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

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

OPERATIONAL LOAD FLOW STUDIES UNDER SUMMER PEAK LOADING CONDITIONS

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Power Research and Development Consultants Private Limited
5, 11th cross, 2nd stage, west of chord road,
Bangalore - 560 086, Karnataka
Tel: +91- 80-23192159 / 23192168
E-mail – prdc@vsnl.com
Web site: www.prdcinfotech.com

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Prepared by	Ms. Suman Kumari	19.09.2017	
	Mr. Anirban Banerjee		
Reviewed by	Mrs. Debarati Basu	20.09.2017	
Approved by	Dr. Nagaraja Ramappa	20.09.2017	

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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 37871 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 summer peak 2016, summer off peak 2016, winter off peak 2016 and summer peak 2017 loading conditions of ER. The network was updated till 31st May 2016, 31st August 2016, 31st December 2016 and 30th April 2017 for summer peak 2016, summer off peak 2016, winter off peak 2016 and summer peak 2017 loading condition respectively and report was submitted with study results on 27th July 2016 for summer peak loading, 6th January 2017 for summer off peak loading and 3rd April 2017 for winter off peak loading and 21st September 2017 for summer peak case.

As a next phase of the power system studies, the summer 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 30th April 2017 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 132th OCC meeting that the operational Load Flow study for ER grid is carried out for a load generation condition during summer peak condition on an updated network data till April 2017. The load generation condition was selected for two time steps are collected for 4th & 5th May 2017 at 19:00 hours and 20:00 hours respectively.

In 133rd OCC meeting, it was decided that the summer peak load flow study will be carried out with load generation scenario of 4th May 2017 at 20:00 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, 29th December 2106 off peak hours and 4th May 2017 peak hours of ER grid is presented below.

Sl. No.	Constituents	Load (MW)			
		4th May-17, 20:00 hrs	**29th Dec-16, 02:00 hrs**	**27th Aug-16, 13:00 hrs**	**26th May-16, 20:00 hrs**
1	Bihar	3362	2321	2716	3044
2	Jharkhand	1014	914	799	991
3	Odisha	3666	2236	2872	3354
4	Sikkim	57	36	43	75
5	W. Bengal	5854	3176	4858	5460
6	DVC	2494.5	2330	2426	2621
7	CESC	1675.8	558	1507	1441
8	DPL	231	181	217	217
Total Load		18354	11753	15438	17203
loss		749	389	671	762
Total Demand		19103	12142	16109	17965

Load flow analysis and short circuit studies are conducted under summer 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	3362
2	Jharkhand	1014
3	Odisha	3666
4	Sikkim	57
5	W. Bengal	5854
6	DVC	2495
7	CESC	1676
8	DPL	231

Summarized particulars of network data for ER as on 30st April 2017 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 47 with an installed capacity of 36390 MVA
- 220 kV: Number of substation is 105 with an installed capacity of 39140 MVA
- 132 kV: Number of substation is 348 with an installed capacity of 38254 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 28403 MW with a hydro thermal mix of 5.5 : 22.8.The break up is given as,

- Total number of hydro generating units is 91 with an installed capacity of 5598 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 2.06: 92.62.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): 85144 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 Peak Scenario:

- System input (Generation & Import): 25390 MW
- System Demand including losses in ER network : 19103 MW
- Consolidated Export from ER bus : 6287 MW

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

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

Transformer loading: In the entire population overloading of 1 transformer is observed. 76 number of transformers are loaded beyond 80% and 265 numbers are loaded below 20%.

Line loading: Number of lines loaded beyond 100% of thermal capacity is 8 in 220 kV and 132 kV voltage level. Number of lines loaded between 80 to 100% of thermal capacity is 49 predominantly in 220 kV and 132 kV level. Number of lines loaded below 5% thermal capacity is 126 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.

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

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 **37871 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 summer peak load condition. With reference to the discussions with M/s ERPC and its constituents, 4th May 2017 is identified as a typical day with evening peak load at 20:00 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 4th May 2017 20:00 hours, wherein a demand recorded 19103 MW 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 summer 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.

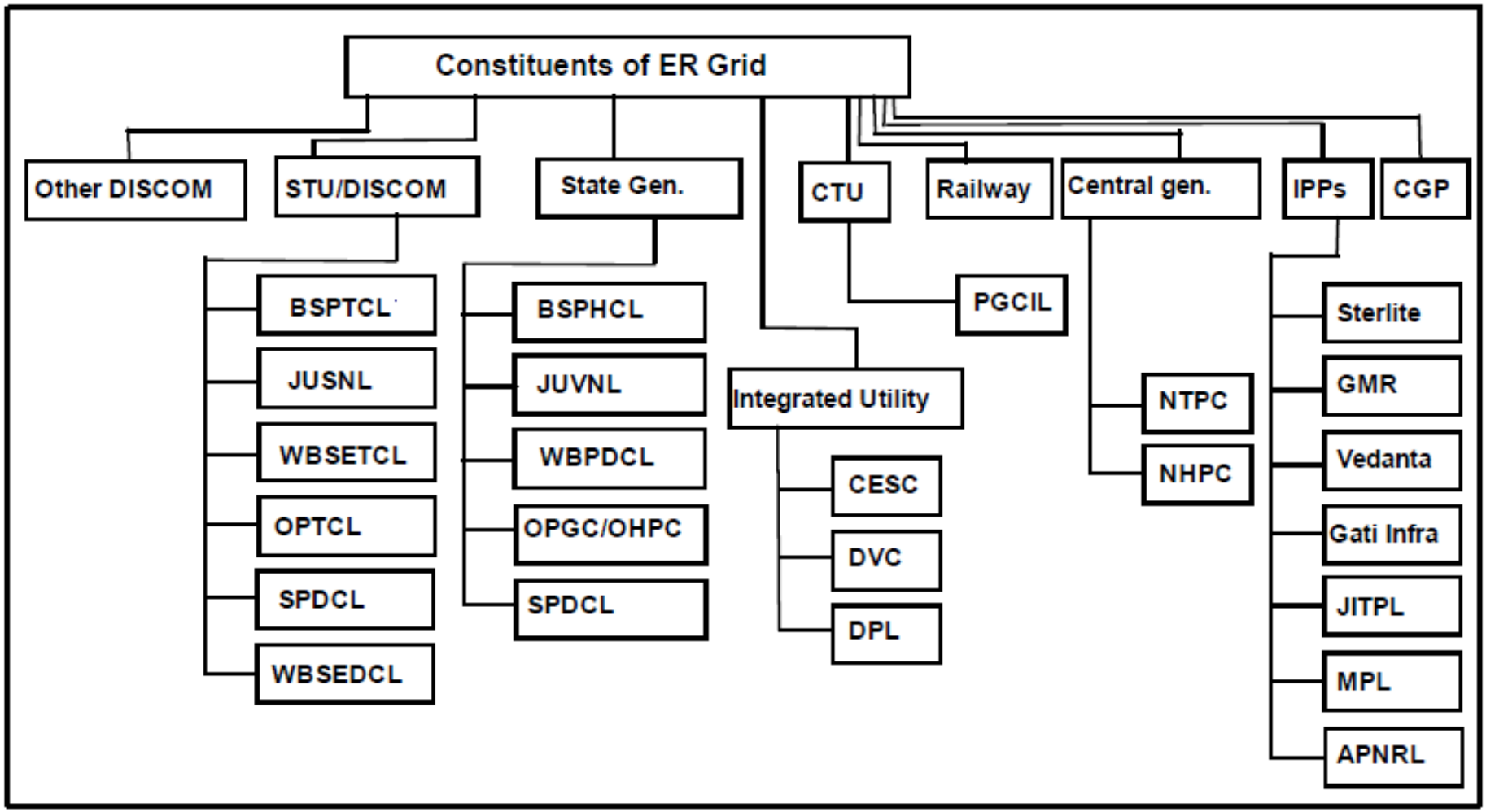
This report includes operational load flow and short circuit study of existing ER grid under summer peak loading condition.

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 132th OCC meeting, it was decided that operational load flow study under summer peak loading scenario will be carried out for load conditions of 04.05.2017 and 05.05.2017 at 19.00 hrs and 20.00 hrs respectively.
- To collect the Eastern grid network data for operational load flow under 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 of ER constituent has been done based on monthly report of CEA and OCC meeting and verified with the data received from concerned utilities.

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	91	0
Jharkhand	74	0
Odisha	62	0
Sikkim	8	0
West Bengal	91	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 and 220kV 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 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 summer peak scenario by taking load demand of 04.05.2017 at 20.00 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	4h May 2017, 20:00 hrs.
System Demand Met	19103 MW
Total Load	18354 MW
System Loss	749 MW
Percentage Loss	2.95%

- Software used : MiP-PSCT

3.2 May 04, 2017 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 Susceptance, B/2 (mho/km/ckt)	Zero Sequence Resistance (ohm/km/ckt)	Zero Sequence Reactance (ohm/km/ckt)	Zero Sequence Susceptance, 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	12	7	13	1	14

Sl. No.	Substation*	State				
		Bihar	Jharkhand	Odisha	Sikkim	W. Bengal
3	220 kV	24	16	26	-	39
4	132 kV	100	47	86	4	111
5	66 kV	-	-	-	19	-
Total No. of S/S in ER				**524**		

Note: If 765/400/220 kV substation has 400/220 kV transformation level also, in that case 765/400/220 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	3014
2	400	34382
3	220	19202
4	132	29225
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	36390
3	220	39140
4	132	38254
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	2072
5	West Bengal	14155	1265
Total ER		**39907**	**5804**
		45711	

**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	3362
2	Jharkhand	1014
3	Odisha	3666
4	Sikkim	57
5	West Bengal	5854
6	DVC	2495
7	CESC	1676
8	DPL	231

**Note: 18354 MW (summation of recorded loads in S/S) on 04.05.2017 at 20:00 hrs in ER grid*

3.6 Generation schedule details for operational load flow

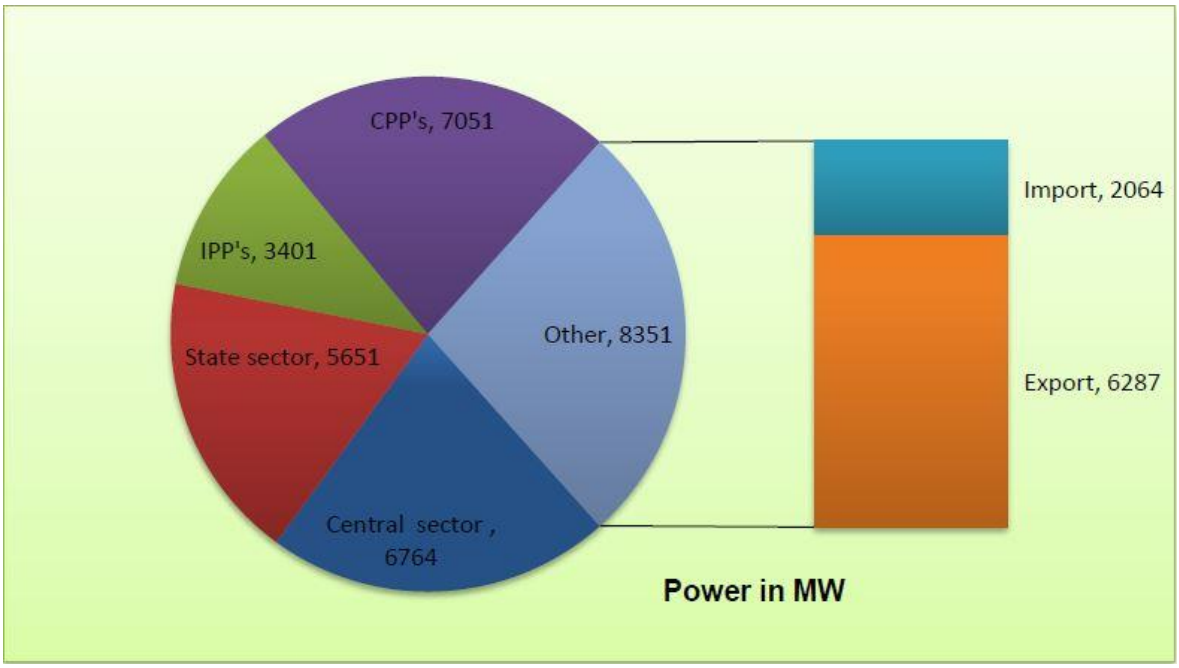
The generation schedule considered was based on the information obtained from the ERLDC and other constituents of ER grid. Power plant wise generation allocation is given in Table 3.14 and graphically represented in figure 3.2.

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	90.0
2		Baruni TPS	BSEB	70.0
3		Kahalgaon	NTPC	1710.0
4		Barh		636.0
5	Jharkhand	Patratu Thermal	JVNL	50.0
6		Tenughat Thermal		124.0
7		Sikidiri Gen		45.0
8		Koderma Thermal	DVC	456.4
9		Chandrapura Thermal		640.0
10		Maithon Dam		34.1
11		Bokaro Thermal		625.0
12		Adhunik Thermal	APNRL	488.0

Sl.no.	State	Station Name	Owned By	Scheduled Generation (MW)
13		Maithon RB Thermal	MPL	513.0
14		Inland Power		62.1
15		ABCIL		24.0
16	Odisha	Upper Kolab	OHPC	240.0
17		indravati		566.0
18		Rengali		187.4
19		Hirakud		95.7
20		Chiplima		22.7
21		Talcher Thermal	NTPC	432.0
22		IB Thermal	OPGC	258.0
23		Balimela	OHPC	326.0
24		Machkund		47.1
25		Talcher Super Thermal	NTPC	1669.0
26		Meenakshi Power		20.0
27		GMR	GMR Kamalanga Energy	997.0
28		Jindal Thermal	JITPL	456.0
29		Sterlite Energy	Vedanta Ltd.	0.0
30		Net CPP Injection to Grid		591.0
31	Sikkim	Rangeet Hydro	NHPC	57.0
32		Teesta 5 Hydro		528.0
33		Teesta 3		714.0
34		Lagit Hydro	Sikkim Gov.	0.0
35		Meyong Hydro		0.0
36		Rongli Hydro		0.0
37		Chuzachen	Gati Infrastructure Pvt. Ltd	72.0
38		Jorethang	DANS Energy Pvt. Ltd.	54.8
39	West Bengal	Bandel Thermal	WBPDCL	322.1
40		Santaldih Thermal		467.0
41		Kolaghat Thermal		544.5
42		Bakreswar Thermal		955.0
43		Sagardighi Thermal		852.0
44		TCF		6.1
45		Purulia Pump Storage Hydro	WBSEDCL	342.8
46		Jaldhaka Hydro		27.0
47		Rammam Hydro		12.2
48		Teesta Load Dam Hydro	NHPC	212.0
49		Farakka Super Thermal	NTPC	1519.9
50		Mejia	DVC	1682.0
51		DTPS		197.5
52		Raghunathpur		349.8
53		Durgapur Steel Thermal		935.0
54		DPL Thermal	DPL	450.0
55		Budge Budge	CESC	690.0
56		SRS		87.0
57		TRS		0.0
58		Haldia Thermal		552.0
59		Net CPP Injection to Grid		124.4

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	23326
2	Import	2064
Total (Generation + Import)		**25390**
3	Loss	749*(2.95%)
4	Load	18354
Demand Met (Load + Loss)		**19103**
5	Export	6287
Total System (Load + Export + Loss)		**25390**

**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	2505
2	Import	3789.6
Total Total(Generation + Import)		6295
3	Loss	134* (2.12%)
4	Load	3362
Demand Met (Load + Loss)		**3496**
5	Export	2799
Total (Load + Export + Loss)		**6295**

**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	1306
2	Import	3202
Total (Generation + Import)		**4508**
3	Loss	38*(0.84%)
4	Load	1014
Demand Met (Load + Loss)		**1052**

Sl. No.	Description	Quantity (MW)
5	Export	3456
Total (Load + Export + Loss)		**4508**

**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	5908
2	Import	1396
Total (Generation + Import)		**7304**
3	Loss	155*(2.12%)
4	Load	3666
Demand Met (Load + Loss)		**3822**
5	Export	3482
Total (Load + Export + Loss)		**7304**

**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	1426
2	Import	0
Total (Generation + Import)		**1426**
3	Loss	14*(0.98%)
4	Load	57
Demand Met (Load + Loss)		**71**
5	Export	1355
Total (Load + Export + Loss)		**1426**

**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	5930
2	Import	3667
Total (Generation + Import)		**9597**
3	Loss	321*(3.35%)
4	Load	5854
Demand Met (Load + Loss)		**6175**
5	Export	3422
Total (Load + Export + Loss)		**9597**

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	5024
2	Import	702
Total (Generation + Import)		**5726**
3	Loss	68*(1.19%)
4	Load	2495
Demand Met (Load + Loss)		**2563**
5	Export	3164
Total (Load + Export + Loss)		**5727**

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	777
2	Import	913
Total (Generation + Import)		**1690**
3	Loss	14*(0.82%)
4	Load	1676
Demand Met (Load + Loss)		**1690**
5	Export	0
Total (Load + Export + Loss)		**1690**

Note: Only for 220 kV and 132 kV transmission network

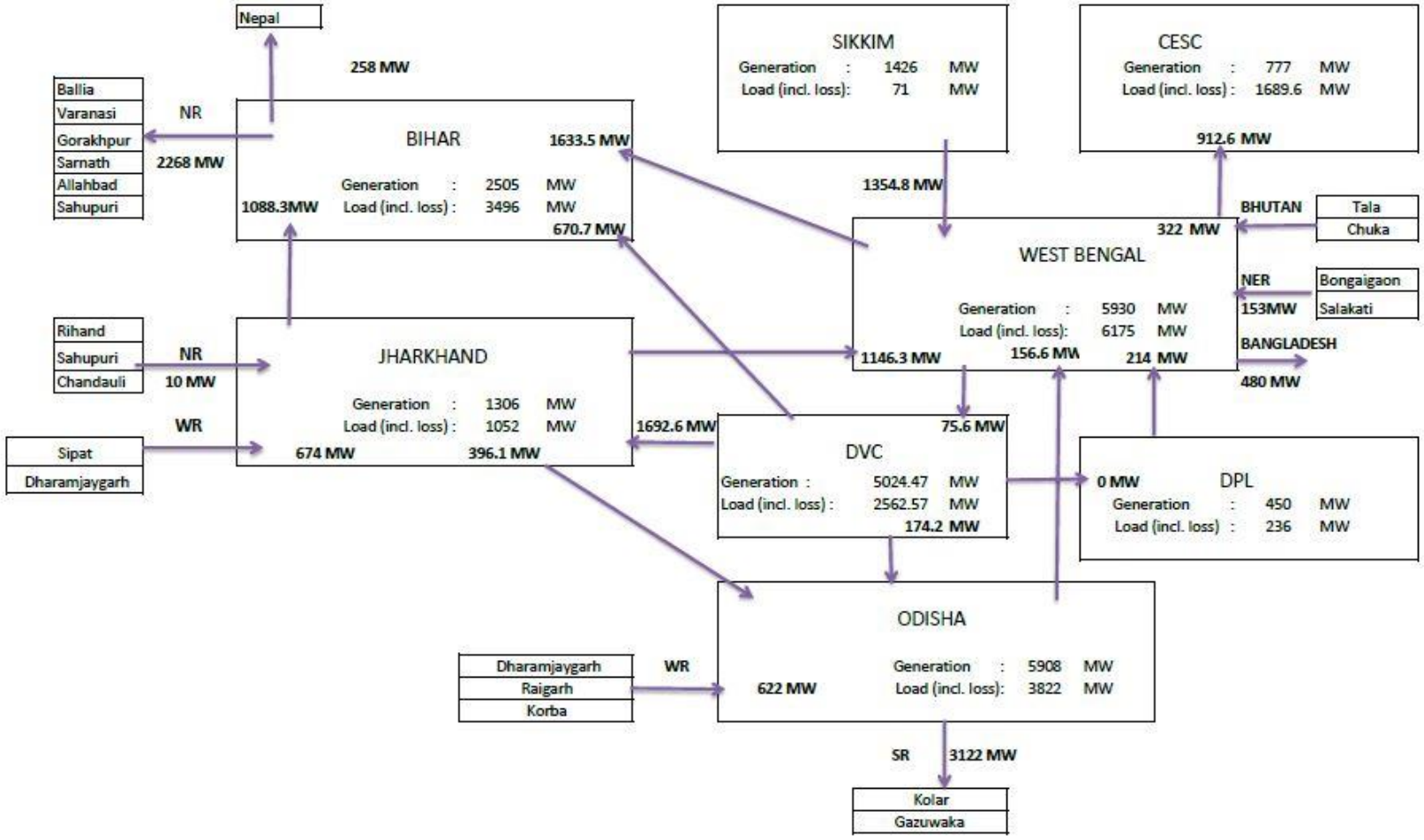
Table 4.9: Load generation balance details of DPL

Sl. No.	Description	Quantity (MW)
1	Generation	450
2	Import	0
Total (Generation + Import)		**450**
3	Loss	5*(1.02%)
4	Load	231
Demand Met (Load + Loss)		**236**
5	Export	214
Total (Load + Export + Loss)		**450**

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 Over 100%	No of lines Over 80%	No of Lines less than 5%
1	765	14.50	4.00	7.00	0	0	3
2	400	81.60	2.10	19.68	0	1	8
3	220	105.00	0.20	30.81	2	7	20
4	132	125.90	0.10	32.09	5	42	89
5	66	26.90	1.30	12.19	0	0	6

Table 4.11: Percentage loading details of lines of Bihar

Sl.No	Voltage Grade (kV)	Loading Percentage					
		Max	Min	Avg	No of lines Over 100%	No of lines Over 80%	No of Lines less than 5%
1	765	11.20	4.70	7.95	0	0	1
2	400	51.60	6.70	21.16	0	0	0
3	220	98.60	13.60	45.92	0	3	0
4	132	99.20	0.10	35.20	0	18	18

Table 4.12: Percentage loading details of lines of Jharkhand

Sl.No	Voltage Grade (kV)	Loading Percentage					
		Max	Min	Avg	No of lines Over 100%	No of lines Over 80%	No of Lines less than 5%
1	765	10.40	5.60	8.00	0	0	0
2	400	38.60	2.10	17.28	0	0	3
3	220	62.30	2.20	21.70	0	0	4
4	132	85.90	0.30	25.07	0	1	11

Table 4.13: Percentage loading details of lines of Odisha

Sl.No	Voltage Grade (kV)	Loading Percentage					
		Max	Min	Avg	No of lines Over 100%	No of lines Over 80%	No of Lines less than 5%
1	765	6.50	4.00	5.20	0	0	2
2	400	56.80	4.00	18.15	0	0	3
3	220	82.50	0.30	25.46	0	1	10
4	132	118.60	0.10	28.22	1	8	34

Table 4.14: Percentage loading details of lines of Sikkim

Sl.No	Voltage Grade (kV)	Loading Percentage					
		Max	Min	Avg	No of lines Over 100%	No of lines Over 80%	No of Lines less than 5%
1	400	81.60	9.60	48.27	0	1	0
2	220	11.90	9.10	10.60	0	0	0
3	132	77.5	3.6	38.22	0	0	1
4	66	44.70	0.10	9.77	0	0	10

Table 4.15: Percentage loading details of lines of West Bengal

Sl.No	Voltage Grade (kV)	Loading Percentage					
		Max	Min	Avg	No of lines Over 100%	No of lines Over 80%	No of Lines less than 5%
1	400	43.10	4.00	20.33	0	0	1
2	220	105.00	0.20	34.00	2	2	3
3	132	125.90	0.40	36.29	4	15	16
4	66	26.90	26.80	26.85	0	0	0

Table 4.16: Percentage loading details of lines of DVC

Sl.No	Voltage Grade (kV)	Loading Percentage					
		Max	Min	Avg	No of lines Over 100%	No of lines Over 80%	No of Lines less than 5%
1	400	39.6	6.7	25.4	0	0	0
2	220	72.7	1.6	24.35	0	0	3

Sl.No	Voltage Grade (kV)	Loading Percentage					
		Max	Min	Avg	No of lines Over 100%	No of lines Over 80%	No of Lines less than 5%
3	132	84.8	0.5	25.25	0	2	13

Table 4.17: Percentage loading details of lines of CESC

Sl.No	Voltage Grade (kV)	Loading Percentage					
		Max	Min	Avg	No of lines Over 100%	No of lines Over 80%	No of Lines less than 5%
2	220	87.2	47.7	56.24	0	1	0
3	132	102.7	2.5	43.94	1	2	3

Table 4.18: Percentage loading details of lines of DPL

Sl.No	Voltage Grade (kV)	Loading Percentage					
		Max	Min	Avg	No of lines Over 100%	No of lines Over 80%	No of Lines less than 5%
1	132	67.70	11.90	29.92	0	0	0

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 Over 100%	No of Transformers Over 80%	No of Transformers less than 20%
1	765	14.6	3.9	6.98	0	0	13
2	400	94.5	1.4	47.26	0	8	23
3	220	98.4	1.8	43.84	0	16	80
4	132	101.9	1.1	44.12	1	52	145
5	66	55.9	19.8	30.43	0	0	4

Table 4.20: Percentage loading details of Transformers of Bihar

Sl.No	Voltage Grade (kV)	Loading Percentage					
		Max	Min	Avg	No of Transformers Over 100%	No of Transformers Over 80%	No of Transformers less than 20%
1	765	14.6	3.9	7.47	0	0	5
2	400	75.8	17.6	51.48	0	0	2
3	220	75.8	13.8	47.13	0	0	6
4	132	99.2	4.1	42.83	0	8	32

Table 4.21: Percentage loading details of Transformers of Jharkhand

Sl.No	Voltage Grade (kV)	Loading Percentage					
		Max	Min	Avg	No of Transformers Over 100%	No of Transformers Over 80%	No of Transformers less than 20%
1	765	9	9	9.00	0	0	2
2	400	77.6	1.4	44.56	0	0	2
3	220	52.8	3.1	33.03	0	0	4
4	132	88.5	1.8	36.60	0	1	23

Table 4.22: Percentage loading details of Transformers of Odisha

Sl.No	Voltage Grade (kV)	Loading Percentage					
		Max	Min	Avg	No of Transformers Over 100%	No of Transformers loaded 80% and above	No of Transformers less than 20%
1	765	7.2	5	5.88	0	0	6
2	400	79.9	7.8	36.73	0	0	10
3	220	98.4	1.8	37.13	0	5	50
4	132	83.7	1.1	41.17	0	5	43

Table 4.23: Percentage loading details of Transformers of Sikkim

Sl.No	Voltage Grade (kV)	Loading Percentage					
		Max	Min	Avg	No of Transformers Over 100%	No of Transformers loaded 80% and above	No of Transformers less than 20%
1	400	87.6	2.4	46.03	0	3	5
2	220	31.6	2.4	25.00	0	0	5
3	132	93	10.9	37.87	0	2	2
4	66	53	19.8	29.27	0	0	4

Table 4.24: Percentage loading details of Transformers of West Bengal

Sl.No	Voltage Grade (kV)	Loading Percentage					
		Max	Min	Avg	No of Transformers Over 100%	No of Transformers loaded 80% and above	No of Transformers less than 20%
1	400	94.5	4.5	53.04	0	5	2
2	220	94.5	4.5	49.36	0	9	8
3	132	101.9	3	50.45	1	27	25
4	66	55.9	55.9	55.90	0	0	0

Table 4.25: Percentage loading details of Transformers of DVC

Sl.No	Voltage Grade (kV)	Loading Percentage					
		Max	Min	Avg	No of Transformers Over 100%	No of Transformers Over 80%	No of Transformers less than 20%
1	400	55.3	55.3	55.3	0	0	0
2	220	80.2	2.2	43.76	0	1	5
3	132	91.7	2.9	42.97	0	3	16

Table 4.26: Percentage loading details of Transformers of CESC

Sl.No	Voltage Grade (kV)	Loading Percentage					
		Max	Min	Avg	No of Transformers Over 100%	No of Transformers Over 80%	No of Transformers less than 20%
1	220	79.3	8.5	57.81	0	0	2
2	132	85.5	8.5	50.00	0	6	4

Table 4.27: Percentage loading details of Transformers of DPL

Sl.No	Voltage Grade (kV)	Loading Percentage					
		Max	Min	Avg	No of Transformers Over 100%	No of Transformers Over 80%	No of Transformers less than 20%
1	220	81.3	60.5	66.74	0	1	0
2	132	64.6	6.7	35.83	0	0	7

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	Bus name	Min	Bus name	Average
1	765	1.009	Jharsuguda	0.988	Gaya	0.998
2	400	1.031	DSTPS	0.987	Jeerat	1.009
3	220	1.031	Arrah	0.946	Balimela	0.992
4	132	1.026	Machkund	0.902	Buxar	0.967
5	66	1.011	Rangit	0.969	Chalsa	0.991

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	0.986	0.995	0.009	0.911%
		400	0.983	0.996	0.013	1.333%
2	Gaya	765	0.986	0.988	0.003	0.272%
		400	0.995	0.995	0.001	0.060%
3	Banka	400	1.018	1.012	-0.006	-0.560%
4	Barh	400	1.025	1.013	-0.012	-1.132%
5	Biharsharif	400	0.995	1.014	0.019	1.859%
6	Kahalgaon	400	1.018	1.018	0.001	0.088%
7	Muzaffarpur	400	0.993	1.001	0.008	0.856%
8	New Purnea	400	0.993	1.011	0.019	1.904%
9	Patna	400	1.009	1.006	-0.003	-0.253%
10	Lakhisarai	400	1.008	1.007	0.000	-0.020%
11	Kishanganj	400	1.008	1.012	0.004	0.397%
Jharkand						
1	Ranchi New	765	1.016	1.006	-0.010	-0.993%
		400	1.028	1.008	-0.020	-1.927%
2	Jamshedpur	400	1.025	1.020	-0.005	-0.459%
3	Maithon	400	1.018	1.014	-0.004	-0.344%
4	Ranchi	400	1.020	1.016	-0.004	-0.392%

Sl.No	Name of the SubStation	Voltage level (kV)	Voltage in pu		Difference	% Difference
		Nominal	Recorded	Simulated		
5	Chaibasa	400	1.025	1.015	-0.010	-0.966%
6	Koderma (KTPS)	400	1.018	1.013	-0.004	-0.423%
7	BTPS-A (Bokaro)	400	1.028	1.019	-0.009	-0.847%
8	TISCO	400	1.010	1.017	0.007	0.703%
9	Chandwa	400	1.005	0.999	-0.006	-0.577%
Odisha						
1	Jharsuguda	765	1.009	1.009	0.000	0.025%
		400	1.028	1.018	-0.010	-0.934%
2	Angul	765	1.018	1.004	-0.015	-1.424%
		400	1.010	1.007	-0.003	-0.277%
3	Bisra	400	1.010	1.013	0.003	0.297%
4	Bolangir	400	0.994	1.008	0.014	1.406%
5	Indravati	400	0.995	0.994	-0.001	-0.060%
6	Jaypore	400	0.988	0.994	0.006	0.618%
7	Kaniha	400	0.993	1.002	0.010	0.997%
8	Keonjhar	400	1.018	1.006	-0.012	-1.170%
9	Kuchei/Baripada	400	1.005	1.008	0.003	0.328%
10	Mendhasal	400	0.995	0.999	0.004	0.412%
11	Meramundali	400	1.013	1.009	-0.003	-0.326%
12	Rengali	400	0.995	1.004	0.009	0.935%
13	New Duburi	400	1.008	1.005	-0.003	-0.258%
14	Sterlite	400	1.025	1.015	-0.010	-0.976%
15	Pandiabil	400	0.999	0.999	0.000	-0.043%

Sl.No	Name of the SubStation	Voltage level (kV)	Voltage in pu		Difference	% Difference
		Nominal	Recorded	Simulated		
16	JITPL	400	1.022	1.020	-0.002	-0.225%
17	GMR	400	1.009	1.009	0.000	0.050%
18	JSPL	400	0.995	1.008	0.013	1.276%
Sikkim						
1	Rangpo	400	1.000	0.999	-0.002	-0.155%
2	Teesta V	400	0.998	1.000	0.002	0.201%
West Bengal						
1	Arambagh	400	1.028	1.002	-0.026	-2.511%
2	Jeerat	400	0.983	0.987	0.005	0.499%
3	Bidhannagar (WBSETCL)	400	1.015	1.010	-0.005	-0.502%
4	Kharagpur	400	1.007	1.006	-0.001	-0.070%
5	Bakreswar	400	0.990	0.991	0.001	0.111%
6	Kolaghat TPS	400	1.000	1.001	0.001	0.100%
7	Sagardighi	400	1.023	1.019	-0.003	-0.303%
8	Binaguri	400	1.008	1.006	-0.002	-0.169%
9	Malda	400	1.025	1.021	-0.004	-0.390%
10	Parulia (Durgapur PG)	400	1.023	1.010	-0.012	-1.193%
11	Farakka	400	1.033	1.024	-0.009	-0.862%
12	Subhashgram	400	0.998	0.989	-0.009	-0.852%
13	Raghunathpur DSTPS	400	1.037	1.031	-0.007	-0.646%
14	Mejia	400	1.028	1.028	0.000	0.019%
15	PPSP	400	1.030	1.021	-0.009	-0.893%
16	Berhampore	400	1.022175	1.016	-0.006	-0.624%

Sl.No	Name of the SubStation	Voltage level (kV)	Voltage in pu		Difference	% Difference
		Nominal	Recorded	Simulated		
17	Alipurduar	400	1.0225	1.022	-0.001	-0.098%
18	Haldia	400	1.005	1.007	0.002	0.229%

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.
- All the bus Voltages (765 kV, 400 kV, 220 kV, 132 kV and 66 kV) were within the standard tolerance limits (as per CEA grid code).
- Total nine numbers of line/Transformers loaded beyond 100%, rest of the network elements were loaded within the rated capacity under summer-peak operating condition of 4th May 2017 at 20.00 hrs.
- Maximum inter regional power exchange is 3122 MW to SR.

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 220 kV and 132 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 & 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	CTPS-A	132	5765.10	25.22
2	CTPS-B	132	5765.89	25.22
3	Angul	400	36101.97	52.11
4	Meramandali	220	13069.98	34.3
5	Budhipadar	220	14262.63	37.43

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

Sl.No.	Substation Name	Rated Voltage (kV)	SLG fault (MVA)	Fault Current (kA)
1	CTPS-A	132	6035.999	26.401
	CTPS-B	132	6034.305	26.393
2	Meramandali	220	13003.502	34.125
3	Budhipadar	220	13967.8	36.656
4	Vedanta	220	12652.203	33.203
5	NALCO	220	12347.226	32.403
6	Mejia	220	12840.489	33.698
7	BTPS132	132	6114.185	26.743

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 said condition following observation are made,

- The voltages at all the bus bars (765 kV, 400 kV, 220 kV, 132 kV and 66 kV) were within the standard tolerance limits (as per CEA grid code).
- Number of line/Transformers were loaded beyond 100% is 9, rest of line/Transformers loaded within the rated capacity under summer-peak operating condition of 4th May 2017 at 20.00 hrs.
- Maximum inter regional power exchange is 3122 MW to SR.
- 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 transient studies and tripping analysis.

ANNEXURE-1 EXISTING EASTERN REGION TRANSMISSION NETWORK AND LOAD DETAILS

Table A: State wise list of substation 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	315	315	
			1	500	500	
7	Patna	400/220	2	315	630	
8	Lakhisarai	400/132	2	200	400	
9	Sasaram B2B	400/(93/√3)/93	3	234/117/117	1350	
10	Kishanganj	400/220	2	500	1000	
11	Nabinagar RLY	400/132	2	200	400	Railway
12	Darbhanga (DMTCL)	400/220	2	160	320	DMTCL
220kV Level						
1	Purnea	220/132	3	160	480	PGCIL
2	Arrah	220/132	1	160	160	
			2	100	200	
3	Amnour (Chhapra)	220/132	**2**	100	200	BSPTCL
4	Biharshariff	220/132	3	150	450	
		132/33	1	20	20	
5	Bodhgaya	220/132	4	150	600	
		220/132	1	160	160	
		132/33	3	50	150	
6	Darbhanga new	220/132	2	160	320	
7	Dehri	220/132	4	100	400	
		132/33	2	50	100	
8	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)	
9	Gopalganj	220/132	3	100	300	
		132/33	3	50	150	
10	Khagaul	220/132	4	100	400	
		132/33	5	50	250	
11	Begusarai	220/132	4	100	400	
		132/33	3	50	150	
12	Sipara	220/132	2	150	300	
		220/132	1	160	160	
		132/33	2	50	100	
13	Hazipur New	220/132	2	100	200	
14	Madhepura	220/132	3	100	300	
		132/33	2	20	40	
15	Pusauli New	220/132	2	150	300	
		132/33	2	50	100	
16	Sonenagar	220/132	2	160	320	
		132/33	2	50	100	
17	Muzaffarpur (MTPS)	220/132	3	100	300	
18	Kishanganj _New	220/132	2	160	320	
19	Muzzafarpur_BSPTCL	220/132	2	160	320	
		132/33	3	50	150	
20	Musahari_BSPTCL	220/132	2	160	320	
		132/33	3	50	150	
21	Samastipur_New	220/132	2	160	320	
		132/33	2	50	100	
22	Sonenagar_New	220/132	2	160	320	
		132/33	2	50	100	
23	Mushahri	220/132	2	160	320	
		132/33	3	50	150	
24	Motipur	220/132	2	160	320	
		132/33	3	50	150	
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	1	20	20	
		132/33	1	50	50	
4	Banjari	132/33	3	20	60	
5	Banka	132/33	3	20	60	
6	Banmakhi	132/33	2	20	40	
7	Barauni TPS	132/33	1	50	50	
			2	20	40	
8	Barh	132/33	1	20	20	
			1	50	50	
9	Baripahari	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)	
10	Belaganj	132/33	2	20	40	
11	BENIPATTI	132/33	2	20	40	
12	Belsand	132/33	2	10	20	
13	Bettiah	132/33	2	20	40	
			1	50	50	
14	Bihta	132/33	3	50	150	
15	Bikramganj	132/33	2	20	40	
			1	50	50	
16	Buxar	132/33	2	20	40	
			1	50	50	
17	Chandauti (Gaya)	132/33	2	50	100	
		132/25	2	13.35	26.7	
18	Chhapra	132/33	2	20	40	
			1	50	50	
19	Darbhanga (old)	132/33	2	50	100	
20	Dhaka	132/33	3	20	60	
21	Dalsingsarai	132/33	2	20	40	
		132/33	1	50	50	
22	Digha	132/33	3	50	150	
23	Dumraon	132/33	1	20	20	
			1	50	50	
24	Ekma	132/33	1	20	20	
25	Ekanga Sarai (Ekanagar)	132/33	3	20	60	
26	Forbeshganj	132/33	2	20	40	
			1	50	50	
27	Goh	132/33	2	20	40	
28	Gangwara	132/33	2	50	100	
29	Gaighat	132/33	2	50	100	
30	Hazipur	132/33	3	50	150	
31	Hulasganj	132/33	2	20	40	
32	Harnaut	132/33	2	20	40	
33	Hathidah	132/33	3	20	60	
34	Hathua	132/33	2	20	40	
35	Imamganj	132/33	2	20	40	
36	Jagdishpur	132/33	2	20	40	
37	Jandaha	132/33	2	20	40	
38	Jainagar	132/33	3	20	60	
39	Jakkanpur	132/33	4	50	200	
			1	20	20	
40	Jamalpur	132/33	2	50	100	
41	Jamui	132/33	2	20	40	
			1	50	50	
42	Jehanabad	132/33	2	20	40	
43	Kahalgaon	132/33	2	20	40	
			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)	
44	Karmnasa	132/33	2	50	100	
			1	20	20	
		132/25	1	21.6	21.6	
			1	20	20	
45	Kataiya	132/33	2	20	40	
		132/33	1	50	50	
46	Katihar	132/33	3	20	60	
			1	50	50	
47	Katra	132/33	3	50	150	
48	Kusheshwarsthan	132/33	2	20	40	
49	Kochas	132/33	2	20	40	
50	Karbigahiya	132/33	4	50	200	
51	Kudra	132/33	2	20	40	
52	Khagaria	132/33	2	20	40	
			1	50	50	
53	Kishanganj	132/33	2	50	100	
			1	20	20	
54	Lakhisarai	132/33	3	20	60	
55	Madhubani	132/33	2	20	40	
56	Manjhaul					
57	Masaurhi	132/33	3	20	60	
58	Mahanar	132/33	2	20	40	
59	Mithapur	132/33	2	50	100	
60	Mohania	132/33	1	50	50	
			1	20	20	
61	Motihari	132/33	1	20	20	
			1	50	50	
62	Masrakh	132/33	2	20	40	
63	Muzaffarpur	132/33	3	50	150	
64	Nalanda	132/33	2	20	40	
65	Narkatyagaunj	132/33	2	20	40	
66	Naugachhia	132/33	3	20	60	
67	Nawada	132/33	1	20	20	
			3	50	150	
68	Pandaul	132/33	2	20	40	
			1	50	50	
69	Phulparas	132/33	2	20	40	
70	Pupri	132/33	2	20	40	
71	Purnea	132/33	1	20	20	
			2	50	100	
72	Rafiganj	132/33	1	50	50	
			1	20	20	
73	Rajgir	132/33	2	20	40	
74	Ramnagar	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)	
		132/33	1	50	50	
75	Raxaul	132/33	2	20	40	
76	Remi nagar (Runni Saidpur)	132/33	2	20	40	
77	Sherghati	132/33	2	20	40	
78	SKMCH	132/33	2	50	100	
79	Sonebarsa	132/33	2	20	40	
80	Sabour	132/33	3	50	150	
81	Saharsa	132/33	1	20	20	
82	Samastipur	132/33	2	20	40	
83	Sasaram	132/33	2	50	100	
84	Shekhpura	132/33	2	20	40	
85	Sheohar	132/33	2	50	100	
86	Sherghati	132/33	2	20	40	
87	Sheetalpur	132/33	2	20	40	
88	Sitamarhi	132/33	3	50	150	
89	Siwan	132/33	1	20	20	
			2	50	100	
90	Sonenagar	132/33	1	50	50	
			1	20	20	
		132/25	1	21.6	21.6	
			1	20	20	
91	Sultanganj	132/33	2	20	40	
			2	50	100	
92	Supaul	132/33	3	20	60	
93	Tarapur	132/33	2	20	40	
94	Tehta	132/33	2	20	40	
95	Tekari	132/33	2	20	40	
96	Triveniganj	132/33	2	20	40	
97	Udaikishanganj	132/33	2	20	40	
98	Vaishali	132/33	2	20	40	
99	Valmikinagar	132/33	1	10	10	
100	Wazirganj	132/33	2	20	40	
Jharkhand						
765kV Level						
1	Ranchi New	765/400	2	1500	3000	PGCIL
400kV Level						
1	Jamshedpur (3*315)	400/220	2	315	630	PGCIL
2	Maithon	400/220	2	315	630	
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	

Sl.No	Name of the Substation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
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	
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	1	150	150	
15	Ramkanali	132/33	2	25	50	
16	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	2	20	40	
4	Dalbhumgarh	132/33	3	50	150	
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	

Sl.No	Name of the Substation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
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	
			1	50	50	
21	Kanke	132/33	2	50	100	
22	Kendposi	132/33	1	20	20	
			1	50	50	
23	Latehar	132/33	2	50	100	
24	Lohardaga	132/33	2	50	100	
25	Namkum	132/33	3	50	150	
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	

Sl.No	Name of the Substation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
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						
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	
		400/220	1	500	500	
		220/132	2	160	320	
8	Mendhasal	400/220	2	315	630	OPTCL
		220/132	2	100	200	
		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	

Sl.No	Name of the Substation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
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	
		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	1	160	160	
		132/33	2	20	40	
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	

Sl.No	Name of the Substation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
24	Laxmipur	220/33	1	20	20	
25	Rengali	220/33	2	20	40	
26	Cuttack(POPARDA)	220/132	1	160	160	
132 kV Level						
1	Akhusingh	132/33	2	12.5	25	OPTCL
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	2	40	80	
		132/33	1	20	20	
5	Atri	132/33	1	34	34	
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	
		132/33	1	12.5	12.5	
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	

Sl.No	Name of the Substation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
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	
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	12.5	

Sl.No	Name of the Substation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
55	Nuapara	132/33	2	20	40	
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	
		132/25	1	12.5	12.5	
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	
		132/33	2	12.5	25	

Sl.No	Name of the Substation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
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	
West Bengal						
400 kV Level						
1	Arambagh	400/220	4	315	1260	WBSETC

Sl.No	Name of the Substation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
		220/132	3	160	480	L
		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	3	315	945	
		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	
13	Alipurduar_ HVDC	400/220	2	315	630	PGCIL
14	Gokarna	400/220	2	315	630	WBSETCL
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	1	31.5	31.5	
			2	20	40	
4	Dharampur	220/132	2	160	320	
		132/33	2	50	100	
5	Domjur	220/132	2	160	320	
			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	1	31.5	31.5	
			2	50	100	
		132/25	2	12.5	25	
11	New Haldia	220/132	2	160	320	
		132/33	2	50	100	
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	4	50	200	
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	3	200	600	WBSETCL
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(CLC)	220/132	2	160	320	
		132/33	3	50	150	
28	Vidyasagar Park	220/132	2	160	320	
		132/33	2	50	100	
29	Sadaipur	220/132/33	2	160	320	
30	Egra	200/132/33	2	160	320	
31	EMSS	220/132 /33	5	160	800	CESC
32	BBGS	220/132 /33	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)	
33	NCSS	220/132 /33	2	160	320	
34	Waria (DTPS)	220/132/33	3	150	450	DVC
		132/33	3	50	150	
		132/25	2	25	50	
35	Durgapur/ Muchipara	220/33	2	80	160	
			1	50	50	
36	Parulia	220/33	2	80	160	
		132/33	1	50	50	
37	Barjora	220/132	2	150	300	
		220/33	1	100	100	
			1	80	80	
			1	50	50	
38	Mejia	220/33	2	35	70	
39	Burnpur	220/33	2	50	100	
132 kV Level						
1	Adisapthagram	132/33	3	50	150	WBSETCL
		132/25	2	20	40	
2	Alipurduar	132/66	2	16	32	
			1	20	20	
		132/33	2	31.5	63	
3	Amtala	132/33	1	31.5	31.5	
			1	50	50	
4	Asoknagar	132/33	3	50	150	
		132/25	2	7.5	15	
5	Bagnan GIS	132/33	2	50	100	
6	Bagmundi	132/33	2	20	40	
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	
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	

Sl.No	Name of the Substation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
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	2	30.24	60.48	
31	Haldia NIZ	132/33	2	31.5	63	
32	Hizli	132/33	2	50	100	
		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	Kalingpong	132/66	MVA rating not given			
38	Kalan	132/33	2	31.5	63	
39	Kalyani	132/33	1	31.5	81.5	
			1	50	150	
40	Khatra	132/33	2	50	100	
41	Katwa	132/33	1	31.5	31.5	
			2	50	100	
42	Khanyan	132/33	2	31.5	63	
43	Kharagpur WBIIDC	132/33	2	31.5	63	
44	Khejuria GIS	132/33	2	50	100	
45	Kolaghat	132/33	3	50	150	
		132/25	2	12.5	25	
46	Lalgola	132/33	2	31.5	63	
47	Lilooah	132/33	3	50	150	
		132/25	2	20	40	
48	Mahachanda	132/33	1	31.5	31.5	
			2	50	100	
49	Mathabhanga	132/33	1	50	50	
			1	31.5	31.5	
50	Malda	132/33	3	50	150	
51	Mankar	132/33	3	31.5	94.5	
52	Maynaguri	132/33	1	31.5	31.5	
			1	50	50	

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	30	60	
53	North Bengal university (NBU)	132/33	2	31.5	63	
			1	50	50	
54	Najirpur	132/33	2	31.5	63	
55	New town AA 1	132/33	2	50	100	
56	Pingla	132/33	3	50	150	
57	Purulia (WB)	132/33	2	31.5	63	
			1	20	20	
		132/25	2	12.5	25	
58	Raghunathganj	132/33	2	31.5	63	
			2	50	100	
59	Raghunathpur	132/33	2	31.5	63	
60	Raigunj	132/33	1	31.5	31.5	
			2	20	40	
			2	12.5	25	
61	Raina	132/33	3	50	150	
62	Rampurhat	132/33	2	50	100	
63	Ranaghat	132/33	2	50	100	
		132/66	2	31.5	63	
		132/25	1	12.5	12.5	
			1	10	10	
64	Sainthia	132/33	2	50	100	
65	Salt lake	132/33	3	50	150	
66	Salt lake GIS	132/33	2	50	100	
67	Samsi	132/33	2	31.5	63	
			1	50	50	
68	Siliguri	132/33	2	50	100	
69	Sonarpur	132/33	3	31.5	94.5	
		132/25	2	20	40	
70	Serakol	132/33	2	50	100	
71	Tamluk	132/33	2	50	100	
72	Tarakeswar	132/33	1	31.5	31.5	
			1	50	50	
73	Titagarh	132/33	3	50	150	
		132/25	2	20	40	
74	Ukhra	132/33	2	50	100	
75	Uluberia	132/33	3	50	150	
76	Kuli	132/33	2	50	100	
77	Birpara	132/66	3	20	60	
78	Chalsa	132/66	1	20	20	
			1	10	10	
		132/33	2	20	40	
79	Bajkul	132/33	2	50	100	
80	Food Park	132/33	2	50	100	
81	Belur	132/33	3	50	150	CESC

Sl.No	Name of the Substation	Voltage level (kV)	Substation details			Owned By
			No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	
82	BT Road	132/33	2	75	150	
83	B.Garden	132/33	1	50	50	
			1	100	100	
84	Titagarh (TRS)	132/33	5	50	250	
85	Dum Dum	132/33	2	75	150	
86	Park lane	132/33	1	75	75	
			1	50	50	
87	Jadavpore	132/33	3	75	225	
88	Chakmir	132/33	2	55	110	
89	Majerhat	132/33	2	75	150	
			1	50	50	
90	BBD Bag	132/33	1	68	68	
			1	69	69	
91	PRS	132/33	1	50	50	
			1	75	75	
			1	100	100	
92	East Calcutta	132/33	3	75	225	
93	NCSS	132/33	1	50	50	
			1	75	75	
94	SRS	132/33	2	55	110	
			1	75	75	
95	Patuli	132/33	2	75	150	
96	Park Circus	132/33	2	75	150	
97	WBRS	132/33	2	75	150	
98	A Zone	132/11	1	20	20	DPL
		132/11	1	31.5	31.5	
		132/33	1	31.5	31.5	
		132/33	1	50	50	
99	B Zone	132/11	5	31.5	157.5	
		132/33	1	31.5	31.5	
		132/33	1	50	50	
100	AB Zone	132/33	1	50	50	
101	C Zone	132/11	1	31.5	31.5	
			2	20	40	
		132/33	1	31.5	31.5	
			1	50	50	
102	C1 Zone	132/11	2	31.5	63	
		132/33	2	50	100	
103	Bamunara SS	132/33	2	50	100	
104	Kalipahari	132/33	1	50	50	DVC
		132/33	2	80	160	
105	Kharagpur	132/11	1	7.5	7.5	
106	Burdwan	132/33	2	50	100	
			1	80	80	
107	Belmuri	132/33	1	50	50	

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	31.5	31.5	
		132/25	2	25	50	
108	Purulia	132/33/11	1	50	50	
109	ASP	132/33/11	2	50	100	
		132/33	2	50	100	
110	Jamuria	132/33	2	50	100	
111	Howrah	132/33	3	50	150	

Table B: State wise list of transmission lines present in 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	D/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	Muzaffarpur to DMTCL	D/C	63.3	Twin-Moose	DMTCL
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	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
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	D/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	Amnour(Chhapra) to Hajipur	D/C	50.0	Zebra	
23	Patna (PG) to Fatuha	S/C	27.6	Zebra	
24	MTPS to Motipur	D/C	56.8	Zebra	
25	Motipur to Mushahri	D/C	88.7	Zebra	
26	Motipur to DMTCL	D/C	68.5	Zebra	
27	Mushahri to Darbhanga	D/C	57.9	Zebra	
28	Sipara to Fatuha	S/C	26.0	Zebra	
29	Pusauli (PG) to Pusauli new	S/C	1.7	Zebra	PGCIL
30	Pusauli new to Ara (PG)	S/C	116.0	Zebra	
31	Pusauli (PG) to Ara (PG)	S/C	112.0	Zebra	
32	Purnea (PG) to Purnea old	D/C	2.0	Zebra	
33	Kishanganj to Siliguri	D/C	108.0	Zebra	
34	Kishanganj to Dalkhola PG	D/C	31.0	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	
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

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
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	
21	Chandauti to Sonenagar (L - 30)	S/C	76.0	Panther	
22	Chandauti to Rafiganj (L - 31)	S/C	41.0	Panther	
23	Rafiganj to Sonenagar (L - 31)	S/C	35.0	Panther	
24	Chandauti to Tekari	S/C	28.9	Panther	
25	Bodhgaya to Chandauti (Gaya)(Line - I)	D/C	16.0	Panther	
26	Bodhgaya to Chandauti (Gaya) (Line - II)	D/C	14.0	Panther	
27	Tekari to Goh	S/C	22.0	Panther	
28	Bodhgaya to Wazirganj	S/C	30.0	Panther	
29	Wazirganj to Nawada	S/C	26.0	Panther	
30	Bodhgaya to Sherghati	S/C	27.0	Panther	
31	Bodhgaya to Imamganj	S/C	56.0	Panther	
32	Dehri to Banjari	S/C	38.0	Panther	
33	Dehri to Sasaram Ckt. - I	S/C	20.0	Panther	
34	Sasaram to Kudra Ckt. - I	S/C	13.0	Panther	
35	Kudra to Karamnasa Ckt.- I	S/C	10.0	Panther	
36	Dehri to Pusauli PG Ckt - II	S/C	26.0	Panther	
37	Pusouli PG to Mohania Ckt. - II	S/C	10.0	Panther	
38	Mohania to Pusauli BS	S/C	15.0	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	
42	Dumroan to Buxar	S/C	16.1	Panther	
43	Ara (PG) to Jagdishpur	S/C	26.3	Panther	
44	Fatuha to Sipara	S/C	26.0	Panther	
45	Sipara to Mithapur	S/C	16.0	Panther	
46	Mithapur to Jakkanpur	S/C	1.0	Panther	
47	Gaighat to Mithapur	S/C	5.0	Panther	
48	Fatuha to Gaighat	S/C	23.0	Panther	
49	Fatuha to Katra	S/C	17.0	Panther	
50	Biharsarif (SG) to Barh Ckt. - I	S/C	25.0	Panther	
51	Barh to Hathidah Ckt. - I	S/C	20.0	Panther	
52	Biharsarif (SG) to Hathidah Ckt. - II	S/C	32.5	Panther	
53	Biharsarif (SG) to Ekangarsarai	S/C	30.0	Panther	
54	Ekangarsarai to Hulasgarh	S/C	14.5	Panther	
55	Baripahari to Harnaut	S/C	26.0	Panther	
56	Motipur to motihari	S/C	45.0	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
57	Motipur to MTPS	S/C	24.2	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	Sultanganj to Tarapur	S/C	19.7	Panther	
71	Sabour to Sultanganj Ckt I	S/C	30.0	Panther	
72	Sabour to Sultanganj Ckt II	S/C	31.0	Panther	
73	Sultanganj to Deoghar	S/C	105.0	Panther	
74	KhSTPP to Sabour	S/C	25.0	Panther	
75	Purnia(bs) to Naugachia (L - 16)	S/C	70.0	Panther	
76	Naugachia to BTPS (L- 16)	S/C	136.0	Panther	
77	Purnia(bs) to Khagaria (L - 23)	S/C	150.0	Panther	
78	Khagaria to BTPS (L - 23)	S/C	60.0	Panther	
79	Purnia(BS) to Katihar	S/C	29.0	Panther	
80	Purnia(BS) to Saharsa	S/C	101.2	Panther	
81	Purnia (BS) to Farbisganj	S/C	85.0	Panther	
82	Kishanganj to Dalkola (WB)	S/C	26.0	Panther	
83	Kishanganj to Farbisganj	S/C	88.6	Panther	
84	Farbisganj to Kataya (Kosi) Ckt. - II (Old)	S/C	50.9	Panther	
85	Madhepura to Saharsa	S/C	50.0	Panther	
86	Madhepura to Sonebarsa	S/C	50.0	Panther	
87	Saharsa to UdaKishanganj	S/C	50.4	Panther	
88	Begusarai to Samastipur (L - 9)	S/C	57.0	Panther	
89	Begusarai to Dalsingsarai (L - 10)	S/C	34.0	Panther	
90	Dalsingsarai to Samastipur (L - 10)	S/C	23.0	Panther	
91	KBUNL to Muzaffarpur Ckt - I	S/C	15.5	Panther	
92	KBUNL to Muzaffarpur Ckt - II	S/C	16.7	Panther	
93	KBUNL to SKMSH	S/C	14.1	Panther	
94	Samastipur to Darbhanga	S/C	40.0	Panther	
95	Samastipur to Hazipur LILO at Jandaha	S/C	92.0	Panther	
96	Hazipur to Sheetalpur	S/C	30.0	Panther	
97	Chapra to Sheetalpur	S/C	40.0	Panther	
98	Muzaffarpur to Vaishali	D/C	30.1	Panther	
99	Chapra to Siwan	S/C	70.0	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
100	Chapra/Siwan to Ekma	S/C	0.6	Panther	
101	Gopalganj to Hathua	S/C	25.0	Panther	
102	Hathua to Siwan	S/C	40.0	Panther	
103	Gopalganj to Siwan	S/C	40.0	Panther	
104	Gopalganj to Masrakh to Siwan	S/C	74.9	Panther	
105	Gopalganj to Bettia	D/C	60.8	Panther	
106	Gopalganj/Bettia Ckt- I LILO at Sidhwalia SM	S/C	12.0	Panther	
107	Betiya to narkatiyaganj	S/C	35.5	Panther	
108	MTPS to Motihari	S/C	70.0	Panther	
109	Bettia to Motihari	S/C	45.0	Panther	
110	Bettia to Ramnagar	S/C	41.5	Panther	
111	Bettia to Raxaul	D/C	37.1	Panther	
112	Ramnagar to BHPC, Valmikinagar	S/C	77.8	Panther	
113	BHPC, Valmikinagar to Nepal (Surajpura)	S/C	7.2	Panther	
114	Motihari to Dhaka	S/C	24.0	Panther	
115	Mushahri to Sitamarhi	D/C	63.0	Panther	
116	Mushahri to SkMCH	S/C	21.0	Panther	
117	Dhaka to Sitamarhi	S/C	52.0	Panther	
118	Sitamarhi to Runisaidpur(Reminagar)	S/C	21.0	Panther	
119	Runisaidpur to SKMCH	S/C	35.0	Panther	
120	SKMCH to Muzaffarpur	S/C	15.0	Panther	
121	Darbhanga (220 kV) to Darbhanga (132 kV)	S/C	1.0	Panther	
122	Darbhanga to Phoolparas	S/C	71.8	Panther	
123	Pandaul to Madhubani	S/C	16.0	Panther	
124	Madhubani to Jainagar	S/C	40.0	Panther	
125	Jainagar to Phoolparas	S/C	55.0	Panther	
126	Barauni TPS to Begusarai (L - 9 & L - 10)	D/C	10.0	Panther	
127	BHPC Kosi (Kataiya) to Duhabi (Nepal)	D/C	3.5	Panther	
128	Biharshariff (BSEB) to Baripahari	D/C	5.0	Panther	
129	Dehri to Sonenagar	D/C	14.5	Panther	
130	Khagaul to Bihta	D/C	14.5	Panther	
131	Khagaul to Digha	D/C	16.0	Panther	
132	Samastipur to MTPS (Kanti)	D/C	85.2	Panther	
133	Sheetalpur to Vaishali	D/C	30.2	Panther	
134	Sonenagar to Aurangabad	D/C	21.0	Panther	
135	Supaul to Phulparas	D/C	31.9	Panther	
136	Madhepura to Supaul	D/C	30.0	Panther	
137	Biharshariff to Hullasgarh	S/C	40.0	Panther	
138	Ara to Ara TSS	S/C	4.0	Panther	
139	Dumroan to Dumroan TSS	S/C	2.0	Panther	
140	Rafiganj to Rafiganj TSS	S/C	4.6	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
141	Barh/Hathidah line to Mokama TSS	S/C	6.0	Panther	
142	Lakhisaai to Lakhisarai TSS	S/C	6.0	Panther	
143	Khagaul to Khagaul TSS	S/C	1.0	Panther	
144	Fatuha to Khusrupur TSS	S/C	7.2	Panther	
145	Chapra to Chapra TSS	S/C	1.0	Panther	
146	Hazipur to Hazipur TSS	S/C	2.0	Panther	
147	Lakhisari PG to Lakhisarai BSPTCL	D/C	15.3	Panther	
148	Chandauti to Tehta	D/C	15.0	Panther	
149	Tehta to Jehanabad	D/C	40.0	Panther	
150	Sipara to Jakkanpur	D/C	18.0	Panther	
151	Farbisganj to Kataya Ckt. - I (New)	D/C	39.7	Panther	
152	Supaul to Kataya	D/C	59.6	Panther	
153	Samastipur to Hazipur (220 kV)	D/C	70.0	Panther	
154	Bodhgaya to Paharpur TSS	D/C	35.0	Panther	
155	Jamui to Jhajha TSS	D/C	31.0	Panther	
156	Lakhisari PG to Jamui	D/C	25.3	Panther	
157	Dehri to Kudra	S/C	46.0	Panther	
158	kudra to Pusauli	S/C	25.0	Panther	
159	Kudra to kochas	S/C	27.0	Panther	
160	Banjari to KCL	S/C	1.0	Panther	
161	Khagaul to Fatuha	S/C	35.0	Panther	
162	Begusarai to Khusweshthan	S/C	65.5	Panther	
163	Fatuha to Birpahari	S/C	42.0	Panther	
164	Nalanda to (L - 28) LILO Point	D/C	2.0	Panther	
165	(L - 28) Line to Rajgir grid (T - Connection)	S/C	6.0	Panther	
166	Muzaffarpur to SKMCH	S/C	16.7	Panther	
167	Sasaram to Banjari	S/C	47.5	Panther	
168	Tehata to Belaganj	S/C	22.0	Panther	
169	Aurangabad to Shree Cement	S/C	0.8	Panther	
170	Kahalgaon (BSPTCL) to Sultangunj	D/C	63.5	Panther	
171	Darbhanga to Gangwara GSS	D/C	7.3	Panther	
172	Gangwara GSS to Pandaul			Panther	
173	Kisanganj to Forbesganj Circuit- 2	S/C	88.4	Panther	
174	Forbesganj to Kataiya Circuit- 3	S/C	39.8	Panther	
175	Mithapur to Karbighaia	S/C	2.5	Panther	
176	Dehri to Kochas	S/C	31.6	Panther	
177	Kochas to Dumraon Circuit- 1	S/C		Panther	
178	Banka (PG) to Sultanganj	D/C	46.0	Panther	
Jharkhand					
765 kV					
1	Ranchi (New) to Dharamjaygarh	S/C	301.0	Qd Bermis	PGCIL

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
2	Ranchi (New) to Dharamjaygarh	S/C	344.6	Qd Bermis	
400 kV					
1	Chaibasa to Bisra (Rourkela)	S/C	131.0	Twin-Moose	PGCIL
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	
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	PGCIL
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	70.7	Lapwing	
18	Ranchi to Maithon RB	D/C	188.0	Twin-Moose	
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) to Gaya	D/C	117.0	Quad-Moose	
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	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
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	
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

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
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	
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	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
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	
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	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
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 Srikakulam	D/C	276.0	ACSR Quad Bersimis	
3	Angul to Jharsuguda pooling station	D/C	272.0	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	
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	S/C	131.5	ACSR Moose	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
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	
10	Budhipadar to Basundhara	S/C	35.8		
11	Budhipadar to Lapanga	D/C	25.0	Zebra	
	Lapanga to Katapalli	D/C	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	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
25	Meramundali to Dubri	D/C	95.6	ACSR Zebra	OPTCL
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	S/C	69.0		
	Nayagarh to Bhanja nagar	S/C	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	S/C	70.0		
	Theruvali to Jaynagar	S/C	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	
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)	S/C	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	S/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	S/C	62.7		
	NALCO to TTPS	S/C	8.6		

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
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	S/C	115.0		
62	Rengali Switching Station to Chandiposh	S/C	102.0	Zebra	
	Chandiposh to Tarkera	S/C	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	D/C	45.9	Zebra	
67	Cuttack to Bidanasi	D/C	7.4	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.		
	Mania to OCL		5.0		
	OCL to Salipur		35.0		
7	LILO at Kamakhyanagar		1.0	Panther	
	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		

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
	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	
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	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
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	
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		

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
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				
	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		

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
	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		
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	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
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	
	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	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
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	
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	
Sikkim					
400 kV					
1	Lilo of Teesta to V to Binaguri D/C line (115km) at Rangpo		-	Twin Moose	PGCIL

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
	Teesta V to Rangpo	D/C	12.3		
	Rangpo to Binaguri	D/C	110.0		
2	Teesta 3 to Rangpo	S/C	47.0		
3	Rangpo to Kishanganj	D/C	148.0		
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	
3	Jorethang loop to New Melli	S/C	11.5	Zebra	
4	Rangpo to new melli	S/C	26.0	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	
6	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
7	Melli to NJP	S/C	90.0	Panther	PGCIL
8	Melli to Rangpo	S/C	16.6	Panther	
9	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	
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	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
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	Farakka (NTPC) to Gokarna	D/C	94.6	Twin Moose	
14	Sagardighi to Parulia (PGCIL)	D/C	171.0	Twin Moose	WBSETCL
15	Arambag to KTPS	S/C	78.0	Twin Moose	
16	KTPS to Kharagpur	S/C	95.0	Twin Moose	
17	KTPS to Kharagpur	S/C	91.0	Twin Moose	
18	Kharagpur to Baripada	S/C	98.0	Twin Moose	WBSETCL & OPTCL
19	PPSP to Arambag	D/C	210.0	Twin Moose	WBSETCL
20	PPSP to Bidhanagar	D/C	183.5	Twin Moose	
21	PPSP to New ranchi	S/C	85.0	Twin Moose	
22	Parulia (PGCIL) to Bidhanagar (Durgapur)	D/C	11.0	Twin Moose	
23	Parulia (PGCIL) to Jamshedpur	S/C	177.0	Twin Moose	PGCIL
24	Durgapur (DSTPS) to Raghunathpur (RTPS)	D/C	70.5	Twin Moose	DVC
25	Maithon to Raghunathpur (RTPS)	S/C	52.9	Twin Moose	DVC & PGCIL
	Raghunathpur (RTPS) to Ranchi		169.0		
26	Raghunathpur (RTPS) to Ranchi	D/C	155.0	Quard Moose	DVC
27	Durgapur (DSTPS) to Jamshedpur PG	D/C	161.0	Twin Moose	DVC & PGCIL
28	Maithon to Mejia B	S/C	84.0	Twin Moose	PGCIL
	Mejia B to Jamshedpur		168.0		
29	Maithon to Mejia B	D/C	59.0	Twin Moose	
30	Malda (PGCIL) to Purnea	D/C	167.0	Twin Moose	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
31	Binaguri (PGCIL) to Purnia I & II	D/C	168.0	Twin Moose	
32	Binaguri (PGCIL) to Purnia III & IV	D/C	160.0	Quad Moose	
33	Binaguri (PGCIL) to Malbase	S/C	121*	Twin Moose	
34	Binaguri (PGCIL) to Rangpo - I	S/C	110.0	Twin Moose	
35	Binaguri (PGCIL) to Rangpo - II	S/C	110.0	Twin Moose	
36	Binaguri (PGCIL) to Bongaigaon	D/C	217.0	Twin Moose	
37	Binaguri (PGCIL) to Alipurduar	D/C	114.0	Quad Moose	
38	Alipurduar to Bongaigaon	D/C	122.4	Quad Moose	
39	Binaguri (PGCIL) to Tala IV	S/C	98*	Twin Moose	
40	Binaguri (PGCIL) to Tala I & II	D/C	115*	Twin Moose	
41	Farakka (NTPC) to Parulia (PGCIL)	D/C	150.0	Twin Moose	
42	Arambag to Bakreswar	S/C	130.0	Twin Moose	WBSETCL
43	Maithon to Parulia (PGCIL)	D/C	70.7	Twin Moose	PGCIL
44	Bidhannagar to Arambag	S/C	115.0	Twin Moose	
45	Ranchi to Arambag	S/C	111.5	Twin Moose	
46	KTPS to Chaibasa	S/C	70.0	Twin Moose	
47	Kharagpur to Chaibasa	S/C	161.0	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 Sadaipur	D/C	75.0	Zebra	
5	Sadaipur to Bakreswar	D/C	6.0	Zebra	
6	Jeerat to New Town	D/C	40.0	Zebra	
7	KTPS to Howrah	D/C	71.0	Zebra	
8	NJP (WB) to Binaguri	D/C	6.0	Zebra	PGCIL
9	J K nagar to Bidhanagar	S/C	40.5	Deer+Zebra	WBSETCL/IPCL
10	J K Nagar to STPS	S/C	89.9	Deer+Zebra	
11	STPS to New Bishnupur	S/C	145.5	Zebra	WBSETCL
12	Subhasgram (WB) to Subhasgram (PG)	D/C	0.6	Moose	
13	Kharagpur to Midnapur	D/C	45.6	Zebra	
14	Dalkhola to Dalkhola (PG)	D/C	1.0	Zebra	PGCIL
15	Dalkhola PG to Kishanganj	D/C	31.0	Zebra	
	Kishanganj to Siliguri (PG)	D/C	108.0	Zebra	
16	Dalkhola PG to Purnea	D/C	41.0	Zebra	
17	Dalkhola PG to Malda	D/C	116.0	Zebra	
18	Binaguri to Siliguri (PG)	D/C	6.0	Zebra	
19	Binaguri to Birpara	D/C	80.0	Zebra	
20	Birpara to Salakati (NER)	D/C	160.0	Zebra	
21	Birpara to Malbase	S/C	40.0	Zebra	
22	Birpara to Chukha	D/C	38.0	Zebra	PGCIL
23	Gokarna to Sagardighi	D/C	40.0	Zebra	WBSETCL
24	Farakka to Lalmatia	S/C	79.0	Zebra	PGCIL
25	STPS to Chandil	S/C	98.0	Zebra	WBSETCL & JSEB

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
26	Subhashgram (PG) to Newtown (WBSETCL)	S/C	24.0	Zebra	WBSETCL
27	Kasba to EMSS	S/C	1.0	Single Core XLPE	CESC
28	Subhasgram (PG) to EMSS (CESC)	D/C	23.2	ACSR Moose	
29	EMSS to Budge Budge G.S (BBGS)	D/C	85.0	Moose	
		D/C	2.5	800 sqmm, XLPE	
30	NCGS to EMSS	D/C	19.0	800 sqmm, XLPE	
31	Arambagh to Midnapore	D/C	71.0	Zebra	WBSETCL
32	Arambagh to Rishra	S/C	73.0	Zebra	
33	Arambag to New Bishnupur	D/C	49.0	Zebra	
34	Bakreswar to Satgachia	D/C	132.0	Zebra	
35	Domjur to Arambagh	D/C	58.0	Zebra	
36	Howrah to Foundry Park	D/C	34.0	Zebra	
37	Foundry Park to Domjur	D/C	14.5	Zebra	
38	Jeerat to Satgachia	D/C	78.0	Zebra	
39	Kasba to Jeerat	D/C	55.0	Zebra	
40	Kasba to Subhasgram (WB)	D/C	22.0	Zebra	
41	Krishnanagar to Satgachia	D/C	52.0	Zebra	
42	NJP (WB) to TLDP-III	S/C	80.8	Zebra	
43	NJP (WB) to TLDP-IV	D/C	145.0	Zebra	
44	New Haldia to KTPS	D/C	56.0	Zebra	
45	Bidhanagar to Asansol	S/C	114.0	Zebra	
46	STPS to Asansol	S/C	62.0	Zebra	
47	STPS to Hura	S/C	45.3	Zebra	
48	Hura to New Bishnupur	S/C	131.8	Zebra	
49	Subhasgram (WB) to Lakshmikantapur	D/C	43.0	Zebra	
50	Jeerat to Rishra	S/C	70.0	Zebra	
51	Jeerat to Dharampur	S/C	32.5	Zebra	
52	Dharampur to Rishra	S/C	32.5	Zebra	
53	Malbase to Chukha	S/C	36.0	Zebra	PGCIL
54	Subhasgram (PG) to Bantala - CLC (WB)	S/C	20.7	Zebra	WBSETCL
55	Bantala (CLC) to New town	S/C	20.0	Zebra	
56	Kalyanisweri to Maithon (Pithakari) PGCIL	D/C	7.6	Zebra	PGCIL
57	Maithon(Pithakari) to Dhanbad	D/C	52.0	Zebra	
58	Mejia to Borjora	D/C	8.5	ACSR Zebra	DVC
59	Mejia to Muchipara (Durgapur)	D/C	31.5	Zebra	
60	Muchipara (Durgapur) to Parulia (DVC)	D/C	14.8	Zebra	
61	Parulia (DVC) to Tumla	3	6.0	Zebra	
62	Burnpur to IISCO	D/C	1.2	AAAC ZEBRA	
63	Mejia (DVC) to Waria DTPS (DVC)	D/C	42.0	Zebra	
64	Waria (DTPS) to Parulia (DVC)	D/C	22.0	Zebra	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
65	Parulia (DVC) to Parulia (PG)	D/C	1.0	Zebra	
66	Mejia to Kalyanswari	S/C	54.9	Zebra	
67	Mejia to Burnpur	S/C	58.2	Zebra	
68	Burnpur to Kalyanswari	S/C	22.0	Zebra	DVC
69	Gokarna to Krishnanagar	D/C	105.0	Zebra	
70	Kharagpur to Egra	D/C	53.5	Zebra	WBSETCL
71	Kharagpur to Vidyasagar Park	D/C	100.0	Zebra	
132 kV					
1	Adisaptagram to Belmuri	D/C	32.0	Panther	
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	WBSETCL
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	
24	Chandrakonaroad (CK Road) to CK Road Rail	S/C	5.0	Panther	
25	Bishnupur to Midnapur	S/C	88.0	Panther	
26	Bishnupur to Modern/ Gaytri (load)	S/C	4.0	Panther	
27	Bishnupur to New Bishnupur	D/C	5.5	Panther	
28	Bishnupur to New Bishnupur	S/C	3.0	Panther	
29	Bishnupur to Rohit Ferro	S/C	2.8	Panther	
30	New Bishnupur to Borjora	D/C	44.5	Panther	
31	Borjora to Durgapur (Bidhanagar)	D/C	27.0	Panther	
32	Bolpur to Durgapur (Bidhanagar)	D/C	71.0	Panther	
33	Bolpur to Sainthia	D/C	40.0	Panther	
34	BTPS to Dharampur	3	26.0	Panther	
35	BTPS to Bighati	D/C	25.0	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
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 Bajkul	S/C	33.0	Panther	
43	Egra to Bajkul	S/C	65.0	Panther	
44	Contai to New Haldia	S/C	77.0	Panther	
45	Dalkhola to Raigaunj	D/C	51.0	Panther	
46	Dalkhola to TCF PS - III	D/C	95.0	Panther	
47	Dankuni to Hind Motor	S/C	7.0	Panther	
48	Dankuni to Liluah	S/C	8.0	Panther	
49	Debagram to Debagram TSS	S/C	6.0	Panther	
50	Debagram to Katwa	D/C	35.0	Panther	
51	Dharampur to Kalyani	S/C	10.0	Panther	
52	Dharampur to Ranaghat	D/C	26.0	Panther	
53	Dharampur to Titagarh	D/C	29.0	Panther	
54	Dhulian to Farakka	S/C	22.0	Panther	
55	Domjur to Jangipara	D/C	17.0	Panther	
56	Domjur to Chanditola	D/C	25.0	Panther	
57	Domjur to Uluberia	D/C	27.0	Panther	
58	Durgapur (Bidhanagar) to DPL	D/C	10.0	Panther	
59	Durgapur (Bidhanagar) to Mankar	D/C	30.0	Panther	
60	Durgapur (Bidhanagar) to Ukhra	D/C	22.5	Panther	
61	Egra to New Haldia	S/C	100.0	Panther	
62	Gangarampur to Balurghat	S/C	35.0	Panther	
63	Gokarna to Katwa	D/C	57.0	Panther	
64	Gokarna to Berhampore	D/C	18.0	Panther	
65	Gokarna to Lalgola	S/C	46.8	Panther	
66	Gokarna to Lalgola	S/C	67.0	Panther	
67	Lalgola to Raghunathganj	S/C	27.0	Panther	
68	Gokarna to Raghunathganj	S/C	42.0	Panther	
69	Gokarna to Rampurhat	S/C	63.0	Panther	
70	Gokarna to Kuli	S/C	23.6	Panther	
71	Haldia to Haldia NIZ	D/C	22.0	Panther	
72	Haldia NIZ to Rohit Ferro	S/C	2.0	Panther	
73	Haldia to TATA Power	D/C	6.5	Panther	
74	Haldia to New Haldia	S/C	2.0	Panther	
75	New Haldia to Bajkul	D/C	45.0	Panther	
76	Haldia NIZ to Maniksia	S/C	1.0	Panther	
77	Hizli to Midnapur	D/C	25.5	Panther	
78	Egra to Bengal Energy (BEL)	S/C	50.1	Panther	
79	Bengal Energy (BEL) to Hizli	S/C	22.7	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
80	Hind Motor (HM) to Rishra	S/C	13.0	Panther	
81	Howrah to Liluah I&II	D/C	14.0	Panther	
82	Howrah to Liluah III	S/C	18.0	Panther	
83	Howrah to Liluah IV	S/C	24.0	Panther	
84	HPCL to Haldia	S/C	3.0	Panther	
85	HPCL to New Haldia	S/C	2.0	Panther	
86	Jeerat to Ashoknagar	D/C	15.0	Panther	
87	Jeerat to Mahispota	D/C	27.7	Panther	
88	Jeerat to Barasat	D/C	24.5	Panther	
89	Jeerat to Bongaon	D/C	36.0	Panther	
90	Jeerat to Dharampur	D/C	14.0	Panther	
91	Kalna to Satgachia	D/C	18.8	Panther	
92	Kasba to Salt Lake	S/C	21.0	Panther	
93	Kasba to KLC	S/C	13.0	Panther	
94	KLC to Salt Lake	S/C	13.0	Panther	
95	Kasba to Sonarpur	S/C	12.0	Panther	
96	Katwa to Katwa TSS	S/C	2.4	Panther	
97	Katwa to Satgachia	D/C	45.0	Panther	
98	Khanyan to Satgachia	S/C	42.0	Panther	
99	Kharagpur (DVC) to Kharagpur (WB)	S/C	1.0	Panther	
100	Khargapur (WBIDC) to TATA Metalic	S/C	5.0	Panther	
101	Khatra to Bishnupur Old	D/C	66.5	Panther	
102	Khejuria to Farakka (Cable)	D/C	2.6	Panther	
103	Kolaghat to KTPS	D/C	4.0	Panther	DVC
104	Kolaghat to Madras Cement	S/C	5.0	Panther	WBSETCL
105	Krishnanagar to Bongaon	D/C	53.0	Panther	
106	Krishnanagar to Debagram	D/C	46.0	Panther	
107	Krishnanagar to Ranaghat	D/C	33.4	Panther	
108	Tamluk TO Tamluk rail	S/C	10.0	Panther	
109	KTPS to Tamluk	D/C	19.0	Panther	
110	KTPS to Uluberia	S/C	29.0	Panther	
	KTPS to Bagnan		16.0		
	Bagnan to Uluberia		21.0		
111	Kuli to Sainthia	S/C	35.6	Panther	
112	Laxmikantapur to Falta	D/C	34.0	Panther	
113	Laxshmikantapur to Kakdwip	D/C	53.5	Panther	
114	Liluah to BTPS	S/C	58.0	Panther	
115	Liluah to Rishra	S/C	19.5	Panther	
116	Liluah to Rishra	S/C	36.0	Panther	
117	Mahachanda to Mankar	D/C	43.0	Panther	
118	Mahachanda to Satgachia	D/C	54.0	Panther	
119	Malda to Balurghat Tap point	S/C	98.4	Panther	
120	Malda to Khejuriaghat	D/C	35.0	Panther	
121	Malda to Malda (PG)	D/C	7.0	Panther	
122	Malda to Raigaunj	S/C	85.0	Panther	
123	Malda to Samsi	S/C	55.0	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
124	Midnapur to Khargapur (WBIDC)	S/C	18.0	Panther	
125	Midnapur to Balichak TSS	S/C	26.0	Panther	
126	Midnapur to Chandrakonaroad (CK Road)	S/C	46.0	Panther	
127	Midnapur to Jhargram	D/C	48.0	Panther	
128	Midnapur to Pingla	S/C	41.0	Panther	
129	Moinaguri to Birpara	S/C	43.0	Panther	
130	Moinaguri to Mathabhanga	S/C	50.0	Panther	
131	Mathabhanga to Birpara	S/C	83.8	Panther	
132	Moinaguri to Chalsa	S/C	43.0	Panther	
133	Gokarna to Sonar Bangla	S/C	47.2	Panther	
134	Sonar Bangla to Lalgola	S/C	28.4	Panther	
135	New Town AA-III to New Town AA-I	S/C	8.3	Panther	
136	New Town AA-III to Salt Lake GIS	S/C	15.0	Panther	
137	New Town AA-I to Salt Lake GIS S/C	D/C	11.1	Panther	
138	New Town AA-I to CLC	S/C	12.1	Panther	
139	NBU to Lebong	S/C	66.0	Panther	
140	NBU to NJP (PG)	S/C	15.0	Panther	
141	NBU to Rammam	S/C	69.0	Panther	
142	NBU to TCF PS - I	S/C	18.0	Panther	
143	NJP (WB) to Chalsa	S/C	78.0	Panther	
144	NJP (WB) to Moinaguri	S/C	41.0	Panther	
145	NJP (WB) to TCF PS - I	S/C	16.0	Panther	
146	Purulia (WB) to STPS	D/C	35.0	Panther	
147	Raghunathganj to Dhulian	S/C	22.0	Panther	
148	Raghunathganj to Farakka	S/C	44.0	Panther	
149	Raigaunj to Gangarampur	S/C	75.0	Panther	
150	Rampurhat to Sainthia	S/C	38.0	Panther	
151	Reshmi to TATA Metalic	S/C	6.0	Panther	
152	Samsi to Raigaunj	S/C	68.0	Panther	
153	Satgachia to Debagram TSS	S/C	18.0	Panther	
154	Siliguri to NJP (WB)	D/C	16.0	Panther	
155	Tamluk to Haldia NIZ	D/C	46.0	Panther	
156	Tarakeswar to Belmuri	D/C	18.0	Panther	
157	TCF PS - I to TCF PS - II	S/C	16.0	Panther	
158	TCF PS - I to TCF PS - III	S/C	34.0	Panther	
159	TCF PS - II to TCF PS - III	S/C	20.0	Panther	
160	Hura to Purulia(WB)	D/C	15.9	Panther	
161	Howrah to Foodpark	S/C	20.0	Panther	
162	Foodpark to Kolaghat	S/C	37.0	Panther	
163	Vidyasagarpark to Hizli TSS	S/C	90.0	Panther	
164	Vidyasagarpark to Hizli	S/C	80.0	Panther	
165	Hizli to Hizli TSS	S/C	1.1	Panther	
166	Midnapur to BRG steel Tap	S/C	2.5	Panther	
167	BRG steel Tap to BRG	S/C	8.4	Panther	
168	BRG steel Tap to Vidyasagarpark	S/C	87.5	Panther	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
169	New Town AA-1 to Salt Lake GIS	D/C	11.1	Panther	
170	NJP (WB) to NJP (PG)	S/C	10.0	Panther	
171	NJP (PG) to Melli	S/C	90.0	Panther	PGCIL
172	NJP (PG) to Kurseong	S/C	31.3	Panther	
173	Kurseong to Rangit	S/C	68.0	Panther	
174	NJP (WB) to NBU	S/C	10.0	Panther	
175	Raghunathganj to farakka Ambuja Cement	D/C	5.0	Panther	WBSETCL
176	NBU to Siliguri (Ujanoo)	S/C	10.0	Panther	
177	Midnapur to Rashmi	S/C	10.0	Panther	
178	Crescent power to Asansol	D/C	20.0	Panther	
179	Raghunathpur to Hura	D/C	33.4	Zebra	
180	Joka to Falta	D/C	28.8	Panther	
181	Joka to Sonarpur	S/C	18.0	Panther	
182	Kasba to Joka	S/C	27.0	Panther	
183	Kolagat (WB) to Kolagat (DVC)	D/C	5.0	Panther	
184	Waria (DTPS) to ASP	D/C	5.0	Lark	DVC
185	Wariac (DTPS) to Kalipahari	D/C	39.7	Lark	
186	Waria to Burdwan	D/C	69.2	Lark	
187	Belmuri to Burdwan	D/C	51.5	Lark	
188	Belmuri to Howrah	D/C	49.3	Lark	
189	Howrah to Kolaghat	D/C	57.3	Lark	
190	Kolaghat to kharagpur	D/C	69.2	Lark	
191	Waria (DTPS) to Jamuria	S/C	33.0	AAAC Panther	
192	Borjora to Sonic Thermal	S/C	1.8	AAAC Panther	
193	Mosabani to Kharagpur	D/C	95.2	ACSR LARK	
194	Kolaghat to Badrinarayan alloy steel		No proper details available		
195	DTPS to DPL	D/C	11.0	Lark	DVC/DPL
196	Joka to Sirakol	S/C	17.0	Panther	WBSETCL
197	Amtala to Najirpur	D/C	13.4	Panther	
198	Rammam to Rangit	S/C	27.0	Panther	
199	Laxmikantapur to Sirakol	D/C	35.2	Panther	
200	Siliguri to Siliguri (Ujanoo)	S/C	10.0	Panther	
201	Dalkhola to Kishengunj	S/C	26.0	Panther	
202	Lebong (Darjeling) to Rammam	S/C	20.0	Panther	
203	DPPS to B Zone	D/C	1.6	Panther	DPL
204	DPPS to A Zone	S/C	6.4	Panther	
205	DPPS to C Zone	D/C	4.8	Bison	
206	DPPS to C1 Zone	D/C	5.5	Panther	
207	DPPS to AB Zone	D/C	1.2	Panther	
208	A Zone to Bamunara	D/C	3.6	Panther	
209	BBGS to Chakmir	D/C	20.1	ACSR Moose	CESC
210	BBGS to Chakmir	D/C	18.7	ACSR Moose	
211	Chakmir to Majerhat	D/C	6.1	XLPE 630 sqmm	
212	Chakmir to Taratala	D/C	5.4	XLPE 630 sqmm	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type	Owned By
213	Taratala to BBD Bag	S/C	10.4	XLPE 630 sqmm	
214	Taratala to PRS	S/C	11.0	XLPE 630 sqmm	
215	Majerhat to Taratala	S/C	0.9	XLPE 630 sqmm	
216	Jadavpore to Majerhat	S/C	5.6	XLPE 630 sqmm	
217	Majerhat to Southern	D/C	6.4	XLPE 400 sqmm	
218	Majerhat to PRS	S/C	9.0	XLPE 400 sqmm	
219	WBSETCL (Howrah) to Southern	S/C	3.0	GF 161 sqmm	
220	Botanical Garden to Southern	D/C	2.2	XLPE 800 sq.mm(1st circuit) 2 x GF 161 sq.mm. Cu.(2nd circuit)	
221	WBSETCL (Howrah) to B.Garden	D/C	1.1	XLPE 630 sq.mm(1st circuit) 2 x GF 161 sq.mm. Cu.(2nd circuit)	
222	BBD Bag to PRS	D/C	1.4	XLPE 630 sqmm	
223	East Calcutta to PRS	S/C	6.6	XLPE 630 sqmm	
224	PRS to Park lane	S/C	2.1	XLPE 800 sqmm	
225	East Calcutta to Chitpur railway	S/C	7.4	XLPE 630 sqmm	
226	Chitpur railway to Btroad	S/C	5.6	XLPE 630 sqmm	
227	BT road to NCGS	S/C	1.5	GF 260 sq. mm. Cu	
228	BT road to NCGS	S/C	2.5	XLPE 800 sqmm	
229	BT road to Titagarh	S/C	9.3	XLPE 800 sqmm	
230	Dum dum to BT road	S/C	7.5	XLPE 800 sqmm	
231	NCGS to Titagarh	S/C	13.4	XLPE 400 sqmm	
232	WBSETCL (Titagarh) to Titagarh	D/C	0.5	GF 225 sq. mm. Al.	
233	WBSETCL (Lilooah) to Belur	T/C	4.4	GF 161 sq.mm. Cu	
234	WBSETCL (Rishra) to Rishra	D/C	6.4	XLPE 800 sqmm	
235	EMSS to East Calcutta	S/C	7.8	XLPE 800 sqmm	
236	EMSS to PRS	S/C	9.8	XLPE 800	

Sl.No	Transmission line	Ckt type	Distance (km)	Conductor Type sqmm	Owned By
237	WBSETCL (Kasba) to EMSS	T/C	0.4	XLPE 800 sqmm	
238	EMSS to Jadavpore	S/C	11.0	XLPE 630 sqmm	
239	EMSS to Park lane	S/C	7.0	XLPE 800 sqmm	
240	EMSS to Patuli	S/C	7.0	XLPE 800 sqmm	
241	East calcutta to DDSS	S/C	11.0	XLPE 800 sqmm	
242	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	
IPP					
1	Adhunik Power Co. Ltd.	2	270	540	
2	Maithon RB (MPL)	2	525	1050	Joint venture of DVC & TATA

Sl.No	Name of the power station	Power station details			Owned By
		No. of units	Capacity of each unit (MW)	Total capacity (MW)	
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		
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	

Sl.No	Name of the power station	Power station details			Owned By
		No. of units	Capacity of each unit (MW)	Total capacity (MW)	
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	
7	Ind-Barath	1	350	350	
Sikkim					
State Sector					
1	LLHP	2	6	12	Sikkim Gov.
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

Sl.No	Name of the power station	Power station details			Owned By
		No. of units	Capacity of each unit (MW)	Total capacity (MW)	
3	Teesta-III	6	200	1200	Teesta Urga ltd.
4	Dikchu	2	48	96	
IPP					
1	Chuzachen	2	55	110	
2	Jortheang 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	1600	WBPDCL
		2	500		
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
		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					

Sl.No	Name of the power station	Power station details			Owned By
		No. of units	Capacity of each unit (MW)	Total capacity (MW)	
1	Tata power	2	45	120	
		1	30		
2	Crescent power	2	20	40	

Table D: State wise list of Bus reactors 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	3	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	2	125	125
Jharkhand					
1	Ranchi (New)	400	2	125	250
		765	2	240	480
2	Maithon	400	1	50	50
3	Maithon RB (MPL I & II)	400	2	125	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	330
2	Jharsuguda	765	1	240	240
			1	240	240
3	Bolangir	400	1	80	80
4	Rourkela	400	1	50	50
			1	125	125
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

Sl. No	Name of the substaion	Voltage level (kV)	Existing reactor details		
			no of units	capacity of each unit (MVAr)	Total capacity (MVAr)
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	50.31
3	Bidhannagar	400	1	50	50
4	Bakreswar	400	1	50	50
5	Jeerat	400	1	50	50
6	Arambagh	400	1	50	50
7	Ragunathpur	400	2	50	100
8	Kharagpur	400	1	80	80
9	Binaguri	400	2	125	250
10	Behrampur	400	1	80	80
11	KTPS	400	2	50	100
12	Durgapur	400	1	50	50
13	Alipurduar	400	2	125	250

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	2	50	100	Biharshariff	-
12	Barh to Patna I & II	400	2	63	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	50	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

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	
25	Gaya to Varanasi-II	765	2	240	480	Gaya	Switchable
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	
Odisha							
33	Jharsuguda to Angul-I & II	765	2	240	480	Jharsuguda	Switchable
			2	240	480	Angul	-
34	Jeypore to Gajuwaka I & II	400	2	80	160	Gajuwaka	Switchable
35	Pandiabill to Mendhasal	400	1	63	63	Mendasal	-
	Baripada to Pandiabill	400	1	63	63	Baripada	
36	Rourkel to Jharsuguda I	400	1	63	63	Rourkela	-
37	Rourkel to Sterlite I	400	1	63	63	Rourkela	-
38	Meramundali to Angul I	400	1	80	80	Meramundali	-
	Meramundali to Vedanta	400	2	50	100	Meramundali	
39	Angul to Bolangir	400	1	50	50	Bolangir	-
40	Bolangir to Jeypore	400	1	50	50	Bolangir	-
		400	1	80	80	Jeypore	
41	Rourkela to Talcher I & II	400	2	50	100	TSTPP	-
42	Keonjhar to Rengali	400	1	63	63	Rengali	-
43	Rengali to Indravati	400	2	50	100	Rengali	-
			1	50	50	Indravati	
44	Rourkela to Chaibasa-I	400	1	50	50	Rourkela	Switchable
45	Baripada to Duburi	400	1	63	63	Baripada	-
46	Rourkela to Jamshedpur II	400	1	50	50	Rourkela	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	
47	Baripada to Keonjhar	400	3	16.67	50.01	Baripada	-
48	Jharsuguda to Dharamjaygarh-I	765	1	330	330	Dharamjaygarh	-
49	Jharsuguda to Dharamjaygarh-II	765	1	330	330	Dharamjaygarh	-
West Bengal							
50	Behrampur to Jeerat-I	400	1	50	50	Jeerat	-
51	Sagardighi to Subashgram	400	3	21	63	Sagardighi	-
			1	50	50	Subashgram	
52	Farakka to Parulia-I	400	1	50	50	Farakka	-
53	Bidhannagar to Parulia-I	400	3	16.7	50.01	Parilia	-
54	Bakreswar to Arambagh	400	1	63	63	Bakreswar	-
55	Bakreswar to Jeerat	400	1	63	63	Jeerat	-
56	Malda to Purnea I & II	400	2	63	126	Malda	-
57	Binaguri to Bongaigaon- I & II	400	2	63	126	Bongaigoan	
58	Binaguri to Tala I & II	400	2	63	126	Binaguri	-
59	Binaguri to Tala IV	400	1	63	63	Binagiri	-
60	Binaguri to Bongaigaon III & IV	400	2	80	160	Binagiri	Switchable
61	Ragunathpur to Ranchi	400	1	60	60	Ranchi_PG	-
62	Ragunathpur to Ranchi	400	1	60	60	Ranchi_PG	-

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	50.81	16.70
			3	50	150		
2	Ataula (Arwal)(Karpi)	132/33	2	20	40	16.09	4.99
3	Aurangabad	132/33	2	20	40	31.75	13.86
4	Banjari	132/33	3	20	60	12.70	6.35
5	Banka	132/33	3	20	60	31.75	10.44
6	Barauni TPS	132/33	1	50	50	12.70	6.35
			2	20	40		
7	Barh	132/33	1	20	20	33.87	11.14
			1	50	50		
8	Baripahari	132/33	2	50	100	64.56	21.22
9	Belaganj	132/33	2	20	40	8.47	2.75
10	Bettiah	132/33	2	20	40	22.99	7.56
			1	50	50		
11	Bihta	132/33	3	50	150	88.91	29.15
12	Bikramganj	132/33	2	20	40	23.38	1.34
			1	50	50		
13	Buxar	132/33	2	20	40	28.19	10.64
			1	50	50		
14	Chandauti (Gaya)	132/33	2	50	100	63.51	25.50
		132/25	2	13.35	26.7	1.06	0.41
15	Chhapra	132/33	2	20	40	40.22	13.22
			1	50	50		
16	Darbhanga (old)	132/33	2	50	100	21.17	6.95
17	Dhaka	132/33	3	20	60	15.88	4.85
18	Dalsingsarai	132/33	2	20	40	22.97	6.25
19	Digha	132/33	3	50	150	55.03	18.07
20	Dumraon	132/33	1	20	20	28.58	4.80
			1	50	50		
21	Ekma	132/33	1	20	20	6.35	1.91
22	Ekanga Sarai (Ekanagar)	132/33	3	20	60	21.17	4.23
23	Forbeshganj	132/33	1	20	20	42.34	1.63
			1	50	50		
24	Goh	132/33	2	20	40	11.93	3.87
25	Gangwara	132/33	2	50	100	44.03	5.73
26	Gaighat	132/33	2	50	100	66.69	15.12
27	Hazipur	132/33	3	50	150	57.16	18.34
28	Hulasganj	132/33	2	20	40	19.71	4.55
29	Harnaut	132/33	2	20	40	19.55	12.12
30	Hathidah	132/33	3	20	60	23.50	7.65

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
31	Imamganj	132/33	2	20	40	13.34	4.10
32	Jagdishpur	132/33	2	20	40	19.37	5.29
33	Jandaha	132/33	2	20	40	16.09	3.39
34	Jainagar	132/33	3	20	60	12.91	4.21
35	Jakkanpur	132/33	4	50	200	95.17	30.01
36			1	20	20		
37	Jamalpur	132/33	2	50	100	30.48	9.95
38	Jamui	132/33	2	20	40	31.75	10.36
39	Jehanabad	132/33	2	20	40	21.22	4.27
40	Kahalgaon	132/33	2	20	40	29.64	14.82
			2	50	100		
41	Karmnasa	132/33	2	50	100	23.82	6.59
			1	20	20		
42		132/25	1	21.6	21.6	0.26	0.77
			1	20	20		
43	Kataiya	132/33	3	20	60	30.38	7.11
44	Katihar	132/33	3	20	60	25.93	8.46
			1	50	50		
45	Katra	132/33	3	50	150	74.73	11.54
46	Kusheshwarsthan	132/33	2	20	40	12.92	4.23
47	Kochas	132/33	2	20	40	12.82	2.45
48	Karbigahiya	132/33	4	50	200	58.75	19.02
49	Kudra	132/33	2	20	40	13.89	3.90
50	Khagaria	132/33	2	20	40	14.07	2.29
			1	50	50		
51	Kishanganj	132/33	1	50	50	21.17	6.29
			1	20	20		
52	Lakhisarai	132/33	3	20	60	38.11	12.44
53	Madhubani	132/33	2	20	40	8.47	2.76
54	Masaurhi	132/33	2	20	40	15.88	16.91
55	Mithapur	132/33	2	50	100	46.57	15.08
56	Mohania	132/33	1	50	50	32.04	9.26
			1	20	20		
57	Motihari	132/33	1	20	20	45.38	14.51
			1	50	50		
58	Masrakh	132/33	2	20	40	15.88	3.28
59	Muzaffarpur	132/33	3	50	150	65.63	21.42
60	Nalanda	132/33	2	20	40	26.67	8.76
61	Naugachhia	132/33	3	20	60	20.64	5.40
62	Nawada	132/33	1	20	20	41.81	8.19
			3	50	150		
63	Pandaul	132/33	2	20	40	22.79	2.22
			1	50	50		
64	Phulparas	132/33	2	20	40	25.40	8.35

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
65	Purnea	132/33	1	20	20	55.04	18.09
			2	50	100		
66	Rafiganj	132/33	1	50	50	15.88	5.19
			1	20	20		
67	Rajgir	132/33	2	20	40	26.57	8.66
68	Ramnagar	132/33	2	20	40	28.52	9.29
69	Raxaul	132/33	2	20	40	7.30	2.40
70	Remi nagar (Runni Saidpur)	132/33	2	20	40	7.62	2.48
71	Sherghati	132/33	2	20	40	23.96	6.18
72	SKMCH	132/33	2	50	100	65.28	21.30
73	Sonebarsa	132/33	2	20	40	10.62	3.72
74	Sabour	132/33	3	50	150	66.69	21.76
75	Saharsa	132/33	1	20	20	25.40	9.54
76	Samastipur	132/33	2	20	40	28.79	8.90
77	Sasaram	132/33	2	50	100	31.75	3.04
78	Shekhpura	132/33	2	20	40	28.05	9.15
79	Sheetalpur	132/33	2	20	40	10.58	4.77
80	Sitamarhi	132/33	3	50	150	30.59	9.97
81	Siwan	132/33	1	20	20	47.63	15.66
			2	50	100		
82	Sonenagar	132/33	1	50	50	40.49	13.38
			1	20	20		
83		132/25	1	21.6	21.6	10.58	2.83
			1	20	20		
84	Sultanganj	132/33	2	20	40	16.63	4.57
			2	50	100		
85	Supaul	132/33	3	20	60	25.40	5.09
86	Tehta	132/33	2	20	40	6.35	0.86
87	Tekari	132/33	2	20	40	12.55	2.95
88	Udaikishanganj	132/33	2	20	40	9.31	2.01
89	Vaishali	132/33	2	20	40	16.94	5.94
90	Wazirganj	132/33	2	20	40	12.62	5.45
91	BodhGaya	132/33	1	50	50	54.49	4.32
92	Dehri	132/33	2	50	100	24.87	8.12
93	GopalGanj	132/33	2	50	100	42.13	13.27
94	Begusarai	132/33	3	50	150	61.39	54.12
95	Khagaul	132/33	5	50	250	120.67	39.65
96	Sipar	132/33	2	50	100	35.25	9.63
97	Fatuha	132/33	3	50	150	61.39	16.24
98	Bihar Sarif	132/33	1	20	20	0.00	0.00
99	Madhepura	132/33	2	20	40	31.42	9.38
			1	100	100		
100	Pussori New	132/33	1	50	50	97.00	21.05

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
101	Benipatti	132/33	2	20	40	4.93	0.13
102	Belsand	132/33	1	10	10	6.51	2.14
103	Mahanar3	132/33	2	20	40	6.12	1.99
104	Sheohar	132/33	2	50	100	9.02	2.93
105	Kishanganj New	132/33	1	50	50	9.38	1.19
106	Banmakhi	132/33	2	20	40	6.13	1.30
107	Hathua	132/33	2	20	40	10.58	3.48
108	Narkatiyaganj	132/33	2	20	40	3.75	1.23
109	Pupri	132/33	2	20	40	1.52	0.50
110	Tarapur	132/33	2	20	40	15.88	4.13
111	Trivenigaunj	132/33	2	20	40	4.39	0.54
112	SamastipurN	132/33	2	50	100	5.48	0.75
113	motipur	132/33	3	50	150	9.18	2.17
Traction							
114	Arrah Rly	132/25				7.41	2.40
115	LakhisR	132/25				4.00	1.29
116	RafignR	132/25				3.40	1.10
117	DumarnR	132/25				3.00	0.54
118	HajiR	132/25				0.86	0.69
119	ChprR	132/25				6.49	2.10
120	KudraR	132/25				3.80	1.23
121	Mokama Rly	132/25				7.00	2.27
122	Railfactory Rly	132/25				10.00	2.97
123	Khsurupur Rly	132/25				6.00	1.97
124	Paharpur Rly	132/25				2.90	1.86
125	KCL Rly	132/25				0.80	2.00
126	JHAJA Rly	132/25				10.00	3.28
127	Khagaul Rly	133/25				4.00	1.34
128	Jehanabad_Railway	132				3.83	0.23
129	Dalsingsarai_R	132				2.70	0.18
130	Arrah RLY	132				5.00	1.61
Bihar Industry							
131	Ordinance Factory(Rajgir)	132				0.40	0.13
132	Samastipur Trac	132				3.80	0.15
133	RailLoacal Plant (vaisali)	132				3.02	1.50
134	Shree Cement	132				18.00	2.91
135	Surajpur	132				21.76	7.16
136	Chandauli	132				0.00	0.00
137	BharatSM_Gen	132				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
138	Hasanpur SMG	132				0.00	0.00
139	SUGAULI	132				0.07	0.02
140	LAURIYA	132				0.07	0.02
141	Swdesi Sugarmill Gen	132				0.00	0.00
142	Narinagar SugerMill	132				0.60	0.20
Jharkhand							
1	Chaibasa	132/33	2	50	100	8.79	2.89
2	Lalmatiya	132/33	1	20	120	25.00	8.21
			2	50			
3	Adityapur	132/33	4	50	200	89.43	-13.30
4	Chakradharpur	132/33	1	20	20	8.00	6.62
5	Dalbhumgarh	132/33	2	50	100	37.20	23.17
		Railway feeder				6.00	2.03
6	Chaibasa	132/33	1	25	25	6.00	1.98
7	Chandil II/ Maniq	132/33	2			51.00	16.33
8	Deogarh	132/33	3	50	150	30.00	8.10
9	Dumka(Maharo)	132/33	2	50	100	20.00	5.78
10	Garhwa Rd	132/33	1	50	70	42.00	5.98
			1	20			
11	Goielkara	132/33	1	20	20	12.00	3.94
		Railway feeder				3.00	0.99
12	Golmuri	132/33	2	50	100	34.00	11.17
13	Gumla	132/33	2	20	40	17.57	5.77
14	Hatia old	132/33	4	50	200	105.00	34.51
15	Tamar	132/33	2	50	100	13.00	0.33
16	Madhupur	132/33	2	50	100	16.40	3.40
17	Jadugoda	132/33	2	20	90	21.00	6.90
			1	50			
18	Jamtara	132/33	1	50	70	25.20	4.42
			1	20			
		Railway feeder				8.00	1.40
19	Japla	132/33	2	20	40	16.00	2.28
20	Kamdara	132/33	2	20	60	30.50	10.50
			1	20			
21	Kanke	132/33	2	50	100	33.10	9.42
22	Kendposi	132/33	2	20	90	28.00	9.19
			1	50			
		Railway feeder				6.00	1.97
23	Latehar	132/33	2	50	100	1.60	0.53
24	Lohardaga	132/33	2	50	100	31.70	10.42

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
25	Namkum	132/33	4	50	200	93.20	39.25
26	Nowamundi	132/33	1	50	50	0.00	0.00
27	Nowamundi Tata Steel	132				0.00	0.00
28	Pakur	132/33	2	50	100	23.07	6.69
29	Rajkharsawan	132/33	2	50	100	0.00	0.00
		Railway feeder				8.30	3.16
30	Sahebgunj	132/33	2	50	100	10.53	3.61
31	Daltonganj	132/33	2	50	100	43.00	14.14
32	Manoharpur_JUSNL	132/33				4.00	5.95
33	Sikidri_JUSNL	132/33				9.50	8.00
34	Saljagiri RLY	132/25	-	-	-	0.00	0.00
35	Shankarpur RLY_deogarh	132/25	-	-	-	3.00	0.65
36	Tatisiloi RLY	132/25	-	-	-	10.80	5.23
37	Tolra RLY	132/25	-	-	-	16.00	2.28
38	Lodhma RLY	132/25	-	-	-	2.63	0.25
39	Bakaspur RLY	132/25	-	-	-	3.00	0.99
40	Chakradharpur RLY	132/25	-	-	-	9.36	3.10
41	Bano RLY	132/25	-	-	-	0.00	0.00
42	Umi Rly	132/25	-	-	-	2.90	2.08
43	Pakur Rly	132				0.02	0.22
DVC							
44	Patherdih	132/33	2	80	160	46.64	24.84
			1	50	50		
		132/25				9.67	4.92
45	Pattratu (DVC)	132/33	1	31.5	31.5	4.50	2.23
46	Gola	132/33	2	50	100	5.80	1.73
47	K'Dubi	132/33	2	50	100	38.99	18.85
			1	80	80		
		132/25				8.55	8.55
48	Konar	132/33	1	20	20	11.15	2.97
		132/25				5.30	1.67
49	Biada	132/33	2	80	160	30.00	8.54
50	BTPS'B	220				37.91	27.96
51	Dhanbad	220/33	2	80	160	21.70	4.99
52	Jamshedpur	132/33	3	45	135	13.80	2.55
53	Koderma	132/33	1	80	80	78.19	24.65
			1	50	50	15.15	3.80
54	Ramgarh	132/33	2	80	160	95.71	25.30
		132/33	1	50	50		
55	Mosabani	132/33	2	20	40	21.21	7.05
56	Ramgarh_33	220/33	2	50	100	37.95	16.13
JUSNL Industry							
1	HEC Hatia	132				9.41	3.84

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
2	Ushamartin	132				18.60	6.11
3	APL Ramchandrapur	132				16.22	12.91
4	ECL_Lalmatya_JUSNL	132				5.00	1.64
DVC industry							
1	GIRDHI	132/33				93.54	28.31
		220/33				27.35	11.94
2	North Karanpura	132/33				9.91	3.01
3	Govindpur	132				50.60	3.00
4	Hazaribag	132/33				47.23	15.60
5	Nimghat	132/33				33.00	10.40
6	Putki	132/33				145.50	65.50
7	Barhi DVC	132/33				47.00	22.00
8	CTPS	132/33				89.54	27.24
9	MHS-RB3	132/33				12.35	3.54
10	Panchet	132/33				11.90	0.59
11	Maniq Railway	132				2.09	0.65
12	Jamshedpur	220/132				17.50	52.91
13	JSPL	132				19.73	3.89
14	TISCO	400/132				253.00	17.43
15	Maniq DVC	132				11.50	-2.42
16	PDIL	132				0.19	0.62
17	BSL_DVC	220				130.00	68.00
Traction							
1	ECRBR-D	132				0.00	0.00
2	ECRly North Karanpura DVC	132				9.84	2.84
3	BSL-DVC	132				0.00	0.00
4	ElctrDVC /Dhanbad	220				32.30	29.10
5	Nimiaghat Railway	132/25				5.00	1.84
6	ECR Gomia	132				0.29	-0.14
7	MAL-Impex	132				36.00	4.00
8	Sermuri DVC	132				4.21	2.22
9	Pradhankant	132				3.50	2.50
10	BSLGD	132				0.00	0.00
11	Rajbera DVC	132				9.50	4.41
12	E C RLY(from sindri DVC)	132				6.48	0.90
Odisha							
1	Mendhasal	220/33	1	20	20	15.00	0.78
2	Balasore	132/33	2	63	166	73.39	22.84
			1	40			
		Railway Feeder				2.50	0.06

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
3	Bhadrak	132/33	2	63	166	54.31	15.62
			1	40			
		Railway Feeder				5.73	0.53
4	Bidanasi	132/33	2	63	166	74.70	30.40
			1	40			
5	Budhipadar	132/33	1	20	20	6.20	0.67
6	Chandaka	132/33	2	63	166	91.00	31.38
			1	40			
7	Jayanagar	132/33	2	20	52.5	34.80	23.40
			1	12.5			
		Railway trac				2.80	-12.50
		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	27.80	8.90
			2	160			
		132/33	2	40			
			1	20			
10		Railway (JagnathTr)				4.32	7.34
11	Paradip	132/33	2	20	52.5	28.50	7.20
			1	12.5			
12	Theruvali	132/33	2	12.5	25	12.00	2.22
13	Balimela	220/33	1	20	60	14.40	1.91
			1	40			
14	Barkote	220/33	2	40	80	15.00	3.92
15	Nayagarh	220/33	1	40	80	75.90	23.90
			2	20			
16	Duburi	220/33	2	40	80	9.92	3.00
17	Akhusingh	132/33	2	12.5	25	10.00	2.50
18	Anandapur	132/33	2	12.5	45	16.54	4.63
			1	20			
19	Angul	132/33	2	40	100	30.40	10.17
			1	20			
20	Argul	132/33	1	40	60	1.20	-0.80
			1	20			
21	Atri	132/33	1	20	20	0.00	0.00
22	Aska	132/33	3	40	120	27.00	13.76
23	Balugaon	132/33	1	40	72.5	30.15	7.92
			1	20			
			1	12.5			
		Railway feeder (Solar trac)				4.41	1.20
24	Banki	132/33	2	20	40	10.80	2.20
25	Barbil	132/33	2	12.5	25	7.44	2.90
		traction				2.40	7.75
26	Baragarh	132/33	3	40	120	53.05	25.69

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
27	Baripada	132/33	3	40	120	69.00	24.00
28	Barpalli	132/33	1	20	60	32.18	13.48
			1	40			
29	Berhampore	132/33	2	40	100	44.81	15.63
			1	20			
30	Basta	132/33	1	12.5	32.5	13.00	3.42
			1	20			
31	Bhanjanagar	132/33	2	40	96	23.76	5.34
			1	16			
32	Bhawanipatna	132/33	2	12.5	25	6.66	2.59
33	Bhubaneswar (BBSR)	132/33	3	63	189	94.00	28.53
34	Boinda	132/33	1	20	45	18.40	4.20
			2	12.5			
35	Boudh	132/33	1	20	20	4.90	1.34
36	Bolangir	132/33	2	40	92.5	61.10	17.98
			1	12.5			
37	Brajrajnagar	132/33	1	40	100	43.45	15.87
			3	20			
38		132/11	1	12.5	12.5	3.72	1.26
39	Chainpal	132/33	2	40	100	49.23	14.94
			1	20			
40	Chandikhole	132/33	3	20	60	34.30	8.60
41	Chhandpur	132/33	2	12.5	25	9.40	2.00
42	Chhatrapur	132/33	3	20	60	33.73	14.46
		Railway Traction Feeder (Ramba trac)				2.33	2.28
43	Chhend	132/33	3	40	120	60.02	18.60
		Railway Traction Feeder (Naugaon trac.)				0.07	4.27
44	Choudwar	132/33	1	20	100	26.98	9.07
			2	40			
45		Railway Traction Feeder (Kendpur trac.)				7.30	1.70
46	Cuttack	132/33	3	40	120	40.00	10.16
47	Dabugaon	132/33	2	12.5	25	6.50	0.72
48	Dhenkanal	132/33	3	40	120	57.39	21.54
49		traction (JorndaTr)				4.71	3.51
50	Digapahandi	132/33	2	20	52.5	32.75	10.12
			1	12.5			
51	Ganjam	132/33	2	12.5	25	7.43	2.53
52	Ganjam_132	132				10.30	1.26
53	Jagatsinghpur	132/33	2	20	80	32.20	8.48
			1	40			
		Railway Traction Feeder (Goreknath Trac.)				7.80	2.70
55	Jajpur road	132/33	2	40	100	37.84	16.34

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	20			
56	Jajpur town	132/33	2	40	100	47.97	16.07
			1	20			
57	Jaleswar	132/33	2	31.5	75.5	20.41	7.22
			1	12.5			
		Railway Traction Feeder				9.53	1.08
58	Jharsuguda	132/33	1	40	40	9.50	3.22
		132/11	1	20	20	0.00	0.00
			1	12.5	12.5		
		Railway Traction Feeder				10.40	3.20
59	Junagarh	132/33	3	20	60	18.44	2.58
60	Kalarangi	132/33	2	12.5	45	27.81	7.43
			1	20			
61	Kalunga	132/33	2	40	80	31.00	10.24
62	Kamakshyanagar	132/33	1	20	45	17.65	4.17
			2	12.5			
63	Karanjia	132/33	2	12.5	45	7.32	2.03
			1	20			
64	Kendrapara	132/33	2	40	92.5	21.07	6.36
			1	12.5			
65	Kesinga	132/33	1	40	80	27.77	5.90
			2	20			
66	Kesura/Badagada	132/33	1	63	103	22.00	8.26
			1	40			
67	Khariar	132/33	2	40	80	38.07	9.11
68	Khurda	132/33	3	40	120	68.99	8.52
		Railway Traction Feeder (Kaipad trac)				11.87	2.89
69	Konark	132/33	2	20	40	5.80	1.54
70	Kuchinda	132/33	2	20	40	18.71	5.35
71	Lapanaga	132/33	1	20	20	0.20	0.07
73	Mania	132/33	1	12.5	12.5	0.00	0.00
74	Marshaghai	132/33	2	20	40	3.96	1.52
75	Mohana	132/33	2	12.5	25	4.60	0.31
76	Nimapara	132/33	2	40	92.5	42.85	5.66
			1	12.5			
77	Nuapara	132/33	2	20	40	11.60	3.90
78	Nuapatna	132/33	1	40	72.5	36.89	11.56
			1	20			
			1	12.5			
79	Padampur	132/33	1	20	20	7.32	0.79
80	Parlakhemundi	132/33	3	12.5	37.5	8.23	4.47
81	Patnagarh	132/33	1	40	80	24.12	6.08
			2	20			
82	Pattamundai	132/33	2	20	52.5	30.72	7.06

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			
83	Phulbani	132/33	2	12.5	65	20.45	4.05
			1	40			
84	Phulnakhara	132/33	2	20	40	14.22	4.21
85	Polasapanga	132/33	1	40	80	36.40	8.90
			2	20			
86	Polasapanga_132					11.20	0.69
87	Puri	132/33	3	40	120	36.00	10.20
88	Purusottampur	132/33	2	12.5	25	12.20	3.30
89	Rairakhole	132/33	2	12.5	25	11.75	2.82
90	Rairangpur	132/33	2	20	52.5	6.50	0.80
			1	12.5			
91	Rajgangpur	132/33	3	40	120	52.72	10.10
92		Railway Traction Feeder				2.68	2.45
93	Ranasinghpur	132/33	2	63	166	72.00	12.00
			1	40			
94	Rayagada	132/33	2	12.5	25	6.45	2.30
95	Rourkela	132/33	4	35	140	36.60	9.30
		132/25 Railway Tr	1			1.60	2.39
96	Saintala	132/33	1	10	22.5	2.80	0.14
			1	12.5			
97	Salipur	132/33	2	20	52.5	29.80	9.30
			1	12.5			
98	Sambalpur	132/33	2	31.5	103	75.40	18.65
			1	40			
99	Shamuka	132/33	2	31.5	63	9.52	1.00
	Sijua	132/33	3				
100	Somnathpur	132/33	1	12.5	12.5	5.29	1.75
101	Sonepur	132/33	3	20	60	25.08	7.51
102	Soro	132/33	1	40	80	39.19	11.99
			2	20			
103	Sunabeda	132/33	3	12.5	37.5	23.60	5.00
104	Sundargarh	132/33	1	40	60	32.00	7.00
			1	20			
105	Tentulikhunti	132/33	1	20	32.5	15.74	4.16
			1	12.5			
106	Tarkera	132/33	1	12.5	12.5	0.00	0.00
107	Umerkote	132/33	2	20	40	16.20	5.10
108	Bolani	132/11	2	10	20	2.22	0.40
109	REN	220/33	2	20	40	5.05	1.08
110	Laksmi	220/33	1	20	20	6.98	1.40
111	Katpali	132/33	2	20	60	37.20	13.80
		132/33	1	40			

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
112	Bolangir_New	132/33	1	12.5	12.5	1.90	0.13
113	Rengli	132/33	2	20	40	14.00	3.06
114	Smangara	132/33	2	20	40	10.70	14.30
115	Rajgangpur	132/33	3	40	120	0.02	-0.54
Traction Load							
1	BhultaTraction	132				**5.48**	**1.80**
2	Meramandali TR	132				7.40	1.90
3	Jakhpur Traction (Dubri)	132				16.00	8.00
4	Dharma Traction	132				2.60	1.01
5	Tomka Trac	132				0.00	0.00
6	Padwa Tr	132				5.00	1.64
7	Manbar Trac.	132				5.00	1.64
8	Maling Tr	132				5.00	1.64
9	KeonjharTr	132				4.20	2.79
10	Talcher_R	132	Railway			4.20	1.10
11	Bamra Tr	132				0.00	0.00
Bulk Load							
1	IMFA1	132				44.00	14.66
2	Damanjod	132				43.41	-30.10
3	IRE	132				6.05	1.83
4	FCI	132				0.40	0.19
5	Baminpl	132				9.92	0.50
6	Balasore Alloy	132				44.78	3.17
7	BirlaTyr	132				3.66	0.24
8	PPL	132				10.00	0.96
9	L&T Cem co	132				1.79	0.50
10	Power Max	132				0.69	0.23
11	MCL	132				17.00	3.00
12	Chandiposh	220				3.00	0.08
13	J K Paper	132				0.02	0.55
14	FAP-Joda	132				15.94	1.13
15	HAL	132				3.42	0.57
16	BRG	132				12.50	5.60
17	M L Rungta	132				0.01	0.30
18	PPT	132				12.00	4.74
19	RAW MET	132				11.09	-4.44
20	Hind Metalic	132				0.00	0.00
21	MESCO	132				3.56	1.18
22	ROHIT	220				30.75	2.00
23	Adhunik	132				19.27	6.39
24	Dahmra Prt	132				2.94	0.69
25	OCL_TA	132				7.78	2.58
26	Saliban (Bhuvi Profile)	132				1.49	0.50
27	ESSAR	220				4.00	2.09

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
28	IOCL	220				0.50	0.48
29	Jabamaye Fe	132				2.63	0.87
30	Beekay Steels	132				7.78	2.58
31	Arya	132				6.48	2.15
32	Bansapani	132				2.26	0.93
33	BC-monty	132				9.92	0.50
34	Saintla	132				3.63	0.16
35	Tata Steel	220				134.89	10.00
36	BRPL	132				7.35	2.44
37	MSL	132				3.23	0.83
38	VVC	132				0.00	0.00
39	JSPL	220				44.00	14.50
40	Greed Steel	132				0.00	0.00
41	BRP-St	132				3.47	1.15
42	Basundra	220				2.00	0.57
43	Utkal Aluminum	220				0.00	0.00
44	Adity Aluminum	220				0.00	0.00
45	Salibani	132				16.57	2.93
46	SPS	220				0.99	-1.00
47	Nandira	132				24.70	2.80
48	Sterling	400				0.00	0.00
49	Chiplma	132				19.00	6.30
50	Remja Load (Budhipadar)	132				43.00	16.00
51	Joda_SMPL(Joda)	132				0.31	0.20
52	RSP_220	220				54.39	27.12
53	CTC_Feeder(BBSR)	132				20.83	9.18
CGP							
1	Vedanta	132				0.00	0.00
2	FACOR	132				0.00	0.00
3	RSP	132				0.00	0.00
4	ACC	132				26.54	8.98
5	Bhusan#1G	220/11				34.30	11.60
6	Bhusan#2G	220/11				51.50	17.41
7	NBVL	132				55.80	18.86
8	IFFCO	132				5.00	1.64
9	NINL2	220				0.00	0.00
10	Maheswri	132				0.00	0.00
11	Shyam DRI	132				0.00	0.00
12	JINDAL	220				115.00	38.88
13	KMCLG	33/11				24.86	8.64
14	ICCL#1G	132/11				58.22	19.67
15	RSP#1G	132/11				43.00	14.50

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
16	RSP#2G	132/11				43.00	14.50
17	RSP#G3-7	132/11				68.00	22.90
18	NALCO#1G	220/10.5				884.00	290.55
19	Veda_135	220				706.00	238.72
20	MSP	132				0.00	0.00
21	AryanISt	132				2.62	-3.00
22	Bhusan2	220				66.00	21.69
23	EMAMI	132				0.00	0.00
24	maithan2	220				0.00	0.00
25	SMC1	132				0.00	0.00
26	OPCL	132				9.60	3.24
27	MERAMDL3	132				0.00	0.00
28	JSPLG	132				649.00	219.44
29	HinlcoG	132				311.00	105.16
30	BSSL	220				0.00	0.00
31	ICCL1	132				0.00	0.00
32	ICCL#3G	132				20.39	6.90
33	AryaIspt	132				14.57	4.93
34	SDRI_GEN	132				24.96	8.44
35	BHU3G	132				120.00	40.60
36	BHU5G	132				9.60	3.25
37	EMAMIG	132				10.75	3.63
38	EMAM2G	132				2.50	0.84
39	ICCL#2G	132				41.25	13.95
40	maheIsG	132				6.51	2.20
41	IFFCOG	132				24.43	8.26
42	VEDNT_GN	132				74.89	25.32
43	RathiG	132				0.00	0.00
44	visastlG	132				64.20	22.37
45	MAITHN	132				16.00	5.41
46	MSPG	132				9.50	3.21
47	INDAL#1G	132				55.36	18.72
48	INDAL#2G	132				216.30	73.14
49	AARTI#1	132				48.81	16.50
50	OCL-Raj	132				36.43	12.32
51	BSSL2G	132				38.77	13.10
52	BSSL1	132				11.87	4.01
53	Facor	132				32.58	11.02
54	NINL	132				15.00	5.06
55	SMCG	132				4.00	1.34

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
56	SMCG2	132				17.10	5.78
57	SrigaG	132				14.57	4.93
58	ActIspG2	132				16.61	5.62
59	ActnIsG	132				10.00	3.38
60	JSPL_4	132				0.00	0.00
61	BSSP3G	132				23.07	7.79
62	ActIspG3	132				62.16	21.00
63	Sterlite	132				289.00	41.89
64	BPPLGEN	132				125.00	18.33
65	BPPLGEN2	132				125.00	18.33
66	TSAlloy	132				0.00	0.00
Sikkim							
1	Phodong	66/11	1	5	5	1.42	0.36
			1	2.5	2.5		
2	Bulbuley	66/11	2	10	20	4.99	1.25
3	Sichey	66/11	2	10	20	8.55	2.14
			1	5	5		
4	Tadong	66/11	3	5	15	4.99	1.25
5	Rongly	66/11	2	2.5	5	1.07	0.27
6	Mamring	66/11	1	10	10	6.77	1.73
			1	7.5	7.5		
			1	15	15		
7	Melli	66/11	2	5	10	2.14	0.55
8	Namchi	66/11	2	2.5	5	1.07	0.27
9	Rabangla	66/11	1	5	5	2.14	0.55
10	Rothak	66/11	2	2.5	5	1.07	0.27
11	Soreng	66/11	2	2.5	5	1.07	0.27
12	Geyzing	66/11	2	2.5	5	1.07	0.27
13	Purano Namchi	66/11	2	7.5	15	2.85	0.73
14	Pakyong	66/11	1	10	10	4.99	1.25
15	Pelling	66/11	1	5	5	2.14	0.55
16	Rhenock	66/11	1	5	5	2.14	0.55
17	Mangan	66/11	2	5	10	2.85	0.73
18	Ranipool	66/11	2	7.5	15	2.85	0.73
19	Topakhani	66/11	1	7.5	7.5	2.85	0.73
		66/11	1	5	5		
West Bengal							
1	Arambagh	132/33	3	50	150	66.00	12.00
2	Bakreswar	220/33	1	50	50	30.00	10.00
3	Asansol	132/33	3	50	150	104.40	41.42
4	New_Bishnupur	132/33	2	31.5	63	16.00	6.00

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
5	Dalkhola	132/33	3	20	60	26.50	8.46
6	Dharampur	132/33	2	50	100	80.30	14.38
7	Domjur	132/33	3	50	150	79.00	17.03
8	Gokarna	132/33	3	50	150	63.80	21.12
9	Howrah	132/25	2	20	40	8.00	2.33
10	Krishnagar	132/33	2	50	100	93.00	30.56
			1	31.5	31.5		
11	Laxmikantpur	132/33	1	31.5	81.5	77.86	25.81
			1	50			
	Laxmikantpur_railway	132/25	2	12.5	25	14.13	3.36
12	New Haldia	132/33	1	31.5	31.5	44.00	14.46
		132/33	1	50	50		
13	New Jalpaiguri	132/33	2	50	100	54.00	17.75
14	New town action area-III	220/33	2	50	100	48.00	8.00
15	Rishra	132/33	3	50	150	71.02	23.34
16	Satgachia	132/33	2	50	131.5	48.00	15.77
			1	31.5			
17	Subhashgram	132/33	2	31.5	63	60.92	8.68
18	Hura	132/33	2	50	100	17.80	5.85
19	Foundry park	132/33	2	50	100	26.00	8.50
20	Midnapur	132/33	2	50	100	64.50	21.20
21	Kolkata leather complex (KLC)	132/33	3	50	150	66.50	8.00
22	Adisapthagram	132/33	2	50	131.5	87.79	10.57
			1	31.5			
		Railway	2	20	40	15.28	8.73
23	Alipurduar	132/66	2	16	52	13.38	6.30
			1	20			
		132/33	1	31.5	31.5	4.02	0.21
24	Amtala	132/33	1	31.5	31.5	59.00	19.55
			1	50	50		
25	Asoknagar	132/33	2	50	100	70.50	11.68
		132/25	2	7.5	15	0.40	0.13
26	Bagnan GIS	132/33	2	50	100	48.80	16.03
27	Bagmundi	132/33	1	20	20	4.40	4.30
28	Balurghat	132/33	4	12.5	50	26.20	5.71
29	Bankura	132/33	2	50	100	50.40	7.20
		Railway				7.50	3.20
30	Barasat	132/33	3	50	150	120.00	30.07
		Railway				4.00	1.31
31	Behala/ joka	132/33	3	50	150	110.86	25.77
32	Basirhat	132/33	2	50	100	88.00	15.59
33	Belmuri	132/33	2	31.5	63	24.00	2.67
34	Berhampore	132/33	3	50	150	98.50	29.40

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
35	Bighati	132/33	2	50	100	30.00	4.00
36	Birsingha	132/33	2	50	100	54.31	16.87
37	Bishnupur (old)	132/33	1	50	50	47.90	14.50
		132/33	1	31.5	31.5		
38	Bolpur	132/33	3	50	150	69.50	6.80
	Bolpur_Prantik TSS	132/25				2.00	3.80
39	Bongaon	132/33	3	31.5	94.5	61.50	20.40
40	Barjora	132/33	2	31.5	63	20.00	2.00
41	Chanditala	132/33	2	50	100	40.00	2.66
42	Chandrakora road	132/33	1	50	81.5	47.90	18.50
			1	31.5			
		Railway				1.80	1.80
43	Contai	132/33	2	50	100	74.50	20.50
		Railway				1.10	0.36
44	Coochbehar	132/33	3	50	150	58.50	19.39
45	Darjeeling	132/33	3	10	30	12.42	0.50
46	Debogram	132/33	1	20	101.5	37.25	5.35
			1	31.5			
			1	50			
		Railway				2.76	0.63
47	Dhulian	132/33	2	31.5	63	26.00	2.20
48	Egra	132/33	3	50	150	121.00	6.51
49	Falta	132/33	2	31.5	63	70.00	23.19
			1	50	50		
50	Gangarampur	132/33	3	20	72.5	40.45	18.60
			1	12.5			
51	Haldia	132/33	1	50	81.5	20.40	6.75
			1	31.5			
		132/25	1	10	22.5	0.96	0.32
			1	12.5			
52	Haldia NIZ	132/33	2	31.5	63	18.68	6.15
53	Hizli	132/33	1	31.5	81.5	58.00	13.57
			1	50			
		132/25	2	10	20	11.20	2.20
54	Jangipara	132/33	2	31.5	63	20.00	2.00
55	Jhargram	132/33	1	31.5	31.5	46.62	13.05
			1	50	50		
56	Kurseong	132/33	3	10	30	7.40	1.70
57	Kakdwip	132/33	2	31.5	63	44.40	15.00
58	Kalan	132/33	2	31.5	63	42.00	15.40
59	Kalyani	132/33	1	31.5	81.5	60.16	21.73
			1	50			
60	Khatra	132/33	2	50	100	26.80	1.48
61	Katwa	132/33	2	31.5	63	58.26	34.57

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	50		
		Railway				0.30	0.17
62	Khanyan	132/33	2	31.5	63	32.00	10.50
63	Kolaghat	132/33	3	50	150	51.00	16.89
		132/25	2	12.5	25	11.60	5.60
64	Lalgola	132/33	2	31.5	63	30.00	16.00
65	Lilooah	132/33	3	50	150	83.00	27.50
		132/25	2	20	40	18.00	5.92
66	Mahachanda	132/33	2	31.5	63	48.03	13.10
			1	50	50		
67	Mathabhanga	132/33	1	50	50	30.50	10.02
			1	31.5	31.5		
68	Malda	132/33	3	50	150	95.00	41.67
69	Mahishpota	132/33	2	31.5	63	48.00	18.00
70	Mankar	132/33	3	31.5	94.5	48.60	18.00
71	Maynaguri	132/33	1	31.5	141.5	62.99	7.55
			1	50			
			2	30			
72	Nazirpur	132/33	2	31.5	63	30.00	9.86
73	North Bengal university (NBU)	132/33	2	31.5	113	46.00	15.12
			1	50			
74	New town AA 1	132/33	2	50	100	63.60	20.90
75	Pingla	132/33	3	50	150	54.00	17.74
76	Purulia(WB)	132/33	2	31.5	83	44.00	14.46
			1	20			
		132/25	2	12.5	25	4.30	1.41
77	Raghunathganj	132/33	1	31.5	101.5	67.00	22.02
			1	20			
			1	50			
78	Raghunathpur	132/33	2	31.5	63	22.98	5.33
79	Raigunj	132/33	1	31.5	96.5	53.00	17.42
			2	20			
			2	12.5			
80	Raina	132/33	2	50	100	80.10	26.32
81	Rampurhat	132/33	2	50	100	72.88	24.05
82	Rampurhat_railway	132				4.10	1.35
83	Ranaghat	132/33	2	50	100	82.31	23.18
		132/66	2	31.5	63	13.80	1.16
		132/25	1	12.5	22.5	3.07	0.77
			1	10			
84	Sainthia	132/33	2	50	100	44.20	14.52

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
85	Salt lake	132/33	3	50	150	78.30	25.73
86	Salt lake GIS	132/33	2	50	100	49.87	16.39
87	Samsi	132/33	3	31.5	94.5	67.40	22.15
88	Siliguri	132/33	2	50	100	41.90	9.92
89	Sonarpur	132/33	3	31.5	94.5	62.20	20.44
		132/25	2	20	40	8.00	2.62
90	Tamluk	132/33	2	50	100	60.70	18.70
	Tamluk	Railway				3.70	2.30
91	Tarakeswar	132/33	1	31.5	81.5	41.80	13.85
			1	50			
92	Titagarh	132/33	3	50	150	84.00	27.60
	Titagarh_railway	132/25	2	20	40	13.50	4.43
93	Ujaano (NBU _ NEW)	132/33	2	31.5	63	20.80	6.90
94	Ukhra	132/33	2	50	100	64.20	12.90
95	Uluberia	132/33	3	50	150	91.00	19.20
96	Kuli	132/33	2	50	100	33.00	6.70
97	Food Park	132/33	2	50	100	9.60	2.99
98	Birpara	132/66	3	20	60	16.20	5.32
99	Chalsa_66	132/66	1	20	30	36.97	8.23
			1	10			
	Chalsa_33	132/33	2	20	40	8.05	1.52
100	Serakol	132/33	2	50	100	32.84	10.79
101	Cossipur traction	132				5.00	1.50
102	Balichak	132				13.00	4.20
103	Dhatrigram Traction	132				4.00	0.00
104	Kalingpong	66/33				6.75	0.80
105	WBIDC_33	132/33	2	31.5	63	32.26	10.28
106	KhjrGIS3	132/33	2	50	100	6.60	2.35
107	Vidyasagar Park_33	220/33	2	50	100	17.00	5.58
108	TCF	132/33	2	20	40	32.00	10.50
109	Bajkul	132/33	2	50	100	32.00	10.73
DPL substations in West Bengal							
1	A Zone	132/11	1	20	20	28.91	9.51
		132/11	2	31.5	63		
		132/33	1	50	50	0.00	0.00
2	B Zone	132/11	5	31.5	157.5	63.74	20.95
		132/33	1	31.5	31.5	3.28	1.08
		132/33	1	50	50		
3	AB Zone	132/33	1	50	50	1.63	0.27
4	C Zone	132/11	3	31.5	94.5	17.48	7.25
		132/33	1	50	50	5.23	4.52
5	C1 Zone	132/11	2	31.5	63	3.72	1.50
		132/33	2	50	100	18.61	4.42
6	Bamunara SS	132/34	2	50	100	20.03	3.83

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
7	Shayam Stl (DPL_C)	132				18.61	6.12
8	PCBL (DPL_AB)	132				16.43	10.14
9	Shayam Ferro(DPL_C1)	132				33.71	4.79
West Bengal DVC substations							
1	Burnpur	220/33	2	50	100	0.90	0.60
2	Purulia	132/33	1	50	50	17.43	2.61
3	ASP	132	4	50	200	36.18	14.52
4	Jamuria	132/33	2	50	100	70.90	5.40
5	Kalipahari	132/33	2	80	160	57.66	18.55
6	Kalyaneswari	132/33				85.00	18.00
7	Mejia TPS	220/33	2	80	160	48.00	13.70
8	Barjora	220/33	1	100	100	81.37	5.53
		220/33	1	80	80		
		220/33	1	50	50		
9	Durgapur	220/33	1	50	50	126.00	8.00
		220/33	2	80	160		
10	DTPS_Waria	132/33				13.40	2.16
11	DTPS_Waria_railway	132/25				8.32	2.62
12	Belmuri_DVC	132/33				0.70	0.85
13	Belmuri_DVC_railway	132/25				17.81	5.85
14	Burdwan_DVC	132/33				74.00	11.82
15	Burdwan_trac_railway	132/25				3.00	6.00
16	Rumkanali_traction	132/25				4.00	1.09
17	Tamla traction	220				31.00	9.00
18	IISCOD	220				111.20	4.41
19	Sonic thermal-DVC	132				51.71	1.57
20	Badrinarayan Alloy	132				8.60	2.70
21	Parulia	220/33				56.00	4.32
22	Howrah_DVC_33	132/33				0.00	0.00
23	KGP_Traction_11	132/25				0.06	0.20
CESC							
1	EMSS	220/132 /33	5	160	800	38.5	18.638549
2	EMS-ter1					37.3	18.05
3	EMS-ter2					37.3	18.05
4	EMS-ter3					37.3	18.05
5	EMSS_T5					38.5	18.638549
6	Belur	132/33	3	50	150	118	0.9
7						0	0
8	BT Road	132/33	2	75	150	81	35
9						0	0
10	B.Garden	132/33	2	50	100	108	49

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	Titagarh(trs)	132/33	5	50	250	39	9.774321
12						57	9.499973
13						53	8.209934
14	Dum Dum	132/33	2	75	150	33	13.2
15	Park lane	132/33	2	75	150	31.9	0.439742
16						0	0
17	Jadavpore	132/33	2	50	100	70	27
	Jadavpore_2		1	55	55	35	6.3
18	Chakmir	132/33	2	55	110	73	30
19	Majerhat	132/33	2	75	150	101	14.8
20	BBD Bag	132/33	1	68	136	35	4
			1	68		23	3.8
21	PRS	132/33	2	50	175	0	0
		132/33				37	12.140686
		132/33	1	75		82	3.452144
22	East Calcutta	132/33	2	50	100	39	16.354884
						70	24.5
23	NCGS	132/33	2	50	100	39	35
			1	75	75	95	31.220607
			2	50			
24	SRS	132/33	2	55	110	129	19.657472
25	SRS_33					21	4.199964
			1	75	75		
26	Patuli	132/33	2	75	150	32	8.7
27	WBRS	132/33	2	75	150	64	7.9
28	Park Circus	132/33	1	75	75	21	8.9
West Bengal Bulk Load							
29	Resmi Bulk					15.00	4.96
30	Tata Metalic					15.00	4.96
31	SonarLal					10.01	1.32
32	HNIZ MICL					24.00	3.00
33	Ambuja Frakka					10.00	3.31
34	Dankuni					6.00	1.97
35	HPCL					7.70	13.80
36	Madras Cement					4.00	1.00
37	Rohit Ferro1					0.00	0.00
38	Manaksia					2.00	2.00
39	Bencon					0.25	2.06

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
40	Rohit Ferro					0.00	0.00
41	Modern					9.10	0.38
42	BEL					15.40	5.06
43	OCL_Midnapore					1.00	0.00
44	Emami Cement					0.80	0.60
45	Jayshree (from liluahh_WB)					10.43	3.45
46	BRGSteeel					1.30	0.50
47	MCCPT					21.00	4.00
West Bengal IPCL Load							
1	JK Nagar	220/33	2	100	200	45.00	9.14

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

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	FORWARD			OWNER
				MW	MVAr	% LOADING	
Bihar line loading							
765 kV							
1	1	Fathepur	Sasaram	112.00	-534.18	14.5	**PGCIL**
2	1	Balia	Gaya	-286.00	-32.78	7.6	
3	1	Gaya	Varanasi	-163.70	150.62	5.8	
4	1	Gaya	Varanasi	163.49	-167.01	11.2	
400 kV							
5	1	Varanasi	Biharshariff	3.52	-50.00	7.5	**PGCIL**
6	1	Varanasi	Biharshariff	8.48	-58.92	4.8	
7	1	Banka	Biharshariff	243.95	-16.29	27.6	
8	1	Banka	Biharshariff	243.95	-16.29	27.6	
9	1	Biharshariff	Muzaffarpur	65.05	-2.99	10.9	
10	1	Biharshariff	Muzaffarpur	65.05	-2.99	10.9	
11	1	Biharshariff	Purnea	LINE	IS	0	
12	1	Biharshariff	Purnea	LINE	IS	0	
13	1	Biharshariff	Lakhisarai	-172.76	73.71	21.2	
14	1	Biharshariff	Lakhisarai	-172.76	73.71	21.2	
15	1	Biharshariff	Balia	83.48	-85.15	6.7	
16	1	Balia	Biharshariff	-76.67	-43.14	6.7	
17	1	Sasaram	Biharshariff	-270.65	-58.97	31.8	
18	1	Sasaram	Biharshariff	-270.65	-58.97	31.8	
19	1	Barh	Kahalgaon	-329.44	-58.84	19	
20	1	Barh	Kahalgaon	-329.44	-58.84	19	
21	1	Kahalgaon	Banka	311.32	24.29	35.4	
22	1	Kahalgaon	Banka	311.32	24.29	35.4	
23	1	Farraka	Kahalgaon	1.42	2.27	6.4	
24	1	Farraka	Kahalgaon	1.42	2.27	6.4	
25	1	Farraka	Kahalgaon	38.67	-3.67	7.2	
26	1	Farraka	Kahalgaon	38.67	-3.67	7.2	
27	1	Lakhisarai	Kahalgaon	-271.42	3.36	30.8	
28	1	Lakhisarai	Kahalgaon	-271.42	3.36	30.8	
29	2	Patna	Kishanganj	LINE	IS	0	
30	2	Patna	Kishanganj	LINE	IS	0	
31	1	Patna	Barh	-200.63	-69.54	12.1	
32	1	Patna	Barh	-200.63	-69.54	12.1	
33	1	Patna	Barh	-200.63	-69.54	12.1	
34	1	Patna	Barh	-200.63	-69.54	12.1	
35	1	Balia	Patna	-100.62	-38.74	6.6	
36	1	Balia	Patna	-100.62	-38.74	6.6	
37	1	Balia	Patna	-100.62	-38.74	6.6	
38	1	Balia	Patna	-100.62	-38.74	6.6	
39	1	Balia2	Brshrf-I	-76.67	-43.14	6.7	
40	1	Barh	Gorakhpur	174.05	-13.07	13.9	
41	1	Barh	Gorakhpur	174.05	-13.07	13.9	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
42	1	Sarnath	Sasaram	-127.00	-43.05	16.2	
43	1	NabinagarRly	Sasaram	LINE	IS	0	
44	1	NabinagarRly	Sasaram	LINE	IS	0	
45	1	Allhabad	Sasaram	-15.00	-2.14	7.2	
46	1	Muzaffarpur	Gorakhpur	170.83	35.61	13.4	Power link
47	1	Muzaffarpur	Gorakhpur	170.83	28.45	13.4	
48	1	Muzaffarpur	Purnea	-515.23	26.48	29.5	
49	1	Muzaffarpur	Purnea	-515.23	26.48	29.5	
50	2	Kishanganj	Purnea	317.30	-38.65	18.1	
51	2	Kishanganj	Purnea	317.30	-38.65	18.1	PGCIL
52	1	Kishanganj	Binaguri	-431.78	40.19	25.1	
53	1	Kishanganj	Binaguri	-431.78	40.19	25.1	
54	1	Malda	Purnea	47.16	35.52	9.6	
55	1	Malda	Purnea	47.16	35.52	9.6	
56	1	Binaguri	Purnea	294.11	-74.58	34.5	
57	1	Binaguri	Purnea	294.11	-74.58	34.5	
58	1	Gaya	Mathn-I	-220.02	-74.43	13.3	
59	1	Gaya	Mathn-I	-220.02	-74.43	13.3	
60	1	Gaya	Koderma	-116.57	-127.82	9.9	
61	1	Gaya	Koderma	-116.57	-127.82	9.9	
220kv line							
62	1	Bodhgaya	Biharshariff	LINE	IS	0.00	BSPTCL
63	1	Bodhgaya	Biharshariff	LINE	IS	0.00	
64	1	MTPS	Gopalganj	160.62	-21.88	38.40	
65	1	MTPS	Muzaffarpur	-131.65	9.76	62.70	Power link
66	1	MTPS	Muzaffarpur	-131.65	9.76	62.70	
67	1	Purnea	Madhepura	62.64	-2.23	29.50	PGCIL
68	1	Purnea	Madhepura	62.64	-2.23	29.50	
69	1	Biharshariff	Biharshariff	144.53	42.31	71.30	BSPTCL
70	1	Biharshariff	Biharshariff	144.53	42.31	71.30	
71	1	Biharshariff	Biharshariff	144.53	42.31	71.30	
72	1	Patna	Khagaul	154.87	47.63	77.80	BSPHCL
73	1	Pusauli new	Pusauli	-119.91	-10.98	57.10	PGCIL
74	1	Pusauli	Dehri	-71.35	13.52	35.40	BSPHCL & PG
75	1	Arrah	Pusauli	-146.31	-15.80	72.10	PGCIL
76	1	Hajipur	Muzaffarpur	87.81	4.80	41.60	BSPTCL
77	1	Hajipur	Muzaffarpur	87.81	4.80	41.60	
78	1	MTPS	Darbhanga	LINE	IS	0.00	
79	1	Gaya	Dehri	84.31	-17.53	40.90	BSPHCL & PG
80	1	Gaya	Dehri	84.31	-17.53	40.90	
81	1	Gaya	Bodhgaya	124.50	19.89	59.90	
82	1	Gaya	Bodhgaya	124.50	19.89	59.90	
83	1	Patna	Sipara	365.02	101.95	91.00	
84	1	Patna	Fatua	LINE	IS	0.00	
85	1	Sipara	Khagaul	118.76	35.47	59.50	
86	1	Sipara	Fatua	LINE	IS	0.00	
87	1	Arraha	PusaliNew	LINE	IS	0.00	
88	1	Pusali	Sahupura	229.11	-48.84	98.60	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
89	1	Samastipur	Begusarai	LINE	IS	0	BSPTCL
90	1	Samastipur	Begusarai	LINE	IS	0	
91	1	Hajipur	Amnour	55.81	-6.38	26.80	
92	1	Hajipur	Amnour	LINE	IS		
93	1	Begusarai	Purnea_PG	LINE	IS	0	
94	1	Begusarai	Purnea_PG	LINE	IS	0	
95	1	Purnea_PG	Purnea_BS	71.17	7.56	33.3	
96	1	Purnea_PG	Purnea_BS	71.17	7.56	33.3	
97	1	Gaya_PG	Sonenagar New	160.34	-8.89	38.2	
98	1	MTPS_Kanti	Samastipur	LINE	IS	0	
99	1	MTPS_Kanti	Samastipur	LINE	IS	0	
100	1	Biharsarif	TTPS	-89.06	-8.76	18.9	
101	1	Arrah	Khagaul	LINE	IS	0	
102	1	Fatua	Biharsarif	-125.71	-22.32	61	
103	1	Fatua	Biharsarif	-125.71	-22.32	61	
104	1	Biharsarif	Begusarai	24.41	4.81	13.6	
105	1	Arrah	Khagaul	LINE	IS	0	
106	1	Purnia_PG	Purnea_BS	71.17	7.56	33.3	
107	1	Purnia_PG	Purnea_BS	71.17	7.56	33.3	
108	1	Biharsarif	Begusarai	24.41	4.81	13.6	
132KV line							
109	1	Chandauti	Karamnasa	LINE	IS	0.00	BSPHCL & UPPCL
110	1	Bodhgaya	Wajirganj	12.71	4.59	17.40	BSPTCL
111	1	Sonenagar	Japla	42.22	-11.51	54.20	
112	1	Sonenagar	Aurangabad	25.12	9.01	33.50	
113	1	Sonenagar	Aurangabad	25.12	9.01	33.50	
114	1	Jehanabad	Arwal	16.22	-2.51	21.20	
115	1	Rafiganj	Sonenagar	LINE	IS	0.00	
116	1	Rafiganj	Rafiganj_R	3.40	0.64	2.20	
117	1	Dehri	Banjari	13.63	7.07	19.90	
118	1	KCL	Banjari	-0.80	-1.97	2.60	
119	1	Dehri	Sasaram	LINE	IS	0.00	
120	1	Dehri	Sonenagar	LINE	IS	0.00	
121	1	Dehri	Sonenagar	LINE	IS	0.00	
122	1	Dehri	Bikramganj	23.68	0.73	28.90	
123	1	Biharshariff	Rajgir	28.12	-7.78	36.30	
124	1	Biharshariff	Barh	LINE	IS	0.00	BSPTCL & DVC
125	1	Biharshariff	Hathidah	-5.59	22.83	31.10	BSPTCL
126	1	Biharshariff	Nalanda	27.93	0.33	34.80	
127	1	Biharshariff	Ekangasarai	41.63	10.36	53.40	
128	1	Biharshariff	Nawada	42.69	9.52	54.50	
129	1	Biharshariff	Sheikhpura	LINE	IS	0.00	
130	1	Hathidah	Sheikhpura	LINE	IS	0.00	
131	1	Hathidah	Lakhisarai	-70.70	0.18	89.50	
132	2	Lakhisarai	Jamui	71.16	13.80	44.20	
133	2	Jamui	Jhajha_R	10.02	0.26	6.50	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
134	1	Lakhisarai	Lakhisarai_R	4.00	0.98	5.20	
135	1	Jamui	Sheikhpura	28.67	10.62	38.90	
136	1	Rajgir	Barhi	LINE	IS	0.00	
137	1	Jamalpur	Tarapur	0.00	0.00	0.10	
138	1	Tarapur	Sultanganj	15.93	4.84	20.30	
139	1	Sultanganj	Sabour	LINE	IS	0.00	
140	1	Sultanganj	Sabour	LINE	IS	0.00	
141	1	Jamalpur	Lakhisarai	-30.56	-10.95	40.40	
142	2	Lakhisarai	Lakhisarai	-145.48	-28.57	91.70	
143	1	Lakhisarai	Jamui	LINE	IS	0.00	
144	1	Sabour	Kahalgaon	LINE	IS	0.00	**PGCIL**
145	1	Dumraon	Arrah	-60.30	5.83	80.70	
146	1	Dumraon	Dumraon_R	3.00	0.42	4.00	
147	1	Dumraon	Buxar	28.46	-1.45	37.90	
148	1	Arrah_PG	Arrah_BSEB	63.49	8.91	82.30	
149	1	Arrah_PG	Jagdishpur	19.53	0.89	25.10	
150	1	Purnea_BSEB	Banmakhi	69.76	-3.29	84.20	
151	1	Banmakhi	Saharsa	63.57	-4.89	76.90	
152	1	Purnea_BSEB	Trivenigaunj	22.63	-6.68	28.40	
153	1	Trivenigaunj	Forbesganj	18.03	-5.83	22.90	
154	1	Saharsa	Udakishanganj	LINE	IS	0.00	
155	1	Saharsa	Madhepura	38.09	-7.07	46.70	
156	1	Khagaul	Purnea	LINE	IS	0.00	
157	1	Muzaffarpur	SKMCH	LINE	IS	0.00	
158	1	Samastipur	Begusarai	LINE	IS	0.00	
159	1	Samastipur	Hajipur	LINE	IS	0.00	
160	1	Pandauli	Madhubani	0.00	0.00	1.00	
161	1	Hajipur	Hajipur	0.86	0.57	1.40	
162	1	Gopalganj	Mashrakh	16.21	-15.36	27.30	
163	1	Chhapra	Chhapra	6.49	1.94	8.80	**BSPTCL**
164	1	Siwan	Mushark	0.00	0.00	0.10	
165	1	Mushark	Gopalganj	16.21	-15.36	27.30	
166	1	Ekma	Ekma	6.38	-5.90	10.90	
167	1	Motihari	Dhaka	16.00	4.70	22.00	
168	1	Bettiah	Motihari	LINE	IS	0.00	
169	1	Bettiah	Gopalganj	-43.39	4.86	54.90	
170	1	Bettiah	Gopalganj	-43.39	4.86	54.90	
171	1	Ramnagar	Bettiah	-51.48	-1.04	65.70	
172	1	Ramnagar	Swadesi_G	LINE	IS	0.00	
173	1	Darbhanga	Darbhanga	-80.71	9.90	99.20	
174	1	Darbhanga	Samastipur	1.64	-2.68	3.80	
175	1	Kahalgaon	Sabour	LINE	IS	0.00	
176	1	Kahalgaon	Lalmatia	26.07	-7.19	32.10	
177	1	Kahalgaon	Lalmatia	15.77	-7.19	20.60	
178	1	Belaganj	Chandauli	-8.48	4.86	12.90	
179	1	Belaganj	Hjehanabad	LINE	IS	0.00	
180	1	MTPS	Samastipur	-4.76	-6.44	9.90	
181	1	MTPS	Samastipur	-4.76	-6.44	9.90	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
182	1	Sitalpur	Chhapra	47.91	5.63	60.90	
183	1	Jainagar	Pulparas	-37.74	21.76	55.00	
184	1	Pulparas	Supaul	-3.79	0.09	5.10	
185	1	Pulparas	Supaul	-3.79	0.09	5.10	
186	1	Supaul	Katiya	8.94	-1.31	11.20	
187	1	Supaul	Katiya	8.94	-1.31	11.20	
188	1	Mohania	Karmansa	LINE	IS	0.00	
189	1	Dehri	Kochas	LINE	IS	0.00	
190	1	Bikranganj	Dumraon	LINE	IS	0.00	
191	1	Forbesganj	Katiya	83.93	3.82	51.20	
192	2	Forbesganj	Katiya	83.93	3.82	51.20	
193	1	Barh	Hathidah_R	-34.01	-13.16	46.70	
194	1	Pusauli	Sasaram	31.94	-12.15	41.80	
195	1	Katiya	Duhabi	102.16	14.62	49.90	
196	1	BarauniTPS	Khagaul	14.23	-8.12	20.10	
197	1	BarauniTPS	Begusarai	26.14	14.29	36.80	
198	1	BarauniTPS	Begusarai	26.14	14.29	36.80	
199	1	Surjapur	Balmikinagar	-21.77	1.85	28.30	
200	1	MTPS	Muzaffarpur	57.42	2.95	70.90	
201	1	MTPS	Muzaffarpur	57.42	2.95	70.90	
202	2	MTPS	Vaisali	52.33	-4.52	32.70	
203	1	MTPS	SKMCH	80.34	17.83	50.70	
204	1	Kudra_R	Karmansa	24.17	-5.05	30.30	
205	2	Mithapur	Karbigahia	27.64	6.92	19.40	
206	1	Kudra new	Dehri	-31.87	11.01	42.20	
207	1	Pusauli	Kudra	-5.02	7.91	12.70	
208	1	Kudra	Kochas	12.90	-6.42	17.60	
209	1	Chandauli	Bodhgaya	LINE	IS	0.00	
210	1	Chandauli	Bodhgaya	LINE	IS	0.00	
211	1	Chandauli	Bodhgaya	LINE	IS	0.00	
212	1	chandauli	Bodhgaya	LINE	IS	0.00	
213	2	Bodhgaya	Paharpur	2.90	-1.55	2.10	
214	1	chandauli	Tekari	24.75	-1.91	31.10	
215	1	Balmikinagar	Ramnagar	-21.80	2.08	29.00	
216	1	Purnea	Katihar	26.25	9.28	34.20	
217	1	Purnea_PG	Kishanganj	-8.44	-4.22	11.40	
218	1	Purnea_PG	Purnea	68.30	5.95	26.80	
219	1	Purnea_PG	Purnea	68.30	5.95	26.80	
220	1	Purnea_PG	Purnea	68.30	5.95	26.80	
221	1	Masaurhi	Jehanabad	41.91	-3.84	53.90	
222	1	Masaurhi	Sipara	-57.83	-5.99	74.30	
223	1	Pusauli	Mohania	70.61	-9.10	86.80	
224	1	Kahalgaon TPP	Kahalgaon	45.59	8.81	55.10	**PGCIL**
225	1	Hathidah_R	Mokama_R	7.00	1.92	9.40	
226	1	Hathidah_R	Hathidah	-41.15	-14.96	55.70	
227	1	Nalanda	Rajgir	LINE	IS	0.00	**BSPTCL**
228	1	Raxaul	Bettiah	-7.32	2.17	10.40	
229	1	Runisaudpur	Sitamarhi	LINE	IS	0.00	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
230	1	Tekari	Goh	11.99	-4.40	16.10	
231	1	Wazirganj	Nawada	LINE	IS	0.00	
232	1	Ekangasarai	Hulasganj	19.85	5.29	26.30	
233	1	Biharshariff	Hulasganj	LINE	IS	0.00	
234	1	Gangwara	Pandauli	0.00	-1.34	1.60	
235	1	Madhepura	Supaul	54.74	-5.10	67.00	
236	1	Madhepura	Supaul	54.74	-5.10	67.00	
237	1	Madhepura	Sonbhadra	20.20	2.95	25.50	
238	1	Mashrakh	Siwan	LINE	IS	0.00	
239	1	Dalsingsarai	Siwan	LINE	IS	0.00	
240	2	Jehanabad	Tehta	LINE	IS	0.00	
241	1	Begusarai	Dalsingsarai	25.97	-1.76	32.10	
242	1	Jandaha	Samastipur	LINE	IS	0.00	
243	1	Hazipur	Jandaha	22.54	-6.68	29.40	
244	1	Begusarai	Kuswesthan	13.07	1.85	17.20	
245	1	Sherghati	Bodhgaya	-24.08	-8.08	32.10	
246	1	Immamganj	Bodhgaya	-13.37	-4.62	17.70	
247	1	Purnea	naughat	30.83	-2.94	37.30	
248	1	Railfactory	Sitalpur	-10.00	-2.87	13.20	
249	1	Muzaffarpur	Dhalkera	133.86	32.07	33.10	
250	1	Khagul	Bihta	90.07	23.77	59.60	
251	1	Khagul	Fatua	LINE	IS	0.00	
252	1	Digha	Khagul	-55.21	-6.43	35.60	
253	1	Khagul	Khagaul Rail	4.00	1.26	5.40	
254	1	Mithapur	Gaighat	LINE	IS	0.00	
255	1	Katra	Fatua	-75.05	-10.10	95.90	
256	1	Sipara	Mithapur	75.34	12.09	96.00	
257	1	Jakkanpur (Patna)	Mithapur	LINE	IS	0.00	
258	1	Jakkanpur (Patna)	Sipara	-126.88	-20.07	82.00	
259	1	Khusrupur RLY	Fatua	-6.00	-1.92	7.90	
260	1	Fatua	Harnuth	LINE	IS	0.00	
261	1	Fatua	Sipara	39.00	-2.31	48.70	
262	1	Harnuth	Baripahari	-19.62	-5.78	25.80	
263	1	Baripahari	Biharshariff	-84.55	-30.31	56.10	
264	1	Baripahari	Fatua	LINE	IS	0.00	
265	1	Sabour	BankaPG	-67.00	-27.07	43.90	
266	1	Rafiganj	Chandauti (Gaya)	-19.30	1.53	24.70	
267	1	Karmnasa	Sahupura	LINE	IS	0.00	
268	1	Fatua	Gaighat	68.15	9.08	85.70	
269	1	Naugachhia	BaruniTPS	9.53	-7.05	14.50	
270	1	Sitamarahi	Dhaka	LINE	IS	0.00	
271	1	Hazipur	Sheetalpur	37.22	-2.57	46.70	
272	1	Hazipur	Hazipur New	-95.41	-18.99	60.80	
273	1	Chapra	Ekma Tap	LINE	IS	0.00	
274	1	Motihari	Motipur	63.53	16.60	81.10	
275	1	Motipur	MTPS	-1.52	-2.26	3.40	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
276	1	Vaishali	Sheetalpur	31.90	4.91	20.60	
277	1	Banka	Banka PG	-31.85	-12.15	20.70	
278	1	Kishanganj	Dalkhola	LINE	IS	0.00	
279	1	Chandauti (Gaya)	Sipara	14.00	-6.34	9.60	
280	1	Sultanganj	Kahalgaon	LINE	IS	0.00	
281	1	Ekma Traction	Siwan	-6.38	5.90	12.40	
282	1	Banka PG	Sultanganj	32.81	0.33	20.00	
283	1	Kochas	Dumaraon	LINE	IS	0.00	
284	1	Pusali	Kudra Rail	28.05	-4.14	34.70	
285	1	Karbigahiya	Jakkanpur(Patna)	-31.28	2.32	40.10	
286	1	Naugachhia	Begusarai	LINE	IS	0.00	
287	1	Sonebarsha	Udakishanganj	9.36	0.88	11.90	
288	1	Jehanabad	Jehanabad Traction	3.83	0.19	5.00	
289	1	Rihand	Sonenagar	-13.78	5.72	24.50	
290	1	Dehri	Karamnasa	LINE	IS	0.00	
291	1	Dehri	Karamnasa	LINE	IS	0.00	
292	1	Kishanganj New	Kishangaunj	92.82	-0.88	21.60	
293	1	Kishanganj New	Kishangaunj	92.82	-0.88	21.60	
294	1	Sonenagar New	Sonenagar	79.05	-2.07	97.80	
295	1	Dalsingarai	Kusheswar	LINE	IS	0.00	
296	1	Dalsingarai	Kusheswar	LINE	IS	0.00	
297	1	Arrah	Arrah Rail	7.41	2.12	10.00	
298	1	Madhubani	Phulparas	LINE	IS	0.00	
299	1	Benpatti Tap	Jainagar	-24.69	17.88	37.70	
300	1	Kishanganj New	Forbesganj	73.55	-10.94	44.30	
301	1	Darbhanga	Gangawara	44.36	-1.20	54.10	
302	1	Bharti Gen	Gopalgaunj	LINE	IS	0.00	
303	1	SKMCH	Belsand	14.21	-1.25	17.80	
304	1	Sherghati	Bodhgaya	-24.08	-8.08	32.10	
305	1	Imamgaunj	Bodhgaya	-13.37	-4.62	17.70	
306	1	Hari Sugar Mill	Ramnagar	-0.60	-0.19	0.80	
307	1	Tetha	Chandauti (Gaya)	-6.36	-0.97	8.10	
308	1	Tetha	Chandauti (Gaya)	-6.36	-0.97	8.10	
309	1	HasnpSM	Dalsingarai	LINE	IS	0.00	
310	1	SUGAULI	Mothihari	-0.07	-0.02	0.60	
311	1	LAURIYA	Ramnagar	-0.07	-0.02	0.6*	
312	1	Sasaram1	Banjari	LINE	IS	0.00	
313	1	Madhubani	Benpatti Tap	-18.06	17.52	31.70	
314	1	Aurangabad	Shree Cement	18.01	2.75	22.80	
315	1	Arrah BS	Arrah RLY	5.00	1.47	6.70	
316	1	Belsand	Runisaidpur	7.64	-2.88	10.20	
317	1	Dhaka	Sheohar	LINE	IS	0.00	
318	1	Sitamari	Sheohar	9.05	1.95	12.40	
319	1	Gaighat	Katra	LINE	IS	0.00	
320	1	Jandha	Mahanar	6.16	-1.59	8.20	
321	1	Samstipur	Samasti Trac	3.80	0.10	4.60	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
322	1	Kishanganj New	Kishngaunj	102.13	-3.09	60.90	
323	1	Benipatti Tap	Benipati	6.47	0.59	8.00	
324	1	Darbhanga	Pandaul	23.00	-5.59	28.90	
325	1	Phulparas	Pandaul	0.00	-2.28	2.80	
326	1	Madhubani	Darbhanga	9.55	-2.71	12.10	
Jharkhand line loading							
765 kV							
1	1	Ranchi New	Dharamjaygarh	-140.80	-164.89	5.6	**PGCIL**
2	1	Ranchi New	Dharamjaygarh	-140.80	-164.89	5.6	
400 kV							
3	1	Aadhunik	Jamshedpur	242.76	-1.98	13.6	**APNRL**
4	1	Aadhunik	Jamshedpur	242.76	-1.98	13.6	
5	1	Maithon	Jamshedpur	-21.68	-61.67	7.4	**PGCIL**
6	1	Jamshedpur	Durgapur (DSTPS)	-326.62	-31.93	36.7	
7	1	Jamshedpur	Durgapur (DSTPS)	-326.62	-31.93	36.7	
8	1	Jamshedpur	Mejia B	-154.46	-52.53	18.3	
9	1	Chaibasa	Jamshedpur	-240.66	-44.52	27.6	
10	1	Chaibasa	Jamshedpur	-240.66	-44.52	27.6	
11	1	TISCO	Jamshedpur	-343.13	-16.01	38.6	**DVC**
12	1	Parulia (PGCIL)	Jamshedpur	78.65	-61.90	11.2	**PGCIL**
13	1	MPL	Ranchi	152.26	6.90	17	
14	1	MPL	Ranchi	152.26	6.90	17	
15	1	Ranchi	RanchiP	180.54	29.86	11.3	
16	1	Ranchi	RanchiP	180.54	29.86	11.3	
17	1	Ranchi	RanchiP	180.54	29.86	11.3	
18	1	Ranchi	RanchiP	180.54	29.86	11.3	
19	1	Ranchi	Maithon	-126.48	-62.77	15.9	
20	2	Ranchi	Chandwa	523.98	81.65	15.7	
21	1	Ranchi	Sipat	-196.11	-75.32	23.7	
22	1	Ranchi	Sipat	-196.11	-75.32	23.7	
23	1	Raghunathpur	Ranchi	262.24	-23.08	29.9	
24	1	Raghunathpur	Ranchi	262.24	-23.08	29.9	
25	1	Gaya	Maithon	-220.02	-74.43	13.30	
26	1	Gaya	Maithon	-220.02	-74.43	13.30	
27	1	Maithon	Mejia B	-14.79	2.60	2.10	
28	1	Mejia B	Maithon	348.40	34.86	39.70	
29	1	Mejia B	Maithon	348.40	34.86	39.70	
30	1	Maithon	Kahalgaon	152.38	-43.11	17.90	
31	1	Maithon	Kahalgaon	-29.82	-10.50	5.70	
32	1	Maithon	MPL	-103.45	-11.47	11.60	
33	1	Maithon	MPL	-103.45	-11.47	11.60	
34	1	Maithon	Parulia (PGCIL)	148.71	7.42	17.40	
35	1	Maithon	Parulia (PGCIL)	148.71	7.42	17.40	
36	1	Raghunathpur	Maithon	356.36	6.24	39.60	
37	1	Gaya	Koderma	-116.57	-127.82	9.90	
38	1	Gaya	Koderma	-116.57	-127.82	9.90	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
39	1	Koderma	Biharshariff	219.36	-52.48	12.70	
40	1	Koderma	Biharshariff	219.36	-52.48	12.70	
41	1	Koderma	Bokaro (BTPS)	-172.62	-37.41	19.90	
42	1	Koderma	Bokaro (BTPS)	-172.62	-37.41	19.90	
43	2	Chandwa	Gaya	523.07	-58.74	15.20	
44	1	Chaibasa	Bisra	-12.78	-28.78	3.50	
45	1	Chaibasa	Bisra	-12.78	-28.78	3.50	
46	1	Ranchi PG	PPSP	128.84	-62.82	16.10	
47	1	Ranchi PG	PPSP	128.84	-62.82	16.10	
220kV							
48	1	Kalyaneshwari	Mejia-D	-95.89	9.07	45.9	**DVC**
49	1	Kalyaneshwari	Mejia-D	-95.89	9.07	45.9	
50	1	Kalyaneshwari	Mejia-D	-95.89	9.07	45.9	
51	1	CTPS-new	BTPS-B	42.83	-28.37	24.5	
52	1	CTPS-new	BTPS-B	42.83	-28.37	24.5	
53	1	CTPS-old	Kalyaneshwari	-24.21	-14.00	13.4	
54	1	CTPS-old	Kalyaneshwari	-24.21	-14.00	13.4	
55	1	CTPS-New	Dhanbad	35.82	-7.20	17.4	
56	1	Kalyaneshwari	Maithon	-30.68	-55.27	29.9	
57	1	Kalyaneshwari	Maithon	-30.68	-55.27	29.9	
58	1	BTPS-B	Jamshedpur	44.61	-1.97	22.7	
59	1	BTPS-B	Jamshedpur	44.61	-1.97	22.7	
60	1	Giridhi	Dhanbad	-77.92	-7.48	37.4	
61	1	Giridhi	Dhanbad	-77.92	-7.48	37.4	
62	1	Maithon	Dhanbad	191.73	26.27	45.5	
63	2	Ramgarh	BTPS-B	-161.88	-30.82	39.6	
64	1	CTPS-old	CTPS-New	-147.50	-43.71	72.7	
65	1	CTPS-old	CTPS-New	-147.50	-43.71	72.7	
66	1	Kalyaneshwari	Maithon	-30.68	-55.27	29.9	
67	1	Kalyaneshwari	Maithon	-30.68	-55.27	29.9	
68	2	BSL	CTPS-New	-130.00	-66.88	35.1	
69	1	CTPS-New	Dhanbad	35.82	-7.20	17.4	
70	1	Ramchandapur	Jamshedpur	-133.88	-11.01	62.3	**JUSNL**
71	1	Ramchandapur	Jamshedpur	-133.88	-11.01	62.3	
72	1	PTPS-TPS	Hatia	6.26	0.19	4.1	
73	1	PTPS-TPS	Hatia	6.26	0.19	4.1	
74	1	PTPS-TPS	TTPS	-33.78	-15.24	7.8	
75	1	KTPP	Giridhi	-5.99	1.46	7.8	
76	1	KTPP	Giridhi	-5.99	1.46	7.8	
77	1	RanchiTG	Chandil	30.52	-11.06	15.2	
78	1	Maithon	Dumka	24.10	-20.37	6.6	
79	1	Maithon	Dumka	24.10	-20.37	6.6	
80	2	RanchiTG	Hatia	212.83	50.95	51.1	
81	1	Chandil	Ramchandapur	-74.27	-16.87	35.6	
82	2	Chaibasa	Chaibasa	8.80	2.83	2.2	
83	2	Maithon	Dhanbad	191.73	26.27	45.5	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
84	2	PTPS-TPS	Bodhgaya	LINE	IS	0	**BSPHCL & JSEB**
85	1	PTPS-TPS	Bodhgaya	LINE	IS	0	**BSPHCL & JSEB**
86	1	Chandil	STPS	-40.45	14.74	23	**WBSETCL & JSEB**
87	2	Dhanbad	Elctro SteelD	32.37	13.12	10.4	**PGCIL**
88	1	CTPS-New	BTPS-B2	42.83	-28.37	24.5	**DVC**
89	1	CTPS-New	BTPS-B2	42.83	-28.37	24.5	
90	1	Ramghar	Gola	0.00	-6.81	1.6	
132kV							
91	2	ManiqueD	GolaD	-36.94	-10.62	24.6	**DVC**
92	2	ManiqueD	Jamshedpur	-27.90	-0.73	18	
93	1	CTPS-B	Putki	41.09	16.21	48.6	
94	1	CTPS-B	Putki	41.09	16.21	48.6	
95	1	CTPS-B	Putki	41.09	16.21	48.6	
96	1	CTPS-B	Putki	41.09	16.21	48.6	
97	1	BTPS-B-D	ECR-GomD	0.15	-0.40	0.5	
98	1	BTPS-B-D	ECR-GomD	0.15	-0.40	0.5	
99	1	CTPS-A	PuruliaD	20.03	-1.70	22.1	
100	1	CTPS-A	PuruliaD	20.03	-1.70	22.1	
101	1	Jamshedpur	MosabaniD	35.41	1.82	39.9	
102	1	Jamshedpur	MosabaniD	35.41	1.82	39.9	
103	1	CTPS-A	GolaD	32.75	-9.28	37.4	
104	1	CTPS-A	GolaD	32.75	-9.28	37.4	
105	1	Ramgarh	GolaD	-8.49	10.09	15.5	
106	1	Ramgarh	GolaD	-8.49	10.09	15.5	
107	1	PatratuD	North karnpuraD	9.92	-2.58	12.8	
108	1	PatratuD	Ramgarh	-22.94	3.61	25.9	
109	1	PatratuD	Ramgarh	-22.94	3.61	25.9	
110	1	PatratuD	North karnpuraD	9.92	-2.58	12.8	
111	2	PatratuD	JSPL	19.73	-3.92	22.2	
112	1	MaithonD	KumardubiD	41.14	22.47	58.4	
113	1	Klyaneshwari	MaithonD	75.21	17.54	84.8	
114	1	MaithonD	Panchet	9.48	3.52	12.9	
115	1	KumardubiD	Panchet	-6.61	-5.81	11	
116	1	MaithonD	PatherdhiD	35.32	10.17	45.8	
117	1	MaithonD	PatherdhiD	35.32	10.17	45.8	
118	1	PatherdhiD	SindriD	5.09	0.49	6.6	
119	1	PatherdhiD	SindriD	5.09	0.49	6.6	
120	1	PatherdhiD	Putki	0.99	-3.52	4.1	
121	1	PatherdhiD	Putki	0.99	-3.52	4.1	
122	1	Putki	Nimiaghat	7.98	-10.21	16.5	
123	1	Putki	Nimiaghat	7.98	-10.21	16.5	
124	1	Nimiaghat	GiridhiD	-11.15	-7.95	17.3	
125	1	Nimiaghat	GiridhiD	-11.15	-7.95	17.3	
126	1	BarhiD	BTPS-B-D	-28.65	-2.95	36.4	
127	1	BarhiD	Konar	-23.53	-2.56	29.9	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
128	1	BarhiD	KTPP	-21.47	-10.70	30.5	
129	1	BarhiD	Hazaribhag	23.96	8.11	32.9	
130	1	BarhiD	Hazaribhag	23.96	8.11	32.9	
131	1	BarhiD	KTPP	-21.47	-10.70	30.5	
132	1	Konar	BTPS-B-D	-40.38	-2.68	50.6	
133	2	RamkanaliD	Panchet	9.08	0.79	5.8	
134	1	CTPS-B	RamkanaliD	LINE	IS	0	
135	1	CTPS-B	Jamuria	0.01	-5.71	6.3	
136	2	MosabaniD	KharagpurD	5.12	-10.64	6.8	
137	2	KodermD1	KTPP	-93.82	-36.17	64.1	
138	1	SindriD	Pradhankhanda	1.75	0.30	2.7	
139	1	SindriD	Pradhankhanda	1.75	0.30	2.7	
140	2	DHANBAD1	GovndrD	50.90	1.33	31.3	
141	1	CTPS-A	BSL-DVC	LINE	IS	0	
142	1	CTPS-A	BSL-DVC	LINE	IS	0	
143	1	CTPS-A	Rajbera_DVC	9.50	4.09	11.5	
144	2	CTPS-B	BiadaDVC	30.14	8.90	17.5	
145	2	Putki	BalhrDVC	-0.91	2.22	2.7	
146	1	Ramgarh	ECR Barkakana	LINE	IS	0	
147	2	ECRlyDVC	North karnpuraD	-9.84	-2.77	5.7	
148	1	Klyaneshwari	MaithonD	75.21	17.54	84.8	
149	1	CTPS-A	CTPS-B	-20.68	28.90	17.3	
150	1	BSLGD	CTPS-B	LINE	IS	0	
151	1	PatherdhiD	BalhrDVC	0.91	-3.33	3.9	
152	2	GolaD	SER Muri	4.21	-0.70	2.6	
153	2	Klyaneshwari	MAL-Impex ferro	36.02	3.89	45	
154	1	ManiqueD	Manique R	2.09	0.44	2.8	
155	1	CTPS-A	Rajbera_DVC	9.50	4.09	11.5	
156	1	Garhwa	Japla	-24.74	12.80	36	JUSNL
157	2	Dhalbhumgarh	DhalbhumgarhRL	6.00	1.75	4.1	
158	1	Lohardaga	Gumla	5.33	0.94	8.6	
159	1	Lohardaga	Gumla	5.33	0.94	8.6	
160	1	Kamdara	Gumla	7.06	-4.51	10.6	
161	1	Hatia Old	Sikadari	-27.59	4.58	35.1	
162	1	Hatia New	Namkum	40.61	21.11	56.6	
163	1	Hatia Old	Kamdara	41.71	0.12	51.6	
164	1	Kamdara	Bakaspur R	3.00	0.27	4	
165	1	Kamdara	Bano R	LINE	IS	0	
166	1	Hatia Old	Hatia New	-47.04	-11.50	59.9	
167	1	Hatia Old	Hatia New	-47.04	-11.50	59.9	
168	1	Namkum	Sikadari	-67.40	-8.62	85.9	
169	1	PTPS	Kanke	40.57	9.58	33	
170	1	PTPS	Hatia Old	30.45	5.44	24.9	
171	1	Deoghar	Sultanganj	0.00	0.00	6.4	
172	1	Deoghar	Jamtara	LINE	IS	0	
173	1	Deoghar	Shankarpur R	3.00	0.08	3.7	
174	1	Deoghar	Dumka	-16.53	5.78	22.6	
175	1	Deoghar	Dumka	-16.53	5.78	22.6	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
176	1	Dumka	Lalmtiya	-14.49	3.16	19.7	
177	1	Dumka	Lalmtiya	-14.49	3.16	19.7	
178	1	Dumka	Pakur	23.56	-4.09	28.5	
179	2	Dumka	Dumka	24.51	-13.64	16.7	
180	1	Kendposi	Chaibasa	-26.13	-0.99	32.2	
181	2	Kendposi	Kendposi	6.00	1.55	3.9	
182	1	Manique	Chandil	LINE	IS	0	
183	1	Adityapur	Ushamartin	9.30	2.89	11.8	
184	1	Adityapur	Ushamartin	9.30	2.89	11.8	
185	1	Golmuri	Jharsuguda	21.14	-1.26	25.6	
186	1	Golmuri	Saljhagiri R	LINE	IS	0	
187	1	Rajkharsawan	Chandil	-46.63	-8.14	37.1	
188	1	Goelkera	Rajkharsawan	-19.02	-10.19	26.8	
189	1	Rajkharsawan	CKPR	9.37	0.90	6	
190	1	Goelkera	Manoharpur	4.01	5.39	8.8	
191	1	Ramchandapur	APL	16.24	12.79	24.9	
192	1	Nowamundi	Kendposi	LINE	IS	0	
193	1	Sikadari	PH1	-44.82	-8.21	56	
194	1	Sikadari	PH2	LINE	IS	0	
195	1	Chandil	Adityapur	29.22	-10.74	37.4	
196	1	Adityapur	Ramchandapur	-55.28	4.34	66.6	
197	1	Adityapur	Ramchandapur	-55.28	4.34	66.6	
198	1	Dhalbhumgarh	MosabaniD	-21.64	-4.06	28.6	
199	1	Dhalbhumgarh	MosabaniD	-21.64	-4.06	28.6	
200	1	Kanke	Hatia Old	7.19	-0.88	5.8	
201	1	Lathehar	Lohardaga	-22.50	-2.64	18.6	
202	1	Lathehar	Lohardaga	-22.50	-2.64	18.6	
203	1	Lathehar	Daltanganj	21.70	2.38	18.3	
204	1	Lathehar	Daltanganj	21.70	2.38	18.3	
205	1	Garhwa	Tolrah R	16.02	1.90	20.1	
206	1	Lalmtiya	Sahebganj	10.59	1.38	13.4	
207	1	Hatia New	Lohardaga	44.37	3.86	35.7	
208	1	Hatia New	Lohardaga	44.37	3.86	35.7	
209	1	Namkum	Tatisiloi R	10.82	4.40	15.2	
210	1	Namkum	Tatisiloi R	10.82	4.40	15.2	
211	1	Namkum	UMIRa	2.90	1.78	4.5	
212	1	Hatia Old	LodhmaR	2.63	-0.48	3.3	
213	1	Hatia Old	LodhmaR	2.63	-0.48	3.3	
214	1	Adityapur	Rajkharsawan	31.19	1.81	37.5	
215	1	Golmuri	Chandil	-27.61	-1.75	33.4	
216	1	Golmuri	Chandil	-27.61	-1.75	33.4	
217	1	Rajkharsawan	Chakradharpur	8.02	-2.49	10.2	
218	1	Rajkharsawan	Chakradharpur	8.02	-2.49	10.2	
219	1	Hazaribhag Rd	Konar	-2.65	-0.81	3.5	
220	1	Hazaribhag Rd	Konar	-2.65	-0.81	3.5	
221	1	Tamar	Chandil	-13.01	-0.57	15.9	
222	1	Hatia Old	HEC	9.42	3.40	12.6	
223	2	Jamtara	Madhupur	16.51	-0.97	10.7	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
224	1	Chaibasa	Rajkharsawan	-32.34	-2.14	39.6	
225	1	Manique	ManiqueD	-51.24	-13.21	67.8	
226	1	ABCILG	Garhwa	23.93	14.80	35	
227	1	Jamtara	Jamtara R	8.00	1.14	10.3	
228	1	Rajkharsawan	RKSNR	8.30	2.90	10.8	
229	1	Hatia Old	HEC	9.42	3.40	12.6	
230	1	Deoghar	Jamtara	LINE	IS	0	
231	1	Goelkera	GoelkeraT	12.00	3.77	15.7	
232	1	MaithonD	Jamtara	50.53	-1.58	63	**DVC & JSEB**
233	1	Kendposi	Nowamundi	LINE	IS	0	**JSEB**
234	2	PatratuD	PTPS	LINE	IS	0	**JSEB & DVC**
235	1	Garhwa	Rihand	-9.66	-7.00	14.8	**JSEB & UPPCL**
236	1	Inland P	Sikidiri	30.89	2.31	38	**JSEB**
237	1	Inland P	Sikidiri	30.89	2.31	38	
238	1	Sindri DVC	ECRLY DVC	6.49	0.07	8.4	**DVC**
Odisha line loading							
765 kV							
1	1	Jharsuguda	Dharamjaygarh	-169.29	-51.24	4	**PGCIL**
2	1	Jharsuguda	Dharamjaygarh	-169.29	-51.24	4	
3	1	Jharsuguda	Angul	140.27	-65.78	5.1	
4	1	Jharsuguda	Angul	140.27	-65.78	5.1	
5	1	ANGUL PG	Srikakulam	17.11	-251.50	6.5	
6	1	ANGUL PG	Srikakulam	17.11	-251.50	6.5	
400 kV							
7	1	Jaypore	Bolangir	-39.93	-26.47	8.3	**PGCIL**
8	1	Jaypore	Gazuwaka	296.79	-25.74	34.3	
9	1	Jaypore	Gazuwaka	296.79	-25.74	34.3	
10	1	Indravati PG	Jaypore	268.21	-32.83	31.1	
11	1	Indravati OHPC	Indravati PG	259.35	12.35	29.9	**OPTCL**
12	1	Rengali	Indravati PG	8.93	-41.26	7.6	**PGCIL**
13	1	Bolangir	Angul	-173.12	-33.00	21.2	
14	1	Angul	JITPL	-226.78	-85.08	27.5	**Jindal**
15	1	Angul	JITPL	-226.78	-85.08	27.5	
16	1	Angul	Meramundali	353.01	-74.73	41	**PGCIL**
17	1	Angul	Meramundali	353.01	-74.73	41	
18	2	TSTPS	Angul	-338.76	-14.38	38.7	
19	1	Angul	GMR	-329.09	6.60	18.7	**GMR**
20	1	Angul	GMR	-329.09	6.60	18.7	
21	1	Sterlite	Meramundali	-6.17	-50.19	8.6	**PGCIL**
22	1	Sterlite	Meramundali	-6.17	-50.19	8.6	
23	1	JSPL	Meramundali	22.88	-32.51	4.5	**OPTCL**
24	1	JSPL	Meramundali	22.88	-32.51	4.5	
25	1	GMR	Meramundali	333.35	-30.60	38	**OPTCL**
26	2	Duburi	Meramundali	-412.95	-51.61	23.6	**OPTCL**
27	1	TSTPS	Meramundali	-274.23	-48.76	31.8	
28	1	Meramundali	Mendhasal	289.62	-0.65	33.3	**OPTCL**

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
29	2	Pandibl D/C	Mendhasal	99.28	-39.69	6.1	**OPTCL & PGCIL**
30	1	DUBURI4	Pandibl4	72.21	-18.95	8.5	**PGCIL**
31	1	Duburi	Baripada	7.31	-62.44	7.2	**OPTCL**
32	1	Pandibl4	Baripada	-27.20	-37.68	8.5	**PGCIL**
33	1	Baripada	Jamshedpur	-253.60	-49.35	29.3	**PGCIL**
34	1	Baripada	TISCO	-193.94	-47.93	22.7	**PGCIL**
35	1	Baripada	Kharagpur	156.68	-28.02	18.1	**OPTCL & WBSETCL**
36	1	Baripada	Keonjhar	-28.11	12.92	7	**OPTCL**
37	1	Rengali	Keonjhar	28.15	20.83	4	**OPTCL**
38	1	TSTPS	Rengali	-6.35	-44.83	5.2	**PGCIL**
39	1	TSTPS	Rengali	-6.35	-44.83	5.2	
40	1	Bisra	TSTPS	112.22	-26.24	13	
41	1	Bisra	TSTPS	112.22	-26.24	13	
42	1	Bisra	Jamshedpur	LINE	IS	0	
43	1	Chaibasa	Bisra	-12.78	-28.78	3.5	
44	1	Bisra	Ranchi	-57.79	-45.61	8.3	
45	1	Bisra	Ranchi	-57.79	-45.61	8.3	
46	1	Bisra	Raigarh	-117.13	18.68	21	
47	1	Bisra	Sterlite	45.78	9.49	6	**PGCIL& Sterlite**
48	1	Jharsuguda	Bisra	101.84	-32.95	12	**PGCIL**
49	1	Jharsuguda	Bisra	101.84	-32.95	12	
50	1	Ind-Bharath	Jharsuguda	LINE	IS	0	
51	1	Jharsuguda	Raigarh	-145.72	-145.59	11.6	
52	1	Ind-Bharath	Raigarh	0.00	0.00	0	
53	1	Sterlite	Raigarh	57.13	-79.89	11.1	**PGCIL& Sterlite**
220KV line							
54	1	Balimela	Upper Silleru	-1.12	-49.44	22.5	**OPTCL**
55	1	Budhipadar	Bhusan	33.04	17.56	17.9	
56	1	Budhipadar	Bhusan	33.04	17.56	17.9	
57	1	UPPER KOLAB	JAYA NAGAR	112.47	-6.26	52.4	
58	1	Theruvali	BHANJANAGAR	41.87	-23.48	22.5	
59	1	Theruvali	Narendrapur	103.47	4.77	48.4	
60	1	BHANJANAGAR	MENDHASAL	34.27	1.55	18.5	
61	1	BHANJANAGAR	NAYAGARH	72.29	11.65	34.9	
62	1	NAYAGARH	MENDHASAL	-4.63	0.83	5.4	
63	1	Rengali PH	TSTPS	58.73	-8.59	27.4	
64	1	Rengali PH	Rengali Switching Station	43.48	21.75	22.6	
65	1	Rengali Switching Station	BARKOT	16.63	0.00	8	
66	1	TSTPS	TTPS	22.57	-15.60	12.7	
67	1	NEW DUBURI	BHADRAK	88.07	-3.54	41.7	
68	1	ITPS	Budhipadar	64.29	9.72	27	
69	1	TARKERA	BISRA	-67.67	-13.35	28.6	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
70	1	JAYA NAGAR	Jaya nagar PGCIL (Jaypore)	143.85	27.50	68.2	
71	1	JAYA NAGAR	Jaya nagar PGCIL (Jaypore)	143.85	27.50	68.2	
72	1	Rengali Switching Station	Rengali PG	24.93	21.05	15.3	
73	1	MERAMAUNDLI	TSTPS	-23.11	21.29	16.5	
74	1	Budhipadar	RAIGARH	87.39	5.43	40.7	
75	1	Balimela	JAYA NAGAR	103.53	8.45	47.3	
76	1	JAYA NAGAR	Balimela	-103.18	-14.21	47.8	
77	1	JAYA NAGAR	Balimela	-103.18	-14.21	47.8	
78	1	Rengali Switching Station	Chandiposh	6.42	-1.06	7	
79	1	TARKERA	Chandiposh	-3.40	-17.71	8.4	
80	1	UPPER KOLAB	JAYA NAGAR	14.22	-5.71	7.1	
81	1	JAYA NAGAR	Theruvali	50.91	-3.24	23.7	
82	1	DUBURI	NINL	-2.83	-3.75	2.2	
83	1	BIDANASI	MERAMAUNDLI	-173.10	-18.93	35.9	
84	1	MENDHASAL	CHANDAKA	68.05	6.83	32.4	
85	1	TTPS	MERAMAUNDLI	80.14	23.47	38.8	
86	1	TTPS	MERAMAUNDLI	80.14	23.47	38.8	
87	1	MERAMAUNDLI	BHANJANAGAR	54.62	-9.11	25.5	
88	1	MERAMAUNDLI	BHANJANAGAR	54.62	-9.11	25.5	
89	1	Indravati	Theruvali	77.98	-21.53	37.9	
90	1	ITPS	Budhipadar	64.29	9.72	27	
91	1	Budhipadar	TARKERA	44.48	-7.09	20.9	
92	1	Budhipadar	SPS	0.99	-2.03	1	
93	1	TSIL	JODA	10.48	0.35	5	
94	1	DUBURI	NEW DUBURI	46.79	4.41	22.3	
95	1	ITPS	Budhipadar	64.29	9.72	27	
96	1	Budhipadar	SPS	0.99	-2.03	1	
97	1	BALASORE	KUCHEI	-102.33	-12.29	48.7	
98	1	Indravati	Theruvali	77.98	-21.53	37.9	
99	1	KATAPALI	BOLANGIR	45.93	-11.79	22.1	
100	1	MENDHASAL	CHANDAKA	68.05	6.83	32.4	
101	1	BALASORE	NEW DUBURI	-30.97	-11.14	15.7	
102	2	NEW DUBURI	PARADEEP	196.72	25.29	41.6	
103	2	PARADEEP	ESSAR	4.00	-0.31	1.1	
104	1	UPPER KOLAB	JAYA NAGAR	112.47	-6.26	52.4	
105	1	Theruvali	BHANJANAGAR	41.87	-23.48	22.5	
106	1	Theruvali	Narendrapur	103.47	4.77	48.4	
107	1	Rengali PH	Rengali Switching Station	43.48	21.75	22.6	
108	1	ITPS	Budhipadar	64.29	9.72	27	
109	1	TARKERA	BISRA	-67.67	-13.35	28.6	
110	1	Rengali Switching Station	Rengali PG	24.93	21.05	15.3	
111	1	MERAMAUNDLI	TSTPS	-23.11	21.29	16.5	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
112	1	Budhipadar	Korba	-82.18	-29.86	40.6	
113	1	Budhipadar	Korba	-82.18	-29.86	40.6	
114	1	Indravati	Theruvali	77.98	-21.53	37.9	
115	1	Indravati	Theruvali	77.98	-21.53	37.9	
116	1	MERAMAUNDLI	DUBURI	74.95	8.38	36	
117	1	MERAMAUNDLI	DUBURI	74.95	8.38	36	
118	1	Budhipadar	TARKERA	44.48	-7.09	20.9	
119	1	DUBURI	NEW DUBURI	46.79	4.41	22.3	
120	1	BALASORE	KUCHEI	-102.33	-12.29	48.7	
121	1	KATAPALI	BOLANGIR	45.93	-11.79	22.1	
122	1	MENDHASAL	CHANDAKA	68.05	6.83	32.4	
123	1	MENDHASAL	CHANDAKA	68.05	6.83	32.4	
124	1	NEW DUBURI	JINDAL	-29.49	16.08	16	**JSL**
125	1	NEW DUBURI	JINDAL	-29.49	16.08	16	
126	1	NEW DUBURI	VISA	0.00	-6.76	3.2	**VISA**
127	1	NEW DUBURI	ROHIT	30.75	1.36	14.6	**Rohit**
128	1	Budhipadar	VEDANTA	-81.66	14.97	34.4	**VEDANTA**
129	1	Budhipadar	VEDANTA	-81.66	14.97	34.4	
130	1	DubriNew	Maithan2	3.20	-2.48	1.9	**OPTCL**
131	1	Mendha	BIDANASI	LINE	IS	0	
132	1	Bhadrak	Balasore	-26.18	0.87	13.4	
133	1	BALIMELA	Balimela Splt	14.42	2.33	6.7	
134	1	THERUVALI	Lakshmipur	-51.51	-16.02	12.6	
135	1	Lakshmipur	JAYANAGAR	-58.64	1.47	14.2	
136	1	THERUVALI	JAYANAGAR	LINE	IS	0	
137	1	Narendrapur	Aatri	LINE	IS	0	
138	1	Mendhasal	Aatri	68.91	-9.26	16.4	
139	1	TARKERA	BARKOTE	-1.58	-17.04	8	
140	1	Rengali Hydro	TTPS	35.97	-14.11	17.9	
141	1	JSPL	Jamshedpur	20.48	8.24	15.4	
142	1	JODA	Ramchandrapur	-64.86	-11.21	31	
143	1	BOLANGIR-NEW	Bolagir	175.17	18.95	82.5	
144	1	NALCO	Meramundali	113.93	52.60	29.1	
145	1	BSSL	Meramundali	15.66	30.66	8.1	
146	1	JODA	JSPL	64.56	21.45	32.3	
147	1	Paradeep	IOCL	0.50	-0.34	0.3	
148	1	Basundhora	BUDHIPADAR	-2.00	-0.57	2.3	
149	1	Lakshmipur	Utkal Aluminium	LINE	IS	0	
150	1	Atri	Pandibil	LINE	IS	0	
151	1	Pandibil	Samangara	LINE	IS	0	
152	1	Lakshmipur	Aditya Aluminium	LINE	IS	0	
153	1	JAYA NAGAR Traction	Jayanagar	-36.72	6.47	17.4	
154	1	JODA	TTPS2	-42.59	-19.12	22	
155	1	JODA	TTPS2	-42.59	-19.12	22	
156	1	BUDHIPADAR	Lapanga	110.50	-6.27	51.5	
157	1	BUDHIPADAR	Lapanga	110.50	-6.27	51.5	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
158	1	VEDANT	Veda_135	0.00	0.00	0.4	
159	1	VEDANT	Veda_135	0.00	0.00	0.4	
160	1	Lapanga	KATAPALI	65.59	-9.41	30.9	
161	1	Lapanga	KATAPALI	65.59	-9.41	30.9	
162	1	TARKERA	RSP_220	27.21	12.24	14.2	
163	1	TARKERA	RSP_220	27.21	12.24	14.2	
164	1	DubriNew	Tata Steel	67.47	4.57	32	
165	1	DubriNew	Tata Steel	67.47	4.57	32	
166	1	KATAPALI	BOLANGIR-New	42.57	-12.35	20.7	
132KV lines							
167	1	Balimela	Upper Silleru	-1.12	-49.44	22.5	**OPTCL**
168	1	Theruvali	Rayagada	LINE	IS	0	
169	1	Jayanagar	Damanjodi	44.58	-30.08	64.3	
170	1	Theruvali	IMFA	44.04	14.63	56	
171	1	Vedanta	Kesinga	55.50	-0.51	67.1	
172	1	RyagdSp	Akhusinghi	40.90	-5.13	51.5	
173	1	Digha	Berhampore	-16.41	2.99	21.8	
174	1	BHANJANAGAR	Aska	19.78	-1.09	23.6	
175	1	BHANJANAGAR	PHULBNI	20.86	-7.13	26.3	
176	1	Aska	Berhampore	LINE	IS	0	
177	1	Aska	Chatrapur	LINE	IS	0	
178	1	Chatrapur	Ganjam	17.79	-4.02	23.3	
179	1	Chatrapur	IRE	3.03	0.62	4	
180	1	Chatrapur	Balugaon	45.35	-1.79	58.1	
181	1	MENDHASAL1	Chandaka	LINE	IS	0	
182	1	Chandaka	Bhubaneswar	115.51	20.11	71.8	
183	1	ChandSpl	Bhubaneswar	-2.60	-9.24	11.7	
184	1	Phulnakhara	Bhubaneswar	2.62	7.84	11.4	
185	1	Chandaka	Ranasinghpur	96.60	6.74	118.6	
186	2	TTPS	Chainpal	45.16	5.01	53.6	
187	1	TTPS	Angul	42.31	8.83	51	
188	1	Angul	NANDIRA	24.76	2.40	29.6	
189	1	Chainpal	FCI	0.40	-0.18	0.5	
190	1	MERAMAUNDLI	Dhenkanal	73.56	8.05	88.5	
191	1	Kamakhyanagar	OPCL	-38.76	-4.24	47.1	
192	1	Dhenkanal	Nuapatna Tap	LINE	IS	0	
193	1	ICCL	Maheswari	-9.03	22.94	31.2	
194	1	Grid Steel (GSAL)	Choudwar	14.37	18.54	28.6	
195	1	Choudwar	BIDANASI	-7.19	4.43	10.5	
196	1	BPPL	BIDANASI	4.61	1.40	6.8	
197	1	Cuttack	Jagatsinghpur	0.00	-1.78	2.2	
198	1	Duburi	Jambay Ferro	-64.69	-4.20	79.6	
199	1	B.C. Mohanty	TISCO (Bamanipal)	9.93	-0.11	12.2	
200	1	Duburi	Jajpur Road	27.39	6.00	34.4	
201	1	Chandikhole	Kendapra	-34.45	-4.30	45.6	
202	1	Kendapra	Ptamundi	31.06	2.06	40.4	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
203	1	Nuapatna Tap	ARATI STEEL	-37.62	-13.58	48.8	
204	1	Paradip	PPL	LINE	IS	0	
205	1	Jajpur Road	Jajpur Town	LINE	IS	0	
206	1	Bhadrak	Soro	LINE	IS	0	
207	1	Balasore	Soro	39.98	14.30	53	
208	1	Balasore	Basta	43.80	-3.16	54.8	
209	1	Balasore	BIRLA TYRE	3.66	0.09	4.6	
210	1	Balasore	Balasore Alloys	44.90	3.09	56.2	
211	1	Bhadrak	FACOR	-1.60	-15.42	9.5	
212	1	Joda	Polasapanga	42.62	-7.26	53	
213	1	Polasapanga	Karenjia	-7.01	-4.97	10.7	
214	1	Budhipadar	Kuchei	-69.31	-29.25	92.6	
215	1	Burla	Samblpur	51.43	0.24	61.8	
216	1	Hindalco	Burla	4.42	-4.45	7.5	
217	1	Budhipadar	Brajaraj Nagar	47.68	20.90	62.9	
218	1	Jharsuguda	L0TCemco	0.89	-0.54	1.3	
219	1	Rajgangpur	Tarkera	-11.20	-2.01	13.9	
220	1	Tarkera	Rourkela	22.33	0.87	27.3	
221	1	Tarkera	Rourkela	22.33	0.87	27.3	
222	1	Tarkera	RSP	LINE	IS	0	
223	1	Rourkela	Bhalulata Tap	LINE	IS	0	
224	1	Burla	Chiplima	6.02	-0.84	7.3	
225	1	Burla	Chiplima	6.02	-0.84	7.3	
226	1	Bolangir Old	Saintala	60.56	-7.76	74.3	
227	1	Saintala	Kesinga	52.97	-9.30	66.2	
228	1	Kesinga	Khariar	51.49	-1.36	64.2	
229	1	Kesinga	PowerMax	0.69	-0.47	1	
230	2	Budhipadar	MCL	17.03	0.74	10.5	
231	1	Tarkera	Chhend	34.33	12.93	44.8	
232	1	Jaleswar	Jaleswar traction	9.53	0.95	12.2	
233	1	Chhend	Adhunik	8.19	1.12	10.4	
234	1	Chhend	NugaonTraction	0.07	2.45	5.2	
235	1	Tarkera	Chhend	34.33	12.93	44.8	
236	1	Nalda Traction	BEEKAY	13.29	2.87	17.5	
237	1	Nalda Traction	Barbil	-15.69	-10.34	23.9	
238	1	Kesinga	Bhawanipatna	25.60	-9.15	33.9	
239	1	Jajpur Road	Kendapra	LINE	IS	0	
240	1	Jajpur Town	Bhadrak	-48.14	-11.47	61.9	
241	1	Kuchinda	SMC	-23.80	-3.60	29.1	
242	1	Rajgangpur	Rourkela	LINE	IS	0	
243	1	Joda	Kendposi	7.97	0.63	10.5	
244	1	Chatrapur	Narendra Pur	-52.70	0.82	67.4	
245	1	Berhampore	Narendra Pur	-30.74	-3.12	39.4	
246	1	Berhampore	Narendra Pur	-30.74	-3.12	39.4	
247	1	Puri	Nimpara	LINE	IS	0	
248	1	Sunabeda	Damanjodi	LINE	IS	0	
249	1	Jayanagar	Tentulik	39.76	7.81	48.5	
250	1	Burla	Katapali	44.52	7.01	27.2	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
251	1	Theruvali	JK Paper	0.02	0.06	0.7	
252	1	Rajgangpur	OCL	-9.55	-9.71	16.7	
253	2	Rajgangpur	Rajgangpur Traction	2.68	2.22	2.2	
254	1	Paradip	IFFCO	LINE	IS	0	
255	1	Boinda	Rairakhole	4.23	0.28	7.7	
256	1	Mohana	Akhusinghi	-21.17	7.14	29.6	
257	1	Akhusinghi	Parlakemundi	8.31	1.24	12.2	
258	1	Bolangir Old	Sonepur	30.60	-10.04	39.2	
259	1	Bolangir New	Patnagarh	31.93	4.97	39.2	
260	1	Patnagarh	Padamapur	7.36	-0.97	9.2	
261	1	Khurdah	Balugaon T	LINE	IS	0	
262	1	Balugaon T	Narendra Pur	LINE	IS	0	
263	1	Tarkera	Rajgangpur	10.99	0.64	13.6	
264	1	NUAPATNA	Nuapatna Tap	-37.04	-13.95	49.2	
265	1	OPCL	TTPS	-39.36	-7.27	47.5	
266	1	Chainpal	Angul	36.24	8.38	43.9	
267	2	Machkhnd	Vizag	LINE	IS	0	
268	1	Joda	FAP-Joda	15.94	1.09	19.6	
269	1	Chatrapur	Rambha Traction	2.33	0.89	4.1	
270	1	Digha	Mohana	-16.49	-0.85	21.1	
271	1	Budhipadar	Sundargarh	16.15	3.46	20.4	
272	1	Boinda	Angul	-22.68	-5.46	28.1	
273	1	Kurdsplt	Kaipadar traction	11.89	2.32	15.1	
274	1	Balugaon	Solari Rly	4.41	0.50	6	
275	1	Jajpur Road	Chandikhole	LINE	IS	0	
276	1	HMSwitch	HindMtl	0.00	-0.02	0	
277	1	Sunabeda	HAL	3.42	0.53	4.2	
278	1	Rayagada	VVC	LINE	IS	0	
279	1	Paradip	PPT	LINE	IS	0	
280	1	Duburi	Jakhpur Traction	16.04	7.32	22	
281	1	Duburi	MESCO	LINE	IS	0	
282	1	Bhadrak	Bhdrak Traction	5.73	0.11	7.1	
283	1	Balasore	Balsore Traction	2.50	-0.11	3.1	
284	1	Balasore	Somanthpur	LINE	IS	0	
285	1	Bhalulata Tap	Bhulta Traction	5.48	1.58	7.3	
286	1	Jharsuguda	Jharsuguda Traction	10.40	3.18	13.2	
287	1	Vedanta	Theruvali	-53.31	21.58	70.9	
288	1	Choudwar	Kendrapara Road(Traction)	7.30	1.46	9.1	
289	1	Dhenkanal	Joranda traction	4.72	2.52	7.2	
290	1	ICCL	Mania	38.39	4.93	47	
291	1	MERAMAUNDLI	ML Rungta	0.01	-0.09	0.4	
292	1	MERAMAUNDLI	BRG	12.50	5.46	16.4	
293	1	HMSwitch	Meramaundali Traction	7.40	1.77	9.8	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
294	1	Narendra Pur	Jagannathpur traction	4.32	7.06	10.5	
295	1	Jayanagar	Jayanagar Traction	17.86	-13.01	26.4	
296	1	JayaSplt	Machkhnd	-46.17	0.17	55.2	
297	1	Machkhnd	MackndRd	LINE	IS	0	
298	1	MackndRd	Padwa traction	5.01	0.63	6.3	
299	1	MERAMAUNDLI	Chainpal	LINE	IS	0	
300	1	MERAMAUNDLI	Chainpal	LINE	IS	0	
301	1	Dhenkanal	Maheswari	9.03	-22.59	30.2	
302	1	RAWMET	Choudwar	12.83	-4.01	16.3	
303	1	MackndRd	Manbar Traction	-5.01	-0.63	6.2	
304	1	Manbar traction	Maliguda traction	-10.01	-0.40	12	
305	1	Jayanagar Traction	Maliguda traction	15.06	0.61	18.1	
306	1	Jayanagar Traction	Ch Kusumi Traction	0.00	-1.04	1.2	
307	1	Chiplima	Katapali	15.47	5.06	10.2	
308	1	Barpali	Bolangir New	-32.29	0.18	40	
309	1	Rajgangpur	Budhipadar	-18.86	-0.78	23.4	
310	1	Rairakhole	Rairakhole Tap	-7.58	1.25	10.7	
311	1	Samblpur	Rairakhole Tap	-1.41	-6.04	7.5	
312	1	Kendapra	Paradip	-64.24	-9.70	41.9	
313	1	Rairakhole Tap	Katapali	-9.03	-1.59	11.4	
314	1	Budhipadar	Budhipadar	140.01	44.53	73.7	
315	1	Bolangir New	Bolangir Old	76.46	-0.52	92.8	
316	1	Phulnakhara	Cuttack	-16.88	-4.45	21.2	
317	1	Arya	Bolani	-33.20	-15.66	45.9	
318	1	Karenjia	Rairangpur	-14.39	1.96	18.9	
319	1	Jayanagar	Meenakshi	-19.74	-4.98	24.3	
320	1	DhmraPrt	Bhadrak	-2.94	-0.68	4.7	
321	1	Budhipadar	MSP	LINE	IS	0	
322	1	OCL	Salipur	30.23	2.81	37.3	
323	1	Jajpur Road	Anandpr	16.62	-5.31	10.8	
324	1	Basta	Jaleswar	30.29	0.53	38.2	
325	1	Samblpur	ShyamDRI	-23.41	-3.56	28.5	
326	1	BHANJANAGAR	Aska	19.78	-1.09	23.6	
327	1	Chatrapur	IRE	3.03	0.62	4	
328	1	TTPS	Chainpal	45.16	5.01	53.6	
329	1	Angul	NANDIRA	24.76	2.40	29.6	
330	1	Chainpal	FCI	0.40	-0.18	0.5	
331	1	Tarkera	RSP	LINE	IS	0	
332	1	Tarkera	RSP	LINE	IS	0	
333	1	Chatrapur	Narendra Pur	-52.70	0.82	67.4	
334	1	Paradip	IFFCO	LINE	IS	0	
335	1	NBVL	HMSwitch	25.47	4.58	33.2	
336	1	NBVL	HMSwitch	25.47	4.58	33.2	
337	1	Budhipadar	Sundargarh	16.15	3.46	20.4	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
338	2	MERAMAUNDLI	HMSwitch	LINE	IS	0	
339	1	Paradip	PPT	LINE	IS	0	
340	1	Duburi	BRPL	10.92	3.07	14	
341	1	MESCO	BRPL	-3.56	-1.16	4.6	
342	1	Bolangir New	Bolangir Old	76.46	-0.52	92.8	
343	1	Duburi	Jajpur Road	27.39	6.00	34.4	
344	1	Paradip	PPL	LINE	IS	0	
345	1	Hindalco	Burla	4.42	-4.45	7.5	
346	1	Jharsuguda	L&TCemco	0.89	-0.54	1.3	
347	1	Tarkera	Rourkela	22.33	0.87	27.3	
348	1	SMC	Lapanga	-21.30	-1.77	25.7	
349	1	Lapanga	Budhipadar	38.38	17.18	25.7	
350	1	Jayambee Ferro	TTPS	-67.64	-5.44	82.6	
351	1	BEEKAY Steel	Bhulta Tap	5.49	0.96	7.3	
352	1	Chandaka	Nimpara	50.32	-6.03	62.1	
353	1	Joda	Bansapani	2.26	0.77	3	
354	1	Barbil	Arya	-23.18	-13.17	33.8	
355	1	Saliban	HMSwitch	-1.49	-0.48	2	
356	1	Jagatsingpur	GOREKNATH TRACTION	7.81	1.88	10.9	
357	1	Paradip	Jagatsingpur	41.19	6.10	53.2	
358	1	Aska	Purusattampur	12.28	-5.63	16.2	
359	1	Chatrapur	Purusattampur	LINE	IS	0	
360	1	Balugaon	Chandpur	9.46	-6.34	14.9	
361	1	Chandpur	Balugaon Tap	0.00	-0.22	0.3	
362	1	Balugaon Tap	Atri	LINE	IS	0	
363	1	Arati Steel	RAWMET	24.06	-9.22	31.3	
364	1	Nimapara	Konark	5.81	0.67	7.5	
365	1	Nimapara	Kesura	LINE	IS	0	
366	1	Nimapara	Samangara	LINE	IS	0	
367	1	Khariar	Nuapara	11.75	1.07	16.1	
368	1	Argul Tap	Shamuka	LINE	IS	0	
369	1	Sonepur	Boudh	4.92	-1.01	6.3	
370	1	JUNAGRH	Bhawanipatna	-18.48	4.45	24.4	
371	1	Shamuka	Puri	-9.54	6.99	15.1	
372	1	Puri	Samangara	-45.63	10.98	57.6	
373	1	Dabugaon	Tentulikhunti	-22.91	-5.24	29.4	
374	1	Dabugaon	Umerkote	16.39	4.07	21.9	
375	1	Joda	Bolani	35.96	15.63	48.1	
376	1	Jayanagar	Sunabeda	27.39	5.55	34	
377	1	Polasponga	Keonjhar Traction	4.20	1.81	6.2	
378	1	KATAPALI	Bargarh	55.39	15.28	69.3	
379	1	Bargarh	Barpalli	LINE	IS	0	
380	1	Bargarh	ACC	0.97	1.09	2	
381	1	Budhipadar	Kahalgaon	15.44	-1.87	18.8	
382	1	Burla-Rajganpur Tap	Kuchinda	LINE	IS	0	
383	1	Aryan Steel	ShyamDRI	22.91	-6.78	28.7	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
384	1	Baripada	Balasore	LINE	IS	0	
385	1	Kendrapra	Marshghai	-22.84	-3.16	29.8	
386	1	Arati Steel	Meramundali	-43.03	8.14	53.9	
387	1	BC Mohanty	Duburi	-19.85	0.20	24.4	
388	1	Budhipadar	Jharsuguda	19.10	-1.23	23.1	
389	1	Khurdah Split	Argul Tap	LINE	IS	0	
390	1	Argul Tap	Argul	LINE	IS	0	
391	1	Rayagarh Split	Jayangr splt	-47.36	2.72	59.6	
392	1	Action Ishpat	Jharsiguda	2.63	6.38	4.3	
393	1	Rathi	CHIPLMA	0.00	0.00	0.3	
394	1	Adhunik	Sri ganesh	-11.10	-4.19	14.6	
395	1	Kesura	Ranasinghpur	-22.05	-1.59	27.9	
396	1	Grid Steel	ICCL	-14.37	-18.54	28.5	
397	1	Mania	OCL TAP	38.08	5.28	47.1	
398	1	BPPL	Chandaka Split	65.29	10.46	80.2	
399	1	Kurda split	Mendhasal	-17.33	-2.39	21.6	
400	1	Aryan Steel	Lapanga	-25.10	9.32	32.3	
401	1	Burla-Rajganpur Tap	Rajganpur	LINE	IS	0	
402	1	Burla-Rajganpur Tap	Bamra Traction	0.00	0.00	0	
403	1	Kalugaon	Tarkera	-15.86	-9.39	22.6	
404	1	Somnathpur	EMAMI	-5.30	-2.04	6.9	
405	1	Bhadrak	Dhamra Traction	2.60	-0.77	3.4	
406	1	Marshghai	PARADEEP	-26.87	-4.30	34.9	
407	1	Duburi	MSL	3.23	0.38	4.1	
408	1	BC Mohanty	Tomka Traction	0.00	-0.58	0.7	
409	1	HMSwitch	Samal Metalics	0.00	-0.05	0.1	
410	1	Arya	BRP-St	3.47	0.70	4.6	
411	1	Argul	Atri	-0.60	0.39	1.8	
412	1	Atri	Baki	10.84	-3.35	13.7	
413	1	Rajganpur	Kuchinda	-5.01	-0.25	7.1	
414	1	Duburi	Kamakhyanagar	-20.85	-1.24	25.6	
415	1	Polasponga	MSP	-3.26	-7.69	10.4	
416	1	HMSwitch	SGEL	16.58	2.73	21.6	
417	1	Lapanga	Jharsiguda	LINE	IS	0	
418	1	Lapanga	Burla	LINE	IS	0	
419	2	Lapanga	Burla	LINE	IS	0	
420	1	Kalarangi	Duburi	-28.05	-9.36	36.8	
421	1	Kalarangi	Kmakhyanagar	LINE	IS	0	
422	1	Kuchai	Bangaripusi	21.39	-7.08	27.4	
423	1	Khurda	Kurda splt	-5.45	-0.12	6.7	
424	1	Chandka	Chandka Splt	-67.41	-19.12	85.8	
425	1	Rayagda	Rayagda Sp	-6.46	-2.48	8.6	
426	1	Kesinga Splt	Kesinga	0.35	-8.68	10.8	
427	1	Joda	Rourkela	-28.10	7.93	37.1	
428	1	Kalarangi Tap	Kalarangi	28.05	9.36	37	
429	1	Bhubaneswar	CTC	20.83	9.01	27.9	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
430	1	Bangaripusi	Rairangpur	21.21	-5.64	26.8	
431	1	Chandaka	Bidansi	-37.94	-3.47	46.6	
Sikkim line loading							
400 kV							
1	1	Teesta-5	Rangpo	262.39	15.05	30.1	**PGCIL**
2	1	Teesta-5	Rangpo	262.39	15.05	30.1	
3	1	Malbase	TALA	LINE	IS	0	
220kV							
4	1	New Melli	Jorthang	-16.83	-18.76	11.9	**PGCIL**
5	1	New Melli	Rangpo	31.46	-22.17	9.1	
6	1	Rangpo	Jorthang	-23.11	0.74	11	
132kV							
7	1	Rangit	Ramam	63.52	-14.96	77.5	**PGCIL**
8	1	Rangit	Sagbari	-14.68	8.80	20.3	**NHPC**
9	1	Melli	NJPPG	47.74	-14.46	59.3	**PGCIL**
10	1	Rangit	Kurseong	39.83	-10.44	48.9	**PGCIL**
11	1	Rangpo	Chuzechan	-45.94	-4.45	35.5	**Gati infra**
12	1	Gantok	Chuzechan	-25.55	-6.44	20.4	**Sikkim**
13	1	Rangpo	Melli	88.19	-18.24	69.5	**PGCIL**
14	1	Gantok	Rangpo	-11.63	-4.72	15	
15	1	Rangpo	Rangit	34.91	-17.35	46.4	
16	1	Sagbari	Melli	-17.51	8.43	24	
17	1	Sagbari	Geyzing	2.83	0.38	3.6	
66kV							
18	1	Mangan	Phudong	-2.86	-0.67	6.1	**Sikkim Gov**
19	1	Geyzing	Namchi	-0.39	0.22	1.3	
20	1	Bulbuley	Sichey	5.05	1.29	10.6	
21	1	Bulbuley	Gangtok	-10.04	-2.66	21.1	
22	2	Ranipool	LLHP	0.00	-0.01	0	
23	1	Rongli	Pakyong	-3.22	-0.75	6.8	
24	1	Mamring	Melli	-6.78	-1.91	14	
25	1	Rangit	Rabangla	2.15	0.50	4.4	
26	1	Ranipool	Pakyong	8.27	1.97	9.1	
27	1	Melli	Namchi	1.46	-0.48	3.1	
28	1	Pelling6	Geyzing	-2.14	-0.65	4.5	
29	1	PNamchi6	Rothak	2.14	0.35	4.4	
30	1	Rothak	Soreng	1.07	0.16	2.2	
31	2	Melli	Kalingpong	6.78	0.47	6.8	
32	1	Melli6	Melli	22.27	3.31	44.7	
33	1	Melli	PNamchi6	5.04	0.93	10.2	
34	1	Gangtok	Tadong	12.97	3.27	27	
35	1	Ranipool	Gangtok	-13.99	-3.37	29	
36	1	Tadong	Sichey	3.54	1.13	7.6	
37	1	Tadong	Phudong	4.32	0.68	9	
38	1	Rongli	Rhenock	2.15	0.52	4.6	
39	1	Geyzing	Geyzing	0.68	0.51	1.7	
40	1	Ranipool	Topakhani	2.86	0.63	6	
41	1	Mangan	Meyong HEP	0.00	-0.13	0.3	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
42	1	Rongli	RongliH	0.00	-0.06	0.1	
West Bengal line loading							
400 kV							
1	1	Malbase	Binaguri	LINE	IS	0	**PGCIL**
2	1	Rangpo	Binaguri	598.57	-74.82	69.1	
3	1	Rangpo	Binaguri	598.57	-74.82	69.1	
4	1	TALA	Binaguri	95.24	-29.97	11.5	
5	1	TALA	Binaguri	95.24	-29.97	11.5	
6	1	TALA	Binaguri	95.24	-29.97	11.5	
7	1	Binaguri	Bongaigaon (NER)	LINE	IS	0	
8	1	Binaguri	Bongaigaon (NER)	LINE	IS	0	
9	1	Farraka	MaldaPG	161.80	7.54	18.4	
10	1	Farraka	MaldaPG	161.80	7.54	18.4	
11	1	Farraka	Parulia (PGCIL)	-79.75	29.00	11.7	
12	1	Farraka	Parulia (PGCIL)	158.72	-10.47	19.5	
13	1	Farraka	Behrampur	347.22	8.96	38.8	
14	1	Farraka	Sagardighi	282.19	-8.70	31.6	
15	1	Sagrdghi	Behrampur	248.64	39.95	28.6	
16	1	Sagrdghi	Behrampur	248.64	39.95	28.6	
17	1	Sagrdghi	Parulia (PGCIL)	29.45	-25.66	8.8	**WBSETCL**
18	1	Sagrdghi	Parulia (PGCIL)	29.45	-25.66	8.8	**WBSETCL**
19	1	Subhashgram	Sagardighi	-374.49	-56.06	43.1	**PGCIL**
20	1	Behrampur	Behramara (Bangladesh)	240.25	2.01	27.4	
21	1	Behrampur	Behramara (Bangladesh)	240.25	2.01	27.4	
22	1	Behrampur	Jeerat	361.83	6.18	42	
23	1	Haldia	Subhashgram	274.47	55.37	33.3	**CESC**
24	1	Haldia	Subhashgram	274.47	55.37	33.3	
25	1	Jeerat	Subhashgram	178.11	-44.51	21.3	**PGCIL**
26	1	Jeerat	Bakreswar	-362.26	0.83	42.6	**WBSETCL**
27	1	Jeerat	KTPS	272.19	-3.79	31.8	
28	1	KTPS	Kharagpur	-147.38	-88.05	9.8	
29	1	KTPS	Kharagpur	-147.38	-88.05	9.8	
30	1	Arambag	KTPS	114.17	-26.33	13.4	**WBSETCL**
31	1	Arambag	Bidhannagar	-224.44	-40.42	26	
32	1	Arambag	Bakreswar	-111.39	14.92	13.3	
33	1	PPSP	Arambag	126.60	-24.13	17.5	
34	1	PPSP	Arambag	126.60	-24.13	17.5	
35	1	PPSP	Bidhannagar	2.02	-24.06	9.1	
36	1	PPSP	Bidhannagar	2.02	-24.06	9.1	
37	1	Parulia (PGCIL)	Bidhannagar	134.65	54.03	16.4	
38	1	Parulia (PGCIL)	Bidhannagar	134.65	54.03	16.4	
39	1	Khargpr4	Chaibasa	-249.35	-40.36	28.5	**PGCIL**
40	1	Khargpr4	Chaibasa	-249.35	-40.36	28.5	**PGCIL**

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
41	1	Durgapur (DSTPS)	Raghunathpur	135.35	-21.21	15.2	**DVC**
42	1	Durgapur (DSTPS)	Raghunathpur	135.35	-21.21	15.2	**DVC**
43	1	Binaguri	Purnea PG	294.11	-74.58	34.5	**PGCIL**
44	1	Binaguri	Purnea PG	294.11	-74.58	34.5	
45	1	MaldaPG	Purnea PG	47.16	35.52	9.6	
46	1	MaldaPG	Purnea PG	47.16	35.52	9.6	
47	1	Farraka	Khalgaon-I	1.42	2.27	6.4	
48	1	Farraka	Khalgaon-I	1.42	2.27	6.4	
49	1	Farraka	Khalgaon-II	38.67	-3.67	7.2	
50	1	Farraka	Khalgaon-II	38.67	-3.67	7.2	
51	1	MejiaB4	Maithan-I	348.40	34.86	39.7	
52	1	MejiaB4	Maithan-I	348.40	34.86	39.7	
53	1	Raghunathpur	Ranchi	262.24	-23.08	29.9	
54	1	Raghunathpur	Ranchi	262.24	-23.08	29.9	
55	1	Binaguri	Alipurduar PG	-47.52	-53.08	4	
56	1	Binaguri	Alipurduar PG	-47.52	-53.08	4	
57	1	AlipurDP	Bongaigaon	-80.39	-110.32	7.6	
58	1	AlipurDP	Bongaigaon	-80.39	-110.32	7.6	
220kV							
59	1	STPS	Asansol	61.16	15.04	30.9	**WBSETCL**
60	1	SubhasgramPG	CLC	80.19	21.77	40.5	
61	1	Kasba	SubhasgramW	-29.71	-5.21	14.6	
62	1	Jeerat	Satgachia	0.00	0.00	5	
63	1	Arambag	Domjur	153.48	21.95	74.1	
64	1	Arambag	Domjur	153.48	21.95	74.1	
65	1	Arambag	Midnapur	41.17	-2.92	19.9	
66	1	Arambag	Midnapur	41.17	-2.92	19.9	
67	1	Bakreshwar	Bidhanagar	23.20	13.72	14.3	
68	1	Bakreshwar	Bidhanagar	23.20	13.72	14.3	
69	1	Bidhanagar	DPL	-106.73	90.87	67.4	
70	1	Bidhanagar	DPL	-106.73	90.87	67.4	
71	1	Howrah	KTPS	-90.59	-17.36	44.7	
72	1	Howrah	KTPS	-90.59	-17.36	44.7	
73	1	Jeerat	Kasba	92.93	-11.44	45.2	
74	1	Jeerat	Kasba	92.93	-11.44	45.2	
75	1	ParuliaW	ParuliaD	42.39	41.18	27.9	
76	1	ParuliaW	ParuliaD	42.92	41.20	28.1	
77	1	Bidhanagar	DTPS-D	LINE	IS	0	
78	1	Bidhanagar	DTPS-D	LINE	IS	0	
79	1	STPS	Hura	162.93	-15.03	77.3	
80	1	BishnupurNew	Arambag	22.93	-9.60	11.9	
81	1	BishnupurNew	Arambag	22.93	-9.60	11.9	
82	1	Laxmikantapur	SubhasgramW	-179.89	-19.95	88.9	
83	1	Laxmikantapur	SubhasgramW	-179.89	-19.95	88.9	
84	1	Bakreshwar	Satgachia	123.93	0.81	58.8	
85	1	Bakreshwar	Satgachia	123.93	0.81	58.8	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
86	1	SubhasgramPG	SubhasgramW	242.63	35.28	105	
87	1	SubhasgramPG	SubhasgramW	242.63	35.28	105	
88	1	Kasba	SubhasgramW	-29.71	-5.21	14.6	
89	1	Kharagpur	Midnapur	88.03	17.45	43.2	
90	1	Kharagpur	Midnapur	88.03	17.45	43.2	
91	1	SubhasgramPG	NTAA	27.25	27.75	19.9	
92	1	NTAA	Jeerat	-122.62	-1.37	59.6	
93	1	TLD	NJP	131.24	-6.05	60.3	
94	1	NJP	TLD	-39.45	-16.11	19.8	
95	1	NJP	TLD	-39.45	-16.11	19.8	
96	1	Gokarna	Sadaipur	-72.91	7.31	35.5	
97	1	Gokarna	Sadaipur	-72.91	7.31	35.5	
98	1	Sadaipur	Bakreshwar	-73.51	14.18	35.6	
99	1	Gokarna	Sagardighi	-73.51	14.18	35.6	
100	1	Gokarna	Sagardighi	-95.02	-35.08	48.1	
101	1	Foundry Park	Domjur	-66.25	-7.97	32.7	
102	1	Foundry Park	Domjur	-66.25	-7.97	32.7	
103	1	Howrah	Foundry Park	-53.06	-6.52	26.3	
104	1	Howrah	Foundry Park	-53.06	-6.52	26.3	
105	1	Krishnanagar	Satgachia	-13.91	-7.97	7.8	
106	1	Krishnanagar	Satgachia	-13.91	-7.97	7.8	
107	1	Asansol	Bidhanagar	-7.67	-9.34	5.8	
108	1	NTAA	CLC	49.89	-12.72	25	
109	1	Bishnupr New	STPS	-106.94	5.46	52	
110	1	New Haldia	KTPS	-52.09	-6.68	25.5	
111	1	New Haldia	KTPS	-52.09	-6.68	25.5	
112	1	Bishnupr New	Hura	-63.84	-3.44	31	
113	1	Sadaipur	Bakreshwar	-73.51	14.18	35.6	
114	1	SubhasgramPG	EMSS	250.67	11.45	49.4	
115	1	SubhasgramPG	EMSS	250.67	11.45	49.4	
116	1	NTAA	Jeerat	-122.62	-1.37	59.6	
117	1	Jeerat	Satgach2	0.00	0.00	5	
118	1	Jeerat	Dharampur	81.33	33.75	22.1	
119	1	Arambag2	Rishra	156.78	7.05	75	
120	1	Dharampur	Rishra2	9.32	20.11	7.3	
121	2	Gokarna	Kishnanagar	213.29	20.35	50.9	
122	2	VidyasagarW	Kharagpur	-60.52	-11.44	29.6	
123	2	New Haldia	IPCLG	0.00	-0.84	0.2	
124	1	Parulia	Parulia	-94.95	-4.46	44.8	
125	1	Kharagpur	Egra	103.72	22.31	50.3	
126	2	Kharagpur	Egra	103.72	22.31	50.3	
127	1	Khargpur	Vidysagar Park	61.08	1.00	29.6	
128	1	STPS	JK nagar	36.47	2.21	18.2	**WBSETCL/IPCL**
129	1	JK Nagar	Bidhanagar	-8.80	5.00	5.8	
130	1	DalkholaPG	MaldaPG	4.38	-10.44	5.3	**PGCIL**
131	1	DalkholaPG	MaldaPG	4.38	-10.44	5.3	
132	1	Binaguri	BirparaPG	8.67	-6.76	5.1	
133	1	Binaguri	BirparaPG	8.67	-6.76	5.1	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
134	1	Binaguri	SliguriPG	82.46	-9.31	38.5	
135	1	Binaguri	SligurPG	82.46	-9.31	38.5	
136	1	NJP	Binaguri	51.55	-6.92	24.1	
137	1	NJP	Binaguri	51.55	-6.92	24.1	
138	1	BirparaPG	Malbase	6.00	-5.75	3.9	
139	1	BirparaPG	Chukha	-35.87	9.63	18.1	
140	1	BirparaPG	Chukha	-35.87	9.63	18.1	
141	1	DalkholaPG	Purnea	27.36	-1.54	12.9	
142	1	DalkholaPG	Purnea	27.36	-1.54	12.9	
143	1	DalkholaPG	DkholaW	62.40	1.27	29	
144	1	DalkholaPG	DkholaW	62.40	1.27	29	
145	1	Farakka	Lalmatiya	28.78	-3.67	13.6	
146	1	SiliguriP	Krishanganj	74.02	-18.32	35.4	
147	1	SiliguriP	Krishanganj	74.02	-18.32	35.4	
148	2	DalkholaP	Krishanganj	-188.26	21.41	44.3	
149	1	BirpraP2	ALIPURDUAR	-28.59	-4.85	13.6	
150	1	BirpraP2	ALIPURDUAR	-28.59	-4.85	13.6	
151	1	ALIPURDU	Salakati_NER	4.05	14.29	12.2	
152	1	ALIPURDU	Salakati_NER	4.05	14.29	12.2	
153	1	JK Nagar	JK Nagar	36.32	11.66	18.5	**IPCL**
154	1	JK Nagar	JK Nagar	-8.80	2.93	4.8	
155	1	BurnpurD	Mejia-D	-96.20	5.22	45.9	**DVC**
156	1	BurnpurD	Kalyaneshwari	-15.91	-9.76	8.8	
157	2	Mejia	Durgapur	133.95	-15.14	31.8	
158	2	ParuliaD	Durgapur	-6.97	23.77	6.8	
159	2	Barjora	Mejia	-133.45	-13.59	31.6	
160	1	DTPS-D	Mejia	-52.47	-6.08	25	
161	1	DTPS-D	Mejia	-52.47	-6.08	25	
162	1	Parulia-D	TamlaD	10.33	2.16	5.1	
163	1	Parulia-D	TamlaD	10.33	2.16	5.1	
164	1	Parulia-D	Tamla	10.33	2.16	5.1	
165	2	DTPS-D	Parulia-D	-5.07	-51.14	12.2	
166	2	IISCOD	BurnpurD	-111.20	-4.38	26.3	
167	1	EMSS	NCGS	LINE	IS	0	**CESC**
168	1	EMSS	NCGS	LINE	IS	0	
169	1	EMSS	EMSS	LINE	IS	0	
170	1	BBGS	BBG	123.14	12.53	49.3	
171	1	BBGS	BBG	123.14	12.53	49.3	
172	1	BBG	EMSS	122.33	17.75	47.7	
173	1	BBG	EMSS	122.33	17.75	47.7	
174	1	EMSS	Kasba	LINE	IS	0	
175	1	EMSS	EMSS	LINE	IS	0	
132kV							
176	1	Howrah	B. Garden	41.70	3.32	89.1	**WBSETCL**
177	1	Howrah	B. Garden	41.70	3.32	89.1	
178	1	Howrah	SRS	LINE	IS	0	
179	1	Lilooah	Belur	39.56	-0.77	85.2	
180	1	Lilooah	Belur	39.56	-0.77	85.2	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
181	1	Lilooah	Belur	39.56	-0.77	85.2	
182	1	Titagarh	Titagarh	39.15	1.31	85.5	
183	1	Titagarh	Titagarh	39.15	1.31	85.5	
184	1	Kasba	EMSS	28.68	-20.53	22.7	
185	1	Kasba	EMSS	28.68	-20.53	22.7	
186	1	Howrah	B. Garden	41.70	3.32	89.1	
187	1	Rishra	Rishra	32.06	-0.59	21.4	
188	1	Rishra	Rishra	32.06	-0.59	21.4	
189	1	Alipurduar	Birpara	-37.02	15.81	49.4	
190	1	Midnapur	Balichauk	35.58	4.88	45	
191	1	Pingla	Balichauk	-22.15	-1.69	28.2	
192	1	CK Road	Midnapur	-49.90	-2.42	64.1	
193	1	Leobong	NBU	25.84	-7.45	32.3	
194	1	Leobong	Ramam	-38.30	6.30	46.8	
195	1	Dharampur	Kalyani	4.91	-0.46	6.3	
196	1	Dhulian	Farakka	-26.07	4.45	32.7	
197	1	Joka	Sonarpur	LINE	IS	0	
198	1	Lalgola	Raghunathpur	23.68	6.74	31.9	
199	1	Gokarna	Rampurhat	52.44	7.22	66.4	
200	1	Gokarna	KuliGIS	58.07	13.47	74.7	
201	1	HM	Dankuni	LINE	IS	0	
202	1	Dankuni	Lilooah	-6.00	-1.97	8.1	
203	1	HM	Rishra	LINE	IS	0	
204	1	Khanyan	Satgachia	-32.58	16.94	47.3	
205	1	Malda	Samsi	70.35	10.03	86.6	
206	1	Satgachia	DhatriT	4.00	-0.83	5.2	
207	1	NBU	TCF-1	14.31	0.26	17.3	
208	1	NJP	TCF-1	11.88	8.91	18.5	
209	1	Samsi	Raigunj	LINE	IS	0	
210	1	Saintia	Rampurhat	27.04	-1.03	35.1	
211	1	TCF-1	TCF-2	0.00	-0.81	1	
212	1	TCF-1	TCF-3	0.00	-1.72	2.1	
213	1	TCF-2	TCF-3	LINE	IS	0	
214	1	NBU	NJP	6.83	-13.89	18.7	
215	1	New Haldia	Haldia	3.36	-19.11	24.4	
216	1	New Haldia	HPCL	5.96	0.54	7.5	
217	1	Haldia	HPCL	1.74	13.04	16.7	
218	2	Rishra	CTOLA	3.88	20.70	13.7	
219	1	Raigunj	Gangarampur	40.35	0.57	49.3	
220	1	Cooch Bihar	Alipurduar	-19.50	4.28	24.2	
221	1	Chalsa	Maynaguri	3.05	-1.06	3.9	
222	1	Chalsa	NJP	-22.32	5.58	29.3	
223	1	Contai	Egra	-48.51	-9.84	63.9	
224	1	Gokarna	Raghunathpur	44.63	12.19	58	
225	1	CLC	Kasba	-40.01	-18.97	55.3	
226	1	Kasba	Joka	LINE	IS	0	
227	1	TMBLK	RMBLK	-23.84	-9.75	32.5	
228	1	CK Road	Bishnupur Old	LINE	IS	0	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
229	1	Basirhat	Ashoknagar	-44.30	-2.73	58.3	
230	1	Basirhat	Ashoknagar	-44.30	-2.73	58.3	
231	1	Arambag	Raina	40.87	16.84	55.5	
232	1	Arambag	Raina	40.87	16.84	55.5	
233	1	Arambag	Tarakeshwar	47.75	-4.13	60.1	
234	1	Arambag	Tarakeshwar	47.75	-4.13	60.1	
235	1	Ashoknagar	Jeeerat	-80.72	-7.86	104.5	
236	1	Ashoknagar	Jeeerat	-80.72	-7.86	104.5	
237	1	Bankura	Bishnupur New	-2.07	-5.83	7.7	
238	1	Bankura	Bishnupur New	-2.07	-5.83	7.7	
239	1	Barasat	Jeeerat	LINE	IS	0	
240	1	Barasat	Jeeerat	LINE	IS	0	
241	1	Birpara	BRPPG	-69.91	0.97	83.6	
242	1	Birpara	BRPPG	-69.91	0.97	83.6	
243	1	Birpara	Maynaguri	14.72	6.20	20.3	
244	1	Birpara	Mathabhanga	31.45	9.29	39.2	
245	1	Bolpur	Saintia	24.01	-2.18	31	
246	1	Bolpur	Saintia	24.01	-2.18	31	
247	1	Bongaon	Krishnanagar	LINE	IS	0	
248	1	Bongaon	Krishnanagar	LINE	IS	0	
249	1	Dlkhola	Raigunj	48.97	-2.33	54.1	
250	1	Dlkhola	Raigunj	48.97	-2.33	54.1	
251	1	Debagram	Katwa	LINE	IS	0	
252	1	Debagram	Katwa	LINE	IS	0	
253	1	Debagram	DebagramTSS	2.76	0.36	3.7	
254	1	Dharampur	Titagarh	70.07	12.42	90.7	
255	1	Dharampur	Titagarh	70.07	12.42	90.7	
256	1	Domjour	Uluberia	16.88	10.49	26	
257	1	Domjour	Uluberia	16.88	10.49	26	
258	1	Bidhannagar	DPL	LINE	IS	0	
259	1	Bidhannagar	DPL	LINE	IS	0	
260	1	Bidhannagar	Mankar	49.93	-4.74	61.7	
261	1	Bidhannagar	Mankar	49.93	-4.74	61.7	
262	1	Falta	Laxmikantapur	-59.87	1.03	78.4	
263	1	Falta	Laxmikantapur	-59.87	1.03	78.4	
264	1	Gokarna	Katwa	0.00	-2.69	3.4	
265	1	Gokarna	Katwa	0.00	-2.69	3.4	
266	1	Joka	Sirkl	-62.46	1.36	82.3	
267	1	Jeeerat	Bongaon	31.28	5.56	40.3	
268	1	Jeeerat	Bongaon	31.28	5.56	40.3	
269	1	Kasba	SaltLak	45.81	16.81	60.6	
270	1	Katwa	Satgachia	-29.38	-9.02	39	
271	1	Katwa	Satgachia	-29.38	-9.02	39	
272	1	KTPS	KolaghatW	33.45	13.52	45.7	
273	1	KTPS	KolaghatW	33.45	13.52	45.7	
274	1	KTPS	TMLK	32.34	7.16	41.9	
275	1	KTPS	TMLK	32.34	7.16	41.9	
276	1	KTPS	Uluberia	36.06	2.58	45.8	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
277	1	KTPS	Bagnan	71.74	5.67	45.5	
278	1	Lilooah	Rishra	LINE	IS	0	
279	1	Lilooah	Howrah	-29.25	1.05	37.8	
280	1	NJP	Siliguri	17.57	2.99	21.7	
281	1	NJP	Siliguri	17.57	2.99	21.7	
282	1	STPS	PuruliaW	26.68	2.55	32.6	
283	1	STPS	PuruliaW	26.68	2.55	32.6	
284	1	NJP PG	Kurseong	-31.08	10.42	40	
285	1	Domjour	Jangipara	10.04	-3.08	13.3	
286	1	Domjour	Jangipara	10.04	-3.08	13.3	
287	1	Arambag	Birsingha	27.46	6.40	35.4	
288	1	Arambag	Birsingha	27.46	6.40	35.4	
289	1	Tarakeshwar	Belmuri	25.98	-13.11	37	
290	1	Tarakeshwar	Belmuri	25.98	-13.11	37	
291	1	Bishnupur New	Borjora	10.07	-0.61	12.6	
292	1	Bishnupur New	Borjora	10.07	-0.61	12.6	
293	1	Borjora	Bidhannagar	LINE	IS	0	
294	1	Borjora	Bidhannagar	LINE	IS	0	
295	1	RGP	Bankura	27.53	0.19	33.6	
296	1	RGP	Bankura	27.53	0.19	33.6	
297	1	Mankar	Mahachanda	24.37	-9.42	32.5	
298	1	Mankar	Mahachanda	24.37	-9.42	32.5	
299	1	Mahachanda	Satgachia	LINE	IS	0	
300	1	Mahachanda	Satgachia	LINE	IS	0	
301	1	TATA Power	Haldia	43.43	22.43	61	
302	1	TATA Power	Haldia	43.43	22.43	61	
303	1	Cresent	Asansol	18.40	8.02	25.3	
304	1	Cresent	Asansol	18.40	8.02	25.3	
305	1	Krishnanagar	Ranaghat	51.13	-2.35	65.4	
306	1	Krishnanagar	Ranaghat	51.13	-2.35	65.4	
307	1	Debagram	Amtala	LINE	IS	0	
308	1	Debagram	Amtala	LINE	IS	0	
309	1	Berhampur	Amtala	45.80	-1.85	58.8	
310	1	Berhampur	Amtala	45.80	-1.85	58.8	
311	1	Hizli	Midnapur	LINE	IS	0	
312	1	Hizli	Midnapur	LINE	IS	0	
313	1	Midnapur	Pingla	32.43	3.39	40.8	
314	1	Jhargram	Midnapur	-23.41	-4.91	30	
315	1	Jhargram	Midnapur	-23.41	-4.91	30	
316	2	NTAAIII	Barasat	127.79	22.98	82.3	
317	1	Ukhra	Bidhannagar	-32.19	-0.51	39.9	
318	1	Ukhra	Bidhannagar	-32.19	-0.51	39.9	
319	1	TCF-3	Dlkhola	LINE	IS	0	
320	1	TCF-3	Dlkhola	LINE	IS	0	
321	1	Rishra	Bighati	6.68	-10.19	15.4	
322	1	Rishra	Bighati	6.68	-10.19	15.4	
323	1	Bishnupur New	Bishnupur Old	22.02	1.85	27.3	
324	1	Bishnupur New	Bishnupur Old	22.02	1.85	27.3	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
325	1	Bishnupur New	Bishnupur Old	22.02	1.85	27.3	
326	1	Howrah	Lilooah	50.52	-2.15	64.7	
327	1	Howrah	Lilooah	50.52	-2.15	64.7	
328	1	Howrah	Lilooah	50.52	-2.15	64.7	
329	1	Khejuria GIS	Malda	-21.43	4.06	27.1	
330	1	Bishnupur Old	Khatra	13.54	-1.68	16.9	
331	1	Bishnupur Old	Khatra	13.54	-1.68	16.9	
332	1	Satgachia	Kalna	21.19	1.72	26.8	
333	1	Satgachia	Kalna	21.19	1.72	26.8	
334	1	Laxmikantapur	Kakdwip	22.60	-2.79	29.2	
335	1	Laxmikantapur	Kakdwip	22.60	-2.79	29.2	
336	1	Dharampur	Jeeerat	-9.17	-11.40	18.7	
337	1	Dharampur	Jeeerat	-9.17	-11.40	18.7	
338	1	Hura	PuruliaW	LINE	IS	0	
339	1	Hura	PuruliaW	LINE	IS	0	
340	2	Hura	RGP	78.50	-2.25	18.6	
341	1	Bagnan	Uluberia	22.34	1.24	28.5	
342	1	Krgpr132	Hizli	LINE	IS	0	
343	1	Saintia	KuliGIS	-23.86	-4.23	31.1	
344	1	Malda	Khejuria GIS	21.59	-5.42	27.1	
345	1	Bengal Energy	Egra	-23.30	-0.28	29.9	
346	1	SonarLal	Lalgola	9.85	3.62	14	
347	1	Raghunathpur	Dhulian	LINE	IS	0	
348	1	MaldaPG	Malda	118.09	14.51	56.2	
349	1	MaldaPG	Malda	118.09	14.51	56.2	
350	1	Berhampur	Gokarna	-97.79	-9.43	125.9	
351	1	Berhampur	Gokarna	-97.79	-9.43	125.9	
352	1	Berhampur	Cossim bazarTSS	5.00	0.93	6.7	
353	1	Ranaghat	Dharampur	0.69	-27.69	36	
354	1	Ranaghat	Dharampur	0.69	-27.69	36	
355	1	NTAAIII	NTAA	70.29	8.35	89.7	
356	1	Bidhannagar	Bolpur	62.58	1.16	77	
357	1	Bidhannagar	Bolpur	62.58	1.16	77	
358	1	Ujanoo	NBU	-27.79	4.55	34.2	
359	1	NJP PG	NBU	34.63	2.90	41.7	
360	1	Ujanoo	Siliguri	6.97	-3.80	9.6	
361	1	Adisaptagram	BTPS	-38.09	-23.67	56.3	
362	1	Adisaptagram	BTPS	-38.09	-23.67	56.3	
363	1	Lilooah	Rishra	LINE	IS	0	
364	1	NJP PG	NJP	58.97	-8.97	71.6	
365	1	NJP	Maynaguri	46.45	-13.40	58.2	
366	1	Balurghat	BalurghatTP	-27.73	-3.65	34.8	
367	1	Balurghat	Gangarampur	1.43	-4.06	5.4	
368	1	Gokarna	SonarLal	20.06	3.22	26	
369	1	Debagram	Krishnanagar	-20.06	-3.89	26.5	
370	1	Debagram	Krishnanagar	-20.06	-3.89	26.5	
371	1	Haldia	Hizil	33.38	8.62	43.3	

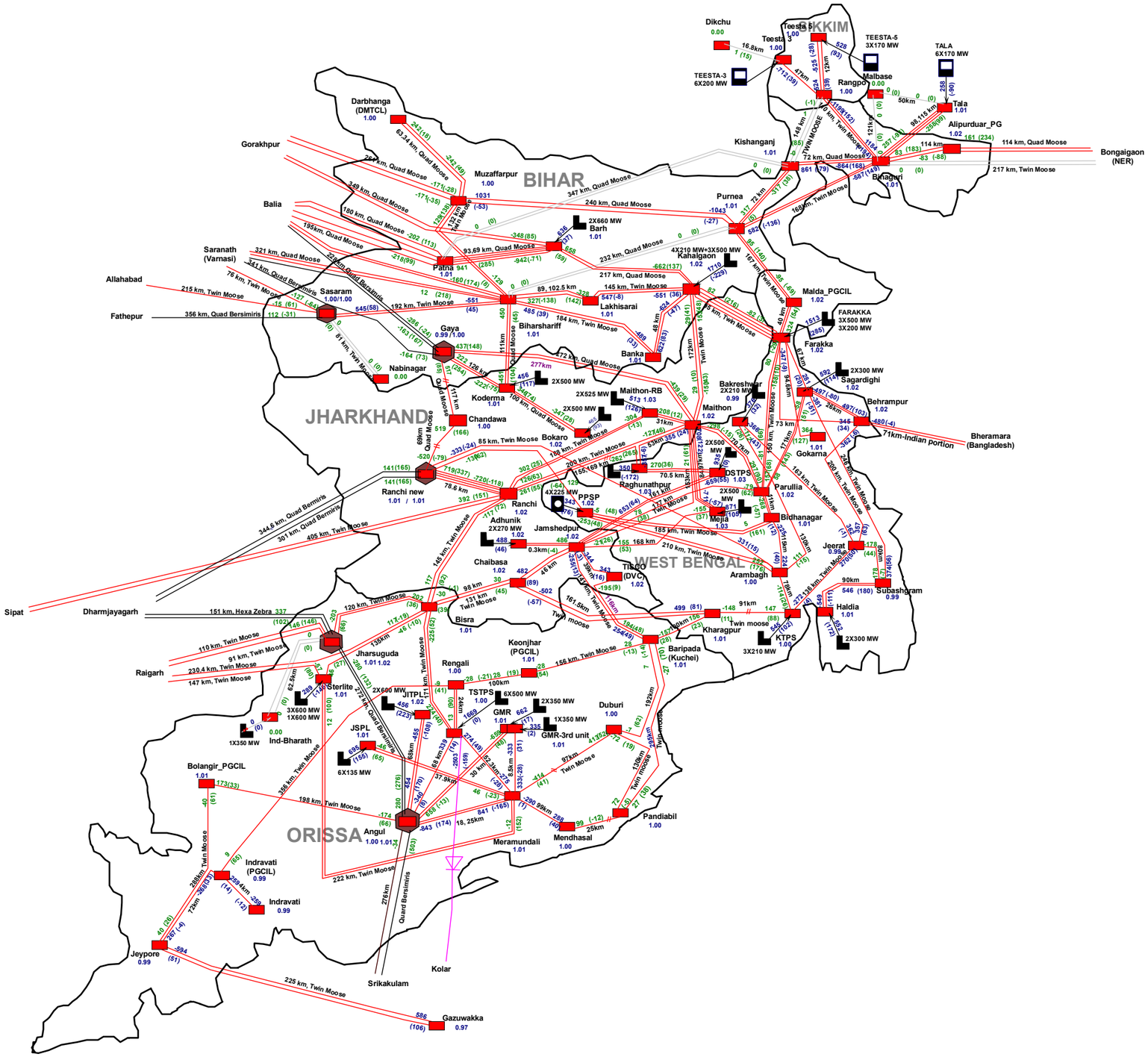
Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
372	1	Haldia	Hizil	33.38	8.62	43.3	
373	1	TMLK	Hizil	-0.23	-5.88	7.5	
374	1	TMLK	Hizil	-0.23	-5.88	7.5	
375	1	Falta	Joka	24.71	-1.93	32.4	
376	1	Falta	Joka	24.71	-1.93	32.4	
377	1	Ramam	NBU	36.10	-8.65	44.4	
378	1	Sonarpur	Kasba	-70.50	-6.33	88.7	
379	1	New Haldia	Bajkul	50.48	10.62	33	
380	1	Bajkul	Egra	-10.02	-3.59	13.6	
381	1	Bengal Energy	Hizli	7.87	2.03	10.8	
382	1	Raigunj	BalurghatTP	2.15	-2.27	3.8	
383	1	Lalgola	Gokarna	-18.08	-5.92	24.3	
384	1	Lalgola	Gokarna	-18.08	-5.92	24.3	
385	1	PuruliaW	Bagmundi	4.42	-3.71	7.1	
386	1	Belmuri	Adisaptagram	13.79	-14.65	25.5	
387	1	Belmuri	Adisaptagram	13.79	-14.65	25.5	
388	1	BalurghatTP	Malda	-26.36	0.68	32.2	
389	2	Hizil	Rohit Ferro	LINE	IS	0	
390	1	Hizil	Mankar	2.00	1.90	3.5	
391	1	CK Road	CK Road-Tr	1.80	1.50	3.2	
392	2	Sirkl	Laxmikantapur	-96.12	2.69	62.7	
393	1	Maynaguri	Mathabhanga	LINE	IS	0	
394	2	Amtala	Najirpur	30.18	-2.22	19.8	
395	1	SaltLak	CLC	-33.30	-8.19	43.2	
396	1	Bankura	Bengal concast	0.25	1.88	2.6	
397	1	Cooch Bihar	Birpara	-39.15	5.80	18.7	
398	1	Katwa	KatwaTss	0.30	0.06	0.4*	
399	1	Bankura	BankuraT	7.50	3.17	10.1	
400	1	Bishnupur Old	Modern	9.10	0.19	11.3	
401	1	Bishnupur Old	Rohit Ferro	LINE	IS	0	
402	1	Midnapur	WBIDC	23.70	7.33	31.4	
403	1	Barasat	BarsatT	4.00	1.18	5.5	
404	1	KolaghatW	Madras cement	4.00	0.77	5.2	
405	1	TMBLK	WBIDC	8.84	4.79	12.8	
406	1	Bolpur	Bolpur Trac	2.00	3.58	5.3	
407	1	Rishra	Jayshree	10.43	3.25	13.8	
408	1	HOWRH DVC	Foundry Park Tap	7.58	-0.98	9.9	
409	1	Foundry Park Tap	Kolaghat DVC	-2.05	-3.02	4.7	
410	1	Vidyasagar Park	BRG Steel Tap	1.31	-4.07	5.3	
411	1	BRG Steel Tap	BRG Steel	1.30	0.09	1.7	
412	1	BRG Steel Tap	Midnapur	LINE	IS	0	
413	1	Vidyasagar Park	Hizli	33.66	0.46	42	
414	1	Vidyasagar Park	HIZLI TSS	29.69	-0.04	37.1	
415	1	HIZLI TSS	Hizli	17.65	-0.95	22.7	
416	1	Khejuria GIS	Farakka Switching	36.25	-2.44	22.2	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
417	1	Farakka Switching	Ambuja Cement Tap	10.01	2.96	12.9	
418	1	Ambuja Cement Tap	Raghunathganj	LINE	IS	0	
419	1	Ambuja Cement Tap	Ambuja Cement	10.00	3.24	12.9	
420	1	Kharagpur DVC	Kharagpur Traction	LINE	IS	0	
421	1	Foundry Park Tap	Food Park	9.61	2.90	13	
422	1	New Haldia	Bajkul	50.48	10.62	33	
423	1	Resmi Metalic BLK	Vidyasagar	-38.88	-14.53	52	
424	1	NewTown Action area-I	SALTLAKE GIS	50.20	5.57	32.3	
425	1	Bishnupur Old	OCL Bishnupur	LINE	IS	0	
426	1	Chanditala	Domjour	-36.25	16.31	25.8	
427	1	Bajkul	CONTAI	27.79	5.06	36.2	
428	1	OCL Bishnupur	Midnapur	-1.00	0.00	5.3	
429	1	Mankar	Emami Cement	0.80	0.54	1.2	
430	1	BTPS	Kalyani	56.34	15.13	72.9	DVC
431	1	BTPS	Lilooah	58.66	16.21	38	
432	1	BTPS	Khanyan	-0.44	13.60	18.1	
433	1	BTPS	Satgachia	-25.14	17.12	39.9	
434	1	BTPS	Bighati	8.42	11.35	18.9	
435	1	BTPS	Bighati	8.42	11.35	18.9	
436	3	BTPS	Dharampur	137.25	38.01	59.3	
437	1	KolaghatD	KolaghatW	LINE	IS	0	
438	1	KolaghatD	KolaghatW	LINE	IS	0	
439	1	DTPS-D	ASP	18.16	7.86	21.7	
440	1	DTPS-D	Kalipahari	23.50	2.49	25.8	
441	1	DTPS-D	Kalipahari	23.50	2.49	25.8	
442	1	DTPS-D	ASP	18.16	7.86	21.7	
443	1	KharagpurD	KolaghatD	2.51	-1.24	3.5	
444	1	KharagpurD	KolaghatD	2.51	-1.24	3.5	
445	1	KolaghatD	KolaghatT	4.29	1.91	5.8	
446	1	KolaghatD	HowrahD	-1.32	0.36	3.6	
447	1	HowrahD	BelmuriD	-6.62	2.96	9.6	
448	1	HowrahD	BelmuriD	-6.62	2.96	9.6	
449	1	BelmuriD	Burdwan	-15.94	1.08	18.6	
450	1	BelmuriD	Burdwan	-15.94	1.08	18.6	
451	1	Burdwan	DTPS-D	-54.69	-0.50	62.1	
452	1	Burdwan	DTPS-D	-54.69	-0.50	62.1	
453	1	Kalipahari	Klyaneshwari	-5.63	-6.64	10.9	
454	1	Kalipahari	Klyaneshwari	-5.63	-6.64	10.9	
455	2	PuruliaD	Jamshedpur	22.12	-2.28	14.3	
456	1	Jamur1	DTPS-D	-71.25	2.94	79.6	
457	1	DTPS-D	RamkanaliD	13.21	-1.25	16.4	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
458	1	SonicTD	Barjora	-51.71	-1.56	55.6	
459	1	KolaghatT	HowrahD	-4.32	0.42	5.5	
460	1	KolaghatT	Badrinarayan AS	8.61	2.36	10.3	
461	2	DPL	DTPS-D	LINE	IS	0	**DVC/DPL**
462	1	B. Garden	SRS	LINE	IS	0	
463	1	B. Garden	SRS	LINE	IS	0	
464	1	SRS	Majerhat	LINE	IS	0	
465	1	SRS	Majerhat	-21.02	-5.00	21.9	
466	1	Majerhat	Taratala	-2.99	9.84	8.5	
467	1	Majerhat	Chakmir	-116.84	-5.98	91.2	
468	1	Majerhat	Chakmir	-116.84	-5.98	91.2	
469	1	Majerhat	Jadavpur	35.07	4.31	28.2	
470	1	PRS	PLN	LINE	IS	0	
471	1	Taratala	Chakmir	LINE	IS	0	
472	1	Taratala	Chakmir	LINE	IS	0	
473	1	Taratala	PRS	62.69	8.88	50.7	
474	1	Taratala	BBD Bag	65.82	9.42	53.1	
475	1	Chakmir	BBGS	-105.85	0.60	59.5	
476	1	Chakmir	BBGS	-105.85	0.60	59.5	
477	1	Chakmir	BBGS	-105.85	0.60	59.5	
478	1	Chakmir	BBGS	-105.85	0.60	59.5	
479	1	EMSS	PKL	32.05	-4.07	20.9	
480	1	Jadavpur	EMSS	-70.10	-3.36	55.8	
481	1	BBD Bag	PRS	3.81	2.88	4.3	
482	1	BBD Bag	PRS	3.81	2.88	4.4	
483	1	Titagarh Gen	BT Road	-72.24	-19.55	48.5	**CESC**
484	1	Titagarh	NCGS	-38.02	-6.80	40	
485	1	NCGS	BT Road	81.22	-3.44	54.1	
486	1	Chitpur Tr	East Calcutta	60.61	-5.13	49.8	
487	1	PRS	PRS	LINE	IS	0	
488	1	East Calcutta	EMSS	-102.68	1.41	66.5	
489	1	Chitpur Tr	BT Road	-60.49	-4.08	48.2	
490	1	East Calcutta	PRS	-70.12	-29.52	59.7	
491	1	EMSS	Kasba	-28.68	20.11	22.7	
492	1	Park Circus	PRS	82.23	1.98	53.5	
493	1	SRS	SRS	LINE	IS	0	
494	1	B. Garden	SRS	LINE	IS	0	
495	1	BT Road	Dumdum	-49.95	-1.28	32.5	
496	1	Park Circus	EMSS	-103.24	-11.36	67.3	
497	1	EMSS	Patuli	32.04	2.42	21.7	
498	1	NCGS	BT Road	-38.10	2.60	49.6	
499	1	NCGS	NCGS	LINE	IS	0	
500	1	BBD Bag	BBD Bag	26.83	7.71	12.4	
501	1	Titagarh	Titagarh	LINE	IS	0	
502	1	EMSS	EMSS	LINE	IS	0	
503	1	East Calcutta	EMSS	-80.09	-0.97	52	
504	1	EMSS	Dumdum	LINE	IS	0	
505	1	EMSS	Dumdum	LINE	IS	0	

Sl. No	No. of ckts	From Station	To Station	FORWARD			OWNER
				MW	MVAr	% LOADING	
506	1	BT Road	BT Road	LINE	IS	0	
507	1	PRS	Majerhat	-37.06	10.28	41.4	
508	1	Majerhat	Majerhat	-79.39	24.15	36.8	
509	1	PLN	PKL	-32.04	-3.22	9.5	
510	1	East Calcutta	East Calcutta	LINE	IS	0	
511	1	Jadavpur	Jadavpur	LINE	IS	0	
512	1	EMSS	EMSS	87.02	46.89	2.5	
513	1	PRS	PRS	LINE	IS	0	
514	1	EMSS	PRS	LINE	IS	0	
515	1	Titagarh	Titagarh Gen	-19.12	-7.35	9.3	
516	1	BT Road	Titagarh	LINE	IS	0	
517	1	SRS	Majerhat	LINE	IS	0	
518	1	PRS	PRS	LINE	IS	0	
519	1	ECAL	PRS	-70.12	-29.52	59.7	
520	1	ECAL	EMSS	-80.09	-0.97	52	
521	1	ECAL	DUMDUM	83.10	4.43	68.4	
522	2	DPL	DPLB	100.39	36.34	67.7	DPL
523	1	DPL	DPLA	16.15	5.47	21.8	
524	2	DPL	DPLC	41.44	18.14	28.8	
525	2	DPL	DPLC	56.17	10.57	36.3	
526	2	DPL	DPLAB	18.08	-5.26	11.9	
527	2	DPLA	DPL-Bamunara	20.07	3.95	13	
66 kV lines							
528	1	JALI	JALI	13.45	-0.94	26.9	WBSETCL
529	1	JALI	JALI	13.45	-0.94	26.9	
530	1	JALI	Chalsa	13.40	-0.96	26.8	
531	1	JALI	Chalsa	13.40	-0.96	26.8	

Geographical Diagram of existing Eastern Region network (May-17)



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	09/11/2017	

(Eastern Region existing network May-17) 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
5, 11th cross, 2nd Stage,
West of chord Road,
Bangalore-560086.INDIA
Tel :+91-80-4245 5555
E-mail:prdc@vsnl.com

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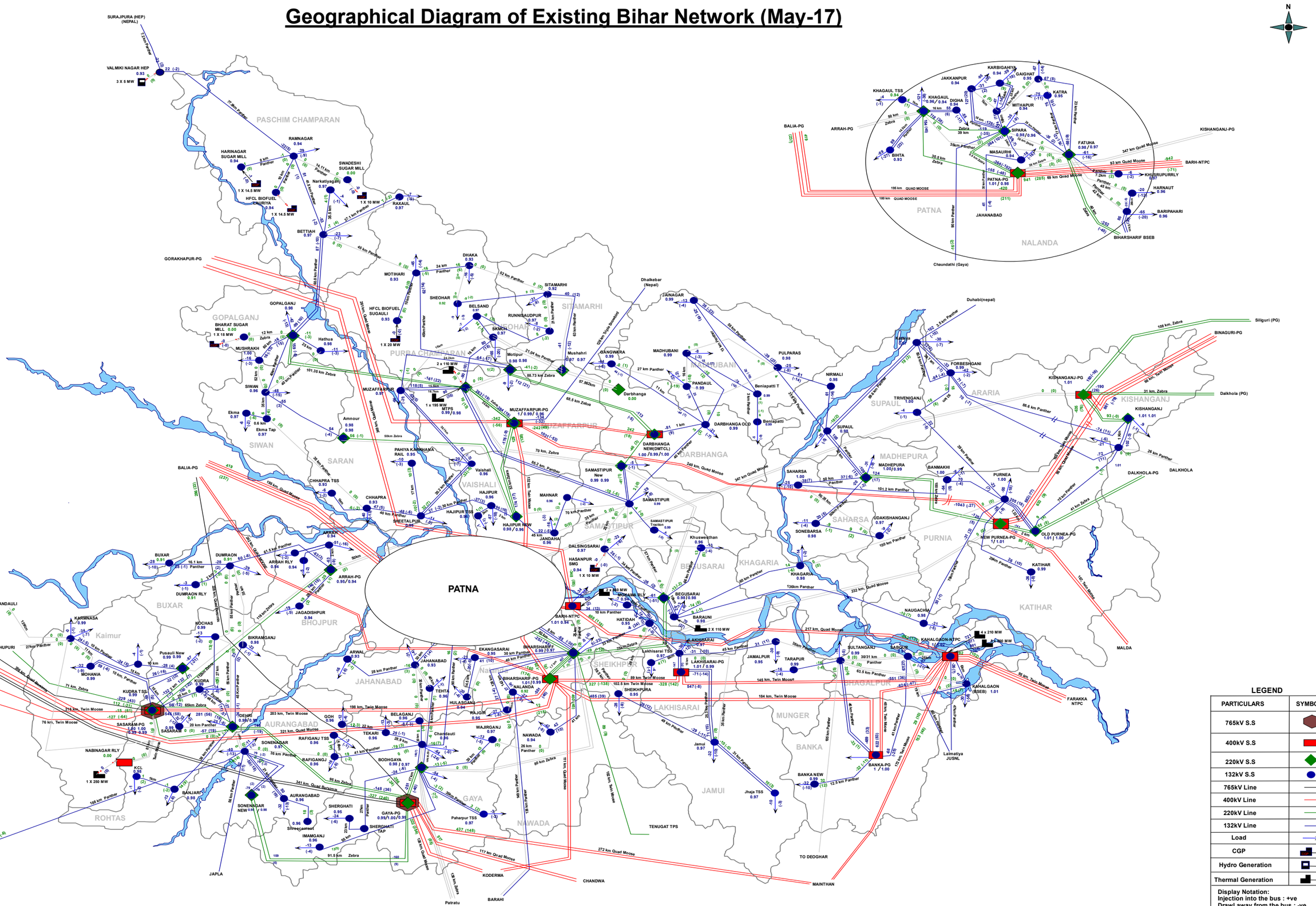
Geographical Diagram of Existing Bihar Network (May-17)



					R0	17/09/2016	
APPROVED	REVIEWED	CHECKED	DRAWN	DESCRIPTION	REV	DATE	REMARKS

Bihar state existing network (May-17) geographical map

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

Power Research & Development Consultants Private Limited
#5, 11th Cross, 2nd Stage,
West of Chord Road,
Bangalore- 560086, INDIA
Ph : +91-080-4245 5555
E-mail : prdc@vsnl.com

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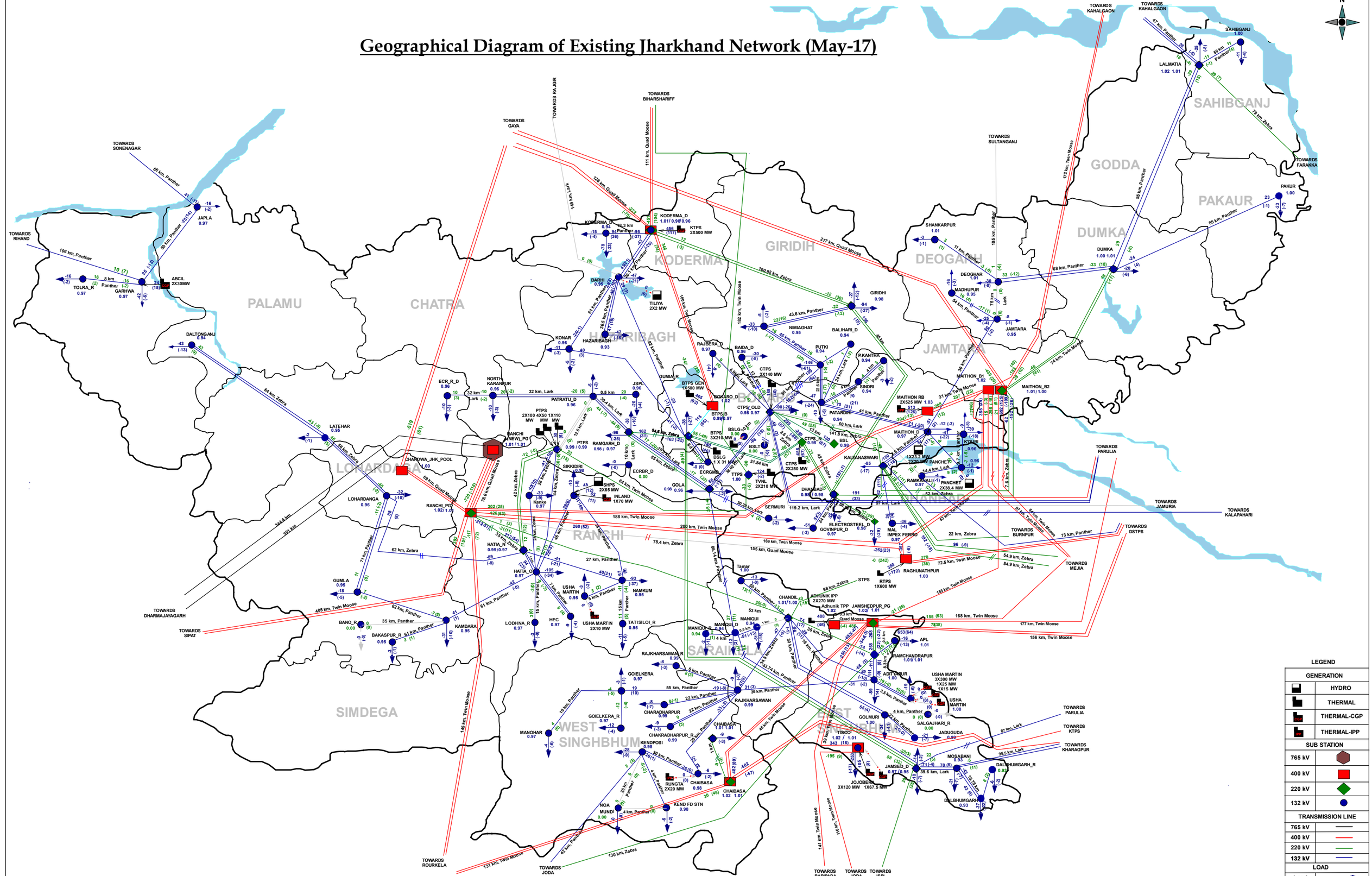
Geographical Diagram of Existing Jharkhand Network (May-17)



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					R0	12/9/2017	

Jharkhand state existing network (May-17) 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 and Development Consultants Pvt. Ltd.
#5, 11th Cross, 2nd Stage,
West of Chord Road,
Bangalore- 560086, INDIA
Ph : +91-080-4245 5555
E-mail : prdc@vsnl.com

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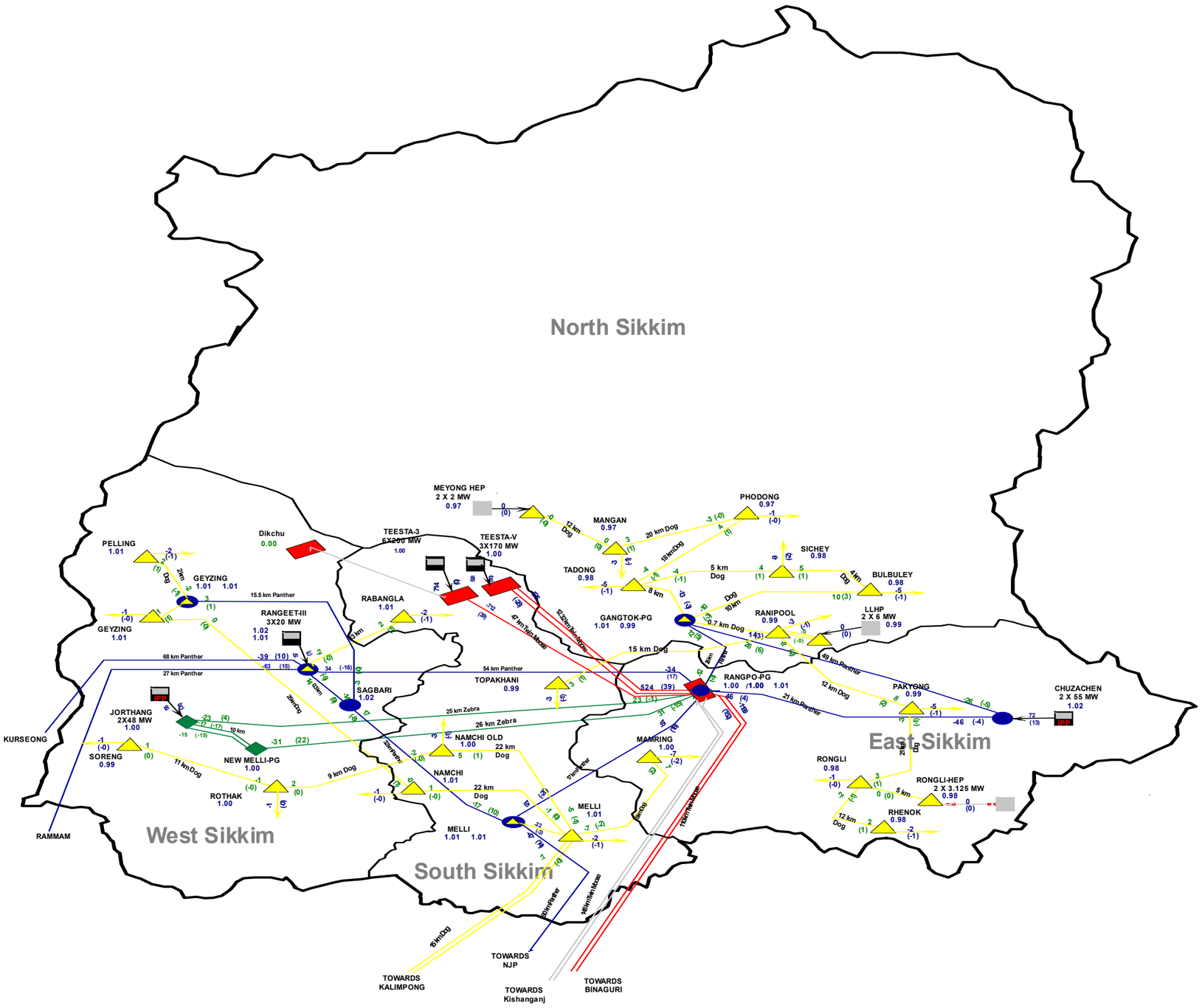
Geographical Diagram of Existing Sikkim Network (MAY-17)



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	15/09/2016	
APPROVED	REVIEWED	CHECKED	DRAWN	DESCRIPTION	REV.	DATE	REMARKS

Sikkim state existing network
(May-17) geographical map.

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

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

Power Research and Development Consultants Pvt. Ltd.
#5, 11th Cross, 2nd Stage,
West of Chord Road,
Bangalore- 560086, INDIA
Ph : +91-080-4245 5555
E-mail : prdc@vsnl.com

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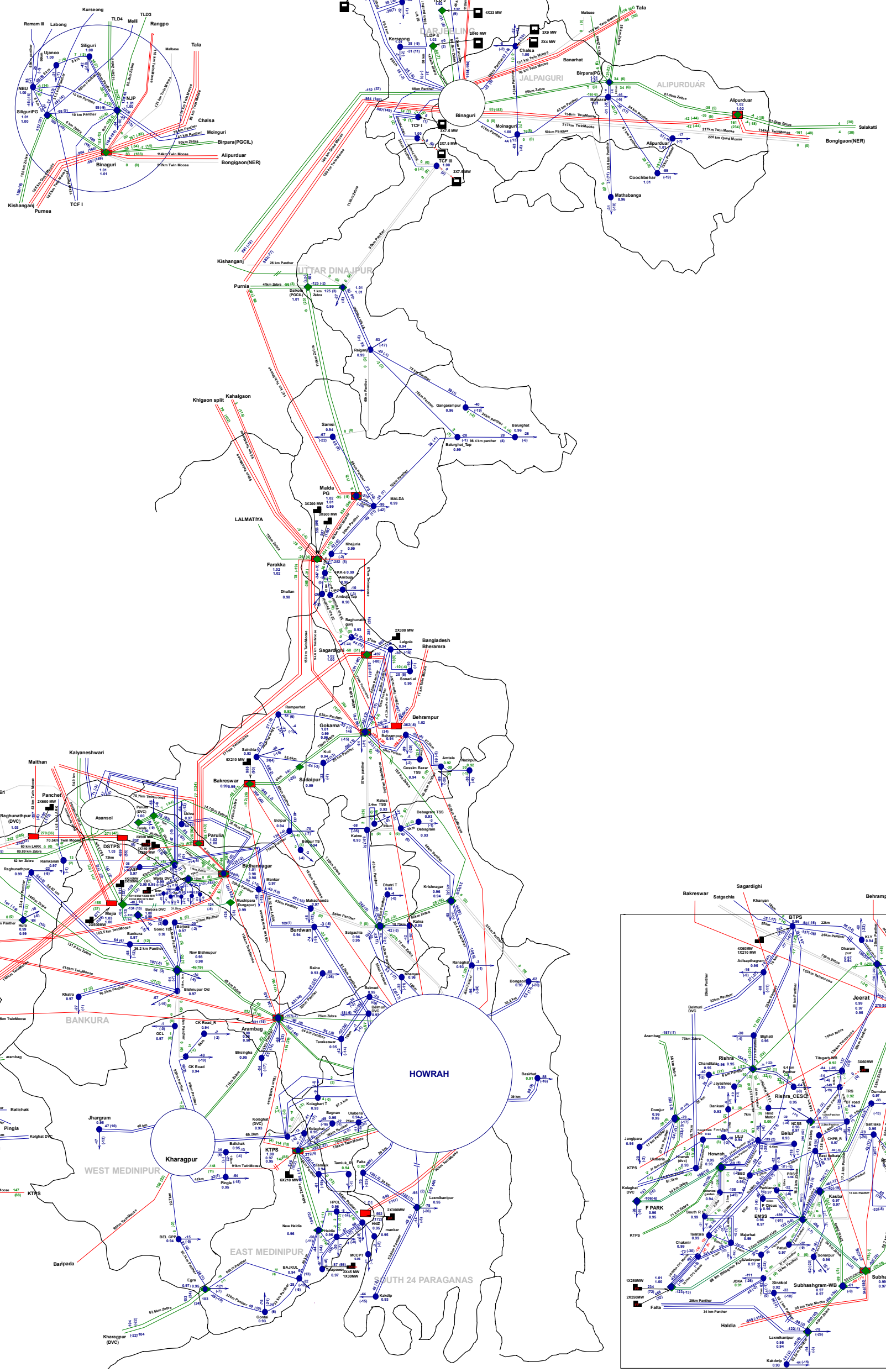
DWG. NO. : Geographical Power Map\ER\May-2017\Sikkim

West Bengal state existing network (May-17) geographical map



						15.09.2017	
APPROVED	REVIEWED	CHECKED	DRAWN	DESCRIPTION	REV.	DATE	REMARKS

West Bengal state existing network (May-17) geographical map

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)

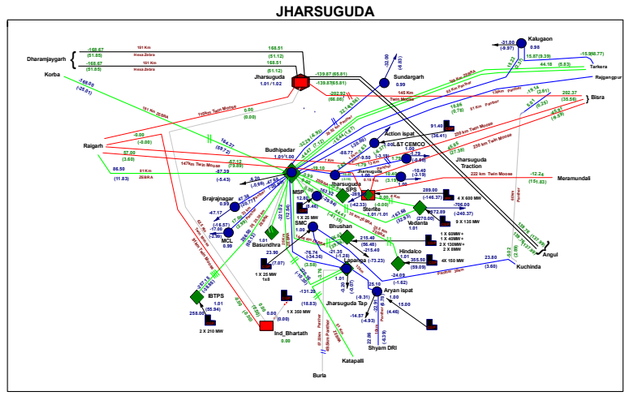
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge,
Kolkata, West Bengal 700033

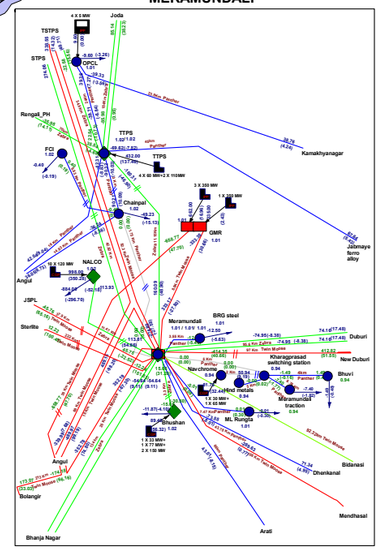
LOA details: ERPC/PR_DBASE/2016/3567 Dated 30 March 2016

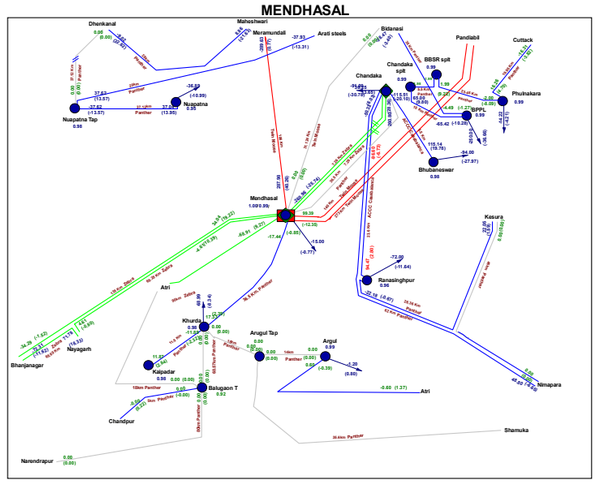
Power Research and Development Consultants Pvt. Ltd.
#5, 11th Cross, 2nd Stage,WOC Road,
Bangalore-560 086, INDIA.
Tel : +91-080-23192159,23192168,
E-mail : prdc@vsnl.com

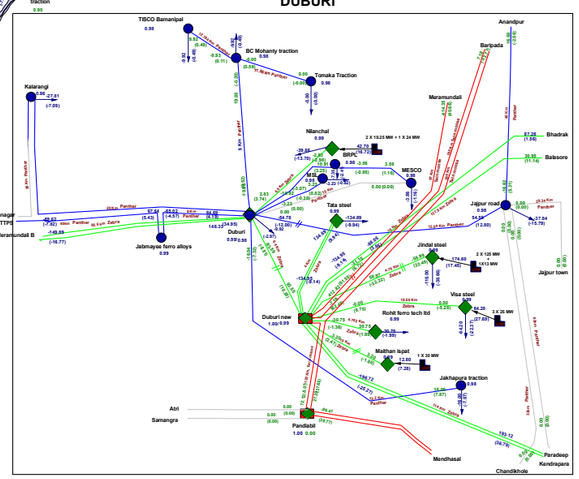
MiP-PSCT TM | DWG. NO. : Geographical Power Map\ER\May-2017\West Bengal

Orissa state existing network (May-17) geographical map









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	

					R0	15.09.2017	
APPROVED	REVIEWED	CHECKED	DRAWN	DESCRIPTION	REVISION	DATE	REMARKS

Orissa state existing network (May-17) 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
#5, 11th Cross, 2nd Stage,
West of Chord Road,
Bangalore- 560086, INDIA
Ph : +91-080-2319 2209,2159
Fax: +91-080-2319 2210
E-mail : prdc@vsnl.com

DRAWN IN : MiP-PSCT™

DWG. NO. : Geographical Power Map\ER\May-2017\Odisha

ANNEXURE-III SHORT CIRCUIT STUDY RESULTS

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

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
Bihar						
1	Sasarm	765	10959.80	8.27	8191.12	6.18
		400	12579.11	18.16	9343.19	13.49
		132	1495.93	6.54	1050.17	4.59
2	Gaya	765	25201.64	19.02	17724.97	13.38
		400	25089.66	36.21	17925.31	25.87
		220	7057.51	18.52	7346.56	19.28
3	Purnea_PG	400	15191.80	21.93	12417.52	17.92
		220	7303.11	19.17	7681.78	20.16
4	Purnea old_PG	220	7142.31	18.74	7204.22	18.91
		132	3215.38	14.06	3058.58	13.38
5	Lakhisarai	400	10972.97	15.84	6769.02	9.77
		132	2207.70	9.66	1533.01	6.71
		132	2880.79	12.60	2543.22	11.12
6	Muzzafarpur_PG	400	13279.94	19.17	10738.05	15.50
		220	6117.31	16.05	6740.25	17.69
		132	1245.01	5.45	1269.94	5.56
7	Patna	400	17000.04	24.54	11716.48	16.91
		220	5795.92	15.21	5875.84	15.42
8	kishanganj	400	13046.79	18.83	12313.58	17.77
		220	7409.09	19.44	4823.95	12.66
		132	2500.60	10.94	2569.25	11.24
9	Banka_PG	400	11142.30	16.08	7578.01	10.94
		132	2475.68	10.83	2242.01	9.81
10	Barh	400	17852.17	25.77	15737.71	22.72
		132	911.83	3.99	500.78	2.19
11	Biharshariff_PG	400	13061.98	18.85	9381.89	13.54
		400	17479.21	25.23	11597.39	16.74
		220	7841.71	20.58	7933.47	20.82
12	Biharshariff_PG	220	7719.65	20.26	7612.04	19.98
		132	2832.31	12.39	2716.28	11.88
13	Kahalgaon_NTPC	400	15627.27	22.56	13635.32	19.68
		400	21048.67	30.38	19576.11	28.26
		132	3204.59	14.02	3002.17	13.13
14	DMTCL	400	7216.40	10.42	5448.44	7.86
		220	2515.14	6.60	2808.78	7.37
		132	1569.72	6.87	1609.80	7.04

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
15	Amnour(Chhapra)	220	1242.92	3.26	761.20	2.00
		132	622.57	2.72	467.23	2.04
16	Motipur	220	1793.04	4.71	1861.84	4.89
		132	1590.11	6.96	1768.65	7.74
17	Mushahri	220	761.82	2.00	862.24	2.26
		132	585.98	2.56	750.14	3.28
18	Bodhgaya	220	4991.41	13.10	4013.77	10.53
		132	3060.01	13.38	2596.66	11.36
19	Dehri	220	3352.58	8.80	2175.52	5.71
		132	2058.02	9.00	1530.39	6.69
20	Fatuha	220	4030.64	10.58	2782.48	7.30
		132	2951.24	12.91	2179.83	9.53
21	Khagaul	220	3132.56	8.22	2301.34	6.04
		132	1961.22	8.58	1594.23	6.97
22	Gopalganj	220	1452.91	3.81	1059.62	2.78
		132	846.84	3.70	729.37	3.19
23	Darbhanga	220	2515.14	6.60	2808.78	7.37
		132	1411.66	6.17	1157.12	5.06
24	MTPS	220	4438.19	11.65	4373.12	11.48
		132	2293.59	10.03	2246.59	9.83
25	Pusauli	220	6440.41	16.90	6391.35	16.77
		132	2326.61	10.18	2156.83	9.43
26	Arrah_PG	220	846.19	2.22	445.61	1.17
		132	628.97	2.75	369.41	1.62
27	Pusauli New	220	5903.05	15.49	5496.84	14.43
		132	2490.86	10.90	2299.83	10.06
28	Sipara	220	5750.37	15.09	5774.68	15.16
		132	3427.44	14.99	3101.30	13.57
29	Madhepura	220	2312.27	6.07	1549.54	4.07
30	Hajipur	220	2698.07	7.08	1962.25	5.15
		132	1195.05	5.23	995.63	4.36
31	Begusarai	220	2982.04	7.83	2428.32	6.37
		132	2493.81	10.91	2228.28	9.75
32	Sonenagar New	220	2213.60	5.81	1937.54	5.09
		132	1466.12	6.41	1610.84	7.05
33	Kishnganj New	220	7018.29	18.42	4652.10	12.21
		132	2539.32	11.11	2692.71	11.78
34	Banka	132	1825.09	7.98	1350.02	5.91
35	Kahalgaon	132	2378.33	10.40	1753.55	7.67

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
36	Muzzafarpur	132	1731.21	7.57	1312.54	5.74
37	Purnea	132	3179.23	13.91	2972.71	13.00
38	Sugauli	132	508.35	2.22	303.92	1.33
39	Lauriya	132	299.22	1.31	160.64	0.70
40	Sone nagar	132	1454.82	6.36	1566.69	6.85
41	Karmansa	132	1098.85	4.81	690.99	3.02
42	Jehanabad	132	612.07	2.68	315.44	1.38
43	Rafiganj	132	702.80	3.07	372.03	1.63
44	Hathidah	132	1619.96	7.09	963.30	4.21
45	Jamui	132	1542.34	6.75	1278.59	5.59
46	Sheikhpura	132	548.12	2.40	318.88	1.40
47	Nawada	132	752.37	3.29	429.12	1.88
48	Jamalpur	132	653.35	2.86	355.54	1.56
49	Sultanganj	132	1058.05	4.63	647.49	2.83
50	Sabour	132	1133.97	4.96	706.03	3.09
51	Dumraon	132	302.67	1.32	136.18	0.60
52	Jakkanpur	132	2269.55	9.93	1596.18	6.98
53	Saharsa	132	2854.54	12.49	2398.69	10.49
54	Khagaria	132	530.76	2.32	291.51	1.28
55	Sitamarhi	132	311.24	1.36	344.90	1.51
56	Samastipur new	220	1599.05	4.20	1470.20	3.86
		132	1410.07	6.17	1422.94	6.22
57	Pandauli	132	733.67	3.21	454.45	1.99
58	Hajipur New	132	1205.48	5.27	1022.63	4.47
59	Chhapra	132	527.64	2.31	282.40	1.24
60	Siwan	132	369.36	1.62	214.96	0.94
61	Motihari	132	578.98	2.53	355.77	1.56
62	Betiah	132	497.78	2.18	307.89	1.35
63	Ramnagar	132	322.36	1.41	174.07	0.76
64	Rajgir	132	277.98	1.22	127.95	0.56
65	Darbhanga New	132	1569.72	6.87	1609.80	7.04
66	Katihar	132	995.11	4.35	580.33	2.54
67	Belaganj	132	1101.64	4.82	616.33	2.70
68	Vaishali	132	1282.20	5.61	837.29	3.66
69	Sitalpur	132	1120.60	4.90	720.95	3.15
70	Dhaka	132	434.01	1.90	252.25	1.10
71	Jainagar	132	778.32	3.40	524.23	2.29
72	Madhubani	132	773.77	3.38	501.18	2.19
73	Phulparas	132	1500.15	6.56	936.75	4.10

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
74	Supaul	132	1577.81	6.90	994.59	4.35
75	Mohania	132	2115.58	9.25	1591.23	6.96
76	Bikramganj	132	641.42	2.81	355.84	1.56
77	Forbeshganj	132	1596.34	6.98	1001.78	4.38
78	Udakishanganj	132	409.05	1.79	217.32	0.95
79	Baripahari	132	2430.65	10.63	2052.86	8.98
80	Samastipur	132	1418.16	6.20	1412.33	6.18
		132	1367.80	5.98	1315.22	5.75
81	Banjari	132	719.07	3.15	404.39	1.77
82	KCL	132	700.97	3.07	392.98	1.72
83	Kataiya	132	1368.03	5.98	807.28	3.53
84	Barauni TPS	132	2367.81	10.36	2372.29	10.38
85	Surajpur	132	187.42	0.82	91.19	0.40
86	Kudra	132	1458.75	6.38	894.93	3.91
87	Chandauti	132	2354.15	10.30	1563.34	6.84
88	Kochas	132	744.54	3.26	405.25	1.77
89	Balmikinagar	132	194.34	0.85	95.13	0.42
90	Masaurhi	132	1134.57	4.96	644.57	2.82
91	Bihta	132	1466.76	6.42	1017.99	4.45
92	Gaighat	132	1114.66	4.88	620.65	2.72
93	Mithapur	132	2177.56	9.52	1513.78	6.62
94	Rafiganj_R	132	676.52	2.96	357.37	1.56
95	Arrah	132	609.20	2.67	354.61	1.55
96	Lakhisarai_	132	1680.56	7.35	1065.33	4.66
97	Raxaul	132	342.63	1.50	194.52	0.85
98	Runisaudpur	132	678.79	2.97	447.75	1.96
99	SKMCH	132	1591.16	6.96	1271.30	5.56
100	Buxar	132	267.83	1.17	118.52	0.52
101	Aurangabad	132	1068.99	4.68	877.99	3.84
102	Tekari	132	887.99	3.88	482.24	2.11
103	Goh	132	600.02	2.62	312.75	1.37
104	Arwal	132	429.32	1.88	215.14	0.94
105	Hulasganj	132	707.64	3.10	400.31	1.75
106	Wajirganj	132	960.81	4.20	549.56	2.40
107	Nalanda	132	255.35	1.12	123.98	0.54
108	Ekanagarsarai	132	938.51	4.11	554.61	2.43
109	Digha	132	1428.99	6.25	980.75	4.29
110	Katra	132	1340.45	5.86	777.35	3.40
111	Gangawara	132	1038.02	4.54	723.43	3.16

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
112	Madhepura	132	1925.25	8.42	1348.30	5.90
113	Sonbarsa	132	580.65	2.54	316.74	1.39
114	Mashrakh	132	370.59	1.62	214.61	0.94
115	Dalsingsarai	132	819.23	3.58	757.17	3.31
116	Kusheshwarnath	132	507.51	2.22	277.66	1.21
117	Jagdispur	132	450.18	1.97	248.35	1.09
118	harbauth	132	964.88	4.22	567.77	2.48
119	Jandaha	132	516.44	2.26	388.02	1.70
120	Imamganj	132	608.60	2.66	330.49	1.45
121	Tetha	132	1277.53	5.59	736.69	3.22
122	Benipati	132	714.90	3.13	536.30	2.35
123	Sheohar	132	265.71	1.16	348.68	1.53
124	Mahanar	132	258.82	1.13	293.61	1.28
125	Belsand	132	953.33	4.17	726.85	3.18
126	Sherghati	132	656.88	2.87	359.24	1.57
127	Paharpur	132	1348.07	5.90	818.65	3.58
128	Ekma	132	277.54	1.21	151.37	0.66
129	Rail Pahiya karkhana	132	770.03	3.37	454.20	1.99
130	Ekma Tap	132	278.71	1.22	152.13	0.67
131	Jhanjha_R	132	981.40	4.29	655.84	2.87
132	Hathidah_R	132	1167.04	5.10	658.85	2.88
133	Khagaul_R	132	1909.54	8.35	1525.49	6.67
134	Khusrupur	132	1965.45	8.60	1247.37	5.46
135	Arrah_R	132	576.33	2.52	332.15	1.45
136	Mokama_R	132	999.30	4.37	553.97	2.42
137	Dumraon_R	132	298.35	1.31	134.42	0.59
138	Hajipur_R	132	1131.68	4.95	909.64	3.98
139	Chhapra_R	132	517.81	2.27	276.78	1.21
140	Kudra_R	132	1497.69	6.55	1053.10	4.61
141	Harinagar sugar mill	132	303.58	1.33	163.17	0.71
142	Karbigahiya	132	2192.34	9.59	1520.30	6.65
143	JahanTrc	132	605.39	2.65	311.90	1.36
144	ShreeCem	132	1010.07	4.42	800.77	3.50
145	Naugachia	132	761.85	3.33	409.06	1.79
146	Beniapatti	132	753.73	3.30	554.08	2.42
147	Hathua	132	565.67	2.47	549.91	2.41
148	Pupri	132	702.83	3.07	522.88	2.29
149	Narkatiyaganj	132	349.74	1.53	201.66	0.88
150	Banmakhi	132	3006.06	13.15	2651.11	11.60

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
151	Tarapur	132	706.23	3.09	401.88	1.76
152	Triveniganj	132	1066.21	4.66	610.53	2.67
Jharkhand						
153	Ranchi New_PG	765	19182.36	14.48	13913.94	10.50
		400	25528.12	36.85	17053.52	24.62
154	Jamshedpur_PG	400	21492.62	31.02	18124.77	26.16
		220	6253.98	16.41	6462.76	16.96
155	Maithon	400	20514.75	29.61	15608.85	22.53
		400	16325.37	23.56	12197.49	17.61
		220	11142.92	29.24	10717.30	28.13
156	MPL	400	16963.52	24.49	15579.03	22.49
157	Chaibasa_PG	400	17297.36	24.97	11455.21	16.53
		220	3903.03	10.24	3500.94	9.19
158	Koderma_D	400	17899.94	25.84	14568.26	21.03
		220	3921.62	10.29	4020.61	10.55
		132	1978.45	8.65	1985.52	8.68
159	BTPS_DVC	400	9314.92	13.45	8809.60	12.72
160	Ranchi_PG	400	23069.60	33.30	15537.20	22.43
		220	6458.91	16.95	6510.28	17.09
161	Chandawa	400	16657.96	24.04	9644.84	13.92
162	Adhunik	400	21401.73	30.89	18046.21	26.05
163	TISCO	400	10835.36	15.64	8484.52	12.25
		132	4866.44	21.29	5519.23	24.14
164	Ramchandrapur	220	6248.92	16.40	6444.26	16.91
		132	2627.35	11.49	2440.60	10.68
165	Chandil	220	4603.10	12.08	3295.26	8.65
		132	2956.76	12.93	2360.93	10.33
166	Hatia New	220	4499.14	11.81	3613.34	9.48
		132	2677.21	11.71	2323.89	10.16
167	PTPS	220	3766.77	9.89	3222.04	8.46
		132	2054.91	8.99	1794.85	7.85
168	TTPS	220	3382.49	8.88	3861.81	10.14
169	Lalmatia	220	1708.98	4.49	1200.56	3.15
		132	1974.06	8.63	1314.18	5.75
170	Chaibasa	220	3859.32	10.13	3438.60	9.02
		132	1560.62	6.83	1487.09	6.50
171	Dumka	220	3253.73	8.54	2058.83	5.40
		132	1772.59	7.75	1377.45	6.03
172	CTPS old	220	8517.27	22.35	8301.23	21.79

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
		132	5765.89	25.22	6034.31	26.39
173	Kalyanaswari	220	10919.55	28.66	9895.70	25.97
		132	4509.84	19.73	4887.79	21.38
174	Jamshedpur_D	220	2589.91	6.80	2138.07	5.61
		132	2053.33	8.98	2110.24	9.23
175	BTPS_D	220	8185.07	21.48	8592.76	22.55
		132	2295.92	10.04	2253.82	9.86
176	CTPS New	220	8863.15	23.26	8934.00	23.45
177	Giridih	220	4302.60	11.29	3564.03	9.35
		132	2131.22	9.32	2277.54	9.96
178	Dhanbad_D	220	6684.89	17.54	5646.07	14.82
		132	1015.46	4.44	988.04	4.32
179	Ramgarh	220	3394.08	8.91	2987.61	7.84
		132	2301.25	10.07	2045.84	8.95
180	Garwah	132	880.19	3.85	810.14	3.54
181	Lahardaga	132	986.10	4.31	614.01	2.69
182	Gumla	132	700.72	3.07	397.12	1.74
183	Kamdara	132	721.75	3.16	399.64	1.75
184	Hatia old	132	2658.73	11.63	2290.30	10.02
185	Namkum	132	1344.29	5.88	882.21	3.86
186	Jmatara	132	1045.25	4.57	586.09	2.56
187	Deoghar	132	704.92	3.08	633.35	2.77
188	Dumka	132	1742.85	7.62	1344.04	5.88
189	Goelkhera	132	517.24	2.26	279.77	1.22
190	Kendposi	132	1069.61	4.68	987.77	4.32
191	Manique	132	1455.65	6.37	955.67	4.18
192	Adityapur	132	2568.16	11.23	2074.49	9.07
193	Golmuri	132	1429.48	6.25	857.23	3.75
194	Jaduguda	132	809.99	3.54	441.74	1.93
195	Rajkharsawa	132	1637.30	7.16	1085.71	4.75
196	Noamundi	132	8.45	0.04	8.45	0.04
197	Sikidiri	132	1527.32	6.68	1503.52	6.58
198	Chakradharpur	132	874.57	3.83	497.56	2.18
199	Bakaspur	132	572.96	2.51	310.39	1.36
200	Kanke	132	1486.89	6.50	1038.49	4.54
201	Chaibasa	132	1198.51	5.24	804.05	3.52
202	Latehar	132	590.29	2.58	346.01	1.51
203	Japla	132	802.51	3.51	536.30	2.35
204	Sahebganj	132	594.54	2.60	320.99	1.40

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
205	Pakur	132	375.96	1.64	195.09	0.85
206	Hazaribag	132	850.40	3.72	541.80	2.37
207	Daltonganj	132	404.65	1.77	229.92	1.01
208	Kendposi FD	132	1017.40	4.45	902.46	3.95
209	Tamar	132	652.06	2.85	354.30	1.55
210	Madhupur	132	621.34	2.72	331.69	1.45
211	Manoharpur	132	460.06	2.01	246.67	1.08
212	ECR-Gomia	132	1939.77	8.48	1648.86	7.21
213	Patratu	132	1265.41	5.54	1009.23	4.41
214	Mosabani	132	1168.35	5.11	965.50	4.22
215	Maithon	132	4375.29	19.14	4490.26	19.64
216	Kumardubi	132	3162.10	13.83	2679.39	11.72
217	Panchet	132	2720.39	11.90	2066.48	9.04
218	Patherdih	132	3152.53	13.79	2002.63	8.76
219	Putki	132	3993.24	17.47	2857.44	12.50
220	Nimiaghat	132	1968.47	8.61	1822.78	7.97
221	Barhi	132	1693.97	7.41	1440.38	6.30
222	Koderma	132	1388.62	6.07	1160.15	5.07
223	Konar	132	1321.36	5.78	994.55	4.35
224	North karanpur_D	132	846.81	3.70	561.06	2.45
225	Gola	220	2497.19	6.55	2174.02	9.51
		132	2696.33	11.79	637.41	2.79
226	Hazaribag	132	975.34	4.27	1477.91	6.46
227	Ramkanali_D	132	2069.99	9.05	978.55	4.28
228	Manique_D_SW	132	1481.75	6.48	2204.24	9.64
229	Balihari_D	132	3841.82	16.80	1625.70	4.27
230	Electrosteel_D	220	2530.32	6.64	3934.14	10.32
231	BSL_D	220	5196.15	13.64	1225.04	5.36
232	HEC	132	1776.92	7.77	1668.89	7.30
233	APL	132	2108.86	9.22	985.01	4.31
234	JSPL	132	1246.31	5.45	3627.14	15.87
235	Mal-Impex	132	3893.67	17.03	1735.71	7.59
236	Sindri_SW	132	2812.78	12.30	947.35	4.14
237	Pkant_D	132	1679.62	7.35	2508.65	10.97
238	Rajbera_D	132	3465.73	15.16	843.20	3.69
239	Sermuri_D	132	1363.01	5.96	633.60	2.77
240	Gobindpur_D	132	792.70	3.47	869.07	3.80
241	Lodhma_R	132	1372.51	6.00	690.72	3.02
242	Chakradharpur_R	132	1145.43	5.01	764.61	3.34

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
243	Dalbhumgarh_R	132	1010.66	4.42	540.02	2.36
244	Titisoloi_R	132	907.53	3.97	474.98	2.08
245	Shankarpur_R	132	594.41	2.60	513.94	2.25
246	Jamtara_R	132	928.70	4.06	862.21	3.77
247	RKSNR_R	132	1370.65	6.00	618.79	2.71
248	Tolra_R	132	753.86	3.30	824.11	3.61
249	Manique_R	132	1297.48	5.68	737.61	3.23
250	Dalbhumgarh_R	132	986.73	4.32		
251	ECR-Barkakhana_D	132			529.07	2.31
252	ECRRky_D	132	809.78	3.54		
253	BSL_D	132			1769.18	7.74
254	Usha Martin	132	2323.03	10.16	728.51	3.19
255	Usha Martin	132	1158.87	5.07	6036.00	26.40
256	CTPS	132	5765.10	25.22	8062.57	221.66
257	ECRLY_DVC	132	1270.01	5.56	695.10	3.04
258	GoelkheraT	132	504.71	2.21	272.47	1.19
Odisha						
259	Angul_PG	765	33803.43	25.51	26820.85	20.24
		400	36101.97	52.11	29721.63	42.90
260	Jharsuguda_PG	765	30205.11	22.80	20001.43	15.10
		400	22422.74	32.36	15064.27	21.74
261	Jaypore_PG	400	8812.36	12.72	6697.34	9.67
		220	7087.97	18.60	7039.06	18.47
262	Indravati_PG	400	6656.51	9.61	5650.34	8.16
263	Indravati_Hdro	400	6535.76	9.43	5698.38	8.23
264	Rengali_PG	400	20176.11	29.12	16174.27	23.35
		220	8679.31	22.78	8719.97	22.88
265	GMR_3rd	400	21635.12	31.23	16850.08	24.32
266	STPS	400	30263.38	43.68	31960.70	46.13
		220	11725.40	30.77	11244.74	29.51
267	Bisra	400	23858.88	34.44	15584.46	22.49
		220	7524.14	19.75	7387.18	19.39
268	Baripada	400	12729.54	18.37	10217.98	14.75
		220	6271.78	16.46	6791.79	17.82
		132	1929.16	8.44	2089.65	9.14
269	Meramundali	400	33085.21	47.75	28272.26	40.81
		220	9076.20	23.82	8484.05	22.27
		132	2572.91	11.25	2446.35	10.70
		220	13069.98	34.30	13003.50	34.13

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
270	Sterlite	400	8366.67	12.08	7933.12	11.45
		400	8366.65	12.08	7932.99	11.45
		220	9023.09	23.68	8095.18	21.24
280	Dubri New	400	12880.69	18.59	9832.76	14.19
		220	8337.45	21.88	8974.15	23.55
281	Keonjhar	400	6138.97	8.86	4765.11	6.88
		220	2830.37	7.43	3054.97	8.02
282	Bolangir	400	4685.74	6.76	3895.69	5.62
		220	3560.02	9.34	3759.53	9.87
283	IndBharat	400	50.63	0.07	42.86	0.06
284	JITPL	400	13847.97	19.99	14106.89	20.36
285	GMR_4	400	21257.37	30.68	17537.78	25.31
286	Mendhasal	400	8633.13	12.46	6853.08	9.89
		220	5292.20	13.89	5830.55	15.30
		132	1218.21	5.33	1375.18	6.02
287	JSPL	400	17268.04	24.92	15572.79	22.48
288	Pandibil	400	8360.49	12.07	6156.04	8.89
289	RSP	220	5746.17	15.08	4416.54	11.59
		132	1023.43	4.48	1271.89	5.56
290	Balimela	220	7024.32	18.43	7473.61	19.61
		220	7107.37	18.65	7628.53	20.02
291	Upper Kolab	220	6762.76	17.75	6768.21	17.76
292	Usileru	220	8143.45	21.37	6641.05	17.43
293	Jaynagar	220	7584.97	19.91	7602.26	19.95
		132	2297.67	10.05	2440.23	10.67
		132	2326.84	10.18	2415.64	10.57
		220	6037.45	15.84	5102.17	13.39
294	Therunali	220	5550.83	14.57	4445.84	11.67
		132	1530.15	6.69	1474.15	6.45
295	Bhanjanagar	220	3672.19	9.64	3041.68	7.98
		132	1481.89	6.48	1657.89	7.25
296	Indravati	220	6570.12	17.24	7404.75	19.43
297	Nayagarh	220	2228.52	5.85	1927.55	5.06
298	Chandaka	220	5123.77	13.45	5489.59	14.41
		132	4176.22	18.27	4666.20	20.41
		132	3989.86	17.45	3950.25	17.28
299	TTPS	220	9699.86	25.46	9034.21	23.71
		132	3956.91	17.31	4481.96	19.60

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
300	Tarkera	220	7557.69	19.83	6573.81	17.25
		132	3702.02	16.19	3953.32	17.29
301	Duburi	220	7653.99	20.09	7632.85	20.03
		132	2571.28	11.25	2671.95	11.69
302	Joda	220	3402.05	8.93	2733.01	7.17
		132	2209.13	9.66	2139.16	9.36
303	Chandiposh	220	3467.35	9.10	2219.51	5.83
304	Balasore	220	3321.40	8.72	2988.00	7.84
		132	1416.79	6.20	1680.63	7.35
305	Bidanasi	220	3053.89	8.01	2785.94	7.31
		132	3899.39	17.06	3789.73	16.58
306	Barkote	220	3270.71	8.58	2590.12	6.80
307	Budhipadar	220	14262.63	37.43	13967.80	36.66
		132	4808.35	21.03	4770.73	20.87
308	Katapali	220	5010.10	13.15	3981.05	10.45
		132	4500.14	19.68	4078.95	17.84
309	Narendrapur	220	998.07	2.62	1131.78	2.97
		132	781.46	3.42	997.74	4.36
310	Bolangir New	220	3394.63	8.91	3468.56	9.10
		132	1569.71	6.87	1803.91	7.89
311	Atri	220	3893.91	10.22	3688.06	9.68
		132	1538.84	6.73	1596.97	6.99
312	Samangara	220	3080.82	8.09	2702.21	7.09
		132	1379.22	6.03	1416.46	6.20
313	Bhadrak	220	2536.35	6.66	2351.54	6.17
		132	1432.23	6.26	1727.47	7.56
314	Paradip	220	1951.94	5.12	1825.44	4.79
		132	1338.31	5.85	1546.02	6.76
315	Lakshmipur	220	4144.89	10.88	3028.23	7.95
316	Lapanga	220	7791.86	20.45	6044.03	15.86
		132	5092.37	22.27	4419.96	19.33
317	MSL	220	6297.28	16.53	5591.18	14.67
318	Cuttack	220	3028.70	7.95	2753.77	7.23
		132	1427.13	6.24	1498.52	6.55
319	Basundhara	132	2710.07	7.11	1654.83	4.34
320	Bangaripusi	132	850.56	3.72	649.39	2.84
321	BPPL	132	3536.87	15.47	3140.98	13.74
322	Damanjodi	132	664.47	2.91	389.94	1.71
323	Chatrapur	132	682.19	2.98	841.69	3.68

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
324	IRE	132	651.61	2.85	753.82	3.30
325	Aska	132	931.88	4.08	1077.01	4.71
326	Berhampur	132	727.05	3.18	911.27	3.99
327	Ganjam	132	568.67	2.49	615.83	2.69
328	Mohana	132	469.85	2.06	513.16	2.25
329	Phulbani	132	356.59	1.56	419.23	1.83
330	Balugaon	132	348.54	1.52	419.01	1.83
331	Khurda	132	994.66	4.35	1140.11	4.99
332	Puri	132	917.79	4.01	1076.30	4.71
333	Nimapada	132	562.47	2.46	675.16	2.95
334	Bhubaneswar	132	3280.88	14.35	3391.11	14.83
335	Chowdhwar	132	3403.15	14.89	3312.75	14.49
336	Dhenkanal	132	1302.63	5.70	1337.86	5.85
337	Chainpal	132	3515.99	15.38	3698.16	16.18
338	Angul	132	2389.75	10.45	2268.53	9.92
339	Nandira (MCL)	132	1477.95	6.46	1043.45	4.56
340	Nuapatna	132	493.22	2.16	557.42	2.44
341	BAMINPL	132	1128.48	4.94	726.95	3.18
342	Jajpur Road	132	1841.14	8.05	1886.50	8.25
343	Kendrapara	132	954.10	4.17	1128.71	4.94
344	Jaleswar	132	476.35	2.08	554.75	2.43
345	Baripada	132	1291.87	5.65	1382.34	6.05
346	Rairangpur	132	613.05	2.68	631.53	2.76
347	Palapanga	132	782.93	3.42	848.54	3.71
348	Nalda_R	132	562.81	2.46	449.19	1.97
349	Rourkela	132	3475.96	15.20	3602.05	15.76
350	Grid_Steel	132	3296.95	14.42	3245.29	14.19
351	Jharsuguda	132	2950.92	12.91	2790.54	12.21
352	Brajrajnagar	132	2052.06	8.98	1787.68	7.82
353	Rajgangpur	132	2439.71	10.67	2391.54	10.46
354	Sambalpur	132	2494.79	10.91	2181.43	9.54
355	Burla	132	5239.96	22.92	5204.50	22.76
356	Somnathpur	132	90.08	0.39	115.93	0.51
357	Bolangir	132	1569.71	6.87	1803.91	7.89
358	Saintala	132	889.13	3.89	743.80	3.25
359	Khariar	132	341.75	1.50	432.01	1.89
360	Tentulikhunti	132	571.87	2.50	598.89	2.62
361	Kalugaon	132	1899.76	8.31	1666.17	7.29
362	Dighapahari	132	514.55	2.25	594.18	2.60

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
363	Jagatsinghpur	132	473.09	2.07	507.65	2.22
364	Marshaghai	132	900.47	3.94	958.54	4.19
365	Rairakhol	132	776.52	3.40	621.33	2.72
366	FAP_Joda	132	2152.98	9.42	2035.62	8.90
367	Junagarh	132	291.10	1.27	358.39	1.57
368	Sundargarh	132	1771.14	7.75	1424.91	6.23
369	Boinda	132	962.47	4.21	850.60	3.72
370	Chend	132	2992.67	13.09	2954.42	12.92
371	Chandikhol	132	532.24	2.33	587.27	2.57
372	Umerkote	132	255.69	1.12	299.20	1.31
373	Soro	132	655.28	2.87	723.15	3.16
374	Pattamundai	132	657.89	2.88	703.71	3.08
375	Akhusingarh	132	424.50	1.86	456.19	2.00
376	HMSwitch(Kharagprasad)	132	391.80	1.71	453.48	1.98
377	Paralakhemundi	132	236.68	1.04	275.98	1.21
378	Sonepur	132	496.26	2.17	560.46	2.45
379	Ranasinghpur	132	1224.41	5.36	1339.50	5.86
380	Kalrangi	132	772.45	3.38	711.35	3.11
381	Kamakhyanagar	132	1122.25	4.91	952.84	4.17
382	Jajpur	132	620.51	2.71	720.74	3.15
383	Bolani	132	950.17	4.16	772.60	3.38
384	Sunabeda	132	722.16	3.16	700.53	3.06
385	Patnagarh	132	630.88	2.76	715.65	3.13
386	Padampur	132	376.23	1.65	365.88	1.60
387	Bolangir	132	1506.50	6.59	1707.56	7.47
388	EMAMI	132	90.35	0.40	116.44	0.51
389	Salepur	132	548.38	2.40	565.22	2.47
390	Balugaon_T	132	266.67	1.17	305.05	1.33
391	Bargarh	132	960.73	4.20	1091.37	4.77
392	Phulnakhara	132	1531.09	6.70	1311.39	5.74
393	Karanjia	132	504.81	2.21	528.83	2.31
394	Banki	132	899.62	3.94	827.77	3.62
395	Kesinga	132	716.01	3.13	832.97	3.64
		132	716.77	3.14	816.97	3.57
396	Mania	132	1189.10	5.20	951.24	4.16
397	Anandpur	132	1114.31	4.87	1017.59	4.45
398	Barpali	132	469.14	2.05	517.31	2.26
399	Bansapanai	132	1910.54	8.36	1639.72	7.17
400	Barbil	132	631.45	2.76	543.14	2.38

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
401	Saliban	132	368.97	1.61	395.14	1.73
402	Purushottampur	132	603.46	2.64	578.31	2.53
403	Chandipur	132	275.50	1.21	329.10	1.44
404	konark	132	441.13	1.93	496.00	2.17
405	Samuka	132	649.35	2.84	716.95	3.14
406	Arugul	132	1143.23	5.00	1000.54	4.38
407	Nuapara	132	207.97	0.91	253.32	1.11
408	Dabugaon	132	357.09	1.56	371.21	1.62
409	Boudh	132	307.92	1.35	311.57	1.36
410	kuchinda	132	1048.83	4.59	861.71	3.77
411	Bhawanipatna	132	401.53	1.76	448.13	1.96
412	Kalarangi Tap	132	1017.21	4.45	833.66	3.65
413	Kesura	132	684.15	2.99	725.42	3.17
414	Rengali_PH_G	220	8949.40	23.49	8547.36	22.43
415	PPL	132	1122.38	4.91	1063.49	4.65
416	ITPS	220	9042.80	23.73	8496.04	22.30
417	NINL	220	5762.35	15.12	5124.74	13.45
418	Bhusan Steel	220	9320.36	24.46	9011.53	23.65
419	TSIL	220	2851.55	7.48	2215.87	5.82
420	Jindal Steel	220	7464.62	19.59	7606.52	19.96
421	VISA	220	5016.76	13.17	4267.12	11.20
422	Rohit ferro	220	6253.72	16.41	5474.62	14.37
423	SPS	220	7736.62	20.30	5648.63	14.82
424	Veda_G	220	11645.72	30.56	12652.20	33.20
425	NALCO	220	11547.26	30.30	12347.23	32.40
426	BSSL	220	11948.87	31.36	11580.09	30.39
427	JSPL	220	2820.42	7.40	2055.25	5.39
428	Tata Steel	220	7321.37	19.21	7087.26	18.60
429	ESSAR	220	1818.49	4.77	1626.68	4.27
430	IOCL	220	1772.85	4.65	1562.58	4.10
431	BPRL	132	2072.26	9.06	1772.65	7.75
432	MSL	132	1664.66	7.28	1245.96	5.45
433	IMFA	132	1429.05	6.25	1294.34	5.66
434	ICCL	132	3224.77	14.11	3398.12	14.86
435	FCI	132	2226.28	9.74	1656.36	7.25
436	FACOR	132	1370.40	5.99	1592.24	6.96
437	Balasore Alloy	132	1184.10	5.18	1138.45	4.98
438	Birla Tyr	132	1290.47	5.64	1358.14	5.94
439	Hindalco	132	4714.92	20.62	5180.41	22.66

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
440	Chiplima	132	3539.25	15.48	2955.38	12.93
441	ACC	132	911.90	3.99	992.43	4.34
442	CTC	132	3044.96	13.32	2919.70	12.77
443	SGEL	132	385.02	1.68	435.18	1.90
444	Action Ispath	132	2834.79	12.40	2706.81	11.84
445	L&T Cemco	132	1900.76	8.31	1363.13	5.96
446	PowerMax	132	572.91	2.51	527.17	2.31
447	OCL	132	2386.20	10.44	2313.72	10.12
448	ARATI	132	1526.78	6.68	1472.70	6.44
449	SamalMtl	132	388.28	1.70	443.87	1.94
450	NBVL	132	393.77	1.72	458.97	2.01
451	MCL	132	2076.37	9.08	1316.49	5.76
452	HindMetals	132	390.08	1.71	448.77	1.96
453	OPTCL	132	1592.51	6.97	1183.05	5.17
454	BC_Monty	132	1732.39	7.58	1324.05	5.79
455	Tomka_Tr	132	1163.31	5.09	756.18	3.31
456	JKPaper	132	1136.78	4.97	878.76	3.84
457	IFFCO	132	1230.68	5.38	1385.73	6.06
458	HAL	132	713.53	3.12	684.48	2.99
459	PPT	132	1081.27	4.73	990.83	4.33
460	Vedanta	132	1016.43	4.45	1074.61	4.70
461	Rungta	132	1770.81	7.75	1307.36	5.72
462	BRG	132	2120.50	9.28	1733.58	7.58
463	Machakunda	132	1170.09	5.12	1237.31	5.41
464	Machakunda Road_SW	132	489.01	2.14	273.95	1.20
465	Maheshwari	132	1612.16	7.05	1275.78	5.58
466	RAWMET	132	1591.60	6.96	1091.69	4.78
467	ShyamDRI	132	2485.35	10.87	1933.31	8.46
468	AryanISt	132	3583.40	15.67	2723.79	11.91
469	Rathi	132	2491.14	10.90	1732.72	7.58
470	Sriganesh	132	1302.95	5.70	979.58	4.29
471	Arya	132	745.03	3.26	612.87	2.68
472	BRP_St	132	641.71	2.81	484.80	2.12
473	Menaksh	132	665.95	2.91	584.19	2.56
474	MSP	132	459.15	2.01	440.89	1.93
475	OCL_TA	132	1038.48	4.54	828.60	3.62
476	B-Rtap	132	0.26	0.00	0.21	0.00
477	Basta	132	768.45	3.36	788.55	3.45
478	SMC	132	2413.96	10.56	1755.21	7.68

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
479	JambyFe	132	2114.72	9.25	1619.85	7.09
480	BEEKAY	132	472.93	2.07	344.84	1.51
481	Rajgangpur_R	132	2299.37	10.06	2135.43	9.34
482	Rambha_R	132	463.95	2.03	388.72	1.70
483	Solari_R	132	309.64	1.35	321.97	1.41
484	Kaipada_R	132	776.92	3.40	686.21	3.00
485	Jhakpur_R	132	1427.42	6.24	996.62	4.36
486	Bhadrak_R	132	1117.04	4.89	1019.40	4.46
487	Balasore-R	132	1267.75	5.55	1307.76	5.72
488	Jaleswar_R	132	465.74	2.04	526.78	2.30
489	Bhulta_R	132	395.24	1.73	268.18	1.17
490	Nuagaon_R	132	836.01	3.66	484.49	2.12
491	Jharsuguda_R	132	2920.25	12.77	2735.97	11.97
492	Kendrapara_R	132	2482.18	10.86	1918.09	8.39
493	Jornda_R	132	811.63	3.55	597.27	2.61
494	Meramundali_R	132	387.80	1.70	442.60	1.94
495	Jagannath_R	132	773.77	3.38	972.79	4.26
496	JayNagar_R	132	2233.69	9.77	2297.48	10.05
497	Padwa_R	132	395.89	1.73	216.84	0.95
498	Manbar_R	132	866.88	3.79	537.15	2.35
499	MalinG_R	132	1370.09	5.99	991.73	4.34
500	CHKSM-R	132	1088.45	4.76	720.18	3.15
501	Dhmraptr_R	132	445.39	1.95	270.24	1.18
502	Dhmra_R	132	646.35	2.83	435.27	1.90
503	Goreknath_R	132	399.52	1.75	363.97	1.59
504	Bamra_R	132	0.26	0.00	0.21	0.00
505	Keonjhor_R	132	573.39	2.51	473.97	2.07
West Bengal						
506	Jeerat	400	9690.07	13.99	9215.96	13.30
		220	7925.99	20.80	9025.67	23.69
		132	4143.21	18.12	4796.39	20.98
507	Arambag	400	15454.41	22.31	12923.45	18.65
		220	9648.25	25.32	10495.71	27.54
		132	3304.49	14.45	4054.99	17.74
508	Durgapur	400	13201.12	19.05	11460.11	16.54
509	Kharagpur	400	12146.99	17.53	10037.42	14.49
		220	6149.64	16.14	6827.84	17.92
		132	1807.98	7.91	2144.34	9.38
510	Raghunathpur	400	14393.43	20.78	12833.76	18.52

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
511	Purullia pump storage	400	13386.38	19.32	12570.58	18.14
512	Bidhannagar	400	15229.95	21.98	12329.91	17.80
		220	9596.50	25.18	10410.48	27.32
		132	3399.15	14.87	4120.62	18.02
513	Kolaghat	400	12707.42	18.34	12322.64	17.79
		220	5601.63	14.70	6360.31	16.69
		132	3184.60	13.93	3858.33	16.88
514	Bakreswar	400	8886.64	12.83	8756.59	12.64
		220	9925.43	26.05	10834.88	28.43
515	sagardighi	400	18390.99	26.55	17393.50	25.11
		220	6623.50	17.38	6949.42	18.24
516	Haldia	400	6023.85	8.70	6236.07	9.00
517	Parulia	400	13905.08	20.07	9744.27	14.07
		400	15223.38	21.97	12077.35	17.43
		220	9025.47	23.69	9411.62	24.70
		220	9025.51	23.69	9411.89	24.70
518	Malda	400	16869.33	24.35	12736.29	18.38
		220	5271.88	13.84	5757.85	15.11
		132	2060.14	9.01	2529.82	11.07
519	Binaguri	400	17609.12	25.42	14378.21	20.75
		220	6601.39	17.32	6809.04	17.87
520	Subhasgarm_PG	400	7612.53	10.99	8188.35	11.82
		220	6310.44	16.56	7845.37	20.59
521	Gokarna	400	9660.93	13.94	7615.30	10.99
522	Mejia	400	14711.91	21.24	13681.97	19.75
523	Farakka	400	30659.76	44.25	30596.02	44.16
		220	4846.40	12.72	5436.12	14.27
524	Alipurduar PG	400	14626.65	21.11	8959.07	12.93
		220	7084.48	18.59	6522.35	17.12
525	Vidyasagar Park	220	2139.68	5.62	1574.61	4.13
		132	1738.85	7.61	1371.88	6.00
526	Sadaipur	220	8591.81	22.55	7965.11	20.90
527	Dharampur	220	5455.14	14.32	4920.50	12.91
		132	4743.77	20.75	4575.64	20.01
528	Domjur	220	4941.00	12.97	4786.77	12.56
		132	3640.13	15.92	4189.15	18.32
529	Gokarna	220	7909.06	20.76	8258.72	21.67
		132	3255.12	14.24	4094.34	17.91

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
530	Howrah	220	4234.98	11.11	4330.01	11.36
		132	2874.36	12.57	3565.98	15.60
531	Kasba	220	5455.57	14.32	5834.77	15.31
		132	3778.64	16.53	4871.81	21.31
532	Laxmikantapur	220	2797.38	7.34	2959.87	7.77
		132	1500.15	6.56	1967.21	8.60
533	Midnapur	220	4708.58	12.36	4435.30	11.64
		132	2351.56	10.29	2873.87	12.57
534	New Jalpaigudi	220	5992.45	15.73	6030.73	15.83
		132	3771.70	16.50	4462.15	19.52
535	New Haldia	220	3005.86	7.89	2745.14	7.20
		132	2506.02	10.96	2728.17	11.93
536	Rishra	220	4832.75	12.68	4533.91	11.90
		132	4103.50	17.95	4873.48	21.32
537	Satgachia	220	3474.25	9.12	3172.02	8.32
		132	2318.18	10.14	2741.06	11.99
538	Santhaldih	220	5022.45	13.18	5263.82	13.81
		132	1328.04	5.81	1444.20	6.32
539	Asansol	220	2381.29	6.25	2227.61	5.85
		132	1368.33	5.99	1620.77	7.09
540	krishnagar	220	3496.48	9.18	3199.33	8.40
		132	2051.95	8.98	2449.98	10.72
541	Bisnupur	220	4225.97	11.09	3976.10	10.44
		132	2209.53	9.66	2723.96	11.91
542	Calcutta Leather Complex	220	4481.43	11.76	4385.71	11.51
		132	3293.47	14.41	3834.49	16.77
543	Subhasgarm	220	6251.67	16.41	7694.33	20.19
		132	1809.15	7.91	2224.80	9.73
544	New Town Action Area-3	220	5330.45	13.99	5457.77	14.32
		132	2622.45	11.47	3030.64	13.26
545	Hura	220	2487.77	6.53	2347.90	6.16
		132	1542.85	6.75	1863.69	8.15
546	Foundary Park	220	4455.65	11.69	4360.41	11.44
		132	1628.00	7.12	1992.31	8.71
547	Dalkhola	220	6336.21	16.63	5199.10	13.64
		132	2041.54	8.93	2380.06	10.41
548	DTPS (Waria)	220	7879.56	20.68	7569.86	19.87
		132	3503.23	15.32	3913.96	17.12

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
549	Barjora	220	8158.86	21.41	7755.54	20.35
		132	1046.25	4.58	1039.33	4.55
550	Parullia_D	220	9078.15	23.82	9386.16	24.63
551	J K Nagar	220	3153.32	8.28	2906.61	7.63
552	Durgapur(Muchipara)	220	7902.46	20.74	7337.89	19.26
553	Burnpur	220	4818.72	12.65	3539.49	9.29
554	Mejia	220	11468.89	30.10	12840.49	33.70
555	DPL	220	7831.15	20.55	8446.85	22.17
		132	2334.56	10.21	2978.66	13.03
556	BBGS_C	220	2683.84	7.04	2703.80	7.10
		220	3229.14	8.47	3582.53	9.40
		132	3371.47	14.75	4163.20	18.21
		132	2248.54	9.84	2869.97	12.55
557	EMSS_C	220	2683.98	7.04	2707.07	7.10
		220	3473.08	9.11	4156.66	10.91
		132	1733.66	7.58	2346.48	10.26
		132	3769.73	16.49	4861.77	21.27
		132	3769.72	16.49	4861.76	21.27
558	NCGS_C	220	2987.44	7.84	3594.88	9.43
		132	1304.34	5.71	1713.80	7.50
		132	2736.84	11.97	3486.17	15.25
559	Birpara	220	6777.88	17.79	5832.84	15.31
		132	2171.09	9.50	2544.18	11.13
560	Siliguri	220	6176.08	16.21	5942.33	15.60
		132	3528.18	15.43	3774.25	16.51
561	Dalkhola	220	6417.14	16.84	5263.19	13.81
562	Adisaptagram	132	3799.49	16.62	3668.00	16.04
563	Alipurduar	132	764.27	3.34	904.15	3.96
564	AshokNagar	132	2361.53	10.33	2480.59	10.85
565	mahispota	132	1764.59	7.72	1263.63	5.53
566	Balurghat	132	541.12	2.37	587.85	2.57
567	Bankura	132	1461.22	6.39	1495.65	6.54
568	Barasat	132	1229.80	5.38	1359.78	5.95
569	Basithpur	132	1102.01	4.82	1147.97	5.02
570	Joka	132	903.87	3.95	1113.10	4.87
571	Berhampore	132	1880.53	8.23	2052.80	8.98
572	Birpara	132	2153.97	9.42	2505.04	10.96
573	Bishnupur	132	2056.33	8.99	2396.74	10.48
574	Bolpur	132	1379.52	6.03	1510.86	6.61

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
575	Bongaon	132	1477.46	6.46	1410.93	6.17
576	C k Road	132	634.65	2.78	700.16	3.06
577	Lebong	132	1253.17	5.48	846.73	3.70
578	Debagram	132	964.51	4.22	910.29	3.98
579	Dhulian	132	649.68	2.84	703.77	3.08
580	Egra	220	2956.87	7.76	2766.02	7.26
		132	1928.69	8.44	2304.58	10.08
581	Food Park	132	577.47	2.53	382.15	1.67
		132	593.96	2.60	396.68	1.74
582	SaltLake GIS	132	1653.36	7.23	1344.17	5.88
583	Bajkul	132	1612.94	7.06	1195.37	5.23
584	Falta	132	1000.26	4.38	1189.82	5.20
585	Haldia	132	2467.47	10.79	2654.45	11.61
586	Hizlee	132	952.22	4.17	1071.53	4.69
587	Kalyani	132	2956.81	12.93	2480.24	10.85
588	Katwa	132	1012.04	4.43	1132.15	4.95
589	Khanyan	132	2110.02	9.23	1728.05	7.56
590	Kolaghat	132	2770.75	12.12	3093.71	13.53
591	Lilooah	132	2645.34	11.57	3092.80	13.53
592	Malda	132	1825.63	7.99	2192.18	9.59
593	Mankar	132	1501.64	6.57	1489.32	6.51
594	Myanaguri	132	1561.15	6.83	1545.07	6.76
595	North Bengal University	132	3108.05	13.59	3187.14	13.94
596	Pingla	132	1065.10	4.66	1208.86	5.29
597	Purulia	132	852.25	3.73	987.12	4.32
598	Raiganj	132	1224.83	5.36	1193.52	5.22
599	Raina	132	1468.03	6.42	1564.82	6.84
600	Rampurhat	132	975.38	4.27	1042.26	4.56
601	Ranaghat	132	1961.40	8.58	2058.65	9.00
602	Mathabang	132	403.72	1.77	482.42	2.11
603	SaltLake	132	2268.87	9.92	2291.14	10.02
604	Samsi	132	516.02	2.26	627.77	2.75
605	Siliguri	132	2532.02	11.08	2501.17	10.94
606	Sonarpur	132	1808.28	7.91	1817.59	7.95
607	Tamluk	132	2262.46	9.90	2171.74	9.50
608	Tarkeshwar	132	2299.61	10.06	2086.04	9.12
609	Titagarh	132	1760.68	7.70	1955.95	8.56
610	Ukhra	132	1779.76	7.78	1851.13	8.10
611	Uluberia	132	2635.50	11.53	2608.10	11.41

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
612	Sirakol	132	1000.39	4.38	1167.13	5.11
613	Cossipur	132	1187.99	5.20	901.80	3.94
614	Balichak	132	1166.21	5.10	997.91	4.37
615	TCF-1	132	2203.55	9.64	1944.39	8.50
616	Dankuni	132	1759.33	7.70	1417.06	6.20
617	Debagram	132	847.11	3.71	721.69	3.16
618	Balurghat	132	1461.71	6.39	1272.83	5.57
619	Modern	132	1724.81	7.54	1647.05	7.20
620	Jangipara	132	2092.68	9.15	1853.92	8.11
621	Chanditala	132	3696.06	16.17	3728.36	16.31
622	Gangarampur	132	550.86	2.41	608.05	2.66
623	Birsingha	132	1701.81	7.44	1656.08	7.24
624	Coochbehar	132	735.39	3.22	910.73	3.98
625	Belmuri	132	2357.81	10.31	2052.46	8.98
626	Barjora	132	1020.93	4.47	989.04	4.33
627	Chalsa	132	998.73	4.37	1027.59	4.50
628	Mechand	132	824.22	3.61	957.83	4.19
629	Raghunathpur	132	1296.21	5.67	1322.50	5.78
630	Amtala	132	873.47	3.82	1002.41	4.38
631	Contai	132	1202.82	5.26	1226.69	5.37
632	Haldia NIZ	132	1988.81	8.70	1799.42	7.87
633	Jhargram	132	998.83	4.37	1016.55	4.45
634	Lalgola	132	1466.21	6.41	1402.27	6.13
635	Najirpur	132	762.83	3.34	857.31	3.75
636	Bighati	132	3765.10	16.47	3523.19	15.41
637	RMBLK	132	1622.83	7.10	1173.58	5.13
638	TMBL	132	1627.46	7.12	1172.51	5.13
639	Farakka	132	997.05	4.36	1096.17	4.79
640	Khatri	132	781.33	3.42	863.96	3.78
641	Kalna	132	1518.96	6.64	1467.06	6.42
642	Kakdwip	132	751.19	3.29	785.12	3.43
643	Kurseong	132	1333.54	5.83	796.75	3.49
644	Bagnan	132	2380.23	10.41	2329.18	10.19
645	Sonarlal	132	1141.79	4.99	789.90	3.46
646	Saintia	132	1351.79	5.91	1434.14	6.27
647	New Town Action Area-1	132	2123.54	9.29	2111.93	9.24
648	Ujanu	132	2326.70	10.18	2272.97	9.94
649	BEL CCp	132	942.29	4.12	970.52	4.25
650	Belmuri	132	791.64	3.46	736.88	3.22

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
651	Burdwan	132	1065.29	4.66	961.51	4.21
652	Bagmundi	132	349.65	1.53	380.00	1.66
653	Kharagpur	132	714.86	3.13	456.20	2.00
654	Howrah	132	690.71	3.02	502.20	2.20
655	Kalapahari	132	2685.98	11.75	1824.18	7.98
656	Purulia	132	1640.73	7.18	979.70	4.29
657	Bandel	132	5675.26	24.82	6114.19	26.74
658	Jamuria	132	917.13	4.01	522.93	2.29
659	TCF	132	787.97	3.45	466.29	2.04
660	ASP	132	2906.56	12.71	2672.72	11.69
661	DPL A Zone	132	2178.67	9.53	2588.91	11.32
662	DPL B Zone	132	2257.80	9.88	2812.78	12.30
663	DPL AB Zone	132	2261.43	9.89	2747.34	12.02
664	DPL C Zone	132	2069.35	9.05	2331.40	10.20
665	DPL C1 Zone	132	2035.40	8.90	2236.78	9.78
666	Bamunara	132	1998.49	8.74	2122.87	9.29
667	NCGS_C	132	2736.84	11.97	3486.17	15.25
668	SRS_C	132	2287.02	10.00	2863.86	12.53
		132	2206.68	9.65	2773.16	12.13
669	TRS_C	132	1744.39	7.63	1939.88	8.49
		132	2542.01	11.12	3199.97	14.00
670	Majerhat_C	132	2491.97	10.90	3190.52	13.96
671	BT Road_C	132	1271.42	5.56	1670.10	7.31
		132	2876.86	12.58	3669.14	16.05
672	Princep Street_C	132	1541.34	6.74	2077.66	9.09
		132	2100.29	9.19	2618.40	11.45
		132	2247.78	9.83	2869.04	12.55
673	East calcutta_C	132	3343.92	14.63	4313.24	18.87
		132	2024.51	8.86	2559.05	11.19
674	Rishra_C	132	3736.48	16.34	4439.71	19.42
675	Taratala_C	132	2478.32	10.84	3171.54	13.87
676	Chakmir_C	132	2566.69	11.23	3263.01	14.27
677	Jadavpur_C	132	2860.81	12.51	3577.11	15.65
		132	2258.74	9.88	2856.57	12.49
678	BBD Bag_C	132	2248.54	9.84	2869.96	12.55
679	Botanical garden_C	132	2830.72	12.38	3511.02	15.36
680	Belur_C	132	2523.95	11.04	2965.77	12.97
681	Park Lane_C	132	1590.74	6.96	2123.71	9.29
		132	1590.74	6.96	2123.72	9.29

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
682	DumDum_C	132	3033.54	13.27	3883.94	16.99
683	Patuli_C	132	1590.74	6.96	2131.85	9.32
684	Park Circus_C	132	1642.57	7.18	2225.18	9.73
685	Majerhat_C	132	2491.97	10.90	3190.52	13.96
686	Kalingpong	66	410.45	3.59	313.21	2.74
687	Alipurduar	66	224.60	1.97	59.20	0.52
688	Birpara	66	337.50	2.95		
689	Jali	66	286.13	2.50	318.61	2.79
		66	291.63	2.55	301.13	2.63
690	Chalsa	66	383.73	3.36	207.79	1.82
691	Salakati NER	220	5789.30	15.19	6029.57	15.82
692	Chukha	220	4042.58	10.61	3929.16	10.31
693	Rammam	132	1714.07	7.50	1575.61	6.89
694	WBIDC	132	1672.98	7.32	1232.34	5.39
695	IPCL Haldia	220	2889.89	7.58	2576.97	6.76
696	Teesta Low Dam	220	1671.35	4.39	1601.32	4.20
697	Teesta Low Dam	220	1574.90	4.13	1380.65	3.62
698	RaghunathGanj	132	1188.67	5.20	1346.19	5.89
699	Madras Cement	132	2086.93	9.13	1780.34	7.79
700	HPCL	132	2370.55	10.37	2422.51	10.60
701	Bencon Street	132	1289.12	5.64	1173.31	5.13
702	Tata Power	132	2218.01	9.70	2202.81	9.64
703	Khejuria	132	1029.35	4.50	1157.80	5.06
704	Kuli	132	1498.81	6.56	1368.13	5.98
705	Ambuja	132	872.69	3.82	833.98	3.65
		132	846.27	3.70	786.91	3.44
706	BRG Steel	132	372.29	1.63	201.04	0.88
		132	346.20	1.51	185.94	0.81
707	Manaksia	132	1933.91	8.46	1711.19	7.48
708	Hizli TSS	132	941.98	4.12	1038.10	4.54
709	Jaysree	132	3408.95	14.91	3275.75	14.33
710	OCL Bishnupur	132	397.50	1.74	219.77	0.96
711	Emammi Cement	132	1449.72	6.34	1390.34	6.08
712	Bolpur TSS	132	1324.34	5.79	1384.68	6.06
713	Badri Narayan alloy	132	549.10	2.40	351.96	1.54
714	Sonic Thermal	132	1002.63	4.39	954.63	4.18
715	Cresent power	132	1121.68	4.91	1082.46	4.74
716	TGS	132	2542.01	11.12	3199.97	14.00
717	Chakaradharpur_R	132	589.73	2.58	599.63	2.62

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
718	Dhatrigram_R	132	1161.95	5.08	815.77	3.57
719	Katwa_R	132	956.35	4.18	1001.83	4.38
720	Bankura_R	132	1431.49	6.26	1434.30	6.27
721	Barasat_R	132	1130.09	4.94	1137.77	4.98
Sikkim						
722	Rangpo_PG	400	11244.84	16.23	11314.16	16.33
		220	6997.55	18.36	8081.32	21.21
		132	2973.17	13.00	2905.25	12.71
723	Teesta-5	400	10251.12	14.80	10139.75	14.64
724	Teesta-3	400	8707.29	12.57	9651.70	13.93
725	Jorethang	220	4668.95	12.25	4281.59	11.24
726	New Melli	220	4834.48	12.69	4363.98	11.45
727	Chuzachen	132	1823.04	7.97	1806.49	7.90
728	Rongit	132	2079.32	9.10	1667.70	7.29
		66	148.60	1.30	145.99	1.28
729	Sagbari	132	2065.66	9.04	1645.58	7.20
730	Geyzing	132	1200.54	5.25	777.79	3.40
		66	259.57	2.27	218.87	1.92
731	Gangtok	132	1353.72	5.92	916.92	4.01
		66	503.27	4.40	427.38	3.74
732	Melli	132	2068.04	9.05	1482.31	6.48
		66	630.66	5.52	560.98	4.91
733	Melli	66	627.45	5.49	556.43	4.87
734	Tadong	66	383.08	3.35	295.70	2.59
735	Bulbuley	66	372.34	3.26	285.28	2.50
736	Sichey	66	365.37	3.20	278.58	2.44
737	Rongli	66	176.51	1.54	114.20	1.00
738	Mamring	66	271.44	2.37	192.30	1.68
739	Namchi	66	320.21	2.80	238.41	2.09
740	Rabangla	66	123.25	1.08	108.74	0.95
741	Rohtak	66	189.87	1.66	129.59	1.13
742	Soreng	66	151.22	1.32	101.59	0.89
743	Lower Lagyep	66	482.47	4.22	402.41	3.52
744	Phudong	66	210.81	1.84	146.47	1.28
745	Geyzing	66	259.67	2.27	218.55	1.91
746	Purano Namchi	66	239.76	2.10	167.29	1.46
747	Pakyong	66	313.10	2.74	210.09	1.84
748	Pelling	66	244.13	2.14	201.48	1.76
749	Rhenock	66	140.52	1.23	90.39	0.79

Sl. no.	Substation Name	Rated Voltage	3-Ph to Ground fault		SLG fault	
			3-Phase MVA	Fault Current	1-Phase MVA	Fault Current
		(kV)	(MVA)	(kA)	(MVA)	(kA)
750	Mangan	66	139.24	1.22	93.48	0.82
751	Rnipool	66	484.98	4.24	405.38	3.55
752	Topakhani	66	264.16	2.31	189.04	1.65
753	Meyong	66	115.58	1.01	76.81	0.67
754	Rongli	66	159.85	1.40	103.13	0.90