati	D/C	25.0	Panther	
36	BTPS to Kalyani	S/C	22.0	Panther	
37	BTPS to Khanyan	S/C	18.0	Panther	
38	BTPS to Satgachia	S/C	55.0	Panther	
39	Chanditala to Rishra	D/C	6.0	Panther	
40	CK Road to Ck Road Traction	S/C	5.0	Panther	
41	Contai to Egra	S/C	32.0	Panther	
42	Contai to New Haldia	S/C	77.0	Panther	
43	Dalkhola to Raigaunj	D/C	51.0	Panther	
44	Dalkhola to TCF PS - III	D/C	95.0	Panther	
45	Dankuni to Hind Motor	S/C	7.0	Panther	
46	Dankuni to Liluah	S/C	8.0	Panther	
47	Debagram to Debagram TSS	S/C	6.0	Panther	
48	Debagram to Katwa	D/C	35.0	Panther	
49	Dharampur to Kalyani	S/C	10.0	Panther	
50	Dharampur to Ranaghat	D/C	26.0	Panther	
51	Dharampur to Titagarh	D/C	29.0	Panther	
52	Dhulian to Farakka	S/C	22.0	Panther	
53	Domjur to Jangipara	D/C	17.0	Panther	
54	Domjur to Uluberia	D/C	27.0	Panther	
55	Durgapur (Bidhanagar) to DPL	D/C	10.0	Panther	
56	Durgapur (Bidhanagar) to Mankar	D/C	30.0	Panther	
57	Durgapur (Bidhanagar) to Ukhra	D/C	22.5	Panther	
58	Egra to New Haldia	S/C	100.0	Panther	
59	Gangarampur to Balurghat	S/C	35.0	Panther	
60	Gokarna to Katwa	D/C	57.0	Panther	
61	Gokarna to Berhampore	D/C	18.0	Panther	
62	Gokarna to Lalgola	S/C	46.8	Panther	
63	Gokarna to Lalgola	S/C	67.0	Panther	
64	Lalgola to Raghunathganj	S/C	27.0	Panther	
65	Gokarna to Raghunathganj	S/C	42.0	Panther	
66	Gokarna to Rampurhat	S/C	63.0	Panther	
67	Gokarna to Kuli	S/C	23.6	Panther	
68	Haldia to Haldia NIZ	D/C	22.0	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
69	Haldia NIZ to Rohit Ferro	S/C	2.0	Panther	
70	Haldia to TATA Power	D/C	6.5	Panther	
71	Haldia to New Haldia	S/C	2.0	Panther	
72	Haldia NIZ to Maniksia	S/C	1.0	Panther	
73	Hizli to Midnapur	D/C	25.5	Panther	
74	Egra to Bengal Energy (BEL)	S/C	50.1	Panther	
75	Bengal Energy (BEL) to Hizli	S/C	22.7	Panther	
76	Hind Motor (HM) to Rishra	S/C	13.0	Panther	
77	Howrah to Liluah I&II	D/C	14.0	Panther	
78	Howrah to Liluah III	S/C	18.0	Panther	
79	Howrah to Liluah IV	S/C	24.0	Panther	
80	HPCL to Haldia	S/C	3.0	Panther	
81	HPCL to New Haldia	S/C	2.0	Panther	
82	Jeerat to Ashoknagar	D/C	15.0	Panther	
83	Jeerat to Barasat	D/C	24.5	Panther	
84	Jeerat to Bongaon	D/C	36.0	Panther	
85	Jeerat to Dharampur	D/C	14.0	Panther	
86	Kalna to Satgachia	D/C	18.8	Panther	
87	Kasba to Salt Lake	S/C	21.0	Panther	
88	Kasba to KLC	S/C	13.0	Panther	
89	KLC to Salt Lake	S/C	13.0	Panther	
90	Kasba to Sonarpur	S/C	12.0	Panther	
91	Katwa to Katwa TSS	S/C	2.4	Panther	
92	Katwa to Satgachia	D/C	45.0	Panther	
93	Khanyan to Satgachia	S/C	42.0	Panther	
94	Kharagpur (DVC) to Kharagpur (WB)	S/C	1.0	Panther	
95	Khargapur (WBIDC) to TATA Metalic	S/C	5.0	Panther	
96	Khatra to Bishnupur Old	D/C	66.5	Panther	
97	Khejuria to Farakka (Cable)	D/C	2.6	Panther	
98	Kolaghat to KTPS	D/C	4.0	Panther	DVC
99	Kolaghat to Madras Cement	S/C	5.0	Panther	
100	Krishnanagar to Bongaon	D/C	53.0	Panther	
101	Krishnanagar to Debagram	D/C	46.0	Panther	
102	Krishnanagar to Ranaghat	D/C	33.4	Panther	
103	KTPS to Tamluk	D/C	19.0	Panther	
104	KTPS to Uluberia	S/C	29.0	Panther	
	KTPS to Bagnan		16.0		
	Bagnan to Uluberia		21.0		
105	Kuli to Sainthia	S/C	35.6	Panther	
106	Laxmikantapur to Falta	D/C	34.0	Panther	
107	Laxshmikantapur to Kakdwip	D/C	53.5	Panther	
108	Liluah to BTPS	S/C	58.0	Panther	
109	Liluah to Rishra	S/C	19.5	Panther	
110	Liluah to Rishra	S/C	36.0	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
111	Mahachanda to Mankar	D/C	43.0	Panther	
112	Mahachanda to Satgachia	D/C	54.0	Panther	
113	Malda to Balurghat Tap point	S/C	98.4	Panther	
114	Malda to Khejuriaghat	D/C	35.0	Panther	
115	Malda to Malda (PG)	D/C	7.0	Panther	
116	Malda to Raigaunj	S/C	85.0	Panther	
117	Malda to Samsi	S/C	55.0	Panther	
118	Midnapur to Khargapur (WBIDC)	S/C	18.0	Panther	
119	Midnapur to Balichak TSS	S/C	26.0	Panther	
120	Midnapur to Chandrakonaroad (CK Road)	S/C	46.0	Panther	
121	Midnapur to Jhargram	D/C	48.0	Panther	
122	Midnapur to Pingla	S/C	41.0	Panther	
123	Moinaguri to Birpara	S/C	43.0	Panther	
124	Moinaguri to Mathabhanga	S/C	50.0	Panther	
125	Mathabhanga to Birpara	S/C	83.8	Panther	
126	Moinaguri to Chalsa	S/C	43.0	Panther	
127	Gokarna to Sonar Bangla	S/C	47.2	Panther	
128	Sonar Bangla to Lalgola	S/C	28.4	Panther	
129	New Town AA-III to New Town AA-I	S/C	8.3	Panther	
130	New Town AA-III to Salt Lake GIS	S/C	15.0	Panther	
131	New Town AA-I to Salt Lake GIS S/C	S/C	11.1	Panther	
132	NBU to Lebong	S/C	66.0	Panther	
133	NBU to NJP (PG)	S/C	15.0	Panther	
134	NBU to Rammam	S/C	69.0	Panther	
135	NBU to TCF PS - I	S/C	18.0	Panther	
136	NJP (WB) to Chalsa	S/C	78.0	Panther	
137	NJP (WB) to Moinaguri	S/C	41.0	Panther	
138	NJP (WB) to TCF PS - I	S/C	16.0	Panther	
139	Purulia (WB) to STPS	D/C	35.0	Panther	
140	Raghunathganj to Dhulian	S/C	22.0	Panther	
141	Raghunathganj to Farakka	S/C	44.0	Panther	
142	Raigaunj to Gangarampur	S/C	75.0	Panther	
143	Rampurhat to Sainthia	S/C	38.0	Panther	
144	Reshmi to TATA Metalic	S/C	6.0	Panther	
145	Samsi to Raigaunj	S/C	68.0	Panther	
146	Satgachia to Debagram TSS	S/C	18.0	Panther	
147	Siliguri to NJP (WB)	D/C	16.0	Panther	
148	Tamluk to Haldia NIZ	D/C	46.0	Panther	
149	Tarakeswar to Belmuri	D/C	18.0	Panther	
150	TCF PS - I to TCF PS - II	S/C	16.0	Panther	
151	TCF PS - I to TCF PS - III	S/C	34.0	Panther	
152	TCF PS - II to TCF PS - III	S/C	20.0	Panther	
153	Hura to Purulia(WB)	D/C	15.9	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
154	Howrah to Foodpark	S/C	20.0	Panther	
155	Foodpark to Kolaghat	S/C	37.0	Panther	
156	Vidyasagarpark to Hizli TSS	S/C	90.0	Panther	
157	Vidyasagarpark to Hizli	S/C	80.0	Panther	
158	Hizli to Hizli TSS	S/C	1.1	Panther	
159	Midnapur to BRG steel Tap	S/C	2.5	Panther	
160	BRG steel Tap to BRG	S/C	8.4	Panther	
161	BRG steel Tap to Vidyasagarpark	S/C	87.5	Panther	
162	New Town AA-1 to Salt Lake GIS	D/C	11.1	Panther	
163	NJP (WB) to NJP (PG)	S/C	10.0	Panther	
164	NJP (PG) to Melli	S/C	90.0	Panther	PGCIL
165	NJP (PG) to Kurseong	S/C	31.3	Panther	
166	Kurseong to Rangit	S/C	68.0	Panther	
167	NJP (WB) to NBU	S/C	10.0	Panther	
168	Raghunathganj to farakka Ambuja Cement	D/C	5.0	Panther	WBSETCL
169	NBU to Siliguri (Ujanoo)	S/C	10.0	Panther	
170	Midnapur to Rashmi	S/C	10.0	Panther	
171	Crescent power to Asansol	D/C	20.0	Panther	
172	Raghunathpur to Hura	D/C	33.4	Zebra	
173	Joka to Falta	D/C	28.8	Panther	
174	Joka to Sonarpur	S/C	18.0	Panther	
175	Kasba to Joka	S/C	27.0	Panther	
176	Kolagat (WB) to Kolagat (DVC)	D/C	5.0	Panther	
177	Waria (DTPS) to ASP	D/C	5.0	Lark	DVC
178	Wariac (DTPS) to Kalipahari	D/C	39.7	Lark	
179	Waria to Burdwan	D/C	69.2	Lark	
180	Belmuri to Burdwan	D/C	51.5	Lark	
181	Belmuri to Howrah	D/C	49.3	Lark	
182	Howrah to Kolaghat	D/C	57.3	Lark	
183	Kolaghat to kharagpur	D/C	69.2	Lark	
184	Waria (DTPS) to Jamuria	S/C	33.0	AAAC Panther	
185	Borjora to Sonic Thermal	S/C	1.8	AAAC Panther	
186	Mosabani to Kharagpur	D/C	95.2	ACSR LARK	
187	Kolaghat to Badrinarayan alloy steel		No proper details available		
188	DTPS to DPL	D/C	11.0	Lark	DVC/DPL
189	Joka to Sirakol	S/C	17.0	Panther	WBSETCL
190	Amtala to Najirpur	D/C	13.4	Panther	
191	Rammam to Rangit	S/C	27.0	Panther	
192	Laxmikantapur to Sirakol	D/C	35.2	Panther	
193	Siliguri to Siliguri (Ujanoo)	S/C	10.0	Panther	
194	Dalkhola to Kishengunj	S/C	26.0	Panther	
195	Lebong (Darjeling) to Rammam	S/C	20.0	Panther	
196	DPPS to B Zone	D/C	1.6	Panther	DPL

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
197	DPPS to A Zone	S/C	6.4	Panther	
198	DPPS to C Zone	D/C	4.8	Bison	
199	DPPS to C1 Zone	D/C	5.5	Panther	
200	DPPS to AB Zone	D/C	1.2	Panther	
201	A Zone to Bamunara	D/C	3.6	Panther	
202	BBGS to Chakmir	D/C	20.1	ACSR Moose	
203	BBGS to Chakmir	D/C	18.7	ACSR Moose	
204	Chakmir to Majerhat	D/C	6.1	XLPE 630 sqmm	
205	Chakmir to Taratala	D/C	5.4	XLPE 630 sqmm	
206	Taratala to BBD Bag	S/C	10.4	XLPE 630 sqmm	
207	Taratala to PRS	S/C	11.0	XLPE 630 sqmm	
208	Majerhat to Taratala	S/C	0.9	XLPE 630 sqmm	
209	Jadavpore to Majerhat	S/C	5.6	XLPE 630 sqmm	
210	Majerhat to Southern	D/C	6.4	XLPE 400 sqmm	
211	Majerhat to PRS	S/C	9.0	XLPE 400 sqmm	
212	WBSETCL (Howrah) to Southern	S/C	3.0	GF 161 sqmm	
213	Botanical Garden to Southern	D/C	2.2	XLPE 800 sq.mm(1st circuit) 2 x GF 161 sq.mm. Cu.(2nd circuit)	
214	WBSETCL (Howrah) to B.Garden	D/C	1.1	XLPE 630 sq.mm(1st circuit) 2 x GF 161 sq.mm. Cu.(2nd circuit)	
215	BBD Bag to PRS	D/C	1.4	XLPE 630 sqmm	
216	East Calcutta to PRS	S/C	6.6	XLPE 630 sqmm	
217	PRS to Park lane	S/C	2.1	XLPE 800 sqmm	
218	East Calcutta to BT road	S/C	9.6	XLPE 630 sqmm	
219	BT road to NCGS	S/C	1.5	GF 260 sq. mm. Cu	
220	BT road to NCGS	S/C	2.5	XLPE 800 sqmm	
221	BT road to Titagarh	S/C	9.3	XLPE 800 sqmm	
222	Dum dum to BT road	S/C	7.5	XLPE 800 sqmm	
223	NCGS to Titagarh	S/C	13.4	XLPE 400 sqmm	
224	WBSETCL (Titagarh) to Titagarh	D/C	0.5	GF 225 sq. mm. Al.	
225	WBSETCL (Lilooah) to Belur	T/C	4.4	GF 161 sq.mm. Cu	
226	WBSETCL (Rishra) to Rishra	D/C	6.4	XLPE 800 sqmm	
227	EMSS to East Calcutta	S/C	7.8	XLPE 800 sqmm	
228	EMSS to PRS	S/C	9.8	XLPE 800 sqmm	
229	WBSETCL (Kasba) to EMSS	T/C	0.4	XLPE 800 sqmm	
230	EMSS to Jadavpore	S/C	11.0	XLPE 630 sqmm	
231	EMSS to Park lane	S/C	7.0	XLPE 800 sqmm	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
232	EMSS to Patuli	S/C	7.0	XLPE 800 sqmm	
233	EMSS to DDSS	S/C	17.3	XLPE 800 sqmm	

Table C: State wise list of generators present in the Eastern region grid

Sl.No	Name of the power station	Power station details			Owned By
		No. of units	Capacity of each unit (MW)	Total capacity (MW)	
Bihar					
State Sector					
1	Barauni (BTPS)	2	110	220	BSPGCL
2	Muzaffarpur (Kanti)	2	110	220	Joint venture of NTPC & BSEB
		1	195	195	
3	Eastern gandak canal HEP (Valmikinagar)	3	5	15	BSHPGCL
Central sector					
1	Khalgoan	4	210	2340	NTPC
		3	500		
2	Barh STPP, St-II	2	660	1320	
Jharkhand					
State Sector					
1	PTPS	1	110	110	
2	TTPS	2	210	420	
3	Subernrekha (SHPS)	2	65	130	
DVC					
1	Bokaro 'B'	3	210	630	DVC
		1	500	500	
2	Chandrapur	3	140	920	DVC
		2	250		
3	Koderma TPS	2	500	1000	DVC
4	Tiliya	2	2	4	DVC
5	Maithon dam	1	23.2	63.2	DVC
		2	20		
6	Panchet	2	40	80	DVC
7	MGT gen (Gas based)	3	27.5	82.5	DVC
CPP					
1	Jojobera	3	120	427.5	Tata Steel
		1	67.5		
2	Inland Power	1	70	70	
3	Usha Martin Ltd. (Adityapur)	3	30	130	
		1	25		
		1	15		
4	Usha Martin Ltd. (Ranchi)	2	10	20	
5	Rungta mines	2	20	40	
6	ABCIL	2	30	60	

Sl.No	Name of the power station	Power station details			Owned By
		No. of units	Capacity of each unit (MW)	Total capacity (MW)	
IPP					
1	Adhunik Power Co. Ltd.	2	270	540	
2	Maithon RB (MPL)	2	525	1050	Joint venture of DVC & TATA
Odisha					
State sector					
1	Burla power house (Hirakud-I)	2	49.5	275.5	OHPC
		2	32		
		3	37.5		
2	Chiplima power house (Hirakud-II)	3	24	72	OHPC
3	Balimela power house (HPS)	6	60	510	OHPC
		2	75		
4	Rengali power house (HPS)	5	50	250	OHPC
5	Upper Kolab power house (HPS)	4	80	320	OHPC
6	Upper Indravati hydro electric (HPS)	4	150	600	OHPC
7	Machhkund power house (HPS)	3	17	115.5	OHPC
		3	21.5		
8	IB thermal power station	2	210	420	OPGC
9	TTPS (NTPC- State dedicated)	4	60	460	NTPC
		2	110		
Central sector					
1	Talcher super thermal power-I	2	500	3000	NTPC
	Talcher super thermal power-II	4	500		
CPP					
1	NALCO (Angul)	10	120	1200	
2	RSP (Rourkela)	2	60	220	
		4	25		
3	ICCL (IMFA), (Choudwara)	2	54	258	
		2	60		
		1	30		
4	HPCL(HINDALCO), (Hirakud)	1	67.5	467.5	
		4	100		
5	KMCL (NINL), (Duburi)	1	24	62.5	
		2	19.25		
6	NBVL (Meramundali)	1	30	94	
		1	64		
7	Bhusan Power & Steel, Jharsuguda	1	60	506	
		1	40		
		3	130		
		2	8		

Sl.No	Name of the power station	Power station details			Owned By
		No. of units	Capacity of each unit (MW)	Total capacity (MW)	
8	Vedanta (Lanjigarh)	3	30	90	
9	Tata sponge iron (Joda)	1	18.5	26	
		1	7.5		
10	Shyam DRI (Pandoli, Sambalpur)	1	33	33	
11	Aarti steel (Ghantikhal, Cuttak)	1	40	40	
12	Bhusan steel and strips (Meramundali)	1	33	410	
		1	77		
		2	150		
13	Jindal stainless Ltd. (Duburi)	2	125	263	
		1	13		
14	Vedanta (Jharsuguda)	9	135	1215	
15	Visa steel (New Duburi)	3	25	75	
16	IFFCO (Paradeep)	2	55	110	
17	SMC power generation Ltd.	1	8	33	
		1	25		
18	Action ispat and power Ltd.	1	12	123	
		1	25		
		2	43		
19	Aryan ispat and power Ltd.	1	18	18	
20	EMAMI	1	15	20	
		1	5		
21	Shree Ganesh	1	32	32	
22	ACC (Baragarh)	1	30	30	
23	Jindal steel and power Ltd. (Angul)	6	135	810	
24	Maithan ispat nigam Ltd. (Jajpur road)	1	30	30	
25	MSP mettallics Ltd.	1	25	25	
26	OCL India Ltd.	2	27	54	
27	FACOR	1	45	45	
		1	55	55	
28	HINDALCO (AAL) (Budhipadar)	4	150	600	
29	Maheswari Ispat Pvt Ltd	2	12	24	
IPP					
1	Meenakshi power (Jayanagar)	3	4	37	
		2	12.5		
2	Odisha power consortium Ltd. (Samal)	4	5	20	
3	Aarati steel (Ghantikhal)	1	50	50	
4	Sterlite energy Ltd. (Jharsuguda)	4	600	2400	
5	GMR Kamalanga	3	350	1050	
6	JITPL (Derang)	2	600	1200	

Sl.No	Name of the power station	Power station details			Owned By
		No. of units	Capacity of each unit (MW)	Total capacity (MW)	
7	Ind-Barath	1	350	350	
Sikkim					
State Sector					
1	LLHP	2	6	12	
2	Meyonchu	2	2	4	
3	Rongali HEP	2	3.125	6.25	
Central sector					
1	Teesta-V	3	170	510	NHPC
2	Rangeet -III	3	20	60	NHPC
IPP					
1	Chuzachen	2	55	110	
2	Jorthang loop	2	48	96	
West Bengal					
State Sector					
1	Bakreswar TPS	5	210	1050	WBPDCL
2	Bandel TPS	4	60	450	WBPDCL
		1	210		
3	Kolaghat TPS	3	210	630	WBPDCL
		3	210	630	
4	Sagardighi TPS	2	300	600	WBPDCL
5	Santaldih TPS	2	250	500	WBPDCL
6	Rammam II hydro	4	12.75	51	WBSEDCL
7	Purulia pumped storage	4	225	900	WBSEDCL
8	Jaldhaka hydro 1	3	9	27	WBSEDCL
9	Teesta canal fall hydro 1	3	7.5	22.5	WBSEDCL
10	Teesta canal fall hydro 2	3	7.5	22.5	WBSEDCL
11	Teesta canal fall hydro 3	3	7.5	22.5	WBSEDCL
Central sector					
1	Farakka	3	200	2100	NTPC
		3	500		
2	Chuka Bhutan, Hydro	4	84	336	Bhutan
3	Tala Bhutan, Hydro	6	170	1020	Bhutan
4	Teesta low dam 3	4	33	132	NHPC
5	Teesta low dam 4	2	40	220	NHPC
Private Sector and DVC					
1	DPL	1	110		DPL
		1	250		
		1	300		
2	Mejia	4	210	1340	DVC
		2	250		
3	Waria TPS (DTPS)	1	140	350	DVC

Sl.No	Name of the power station	Power station details			Owned By
		No. of units	Capacity of each unit (MW)	Total capacity (MW)	
		1	210		
4	Mejia TPS phase-II	2	500	1000	DVC
5	Durgapur steel TPS	2	500	1000	DVC
6	Budge Budge	2	250	500	CESC
		1	250	250	
7	Southern generating station	2	67.5	135	CESC
8	Haldia TPP	2	300	600	CESC
9	Raghunathpur TPS	2	600	1200	DVC
CPP					
1	Tata power	2	45	120	
		1	30		
2	Crescent power	2	20	40	

Table D: State wise list of Bus reactor present in the Eastern region grid

Sl No	Name of the substaion	Voltage level (kV)	Existing reactor details		
			no of units	capacity of each unit (MVAr)	Total capacity (MVAr)
Bihar					
1	Gaya	765	2	240	480
		400	2	125	250
2	Biharshariff	400	1	125	125
		400	1	50	50
		400	1	80	80
3	Kahalgaon	400	2	50	100
4	Muzaffarpur	400	2	125	250
5	Patna	400	1	80	80
		400	2	125	250
6	New Purnea	400	2	125	250
7	Barh	400	1	80	80
8	Banka	400	1	80	80
9	Lakhisarai	400	1	80	80
10	Pusauli	765	1	330	330
		400	2	125	250
11	Kishanganj	400	1	125	125
Jharkhand					
1	Ranchi (New)	400	2	125	250
		765	2	240	480
2	Maithon	400	1	50	50
			2	125	250
3	Maithon RB (MPL I & II)	400	2	50	100
4	Jamshedpur	400	2	50	100
5	Ranchi	400	1	80	80
		400	1	125	125
6	Koderma	400	2	50	100
7	Chaibasa	400	1	80	80
8	Chandwa (Jharkhand Pooling)	400	2	125	250
Odisha					
1	Angul	765	2	330	660
		400	3	125	375
2	Jharsuguda	765	1	240	240
			1	240	240
3	Bolangir	400	1	80	80
4	Rourkela	400	1	50	50
			1	125	125

Sl No	Name of the substaion	Voltage level (kV)	Existing reactor details		
			no of units	capacity of each unit (MVAr)	Total capacity (MVAr)
5	Rengali	33	1	31.5	31.5
6	Jeypore	33	1	31.5	31.5
		400	1	125	125
		400	1	63	63
7	Keonjhar	400	1	80	80
8	Jharsuguda	400	2	125	250
9	Indravati	400	1	125	125
10	Duburi	400	1	80	80
11	JITPL	400	2	50	100
12	Pandiaballi	400	1	80	80
			1	63	63
13	Baripada	400	1	125	125
Sikkim					
1	Rangpo	400	2	80	160
2	New Melli	220	1	63	63
West Bengal					
1	Farakka	400	2	50	100
2	Parulia	400	3	16.77	50.01
			2	125	250
3	Bidhannagar	400	1	50	50
4	Bakreswar	400	1	50	50
5	Jeerat	400	2	50	100
6	Arambagh	400	1	50	50
7	Ragunathpur	400	2	50	100
8	Kharagpur	400	1	80	80
9	Binaguri	400	2	125	160
10	Behrampur	400	1	80	80
			1	50	50
11	KTPS	400	2	50	50
12	Durgapur	400	1	50	50

Table E: State wise list of Line reactor present in the Eastern region grid

Sl No	Name of the transmission line	Voltage level (kV)	Existing reactor details				Remarks
			no of units	capacity of each unit (MVAr)	Total capacity (MVAr)	End	
Bihar							
1	Maithon to Gaya I & II	400	2	50	100	Gaya	Switchable
		400	2	50	100	Maithon	Switchable
2	Purnea to Kishanganj-I	400	1	63	63	Purnea	-
3	Purnea to Binaguri-III	400	1	63	63	Purnea	-
4	Purnea to Muzaffarpur I & II	400	2	63	126	Purnea	Switchable
		400	2	63	126	Muzaffarpur	
5	Muzaffarpur to Gorakhpur I	400	1	63	63	Muzaffarpur	Switchable
6	Muzaffarpur to Gorakhpur II	400	1	50	50	Muzaffarpur	Switchable
7	Biharshariff to Balia I & II	400	2	50	100	Balia	-
8	Pasuali-Fatehpur	765	1	310	240	Pasuali	-
		765	1	330	330	Fatehpur	-
9	Banka to Biharshariff I & II	400	2	50	100	Banka	-
10	Biharshariff to Purnea I & II	400	2	80	160	Biharshariff	-
11	Lakhisarai to Biharshariff I & II	400	1	50	50	Biharshariff	-
12	Barh to Patna I & II	400	2	50	100	Patna	-
13	Lakhisarai to Kahalgaon I & II	400	2	50	100	Lakhisarai	-
14	Biharshariff to Tenughat	**220**	1	50	50	Tenughat	-
15	Biharshariff to Pusauli I	400	1	50	50	Biharshariff	Switchable
16	Pasauli to Allahabad	400	1	63	63	Pasauli	Switchable
17	Pasauli to Sarnath	400	1	63	63	Pasauli	Switchable
18	Patna to Balia III & IV	400	2	63	126	Balia	-
19	Pasauli to Biharshariff I & II	400	2	63	126	Pasauli	-
20	Patna to Krishanganj I & II	400	1	63	63	Patna	Switchable
			1	63	63	Patna	Switchable
21	Patna to Krishanganj I & II	400	1	63	63	Kishangaunj	
			1	63	63	Kishangaunj	
22	Biharshariff to Varanasi I & II	400	2	50	100	Biharshariff	Switchable
23	Gaya to Balia	765	1	240	240	Gaya	Switchable
			1	330	330	Balia	-
24	Gaya to Varanasi-I	765	1	240	240	Gaya	Switchable
25	Gaya to Varanasi-II	765	2	240	480	Gaya	Switchable

Sl No	Name of the transmission line	Voltage level (kV)	Existing reactor details				Remarks
			no of units	capacity of each unit (MVAr)	Total capacity (MVAr)	End	
Jharkhand							
26	Ranchi (New) to Dharmjaygarh I	765	1	240	240	Ranchi	Switchable
			1	330	330	Dharamjaygarh	-
27	Ranchi (New) to Dharmjaygarh II		1	240	240	Ranchi	Switchable
			1	330	330	Dharamjaygarh	-
28	Ranchi to Sipat-I & II	400	2	80	160	Ranchi	-
			2	80	160	Sipat	-
29	Maithon RB (MPL) to Ranchi I & II	400	2	50	100	MPL	-
			2	50	100	Ranchi	
30	Maithon to Kahalgaon-I & II	400	2	50	100	Maithon	-
31	Maithon to Mejia I	400	1	50	50	Maithon	Switchable
32	Kharagpur to Chaibasa	400	1	63	63	Chaibasa	
33	Ranchi (New) to PPSP	400	2	50	100	Ranchi	
Odisha							
34	Jharsuguda to Angul-I & II	765	2	240	480	Jharsuguda	Switchable
			2	240	480	Angul	-
35	Jeypore to Gajuwaka I & II	400	2	80	160	Gajuwaka	Switchable
36	Pandiabill to Mendhasal	400	1	63	63	Mendasal	-
	Baripada to Pandiabill	400	1	63	63	Baripada	
37	Rourkel to Jharsuguda I	400	1	63	63	Rourkela	-
38	Rourkel to Sterlite I	400	1	63	63	Rourkela	-
39	Meramundali to Angul I	400	1	80	80	Meramundali	-
	Meramundali to Vedanta	400	2	50	100	Meramundali	
40	Angul to Bolangir	400	1	50	50	Bolangir	-
41	Bolangir to Jeypore	400	1	50	50	Bolangir	-
		400	1	80	80	Jeypore	
42	Rourkela to Talcher I & II	400	2	50	100	TSTPP	-
43	Keonjhar to Rengali	400	1	63	63	Rengali	-
44	Rengali to Indravati	400	2	50	100	Rengali	-
			1	50	50	Indravati	
45	Rourkela to Chaibasa-I	400	1	50	50	Rourkela	Switchable
46	Baripada to Duburi	400	1	63	63	Baripada	-
47	Rourkela to Jamshedpur II	400	1	50	50	Rourkela	Switchable
48	Baripada to Keonjhar	400	3	16.67	50.01	Baripada	-

Sl No	Name of the transmission line	Voltage level (kV)	Existing reactor details				Remarks
			no of units	capacity of each unit (MVAr)	Total capacity (MVAr)	End	
49	Jharsuguda to Dharamjaygarh-I	765	1	330	330	Dharamjaygarh	-
50	Jharsuguda to Dharamjaygarh-II	765	1	330	330	Dharamjaygarh	-
51	Angul to Srikakulam-II	765	1	240	240	Angul	
West Bengal							
52	Behrampur to Jeerat-I	400	1	50	50	Jeerat	-
53	Sagardighi to Subashgram	400	3	21	63	Sagardighi	-
			1	50	50	Subashgram	
54	Farakka to Parulia-I	400	1	50	50	Farakka	-
55	Bidhannagar to Parulia-I	400	3	16.7	50.01	Parilia	-
56	Bakreswar to Arambagh	400	1	63	63	Bakreswar	-
57	Bakreswar to Jeerat	400	1	63	63	Jeerat	-
58	Malda to Purnea I & II	400	2	63	126	Malda	-
59	Binaguri to Bongaigaon- I & II	400	2	63	126	Bongaigoan	
60	Binaguri to Tala I & II	400	2	63	126	Binaguri	-
61	Binaguri to Tala IV	400	1	63	63	Binagiri	-
62	Binaguri to Bongaigaon III & IV	400	2	80	160	Binagiri	Switchable
63	Ragunathpur to Ranchi	400	1	60	60	Ranchi_PG	-
64	Ragunathpur to Ranchi	400	1	60	60	Ranchi_PG	-
65	Chaibasa to Kolaghat	400	1	63	63	Chaibasa	

Table F: State wise list of load data considered for the study present in the Eastern region grid

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
Bihar							
1	Arrah	132/33	1	20	20	31.11	8.98
			3	50	150		
2	Ataula (Arwal)(Karpi)	132/33	2	20	40	23.39	7.63
3	Aurangabad	132/33	2	20	40	22.15	8.86
4	Banjari	132/33	3	20	60	7.25	3.54
5	Banka	132/33	3	20	60	14.10	4.60
6	Barauni TPS	132/33	1	50	50	42.19	13.77
			2	20	40		
7	Barh	132/33	1	20	20	17.12	5.58
			1	50	50		
8	Baripahari	132/33	2	50	100	45.31	21.31
9	Belaganj	132/33	2	20	40	14.97	4.88
10	Bettiah	132/33	2	20	40	24.68	5.61
			1	50	50		
11	Bihta	132/33	3	50	150	52.36	17.07
12	Bikramganj	132/33	2	20	40	32.22	8.92
			1	50	50		
13	Buxar	132/33	2	20	40	19.47	9.81
			1	50	50		
14	Chandauti (Gaya)	132/33	2	50	100	27.13	15.96
		132/25	2	13.35	26.7	2.03	0.66
15	Chhapra	132/33	2	20	40	20.14	6.57
			1	50	50		
16	Darbhanga (old)	132/33	2	50	100	11.08	6.20
17	Dhaka	132/33	3	20	60	9.06	1.25
18	Dalsingsarai	132/33	2	20	40	13.00	4.88
19	Digha	132/33	3	50	150	22.14	7.23
20	Dumraon	132/33	1	20	20	12.08	2.83
			1	50	50		
21	Ekma	132/33	1	20	20	7.05	2.30
22	Ekanga Sarai (Ekanagar)	132/33	3	20	60	20.64	6.73
23	Forbeshganj	132/33	1	20	20	33.23	10.84
			1	50	50		
24	Goh	132/33	2	20	40	10.75	3.50
25	Gangwara	132/33	2	50	100	20.94	6.83
26	Gaighat	132/33	2	50	100	19.63	9.23
27	Hazipur	132/33	3	50	150	36.25	11.64

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
28	Hulasganj	132/33	2	20	40	10.39	1.08
29	Harnaut	132/33	2	20	40	8.14	8.19
30	Hathidah	132/33	3	20	60	13.00	4.24
31	Imamganj	132/33	2	20	40	8.76	1.14
32	Jagdishpur	132/33	2	20	40	18.63	5.38
33	Jandaha	132/33	2	20	40	17.60	3.40
34	Jainagar	132/33	3	20	60	14.50	4.73
35	Jakkanpur	132/33	4	50	200	35.24	35.46
			1	20	20		
36	Jamalpur	132/33	2	50	100	25.00	8.16
37	Jamui	132/33	2	20	40	45.00	14.68
38	Jehanabad	132/33	2	20	40	8.13	8.18
39	Kahalgaon	132/33	2	20	40	16.11	6.40
			2	50	100		
40	Karmnasa	132/33	2	50	100	24.17	7.88
			1	20	20		
		132/25	1	21.6	21.6	3.05	0.93
			1	20	20		
41	Kataiya	132/33	3	20	60	1.61	0.53
42	Katihar	132/33	3	20	60	21.14	6.90
			1	50	50		
43	Katra	132/33	3	50	150	63.84	30.02
44	Kusheshwarsthan	132/33	2	20	40	0.89	0.29
45	Kochas	132/33	2	20	40	16.71	6.27
46	Karbigahiya	132/33	4	50	200	12.89	4.20
47	Kudra	132/33	2	20	40	19.84	9.39
48	Khagaria	132/33	2	20	40	24.81	5.99
			1	50	50		
49	Kishanganj	132/33	1	50	50	21.14	4.00
			1	20	20		
50	Lakhisarai	132/33	3	20	60	22.15	7.23
51	Madhubani	132/33	2	20	40	8.05	2.63
52	Masaurhi	132/33	2	20	40	20.14	6.57
53	Mithapur	132/33	2	50	100	17.68	17.79
54	Mohania	132/33	1	50	50	23.21	2.02
			1	20	20		
55	Motihari	132/33	1	20	20	22.89	6.50
			1	50	50		
56	Masrakh	132/33	2	20	40	19.74	3.28
57	Muzaffarpur	132/33	3	50	150	52.36	17.09
58	Nalanda	132/33	2	20	40	18.22	8.57
59	Naugachhia	132/33	3	20	60	0.00	0.00

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
60	Nawada	132/33	1	20	20	30.21	4.60
			3	50	150		
61	Pandaul	132/33	2	20	40	22.25	2.90
			1	50	50		
62	Phulparas	132/33	2	20	40	14.10	4.00
63	Purnea	132/33	1	20	20	46.63	17.25
			2	50	100		
64	Rafiganj	132/33	1	50	50	14.60	4.30
			1	20	20		
65	Rajgir	132/33	2	20	40	18.12	5.91
66	Ramnagar	132/33	2	20	40	24.61	8.02
67	Raxaul	132/33	2	20	40	21.14	5.70
68	Remi nagar (Runni Saidpur)	132/33	2	20	40	7.95	2.59
69	Sherghati	132/33	2	20	40	9.46	2.40
70	SKMCH	132/33	2	50	100	31.72	10.35
71	Sonebarsa	132/33	2	20	40	6.24	1.62
72	Sabour	132/33	3	50	150	31.62	10.32
73	Saharsa	132/33	1	20	20	16.11	4.79
74	Samastipur	132/33	2	20	40	31.32	9.05
75	Sasaram	132/33	2	50	100	26.18	2.23
76	Shekhpura	132/33	2	20	40	19.63	6.40
77	Sheetalpur	132/33	2	20	40	13.09	3.31
78	Sitamarhi	132/33	3	50	150	36.25	11.82
79	Siwan	132/33	1	20	20	35.24	14.30
			2	50	100		
80	Sonenagar	132/33	1	50	50	34.23	11.17
			1	20	20		
		132/25	1	21.6	21.6	7.11	2.30
			1	20	20		
81	Sultanganj	132/33	2	20	40	25.82	6.37
			2	50	100		
82	Supaul	132/33	3	20	60	6.04	1.97
83	Tehta	132/33	2	20	40	8.56	8.61
84	Tekari	132/33	2	20	40	19.01	3.88
85	Udaikishanganj	132/33	2	20	40	21.35	-3.40
86	Vaishali	132/33	2	20	40	14.10	3.40
87	Wazirganj	132/33	2	20	40	15.81	4.40
88	BodhGaya	132/33	1	50	50	43.14	14.07
89	Dehri	132/33	2	50	100	20.68	6.75
90	GopalGanj	132/33	2	50	100	46.80	11.82
91	Begusarai	132/33	3	50	150	34.01	11.09

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
92	Khagaul	132/33	5	50	250	47.32	15.45
93	Sipar	132/33	2	50	100	8.86	8.92
94	Fatuha	132/33	3	50	150	54.37	25.57
95	Bihar Sarif	132/33	1	20	20	0.50	0.16
96	Madhepura	132/33	2	20	40	20.76	8.00
97			1	100	100		
98	Pussori New	132/33	1	50	50	82.85	27.02
99	Benipatti	132/33	2	20	40	5.92	1.93
100	Belsand	132/33	1	10	10	1.41	0.46
101	Mahanar	132/33	2	20	40	3.52	1.15
102	Sheohar	132/33	2	50	100	5.47	1.78
103	Kishanganj New	132/33	1	50	50	0.00	0.00
Traction_Bihar							
104	Arrah Rly	132/25				7.41	2.40
105	Lakhisarai Rly	132/25				4.06	1.31
106	Rafigunj Rly	132/25				1.83	0.59
107	Dumarn Rly	132/25				2.03	0.41
108	Hajipur Rly	132/25				0.55	0.34
109	Chapra Rly	132/25				6.49	2.10
	Kudra Rly	132/25				13.10	4.24
110	Mokama Rly	132/25				7.11	2.30
111	Railfactory Rly	132/25				4.00	1.30
112	Khsurupur Rly	132/25				5.08	5.07
113	Paharpur Rly	132/25				2.74	0.89
114	KCL Rly	132/25				8.05	3.48
115	JHAJA Rly	132/25				2.03	0.66
116	Khagaul Rly	133/25				2.03	0.66
117	Jehanabad Rly	132				3.05	0.99
118	Arrah Rly	132				4.06	1.31
Industry							
119	Ordinance Factory (Rajgir)	132				0.40	0.13
120	Samastipur Trac	132				1.27	0.71
121	RailLoacal Plant (Vaisali)	132				3.02	1.50
122	Shree Cement	132				12.08	0.29
123	Chandauli	132				0.00	0.00
124	BharatSM_Gen	132				0.00	0.00
125	Hasanpur SMG	132				0.00	0.00
126	SUGAULI	132				4.60	1.30
127	LAURIYA	132				-10.79	-3.55
128	Swdesi Sugarmill Gen	132				-2.77	-0.91

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
129	Narinagar SugerMill	132				-12.20	-4.00
Jharkhand							
1	Chaibasa	132/33	2	50	100	8.79	2.89
2	Lalmatiya	132/33	1	20	120	38.00	12.48
			2	50			
3	PTPS	220/132	2	150	300		
4	Adityapur	132/33	4	50	200	57.00	-9.22
5	Chakradharpur	132/33	1	20	20	9.65	3.17
6	Dalbhumgarh	132/33	2	50	100	52.00	17.09
		Railway feeder				12.00	3.94
7	Chaibasa	132/33	1	25	25	6.00	1.97
8	Chandil II/ Maniq	132/33	2			41.00	6.23
9	Deogarh	132/33	3	50	150	30.00	8.10
		Railway feeder					
10	Dumka (Maharo)	132/33	2	50	100	38.00	12.49
11	Garhwa Rd	132/33	1	50	70	39.00	5.55
			1	20			
		Railway feeder					
12	Goielkara	132/33	1	20	20	9.00	2.96
						3.00	0.99
13	Golmuri	132/33	2	50	100	23.00	7.56
14	Gumla	132/33	2	20	40	17.58	5.78
15	Hatia old	132/33	4	50	200	69.00	22.68
		Railway feeder					
16	Tamar	132/33	2	50	100	13.00	4.27
17	Madhupur	132/33	2	50	100	16.40	3.40
18	Jadugoda	132/33	2	20	90	15.00	4.93
			1	50			
19	Jamtara	132/33	1	50	70	34.00	5.97
			1	20			
		Railway feeder				8.00	1.40
20	Japla	132/33	2	20	40	14.00	4.08
21	Kamdara	132/33	2	20	60	29.00	9.52
			1	20			
		Railway feeder					
22	Kanke	132/33	2	50	100	20.24	7.91
23	Kendposi	132/33	2	20	90	17.70	5.81
			1	50			
		Railway feeder				8.00	2.63
24	Latehar	132/33	2	50	100	12.00	3.94
25	Lohardaga	132/33	2	50	100	37.40	12.29

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
26	Namkum	132/33	4	50	200	52.00	21.90
		Railway feeder					
27	Nowamundi	132/33	1	50	50	11.00	3.46
28	Nowamundi Tata Steel	132				5.74	1.89
29	Pakur	132/33	2	50	100	24.40	8.02
30	Rajkharsawan	132/33	2	50	100	9.00	2.96
31		Railway feeder				8.20	4.03
32	Sahebgunj	132/33	2	50	100	18.00	5.92
33	Daltonganj	132/33	2	50	100	24.48	8.05
34	Manoharpur	132/33				6.92	10.30
35	Sikidri	132/33				9.00	10.00
36	Saljagiri RLY	132/25	-	-	-	0.00	0.00
37	Shankarpur RLY-Deogarh	132/25	-	-	-	3.00	0.65
38	Tatisiloi RLY	132/25	-	-	-	1.00	3.10
39	Tolra RLY	132/25	-	-	-	11.00	2.75
40	Lodhma RLY	132/25	-	-	-	3.10	1.01
41	Bakaspur RLY	132/25	-	-	-	3.60	1.19
42	Chakradharpur RLY	132/25	-	-	-	18.05	5.93
43	Bano RLY	132/25	-	-	-	0.00	0.00
44	Umi Rly	132/25	-	-	-	2.90	2.08
Industry							
45	HEC Hatia	132				2.00	0.66
46	Ushamartin	132				16.00	5.26
47	APL Ramchandrapur	132				2.14	10.11
48	ECL-Lalmatya	132				5.00	1.64
DVC							
49	Patherdih	132/33	2	80	160	46.64	24.84
			1	50	50		
		132/25				9.67	4.92
50	Pattratu	132/33	1	31.5	31.5	4.50	2.23
51	Gola	132/33	2	50	100	20.05	5.44
52	K'Dubi	132/33	2	50	100	37.02	15.45
			1	80	80		
		132/25				13.34	7.23
53	Konar	132/33	1	20	20	5.30	1.67
		132/25				5.30	1.67
54	Biada	132/33	2	80	160	17.98	5.12
55	BTPS'B	220				24.19	23.69
56	Chandil	132					
57	Dhanbad	220/33	2	80	160	34.72	7.98
58	Jamshedpur	132/33	3	45	135	8.90	0.25

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
59	Koderma	132/33	1	80	80	78.19	24.65
			1	50	50	15.15	5.58
60	Ramgarh	132/33	2	80	160	95.71	25.30
		132/33	1	50	50		
61	Mosabani	132/33	2	20	40	14.42	5.03
62	Ramgarh	220/33	2	50	100	37.95	16.13
63	BTPS-A-SST					7.93	6.56
Industry							
64	Giridih	132/33				93.54	28.31
		220/33				25.03	4.85
65	North Karanpura	132/33				9.91	3.01
66	Govindpur	132				30.86	7.97
67	Hazaribag	132/33				47.23	15.60
68	Nimghat	132/33				34.93	11.01
69	Putki	132/33				119.27	37.60
70	Barhi	132/33				46.38	22.32
71	CTPS	132/33				77.06	27.24
72	MHS-RB3	132/33				30.07	8.64
73	Panchet	132/33				11.82	0.94
74	Maniq Railway	132				2.09	0.65
75	Jamshedpur	220/132				17.50	52.91
76	JSPL	132				19.73	3.89
77	TISCO	400/132				242.92	16.74
78	Maniq	132				6.26	-6.00
79	PDIL	132				0.23	0.20
Traction							
80	ECRBR-D	132				0.00	0.00
81	ECRly North Karanpura DVC	132				9.84	2.84
82	BSL-DVC	132				69.64	25.56
83	Elctr DVC /Dhanbad	220				5.39	1.70
84	Nimiaghat Railway	132/25				5.21	1.92
85	ECR Gomia	132				0.88	-0.75
86	MAL-Impex	132				36.19	1.10
87	Sermuri DVC	132				10.70	4.49
88	Pradhankant	132				3.50	2.50
89	BSLGD	132				34.86	12.78
90	Rajbera DVC	132				9.50	4.41
91	EC Rly (from Sindri DVC)	132				3.50	2.50

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
Odisha							
1	Mendhasal	220/33	1	20	20	5.46	2.00
2	Balasore	132/33	2	63	166	28.24	12.76
			1	40			
		Railway Feeder				6.04	2.15
3	Bhadrak	132/33	2	63	166	35.31	11.87
			1	40			
		Railway Feeder				5.73	0.53
4	Bidanasi	132/33	2	63	166	23.82	13.04
			1	40			
5	Budhipadar	132/33	1	20	20	4.66	0.50
6	Chandaka	132/33	2	63	166	49.59	22.00
			1	40			
		Railway					
7	Jayanagar	132/33	2	20	52.5	18.15	5.80
			1	12.5			
		Railway Feeder				6.20	4.10
		ChakusTr				0.00	0.00
8	Joda	132/33	3	20	100	18.75	5.65
			1	40			
9	Narendrapur	220/132	1	100	520	13.28	4.40
			2	160			
		132/33	2	40			
			1	20			
		Railway (JagnathTr)				4.32	-7.34
10	Paradip	132/33	2	20	52.5	7.47	3.14
			1	12.5			
11	Theruvali	132/33	2	12.5	25	7.93	2.24
12	Balimela	220/33	1	20	60	17.02	2.26
			1	40			
13	Barkote	220/33	2	40	80	15.02	-4.00
14	Nayagarh	220/33	1	40	80	16.42	5.19
			2	20			
15	Duburi	220/33	2	40	80	9.92	3.00
16	Akhusingh	132/33	2	12.5	25	5.36	1.88
17	Anandapur	132/33	2	12.5	45	7.29	2.48
			1	20			
18	Angul	132/33	2	40	100	11.51	4.31
			1	20			
19	Argul	132/33	1	40	60	0.60	0.80
			1	20			

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
20	Atri	132/33	1	20	20	0.00	0.00
21	Aska	132/33	3	40	120	14.28	7.44
22	Balugaon	132/33	1	40	72.5	9.48	2.19
			1	20			
			1	12.5			
		Railway feeder (Solar trac)				4.87	1.20
23	Banki	132/33	2	20	40	5.95	1.20
24	Barbil	132/33	2	12.5	25	7.44	2.90
		traction				2.40	7.55
25	Baragarh	132/33	3	40	120	37.14	20.22
26	Baripada	132/33	3	40	120	32.73	12.00
27	Barpalli	132/33	1	20	60	21.62	7.60
			1	40			
28	Berhampore	132/33	2	40	100	20.35	14.67
			1	20			
29	Basta	132/33	1	12.5	32.5	7.24	2.95
			1	20			
30	Bhanjanagar	132/33	2	40	96	8.23	5.46
			1	16			
31	Bhawanipatna	132/33	2	12.5	25	6.66	2.59
32	Bhubaneswar (BBSR)	132/33	3	63	189	50.59	21.86
33	Boinda	132/33	1	20	45	11.31	3.75
			2	12.5			
34	Boudh	132/33	1	20	20	0.75	0.08
35	Bolangir	132/33	2	40	92.5	24.19	6.82
			1	12.5			
36	Brajrajnagar	132/33	1	40	100	20.43	5.65
			3	20			
		132/11	1	12.5	12.5	2.13	1.68
37	Chainpal	132/33	2	40	100	21.87	7.25
			1	20			
38	Chandikhole	132/33	3	20	60	14.28	6.20
39	Chhandpur	132/33	2	12.5	25	2.98	2.40
40	Chhatrapur	132/33	3	20	60	11.58	8.38
		Railway Traction Feeder (Ramba trac)				1.89	2.57
41	Chhend	132/33	3	40	120	41.86	9.42
		Railway Traction Feeder (Naugaon trac.)				0.07	4.27
42	Choudwar	132/33	1	20	100	26.98	9.07
			2	40			
		Railway Traction Feeder (Kendpur				7.30	1.70

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
		trac.)					
43	Cuttack	132/33	3	40	120	10.12	5.57
44	Dabugaon	132/33	2	12.5	25	4.80	0.35
45	Dhenkanal	132/33	3	40	120	21.31	7.28
		traction (JorndaTr)				4.71	3.51
46	Digapahandi	132/33	2	20	52.5	7.02	6.07
			1	12.5			
47	Ganjam	132/33	2	12.5	25	7.43	2.53
48	Ganjam	132				7.43	2.53
49	Jagatsinghpur	132/33	2	20	80	9.89	3.56
			1	40			
		Railway Traction Feeder (Goreknath Trac.)				4.75	0.85
50	Jajpur road	132/33	2	40	100	21.39	10.00
			1	20			
51	Jajpur town	132/33	2	40	100	17.85	5.37
			1	20			
52	Jaleswar	132/33	2	31.5	75.5	10.91	8.61
			1	12.5			
		Railway Traction Feeder				9.53	1.08
53	Jharsuguda	132/33	1	40	40	7.74	2.80
		132/11	1	20	20	0.00	0.00
			1	12.5	12.5		
		Railway Traction Feeder				10.40	3.20
54	Junagarh	132/33	3	20	60	18.44	2.58
55	Kalarangi	132/33	2	12.5	45	9.63	4.52
			1	20			
56	Kalunga	132/33	2	40	80	7.87	2.60
57	Kamakshyanagar	132/33	1	20	45	10.61	2.44
			2	12.5			
58	Karanjia	132/33	2	12.5	45	13.89	4.46
			1	20			
59	Kendrapara	132/33	2	40	92.5	8.75	3.28
			1	12.5			
60	Kesinga	132/33	1	40	80	27.77	5.90
			2	20			
61	Kesura/Badagada	132/33	1	63	103	7.34	2.43
			1	40			
62	Khariar	132/33	2	40	80	21.13	4.62
63	Khurda	132/33	3	40	120	24.01	3.49
		Railway Traction Feeder (Kaipad trac)				2.94	-3.70

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
64	Konark	132/33	2	20	40	3.77	0.40
65	Kuchinda	132/33	2	20	40	10.95	3.14
66	Lapanaga	132/33	1	20	20	0.20	0.00
67	Mancheswar	132/33	3	63	189		
68	Mania	132/33	1	12.5	12.5	0.00	0.00
69	Marshaghai	132/33	2	20	40	3.96	1.52
70	Mohana	132/33	2	12.5	25	4.60	0.31
71	Nimapara	132/33	2	40	92.5	14.08	4.60
			1	12.5			
72	Nuapara	132/33	2	20	40	14.82	5.75
73	Nuapatna	132/33	1	40	72.5	14.49	0.47
			1	20			
			1	12.5			
74	Padampur	132/33	1	20	20	7.32	0.79
75	Parlakhemundi	132/33	3	12.5	37.5	8.23	4.47
76	Patnagarh	132/33	1	40	80	12.51	2.40
			2	20			
77	Pattamundai	132/33	2	20	52.5	8.66	3.45
			1	12.5			
78	Phulbani	132/33	2	12.5	65	20.45	4.05
			1	40			
79	Phulnakhara	132/33	2	20	40	7.85	3.79
80	Polasapanga	132/33	1	40	80	24.25	4.39
			2	20			
81	Polasapanga					9.35	0.35
82	Puri	132/33	3	40	120	12.71	3.52
83	Purusottampur	132/33	2	12.5	25	10.35	3.33
84	Rairakhole	132/33	2	12.5	25	6.93	1.38
85	Rairangpur	132/33	2	20	52.5	9.18	5.71
			1	12.5			
86	Rajgangpur	132/33	3	40	120	29.36	0.61
87		Railway Traction Feeder				12.24	8.73
88	Ranasinghpur	132/33	2	63	166	16.46	12.80
			1	40			
89	Rayagada	132/33	2	12.5	25	6.45	2.30
90	Rourkela	132/33	4	35	140	52.97	17.55
		132/25 Railway Tr	1			3.30	-0.57
91	Saintala	132/33	1	10	22.5	1.20	0.11
			1	12.5			
		Railway Traction					
92	Salipur	132/33	2	20	52.5	8.53	6.15

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
			1	12.5			
93	Sambalpur	132/33	2	31.5	103	29.86	13.50
			1	40			
94	Shamuka	132/33	2	31.5	63	9.52	1.00
95	Sijua	132/33	3				
96	Somnathpur	132/33	1	12.5	12.5	5.29	1.75
97	Sonepur	132/33	3	20	60	25.08	7.51
98	Soro	132/33	1	40	80	8.89	7.43
			2	20			
99	Sunabeda	132/33	3	12.5	37.5	18.52	4.16
100	Sundargarh	132/33	1	40	60	18.35	3.24
			1	20			
101	Tentulikhunti	132/33	1	20	32.5	13.79	2.90
			1	12.5			
102	Tarkera	132/33	1	12.5	40	0.00	0.00
103	Umerkote	132/33	2	20	40	7.04	-0.80
104	Bolani	132/11	2	10	20	**2.44**	**1.07**
105	REN	220/33	2	20	40	0.76	0.31
106	Laksmi	220/33	1	20	20	5.81	0.75
107	Katpali	132/33	2	20	60	15.97	5.29
		132/33	1	40			
108	Bolangir_New	132/33	1	12.5	12.5	2.38	0.16
109	Rengli	132/33	2	20	40	8.23	2.10
110	Smangara	132/33	2	20	40	0.33	0.44
111	Rajgangpur	132/33	3	40	120	0.74	0.05
Traction Load							
112	BhultaTraction	132				5.48	1.80
113	Meramandali Trac	132				7.40	1.90
114	Jakhpur Traction (Dubri)	132				16.00	8.00
115	Dharma Traction	132				2.60	1.01
116	Tomka Traction	132				0.00	0.00
117	Padwa Traction	132				5.00	1.64
118	Manbar Traction	132				5.00	1.64
119	Maling Traction	132				5.00	1.64
120	Keonjhar Traction	132				4.10	-2.60
121	Bamra Traction	132				0.00	0.00
Bulk Load							
122	IMFA	132				43.64	10.89
123	Damanjod	132				43.41	-30.10
124	IRE	132				6.05	1.83

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
125	FCI	132				0.40	0.19
126	Baminpl	132				9.92	0.50
127	Balasore Alloy	132				58.80	2.85
128	BirlaTyr	132				0.71	0.30
129	PPL	132				6.14	0.59
130	L&T Cem co	132				1.79	0.50
131	Power Max	132				0.69	0.23
132	MCL	132				9.92	1.00
133	Chandiposh	220				5.95	0.16
134	J K Paper	132				0.02	0.65
135	FAP-Joda	132				15.94	1.13
136	HAL	132				3.42	0.57
137	BRG	132				12.50	5.60
138	M L Rungta	132				0.01	0.30
139	PPT	132				6.88	2.72
140	RAW MET	132				11.09	-4.44
141	Hind Metalic	132				0.00	0.00
142	MESCO	132				3.56	1.18
143	ROHIT	220				30.75	2.00
144	Adhunik	132				19.27	6.39
145	Dahmra Prt	132				2.94	0.69
146	OCL_TA	132				7.78	2.58
147	Saliban (Bhuvi Profile)	132				1.49	0.50
148	ESSAR	220				5.98	3.13
149	IOCL	220				0.51	0.48
150	Jabamaye Fe	132				2.63	0.87
151	Beekay Steels	132				7.78	2.58
152	Arya	132				6.48	2.15
153	Bansapani	132				2.26	0.93
154	BC-monty	132				9.92	0.50
155	Saintla	132				0.00	0.00
156	Tata Steel	220				134.89	10.00
157	BRPL	132				7.35	2.44
158	MSL	132				3.23	0.83
159	VVC	132				0.00	0.00
160	JSPL	220				50.59	16.76
161	Greed Steel	132				0.00	0.00
162	BRP-St	132				3.47	1.15
163	Basundra	220				0.99	-5.00
164	Utkal Aluminum	220				0.00	0.00
165	Adity Aluminum	220				0.00	0.00
166	Salibani	132				16.57	2.93

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
167	SPS	220				0.99	-1.00
168	Nandira	132				16.07	1.80
169	Sterling	400				0.00	0.00
170	Chiplma	132				19.00	6.30
171	Remja Load (Budhipadar)	132				21.82	6.00
172	Joda-SMPL (Joda)	132				0.31	0.20
173	CTC-Feeder (BBSR)	132				20.83	9.18
Sikkim							
1	Phodong	66/11	1	5	5	0.90	0.23
			1	2.5	2.5		
2	Bulbuley	66/11	2	10	20	3.15	0.79
3	Sichey	66/11	2	10	20	5.40	1.35
			1	5	5		
4	Tadong	66/11	3	5	15	3.15	0.79
5	Rongly	66/11	2	2.5	5	0.67	0.17
6	Mamring	66/11	1	10	10	4.27	1.09
			1	7.5	7.5		
			1	15	15		
7	Melli	66/11	2	5	10	1.35	0.35
8	Namchi	66/11	2	2.5	5	0.67	0.17
9	Rabangla	66/11	1	5	5	1.35	0.35
10	Rothak	66/11	2	2.5	5	0.67	0.17
11	Soreng	66/11	2	2.5	5	0.67	0.17
12	Geyzing	66/11	2	2.5	5	0.67	0.17
13	Purano Namchi	66/11	2	7.5	15	1.80	0.46
14	Pakyong	66/11	1	10	10	3.15	0.79
15	Pelling	66/11	1	5	5	1.35	0.35
16	Rhenock	66/11	1	5	5	1.35	0.35
17	Mangan	66/11	2	5	10	1.80	0.46
18	Ranipool	66/11	2	7.5	15	1.80	0.46
19	Topakhani	66/11	1	7.5	7.5	1.80	0.46
		66/11	1	5	5		
Westbengal							
1	Arambagh	132/33	3	50	150	30.69	10.17
2	Bakreswar	220/33	1	50	50	11.42	3.45
3	Asansol	132/33	3	50	150	39.92	17.22
4	New Bishnupur	132/33	2	31.5	63	12.84	5.18
5	Dalkhola	132/33	3	20	60	13.65	4.36
6	Dharampur	132/33	2	50	100	24.20	6.41

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
7	Domjur	132/33	3	50	150	50.63	10.92
8	Gokarna	132/33	3	50	150	38.55	12.78
9	Howrah	132/25	2	20	40	1.20	0.35
10	Krishnagar	132/33	2	50	100	34.62	11.47
			1	31.5	31.5		
11	Laxmikantpur	132/33	1	31.5	81.5	27.96	9.27
			1	50			
	Laxmikantpur Railway	132/25	2	12.5	25	1.66	0.55
12	New Haldia	132/33	1	31.5	31.5	16.77	5.56
		132/33	1	50	50		
13	New Jalpaiguri	132/33	2	50	100	26.41	8.76
14	New town action area-III	220/33	2	50	100	24.03	5.04
15	Rishra	132/33	3	50	150	41.94	13.90
16	Satgachia	132/33	2	50	131.5	30.45	10.10
			1	31.5			
		Railway					
17	Subhashgram	132/33	2	31.5	63	19.95	4.57
18	Hura	132/33	2	50	100	13.20	4.34
19	Foundry park	132/33	2	50	100	16.42	5.42
20	Midnapur	132/33	2	50	100	31.17	15.22
21	Kolkata leather complex (KLC)	132/33	3	50	150	39.92	18.34
22	Adisapthagram	132/33	2	50	131.5	33.43	4.64
			1	31.5			
		Railway	2	20	40	0.00	0.00
23	Alipurduar	132/66	2	16	52	11.64	3.86
			1	20			
		132/33	1	31.5	31.5	6.12	2.03
24	Amtala	132/33	1	31.5	31.5	23.61	7.83
			1	50	50		
25	Asoknagar	132/33	2	50	100	20.46	3.39
		132/25	2	7.5	15	1.00	0.33
26	Bagnan GIS	132/33	2	50	100	24.69	5.06
27	Bagmundi	132/33	1	20	20	3.56	8.11
28	Balurghat	132/33	4	12.5	50	11.30	5.52
29	Bankura	132/33	2	50	100	20.46	5.03
		Railway				3.90	2.20
30	Barasat	132/33	3	50	150	44.97	13.04
		Railway				2.00	0.97
31	Behala/ joka	132/33	3	50	150	34.57	10.16
32	Basirhat	132/33	2	50	100	22.84	2.30
33	Belmuri	132/33	2	31.5	63	14.27	1.58

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
34	Berhampore	132/33	3	50	150	39.68	10.84
35	Bighati	132/33	2	50	100	21.18	6.70
36	Birsingha	132/33	2	50	100	21.71	4.35
37	Bishnupur (old)	132/33	1	50	50	19.15	3.93
		132/33	1	31.5	31.5		
38	Bolpur	132/33	3	50	150	36.64	15.54
39	Bolpur Prantik TSS	132/25				1.50	2.70
	Bongaon	132/33	3	31.5	94.5	16.74	5.55
40	Barjora	132/33	2	31.5	63	14.63	3.40
41	Chanditala	132/33	2	50	100	23.17	1.55
42	Chandrakora road	132/33	1	50	81.5	23.08	5.77
			1	31.5			
		Railway				2.00	2.00
43	Contai	132/33	2	50	100	23.13	5.66
		Railway				0.00	0.00
44	Coochbehar	132/33	3	50	150	32.97	10.93
45	Darjeeling	132/33	3	10	30	4.53	0.87
46	Debogram	132/33	1	20	101.5	19.08	5.74
			1	31.5			
			1	50			
		Railway				0.07	-2.00
47	Dhulian	132/33	2	31.5	63	10.94	3.65
48	Egra	132/33	3	50	150	30.69	12.48
49	Falta	132/33	2	31.5	63	29.02	9.61
			1	50	50		
50	Gangarampur	132/33	3	20	72.5	17.87	7.61
			1	12.5			
51	Haldia	132/33	1	50	81.5	19.87	6.57
			1	31.5			
		132/25	1	10	22.5	2.40	0.79
			1	12.5			
52	Haldia NIZ	132/33	2	31.5	63	8.68	2.86
53	Hizli	132/33	1	31.5	81.5	22.60	5.01
			1	50			
		132/25	2	10	20	10.76	3.53
54	Jangipara	132/33	2	31.5	63	14.51	4.80
55	Jhargram	132/33	1	31.5	31.5	21.86	5.29
			1	50	50		
56	Kurseong	132/33	3	10	30	5.54	1.62
57	Kakdwip	132/33	2	31.5	63	16.41	1.86
58	Kalan	132/33	2	31.5	63	16.53	5.56
59	Kalyani	132/33	1	31.5	81.5	21.39	7.79

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
			1	50			
60	Khatra	132/33	2	50	100	18.02	1.63
61	Katwa	132/33	2	31.5	63	86.05	23.57
			1	50	50		
		Railway				0.52	0.23
62	Khanyan	132/33	2	31.5	63	12.41	5.03
63	Kharagpur	132/33	2	31.5	63		
64	Khejuria GIS	132/33	2	50	100		
65	Kolaghat	132/33	3	50	150	25.34	8.40
		132/25	2	12.5	25	3.00	6.00
66	Lalgola	132/33	2	31.5	63	12.25	8.23
67	Lilooah	132/33	3	50	150	37.17	12.32
		132/25	2	20	40	10.50	3.45
68	Mahachanda	132/33	2	31.5	63	31.40	10.29
			1	50	50		
69	Mathabhanga	132/33	1	50	50	15.52	3.28
			1	31.5	31.5		
70	Malda	132/33	3	50	150	38.43	16.75
71	Mahishpota	132/33	2	31.5	63		
72	Mankar	132/33	3	31.5	94.5	32.64	7.50
73	Maynaguri	132/33	1	31.5	141.5	29.98	9.94
			1	50			
			2	30			
74	Nazirpur	132/33	2	31.5	63	12.43	4.69
75	North Bengal university (NBU)	132/33	2	31.5	113	26.05	5.22
			1	50			
76	New town AA 1	132/33	2	50	100	20.94	4.02
77	Pingla	132/33	3	50	150	33.64	11.14
78	Purulia(WB)	132/33	2	31.5	83	25.56	8.46
			1	20			
		132/25	2	12.5	25	3.00	0.99
79	Raghunathganj	132/33	1	31.5	101.5	29.55	10.57
			1	20			
			1	50			
80	Raghunathpur	132/33	2	31.5	63	11.33	2.09
81	Raigunj	132/33	1	31.5	96.5	22.46	7.44
			2	20			
			2	12.5			
82	Raina	132/33	2	50	100	41.41	3.38
83	Rampurhat	132/33	2	50	100	29.98	9.94
84	Rampurhat Railway	132				4.10	8.70
85	Ranaghat	132/33	2	50	100	23.20	6.36

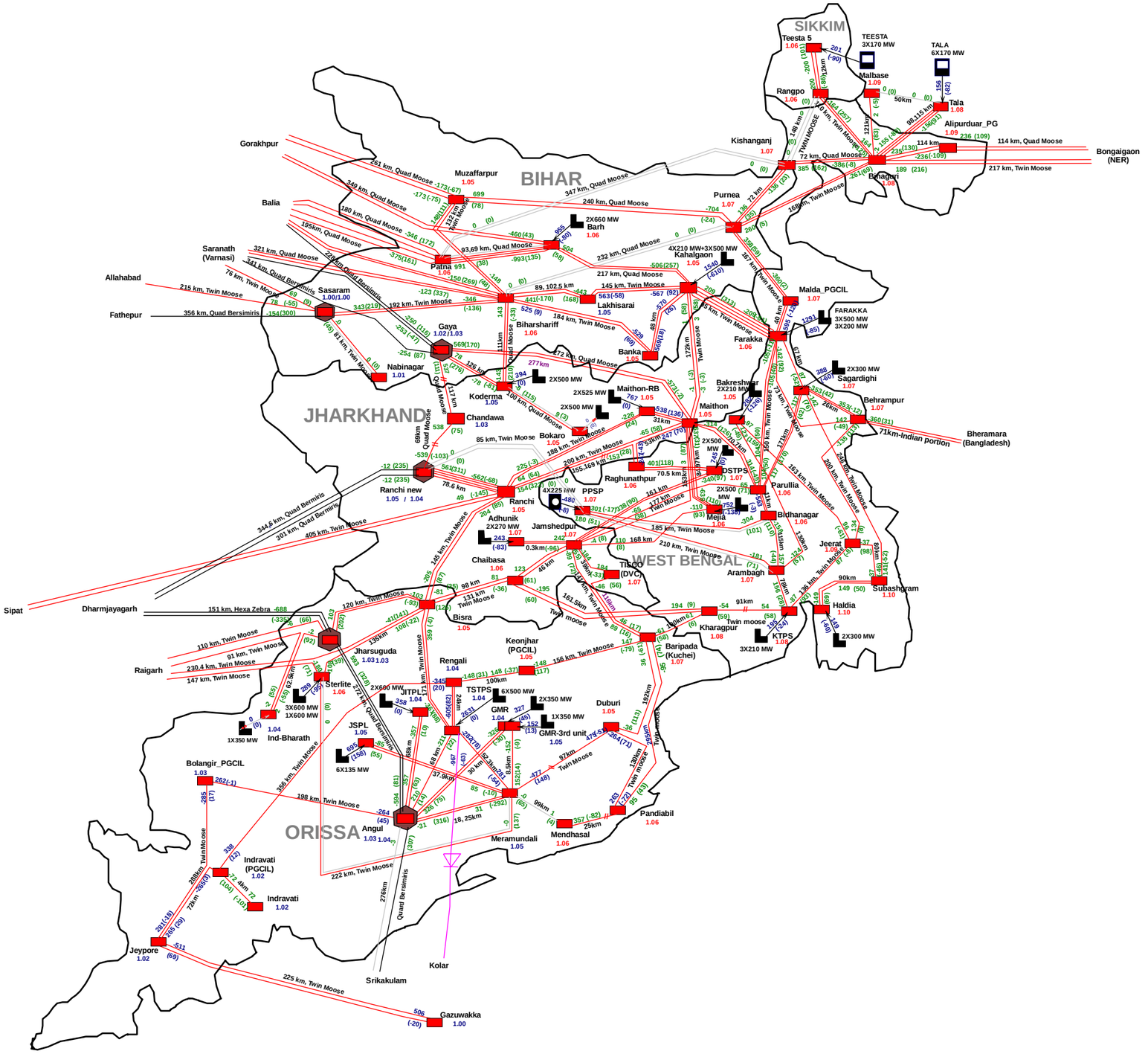
Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
		132/66	2	31.5	63	8.92	1.74
		132/25	1	12.5	22.5	0.00	0.00
			1	10			
86	Sainthia	132/33	2	50	100	28.44	9.42
87	Salt lake	132/33	3	50	150	51.51	17.07
88	Salt lake GIS	132/33	2	50	100	25.48	9.63
89	Samsi	132/33	3	31.5	94.5	19.86	8.77
90	Siliguri	132/33	2	50	100	22.84	7.57
91	Sonarpur	132/33	3	31.5	94.5	21.11	7.00
		132/25	2	20	40	1.80	0.59
92	Tamluk	132/33	2	50	100	20.84	5.18
93	Tarakeswar	132/33	1	31.5	81.5	14.62	4.85
			1	50			
94	Titagarh	132/33	3	50	150	36.42	8.94
	Titagarh-Railway	132/25	2	20	40	1.19	0.29
95	Ujaano (NBU-New)	132/33	2	31.5	63	11.18	3.71
96	Ukhra	132/33	2	50	100	28.79	3.77
97	Uluberia	132/33	3	50	150	42.00	8.86
98	Kuli	132/33	2	50	100	20.46	7.18
99	Food Park	132/33	2	50	100	14.87	4.93
100	Birpara	132/66	3	20	60	13.59	6.64
101	Chalsa	132/66	1	20	30	5.47	1.22
			1	10			
	Chalsa	132/33	2	20	40	5.42	0.47
102	Serakol	132/33	2	50	100	18.13	2.54
103	Cossipur traction	132				0.00	0.20
104	Balichak	132				9.75	3.20
105	Dhatrigram Traction	132				4.00	2.00
106	Kalingpong	66/33				2.26	0.30
107	WBIDC	132/33	2	31.5	63	16.05	3.15
108	KhjrGIS3	132/33	2	50	100	16.65	4.93
109	Vidyasagar Park	220/33	2	50	100	0.00	0.00
110	Bajkul	132/33	2	50	100	0.25	0.08
West Bengal Bulk Load							
111	Resmi Bulk					11.70	3.87
112	Tata Metalic					11.70	3.87
113	SonarLal					10.01	1.32
114	HNIZ					36.98	3.29
115	Ambuja Frakka					39.15	12.97
116	Dankuni					7.83	2.60
117	HPCL					9.06	3.00
118	Madras Cement					4.35	1.10

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
119	Rohit Ferro1					0.00	0.00
120	Manaksia					1.09	1.10
121	Bencon					1.52	0.99
122	Rohit Ferro					0.00	0.00
123	Modern					12.07	0.87
124	BEL					14.68	7.17
125	OCL Midnapore					9.35	5.92
126	Emami Cement					0.28	0.30
127	Jayshree (from Liluahh WB)					6.53	2.16
128	BRG Steeel					1.31	0.88
IPCL							
129	JK Nagar	220/33	2	100	200	45.00	9.14
DPL substations in West Bengal							
1	A Zone	132/11	1	20	20	5.69	2.19
		132/11	2	31.5	63		
		132/33	1	50	50	4.60	1.45
2	B Zone	132/11	6	31.5	189	45.46	14.94
		132/33	1	50	50	0.00	0.00
3	AB Zone	132/33	1	50	50	4.20	0.70
4	C Zone	132/11	3	31.5	94.5	16.46	5.23
		132/33	1	50	50	12.90	4.24
5	C1 Zone	132/11	2	31.5	63	3.10	1.36
		132/33	2	50	100	8.20	4.00
6	Bamunara SS	132/34	2	50	100	19.70	1.40
7	Shayam Stl (DPL-C)	132				11.80	3.88
8	PCBL (DPL-AB)	132				18.61	7.10
9	Shayam Ferro (DPL-C1)	132				30.70	10.10
West Bengal DVC substations							
1	Burnpur	220/33	2	50	100	7.09	2.24
2	Purulia	132/33	1	50	50	17.04	2.01
3	ASP	132	4	50	200	38.15	34.50
4	Jamuria	132/33	2	50	100	64.95	4.00
5	Kalipahari	132/33	2	80	160	30.81	8.22
6	Kalyaneswari	132/33				62.24	14.57
7	Mejia TPS	220/33	2	80	160	39.77	7.75
8	Barjora	220/33	1	100	100	93.76	0.88
		220/33	1	80	80		

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
		220/33	1	50	50		
9	Durgapur	220/33	1	50	50	82.36	10.50
		220/33	2	80	160		
10	DTPS Waria	132/33				26.49	4.28
11	DTPS Waria-Railway	132/25				8.32	2.62
12	Belmuri	132/33				0.52	1.69
13	Belmuri Railway	132/25				21.36	7.12
14	Burdwan	132/33				43.79	7.00
15	Burdwan Railway	132/25				1.04	5.00
16	Rumkanali Traction	132/25				7.82	2.15
17	Tamla traction	220				53.17	21.00
18	IISCOD	220				110.72	4.40
19	Sonic thermal	132				51.71	1.57
20	Badrinarayan Alloy	132				8.60	2.70
21	Parulia	220/33				77.15	8.00
22	Howrah	132/33				2.09	0.66
23	KGP Traction	132/25				0.06	0.20
CESC							
1	EMSS	220/132 /33	5	160	800	0.00	0.00
						25.96	8.54
						0.00	0.00
						4.96	1.62
						24.96	8.21
2	Belur	132/33	3	50	150	45.39	1.44
						0.00	0.00
3	BT Road	132/33	2	75	150	11.23	3.78
						10.93	3.68
4	B.Garden	132/33	2	50	100	31.83	3.29
5	Titagarh (TRS)	132/33	5	50	250	0.00	0.00
						49.40	0.40
						50.40	0.91
6	Dum Dum	132/33	2	75	150	13.21	3.24
7	Park lane	132/33	2	75	150	6.95	1.42
						10.55	3.52
8	Jadavpore	132/33	2	50	100	22.42	7.79
			1	55	55	10.87	2.72
9	Chakmir	132/33	2	55	110	22.68	3.67
10	Majerhat	132/33	2	75	150	29.96	9.44

Sl.No	Name of the Sub-Station	Voltage level (kV)	Substation details			33KV lump load	
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	MW	MVAr
11	BBD Bag	132/33	1	68	136	0.00	0.00
			1	68		9.45	1.07
12	PRS	132/33	2	50	175	16.95	1.99
		132/33				0.00	0.00
		132/33	1	75		9.15	11.71
13	East Calcutta	132/33	2	50	100	10.42	3.65
						21.42	6.32
14	NCGS	132/33	2	50	100	28.06	9.22
			1	75	75	9.80	17.71
			2	50			
15	SRS	132/33	2	55	110	37.74	2.04
						24.58	2.56
			1	75	75		
16	Patuli	132/33	2	75	150	13.02	2.17
17	WBRS	132/33	2	75	150	0.00	0.00
18	Park Circus	132/33	1	75	75	6.13	1.25

ANNEXURE II – POWER MAP OF ER GRID AND ITS CONSTITUENTS STATES AND LINE LOADING DETAILS



LEGEND	Existing
765 kV S/S	
400 kV S/S	
765 kV line	
400 kV line	
Thermal generation	
Hydro generation	
Pumped storage plant	

Display Notation
Injection into the bus : +ve
Drawl away from the bus : -ve
Voltage Mag/(Ang) in pu /degree
Flows in MW and (Mvar)

APPROVED	REVIEWED	CHECKED	DRAWN	DESCRIPTION	REV	DATE	REMARKS
					R0	20/12/2016	

Eastern Region existing network (December-16) geographical map

Eastern Regional Power Committee
14, Golf Club Road, Tollygunge,
Kolkata, West Bengal 700033

LOA details: ERPC/PR_DBASE/2016/3567 Dated 30 March 2016

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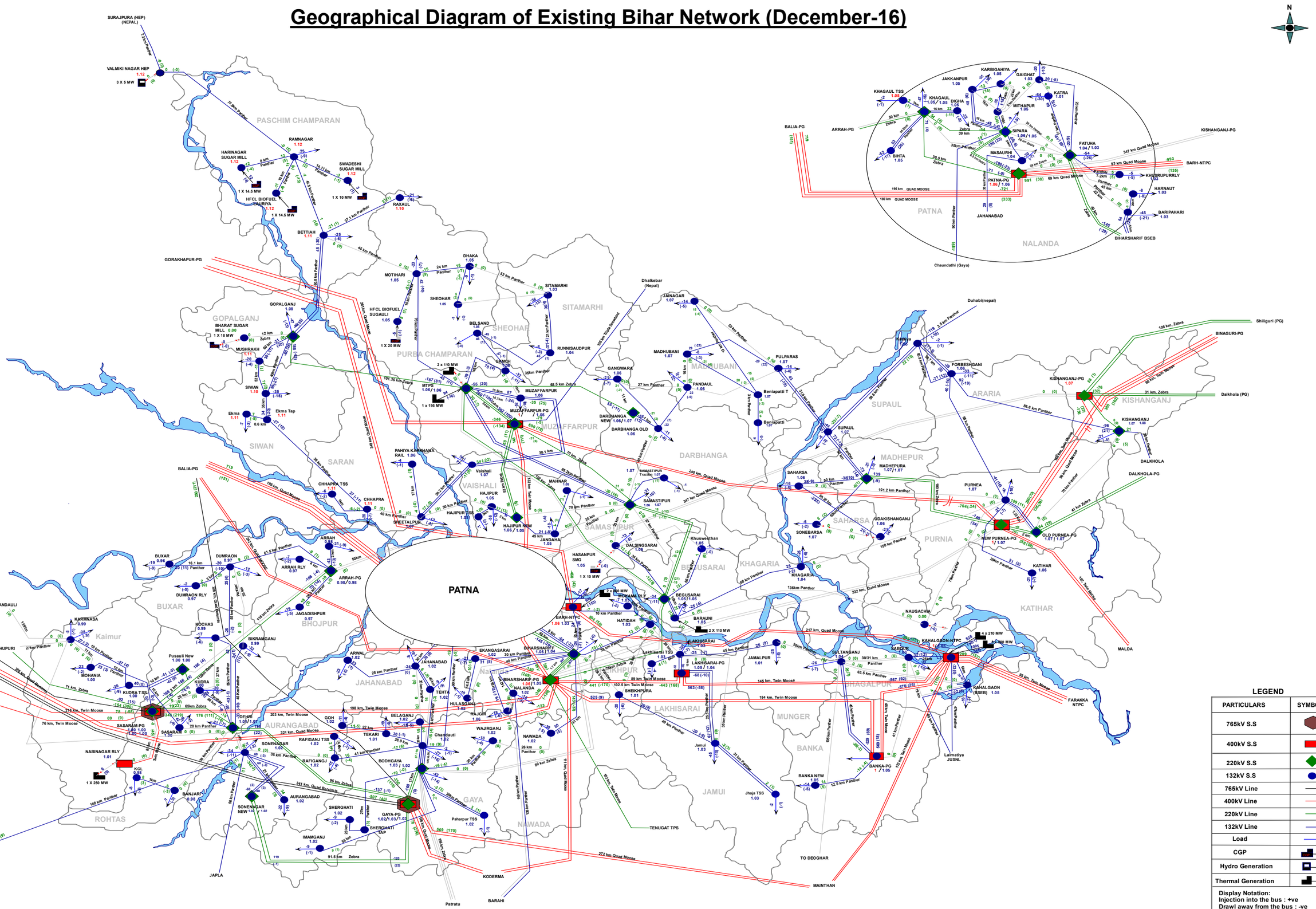
DRAWN USING : MiP-PSCT™

DWG. NO. : Geographical Power Map\December-2016\ER

Geographical Diagram of Existing Bihar Network (December-16)



LEGEND

PARTICULARS	SYMBOL
765kV S.S	
400kV S.S	
220kV S.S	
132kV S.S	
765kV Line	
400kV Line	
220kV Line	
132kV Line	
Load	
CGP	
Hydro Generation	
Thermal Generation	

Display Notation:
Injection into the bus : +ve
Drawl away from the bus : -ve
Voltage Mag in PU
Flows in MW and (MVAr)

APPROVED	REVIEWED	CHECKED	DRAWN	DESCRIPTION	REV	DATE	REMARKS
					R0	20/12/2016	

Bihar state existing network (December-16) geographical map

Eastern Regional Power Committee
14 Golf Club Road, Tollygunge,
Kolkata, West Bengal 700033

LOA details: ERPC/PR_DBASE/2016/3567 Dated 30 March 2016

Power Research & Development Consultants Private Limited
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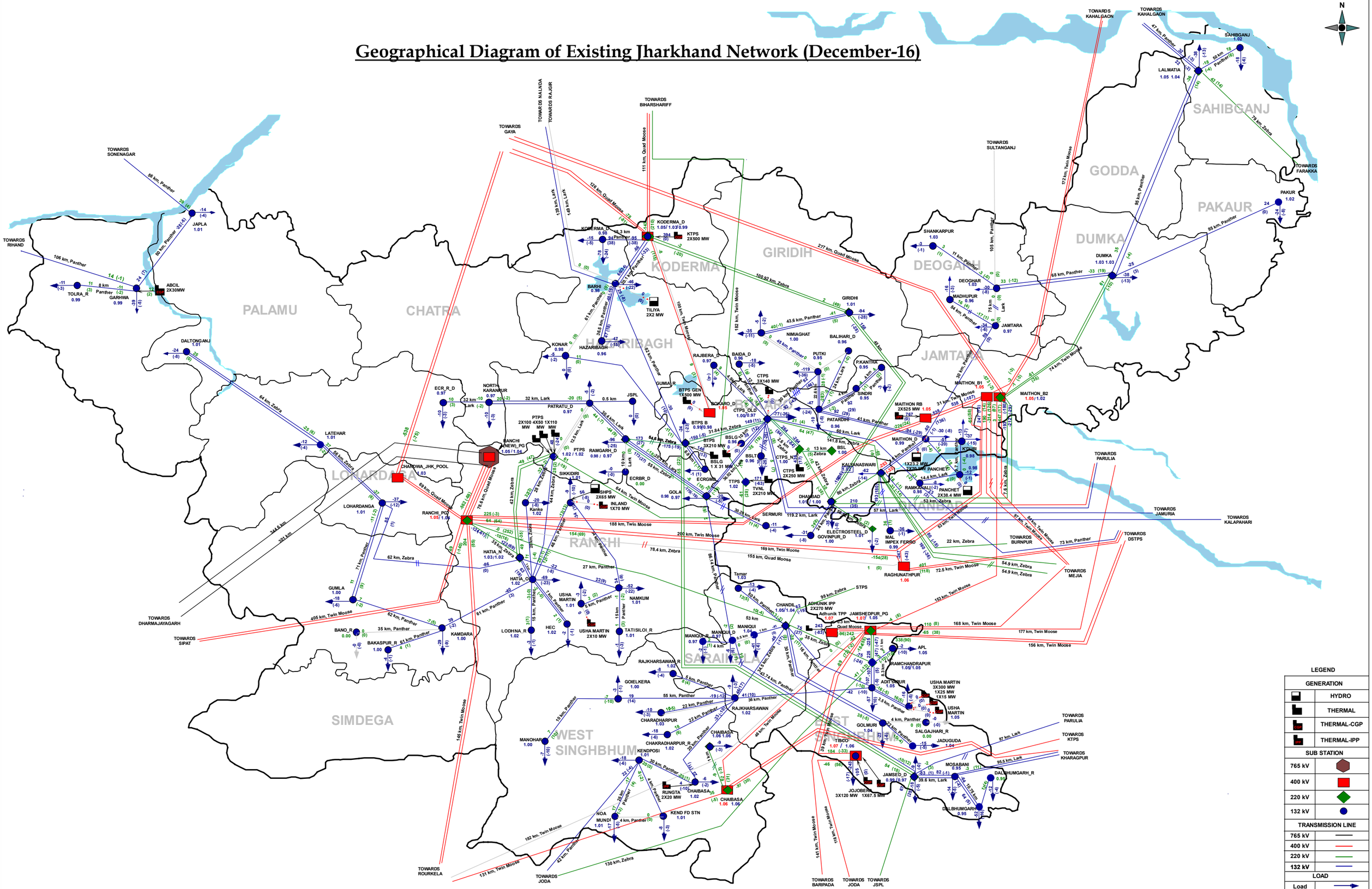
DRAWN IN : MiP-PSCT TM

DWG. NO. : Geographical Power Map\ER\December-16\Bihar

Geographical Diagram of Existing Jharkhand Network (December-16)



APPROVED	REVIEWED	CHECKED	DRAWN	DESCRIPTION	REVISION	DATE	REMARKS
					R0	20/12/2016	

Jharkhand state existing network (December-16) geographical map

Eastern Regional Power Committee
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LOA details: ERPC/PR_DBASE/2016/3567 Dated 30 March 2016

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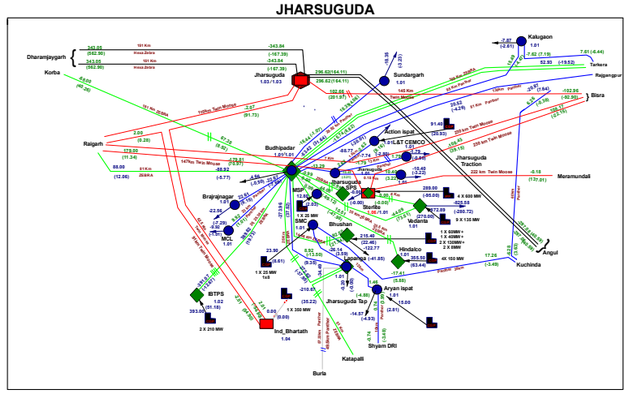
JHARKHAND

WEST BENGAL

JHARSUGUDA



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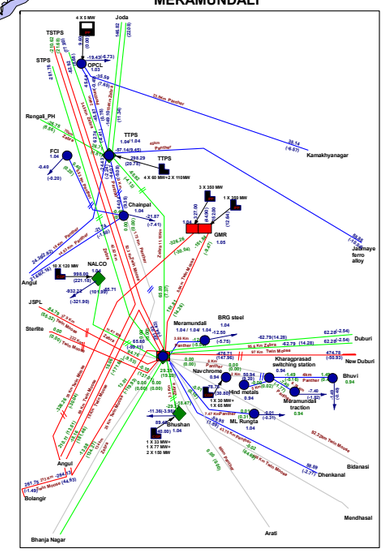

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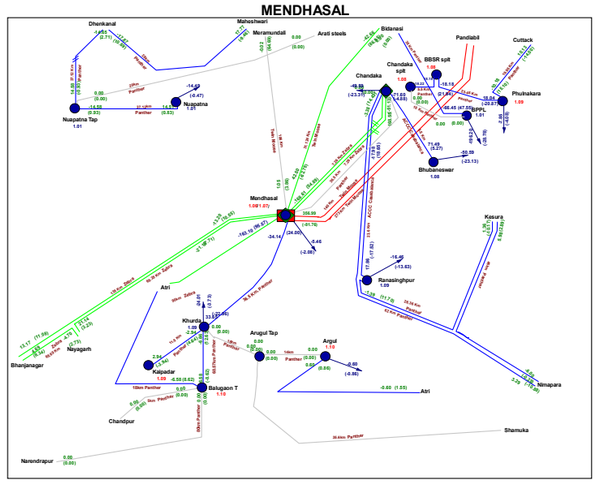

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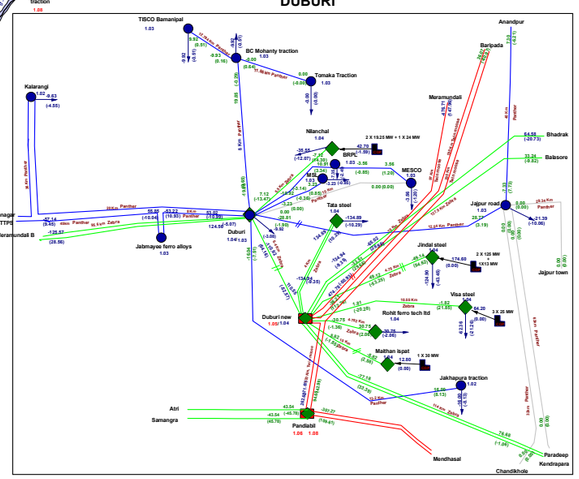

BAY OF BENGAL

LEGEND

GENERATION	
HYDRO	
HYDRO-IPP	
THERMAL	
THERMAL-IPP	
THERMAL-CGP	

SUB STATION	
765 kV	
400 kV	
220 kV	
132 kV	

TRANSMISSION LINE	
HVDC	
765 kV	
400 kV	
220 kV	
132 kV	

APPROVED	REVIEWED	CHECKED	DRAWN	DESCRIPTION	REVISION	DATE	REMARKS
					R0	20.12.2016	

Orissa state existing network (December-16) geographical map

Eastern Regional Power Committee
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Kolkata, West Bengal 700033

LOA details: ERPC/PR_DBASE/2016/3567 Dated 30 March 2016

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DRAWN IN : MiP-PSCT™

DWG. NO. : Geographical Power Map\ER\December-2016\Odisha

Geographical Diagram of Existing Sikkim Network (DECEMBER-16)

LEGEND	
PARTICULARS	SYMBOL
400 kV SS	
220 kV SS	
132 kV SS	
66 kV SS	
400 kV Line	
220 kV Line	
132 kV Line	
66 kV Line	
Load	
Hydro Generation	
IPP Hydro Generation	IPP

					R0	20/12/2016	
APPROVED	REVIEWED	CHECKED	DRAWN	DESCRIPTION	REV.	DATE	REMARKS

Sikkim state existing network (December-16) geographical map.

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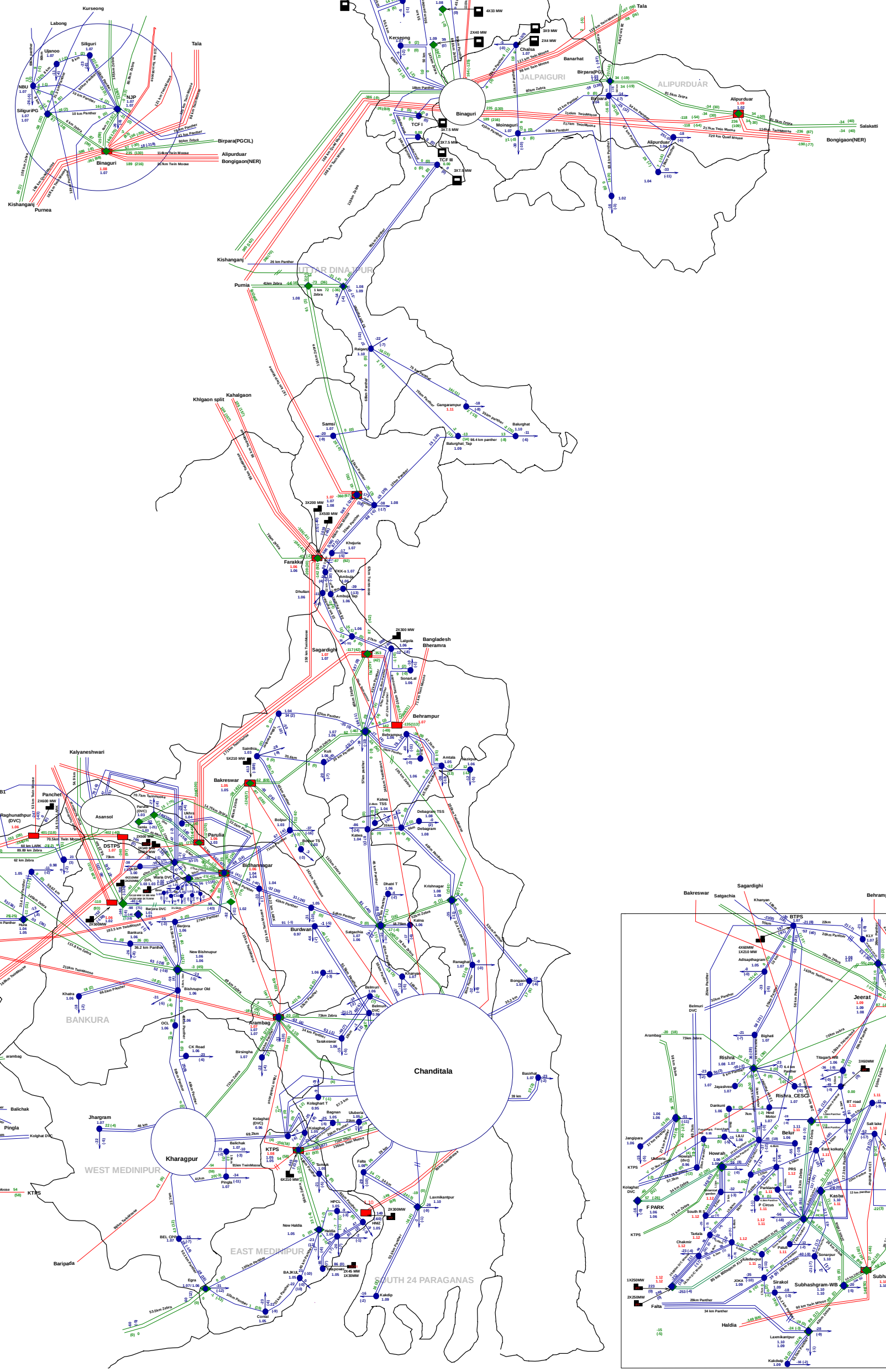
DRAWN IN : MiP-PSCT TM

DWG. NO. : Geographical Power Map\ER\December-2016\Sikkim

Geographical Diagram of Exsisting West Bengal Network (December-2016)



ZZGP0	
400 kV S.S	
220 kV S.S	
132 kV S.S	
400 kV Line	
220 kV Line	
132 kV Line	
Load	
Thermal Generation	
Hydro Generation	
IPP	
CGP	

Display Notation:
Injection into the bus : +ve
Drawl away from the bus : -ve
Voltage Mag(Ang) in Pu / degree
Flows in MW and (Mvar)

APPROVED	REVIEWED	CHECKED	DRAWN	DESCRIPTION	REV.	DATE	REMARKS
						20.12.2016	

West Bengal state existing network geographical map (December-16)

Eastern Regional Power Committee
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LOA details: ERPC/PR_DBASE/2016/3567 Dated 30 March 2016

MiP-PSCT ™ | DWG. NO. : Geographical Power Map\ER\December-2016\West Bengal

Table G: 765 kV, 400 kV, 220 kV, 132 kV and 66 kV line flow (simulated result) of Eastern region grid

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
765 kV							
1	1	Fathepur	Sasaram	-154.0	-515.1	14.1	**PGCIL**
2	1	Balia	Gaya	-250.0	-211.2	8.2	
3	1	Gaya	Varanasi	-252.9	-113.5	8	
4	1	Gaya	Varanasi	252.8	47.0	17.2	
400 kV							
1	1	Varanasi	Biharshariff	-61.5	-2.3	11.1	**PGCIL**
2	1	Varanasi	Biharshariff	-61.5	-16.2	8.3	
3	1	Banka	Biharshariff	264.5	-34.3	29.1	
4	1	Banka	Biharshariff	264.5	-34.3	29.1	
5	1	Biharshariff	Muzaffarpur	73.9	-24.2	10.1	
6	1	Biharshariff	Muzaffarpur	73.9	-24.2	10.1	
7	1	Biharshariff	Purnea	LINE	IS	0	
8	1	Biharshariff	Purnea	LINE	IS	0	
9	1	Biharshariff	Lakhisarai	-236.2	91.8	27.5	
10	1	Biharshariff	Lakhisarai	-236.2	91.8	27.5	
11	1	Biharshariff	Balia	75.1	-134.6	8.3	
12	1	Balia	Biharshariff	-75.0	-11.1	8.3	
13	1	Sasaram	Biharshariff	-176.3	-111.3	23.8	
14	1	Sasaram	Biharshariff	-176.3	-111.3	23.8	
15	1	Barh	Kahalgaon	-252.0	-28.8	15.4	
16	1	Barh	Kahalgaon	-252.0	-28.8	15.4	
17	1	Kahalgaon	Banka	285.2	-13.2	31	
18	1	Kahalgaon	Banka	285.2	-13.2	31	
19	1	Farraka	Kahalgaon	52.4	20.4	10.2	
20	1	Farraka	Kahalgaon	52.4	20.4	10.2	
21	1	Farraka	Kahalgaon	52.1	20.3	10.2	
22	1	Farraka	Kahalgaon	52.1	20.3	10.2	
23	1	Lakhisarai	Kahalgaon	-281.3	29.0	31.2	
24	1	Lakhisarai	Kahalgaon	-281.3	29.0	31.2	
25	2	Patna	Kishanganj	LINE	IS	0	
26	2	Patna	Kishanganj	LINE	IS	0	
27	1	Patna	Barh	-295.9	-18.3	16.1	
28	1	Patna	Barh	-295.9	-18.3	16.1	
29	1	Patna	Barh	-295.9	-18.3	16.1	
30	1	Patna	Barh	-295.9	-18.3	16.1	
31	1	Balia	Patna	-172.6	-15.9	10.4	
32	1	Balia	Patna	-172.6	-15.9	10.4	
33	1	Balia	Patna	-172.6	-15.9	10.4	
34	1	Balia	Patna	-172.6	-15.9	10.4	
35	1	Balia2	Brshrf-I	-75.0	-11.1	8.3	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
36	1	Barh	Gorakhpur	229.9	-21.5	18	
37	1	Barh	Gorakhpur	229.9	-21.5	18	
38	1	Sarnath	Sasaram	69.0	-33.0	8.7	
39	1	NabinagarRly	Sasaram	LINE	IS	0	
40	1	NabinagarRly	Sasaram	LINE	IS	0	
41	1	Allhabad	Sasaram	78.0	-110.8	15.8	
42	1	Muzaffarpur	Gorakhpur	172.9	75.0	14.9	**Power link**
43	1	Muzaffarpur	Gorakhpur	172.9	67.1	14.9	
44	1	Muzaffarpur	Purnea	-349.7	-38.8	18.9	
45	1	Muzaffarpur	Purnea	-349.7	-38.8	18.9	
46	2	Kishanganj	Purnea	135.9	-23.0	7.5	
47	2	Kishanganj	Purnea	135.9	-23.0	7.5	**PGCIL**
48	1	Kishanganj	Binaguri	-192.7	-81.2	11.2	
49	1	Kishanganj	Binaguri	-192.7	-81.2	11.2	
50	1	Malda	Purnea	180.0	-0.9	19.5	
51	1	Malda	Purnea	180.0	-0.9	19.5	
52	1	Binaguri	Purnea	130.7	-34.4	14.4	
53	1	Binaguri	Purnea	130.7	-34.4	14.4	
54	1	Gaya	Mathn-I	-284.6	-85.2	16.5	
55	1	Gaya	Mathn-I	-284.6	-85.2	16.5	
56	1	Gaya	Koderma	-38.8	-138.0	8	
57	1	Gaya	Koderma	-38.8	-138.0	8	
220 kV line							
1	1	Bodhgaya	Biharshariff	LINE	IS	0.00	**BSPTCL**
2	1	Bodhgaya	Biharshariff	LINE	IS	0.00	
3	1	MTPS	Gopalganj	187.4	-81.4	45.20	
4	1	MTPS	Muzaffarpur	-180.1	52.5	83.50	**Power link**
5	1	MTPS	Muzaffarpur	-180.1	52.5	83.50	
6	1	Purnea	Madhepura	69.9	-16.9	31.50	**PGCIL**
7	1	Purnea	Madhepura	69.9	-16.9	31.50	
8	1	Biharshariff	Biharshariff	113.5	17.6	51.50	**BSPTCL**
9	1	Biharshariff	Biharshariff	113.5	17.6	51.50	
10	1	Biharshariff	Biharshariff	113.5	17.6	51.50	
11	1	Patna	Khagaul	70.7	0.4	31.40	**BSPHCL**
12	1	Pusauli new	Pusauli	-166.2	-4.0	77.90	**PGCIL**
13	1	Pusauli	Dehri	-18.6	-22.8	13.80	**BSPHCL & PG**
14	1	Arrah	Pusauli	-70.4	-14.2	34.30	**PGCIL**
15	1	Hajipur	Muzaffarpur	-29.2	-2.7	13.20	**BSPTCL**
16	1	Hajipur	Muzaffarpur	-29.2	-2.7	13.20	
17	1	MTPS	Darbhanga	55.1	-19.8	25.90	
18	1	Gaya	Dehri	68.3	0.4	31.80	**BSPHCL & PG**
19	1	Gaya	Dehri	68.3	0.4	31.80	
20	1	Gaya	Bodhgaya	83.8	0.0	38.30	
21	1	Gaya	Bodhgaya	83.8	0.0	38.30	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
22	1	Patna	Sipara	198.3	22.6	44.30	
23	1	Patna	Fatua	LINE	IS	0.00	
24	1	Sipara	Khagaul	54.0	-1.0	24.10	
25	1	Sipara	Fatua	LINE	IS	0.00	
26	1	Arraha	PusaliNew	LINE	IS	0.00	
27	1	Pusali	Sahupura	91.9	-14.7	43.60	
28	1	Samastipur	Begusarai	-18.2	11.6	12.3	
29	1	Samastipur	Begusarai	-18.2	11.6	12.3	
30	1	Begusarai	Purnea_BS	LINE	IS	0	
31	1	Begusarai	Purnea_BS	LINE	IS	0	
32	1	Gaya_PG	Sonenagar New	120.2	-22.7	28	
33	1	MTPS_Kanti	Samastipur	31.1	-6.2	14.1	
34	1	MTPS_Kanti	Samastipur	31.1	-6.2	14.1	
35	1	Biharsarif	TTPS	-108.5	26.3	24.2	
36	1	Arrah	Khagaul	LINE	IS	0	
37	1	Fatua	Biharsarif	-72.1	-18.8	33.7	
38	1	Fatua	Biharsarif	-72.1	-18.8	33.7	
39	1	Biharsarif	Begusarai	112.0	-30.9	52.1	
40	1	Arrah	Khagaul	LINE	IS	0	
41	1	Purnia_PG	Purnea_BS	22.9	-8.1	10.6	
42	1	Purnia_PG	Purnea_BS	22.9	-8.1	10.6	
43	1	Biharsarif	Begusarai	112.0	-30.9	52.1	
132 kV line							
1	1	Chandauti	Karamnasa	LINE	IS	0.00	**BSPHCL & UPPCL**
2	1	Bodhgaya	Wajirganj	15.9	3.8	19.80	
3	1	Sonenagar	Japla	39.0	-0.8	23.00	
4	1	Sonenagar	Aurangabad	17.2	1.7	20.50	
5	1	Sonenagar	Aurangabad	17.2	1.7	20.50	
6	1	Jehanabad	Arwal	23.6	-0.3	27.80	
7	1	Rafiganj	Sonenagar	LINE	IS	0.00	
8	1	Rafiganj	Rafiganj_R	1.8	0.1	1.10	
9	1	Dehri	Banjari	LINE	IS	0.00	
10	1	KCL	Banjari	-8.1	-3.4	10.80	
11	1	Dehri	Sasaram	LINE	IS	0.00	
12	1	Dehri	Sonenagar	LINE	IS	0.00	
13	1	Dehri	Sonenagar	LINE	IS	0.00	
14	1	Dehri	Bikramganj	32.8	9.7	40.80	
15	1	Biharshariff	Rajgir	19.2	-17.4	30.10	
16	1	Biharshariff	Barh	24.4	6.7	29.80	**BSPTCL & DVC**
17	1	Biharshariff	Hathidah	13.0	1.2	8.10	
18	1	Biharshariff	Nalanda	18.7	-5.5	22.60	
19	1	Biharshariff	Ekangasarai	31.4	7.4	37.50	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
20	1	Biharshariff	Nawada	30.6	4.0	35.80	
21	1	Biharshariff	Sheikhpura	LINE	IS	0.00	
22	1	Hathidah	Sheikhpura	LINE	IS	0.00	
23	1	Hathidah	Lakhisarai	LINE	IS	0.00	
24	2	Lakhisarai	Jamui	67.6	10.5	39.70	
25	2	Jamui	Jhajha_R	2.0	-2.7	2.00	
26	1	Lakhisarai	Lakhisarai_R	4.1	1.0	5.00	
27	1	Jamui	Sheikhpura	19.9	5.6	25.20	
28	1	Rajgir	Barhi	LINE	IS	0.00	
29	1	Jamalpur	Sultanganj	LINE	IS	0.00	
30	1	Sultanganj	Sabour	LINE	IS	0.00	
31	1	Sultanganj	Sabour	LINE	IS	0.00	
32	1	Jamalpur	Lakhisarai	-25.0	-9.0	31.60	
33	2	Lakhisarai	Lakhisarai	-51.6	-16.7	31.70	
34	1	Lakhisarai	Jamui	LINE	IS	0.00	
35	1	Sabour	Kahalgaon	-31.7	-11.7	39.30	**PGCIL**
36	1	Dumraon	Arrah	-8.9	-1.7	11.20	
37	1	Dumraon	Dumraon_R	2.0	0.3	2.60	
38	1	Dumraon	Buxar	19.6	10.2	27.90	
39	1	Arrah_PG	Arrah_BSEB	42.7	13.0	55.00	
40	1	Arrah_PG	Jagdishpur	18.8	0.5	23.20	
41	1	Purnea_BSEB	Saharsa	LINE	IS	0.00	
42	1	Purnea_BSEB	Forbesganj	41.4	-15.8	50.10	
43	1	Saharsa	Udakishanganj	21.6	-4.7	25.00	
44	1	Saharsa	Madhepura	-37.7	8.8	44.60	
45	1	Khagaul	Purnea	LINE	IS	0.00	
46	1	Muzaffarpur	SKMCH	LINE	IS	0.00	
47	1	Samastipur	Begusarai	LINE	IS	0.00	
48	1	Samastipur	Hajipur	LINE	IS	0.00	
49	1	Pandauli	Madhubani	LINE	IS	0.00	
50	1	Hajipur	Hajipur	0.5	0.2	0.70	**BSPTCL**
51	1	Gopalganj	Mashrakh	31.1	-19.7	40.30	
52	1	Chhapra	Chhapra	6.5	2.2	7.50	
53	1	Siwan	Gopalganj	-59.1	27.1	72.20	
54	1	Ekma	Ekma	7.1	-7.8	11.50	
55	1	Motihari	Dhaka	14.6	-8.5	19.30	
56	1	Bettiah	Motihari	LINE	IS	0.00	
57	1	Bettiah	Gopalganj	-22.5	14.8	31.70	
58	1	Bettiah	Gopalganj	-22.5	14.8	31.70	
59	1	Ramnagar	Bettiah	1.0	12.6	16.40	
60	1	Ramnagar	Swadesi_G	-2.8	-1.9	3.60	
61	1	Darbhanga	Darbhanga	-54.5	11.6	63.30	
62	1	Darbhanga	Samastipur	LINE	IS	0.00	
63	1	Kahalgaon	Sabour	LINE	IS	0.00	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
64	1	Kahalgaon	Lalmatia	32.9	-4.7	38.20	
65	1	Kahalgaon	Lalmatia	21.9	-4.6	25.80	
66	1	Belaganj	Chandauli	-15.0	3.1	18.40	
67	1	Belaganj	Hjehanabad	LINE	IS	0.00	
68	1	MTPS	Samastipur	-14.9	3.3	19.20	
69	1	MTPS	Samastipur	-14.9	3.3	19.20	
70	1	Sitalpur	Chhapra	LINE	IS	0.00	
71	1	Jainagar	Pulparas	LINE	IS	0.00	
72	1	Pulparas	Supaul	-21.6	8.8	27.20	
73	1	Pulparas	Supaul	-21.6	8.8	27.20	
74	1	Supaul	Katiya	11.3	3.4	14.90	
75	1	Supaul	Katiya	11.3	3.4	14.90	
76	1	Mohania	Karmansa	LINE	IS	0.00	
77	1	Dehri	Kochas	42.9	0.6	51.20	
78	1	Bikranganj	Dumraon	LINE	IS	0.00	
79	1	Forbesganj	Katiya	71.2	-11.7	40.90	
80	2	Forbesganj	Katiya	71.2	-11.7	40.90	
81	1	Barh	Hathidah_R	7.1	1.5	8.70	
82	1	Pusauli	Sasaram	41.9	-9.0	51.70	
83	1	Katiya	Duhabi	118.6	17.9	53.40	
84	1	BarauniTPS	Khagaul	25.2	-4.2	29.40	
85	1	BarauniTPS	Begusarai	-15.3	-6.5	19.10	
86	1	BarauniTPS	Begusarai	-15.3	-6.5	19.10	
87	1	Surjapur	Balmikinagar	0.0	0.0	0.50	
88	1	MTPS	Muzaffarpur	42.2	-11.8	49.60	
89	1	MTPS	Muzaffarpur	42.2	-11.8	49.60	
90	2	MTPS	Vaisali	34.6	-25.1	24.20	
91	1	MTPS	SKMCH	78.7	2.9	44.60	
92	1	Kudra_R	Karmansa	27.3	-3.8	33.40	
93	2	Mithapur	Karbigahia	LINE	IS	0.00	
94	1	Kudra new	Dehri	-19.9	-5.8	25.10	
95	1	Pusauli	Kudra	LINE	IS	0.00	
96	1	Kudra	Kochas	LINE	IS	0.00	
97	1	Chandauli	Bodhgaya	-23.1	4.0	27.80	
98	1	Chandauli	Bodhgaya	-23.1	4.0	27.80	
99	1	Chandauli	Bodhgaya	-23.1	4.0	27.80	
100	1	chandauli	Bodhgaya	-23.1	4.0	27.80	
101	2	Bodhgaya	Paharpur	2.7	-2.8	2.30	
102	1	chandauli	Tekari	30.1	-1.8	35.60	
103	1	Balmikinagar	Ramnagar	0.0	0.5	5.90	
104	1	Purnea	Katihar	21.3	6.7	25.90	
105	1	Purnea_PG	Kishanganj	LINE	IS	0.00	
106	1	Purnea_PG	Purnea	54.8	5.3	20.20	
107	1	Purnea_PG	Purnea	54.8	5.3	20.20	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
108	1	Purnea_PG	Purnea	54.8	5.3	20.20	
109	1	Masaurhi	Jehanabad	29.1	7.1	35.30	
110	1	Masaurhi	Sipara	-49.3	-6.1	57.60	
111	1	Pusauli	Mohania	23.3	2.6	28.20	
112	1	Kahalgaon TPP	Kahalgaon	38.1	2.0	43.80	**PGCIL**
113	1	Hathidah_R	Mokama_R	7.1	2.0	8.80	
114	1	Hathidah_R	Hathidah	LINE	IS	0.00	
115	1	Nalanda	Rajgir	LINE	IS	0.00	
116	1	Raxaul	Bettiah	-21.2	-1.3	23.20	
117	1	Runisaudpur	Sitamarhi	36.5	3.8	42.40	
118	1	Tekari	Goh	10.8	-5.9	14.60	
119	1	Wazirganj	Nawada	LINE	IS	0.00	
120	1	Ekangasarai	Hulasganj	10.4	0.7	12.40	
121	1	Biharshariff	Hulasganj	LINE	IS	0.00	
122	1	Gangwara	Pandauli	LINE	IS	0.00	
123	1	Madhepura	Supaul	36.4	-6.9	41.60	
124	1	Madhepura	Supaul	36.4	-6.9	41.60	
125	1	Madhepura	Sonbhadra	6.3	-1.1	7.30	
126	1	Mashrakh	Siwan	10.7	-0.8	11.90	
127	1	Dalsingsarai	Siwan	LINE	IS	0.00	
128	2	Jehanabad	Tehta	-5.9	7.6	7.80	
129	1	Begusarai	Dalsingsarai	13.1	-5.0	16.10	
130	1	Jandaha	Samastipur	LINE	IS	0.00	
131	1	Hazipur	Jandaha	21.4	-10.1	27.10	
132	1	Begusarai	Kuswesthan	0.9	-3.4	4.00	**BSPTCL**
133	1	Sherghati	Bodhgaya				
134	1	Immamganj	Sherghati				
135	1	Purnea	naughat	LINE	IS	0.00	
136	1	Railfactory	Sitalpur	-4.0	-1.4	4.80	
137	1	Muzaffarpur	Dhalkera	78.9	4.8	17.40	
138	1	Khagul	Bihta	52.7	18.5	32.30	
139	1	Khagul	Fatua	LINE	IS	0.00	
140	1	Digha	Khagul	-22.2	10.5	14.50	
141	1	Khagul	Khagaul Rail	2.0	0.7	2.50	
142	1	Mithapur	Gaighat	LINE	IS	0.00	
143	1	Katra	Fatua	-64.1	-17.8	78.70	
144	1	Sipara	Mithapur	17.7	-0.1	20.30	
145	1	Jakkanpur(Patna)	Mithapur	LINE	IS	0.00	
146	1	Jakkanpur(Patna)	Sipara	-48.2	-5.6	27.80	
147	1	Khusrupur RLY	Fatua	-5.1	-5.2	8.50	
148	1	Fatua	Harnuth	LINE	IS	0.00	
149	1	Fatua	Sipara	LINE	IS	0.00	
150	1	Harnuth	Baripahari	-8.1	0.3	9.70	
151	1	Baripahari	Biharshariff	-53.7	-23.4	34.10	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
152	1	Baripahari	Fatua	LINE	IS	0.00	
153	1	Sabour	BankaPG	LINE	IS	0.00	
154	1	Rafiganj	Chandauti (Gaya)	-16.4	3.9	20.70	
155	1	Karmnasa	Sahupura	LINE	IS	0.00	
156	1	Fatua	Gaighat	19.8	-8.8	25.30	
157	1	Naugachhia	BaruniTPS	LINE	IS	0.00	
158	1	Sitamarahi	Dhaka	LINE	IS	0.00	
159	1	Hazipur	Sheetalpur	LINE	IS	0.00	
160	1	Hazipur	Hazipur New	-36.9	-13.3	22.50	
161	1	Chapra	Ekma Tap	-26.7	10.7	32.30	
162	1	Motihari	MTPS	-42.1	9.6	50.50	
163	1	Vaishali	Sheetalpur	17.2	-8.3	10.80	
164	1	Banka	Banka PG	-14.1	-5.1	8.60	
165	1	Kishanganj	Dalkhola	-21.2	-4.9	24.20	
166	1	Chandauti (Gaya)	Sipara	-18.8	-9.0	24.60	
167	1	Sultanganj	Kahalgaon	LINE	IS	0.00	
168	1	Ekma Traction	Siwan	-34.0	20.1	44.30	
169	1	Banka PG	Sultanganj	26.0	2.4	15.50	
170	1	Kochas	Dumaraon	25.2	2.1	30.90	
171	1	Pusali	Kudra Rail	40.6	0.3	48.90	
172	1	Karbigahiya	Jakkanpur(Patna)	-12.9	14.0	22.00	
173	1	Naugachhia	Begusarai	LINE	IS	0.00	
174	1	Sonebarsha	Udakishanganj	LINE	IS	0.00	
175	1	Jehanabad	Jehanabad Traction	3.0	1.0	3.80	
176	1	Rihand	Sonenagar	-4.2	-8.6	11.50	
177	1	Dehri	Karamnasa	LINE	IS	0.00	
178	1	Dehri	Karamnasa	LINE	IS	0.00	
179	1	Kishanganj New	Kishangaunj	LINE	IS	0.00	
180	1	Kishanganj New	Kishangaunj	LINE	IS	0.00	
181	1	Sonenagar New	Sonenagar	59.6	-2.9	70.20	
182	1	Dalsingarai	Kusheswar	LINE	IS	0.00	
183	1	Dalsingarai	Kusheswar	LINE	IS	0.00	
184	1	Arrah	Arrah Rail	7.4	2.2	9.60	
185	1	Madhubani	Phulparas	-28.7	21.2	41.50	
186	1	Benpatti Tap	Jainagar	14.5	-4.9	17.30	
187	1	Kishanganj New	Forbesganj	95.6	-21.2	54.60	
188	1	Darbhanga	Gangawara	21.0	-2.2	23.90	
189	1	Bharti Gen	Gopalgaunj	LINE	IS	0.00	
190	1	SKMCH	Belsand	46.5	1.1	53.00	
191	1	Sherghati	Bodhgaya	-9.5	-2.7	11.70	
192	1	Imamgaunj	Bodhgaya	-8.8	-1.4	10.50	
193	1	Hari Sugar Mill	Ramnagar	12.2	4.4	14.10	
194	1	Tetha	Chandauti (Gaya)	-14.5	2.8	17.60	
195	1	Tetha	Chandauti (Gaya)	-14.5	2.8	17.60	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
196	1	HasnpSM	Dalsingarai	LINE	IS	0.00	
197	1	SUGAULI	Mothihari	-4.6	-1.3	5.50	
198	1	LAURIYA	Ramnagar	10.8	3.9	12.60	
199	1	Sasaram1	Banjari	15.5	4.7	20.80	
200	1	Madhubani	Benpatti Tap	20.6	-4.2	23.60	
201	1	Aurangabad	Shree Cement	12.1	0.2	14.30	
202	1	Arrah BS	Arrah RLY	4.1	1.2	5.30	
203	1	Belsand	Runisaidpur	44.8	0.9	51.40	
204	1	Dhaka	Sheohar	5.5	0.6	6.60	
205	1	Sitamari	Sheohar	LINE	IS	0.00	
206	1	Gaighat	Katra	LINE	IS	0.00	
207	1	Jandha	Mahanar	3.5	-3.2	5.50	
208	1	Samstipur	Samasti Trac	1.3	0.7	1.70	
209	1	Kishanganj New	Kishngaunj	LINE	IS	0.00	
210	1	Benipatti Tap	Benipati	5.9	2.1	7.10	
211	1	Darbhanga	Pandaul	22.4	-6.6	26.50	
212	1	Phulparas	Pandaul	LINE	IS	0.00	
213	1	Madhubani	Darbhanga	LINE	IS	0.00	
Jharkhand Line loading							
Sl.No	**CS**	**From Station**	**To Station**	**FORWARD**		**% LOADING**	**OWNER**
				MW	**MVAr**		
765 kV							
1	1	Ranchi New	Dharamjaygarh	11.8	-235.2	5.8	**PGCIL**
2	1	Ranchi New	Dharamjaygarh	11.8	-235.2	5.8	
400 kV							
1	1	Aadhunik	Jamshedpur	121.2	-48.0	7	**APNRL**
2	1	Aadhunik	Jamshedpur	121.2	-48.0	7	
3	1	Maithon	Jamshedpur	-3.5	-86.9	9.4	
4	1	Jamshedpur	Durgapur (DSTPS)	-169.1	-44.8	18.9	
5	1	Jamshedpur	Durgapur (DSTPS)	-169.1	-44.8	18.9	**PGCIL**
6	1	Jamshedpur	Mejia B	-109.7	-7.6	15.6	
7	1	Chaibasa	Jamshedpur	-61.5	-30.7	7.4	
8	1	Chaibasa	Jamshedpur	-61.5	-30.7	7.4	
9	1	TISCO	Jamshedpur	-184.0	32.8	20.6	**DVC**
10	1	Parulia (PGCIL)	Jamshedpur	-64.7	-71.4	10.4	
11	1	MPL	Ranchi	112.8	-12.0	12.3	
12	1	MPL	Ranchi	112.8	-12.0	12.3	
13	1	Ranchi	RanchiP	140.4	17.0	8.8	
14	1	Ranchi	RanchiP	140.4	17.0	8.8	**PGCIL**
15	1	Ranchi	RanchiP	140.4	17.0	8.8	
16	1	Ranchi	RanchiP	140.4	17.0	8.8	
17	1	Ranchi	Maithon	-64.4	-63.6	9.9	
18	2	Ranchi	Chandwa	539.1	102.8	15	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
19	1	Ranchi	Sipat	-24.5	72.4	17.2	
20	1	Ranchi	Sipat	-24.5	72.4	17.2	
21	1	Raghunathpur	Ranchi	154.3	-27.7	18.4	
22	1	Raghunathpur	Ranchi	154.3	-27.7	18.4	
23	1	Gaya	Maithon	-284.6	-85.2	16.50	
24	1	Gaya	Maithon	-284.6	-85.2	16.50	
25	1	Maithon	Mejia B	-190.4	-14.4	21.10	
26	1	Mejia B	Maithon	224.0	-35.5	24.60	
27	1	Mejia B	Maithon	224.0	-35.5	24.60	
28	1	Maithon	Kahalgaon	2.9	2.8	6.30	
29	1	Maithon	Kahalgaon	1.3	2.5	6.30	
30	1	Maithon	MPL	-268.8	53.5	30.20	
31	1	Maithon	MPL	-268.8	53.5	30.20	
32	1	Maithon	Parulia (PGCIL)	157.1	-62.8	18.40	
33	1	Maithon	Parulia (PGCIL)	157.1	-62.8	18.40	
34	1	Raghunathpur	Maithon	247.1	43.4	27.80	
35	1	Gaya	Koderma	-38.8	-138.0	8.00	
36	1	Gaya	Koderma	-38.8	-138.0	8.00	
37	1	Koderma	Biharshariff	71.4	-104.8	6.90	
38	1	Koderma	Biharshariff	71.4	-104.8	6.90	
39	1	Koderma	Bokaro (BTPS)	0.0	-61.0	6.70	
40	1	Koderma	Bokaro (BTPS)	0.0	-61.0	6.70	
41	2	Chandwa	Gaya	538.2	74.8	15.20	
42	1	Chaibasa	Bisra	-34.6	5.0	5.40	
43	1	Chaibasa	Bisra	-34.6	5.0	5.40	
44	1	Ranchi PG	PPSP	LINE	IS	0.00	
45	1	Ranchi PG	PPSP	LINE	IS	0.00	
220 kV							
1	1	Kalyaneshwari	Mejia-D	-79.9	17.8	38.6	DVC
2	1	Kalyaneshwari	Mejia-D	-79.9	17.8	38.6	
3	1	Kalyaneshwari	Mejia-D	-79.9	17.8	38.6	
4	1	CTPS-old	BTPS-B				
5	1	CTPS-old	BTPS-B				
6	1	CTPS-old	Kalyaneshwari	-32.0	-23.3	18.7	
7	1	CTPS-old	Kalyaneshwari	-32.0	-23.3	18.7	
8	1	CTPS-New	Dhanbad	9.8	-41.3	20	
9	1	Kalyaneshwari	Maithon	-96.6	-89.8	60.5	
10	1	Kalyaneshwari	Maithon	-96.6	-89.8	60.5	
11	1	BTPS-B	Jamshedpur	27.3	-11.0	13.9	
12	1	BTPS-B	Jamshedpur	27.3	-11.0	13.9	
13	1	Giridhi	Dhanbad	-78.9	14.1	37.8	
14	1	Giridhi	Dhanbad	-78.9	14.1	37.8	
15	1	Kalyaneshwari	Dhanbad				
16	2	Ramgarh	BTPS-B	-173.4	-26.6	41.6	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
17	1	CTPS-old	CTPS-New	-132.0	-27.0	62.9	
18	1	CTPS-old	CTPS-New	-132.0	-27.0	62.9	
19	1	Kalyaneshwari	Dhanbad				
20	2	BSL	CTPS-New	0.0	0.0	1.2	
21	1	CTPS-New	Dhanbad	9.8	-41.3	20	
22	1	Ramchandapur	Jamshedpur	-112.6	-23.7	51.2	JUSNL
23	1	Ramchandapur	Jamshedpur	-112.6	-23.7	51.2	
24	1	PTPS-TPS	Hatia	24.4	-23.4	15.5	
25	1	PTPS-TPS	Hatia	24.4	-23.4	15.5	
26	1	PTPS-TPS	TTPS	-60.6	18.8	13.7	
27	1	KTPP	Giridhi	1.0	10.2	11.5	
28	1	KTPP	Giridhi	1.0	10.2	11.5	
29	1	RanchiTG	Chandil	10.3	-15.5	8.4	
30	1	Maithon	Dumka	30.7	-17.7	7.2	
31	1	Maithon	Dumka	30.7	-17.7	7.2	
32	2	RanchiTG	Hatia	123.8	61.3	32.3	
33	1	Chandil	Ramchandapur	-74.5	-27.2	35.6	
34	2	Chaibasa	Chaibasa	8.8	2.9	2.1	
35	2	Maithon	Dhanbad	212.0	29.2	49	
36	2	PTPS-TPS	Bodhgaya	LINE	IS	0	BSPHCL & JSEB
37	1	PTPS-TPS	Bodhgaya	LINE	IS	0	BSPHCL & JSEB
38	1	Chandil	STPS	-61.7	19.5	31.6	WBSETCL & JSEB
39	2	Dhanbad	Elctro SteelD	5.4	-15.2	3.7	PGCIL
40	1	CTPS-New	BTPS-B2	74.9	2.5	35.3	DVC
41	1	CTPS-New	BTPS-B2	74.9	2.5	35.3	
42	1	Ramghar	Gola	0.0	-6.8	1.6	
132kV							
1	2	ManiqueD	GolaD	1.5	-2.1	4	DVC
2	2	ManiqueD	Jamshedpur	-9.9	7.5	9.5	
3	1	CTPS-B	Putki	23.5	10.9	29.2	
4	1	CTPS-B	Putki	23.5	10.9	29.2	
5	1	CTPS-B	Putki	23.5	10.9	29.2	
6	1	CTPS-B	Putki	23.5	10.9	29.2	
7	1	BTPS-B-D	ECR-GomD	0.4	-0.7	1	
8	1	BTPS-B-D	ECR-GomD	0.4	-0.7	1	
9	1	CTPS-A	PuruliaD	7.5	-3.9	9.3	
10	1	CTPS-A	PuruliaD	7.5	-3.9	9.3	
11	1	Jamshedpur	MosabaniD	41.4	-0.7	45.6	
12	1	Jamshedpur	MosabaniD	41.4	-0.7	45.6	
13	1	CTPS-A	GolaD	17.6	-9.3	21.9	
14	1	CTPS-A	GolaD	17.6	-9.3	21.9	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
15	1	Ramgarh	GolaD	-2.7	7.6	10.1	
16	1	Ramgarh	GolaD	-2.7	7.6	10.1	
17	1	PatratuD	North karnpuraD	9.9	-2.6	12.8	
18	1	PatratuD	Ramgarh	-22.9	3.7	25.8	
19	1	PatratuD	Ramgarh	-22.9	3.7	25.8	
20	1	PatratuD	North karnpuraD	9.9	-2.6	12.8	
21	2	PatratuD	JSPL	19.7	-4.0	22.1	
22	1	MaithonD	KumardubiD	51.1	20.0	67	
23	1	Klyaneshwari	MaithonD	126.4	32.6	140.3	
24	1	MaithonD	Panchet	17.6	3.9	22.2	
25	1	KumardubiD	Panchet	0.5	-4.1	5.1	
26	1	MaithonD	PatherdhiD	46.9	14.7	60	
27	1	MaithonD	PatherdhiD	46.9	14.7	60	
28	1	PatherdhiD	SindriD	3.6	1.0	4.8	
29	1	PatherdhiD	SindriD	3.6	1.0	4.8	
30	1	PatherdhiD	Putki	14.1	-1.6	15.8	
31	1	PatherdhiD	Putki	14.1	-1.6	15.8	
32	1	Putki	Nimiaghat	LINE	IS	0	
33	1	Putki	Nimiaghat	LINE	IS	0	
34	1	Nimiaghat	GiridhiD	-20.1	0.5	24.5	
35	1	Nimiaghat	GiridhiD	-20.1	0.5	24.5	
36	1	BarhiD	BTPS-B-D	-28.9	7.6	38.2	
37	1	BarhiD	Konar	LINE	IS	0	
38	1	BarhiD	KTPP	-32.8	-16.9	44.8	
39	1	BarhiD	Hazaribhag	23.9	8.0	31.8	
40	1	BarhiD	Hazaribhag	23.9	8.0	31.8	
41	1	BarhiD	KTPP	-32.8	-16.9	44.8	
42	1	Konar	BTPS-B-D	-10.6	-0.1	13.1	
43	2	RamkanaliD	Panchet	-6.2	-0.9	3.9	
44	1	CTPS-B	RamkanaliD	-20.8	-4.0	23.3	
45	1	CTPS-B	Jamuria	-5.0	-6.6	9.2	
46	2	MosabaniD	KharagpurD	2.7	-10.7	6.1	
47	2	KodermD1	KTPP	-93.8	-38.0	62	
48	1	SindriD	Pradhankhanda	1.8	0.3	2.7	
49	1	SindriD	Pradhankhanda	1.8	0.3	2.7	
50	2	DHANBAD1	GovndrD	31.0	5.8	19.2	
51	1	CTPS-A	BSL-DVC	35.0	12.3	40.8	
52	1	CTPS-A	BSL-DVC	35.0	12.3	40.8	
53	1	CTPS-A	Rajbera_DVC	9.5	4.1	11.5	
54	2	CTPS-B	BiadaDVC	18.0	4.5	10.4	
55	2	Putki	BalhrDVC	LINE	IS	0	
56	1	Ramgarh	ECR Barkakana	LINE	IS	0	
57	2	ECRlyDVC	North karnpuraD	-9.8	-2.8	5.6	
58	1	Klyaneshwari	MaithonD	126.4	32.6	140.3	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
59	1	CTPS-A	CTPS-B	-206.8	-18.8	100.9	
60	1	BSLGD	CTPS-B	-34.9	-12.4	46.2	
61	1	PatherdhiD	BalhrDVC	0.0	-1.1	1.2	
62	2	GolaD	SER Muri	10.7	1.5	6.4	
63	2	Klyaneshwari	MAL-Impex ferro	36.2	1.0	22	
64	1	ManiqueD	Manique R	2.1	0.4	2.7	
65	1	CTPS-A	Rajbera_DVC	9.5	4.1	11.5	
66	1	Garhwa	Japla	-24.3	-6.6	30.5	
67	2	Dhalbhumgarh	DhalbhumgarhRL	12.0	3.6	8	
68	1	Lohardaga	Gumla	5.5	0.8	8.4	
69	1	Lohardaga	Gumla	5.5	0.8	8.4	
70	1	Kamdara	Gumla	6.7	-5.1	10.2	
71	1	Hatia Old	Sikadari	-12.4	11.2	21.8	
72	1	Hatia New	Namkum	22.4	8.2	28.8	
73	1	Hatia Old	Kamdara	40.3	-2.8	47.8	
74	1	Kamdara	Bakaspur R	3.6	0.4	4.6	
75	1	Kamdara	Bano R	LINE	IS	0	
76	1	Hatia Old	Hatia New	-31.5	-9.5	38.9	
77	1	Hatia Old	Hatia New	-31.5	-9.5	38.9	
78	1	Namkum	Sikadari	-33.7	9.2	42.4	
79	1	PTPS	Kanke	31.9	2.0	24.4	
80	1	PTPS	Hatia Old	27.7	-2.4	21.3	
81	1	Deoghar	Sultanganj	LINE	IS	0	
82	1	Deoghar	Jamtara	LINE	IS	0	
83	1	Deoghar	Shankarpur R	3.0	0.1	3.6	
84	1	Deoghar	Dumka	-16.5	6.2	22.4	**JUSNL**
85	1	Deoghar	Dumka	-16.5	6.2	22.4	
86	1	Dumka	Lalmtiya	-17.6	2.2	22.2	
87	1	Dumka	Lalmtiya	-17.6	2.2	22.2	
88	1	Dumka	Pakur	24.9	-3.0	29.3	
89	2	Dumka	Dumka	36.3	-8.7	21.8	
90	1	Kendposi	Chaibasa	-20.3	-0.2	24.2	
91	2	Kendposi	Kendposi	8.0	2.2	5	
92	1	Manique	Chandil	-41.1	0.2	47.5	
93	1	Adityapur	Ushamartin	8.0	2.5	9.7	
94	1	Adityapur	Ushamartin	8.0	2.5	9.7	
95	1	Golmuri	Jharsuguda	15.1	-4.6	18.2	
96	1	Golmuri	Saljhagiri R	LINE	IS	0	
97	1	Rajkharsawan	Chandil	-45.6	-16.7	36.6	
98	1	Goelkera	Rajkharsawan	-18.9	-13.8	28.3	
99	1	Rajkharsawan	CKPR	18.1	5.0	22.5	
100	1	Goelkera	Manoharpur	6.9	9.9	15.1	
101	1	Ramchandapur	APL	2.1	10.2	12.3	
102	1	Nowamundi	Kendposi	LINE	IS	0	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
103	1	Sikadari	PH1	-55.7	13.0	68.1	
104	1	Sikadari	PH2	LINE	IS	0	
105	1	Chandil	Adityapur	7.8	-10.6	15.2	
106	1	Adityapur	Ramchandapur	-53.5	2.3	61.7	
107	1	Adityapur	Ramchandapur	-53.5	2.3	61.7	
108	1	Dhalbhumgarh	MosabaniD	-32.1	-2.3	40.8	
109	1	Dhalbhumgarh	MosabaniD	-32.1	-2.3	40.8	
110	1	Kanke	Hatia Old	11.5	-5.6	9.9	
111	1	Lathehar	Lohardaga	-18.3	0.8	14.5	
112	1	Lathehar	Lohardaga	-18.3	0.8	14.5	
113	1	Lathehar	Daltanganj	12.3	-2.8	9.8	
114	1	Lathehar	Daltanganj	12.3	-2.8	9.8	
115	1	Garhwa	Tolrah R	11.0	2.4	13.8	
116	1	Lalmtiya	Sahebganj	18.2	4.2	22.5	
117	1	Hatia New	Lohardaga	43.1	-0.1	33	
118	1	Hatia New	Lohardaga	43.1	-0.1	33	
119	1	Namkum	Tatisiloi R	1.0	2.3	3.9	
120	1	Namkum	Tatisiloi R	1.0	2.3	3.9	
121	1	Namkum	UMIRa	2.9	1.8	4.3	
122	1	Hatia Old	LodhmaR	3.1	0.2	3.9	
123	1	Hatia Old	LodhmaR	3.1	0.2	3.9	
124	1	Adityapur	Rajkharsawan	41.7	9.7	49.3	
125	1	Golmuri	Chandil	-19.1	2.5	22.6	
126	1	Golmuri	Chandil	-19.1	2.5	22.6	
127	1	Rajkharsawan	Chakradharpur	9.7	-6.5	13.7	
128	1	Rajkharsawan	Chakradharpur	9.7	-6.5	13.7	
129	1	Hazaribhag Rd	Konar	-2.6	-0.8	3.4	
130	1	Hazaribhag Rd	Konar	-2.6	-0.8	3.4	
131	1	Tamar	Chandil	-13.0	-4.6	16.1	
132	1	Hatia Old	HEC	2.0	0.2	2.5	
133	2	Jamtara	Madhupur	16.5	-1.1	10.5	
134	1	Chaibasa	Rajkharsawan	-22.4	-10.7	29.5	
135	1	Manique	ManiqueD	LINE	IS	0	
136	1	ABCILG	Garhwa	12.0	2.2	14.8	
137	1	Jamtara	Jamtara R	8.0	1.1	10.1	
138	1	Rajkharsawan	RKSNR	8.2	3.8	10.8	
139	1	Hatia Old	HEC	2.0	0.2	2.5	
140	1	Deoghar	Jamtara	LINE	IS	0	
141	1	Goelkera	GoelkeraT	9.0	2.9	11.4	
142	1	MaithonD	Jamtara	59.6	1.0	72.8	**DVC & JSEB**
143	1	Kendposi	Nowamundi	16.8	-4.1	20.6	**JSEB**
144	2	PatratuD	PTPS	LINE	IS	0	**JSEB & DVC**
145	1	Garhwa	Rihand	-13.9	1.1	18.5	**JSEB & UPPCL**

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
146	1	Inland P	Sikidiri	LINE	IS	0	JSEB
147	1	Inland P	Sikidiri	LINE	IS	0	
148	1	Sindri DVC	ECRLY DVC	3.5	1.6	5.4	DVC
Odisha Line Loading							
Sl.No	**CS**	**From Station**	**To Station**	**FORWARD**		**% LOADING**	**OWNER**
				MW	**MVAr**		
765 kV							
1	1	Jharsuguda	Dharamjaygarh	343.8	167.4	14.8	PGCIL
2	1	Jharsuguda	Dharamjaygarh	343.8	167.4	14.8	
3	1	Jharsuguda	Angul	-296.6	-164.1	8.5	
4	1	Jharsuguda	Angul	-296.6	-164.1	8.5	
5	1	ANGUL PG	Srikakulam	LINE	IS	0	
6	1	ANGUL PG	Srikakulam	LINE	IS	0	
400 kV							
1	1	Jaypore	Bolangir	-281.2	18.5	31.7	PGCIL
2	1	Jaypore	Gazuwaka	255.7	-34.5	29	
3	1	Jaypore	Gazuwaka	255.7	-34.5	29	
4	1	Indravati PG	Jaypore	265.5	-2.6	29.9	
5	1	Indravati OHPC	Indravati PG	-72.1	101.4	14.1	OPTCL
6	1	Rengali	Indravati PG	345.0	-19.9	37.9	PGCIL
7	1	Bolangir	Angul	-261.8	1.5	29.5	
8	1	Angul	JITPL	-178.4	-31.7	19.9	Jindal
9	1	Angul	JITPL	-178.4	-31.7	19.9	
10	1	Angul	Meramundali	13.1	-134.3	14.8	PGCIL
11	1	Angul	Meramundali	13.1	-134.3	14.8	
12	2	TSTPS	Angul	210.6	-21.7	23.2	
13	1	Angul	GMR	-163.1	-37.6	9.2	GMR
14	1	Angul	GMR	-163.1	-37.6	9.2	
15	1	Sterlite	Meramundali	0.0	0.0	15	PGCIL
16	1	Sterlite	Meramundali	0.0	0.0	15	
17	1	JSPL	Meramundali	42.4	-27.7	5.5	OPTCL
18	1	JSPL	Meramundali	42.4	-27.7	5.5	
19	1	GMR	Meramundali	151.8	9.5	16.7	OPTCL
20	2	Duburi	Meramundali	-474.8	50.9	27.3	OPTCL
21	1	TSTPS	Meramundali	281.8	-77.8	32.1	
22	1	Meramundali	Mendhasal	0.0	-64.7	7.1	OPTCL
23	2	Pandibl D/C	Mendhasal	357.3	-109.6	20.2	OPTCL & PGCIL
24	1	DUBURI4	Pandibl	264.2	-70.8	29.7	PGCIL
25	1	Duburi	Baripada	36.2	-112.8	12.9	OPTCL
26	1	Pandibl4	Baripada	-94.6	-43.0	12.8	PGCIL
27	1	Baripada	Jamshedpur	-88.6	-15.6	12.2	PGCIL
28	1	Baripada	TISCO	-45.7	-17.1	7.8	PGCIL

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
29	1	Baripada	Kharagpur	61.0	-57.5	8.9	**OPTCL & WBSETCL**
30	1	Baripada	Keonjhar	-147.1	79.5	20.5	**OPTCL**
31	1	Rengali	Keonjhar	148.2	-30.7	16.5	**OPTCL**
32	1	TSTPS	Rengali	302.7	-41.2	33.5	**PGCIL**
33	1	TSTPS	Rengali	302.7	-41.2	33.5	
34	1	Bisra	TSTPS	-179.4	0.2	20.4	
35	1	Bisra	TSTPS	-179.4	0.2	20.4	
36	1	Bisra	Jamshedpur	LINE	IS	0	
37	1	Chaibasa	Bisra	-34.6	5.0	5.4	
38	1	Bisra	Ranchi	102.4	-43.7	12.1	
39	1	Bisra	Ranchi	102.4	-43.7	12.1	
40	1	Bisra	Raigarh	41.3	-140.5	15.9	
41	1	Bisra	Sterlite	-108.2	22.2	12.5	**PGCIL& Sterlite**
42	1	Jharsuguda	Bisra	-51.3	-101.0	12.5	**PGCIL**
43	1	Jharsuguda	Bisra	-51.3	-101.0	12.5	
44	1	Ind-Bharath	Jharsuguda	-2.0	54.9	10.1	
45	1	Jharsuguda	Raigarh	6.0	-65.6	7.3	
46	1	Ind-Bharath	Raigarh	2.0	-54.9	6	
47	1	Sterlite	Raigarh	179.8	-71.0	20.9	**PGCIL& Sterlite**
220 kV line							
1	1	Balimela	Upper Silleru	0.0	-3.8	1.7	**OPTCL**
2	1	Budhipadar	Bhusan	-46.2	9.1	22.1	
3	1	Budhipadar	Bhusan	-46.2	9.1	22.1	
4	1	UPPER KOLAB	JAYA NAGAR	0.0	0.0	0.4	
5	1	Theruvali	BHANJANAGAR	-49.3	-14.7	22.9	
6	1	Theruvali	Narendrapur	-10.7	-28.5	13.6	
7	1	BHANJANAGAR	MENDHASAL	-13.2	-11.1	7.6	
8	1	BHANJANAGAR	NAYAGARH	-4.7	-8.3	4.2	
9	1	NAYAGARH	MENDHASAL	-21.1	-3.2	9.9	
10	1	Rengali PH	TSTPS	-10.0	-2.6	4.6	
11	1	Rengali PH	Rengali Switching Station	-8.8	5.4	4.8	
12	1	Rengali Switching Station	BARKOT	45.7	-4.0	20.6	
13	1	TSTPS	TTPS	62.9	-8.7	28.5	
14	1	NEW DUBURI	BHADRAK	65.0	-29.0	32.1	
15	1	ITPS	Budhipadar	97.8	3.2	40.1	
16	1	TARKERA	BISRA	-18.4	-32.5	15.2	
17	1	JAYA NAGAR	Jaya nagar PGCIL (Jaypore)	-17.2	48.7	23.8	
18	1	JAYA NAGAR	Jaya nagar PGCIL (Jaypore)	-17.2	48.7	23.8	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
19	1	Rengali Switching Station	Rengali PG	-55.7	6.2	25.2	
20	1	MERAMAUNDLI	TSTPS	-60.2	2.0	27.3	
21	1	Budhipadar	RAIGARH	88.9	5.8	41.3	
22	1	Balimela	JAYA NAGAR	-12.4	0.9	8.8	
23	1	JAYA NAGAR	Balimela	LINE	IS	0	
24	1	JAYA NAGAR	Balimela	LINE	IS	0	
25	1	Rengali Switching Station	Chandiposh	40.0	1.6	19.5	
26	1	TARKERA	Chandiposh	-33.7	-19.8	17.9	
27	1	UPPER KOLAB	JAYA NAGAR	LINE	IS	0	
28	1	JAYA NAGAR	Theruvali	-38.8	-25.4	20.9	
29	1	DUBURI	NINL	-7.1	13.5	7.2	
30	1	BIDANASI	MERAMAUNDLI	LINE	IS	0	
31	1	MENDHASAL	CHANDAKA	44.0	-14.3	20.3	
32	1	TTPS	MERAMAUNDLI	33.0	2.1	14.9	
33	1	TTPS	MERAMAUNDLI	33.0	2.1	14.9	
34	1	MERAMAUNDLI	BHANJANAGAR	LINE	IS	0	
35	1	MERAMAUNDLI	BHANJANAGAR	LINE	IS	0	
36	1	Indravati	Theruvali	18.5	-26.4	14.5	
37	1	ITPS	Budhipadar	97.8	3.2	40.1	
38	1	Budhipadar	TARKERA	53.4	-31.6	28.8	
39	1	Budhipadar	SPS	0.5	-1.5	0.7	
40	1	TSIL	JODA	19.9	-6.4	9.6	
41	1	DUBURI	NEW DUBURI	55.3	-27.1	27.8	
42	1	ITPS	Budhipadar	97.8	3.2	40.1	
43	1	Budhipadar	SPS	0.5	-1.5	0.7	
44	1	BALASORE	KUCHEI	-48.8	-12.7	22.4	
45	1	Indravati	Theruvali	18.5	-26.4	14.5	
46	1	KATAPALI	BOLANGIR	96.0	-9.5	44.8	
47	1	MENDHASAL	CHANDAKA	44.0	-14.3	20.3	
48	1	BALASORE	NEW DUBURI	-33.2	9.8	20.2	
49	2	NEW DUBURI	PARADEEP	77.2	-33.4	16.8	
50	2	PARADEEP	ESSAR	6.0	0.5	1.5	
51	1	UPPER KOLAB	JAYA NAGAR	0.0	0.0	0.4	
52	1	Theruvali	BHANJANAGAR	-49.3	-14.7	22.9	
53	1	Theruvali	Narendrapur	-10.7	-28.5	13.6	
54	1	Rengali PH	Rengali Switching Station	-8.8	5.4	4.8	
55	1	ITPS	Budhipadar	97.8	3.2	40.1	
56	1	TARKERA	BISRA	-18.4	-32.5	15.2	
57	1	Rengali Switching Station	Rengali PG	-55.7	6.2	25.2	
58	1	MERAMAUNDLI	TSTPS	-60.2	2.0	27.3	
59	1	Budhipadar	Korba	-33.7	-4.5	18.4	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
60	1	Budhipadar	Korba	-33.7	-4.5	18.4	
61	1	Indravati	Theruvali	18.5	-26.4	14.5	
62	1	Indravati	Theruvali	18.5	-26.4	14.5	
63	1	MERAMAUNDLI	DUBURI	62.8	-14.3	29	
64	1	MERAMAUNDLI	DUBURI	62.8	-14.3	29	
65	1	Budhipadar	TARKERA	53.4	-31.6	28.8	
66	1	DUBURI	NEW DUBURI	55.3	-27.1	27.8	
67	1	BALASORE	KUCHEI	-48.8	-12.7	22.4	
68	1	KATAPALI	BOLANGIR	96.0	-9.5	44.8	
69	1	MENDHASAL	CHANDAKA	44.0	-14.3	20.3	
70	1	MENDHASAL	CHANDAKA	44.0	-14.3	20.3	
71	1	NEW DUBURI	JINDAL	-24.6	26.6	16.6	**JSL**
72	1	NEW DUBURI	JINDAL	-24.6	26.6	16.6	
73	1	NEW DUBURI	VISA	-1.8	20.3	9.9	**VISA**
74	1	NEW DUBURI	ROHIT	30.8	1.4	13.9	**Rohit**
75	1	Budhipadar	VEDANTA	-22.0	34.6	17.7	**VEDANTA**
76	1	Budhipadar	VEDANTA	-22.0	34.6	17.7	
77	1	DubriNew	Maithan2	-5.8	1.8	2.9	**OPTCL**
78	1	Mendha	BIDANASI	-42.5	82.7	19.1	
79	1	Bhadrak	Balasore	0.5	-19.6	8.8	
80	1	BALIMELA	Balimela Splt	17.0	2.9	7.8	
81	1	THERUVALI	Lakshmipur	45.5	5.4	11.8	
82	1	Lakshmipur	JAYANAGAR	39.6	25.6	12.9	
83	1	THERUVALI	JAYANAGAR	LINE	IS	0	
84	1	Narendrapur	Aatri	-118.1	6.8	27.4	
85	1	Mendhasal	Aatri	163.1	-95.6	41.4	
86	1	TARKERA	BARKOTE	-30.4	-20.9	16.9	
87	1	Rengali Hydro	TTPS	26.8	-8.6	12.6	
88	1	JSPL	Jamshedpur	68.4	12.7	34.3	
89	1	JODA	Ramchandrapur	-40.3	-31.1	23.3	
90	1	BOLANGIR-NEW	Bolagir	LINE	IS	0	
91	1	NALCO	Meramundali	65.7	-102.0	27.4	
92	1	BSSL	Meramundali	29.4	18.5	7.9	
93	1	JODA	JSPL	119.2	29.3	56.3	
94	1	Paradeep	IOCL	0.5	-0.5	0.3	
95	1	Basundhora	BUDHIPADAR	-1.0	5.1	4.8	
96	1	Lakshmipur	Utkal Aluminium	LINE	IS	0	
97	1	Atri	Pandibil	43.6	-52.6	14.9	
98	1	Pandibil	Samangara	43.5	-45.8	13.7	
99	1	Lakshmipur	Aditya Aluminium	LINE	IS	0	
100	1	JAYA NAGAR Traction	Jayanagar	38.8	25.4	21.2	
101	1	JODA	TTPS2	-73.4	-11.0	33.6	
102	1	JODA	TTPS2	-73.4	-11.0	33.6	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
103	1	BUDHIPADAR	Lapanga	137.0	-18.8	64.1	
104	1	BUDHIPADAR	Lapanga	137.0	-18.8	64.1	
105	1	VEDANT	Veda_135	0.0	0.0	0.4	
106	1	VEDANT	Veda_135	0.0	0.0	0.4	
107	1	Lapanga	KATAPALI	105.3	-17.6	49.6	
108	1	Lapanga	KATAPALI	105.3	-17.6	49.6	
109	1	TARKERA	RSP_220	27.2	12.4	14	
110	1	TARKERA	RSP_220	27.2	12.4	14	
111	1	DubriNew	Tata Steel	67.5	4.7	30.5	
112	1	DubriNew	Tata Steel	67.5	4.7	30.5	
113	1	KATAPALI	BOLANGIR-New	23.8	-31.0	18.2	
132KV lines							
1	1	Balimela	Upper Silleru	0.0	-3.8	1.7	**OPTCL**
2	1	Theruvali	Rayagada	LINE	IS	0	
3	1	Jayanagar	Damanjodi	44.5	-31.3	62.6	
4	1	Theruvali	IMFA	43.7	11.2	52	
5	1	Vedanta	Kesinga	55.8	-11.6	67.1	
6	1	RyagdSp	Akhusinghi	5.3	-6.5	9.7	
7	1	Digha	Berhampore	-20.1	-8.5	24.8	
8	1	BHANJANAGAR	Aska	19.5	-7.2	23.2	
9	1	BHANJANAGAR	PHULBNI	20.8	-9.0	25.3	
10	1	Aska	Berhampore	LINE	IS	0	
11	1	Aska	Chatrapur	LINE	IS	0	
12	1	Chatrapur	Ganjam	14.9	4.9	17.9	
13	1	Chatrapur	IRE	6.1	1.6	7.1	
14	1	Chatrapur	Balugaon	17.5	-10.8	23.1	
15	1	MENDHASAL1	Chandaka	LINE	IS	0	
16	1	Chandaka	Bhubaneswar	71.6	4.9	40	
17	1	ChandSpl	Bhubaneswar	18.2	-22.2	32	
18	1	Phulnakhara	Bhubaneswar	-18.0	20.9	31.7	
19	1	Chandaka	Ranasinghpur	18.0	-18.6	28.9	
20	2	TTPS	Chainpal	22.0	4.5	26	
21	1	TTPS	Angul	24.4	2.2	28.3	
22	1	Angul	NANDIRA	16.1	1.3	18.8	
23	1	Chainpal	FCI	0.4	-0.2	0.5	
24	1	MERAMAUNDLI	Dhenkanal	59.9	-1.9	69.6	
25	1	Kamakhyanagar	OPCL	-35.1	6.6	42.4	
26	1	Dhenkanal	Nuapatna Tap	14.7	-2.7	17.7	
27	1	ICCL	Maheswari	-18.0	10.7	25.5	
28	1	Grid Steel (GSAL)	Choudwar	35.3	-26.0	51.8	
29	1	Choudwar	BIDANASI	2.4	-37.3	44.2	
30	1	BPPL	BIDANASI	66.5	-47.5	96.1	
31	1	Cuttack	Jagatsinghpur	LINE	IS	0	
32	1	Duburi	Jambay Ferro	-53.0	11.0	63.6	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
33	1	B.C. Mohanty	TISCO (Bamanipal)	9.9	-0.2	11.7	
34	1	Duburi	Jajpur Road	14.4	1.0	17	
35	1	Chandikhole	Kendapra	-14.3	2.2	17.3	
36	1	Kendapra	Ptamundi	8.7	-6.4	12.5	
37	1	Nuapatna Tap	ARATI STEEL	LINE	IS	0	
38	1	Paradip	PPL	LINE	IS	0	
39	1	Jajpur Road	Jajpur Town	LINE	IS	0	
40	1	Bhadrak	Soro	LINE	IS	0	
41	1	Balasore	Soro	8.9	5.9	13.6	
42	1	Balasore	Basta	28.0	-7.5	33.2	
43	1	Balasore	BIRLA TYRE	0.7	0.1	0.9	
44	1	Balasore	Balasore Alloys	59.0	3.0	67.6	
45	1	Bhadrak	FACOR	-0.6	11.3	6.8	
46	1	Joda	Polasapanga	33.7	-13.4	43.1	
47	1	Polasapanga	Karenjia	-6.2	-5.6	9.9	
48	1	Budhipadar	Kuchei	-32.8	-13.5	40.6	
49	1	Burla	Samblpur	25.4	-5.1	31.1	
50	1	Hindalco	Burla	4.4	-8.2	11.2	
51	1	Budhipadar	Brajaraj Nagar	22.7	7.7	28.8	
52	1	Jharsuguda	L0TCemco	0.9	-0.6	1.3	
53	1	Rajgangpur	Tarkera	-3.1	-9.5	11.9	
54	1	Tarkera	Rourkela	33.0	2.1	39.3	
55	1	Tarkera	Rourkela	33.0	2.1	39.3	
56	1	Tarkera	RSP	1.4	-4.9	6.1	
57	1	Rourkela	Bhalulata Tap	13.3	2.2	16.4	
58	1	Burla	Chiplima	3.5	-4.0	6.3	
59	1	Burla	Chiplima	3.5	-4.0	6.3	
60	1	Bolangir Old	Saintala	39.3	-10.0	48.9	
61	1	Saintala	Kesinga	37.6	-9.7	47	
62	1	Kesinga	Khariar	37.0	-9.0	46.4	
63	1	Kesinga	PowerMax	0.7	-0.5	1	
64	2	Budhipadar	MCL	9.9	-1.4	6	
65	1	Tarkera	Chhend	25.2	10.2	32.5	
66	1	Jaleswar	Jaleswar traction	9.5	1.0	11.1	
67	1	Chhend	Adhunik	8.2	7.1	13.9	
68	1	Chhend	NugaonTraction	0.1	2.4	5.1	
69	1	Tarkera	Chhend	25.2	10.2	32.5	
70	1	Nalda Traction	BEEKAY	LINE	IS	0	
71	1	Nalda Traction	Barbil	-2.4	-7.5	9.6	
72	1	Kesinga	Bhawanipatna	25.6	-10.7	33.1	
73	1	Jajpur Road	Kendapra	LINE	IS	0	
74	1	Jajpur Town	Bhadrak	-17.9	3.2	21.4	
75	1	Kuchinda	SMC	-17.3	3.5	21.9	
76	1	Rajgangpur	Rourkela	LINE	IS	0	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
77	1	Joda	Kendposi	22.5	-6.2	27.7	
78	1	Chatrapur	Narendra Pur	-19.0	1.2	21.4	
79	1	Berhampore	Narendra Pur	-20.3	-6.5	23.9	
80	1	Berhampore	Narendra Pur	-20.3	-6.5	23.9	
81	1	Puri	Nimpara	1.2	3.1	5.6	
82	1	Sunabeda	Damanjodi	LINE	IS	0	
83	1	Jayanagar	Tentulik	26.1	-3.6	30.3	
84	1	Burla	Katapali	10.2	-10.4	17.5	
85	1	Theruvali	JK Paper	0.0	0.1	0.8	
86	1	Rajgangpur	OCL	-9.6	4.1	12.5	
87	2	Rajgangpur	Rajgangpur Traction	12.2	8.6	9	
88	1	Paradip	IFFCO	LINE	IS	0	
89	1	Boinda	Rairakhole	7.0	-3.1	8.9	
90	1	Mohana	Akhusinghi	8.4	2.6	11.6	
91	1	Akhusinghi	Parlakemundi	8.3	0.7	11.1	
92	1	Bolangir Old	Sonepur	26.3	-12.3	35	
93	1	Bolangir New	Patnagarh	20.0	-0.1	24.1	
94	1	Patnagarh	Padamapur	7.4	-1.0	9	
95	1	Khurdah	Balugaon T	6.7	-12.6	15.8	
96	1	Balugaon T	Narendra Pur	LINE	IS	0	
97	1	Tarkera	Rajgangpur	3.0	7.9	11.7	
98	1	NUAPATNA	Nuapatna Tap	-14.5	-0.8	17.4	
99	1	OPCL	TTPS	-45.4	0.5	53	
100	1	Chainpal	Angul	21.7	1.5	25.2	
101	2	Machkhnd	Vizag	46.1	2.8	25.3	
102	1	Joda	FAP-Joda	15.9	1.1	19	
103	1	Chatrapur	Rambha Traction	1.9	1.0	3.7	
104	1	Digha	Mohana	13.0	2.0	15.2	
105	1	Budhipadar	Sundargarh	9.2	0.5	11.3	
106	1	Boinda	Angul	-18.3	-1.0	21.4	
107	1	Kurdsplt	Kaipadar traction	2.9	-4.6	6.1	
108	1	Balugaon	Solari Rly	4.9	0.4	5.6	
109	1	Jajpur Road	Chandikhole	LINE	IS	0	
110	1	HMSwitch	HindMtl	0.0	0.0	0	
111	1	Sunabeda	HAL	3.4	0.5	4	
112	1	Rayagada	VVC	LINE	IS	0	
113	1	Paradip	PPT	LINE	IS	0	
114	1	Duburi	Jakhpur Traction	16.0	7.5	21.1	
115	1	Duburi	MESCO	LINE	IS	0	
116	1	Bhadrak	Bhdrak Traction	5.7	0.1	6.6	
117	1	Balasore	Balsore Traction	6.0	2.0	7.4	
118	1	Balasore	Somanthpur	LINE	IS	0	
119	1	Bhalulata Tap	Bhulta Traction	5.5	1.6	6.9	
120	1	Jharsuguda	Jharsuguda Traction	10.4	3.2	13	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
121	1	Vedanta	Theruvali	-53.6	8.0	64.3	
122	1	Choudwar	Kendrapara Road(Traction)	7.3	1.5	8.9	
123	1	Dhenkanal	Joranda traction	4.7	2.5	7	
124	1	ICCL	Mania	16.4	-2.6	19.6	
125	1	MERAMAUNDLI	ML Rungta	0.0	-0.1	0.4	
126	1	MERAMAUNDLI	BRG	12.5	5.6	16	
127	1	HMSwitch	Meramaundali Traction	7.4	1.8	9.8	
128	1	Narendra Pur	Jagannathpur traction	4.3	-7.8	10	
129	1	Jayanagar	Jayanagar Traction	21.3	3.5	24.8	
130	1	JayaSplt	Machkhnd	-38.0	8.0	45.6	
131	1	Machkhnd	MackndRd	LINE	IS	0	
132	1	MackndRd	Padwa traction	5.0	0.6	6.1	
133	1	MERAMAUNDLI	Chainpal	LINE	IS	0	
134	1	MERAMAUNDLI	Chainpal	LINE	IS	0	
135	1	Dhenkanal	Maheswari	17.9	-10.7	24.7	
136	1	RAWMET	Choudwar	1.4	-1.2	2.2	
137	1	MackndRd	Manbar Traction	-5.0	-0.6	6	
138	1	Manbar traction	Maliguda traction	-10.0	-0.3	11.6	
139	1	Jayanagar Traction	Maliguda traction	15.1	0.4	17.4	
140	1	Jayanagar Traction	Ch Kusumi Traction	0.0	-1.1	1.3	
141	1	Chiplima	Katapali	2.7	-3.1	4.9	
142	1	Barpali	Bolangir New	18.5	-16.5	30.2	
143	1	Rajgangpur	Budhipadar	-20.5	4.3	26.5	
144	1	Rairakhole	Rairakhole Tap	LINE	IS	0	
145	1	Samblpur	Rairakhole Tap	-4.6	-2.4	6.2	
146	1	Kendapra	Paradip	-19.3	3.4	23.1	
147	1	Rairakhole Tap	Katapali	-4.6	-2.4	6.2	
148	1	Budhipadar	Budhipadar	72.9	13.4	36.7	
149	1	Bolangir New	Bolangir Old	45.0	-11.4	55.9	
150	1	Phulnakhara	Cuttack	10.2	-15.1	20.1	
151	1	Arya	Bolani	-19.8	-12.7	28.4	
152	1	Karenjia	Rairangpur	-20.2	-0.7	23.9	
153	1	Jayanagar	Meenakshi	-6.6	-2.6	8.1	
154	1	DhmraPrt	Bhadrak	-2.9	-0.7	4.8	
155	1	Budhipadar	MSP	LINE	IS	0	
156	1	OCL	Salipur	8.6	-4.0	11.2	
157	1	Jajpur Road	Anandpr	7.3	-7.7	12.5	
158	1	Basta	Jaleswar	20.6	-0.5	23.6	
159	1	Samblpur	ShyamDRI	LINE	IS	0	
160	1	BHANJANAGAR	Aska	19.5	-7.2	23.2	
161	1	Chatrapur	IRE	6.1	1.6	7.1	
162	1	TTPS	Chainpal	22.0	4.5	26	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
163	1	Angul	NANDIRA	16.1	1.3	18.8	
164	1	Chainpal	FCI	0.4	-0.2	0.5	
165	1	Tarkera	RSP	1.4	-4.9	6.1	
166	1	Tarkera	RSP	1.4	-4.9	6.1	
167	1	Chatrapur	Narendra Pur	-19.0	1.2	21.4	
168	1	Paradip	IFFCO	LINE	IS	0	
169	1	NBVL	HMSwitch	25.5	4.6	33.1	
170	1	NBVL	HMSwitch	25.5	4.6	33.1	
171	1	Budhipadar	Sundargarh	9.2	0.5	11.3	
172	2	MERAMAUNDLI	HMSwitch	LINE	IS	0	
173	1	Paradip	PPT	LINE	IS	0	
174	1	Duburi	BRPL	10.9	3.1	13.4	
175	1	MESCO	BRPL	-3.6	-1.2	4.4	
176	1	Bolangir New	Bolangir Old	45.0	-11.4	55.9	
177	1	Duburi	Jajpur Road	14.4	1.0	17	
178	1	Paradip	PPL	LINE	IS	0	
179	1	Hindalco	Burla	4.4	-8.2	11.2	
180	1	Jharsuguda	L&TCemco	0.9	-0.6	1.3	
181	1	Tarkera	Rourkela	33.0	2.1	39.3	
182	1	SMC	Lapanga	-26.1	3.1	31.4	
183	1	Lapanga	Budhipadar	-4.5	6.7	5.7	
184	1	Jayambee Ferro	TTPS	-55.9	10.0	66.9	
185	1	BEEKAY Steel	Bhulta Tap	-7.8	-2.6	9.8	
186	1	Chandaka	Nimpara	3.4	-14.4	16.5	
187	1	Joda	Bansapani	2.3	0.8	2.9	
188	1	Barbil	Arya	-9.9	-10.3	17.3	
189	1	Saliban	HMSwitch	-1.5	-0.5	2	
190	1	Jagatsingpur	GOREKNATH TRACTION	4.8	0.0	5.6	
191	1	Paradip	Jagatsingpur	14.8	-8.0	19.4	
192	1	Aska	Purusattampur	24.5	-9.6	29.4	
193	1	Chatrapur	Purusattampur	-13.9	1.4	15.9	
194	1	Balugaon	Chandpur	3.0	-5.1	6.6	
195	1	Chandpur	Balugaon Tap	LINE	IS	0	
196	1	Balugaon Tap	Atri	6.6	-8.6	11.9	
197	1	Arati Steel	RAWMET	12.6	-6.8	16.9	
198	1	Nimapara	Konark	3.8	-0.8	4.2	
199	1	Nimapara	Kesura	6.0	0.3	7.3	
200	1	Nimapara	Samangara	-19.4	9.6	24.4	
201	1	Khariar	Nuapara	15.0	2.9	20.1	
202	1	Argul Tap	Shamuka	LINE	IS	0	
203	1	Sonepur	Boudh	0.8	-2.5	3.2	
204	1	JUNAGRH	Bhawanipatna	-18.5	5.2	23.7	
205	1	Shamuka	Puri	-9.5	8.9	15.2	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
206	1	Puri	Samangara	-23.5	21.3	35.5	
207	1	Dabugaon	Tentulikhunti	-11.9	2.6	14.9	
208	1	Dabugaon	Umerkote	7.1	-3.1	9	
209	1	Joda	Bolani	22.5	12.4	31.2	
210	1	Jayanagar	Sunabeda	22.2	3.8	26.4	
211	1	Polasponga	Keonjhar Traction	4.1	-3.6	6.5	
212	1	KATAPALI	Bargarh	81.3	-8.2	97.9	
213	1	Bargarh	Barpalli	40.8	-24.1	57.9	
214	1	Bargarh	ACC	1.0	6.6	8.4	
215	1	Budhipadar	Kahalgaon	15.7	-8.8	21.5	
216	1	Burla-Rajganpur Tap	Kuchinda	0.0	0.3	4.1	
217	1	Aryan Steel	ShyamDRI	-0.7	-4.0	4.8	
218	1	Baripada	Balasore	LINE	IS	0	
219	1	Kendrapra	Marshghai	-12.5	3.4	15.3	
220	1	Arati Steel	Meramundali	LINE	IS	0	
221	1	BC Mohanty	Duburi	-19.8	0.3	23.3	
222	1	Budhipadar	Jharsuguda	13.3	5.9	17.5	
223	1	Khurdah Split	Argul Tap	LINE	IS	0	
224	1	Argul Tap	Argul	LINE	IS	0	
225	1	Rayagarh Split	Jayangr splt	-11.8	4.0	17.7	
226	1	Action Ishpat	Jharsiguda	2.6	-9.2	5.7	
227	1	Rathi	CHIPLMA	0.0	0.0	0.3	
228	1	Adhunik	Sri ganesh	-11.1	1.8	13.5	
229	1	Kesura	Ranasinghpur	-1.4	10.2	13.1	
230	1	Grid Steel	ICCL	-35.3	26.0	51.9	
231	1	Mania	OCL TAP	16.4	-1.6	19.5	
232	1	BPPL	Chandaka Split	LINE	IS	0	
233	1	Kurda split	Mendhasal	-33.7	23.0	46.4	
234	1	Aryan Steel	Lapanga	-1.5	4.9	6.4	
235	1	Burla-Rajganpur Tap	Rajganpur	LINE	IS	0	
236	1	Burla-Rajganpur Tap	Bamra Traction	0.0	-0.3	0.3	
237	1	Kalugaon	Tarkera	7.6	-7.2	12.5	
238	1	Somnathpur	EMAMI	-5.3	-2.0	6.9	
239	1	Bhadrak	Dhamra Traction	2.6	-1.0	3.2	
240	1	Marshghai	PARADEEP	-16.5	2.4	19.7	
241	1	Duburi	MSL	3.2	0.4	3.9	
242	1	BC Mohanty	Tomka Traction	0.0	-0.6	0.7	
243	1	HMSwitch	Samal Metalics	0.0	0.0	0.1	
244	1	Arya	BRP-St	3.5	0.7	4.4	
245	1	Argul	Atri	-0.6	-0.9	0.9	
246	1	Atri	Baki	6.0	-6.0	9.2	
247	1	Rajganpur	Kuchinda	-6.3	0.4	8.7	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
248	1	Duburi	Kamakhyanagar	-8.5	2.9	12	
249	1	Polasponga	MSP	1.6	0.0	3.9	
250	1	HMSwitch	SGEL	16.6	2.7	21.5	
251	1	Lapanga	Jharsiguda	4.0	7.1	10.5	
252	1	Lapanga	Burla	LINE	IS	0	
253	2	Lapanga	Burla	LINE	IS	0	
254	1	Kalarangi	Duburi	6.3	-7.1	11.1	
255	1	Kalarangi	Kmakhyanagar	-15.9	2.9	19.2	
256	1	Kuchai	Bangaripusi	30.2	0.7	34.3	
257	1	Khurda	Kurda splt	-30.7	18.3	39.5	
258	1	Chandka	Chandka Splt	18.2	-22.3	32	
259	1	Rayagda	Rayagda Sp	-6.5	-2.6	8	
260	1	Kesinga Splt	Kesinga	LINE	IS	0	
261	1	Joda	Rourkela	-28.4	14.3	39.7	
262	1	Kalarangi Tap	Kalarangi	9.7	4.2	12.7	
263	1	Bhubaneswar	CTC	20.8	9.6	25.7	
264	1	Bangaripusi	Rairangpur	29.9	2.1	34.4	
265	1	Chandaka	Bidansi	LINE	IS	0	
Sikkim Line Loading							
Sl.No	**CS**	**From Station**	**To Station**	**FORWARD**		**% LOADING**	**OWNER**
				MW	**MVAr**		
400 kV							
1	1	Teesta-5	Rangpo	100.2	-50.3	12.2	**PGCIL**
2	1	Teesta-5	Rangpo	100.2	-50.3	12.2	
3	1	Malbase	TALA	LINE	IS	0	
220kV							
1	1	New Melli	Jorthang	0.0	-16.9	7.5	**PGCIL**
2	1	New Melli	Rangpo	LINE	IS	0	
3	1	Rangpo	Jorthang	0.0	24.7	12.7	
132 kV							
1	1	Rangit	Ramam	10.8	-11.4	17.7	**PGCIL**
2	1	Rangit	Sagbari	3.2	6.1	7.8	**NHPC**
3	1	Melli	NJPPG	LINE	IS	0	**PGCIL**
4	1	Rangit	Kurseong	5.6	-2.2	6.7	**PGCIL**
5	1	Rangpo	Chuzechan	6.4	-0.1	4.7	**Gati infra**
6	1	Gantok	Chuzechan	-6.3	-3.8	5.5	**Sikkim**
7	1	Rangpo	Melli	10.6	-7.8	9.7	**PGCIL**
8	1	Gantok	Rangpo	-17.0	-1.7	19.5	
9	1	Rangpo	Rangit	2.0	-8.6	10.1	
10	1	Sagbari	Melli	0.9	6.3	9.2	
11	1	Sagbari	Geyzing	2.3	-0.1	2.7	
66 kV							
1	1	Mangan	Phudong	-1.8	-0.4	3.5	**Sikkim Gov**

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
2	1	Geyzing	Namchi	0.3	0.2	1.1	
3	1	Bulbuley	Sichey	3.2	0.7	6.2	
4	1	Bulbuley	Gangtok	-6.3	-1.5	12.4	
5	2	Ranipool	LLHP	0.0	0.0	0	
6	1	Rongli	Pakyong	-2.0	-0.4	4	
7	1	Mamring	Melli	-4.3	-1.2	8.4	
8	1	Rangit	Rabangla	1.4	0.2	2.6	
9	1	Ranipool	Pakyong	5.2	0.9	5.4	
10	1	Melli	Namchi	0.4	-0.6	1.4	
11	1	Pelling6	Geyzing	-1.4	-0.4	2.7	
12	1	PNamchi6	Rothak	1.4	0.1	2.6	
13	1	Rothak	Soreng	0.7	0.0	1.3	
14	2	Melli	Kalingpong	2.3	-0.1	2.2	
15	1	Melli6	Melli	11.5	1.0	21.8	
16	1	Melli	PNamchi6	3.2	0.3	6.1	
17	1	Gangtok	Tadong	8.1	1.7	15.8	
18	1	Ranipool	Gangtok	-8.8	-1.7	17.1	
19	1	Tadong	Sichey	2.2	0.7	4.6	
20	1	Tadong	Phudong	2.7	0.1	5.2	
21	1	Rongli	Rhenock	1.4	0.2	2.7	
22	1	Geyzing	Geyzing	0.9	0.4	1.9	
23	1	Ranipool	Topakhani	1.8	0.3	3.6	
24	1	Mangan	Meyong HEP	0.0	-0.2	0.3	
25	1	Rongli	RongliH	0.0	-0.1	0.1	
WB Line Loading							
Sl.No	**CS**	**From Station**	**To Station**	**FORWARD**		**% LOADING**	**OWNER**
				MW	**MVAr**		
400 kV							
1	1	Malbase	Binaguri	-2.0	5.0	8.8	
2	1	Rangpo	Binaguri	82.1	-128.5	16.5	
3	1	Rangpo	Binaguri	82.1	-128.5	16.5	
4	1	TALA	Binaguri	57.5	-26.3	6.9	
5	1	TALA	Binaguri	57.5	-26.3	6.9	
6	1	TALA	Binaguri	57.5	-26.3	6.9	
7	1	Binaguri	Bongaigaon (NER)	-94.6	-107.8	15.3	
8	1	Binaguri	Bongaigaon (NER)	-94.6	-107.8	15.3	**PGCIL**
9	1	Farraka	MaldaPG	298.0	-78.0	33.2	
10	1	Farraka	MaldaPG	298.0	-78.0	33.2	
11	1	Farraka	Parulia (PGCIL)	104.5	10.7	12.5	
12	1	Farraka	Parulia (PGCIL)	104.5	-40.5	12.5	
13	1	Farraka	Behrampur	142.1	-92.0	18.2	
14	1	Farraka	Sagardighi	86.9	-92.3	13.6	
15	1	Sagrdghi	Behrampur	176.5	-21.0	19	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
16	1	Sagrdghi	Behrampur	176.5	-21.0	19	
17	1	Sagrdghi	Parulia (PGCIL)	58.5	-21.2	11.1	**WBSETCL**
18	1	Sagrdghi	Parulia (PGCIL)	58.5	-21.2	11.1	**WBSETCL**
19	1	Subhashgram	Sagardighi	-140.9	51.7	17.2	
20	1	Behrampur	Behramara (Bangladesh)	179.9	-15.5	19.4	**PGCIL**
21	1	Behrampur	Behramara (Bangladesh)	179.9	-15.5	19.4	
22	1	Behrampur	Jeerat	134.8	-113.2	18.8	
23	1	Haldia	Subhashgram	74.4	-34.4	8.5	**CESC**
24	1	Haldia	Subhashgram	74.4	-34.4	8.5	
25	1	Jeerat	Subhashgram	37.5	-97.7	11	**PGCIL**
26	1	Jeerat	Bakreswar	-96.4	61.4	20.2	
27	1	Jeerat	KTPS	-86.9	7.6	13.6	**WBSETCL**
28	1	KTPS	Kharagpur	-53.5	-57.6	4.2	
29	1	KTPS	Kharagpur	-53.5	-57.6	4.2	
30	1	Arambag	KTPS	-156.0	-28.4	16.9	
31	1	Arambag	Bidhannagar	-157.2	44.2	20.8	
32	1	Arambag	Bakreswar	-123.2	44.6	14.8	
33	1	PPSP	Arambag	-180.3	-50.7	20.8	
34	1	PPSP	Arambag	-180.3	-50.7	20.8	**WBSETCL**
35	1	PPSP	Bidhannagar	-300.9	17.3	34.6	
36	1	PPSP	Bidhannagar	-300.9	17.3	34.6	
37	1	Parulia (PGCIL)	Bidhannagar	281.6	29.6	30.6	
38	1	Parulia (PGCIL)	Bidhannagar	281.6	29.6	30.6	
39	1	Khargpr4	Chaibasa	-97.2	-4.7	11	**PGCIL**
40	1	Khargpr4	Chaibasa	-97.2	-4.7	11	**PGCIL**
41	1	Durgapur (DSTPS)	Raghunathpur	201.2	20.0	22.5	**DVC**
42	1	Durgapur (DSTPS)	Raghunathpur	201.2	20.0	22.5	**DVC**
43	1	Binaguri	Purnea PG	130.7	-34.4	14.4	
44	1	Binaguri	Purnea PG	130.7	-34.4	14.4	
45	1	MaldaPG	Purnea PG	180.0	-0.9	19.5	
46	1	MaldaPG	Purnea PG	180.0	-0.9	19.5	
47	1	Farraka	Khalgaon-I	52.4	20.4	10.2	
48	1	Farraka	Khalgaon-I	52.4	20.4	10.2	
49	1	Farraka	Khalgaon-II	52.1	20.3	10.2	
50	1	Farraka	Khalgaon-II	52.1	20.3	10.2	**PGCIL**
51	1	MejiaB4	Maithan-I	224.0	-35.5	24.6	
52	1	MejiaB4	Maithan-I	224.0	-35.5	24.6	
53	1	Raghunathpur	Ranchi	154.3	-27.7	18.4	
54	1	Raghunathpur	Ranchi	154.3	-27.7	18.4	
55	1	Binaguri	Alipurduar PG	-117.7	-64.9	7.1	
56	1	Binaguri	Alipurduar PG	-117.7	-64.9	7.1	
57	1	AlipurDP	Bongaigaon	-118.0	-54.4	6.8	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
58	1	AlipurDP	Bongaigaon	-118.0	-54.4	6.8	
220 kV							
1	1	STPS	Asansol	30.6	-11.8	14.9	**WBSETCL**
2	1	SubhasgramPG	CLC	43.0	9.6	19.2	
3	1	Kasba	SubhasgramW	-17.4	0.4	7.7	
4	1	Jeerat	Satgachia	9.3	13.5	12.1	
5	1	Arambag	Domjur	17.9	6.6	10.5	
6	1	Arambag	Domjur	17.9	6.6	10.5	
7	1	Arambag	Midnapur	21.9	-13.6	11.3	
8	1	Arambag	Midnapur	21.9	-13.6	11.3	
9	1	Bakreshwar	Bidhanagar	17.8	40.9	22.5	
10	1	Bakreshwar	Bidhanagar	17.8	40.9	22.5	
11	1	Bidhanagar	DPL	-27.8	59.0	30.2	
12	1	Bidhanagar	DPL	-27.8	59.0	30.2	
13	1	Howrah	KTPS	-70.6	25.4	35.1	
14	1	Howrah	KTPS	-70.6	25.4	35.1	
15	1	Jeerat	Kasba	15.7	-36.0	17	
16	1	Jeerat	Kasba	15.7	-36.0	17	
17	1	ParuliaW	ParuliaD	70.0	79.0	48.3	
18	1	ParuliaW	ParuliaD	70.0	79.0	48.3	
19	1	Bidhanagar	DTPS-D	40.0	105.0	52	
20	1	Bidhanagar	DTPS-D	40.0	105.0	52	
21	1	STPS	Hura	53.0	-41.3	30.5	
22	1	BishnupurNew	Arambag	1.5	-22.4	9.9	
23	1	BishnupurNew	Arambag	1.5	-22.4	9.9	
24	1	Laxmikantapur	SubhasgramW	-44.4	-5.5	19.2	
25	1	Laxmikantapur	SubhasgramW	-44.4	-5.5	19.2	
26	1	Bakreshwar	Satgachia	40.7	-38.8	25.1	
27	1	Bakreshwar	Satgachia	40.7	-38.8	25.1	
28	1	SubhasgramPG	SubhasgramW	72.0	-2.7	27.3	
29	1	SubhasgramPG	SubhasgramW	72.0	-2.7	27.3	
30	1	Kasba	SubhasgramW	-17.4	0.4	7.7	
31	1	Kharagpur	Midnapur	LINE	IS	0	
32	1	Kharagpur	Midnapur	LINE	IS	0	
33	1	SubhasgramPG	NTAA	41.6	31.1	23.3	
34	1	NTAA	Jeerat	-35.5	19.4	18.9	
35	1	TLD	NJP	0.0	0.0	5.7	
36	1	NJP	TLD	-19.3	-21.4	12.6	
37	1	NJP	TLD	-19.3	-21.4	12.6	
38	1	Gokarna	Bakreshwar	-30.9	22.9	20.8	
39	1	Gokarna	Bakreshwar	-30.9	22.9	20.8	
40	1	Gokarna	Sagardighi	-93.0	0.3	41	
41	1	Gokarna	Sagardighi	-93.0	0.3	41	
42	1	Foundry Park	Domjur	20.2	-15.9	11.3	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
43	1	Foundry Park	Domjur	20.2	-15.9	11.3	
44	1	Howrah	Foundry Park	28.4	-18.1	14.9	
45	1	Howrah	Foundry Park	28.4	-18.1	14.9	
46	1	Krishnanagar	Satgachia	0.1	-0.5	3.5	
47	1	Krishnanagar	Satgachia	0.1	-0.5	3.5	
48	1	Asansol	Bidhanagar	26.3	-13.8	13.5	
49	1	NTAA	CLC	-5.6	-29.4	12.9	
50	1	Bishnupr New	STPS	-63.3	28.2	35.6	
51	1	New Haldia	KTPS	LINE	IS	0	
52	1	New Haldia	KTPS	LINE	IS	0	
53	1	Bishnupr New	Hura	-52.2	18.6	28.7	
54	1	SubhasgramPG	EMSS	49.0	-44.5	11.5	
55	1	SubhasgramPG	EMSS	49.0	-44.5	11.5	
56	1	NTAA	Jeerat	-35.5	19.4	18.9	
57	1	Jeerat	Satgach2	9.3	13.5	12.1	
58	1	Jeerat	Dharampur	71.5	31.8	18	
59	1	Arambag2	Rishra	20.2	-18.0	11.9	
60	1	Dharampur	Rishra2	54.9	28.8	14.7	
61	2	Gokarna	Kishnanagar	54.5	-50.1	16.3	
62	2	VidyasagarW	Kharagpur	-61.5	1.0	27.8	
63	2	New Haldia	IPCLG	LINE	IS	0	
64	1	Parulia	Parulia	0.0	0.0	0	
65	1	Kharagpur	Egra	60.3	5.0	26.9	
66	2	Kharagpur	Egra	60.3	5.0	26.9	
67	1	Khargpur	Vidysagar Park	LINE	IS	0	
68	1	STPS	JK nagar	51.6	-13.6	24.2	**WBSETCL/IPCL**
69	1	JK Nagar	Bidhanagar	6.2	-10.4	5.5	
70	1	DalkholaPG	MaldaPG	-30.5	-1.4	15.2	**PGCIL**
71	1	DalkholaPG	MaldaPG	-30.5	-1.4	15.2	
72	1	Binaguri	BirparaPG	-8.9	59.2	31.7	
73	1	Binaguri	BirparaPG	-8.9	59.2	31.7	
74	1	Binaguri	SliguriPG	43.5	-19.7	20.9	
75	1	Binaguri	SligurPG	43.5	-19.7	20.9	
76	1	NJP	Binaguri	-12.5	28.3	14	
77	1	NJP	Binaguri	-12.5	28.3	14	
78	1	BirparaPG	Malbase	0.5	96.6	46.7	
79	1	BirparaPG	Chukha	-16.6	8.2	9.8	
80	1	BirparaPG	Chukha	-16.6	8.2	9.8	
81	1	DalkholaPG	Purnea	32.0	8.1	15.4	
82	1	DalkholaPG	Purnea	32.0	8.1	15.4	
83	1	DalkholaPG	DkholaW	36.3	-18.0	17.7	
84	1	DalkholaPG	DkholaW	36.3	-18.0	17.7	
85	1	Farakka	Lalmatiya	43.2	2.2	20.1	
86	1	SiliguriP	Krishanganj	29.0	-16.6	14.6	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
87	1	SiliguriP	Krishanganj	29.0	-16.6	14.6	
88	2	DalkholaP	Krishanganj	-75.5	22.8	18	
89	1	BirpraP2	ALIPURDUAR	-33.5	19.1	20.8	
90	1	BirpraP2	ALIPURDUAR	-33.5	19.1	20.8	
91	1	ALIPURDU	Salakati_NER	-33.7	30.1	24.7	
92	1	ALIPURDU	Salakati_NER	-33.7	30.1	24.7	
93	1	JK Nagar	JK Nagar	51.4	-3.9	23.4	**IPCL**
94	1	JK Nagar	JK Nagar	6.2	-12.7	6.4	
95	1	BurnpurD	Mejia-D	-86.7	10.8	41	**DVC**
96	1	BurnpurD	Kalyaneshwari	-31.1	-17.1	16.4	
97	2	Mejia	Durgapur	98.4	-70.8	28	
98	2	ParuliaD	Durgapur	-15.5	74.5	18.4	
99	2	Barjora	Mejia	-145.9	-10.1	33.8	
100	1	DTPS-D	Mejia	-45.8	21.6	24.6	
101	1	DTPS-D	Mejia	-45.8	21.6	24.6	
102	1	Parulia-D	TamlaD	17.7	6.3	8.7	
103	1	Parulia-D	TamlaD	17.7	6.3	8.7	
104	1	Parulia-D	Tamla	17.7	6.3	8.7	
105	2	DTPS-D	Parulia-D	-24.7	-57.7	14.4	
106	2	IISCOD	BurnpurD	-110.7	-4.4	25.6	
107	1	EMSS	NCGS	LINE	IS	0	**CESC**
108	1	EMSS	NCGS	LINE	IS	0	
109	1	EMSS	EMSS	LINE	IS	0	
110	1	BBGS	BBG	127.4	-8.5	45.5	
111	1	BBGS	BBG	127.4	-8.5	45.5	
112	1	BBG	EMSS	126.7	1.8	43	
113	1	BBG	EMSS	126.7	1.8	43	
114	1	EMSS	Kasba	LINE	IS	0	
115	1	EMSS	EMSS	LINE	IS	0	
132kV							
1	1	Howrah	B. Garden	LINE	IS	0	**WBSETCL**
2	1	Howrah	B. Garden	LINE	IS	0	
3	1	Howrah	SRS	LINE	IS	0	
4	1	Lilooah	Belur	15.2	-6.3	31	
5	1	Lilooah	Belur	15.2	-6.3	31	
6	1	Lilooah	Belur	15.2	-6.3	31	
7	1	Titagarh	Titagarh	LINE	IS	0	
8	1	Titagarh	Titagarh	LINE	IS	0	
9	1	Kasba	EMSS	-17.2	-34.7	21.8	
10	1	Kasba	EMSS	-17.2	-34.7	21.8	
11	1	Howrah	B. Garden	LINE	IS	0	
12	1	Rishra	Rishra	0.0	-8.2	4.8	
13	1	Rishra	Rishra	0.0	-8.2	4.8	
14	1	Alipurduar	Birpara	-25.1	10.1	32.8	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
15	1	Midnapur	Balichauk	23.2	-3.3	26.3	
16	1	Pingla	Balichauk	-13.3	4.3	16.1	
17	1	CK Road	Midnapur	-25.1	-8.4	30.2	
18	1	Leobong	NBU	9.3	-5.8	12.3	
19	1	Leobong	Ramam	-13.9	4.7	16.9	
20	1	Dharampur	Kalyani	0.5	15.3	17.9	
21	1	Dhulian	Farakka	-25.7	3.4	29.6	
22	1	Joka	Sonarpur	-39.4	-9.5	44.6	
23	1	Lalgola	Raghunathpur	LINE	IS	0	
24	1	Gokarna	Rampurhat	34.8	-0.3	39.4	
25	1	Gokarna	KuliGIS	20.6	6.9	25.1	
26	1	HM	Dankuni	7.8	2.2	9.3	
27	1	Dankuni	Lilooah	LINE	IS	0	
28	1	HM	Rishra	-7.8	-2.2	9.2	
29	1	Khanyan	Satgachia	17.5	-2.9	20.1	
30	1	Malda	Samsi	20.1	-3.2	22.6	
31	1	Satgachia	DhatriT	4.0	1.0	5.1	
32	1	NBU	TCF-1	LINE	IS	0	
33	1	NJP	TCF-1	LINE	IS	0	
34	1	Samsi	Raigunj	LINE	IS	0	
35	1	Saintia	Rampurhat	LINE	IS	0	
36	1	TCF-1	TCF-2	LINE	IS	0	
37	1	TCF-1	TCF-3	LINE	IS	0	
38	1	TCF-2	TCF-3	LINE	IS	0	
39	1	NBU	NJP	-3.5	1.0	4.3	
40	1	New Haldia	Haldia	-8.8	0.3	10.1	
41	1	New Haldia	HPCL	1.9	1.8	3.1	
42	1	Haldia	HPCL	7.1	0.9	8.3	
43	2	Rishra	CTOLA	55.0	2.5	31.1	
44	1	Raigunj	Gangarampur	16.5	-14.9	24.4	
45	1	Cooch Bihar	Alipurduar	-7.2	15.9	21.3	
46	1	Chalsa	Maynaguri	8.7	-0.5	10.1	
47	1	Chalsa	NJP	-6.5	-1.1	8.2	
48	1	Contai	Egra	-0.8	-15.0	17.2	
49	1	Gokarna	Raghunathpur	LINE	IS	0	
50	1	CLC	Kasba	-25.0	-20.5	35.4	
51	1	Kasba	Joka	LINE	IS	0	
52	1	TMBLK	RMBLK	-27.8	-7.5	32.5	
53	1	CK Road	Bishnupur Old	LINE	IS	0	
54	1	Basirhat	Ashoknagar	-11.4	-1.4	13	
55	1	Basirhat	Ashoknagar	-11.4	-1.4	13	
56	1	Arambag	Raina	20.9	1.1	23.8	
57	1	Arambag	Raina	20.9	1.1	23.8	
58	1	Arambag	Tarakeshwar	31.6	-2.0	35.8	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
59	1	Arambag	Tarakeshwar	31.6	-2.0	35.8	
60	1	Ashoknagar	Jeeerat	-22.2	-1.4	25	
61	1	Ashoknagar	Jeeerat	-22.2	-1.4	25	
62	1	Bankura	Bishnupur New	-13.0	-4.2	15.5	
63	1	Bankura	Bishnupur New	-13.0	-4.2	15.5	
64	1	Barasat	Jeeerat	LINE	IS	0	
65	1	Barasat	Jeeerat	LINE	IS	0	
66	1	Birpara	BRPPG	-40.4	7.7	47.8	
67	1	Birpara	BRPPG	-40.4	7.7	47.8	
68	1	Birpara	Maynaguri	LINE	IS	0	
69	1	Birpara	Mathabhanga	15.7	-0.4	18.9	
70	1	Bolpur	Saintia	14.3	-5.6	18	
71	1	Bolpur	Saintia	14.3	-5.6	18	
72	1	Bongaon	Krishnanagar	LINE	IS	0	
73	1	Bongaon	Krishnanagar	LINE	IS	0	
74	1	Dlkhola	Raigunj	18.7	-18.3	26.7	
75	1	Dlkhola	Raigunj	18.7	-18.3	26.7	
76	1	Debagram	Katwa	LINE	IS	0	
77	1	Debagram	Katwa	LINE	IS	0	
78	1	Debagram	DebagramTSS	0.1	-2.4	2.6	
79	1	Dharampur	Titagarh	18.9	-1.9	21.4	
80	1	Dharampur	Titagarh	18.9	-1.9	21.4	
81	1	Domjour	Uluberia	21.1	3.8	24.8	
82	1	Domjour	Uluberia	21.1	3.8	24.8	
83	1	Bidhannagar	DPL	21.3	42.3	54.9	
84	1	Bidhannagar	DPL	21.3	42.3	54.9	
85	1	Bidhannagar	Mankar	32.8	-20.6	44.9	
86	1	Bidhannagar	Mankar	32.8	-20.6	44.9	
87	1	Falta	Laxmikantapur	-12.0	-3.4	13.8	
88	1	Falta	Laxmikantapur	-12.0	-3.4	13.8	
89	1	Gokarna	Katwa	LINE	IS	0	
90	1	Gokarna	Katwa	LINE	IS	0	
91	1	Joka	Sirkl	-0.4	-1.8	2.1	
92	1	Jeeerat	Bongaon	8.4	0.9	10	
93	1	Jeeerat	Bongaon	8.4	0.9	10	
94	1	Kasba	SaltLak	29.5	10.4	34.5	
95	1	Katwa	Satgachia	-43.4	-1.7	50.1	
96	1	Katwa	Satgachia	-43.4	-1.7	50.1	
97	1	KTPS	KolaghatW	16.4	7.8	21	
98	1	KTPS	KolaghatW	16.4	7.8	21	
99	1	KTPS	TMLK	10.5	1.8	12.5	
100	1	KTPS	TMLK	10.5	1.8	12.5	
101	1	KTPS	Uluberia	LINE	IS	0	
102	1	KTPS	Bagnan	24.8	-13.4	32.4	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
103	1	Lilooah	Rishra	LINE	IS	0	
104	1	Lilooah	Howrah	-14.4	1.9	16.8	
105	1	NJP	Siliguri	10.8	-2.7	12.5	
106	1	NJP	Siliguri	10.8	-2.7	12.5	
107	1	STPS	PuruliaW	28.7	-14.2	36.9	
108	1	STPS	PuruliaW	28.7	-14.2	36.9	
109	1	NJP PG	Kurseong	LINE	IS	0	
110	1	Domjour	Jangipara	7.3	-3.1	9	
111	1	Domjour	Jangipara	7.3	-3.1	9	
112	1	Arambag	Birsingha	10.9	-3.6	13	
113	1	Arambag	Birsingha	10.9	-3.6	13	
114	1	Tarakeshwar	Belmuri	24.0	-3.3	27.6	
115	1	Tarakeshwar	Belmuri	24.0	-3.3	27.6	
116	1	Bishnupur New	Borjora	7.3	-0.6	8.6	
117	1	Bishnupur New	Borjora	7.3	-0.6	8.6	
118	1	Borjora	Bidhannagar	LINE	IS	0	
119	1	Borjora	Bidhannagar	LINE	IS	0	
120	1	RGP	Bankura	LINE	IS	0	
121	1	RGP	Bankura	LINE	IS	0	
122	1	Mankar	Mahachanda	15.9	-15.2	25.4	
123	1	Mankar	Mahachanda	15.9	-15.2	25.4	
124	1	Mahachanda	Satgachia	LINE	IS	0	
125	1	Mahachanda	Satgachia	LINE	IS	0	
126	1	TATA Power	Haldia	42.7	-3.4	49	
127	1	TATA Power	Haldia	42.7	-3.4	49	
128	1	Cresent	Asansol	17.9	-1.4	21	
129	1	Cresent	Asansol	17.9	-1.4	21	
130	1	Krishnanagar	Ranaghat	LINE	IS	0	
131	1	Krishnanagar	Ranaghat	LINE	IS	0	
132	1	Debagram	Amtala	LINE	IS	0	
133	1	Debagram	Amtala	LINE	IS	0	
134	1	Berhampur	Amtala	18.2	-4.7	21.4	
135	1	Berhampur	Amtala	18.2	-4.7	21.4	
136	1	Hizli	Midnapur	LINE	IS	0	
137	1	Hizli	Midnapur	LINE	IS	0	
138	1	Midnapur	Pingla	20.6	-4.8	23.7	
139	1	Jhargram	Midnapur	-10.9	1.8	13.3	
140	1	Jhargram	Midnapur	-10.9	1.8	13.3	
141	2	NTAAIII	Barasat	47.4	2.4	26.4	
142	1	Ukhra	Bidhannagar	-14.4	6.8	19.1	
143	1	Ukhra	Bidhannagar	-14.4	6.8	19.1	
144	1	TCF-3	Dlkhola	LINE	IS	0	
145	1	TCF-3	Dlkhola	LINE	IS	0	
146	1	Rishra	Bighati	-18.2	13.8	26.2	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
147	1	Rishra	Bighati	-18.2	13.8	26.2	
148	1	Bishnupur New	Bishnupur Old	15.3	-1.2	17.4	
149	1	Bishnupur New	Bishnupur Old	15.3	-1.2	17.4	
150	1	Bishnupur New	Bishnupur Old	15.3	-1.2	17.4	
151	1	Howrah	Lilooah	24.7	-4.6	28.5	
152	1	Howrah	Lilooah	24.7	-4.6	28.5	
153	1	Howrah	Lilooah	24.7	-4.6	28.5	
154	1	Khejuria GIS	Malda	-48.4	-0.5	54.6	
155	1	Bishnupur Old	Khatra	9.1	-2.7	10.7	
156	1	Bishnupur Old	Khatra	9.1	-2.7	10.7	
157	1	Satgachia	Kalna	8.3	2.0	10	
158	1	Satgachia	Kalna	8.3	2.0	10	
159	1	Laxmikantapur	Kakdwip	8.2	-2.0	9.4	
160	1	Laxmikantapur	Kakdwip	8.2	-2.0	9.4	
161	1	Dharampur	Jeeerat	-12.7	-19.4	26.1	
162	1	Dharampur	Jeeerat	-12.7	-19.4	26.1	
163	1	Hura	PuruliaW	-12.3	12.4	20.7	
164	1	Hura	PuruliaW	-12.3	12.4	20.7	
165	2	Hura	RGP	11.4	-10.7	3.5	
166	1	Bagnan	Uluberia	LINE	IS	0	
167	1	Krgpr132	Hizli	LINE	IS	0	
168	1	Saintia	KuliGIS	LINE	IS	0	
169	1	Malda	Khejuria GIS	49.1	0.1	54.6	
170	1	Bengal Energy	Egra	-27.9	13.7	36.6	
171	1	SonarLal	Lalgola	-1.3	-1.7	2.5	
172	1	Raghunathpur	Dhulian	-14.8	-3.4	17.2	
173	1	MaldaPG	Malda	86.3	-19.1	38.4	
174	1	MaldaPG	Malda	86.3	-19.1	38.4	
175	1	Berhampur	Gokarna	-38.1	1.2	43.4	
176	1	Berhampur	Gokarna	-38.1	1.2	43.4	
177	1	Berhampur	Cossim bazarTSS	0.0	-0.5	0.6*	
178	1	Ranaghat	Dharampur	-16.1	0.2	18.3	
179	1	Ranaghat	Dharampur	-16.1	0.2	18.3	
180	1	NTAAIII	NTAA	46.6	14.1	27.3	
181	1	Bidhannagar	Bolpur	34.1	-6.8	40.3	
182	1	Bidhannagar	Bolpur	34.1	-6.8	40.3	
183	1	Ujanoo	NBU	-12.5	4.0	15	
184	1	NJP PG	NBU	13.0	-2.6	14.9	
185	1	Ujanoo	Siliguri	1.3	1.7	3	
186	1	Adisaptagram	BTPS	LINE	IS	0	
187	1	Adisaptagram	BTPS	LINE	IS	0	
188	1	Lilooah	Rishra	LINE	IS	0	
189	1	NJP PG	NJP	16.0	-2.2	18.1	
190	1	NJP	Maynaguri	21.5	-2.4	24.3	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
191	1	Balurghat	BalurghatTP	-13.1	8.5	21.4	
192	1	Balurghat	Gangarampur	1.8	-14.7	16.3	
193	1	Gokarna	SonarLal	8.7	-3.1	10.5	
194	1	Debagram	Krishnanagar	-9.6	-1.9	10.9	
195	1	Debagram	Krishnanagar	-9.6	-1.9	10.9	
196	1	Haldia	Hizil	23.5	-0.1	26.9	
197	1	Haldia	Hizil	23.5	-0.1	26.9	
198	1	TMLK	Hizil	LINE	IS	0	
199	1	TMLK	Hizil	LINE	IS	0	
200	1	Falta	Joka	-2.6	-1.8	3.5	
201	1	Falta	Joka	-2.6	-1.8	3.5	
202	1	Ramam	NBU	13.0	-7.2	16.6	
203	1	Sonarpur	Kasba	-62.5	-17.1	70.9	
204	1	New Haldia	Egra	LINE	IS	0	
205	1	Bengal Energy	Hizli	13.2	-11.8	20	
206	1	Raigunj	BalurghatTP	-2.1	6.1	11.9	
207	1	Lalgola	Gokarna	-5.6	-0.3	7.5	
208	1	Lalgola	Gokarna	-5.6	-0.3	7.5	
209	1	PuruliaW	Bagmundi	3.6	-0.9	5.3	
210	1	Belmuri	Adisaptagram	16.8	-3.5	19.6	
211	1	Belmuri	Adisaptagram	16.8	-3.5	19.6	
212	1	BalurghatTP	Malda	-15.4	24.5	32.7	
213	2	Hizil	Rohit Ferro	LINE	IS	0	
214	1	Hizil	Mankar	1.1	1.1	1.8	
215	1	CK Road	CK Road-Tr	2.0	1.8	3.3	
216	2	Sirkl	Laxmikantapur	-18.5	-3.9	10.5	
217	1	Maynaguri	Mathabhanga	LINE	IS	0	
218	2	Amtala	Najirpur	12.5	-13.4	10.5	
219	1	SaltLak	CLC	-22.3	2.2	24.7	
220	1	Bankura	Bengal concast	1.5	0.8	2.1	
221	1	Cooch Bihar	Birpara	-25.8	7.3	12.6	
222	1	Katwa	KatwaTss	0.5	0.1	0.7	
223	1	Bankura	BankuraT	3.9	2.2	5.1	
224	1	Bishnupur Old	Modern	12.1	0.7	13.7	
225	1	Bishnupur Old	Rohit Ferro	LINE	IS	0	
226	1	Midnapur	WBIDC	LINE	IS	0	
227	1	Barasat	BarsatT	2.0	0.8	2.5	
228	1	KolaghatW	Madras cement	4.4	0.8	5.2	
229	1	TMBLK	WBIDC	16.1	3.6	18.7	
230	1	Bolpur	Bolpur Trac	1.5	2.7	3.7	
231	1	Rishra	Jayshree	6.5	2.1	7.8	
232	1	HOWRH DVC	Foundry Park Tap	13.8	0.1	17.4	
233	1	Foundry Park Tap	Kolaghat DVC	-1.1	-4.0	5.3	
234	1	Vidyasagar Park	BRG Steel Tap	1.3	-4.7	5.5	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
235	1	BRG Steel Tap	BRG Steel	1.3	0.4	1.8	
236	1	BRG Steel Tap	Midnapur	LINE	IS	0	
237	1	Vidyasagar Park	Hizli	10.8	-4.2	13	
238	1	Vidyasagar Park	HIZLI TSS	9.6	-4.2	11.8	
239	1	HIZLI TSS	Hizli	-1.3	-3.4	4.1	
240	1	Khejuria GIS	Farakka Switching	80.2	5.3	45.4	
241	1	Farakka Switching	Ambuja Cement Tap	54.2	9.8	62.3	
242	1	Ambuja Cement Tap	Raghunathganj	14.9	-3.2	17.3	
243	1	Ambuja Cement Tap	Ambuja Cement	39.2	12.9	46.8	
244	1	Kharagpur DVC	Kharagpur Traction	LINE	IS	0	
245	1	Foundry Park Tap	Food Park	14.9	5.0	19.9	
246	1	New Haldia	Bajkul	23.0	-12.1	29.7	
247	1	Resmi Metalic BLK	Vidyasagar	-39.5	-11.1	46.2	
248	1	NewTown Action area-I	SALTLAKE GIS	25.6	10.4	15.7	
249	1	Bishnupur Old	OCL Bishnupur	9.4	6.1	12.7	
250	1	Chanditala	Domjour	31.7	0.9	18	
251	1	Bajkul	CONTAI	22.5	-10.2	28.2	
252	1	OCL Bishnupur	Midnapur	LINE	IS	0	
253	1	Mankar	Emami Cement	0.3	0.3	0.5	
254	1	BTPS	Kalyani	21.1	-8.4	25.6	DVC
255	1	BTPS	Lilooah	10.4	-1.4	11.9	
256	1	BTPS	Khanyan	30.2	-17.6	39.5	
257	1	BTPS	Satgachia	23.3	-8.3	27.9	
258	1	BTPS	Bighati	29.0	-11.6	35.3	
259	1	BTPS	Bighati	29.0	-11.6	35.3	
260	3	BTPS	Dharampur	53.2	-39.9	25	
261	1	KolaghatD	KolaghatW	LINE	IS	0	
262	1	KolaghatD	KolaghatW	LINE	IS	0	
263	1	DTPS-D	ASP	19.2	18.3	28.3	
264	1	DTPS-D	Kalipahari	23.7	0.9	25.2	
265	1	DTPS-D	Kalipahari	23.7	0.9	25.2	
266	1	DTPS-D	ASP	19.2	18.3	28.3	
267	1	KharagpurD	KolaghatD	1.3	-1.0	2.9	
268	1	KharagpurD	KolaghatD	1.3	-1.0	2.9	
269	1	KolaghatD	KolaghatT	1.5	2.1	3.8	
270	1	KolaghatD	HowrahD	LINE	IS	0	
271	1	HowrahD	BelmuriD	-11.5	0.8	13.2	
272	1	HowrahD	BelmuriD	-11.5	0.8	13.2	
273	1	BelmuriD	Burdwan	-22.6	-2.4	25	
274	1	BelmuriD	Burdwan	-22.6	-2.4	25	
275	1	Burdwan	DTPS-D	-45.3	0.7	49.6	
276	1	Burdwan	DTPS-D	-45.3	0.7	49.6	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
277	1	Kalipahari	Klyaneshwari	8.1	-2.1	10.1	
278	1	Kalipahari	Klyaneshwari	8.1	-2.1	10.1	
279	2	PuruliaD	Jamshedpur	-2.2	-5.1	3.4	
280	1	Jamur1	DTPS-D	-70.3	5.7	76.5	
281	1	DTPS-D	RamkanaliD	23.1	0.5	27.7	
282	1	SonicTD	Barjora	-51.7	-1.6	54.6	
283	1	KolaghatT	HowrahD	-7.1	0.6	8.3	
284	1	KolaghatT	Badrinarayan AS	8.6	2.4	10	
285	2	DPL	DTPS-D	LINE	IS	0	**DVC/DPL**
286	1	B. Garden	SRS	-15.9	-2.0	28.8	
287	1	B. Garden	SRS	-15.9	-2.0	28.8	
288	1	SRS	Majerhat	-47.1	-1.3	42.4	
289	1	SRS	Majerhat	-47.1	-1.3	42.4	
290	1	Majerhat	Taratala	-39.1	2.9	27	
291	1	Majerhat	Chakmir	-48.1	-0.3	33.3	
292	1	Majerhat	Chakmir	-48.1	-0.3	33.3	
293	1	Majerhat	Jadavpur	10.9	-2.6	7.7	
294	1	PRS	PLN	LINE	IS	0	
295	1	Taratala	Chakmir	-48.1	-0.2	33.2	
296	1	Taratala	Chakmir	-48.1	-0.2	33.2	
297	1	Taratala	PRS	57.1	4.1	40.6	
298	1	Taratala	BBD Bag	LINE	IS	0	
299	1	Chakmir	BBGS	-51.8	4.1	25.9	
300	1	Chakmir	BBGS	-51.8	4.1	25.9	
301	1	Chakmir	BBGS	-51.8	4.1	25.9	
302	1	Chakmir	BBGS	-51.8	4.1	25.9	
303	1	EMSS	PKL	17.5	-4.5	10.3	**CESC**
304	1	Jadavpur	EMSS	-22.4	-8.2	16.6	
305	1	BBD Bag	PRS	LINE	IS	0	
306	1	BBD Bag	PRS	-9.5	-1.2	6.8	
307	1	Titagarh Gen	BT Road	LINE	IS	0	
308	1	Titagarh	NCGS	-36.0	1.0	34.7	
309	1	NCGS	BT Road	-12.5	-10.5	9.2	
310	1	BT Road	East Calcutta	-11.2	58.1	47.3	
311	1	PRS	PRS	-26.1	-14.3	11.7	
312	1	East Calcutta	EMSS	-116.3	72.5	80.5	
313	1	East Calcutta	PRS				
314	1	EMSS	Kasba	17.2	34.1	21.8	
315	1	Park Circus	PRS	LINE	IS	0	
316	1	SRS	SRS	9.3	-2.1	2.4	
317	1	B. Garden	SRS	-15.9	-2.0	28.8	
318	1	BT Road	Dumdum	-100.1	-10.8	56.7	
319	1	Park Circus	EMSS	-6.1	-1.3	4.3	
320	1	EMSS	Patuli	13.0	-7.4	8.4	

Sl.No	No. of Ckts.	From Station	To Station	Power Flow (Forward)		% Loading	Owned by
				MW	MVAr		
321	1	NCGS	BT Road	-12.6	-8.0	16.8	
322	1	NCGS	NCGS	-23.4	21.4	8.2	
323	1	BBD Bag	BBD Bag	LINE	IS	0	
324	1	Titagarh	Titagarh	LINE	IS	0	
325	1	EMSS	EMSS	191.7	11.0	75.8	
326	1	East Calcutta	EMSS				
327	1	EMSS	Dumdum	23.7	-16.1	16.1	
328	1	EMSS	Dumdum	LINE	IS	0	
329	1	BT Road	BT Road	LINE	IS	0	
330	1	PRS	Majerhat	LINE	IS	0	
331	1	Majerhat	Majerhat	-47.2	4.8	18.5	
332	1	PLN	PKL	-7.0	-1.5	1.8	
333	1	East Calcutta	East Calcutta	LINE	IS	0	
334	1	Jadavpur	Jadavpur	LINE	IS	0	
335	1	EMSS	EMSS	LINE	IS	0	
336	1	PRS	PRS	-17.0	-2.3	6.7	
337	1	EMSS	PRS	LINE	IS	0	
338	1	Titagarh	Titagarh Gen	50.5	3.5	20	
339	1	BT Road	Titagarh	64.0	-5.2	36.3	
340	1	SRS	Majerhat	-47.1	-1.3	42.4	
341	1	PRS	PRS	LINE	IS	0	
342	1	ECAL	PRS	-21.4	-7.0	15.5	
343	1	ECAL	EMSS	4.8	-0.7	7.9	
344	1	ECAL	DUMDUM	89.8	-8.3	64.4	
345	2	DPL	DPLB	45.6	17.1	28.5	**DPL**
346	1	DPL	DPLA	30.1	5.1	35.7	
347	2	DPL	DPLC	41.2	13.9	25.6	
348	2	DPL	DPLC	42.1	15.4	26.3	
349	2	DPL	DPLAB	22.8	-10.0	14.6	
350	2	DPLA	DPL-Bamunara	19.7	1.5	11.6	
66 kV lines							
1	1	JALI	JALI	6.7	-0.1	12.3	**WBSETCL**
2	1	JALI	JALI	6.7	-0.1	12.3	
3	1	JALI	Chalsa	6.7	-0.1	12.3	
4	1	JALI	Chalsa	6.7	-0.1	12.3	

ANNEXURE III – SHORT CIRCUITS STUDY RESULTS

Table H: State wise 3-Ph and SLG results of Eastern region grid

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
Bihar						
1	Sasaram	765	12218.262	9.221	8980.932	6.778
		400	14911.8	21.523	10693.617	15.435
		132	1330.337	5.819	994.967	4.352
2	Gaya	765	24955.899	18.834	17088.122	12.897
		400	24752.258	35.727	17337.507	25.025
		220	7140.555	18.739	7385.878	19.383
3	Purnea_PG	400	16202.421	23.386	12585.814	18.166
		220	7332.143	19.242	7594.348	19.93
4	Purnea old_PG	220	7151.686	18.768	7101.083	18.636
		132	2681.453	11.728	2633.328	11.518
5	Lakhisarai	400	11098.661	16.02	6845.456	9.881
		132	1725.279	7.546	1250.511	5.47
		132	2484.076	10.865	2285.908	9.998
6	Muzzafarpur_PG	400	15175.102	21.903	11042.978	15.939
		220	7004.071	18.381	7367.762	19.335
		132	1302.51	5.697	1314.619	5.75
7	Patna	400	16420.454	23.701	10818.16	15.615
		220	5383.656	14.128	5460.548	14.33
8	kishanganj	400	13702.852	19.778	12327.359	17.793
		220	7506.57	19.7	4650.972	12.206
		132	918.758	4.019	604.945	2.646
9	Banka_PG	400	14954.36	21.585	9572.328	13.816
		132	2636.105	11.53	2398.909	10.493
10	Barh	400	18009.223	25.994	15950.866	23.023
		132	990.173	4.331	621.164	2.717
11	Biharshariff_PG	400	19491.244	28.133	14029.305	20.25
		400	19492.839	28.135	14030.401	20.251
		220	6825.189	17.911	7091.517	18.61
12	Biharshariff_PG	220	6696.859	17.575	6787.237	17.812
		132	2362.236	10.332	2373.471	10.381
13	Kahalgaon_NTPC	400	30505.555	44.031	29227.104	42.186

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
		400	30667.277	44.264	29394.67	42.428
		132	3463.924	15.151	3319.564	14.519
14	Nabinagar Railway	400	4240.845	6.121	2398.249	3.462
15	Bodhgaya	220	5054.826	13.265	4064.343	10.666
		132	3117.229	13.634	2649.734	11.59
16	Dehri	220	3294.243	8.645	2118.553	5.56
		132	1889.634	8.265	1427.353	6.243
17	Fatuha	220	3166.318	8.309	2251.17	5.908
		132	2152.486	9.415	1686.705	7.377
18	Khagaul	220	3045.307	7.992	2285	5.997
		132	1957.04	8.56	1612.589	7.053
19	Gopalganj	220	1624.169	4.262	1042.793	2.737
		132	963.016	4.212	723.828	3.166
20	Darbhanga	220	1308.176	3.433	817.106	2.144
		132	727.085	3.18	479.571	2.098
21	MTPS	220	5177.759	13.588	4850.273	12.729
		132	1998.294	8.74	1943.187	8.499
22	Pusauli	220	6885.718	18.07	6829.385	17.922
		132	1921.391	8.404	1876.8	8.209
23	Arrah_PG	220	1097.082	2.879	651.079	1.709
		132	890.024	3.893	569.552	2.491
24	Pusauli New	220	6268.251	16.45	5816.257	15.264
		132	1779.939	7.785	1776.178	7.769
25	Sipara	220	5336.403	14.004	5365.143	14.08
		132	2704.439	11.829	2583.004	11.298
26	Madhepura	220	2053.336	5.389	1349.549	3.542
27	Hajipur	220	2751.291	7.22	1943.128	5.099
		132	881.481	3.855	785.875	3.437
28	Begusarai	220	3002.433	7.879	2499.537	6.56
		132	2434.835	10.65	2189.845	9.578
29	Sonenagar New	220	2282.437	5.99	1986.716	5.214
		132	1559.094	6.819	1700.288	7.437
30	Kishnganj New	220	6715.32	17.623	4303.197	11.293
		132	2216.232	9.694	2308.908	10.099

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
31	Banka	132	1911.03	8.359	1405.576	6.148
32	Kahalgaon	132	2511.085	10.983	1850.499	8.094
33	Muzzafarpur	132	1454.047	6.36	1116.808	4.885
34	Purnea	132	2630.751	11.507	2523.896	11.039
35	Sugauli	132	415.542	1.818	333.892	1.46
36	Lauriya	132	335.694	1.468	189.126	0.827
37	Sone nagar	132	1547.927	6.77	1654.317	7.236
38	Karmansa	132	1012.871	4.43	674.96	2.952
39	Jehanabad	132	1332.186	5.827	766.469	3.352
40	Rafiganj	132	741.98	3.245	406.768	1.779
41	Hathidah	132	1246.557	5.452	838.985	3.67
42	Jamui	132	1435.532	6.279	1229.397	5.377
43	Sheikhpura	132	535.867	2.344	316.916	1.386
44	Nawada	132	718.51	3.143	421.03	1.842
45	Jamalpur	132	605.722	2.649	338.954	1.483
46	Sultanganj	132	1088.699	4.762	662.615	2.898
47	Sabour	132	1136.031	4.969	669.883	2.93
48	Dumraon	132	644.488	2.819	358.695	1.569
49	Jakkanpur	132	1722.455	7.534	1228.04	5.371
50	Saharsa	132	521.79	2.282	296.938	1.299
51	Khagaria	132	533.814	2.335	302.551	1.323
52	Sitamarhi	132	493.883	2.16	295.209	1.291
53	Samastipur	220	2769.675	7.269	2461.246	6.459
		132	1720.697	7.526	1865.952	8.161
		132	1648.122	7.209	1701.176	7.441
54	Pandauli	132	496.77	2.173	296.595	1.297
55	Hajipur New	132	899.59	3.935	815.961	3.569
56	Chhapra	132	294.132	1.286	163.16	0.714
57	Siwan	132	578.11	2.529	359.374	1.572
58	Motihari	132	461.551	2.019	397.435	1.738
59	Betiah	132	570.974	2.497	353.839	1.548
60	Ramnagar	132	364.987	1.596	207.937	0.909
61	Rajgir	132	291.496	1.275	155.174	0.679
62	Darbhanga New	132	882.472	3.86	627.928	2.746

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
63	Katihar	132	937.892	4.102	562.08	2.458
64	Belaganj	132	1184.199	5.18	688.105	3.01
65	Vaishali	132	957.653	4.189	619.713	2.711
66	Sitalpur	132	711.95	3.114	428.116	1.873
67	Dhaka	132	364.635	1.595	373.774	1.635
68	Jainagar	132	323.151	1.413	264.111	1.155
69	Madhubani	132	468.522	2.049	358.71	1.569
70	Phulparas	132	816.926	3.573	555.113	2.428
71	Supaul	132	1184.795	5.182	813.604	3.559
72	Mohania	132	1261.671	5.518	966.447	4.227
73	Bikramganj	132	626.135	2.739	351.15	1.536
74	Forbeshganj	132	1359.98	5.948	829.685	3.629
75	Udakishanganj	132	319.987	1.4	173.006	0.757
76	Baripahari	132	2081.606	9.105	1857.162	8.123
77	Banjari	132	468.818	2.051	264.747	1.158
78	KCL	132	461.049	2.017	259.808	1.136
79	Kataiya	132	1181.536	5.168	716.813	3.135
80	Barauni TPS	132	2252.559	9.852	2280.581	9.975
81	Surajpur	132	209.375	0.916	112.653	0.493
82	Kudra	132	616.889	2.698	345.347	1.511
83	Chandauti	132	2710.929	11.857	2008.206	8.784
84	Kochas	132	753.893	3.297	421.088	1.842
85	Balmikinagar	132	217.231	0.95	117.204	0.513
86	Masaurhi	132	1465.082	6.408	894.875	3.914
87	Bihta	132	1472.314	6.44	1038.202	4.541
88	Gaighat	132	993.691	4.346	592.482	2.591
89	Mithapur	132	1339.204	5.857	870.682	3.808
90	Rafiganj_R	132	712.793	3.118	389.33	1.703
91	Arrah	132	852.572	3.729	538.926	2.357
92	Lakhisarai_	132	1387.583	6.069	921.312	4.03
93	Raxaul	132	379.549	1.66	217.452	0.951
94	Runisaudpur	132	657.156	2.874	419.719	1.836
95	SKMCH	132	1451.756	6.35	1154.341	5.049
96	Buxar	132	516.232	2.258	281.042	1.229

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
97	Aurangabad	132	1119.339	4.896	905.761	3.962
98	Tekari	132	945.554	4.136	532.146	2.328
99	Goh	132	630.781	2.759	341.02	1.492
100	Arwal	132	703.193	3.076	378.062	1.654
101	Hulasganj	132	677.743	2.964	393.298	1.72
102	Wajirganj	132	967.524	4.232	552.648	2.417
103	Nalanda	132	262.132	1.147	138.687	0.607
104	Ekanagarsarai	132	885.699	3.874	540.852	2.366
105	Digha	132	1435.183	6.277	1001.144	4.379
106	Katra	132	1157.853	5.064	713.676	3.122
107	Gangawara	132	615.528	2.692	386.183	1.689
108	Madhepura	132	1376.195	6.019	1020.448	4.463
109	Sonbarsa	132	521.79	2.282	296.938	1.299
110	Mashrakh	132	528.416	2.311	321.547	1.406
111	Dalsingsarai	132	821.748	3.594	480.901	2.103
112	Kusheshwarnath	132	506.862	2.217	278.614	1.219
113	Jagdispur	132	572.633	2.505	332.32	1.454
114	harbauth	132	914.671	4.001	562.681	2.461
115	Jandaha	132	461.864	2.02	368.548	1.612
116	Imamganj	132	612.322	2.678	332.645	1.455
117	Tetha	132	1688.354	7.385	1022.227	4.471
118	Benipati	132	350.335	1.532	313.548	1.371
119	Sheohar	132	302.418	1.323	389.145	1.702
120	Mahanar	132	246.146	1.077	282.478	1.236
121	Belsand	132	906.063	3.963	646.864	2.829
122	Sherghati	132	660.881	2.891	361.425	1.581
123	Paharpur	132	1361.27	5.954	825.454	3.61
124	Ekma	132	388.035	1.697	223.047	0.976
125	Rail Pahiya karkhana	132	552.015	2.414	317.524	1.389
126	Ekma Tap	132	390.204	1.707	224.484	0.982
127	Jhanjha_R	132	939.325	4.108	644.012	2.817
128	Hathidah_R	132	801.038	3.504	478.91	2.095
129	Khagaul_R	132	1905.675	8.335	1542.382	6.746
130	Khusrupur	132	1581.978	6.919	1070.669	4.683

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
131	Arrah_R	132	789.156	3.452	488.804	2.138
132	Mokama_R	132	718.51	3.143	421.03	1.842
133	Dumraon_R	132	625.208	2.735	346.795	1.517
134	Hajipur_R	132	847.263	3.706	731.793	3.201
135	Chhapra_R	132	291.057	1.273	161.272	0.705
136	Kudra_R	132	1330.337	5.819	994.967	4.352
137	Swadesi mll	132	324.968	1.421	182.346	0.798
138	Harinagar sugar mill	132	341.172	1.492	192.612	0.842
139	Karbigahiya	132	1577.662	6.9	1085.006	4.746
140	JahanTrc	132	1301.076	5.691	745.949	3.263
141	ShreeCem	132	1054.94	4.614	823.837	3.603
	Jharkhand					
143	Ranchi New_PG	765	17868.144	13.485	11809.612	8.913
		400	21770.528	31.423	13324.38	19.232
144	Jamshedpur_PG	400	21892.324	31.599	18320.542	26.443
		220	6417.074	16.84	6608.601	17.343
145	Maithon	400	32172.162	46.437	25452.829	36.738
		400	31957.169	46.126	25331.305	36.563
		220	11606.328	30.459	11716.719	30.748
146	MPL	400	21157.223	30.538	18535.415	26.754
147	Chaibasa_PG	400	17160.297	24.769	11239.492	16.223
		220	3896.146	10.225	3480.678	9.134
148	Koderma_D	400	15752.356	22.737	13127.202	18.947
		220	5317.368	13.954	5657.95	14.848
		132	2018.66	8.829	2082.532	9.109
149	BTPS_DVC	400	3679.172	5.31	2103.073	3.036
150	Ranchi_PG	400	24314.426	35.095	15263.247	22.031
		220	6421.735	16.853	6463.054	16.961
151	Chandawa	400	15591.992	22.505	8766.137	12.653
152	Adhunik	400	21797.682	31.462	18240.059	26.327
153	TISCO	400	10920.141	15.762	8509.533	12.282
		132	4876.805	21.33	5527.017	24.174
154	Ramchandrapur	220	6412.24	16.828	6590.089	17.294
		132	2735.964	11.967	2529.379	11.063

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
155	Chandil	220	4746.623	12.457	3410.509	8.95
		132	3106.602	13.588	2484.826	10.868
156	Hatia New	220	4351.751	11.42	3580.931	9.398
		132	2551.419	11.16	2295.538	10.04
157	PTPS	220	3579.528	9.394	3150.452	8.268
		132	1996.693	8.733	1775.614	7.766
158	TTPS	220	2821.742	7.405	3380.148	8.871
159	Lalmatia	220	1722.879	4.521	1213.384	3.184
		132	2028.81	8.874	1345.462	5.885
160	Chaibasa	220	3852.596	10.11	3419.05	8.973
		132	1559.512	6.821	1483.418	6.488
161	Dumka	220	3335.44	8.753	2128.884	5.587
		132	1839.937	8.048	1434.638	6.275
162	CTPS old	220	6685.113	17.544	6557.04	17.208
		132	3903.916	17.075	3592.211	15.712
163	Kalyanaswari	220	11012.309	28.9	10129.706	26.584
		132	4303.949	18.825	4642.378	20.305
164	Jamshedpur_D	220	2384.343	6.257	2047.066	5.372
		132	1924.576	8.418	2031.726	8.886
165	BTPS_D	220	4881.328	12.81	4721.528	12.391
		132	1907.451	8.343	1855.645	8.116
166	CTPS New	220	6898.181	18.103	7075.116	18.567
167	Giridih	220	4101.737	10.764	3445.091	9.041
		132	1515.624	6.629	1762.878	7.711
168	Dhanbad_D	220	6327.709	16.606	5466.772	14.347
		132	1009.176	4.414	984.418	4.306
169	Ramgarh	220	2730.587	7.166	2552.888	6.7
		132	2040.932	8.927	1891.007	8.271
170	Garwah	132	968.18	4.235	876.926	3.836
171	Lahardaga	132	1003.63	4.39	653.63	2.859
172	Gumla	132	711.065	3.11	415.475	1.817
173	Kamdara	132	729.562	3.191	418.545	1.831
174	Hatia old	132	2533.24	11.08	2262.263	9.895
175	Namkum	132	1249.812	5.467	859.68	3.76

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
176	Jmatara	132	1044.903	4.57	597.634	2.614
177	Deoghar	132	735.381	3.216	662.147	2.896
178	Dumka	132	1810.12	7.917	1400.11	6.124
179	Goelkhera	132	536.797	2.348	294.236	1.287
180	Kendposi	132	1176.372	5.145	1097.227	4.799
181	Manique	132	2713.814	11.87	2011.31	8.797
182	Adityapur	132	2698.968	11.805	2178.455	9.528
183	Golmuri	132	1478.423	6.466	894.99	3.915
184	Jaduguda	132	831.361	3.636	460.84	2.016
185	Rajkharsawa	132	1827.158	7.992	1302.551	5.697
186	Noamundi	132	657.139	2.874	444.161	1.943
187	Sikidiri	132	1221.42	5.342	1134.035	4.96
188	Chakradharpur	132	933.138	4.081	549.734	2.404
189	Bakaspur	132	578.106	2.529	321.851	1.408
190	Kanke	132	1453.519	6.357	1033.452	4.52
191	Chaibasa	132	1451.405	6.348	1305.594	5.71
192	Latehar	132	607.749	2.658	372.341	1.629
193	Japla	132	1031.604	4.512	733.67	3.209
194	Sahebganj	132	600.382	2.626	323.908	1.417
195	Pakur	132	388.68	1.7	210.078	0.919
196	Hazaribag	132	673.55	2.946	455.839	1.994
197	Daltonganj	132	418.902	1.832	249.587	1.092
198	Kendposi FD	132	1113.608	4.871	993.016	4.343
199	Tamar	132	660.197	2.888	358.13	1.566
200	Madhupur	132	622.928	2.725	337.143	1.475
201	Manoharpur	132	475.52	2.08	257.904	1.128
202	ECR-Gomia	132	1654.404	7.236	1424.825	6.232
203	Patratu	132	1195.284	5.228	988.364	4.323
204	Mosabani	132	1150.531	5.032	1053.948	4.61
205	Maithon	132	4148.428	18.145	4187.189	18.314
206	Kumardubi	132	3123.745	13.663	2639.639	11.545
207	Panchet	132	2872.487	12.564	2172.906	9.504
208	Patherdih	132	2452.693	10.728	1571.154	6.872
209	Putki	132	2856.289	12.493	1994.649	8.724

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
210	Nimiaghat	132	855.079	3.74	953.063	4.169
211	Barhi	132	1582.479	6.922	1352.495	5.916
212	Koderma	132	1410.912	6.171	1188.459	5.198
213	Konar	132	937.401	4.1	736.671	3.222
214	North karanpur_D	132	819.953	3.586	562.778	2.462
215	Gola	220	2119.599	5.563	1966.193	8.6
		132	2317.465	10.136	620.93	2.716
216	Hazaribag	132	938.831	4.106	1721.686	7.53
217	Ramkanali_D	132	2423.315	10.599	964.936	4.221
218	Manique_D_SW	132	1403.659	6.139	1765.302	7.721
219	Biada_D	132	2505.82	10.96	1935.504	8.466
220	BSL_D	132	2671.84	11.686	560.123	2.45
221	Balihari_D	132	1017.419	4.45	1617.076	4.244
222	Electrosteel_D	220	2484.134	6.519	3636.472	9.543
223	BSL_D	220	4545.539	11.929	1217.787	5.326
224	HEC	132	1721.705	7.531	1709.846	7.479
225	APL	132	2178.157	9.527	965.569	4.223
226	JSPL	132	1178.458	5.154	3985.838	17.434
227	Mal-Impex	132	4002.6	17.507	1402.491	6.134
228	Sindri_SW	132	2242.543	9.809	839.182	3.67
229	Pkant_D	132	1459.102	6.382	1953.551	8.545
230	Rajbera_D	132	2688.891	11.761	811.183	3.548
231	Sermuri_D	132	1260.471	5.513	632.674	2.767
232	Gobindpur_D	132	789.329	3.452	865.759	3.787
233	Lodhma_R	132	1340.085	5.861	549.734	2.404
234	Chakradharpur_R	132	933.138	4.081	829.253	3.627
235	Dalbhumgarh_R	132	1002.126	4.383	531.826	2.326
236	Titisoloi_R	132	863.878	3.778	491.146	2.148
237	Shankarpur_R	132	616.08	2.695	522.831	2.287
238	Jamtara_R	132	928.488	4.061	993.781	4.347
239	RKSNR_R	132	1501.834	6.569	657.089	2.874
240	Tolra_R	132	817.582	3.576	814.489	3.562
241	Manique_R	132	1237.399	5.412	797.607	3.489
242	Dalbhumgarh_R	132	978.628	4.28		

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
243	ECR-Barkakhana_D	132			530.626	2.321
244	ECRRky_D	132	785.228	3.434	1413.558	6.183
245	BSL_D	132	2130.761	9.32	1844.294	8.067
246	Usha Martin	132	2429.612	10.627	713.209	3.119
247	Usha Martin	132	1088.137	4.759	3588.174	15.694
248	CTPS	132	3901.75	17.066	4743.633	130.416
249	ECRLY_DVC	132	1139.907	4.986	635.062	2.778
250	GoelkheraT	132	523.312	2.289	286.173	1.252
	Orissa					
251	Angul_PG	765	22936.654	17.31	19077.35	14.398
		400	28066.492	40.51	23569.844	34.02
252	Jharsuguda_PG	765	26925.666	20.321	18277.545	13.794
		400	19282.568	27.832	13662.825	19.721
253	Jaypore_PG	400	7285.683	10.516	5642.998	8.145
		220	4909.747	12.885	4952.76	12.998
254	Indravati_PG	400	5239.006	7.562	4765.749	6.879
255	Indravati_Hdro	400	5112.42	7.379	4779.31	6.898
256	Rengali_PG	400	19365.573	27.952	15571.537	22.476
		220	8013.192	21.029	7901.83	20.737
257	GMR_3rd	400	19056.763	27.506	17007.105	24.548
258	STPS	400	28630.591	41.325	30559.561	44.109
		220	11035.522	28.961	10737.104	28.178
259	Bisra	400	20867.963	30.12	13482.623	19.46
		220	5859.58	15.377	5517.88	14.481
260	Baripada	400	12583.62	18.163	9306.785	13.433
		220	4677.379	12.275	4992.572	13.102
		132	1769.042	7.738	1919.91	8.397
261	Meramundali	400	26844.588	38.747	23985.931	34.621
		220	8475.156	22.242	7931.689	20.815
		132	1818.024	7.952	1790.342	7.831
		220	9918.911	26.03	9521.023	24.986
262	Sterlite	400	4890.038	7.058	5216.418	7.529

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
		400	2001.053	2.888	1077.356	1.555
		220	8965.874	23.529	8066.191	21.168
263	Dubri New	400	12408.503	17.91	9629.819	13.899
		220	8655.509	22.715	9225.281	24.21
264	Keonjhar	400	6092.474	8.794	4712.334	6.802
		220	2820.437	7.402	3040.204	7.978
265	Bolangir	400	4223.151	6.096	3447.986	4.977
		220	2920.028	7.663	3031.144	7.955
266	IndBharat	400	5492.979	7.928	3098.155	4.472
267	JITPL	400	12930.076	18.663	13396.431	19.336
268	GMR_4	400	18498.878	26.701	15852.291	22.881
269	Mendhasal	400	5184.777	7.484	4596.477	6.634
		220	4382.503	11.501	4974.135	13.054
		132	1172.546	5.129	1266.071	5.538
270	JSPL	400	15810.313	22.82	14678.573	21.187
271	Pandibil	400	5501.236	7.94	4522.636	6.528
		220	2806.493	7.365	2473.881	6.492
272	RSP	220	5188.899	13.617	4099.915	10.759
		132	3721.574	16.278	3785.17	16.556
273	Balimela	220	3856.764	10.121	3371.854	8.849
		220	3881.701	10.187	3396.806	8.914
274	Upper Kolab	220	4377.546	11.488	3892.908	10.216
275	Usileru	220	6804.314	17.857	5699.167	14.956
276	Jaynagar	220	4915.334	12.899	4709.429	12.359
		132	1066.686	4.666	1223.789	5.353
		132	1453.471	6.357	1381.311	6.042
		220	4212.578	11.055	3593.753	9.431
277	Therunali	220	4391.623	11.525	3835.343	10.065
		132	1397.531	6.113	1384.938	6.058
278	Bhanjanagar	220	3023.092	7.934	2459.697	6.455
		132	1221.503	5.343	1360.219	5.949
279	Indravati	220	3901.603	10.239	4797.081	12.589
280	Nayagarh	220	2037.029	5.346	1731.679	4.544
281	Chandaka	220	4137.047	10.857	4603.512	12.081

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
		132	2215.079	9.688	2735.396	11.964
		132	2057.499	8.999	2322.257	10.157
282	TTPS	220	12383.667	32.499	10735.038	28.172
		132	3985.702	17.433	4515.998	19.752
283	Tarkera	220	6620.975	17.376	5894.3	15.469
		132	4479.346	19.592	4781.499	20.914
284	Duburi	220	8022.279	21.053	7885.484	20.694
		132	2694.01	11.783	2743.209	11.998
284	Joda	220	3519.742	9.237	2814.206	7.385
		132	2304.115	10.078	2220.886	9.714
286	Chandiposh	220	3318.91	8.71	2164.282	5.68
287	Balasore	220	3139.05	8.238	2877.011	7.55
		132	1411.4	6.173	1674.528	7.324
288	Bidanasi	220	3122.669	8.195	2800.18	7.349
		132	3037.74	13.287	3045.777	13.322
289	Barkote	220	3181.886	8.35	2535.16	6.653
290	Budhipadar	220	13968.626	36.658	13787.209	36.182
		132	4682.123	20.479	4683.491	20.485
291	Katapali	220	4470.471	11.732	3575.012	9.382
		132	3432.402	15.013	3135.979	13.716
292	Narendrapur	220	2327.512	6.108	2239.255	5.877
		132	1642.763	7.185	1888.203	8.259
293	Bolangir New	220	1031.652	2.707	984.559	2.584
		132	776.842	3.398	921.723	4.031
294	Atri	220	3662.537	9.612	3568.568	9.365
		132	263.235	1.151	339.999	1.487
295	Samangara	220	1978.306	5.192	1734.245	4.551
		132	1409.401	6.165	1406.28	6.151
296	Bhadrak	220	2549.901	6.692	2361.946	6.199
		132	1461.783	6.394	1756.657	7.683
297	Paradip	220	2012.011	5.28	1845.563	4.843
		132	1388.029	6.071	1569.234	6.864
298	Lakshmipur	220	3352.595	8.798	2610.439	6.851
299	Lapanga	220	7501.659	19.687	5936.415	15.579

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
		132	4672.827	20.438	4302.721	18.82
300	MSL	220	6475.74	16.994	5686.889	14.924
301	Basundhara	132	2701.791	7.09	1654.529	4.342
302	Bangaripusi	132	832.65	3.642	641.637	2.806
303	BPPL	132	2197.468	9.611	2033.023	8.892
304	Damanjodi	132	502.259	2.197	338.208	1.479
305	Chatrapur	132	1425.072	6.233	1553.879	6.796
306	IRE	132	1192.229	5.215	1086.899	4.754
307	Aska	132	1093.992	4.785	1228.828	5.375
308	Berhampur	132	1395.366	6.103	1544.242	6.754
309	Ganjam	132	1014.203	4.436	920.922	4.028
310	Mohana	132	615.783	2.693	620.623	2.715
311	Phulbani	132	347.069	1.518	410.189	1.794
312	Balugaon	132	501.262	2.192	555.384	2.429
313	Khurda	132	577.943	2.528	708.887	3.101
314	Puri	132	1108.201	4.847	1278.104	5.59
315	Cuttack	132	606.696	2.654	734.53	3.213
316	Nimapada	132	1303.768	5.703	1426.365	6.239
317	Bhubaneswar	132	1941.766	8.493	2274.911	9.95
318	Chowdhwar	132	2939.821	12.858	2980.326	13.036
319	Dhenkanal	132	1223.048	5.349	1213.321	5.307
320	Chainpal	132	3523.022	15.409	3708.415	16.22
321	Angul	132	2270.096	9.929	2196.379	9.607
322	Nandira (MCL)	132	1432.154	6.264	1028.257	4.497
323	Nuapatna	132	384.764	1.683	455.904	1.994
324	BAMINPL	132	1151.894	5.038	732.603	3.204
325	Jajpur Road	132	1909.197	8.351	1860.274	8.137
326	Kendrapara	132	852.715	3.73	1013.311	4.432
327	Jaleswar	132	486.277	2.127	563.598	2.465
328	Baripada	132	1218.192	5.328	1320.496	5.776
329	Rairangpur	132	612.056	2.677	631.092	2.76
330	Palapanga	132	806.84	3.529	868.179	3.797
331	Nalda_R	132	571.44	2.499	461.738	2.02
332	Rourkela	132	4138.794	18.103	4171.695	18.246

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
333	Grid_Steel	132	2910.463	12.73	2967.933	12.981
334	Jharsuguda	132	3595.558	15.726	3371.152	14.745
335	Brajrajnagar	132	2031.095	8.884	1776.735	7.771
336	Rajgangpur	132	2605.312	11.395	2512.589	10.99
337	Sambalpur	132	1586.088	6.937	1506.864	6.591
338	Burla	132	3784.011	16.551	3549.494	15.525
339	Somnathpur	132	90.151	0.394	116.017	0.507
340	Bolangir	132	776.842	3.398	921.723	4.031
341	Saintala	132	474.458	2.075	491.728	2.151
342	Khariar	132	223.814	0.979	296.751	1.298
343	Tentulikhunti	132	450.601	1.971	501.553	2.194
344	Kalugaon	132	2043.552	8.938	1750.146	7.655
345	Dighapahari	132	726.442	3.177	766.891	3.354
346	Jagatsinghpur	132	488.225	2.135	519.212	2.271
347	Marshaghai	132	861.498	3.768	926.498	4.052
348	Rairakhol	132	284.016	1.242	290.441	1.27
349	FAP_Joda	132	2243.116	9.811	2109.503	9.227
350	Junagarh	132	217.147	0.95	280.084	1.225
351	Sundargarh	132	1756.735	7.684	1418.933	6.206
352	Boinda	132	734.545	3.213	715.874	3.131
353	Chend	132	3470.352	15.179	3333.063	14.578
354	Chandikhol	132	503.907	2.204	563.374	2.464
355	Umerkote	132	229.869	1.005	274.578	1.201
356	Soro	132	654.973	2.865	722.957	3.162
357	Pattamundai	132	611.258	2.674	665.268	2.91
358	Akhusingarh	132	486.025	2.126	502.399	2.197
359	HMSwitch(Kharagprasad)	132	392.42	1.716	454.107	1.986
360	Paralakhemundi	132	256.104	1.12	293.4	1.283
361	Sonepur	132	383.173	1.676	457.668	2.002
362	Ranasinghpur	132	1183.035	5.174	1372.475	6.003
363	Kalrangi	132	1009.833	4.417	893.83	3.909
364	Kamakhyanagar	132	1520.359	6.65	1297.26	5.674
365	Jajpur	132	633.371	2.77	732.206	3.203
366	Bolani	132	970.634	4.245	831.605	3.637

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
367	Sunabeda	132	534.085	2.336	565.683	2.474
368	Patnagarh	132	447.571	1.958	544.773	2.383
369	Padampur	132	302.837	1.325	316.182	1.383
370	Bolangir	132	756.027	3.307	908.675	3.974
371	EMAMI	132	90.425	0.396	116.533	0.51
372	Salepur	132	547.474	2.395	564.092	2.467
373	Balugaon_T	132	296.953	1.299	335.524	1.468
374	Bargarh	132	1119.262	4.896	1263.087	5.525
375	Phulnakhara	132	854.012	3.735	892.573	3.904
376	Karanjia	132	515.101	2.253	536.852	2.348
377	Banki	132	234.253	1.025	295.017	1.29
378	Kesinga	132	373.202	1.632	469.31	2.053
379		132	326.282	1.427	320.053	1.4
380	Mania	132	1153.177	5.044	934.998	4.09
381	Anandpur	132	816.325	3.57	754.609	3.301
382	Barpali	132	838.513	3.668	821.506	3.593
383	Bansapanai	132	1981.233	8.666	1687.348	7.38
384	Barbil	132	641.883	2.808	560.896	2.453
385	Saliban	132	369.546	1.616	395.642	1.73
386	Purushottampur	132	1120.703	4.902	1034.25	4.524
387	Chandipur	132	368.36	1.611	411.951	1.802
388	konark	132	799.825	3.498	766.547	3.353
389	Samuka	132	743.505	3.252	794.743	3.476
390	Arugul	132	248.049	1.085	323.401	1.415
391	Nuapara	132	158.167	0.692	210.13	0.919
392	Dabugaon	132	307.62	1.345	333.374	1.458
393	Boudh	132	260.872	1.141	277.771	1.215
394	kuchinda	132	1053.038	4.606	865.238	3.784
395	Bhawanipatna	132	269.652	1.179	327.675	1.433
396	Kalarangi Tap	132	1471.885	6.438	1221.971	5.345
397	Kesura	132	965.021	4.221	1068.257	4.672
398	Rengali_PH_G	220	8005.607	21.009	6872.858	18.037
399	PPL	132	1157.337	5.062	1074.581	4.7
400	ITPS	220	8944.515	23.473	8442.111	22.155

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
401	NINL	220	5964.736	15.653	5234.266	13.736
402	Bhusan Steel	220	9226.538	24.213	8955.761	23.503
403	TSIL	220	2932.844	7.697	2266.716	5.949
404	Jindal Steel	220	7706.932	20.225	7776.777	20.409
405	VISA	220	5124.682	13.449	4320.153	11.337
406	Rohit ferro	220	6431.119	16.877	5567.235	14.61
407	SPS	220	9887.871	25.949	7985.677	20.957
408	Veda_G	220	11549.529	30.31	12580.027	33.014
409	Utkal_Aluminium	220				
410	NALCO	220	12871.504	33.779	13436.155	35.261
411	BSSL	220	14259.951	37.423	13558.097	35.581
412	JSPL	220	2883.685	7.568	2095.792	5.5
413	Tata Steel	220	7565.641	19.855	7243.145	19.008
414	ESSAR	220	1870.707	4.909	1642.858	4.311
415	IOCL	220	1822.356	4.782	1577.405	4.14
416	Hindalco	220	8141.884	21.367	8522.521	22.366
417	BPRL	132	2151.433	9.41	1804.001	7.89
418	MSL	132	1715.318	7.503	1261.426	5.517
419	IMFA	132	1313.268	5.744	1225.454	5.36
420	ICCL	132	2903.581	12.7	3139.601	13.732
421	FCI	132	2231.172	9.759	1659.154	7.257
422	FACOR	132	1396.742	6.109	1616.183	7.069
423	Balasore Alloy	132	1180.548	5.164	1135.855	4.968
424	Birla Tyr	132	1286.12	5.625	1354.297	5.924
425	Hindalco	132	3809.473	16.662	4319.745	18.894
426	Chiplima	132	2718.279	11.889	2320.952	10.152
427	ACC	132	1051.327	4.598	1125.388	4.922
428	CTC	132	1857.857	8.126	2053.84	8.983
429	SGEL	132	385.621	1.687	435.765	1.906
430	Action Ispath	132	3415.457	14.939	3207.437	14.029
431	L&T Cemco	132	2152.081	9.413	1489.454	6.515
432	PowerMax	132	330.37	1.445	353.822	1.548
433	OCL	132	2543.248	11.124	2425.949	10.611
434	ARATI	132	1053.764	4.609	1065.405	4.66

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
435	SamalMtl	132	388.891	1.701	444.479	1.944
436	NBVL	132	394.399	1.725	459.61	2.01
437	MCL	132	2055.538	8.991	1311.148	5.735
438	HindMetals	132	390.7	1.709	449.383	1.966
439	OPTCL	132	1711.406	7.485	1242.584	5.435
440	BC_Monty	132	1788.017	7.821	1342.254	5.871
441	Tomka_Tr	132	1188.186	5.197	762.256	3.334
442	JKPaper	132	1063.562	4.652	847.081	3.705
443	IFFCO	132	1267.624	5.544	1411.543	6.174
444	HAL	132	529.392	2.315	555.206	2.428
445	VVC	132				
446	PPT	132	1113.719	4.871	1000.497	4.376
447	Vedanta	132	787.133	3.443	891.93	3.901
448	Rungta	132	1379.492	6.034	1094.667	4.788
449	BRG	132	1581.191	6.916	1377.304	6.024
450	Machakunda	132	1039.814	4.548	1132.458	4.953
451	Machakunda Road_SW	132	396.749	1.735	248.739	1.088
452	Maheshwari	132	1548.512	6.773	1238.635	5.418
453	RAWMET	132	1314.89	5.751	974.609	4.263
454	ShyamDRI	132	1861.71	8.143	1507.135	6.592
455	AryanISt	132	3121.933	13.655	2499.204	10.931
456	Rathi	132	2055.363	8.99	1493.8	6.534
457	Sriganesh	132	1370.031	5.992	1008.529	4.411
458	Arya	132	758.75	3.319	641.294	2.805
459	BRP_St	132	651.926	2.851	502.492	2.198
460	Menaksh	132	503.016	2.2	406.815	1.779
461	MSP	132	466.664	2.041	445.885	1.95
462	OCL_TA	132	1013.297	4.432	817.353	3.575
463	B-Rtap	132	415.347	1.817	246.242	1.077
464	Basta	132	779.941	3.411	796.714	3.485
465	SMC	132	2341.671	10.242	1737.294	7.599
466	JambyFe	132	2175.439	9.515	1639.868	7.173
467	BEEKAY	132	818.345	3.579	454.315	1.987
468	Rajgangpur_R	132	2445.851	10.698	2231.434	9.76

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
469	Rambha_R	132	719.806	3.148	493.903	2.16
470	Solari_R	132	424.674	1.857	397.024	1.737
471	Kaipada_R	132	505.098	2.209	509.109	2.227
472	Jhakpur_R	132	1464.576	6.406	1006.632	4.403
473	Bhadrak_R	132	1135.168	4.965	1029.683	4.504
474	Balasore-R	132	1263.581	5.527	1304.22	5.704
475	Jaleswar_R	132	475.227	2.079	534.764	2.339
476	Bhulta_R	132	1036.86	4.535	592.613	2.592
477	Nuagaon_R	132	870.145	3.806	494.486	2.163
478	Jharsuguda_R	132	3550.395	15.529	3291.984	14.399
479	Kendrapara_R	132	2229.584	9.752	1803.196	7.887
480	Jornda_R	132	780.622	3.414	571.483	2.5
481	Meramundali_R	132	388.416	1.699	443.2	1.938
482	Jagannath_R	132	1609.434	7.039	1801.201	7.878
483	JayNagar_R	132	1052.908	4.605	1187.161	5.192
484	Padwa_R	132	333.536	1.459	200.915	0.879
485	Manbar_R	132	609.227	2.665	444.101	1.942
486	MalinG_R	132	815.558	3.567	709.885	3.105
487	CHKSM-R	132	707.666	3.095	558.912	2.445
488	Dhmraptr_R	132	449.677	1.967	272.36	1.191
489	Dhmra_R	132	653.077	2.856	437.832	1.915
490	Goreknath_R	132	410.407	1.795	370.053	1.619
491	Bamra_R	132	395.602	1.73	232.532	1.017
492	Keonjhor_R	132	586.39	2.565	480.318	2.101
	West Bengal					
493	Jeerat	400	10122.4	14.61	9610.128	13.871
		220	8659.848	22.726	9811.032	25.747
		132	3911.257	17.107	4591.481	20.083
494	Arambag	400	12069.987	17.422	10539.745	15.213
		220	8465.526	22.216	9389.458	24.641
		132	2642.367	11.557	3359.067	14.692
495	Durgapur	400	13014.213	18.784	10871.79	15.692
496	Kharagpur	400	12112.887	17.483	9467.068	13.665
		220	4839.225	12.7	5328.511	13.984

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
		132	1674.614	7.325	1996.976	8.735
497	Raghunathpur	400	13624.058	19.665	8749.797	12.629
498	Purullia pump storage	400	7275.865	10.502	7789.566	11.243
499	Bidhannagar	400	21869.886	31.566	16771.393	24.207
		220	11770.19	30.889	12354.549	32.422
		132	3964.681	17.341	4693.522	20.529
500	Kolaghat	400	12760.778	18.419	12642.053	18.247
		220	7084.034	18.591	8420.891	22.099
		132	2421.997	10.593	3081.087	13.476
501	Bakreswar	400	8420.592	12.154	8253.222	11.912
		220	8830.721	23.175	9128.667	23.957
502	sagardighi	400	18981.945	27.398	17777.225	25.659
		220	5850.933	15.355	6313.614	16.569
503	Haldia	400	5271.335	7.609	4994.825	7.209
504	Parulia	400	25044.32	36.148	19263.226	27.804
		400	25043.79	36.148	19264.068	27.805
		220	9884.008	25.939	10036.425	26.339
		220	9884.008	25.939	10036.425	26.339
505	Malda	400	16888.894	24.377	12656.236	18.268
		220	5399.673	14.17	5843.525	15.335
		132	2165.532	9.472	2632.581	11.515
506	Binaguri	400	19719.681	28.463	14780.451	21.334
		220	7422.336	19.479	7840.123	20.575
507	Subhasgarm_PG	400	7708.643	11.126	8213.051	11.855
		220	6929.923	18.186	8485.044	22.267
508	Mejia	400	15911.321	22.966	14502.561	20.933
509	Farakka	400	29686.164	42.848	28983.767	41.834
		220	4839.521	12.7	5416.843	14.216
510	Alipurduar PG	400	13257.131	19.135	6773.988	9.777
		220	3538.893	9.287	2417.649	6.345
511	Vidyasagar Park	220	1138.163	2.987	819.592	2.151
		132	914.769	4.001	716.539	3.134
512	Dharampur	220	5448.24	14.298	4935.691	12.953
		132	3964.073	17.338	4076.644	17.831

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
513	Domjur	220	4711.746	12.365	4437.431	11.645
		132	2615.744	11.441	3110.591	13.605
514	Gokarna	220	5219.379	13.697	5172.331	13.574
		132	2586.57	11.313	3271.327	14.308
515	Howrah	220	4319.901	11.337	4297.001	11.277
		132	2682.013	11.731	3261.735	14.266
516	Kasba	220	5857.209	15.371	6257.741	16.422
		132	4681.583	20.477	6170.516	26.989
517	Laxmikantapur	220	3328.901	8.736	3332.066	8.744
		132	2178.711	9.529	2697.323	11.798
518	Midnapur	220	3745.209	9.829	3604.409	9.459
		132	1897.914	8.301	2371.682	10.373
519	New Jalpaigudi	220	6406.827	16.814	6419.408	16.847
		132	3423.205	14.973	4095.021	17.911
520	New Haldia	220	2182.106	5.727	2031.373	5.331
		132	1727.991	7.558	1945.744	8.51
521	Rishra	220	4667.088	12.248	4443.889	11.662
		132	3654.515	15.984	4446.557	19.449
522	Satgachia	220	4847.777	12.722	4258.667	11.176
		132	2496.071	10.917	2946.934	12.889
523	Santhaldih	220	5058.043	13.274	5219.541	13.698
		132	1349.726	5.904	1469.886	6.429
524	Asansol	220	2430.511	6.378	2261.241	5.934
		132	1390.086	6.08	1644.609	7.193
525	krishnagar	220	3427.984	8.996	2915.396	7.651
		132	933.037	4.081	1191.328	5.211
526	Bisnupur	220	4040.617	10.604	3847.374	10.097
		132	1971.043	8.621	2474.833	10.825
527	Calcutta Leather Complex	220	4754.154	12.476	4547.538	11.934
		132	3164.252	13.84	3630.061	15.877
528	Subhasgarm	220	6862.04	18.008	8312.611	21.815
		132	1864.803	8.156	2282.729	9.984
529	New Town Action Area-3	220	5599.642	14.695	5654.026	14.838
		132	1757.761	7.688	2169.841	9.491

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
530	Hura	220	2306.648	6.053	1550.99	4.07
		132	749.446	3.278	928.844	4.063
531	Foundary Park	220	4376.698	11.486	4220.886	11.077
		132	1617.113	7.073	1976.901	8.647
532	Dalkhola	220	6495.74	17.047	5195.751	13.635
		132	2104.59	9.205	2415.163	10.564
533	DTPS (Waria)	220	10813.729	28.379	9984.014	26.201
		132	3954.163	17.295	4348.886	19.021
534	Barjora	220	8081.559	21.209	7525.809	19.75
		132	1045.138	4.571	1035.226	4.528
535	Parullia_D	220	10051.145	26.377	10091.746	26.484
536	J K Nagar	220	3282.872	8.615	2984.294	7.832
537	Durgapur(Muchipara)	220	8364.677	21.952	7575.084	19.879
538	Burnpur	220	4826.137	12.665	3547.242	9.309
539	Mejia	220	11319.439	29.706	12033.181	31.579
540	DPL	220	8626.641	22.639	8593.196	22.551
		132	3593.718	15.718	4353.798	19.043
541	BBGS_C	220	2716.063	7.128	2769.329	7.268
		220	2867.158	7.524	3239.867	8.502
		132	2188.003	9.57	2778.832	12.154
		132				
542	EMSS_C	220	4527.407	11.881	5188.814	13.617
		220	2720.567	7.14	2776.031	7.285
		132	4677.886	20.46	6169.642	26.985
		132	4677.896	20.46	6169.657	26.985
		132	3873.956	16.944	4974.828	21.759
543	NCGS_C	220	3956.03	10.382	4555.224	11.954
		132	3431.671	15.01	4423.585	19.348
		132	3431.671	15.01	4423.584	19.348
544	Birpara	220	6105.194	16.022	5324.91	13.974
		132	1804.681	7.893	2169.524	9.489
555	Siliguri	220	6738.314	17.683	6509.302	17.082
		132	3131.969	13.699	3433.121	15.016
556	Dalkhola	220	6579.53	17.267	5259.448	13.802

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
557	Adisaptagram	132	728.443	3.186	919.144	4.02
558	Alipurduar	132	746.649	3.266	868.338	3.798
559	AshokNagar	132	2313.195	10.118	2330.863	10.195
560	Balurghat	132	568.997	2.489	542.888	2.375
561	Bankura	132	1073.265	4.694	1142.987	4.999
562	Barasat	132	1023.814	4.478	1182.087	5.17
563	Basithpur	132	1113.167	4.869	1151.643	5.037
564	Joka	132	1864.157	8.154	2040.621	8.925
565	Berhampore	132	1676.937	7.335	1880.268	8.224
566	Birpara	132	1786.32	7.813	2132.216	9.326
567	Bishnupur	132	1850.59	8.094	2205.006	9.644
568	Bolpur	132	911.839	3.988	1095.019	4.789
569	Bongaon	132	1464.579	6.406	1403.287	6.138
570	C k Road	132	618.7	2.706	686.252	3.002
571	Lebong	132	1142.659	4.998	763.153	3.338
572	Debagram	132	622.623	2.723	670.667	2.933
573	Dhulian	132	739.203	3.233	839.916	3.674
574	Egra	220	1839.363	4.827	1861.41	4.885
		132	1398.721	6.118	1737.432	7.599
575	Food Park	132	593.454	2.596	394.1	1.724
		132	610.873	2.672	409.558	1.791
576	SaltLake GIS	132	1260.537	5.513	1171.426	5.124
577	Bajkul	132	973.361	4.257	703.838	3.078
578	Falta	132	1636.088	7.156	1732.127	7.576
579	Haldia	132	1684.34	7.367	1894.263	8.285
580	Hizlee	132	753.881	3.297	864.826	3.783
581	Kalyani	132	2621.694	11.467	2304.668	10.08
582	Katwa	132	1068.686	4.674	1178.979	5.157
583	Khanyan	132	1980.02	8.66	1657.585	7.25
584	Kolaghat	132	2181.16	9.54	2582.034	11.293
585	Lilooah	132	2342.64	10.246	2779.739	12.158
586	Malda	132	1933.623	8.457	2295.166	10.039
587	Mankar	132	1650.084	7.217	1669.055	7.3
588	Myanaguri	132	1011.37	4.424	1087.02	4.754

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
589	North Bengal University	132	2796.987	12.234	2862.271	12.519
590	Pingla	132	975.417	4.266	1129.089	4.938
591	Purulia	132	871.929	3.814	1075.132	4.702
592	Raiganj	132	1290.4	5.644	1244.344	5.443
593	Raina	132	1328.915	5.812	1350.248	5.906
594	Rampurhat	132	530.156	2.319	626.358	2.74
595	Ranaghat	132	1781.409	7.792	1866.948	8.166
596	Mathabang	132	391.955	1.714	470.96	2.06
597	SaltLake	132	2343.973	10.252	2343.381	10.25
598	Samsi	132	548.15	2.398	658.613	2.881
599	Siliguri	132	2387.072	10.441	2395.573	10.478
600	Sonarpur	132	2415.201	10.564	2376.478	10.394
601	Tamluk	132	1580.493	6.913	1625.964	7.112
602	Tarkeshwar	132	1288.306	5.635	1410.121	6.168
603	Titagarh	132	1674.357	7.323	1797.893	7.864
604	Ukhra	132	1935.336	8.465	1962.683	8.585
605	Uluberia	132	1423.284	6.225	1546.431	6.764
606	Sirakol	132	1592.771	6.967	1652.645	7.228
607	Cossipur	132	1105.267	4.834	867.639	3.795
608	Balichak	132	1052.827	4.605	938.7	4.106
609	TCF-1	132				
610	Hind Motor	132	1717.4	7.512	1182.335	5.171
611	Dankuni	132	1333.72	5.834	846.859	3.704
612	Debagram	132	572.281	2.503	562.903	2.462
613	Balurghat	132	1536.491	6.72	1307.605	5.719
614	Modern	132	1579.14	6.907	1555.376	6.803
615	Jangipara	132	1713.999	7.497	1625.748	7.111
616	Chanditala	132	3229.596	14.126	3397.053	14.858
617	Gangarampur	132	588.473	2.574	636.375	2.783
618	Birsingha	132	1520.117	6.649	1535.808	6.717
619	Coochbehar	132	723.621	3.165	896.74	3.922
620	Belmuri	132	1009.715	4.416	1143.586	5.002
621	Barjora	132	970.595	4.245	957.043	4.186
622	Chalsa	132	860.015	3.762	861.812	3.769

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
623	Mechand	132	892.327	3.903	993.477	4.345
624	Raghunathpur	132	581.002	2.541	677.036	2.961
625	Amtala	132	862.776	3.774	991.818	4.338
626	Contai	132	989.583	4.328	1051.03	4.597
627	Haldia NIZ	132	1174.251	5.136	1146.129	5.013
628	Jhargram	132	916.422	4.008	957.027	4.186
629	Lalgola	132	1160.458	5.076	1094.778	4.788
630	Najirpur	132	758.286	3.317	852.407	3.728
631	Bighati	132	3351.472	14.659	3259.92	14.258
632	RMBLK	132	752.526	3.291	534.236	2.337
633	TMBL	132	679.811	2.973	463.363	2.027
634	Farakka	132	1042.309	4.559	1174.275	5.136
635	Khatri	132	753.762	3.297	841.308	3.68
636	Kalna	132	1606.716	7.028	1525.755	6.673
637	Kakdwip	132	914.145	3.998	898.321	3.929
638	Kurseong	132	430.954	1.885	242.386	1.06
639	Bagnan	132	1272.383	5.565	1308.299	5.722
640	Sonarlal	132	1009.405	4.415	726.176	3.176
641	Saintia	132	634.265	2.774	754.1	3.298
642	New Town Action Area-1	132	1505.62	6.585	1693.126	7.406
643	Ujanu	132	2191.044	9.583	2170.321	9.493
644	BEL CCp	132	785.536	3.436	848.287	3.71
645	Belmuri	132	809.705	3.542	751.293	3.286
646	Burdwan	132	1110.374	4.857	996.608	4.359
647	Bagmundi	132	358.391	1.568	337.153	1.475
648	Kharagpur	132	712.076	3.115	463.372	2.027
649	Howrah	132	697.207	3.049	509.239	2.227
650	Kalapahari	132	2721.497	11.903	1834.729	8.025
651	Purulia	132	1497.402	6.549	927.813	4.058
652	Bandel	132	4286.431	18.748	4460.658	19.51
653	Jamuria	132	1241.613	5.431	711.614	3.113
654	ASP	132	3211.147	14.045	2869.182	12.549
655	DPL A Zone	132	2335.209	10.214	2159.377	9.445
656	DPL B Zone	132	3395.916	14.853	3933.551	17.205

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
657	DPL AB Zone	132	3422.88	14.971	3876.241	16.954
658	DPL C Zone	132	2993.224	13.092	3130.033	13.69
659	DPL C1 Zone	132	2921.58	12.779	2914.777	12.749
660	Bamunara	132	2123.798	9.289	1821.674	7.968
661	NCGS_C	132	3431.671	15.01	4423.584	19.348
662	SRS_C	132	1653.004	7.23	2210.594	9.669
		132	1653.004	7.23	2210.594	9.669
663	TRS_C	132				
		132	3037.92	13.287	3850.909	16.843
664	Majerhat_C	132	1726.285	7.551	2316.052	10.13
665	BT Road_C	132	3233.907	14.145	4065.017	17.78
		132	3485.754	15.246	4507.291	19.714
666	Princep Street_C	132	1514.59	6.625	2015.231	8.814
		132	1514.591	6.625	2015.234	8.814
		132				
		132	1514.593	6.625	2015.236	8.814
667	East calcutta_C	132	4219.014	18.453	5578.786	24.401
		132	1410.16	6.168	1852.487	8.103
668	Rishra_C	132	3112.743	13.615	3776.135	16.516
669	Taratala_C	132	1727.289	7.555	2315.892	10.129
670	Chakmir_C	132	1763.216	7.712	2355.688	10.303
671	Jadavpur_C	132	3375.662	14.765	4227.66	18.491
		132	1611.53	7.049	2135.628	9.341
672	BBD Bag_C	132	1491.552	6.524	1979.012	8.656
673	Botanical garden_C	132	1619.526	7.084	2162.684	9.459
674	Belur_C	132	2248.658	9.835	2679.671	11.721
675	Park Lane_C	132	3766.277	16.473	4811.546	21.045
		132	3766.286	16.473	4811.562	21.045
676	DumDum_C	132	3934.167	17.208	5171.348	22.619
677	Patuli_C	132	3766.28	16.473	4814.759	21.059
678	Park Circus_C	132	4072.805	17.814	5266.454	23.035
679	Majerhat_C	132	1726.284	7.551	2316.049	10.13
680	Kalingpong	66	377.189	3.3	292.221	2.556
681	Alipurduar	66	166.36	1.455		

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
682	Birpara	66	326.833	2.859		
683	Jali	66	247.365	2.164	311.403	2.724
		66	248.099	2.17	291.822	2.553
684	Chalsa	66	267.283	2.338	189.849	1.661
685	Salakati NER	220	5034.082	13.211	5382.307	14.125
686		220	3857.986	10.125	3797.979	9.967
687	Rammam	132	1436.336	6.282	1196.532	5.233
688	Rohit ferro	132				
689	WBIDC	132	629.037	2.751	417.204	1.825
690	IPCL Haldia	220				
691	Teesta Low Dam	220	1204.642	3.161	737.309	1.935
692	Teesta Low Dam	220	1463.793	3.841	1139.572	2.991
693	RaghunathGanj	132	673.71	2.947	812.732	3.555
694	Madras Cement	132	1741.494	7.617	1602.948	7.011
695	HPCL	132	1653.792	7.233	1781.641	7.793
696	Bencon Street	132	977.361	4.275	944.652	4.132
697	Tata Power	132	1599.175	6.995	1682.726	7.36
698	Khejuria	132	1076.972	4.711	1231.831	5.388
699	Kuli	132	1060.554	4.639	1009.133	4.414
700	Ambuja	132	915.374	4.004	934.947	4.089
		132	886.369	3.877	876.187	3.832
701	BRG Steel	132	314.539	1.376	179.274	0.784
		132	295.76	1.294	167.193	0.731
702	Manaksia	132	1155.018	5.052	1109.776	4.854
703	Hizli TSS	132	746.254	3.264	842.356	3.684
704	Jaysree	132	3096.04	13.542	3079.193	13.468
705	OCL Bishnupur	132	1774.661	7.762	1997.142	8.735
706	Emammi Cement	132	1587.583	6.944	1545.752	6.761
707	Bolpur TSS	132	887.389	3.881	1027.157	4.493
708	Badri Narayan alloy	132	560.793	2.453	358.912	1.57
709	Sonic Thermal	132	1001.598	4.381	951.151	4.16
710	Cresent power	132	1135.499	4.967	1093.017	4.781
711	TGS	132	3037.914	13.287	3850.9	16.843
712	Chakaradharpur_R	132	576.055	2.52	589.489	2.578

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
713	Dhatrigram_R	132	1207.562	5.282	834.043	3.648
714	Katwa_R	132	1006.876	4.404	1038.408	4.542
715	Bankura_R	132	1057.115	4.624	1106.795	4.841
716	Barasat_R	132	954.498	4.175	1011.253	4.423
717	**Sikkim**					
718	Rangpo_PG	400	7905.489	11.411	7987.901	11.53
		220	5138.019	13.484	5951.905	15.62
		132	2024.292	8.854	2046.228	8.95
719	Teesta-5	400	7494.071	10.817	7607.143	10.98
720	Jorethang	220	2482.799	6.516	1855.053	4.868
721	New Melli	220	2235.321	5.866	1616.744	4.243
722	Chuzachen	132	1144.297	5.005	853.265	3.732
723	Rongit	132	1444.29	6.317	1146.193	5.013
		66	144.265	1.262	140.569	1.23
724	Sagbari	132	1438.429	6.291	1137.484	4.975
725	Geyzing	132	959.472	4.197	645.472	2.823
		66	247	2.161	208.279	1.822
726	Gangtok	132	1063.162	4.65	738.512	3.23
727	Melli	132	1406.188	6.15	1090.914	4.772
		66	551.533	4.825	495.741	4.337
728	Gangtok	66	458.045	4.007	385.07	3.368
729	Melli	66	553.98	4.846	492.216	4.306
730	Tadong	66	356.617	3.12	275.144	2.407
731	Bulbuley	66	347.233	3.038	266.006	2.327
732	Sichey	66	341.225	2.985	260.234	2.276
733	Rongli	66	155.399	1.359	111.296	0.974
734	Mamring	66	256.934	2.248	184.367	1.613
735	Namchi	66	300.906	2.632	226.616	1.982
736	Rabangla	66	120.244	1.052	105.704	0.925
737	Rohtak	66	183.009	1.601	126.18	1.104
738	Soreng	66	146.918	1.285	99.519	0.871
739	Lower Lagyep	66	440.76	3.856	364.716	3.19
740	Phudong	66	203.074	1.776	141.645	1.239
741	Geyzing	66	247.095	2.162	208.279	1.822

Sl. No	Substation Name	Rated Voltage	3Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
742	Purano Namchi	66	228.663	2	161.496	1.413
743	Pakyong	66	295.28	2.583	199.673	1.747
744	Pelling	66	233.023	2.038	192.492	1.684
745	Rhenock	66	137.116	1.199	88.599	0.775
746	Mangan	66	136.031	1.19	91.644	0.802
747	Rnipool	66	442.86	3.874	367.15	3.212
748	Topakhani	66	251.473	2.2	180.459	1.579
749	Meyong	66	113.395	0.992	75.591	0.661
750	Rongli	66	155.399	1.359	100.77	0.882