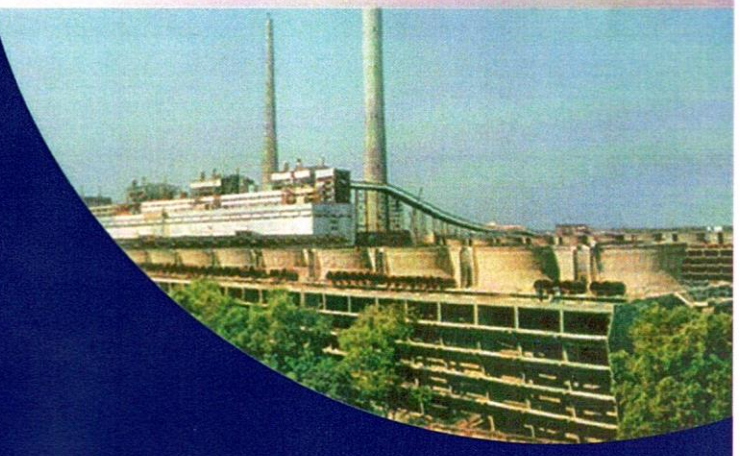
वार्षिक प्रशासन रिपोर्ट
Annual Adminstration Report

2017 - 2018



भारत सरकार
विद्युत मंत्रालय
केन्द्रीय विद्युत प्राधिकरण
पूर्वी क्षेत्रीय विद्युत समिति
कोलकाता

GOVT. OF INDIA
MINISTRY OF POWER
CENTRAL ELECTRICITY AUTHORITY
EASTERN REGIONAL POWER COMMITTEE
KOLKATA, JUNE 2018

Ministry of Power
Central Electricity Authority
ERPC, Kolkata

FOREWORD

The Annual Administration Report of Eastern Regional Power Committee for the year 2017-18 is a compilation of the various facets of grid operation during the year 2017-18. This report is a mirror which reflects the health of the power system of the entire Eastern Region. For preparation of this report, voluminous data and information have been collected , compiled and analysed. This year the report is being published in a record time. This feat has been made possible with the best co-ordinated efforts of all the constituents and the dedicated officials of ERPC Secretariat.

Eastern Regional Power Committee (ERPC) was established by Govt. of India vide resolution dated 25th May 2005.Various important functions like regional level operation analysis, inter state/inter regional transfer of power, planning relating to inter state/intra state transmission system, planning of maintenance of generation schedule, operational planning studies etc. were assigned to ERPC. Further, ERPC has to evolve consensus on all cases relating to economy and efficiency in the operation of power system of the region.

Eastern Region is considered to be the power hub of the country. It is connected with all other regions and also international connections exist with neighbouring countries for transfer of electricity. As such, ERPC plays a pivotal role in planning & operation of the regional grid and has to resolve many issues involving operational, technical, economic and regulatory aspects of the grid.

The various profiles of the grid parameters in the Eastern Region have registered significant improvements in the year 2017-18. The upward trend of overall demand in the region is a healthy sign and augurs well for development of the region. After fulfilment of requirement of Eastern Region,the region exported around 29297 MU of energy including export to Nepal and Bangladesh.

Maximum Net demand met in ER was 20567 MW which is 8.65% more than the previous year. Daily net energy consumption in the region was about 378 MU, which was 7.13% more than the previous year.

Around 3964 MU energy was exported to Bangladesh through 400 kV Berhampur – Bheramara (Bangladesh) transmission line.

Export of power from ER grid to Nepal (apart from Bihar state network) started from February'2016 through 400 kV (charged at 132 kV) Muzaffarpur – Sursand – Dhalkheber (Nepal) line. The energy exported during the year to Nepal was 944.75 MU through this line.

I believe that the Annual Administration Report would prove to be informative and useful for the stakeholders of the Eastern Region. Finally , I would like to thank all the constituents of the Eastern Region for their timely submission of requisite data for this report. ERPC would continuously strive to improve this **Annual Administration Report. For this I would like to invite suggestions for making this report more informative and attractive.**

Jaydeb Bandyopadhyay 22/06/18

(J. Bandyopadhyay)
Member Secretary

Index

Annexure

Exhibits

HIGHLIGHTS

Salient features of ER Grid

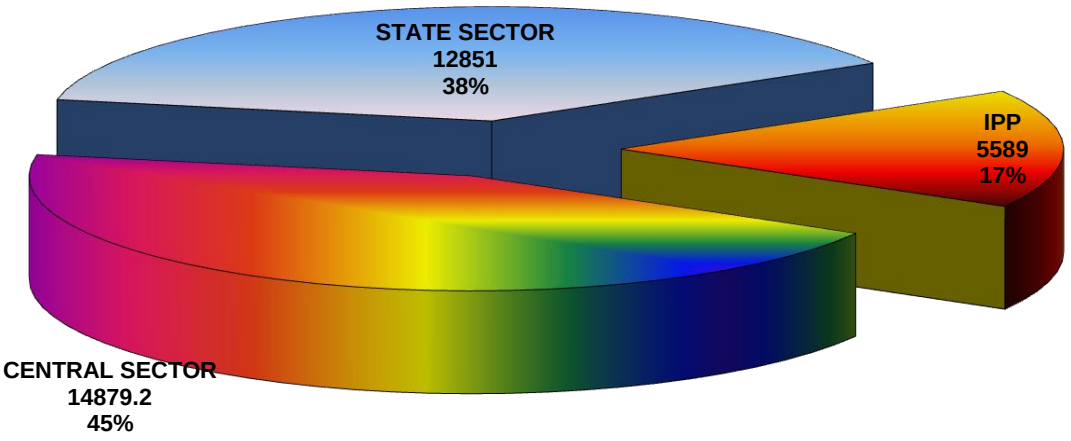
As on 31.03.2018

Installed Capacity	
Thermal	27325 MW
Hydro	5947 MW
Diesel	7 MW
Solar	40 MW
Capacity addition/phase out(-) during 2017-18	
Thermal	445/(-)1040MW
Hydro	193 MW
Total Installed Capacity (Thermal+Hydro+Diesel+Solar)	**33319 MW**
Total Effective Capacity (Thermal+Hydro+ Diesel+Solar)	**33199 MW**
Demand	
Peak Demand Met (Max.)	**20567 MW**
Increase Over Previous Year	8.65 %
Peak Demand Met (Min.)	17837 MW
ER System Load Factor (%)	**76.65 %**
Energy Requirement	
Energy Generation (Gross) (incl. Bhutan Imp, Excl. CPP)	**170844 MU**
Increase over previous year	4.33 %
Net Energy Met	**138105 MU**
Frequency Regime	
% Time frequency remained Below 49.9 Hz	10.6 %
Between 49.9-50.05 Hz (IEGC Band)	**76.3 %**
Above 50.05 Hz	13.1 %
Inter-regional / Outside Country Energy Transfer	
Net Energy export to WR	-8666 MU
Net Energy export to SR	10247 MU
Net Energy export to NR	19054 MU
Net Energy export to NER	3753 MU
Net Energy export to Bangladesh	3964 MU
Net Energy export to Nepal	945 MU
Total Net Regional Export	**29297** MU
Net Energy Export to Nepal through Bihar System	**1362.7 MU**

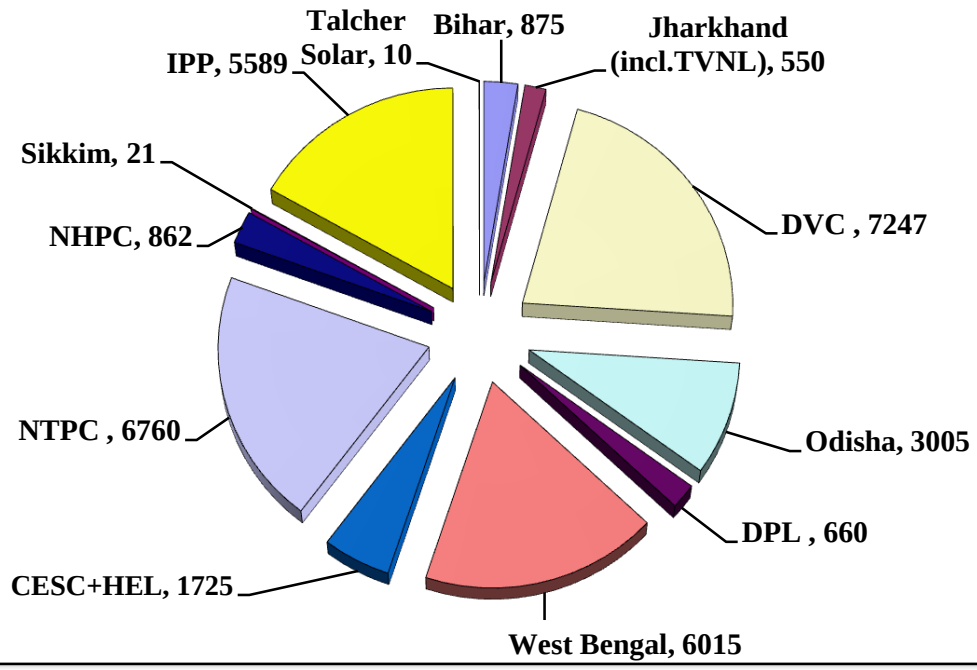
INSTALLED CAPACITY IN EASTERN REGION AS ON 31-03-2018

Figs. In MW

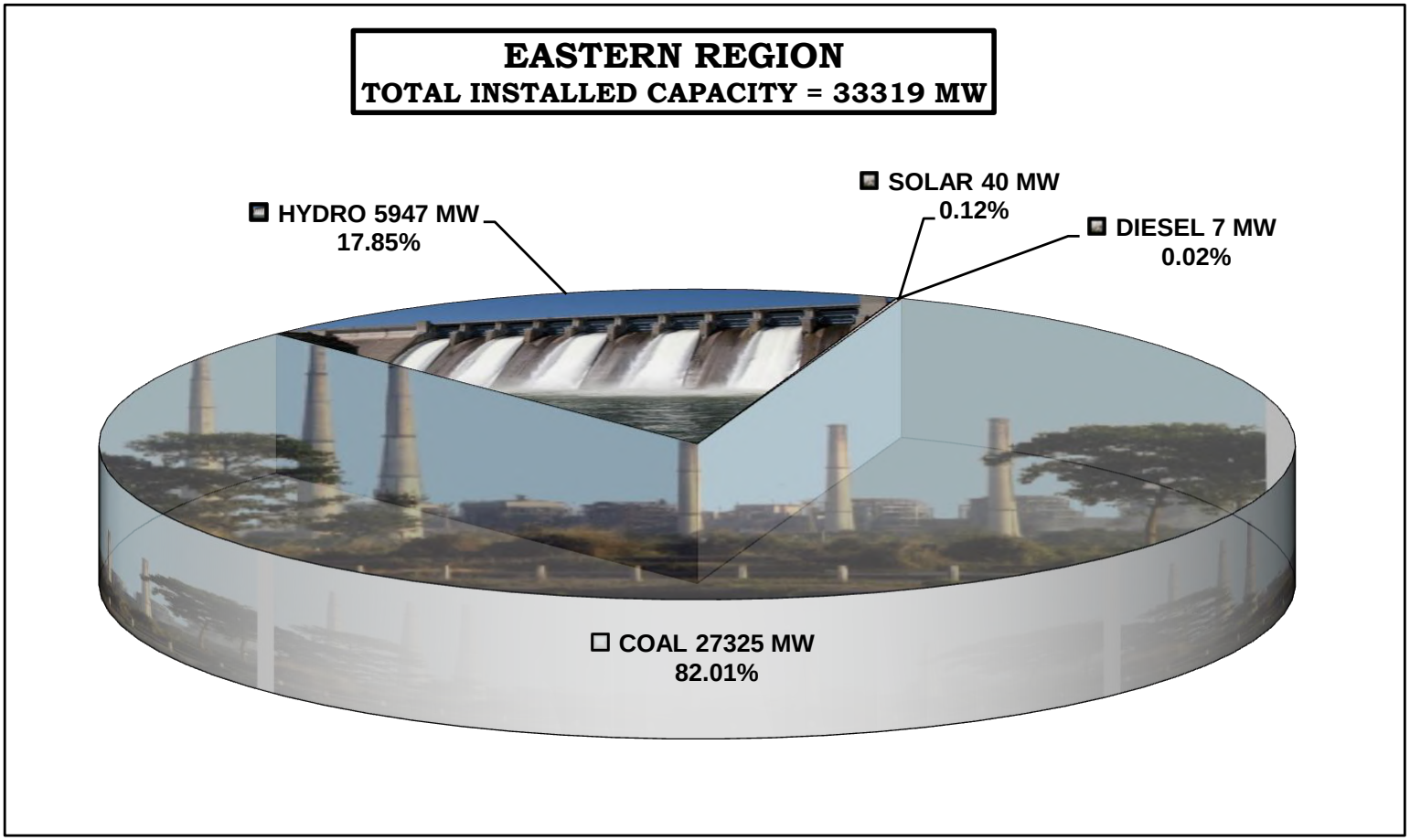
SECTORWISE INSTALLED CAPACITY AS ON 31.03.18



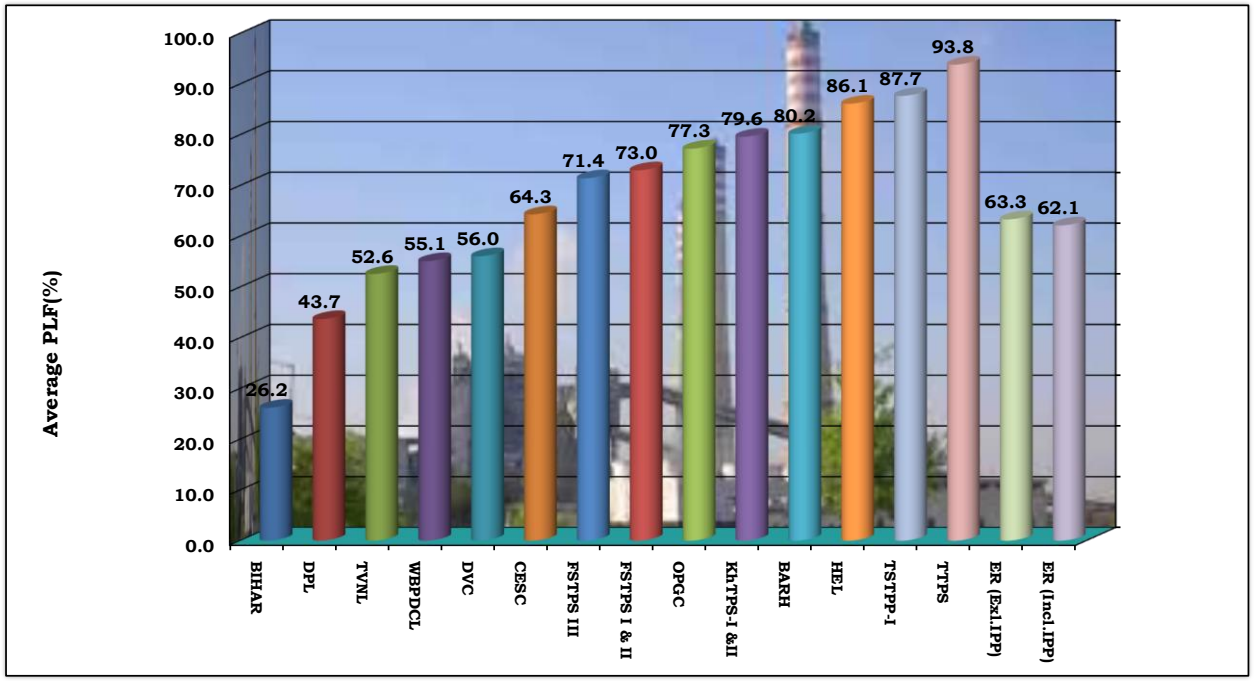
CONSTITUENT WISE INSTALLED CAPACITY AS ON 31.03.18



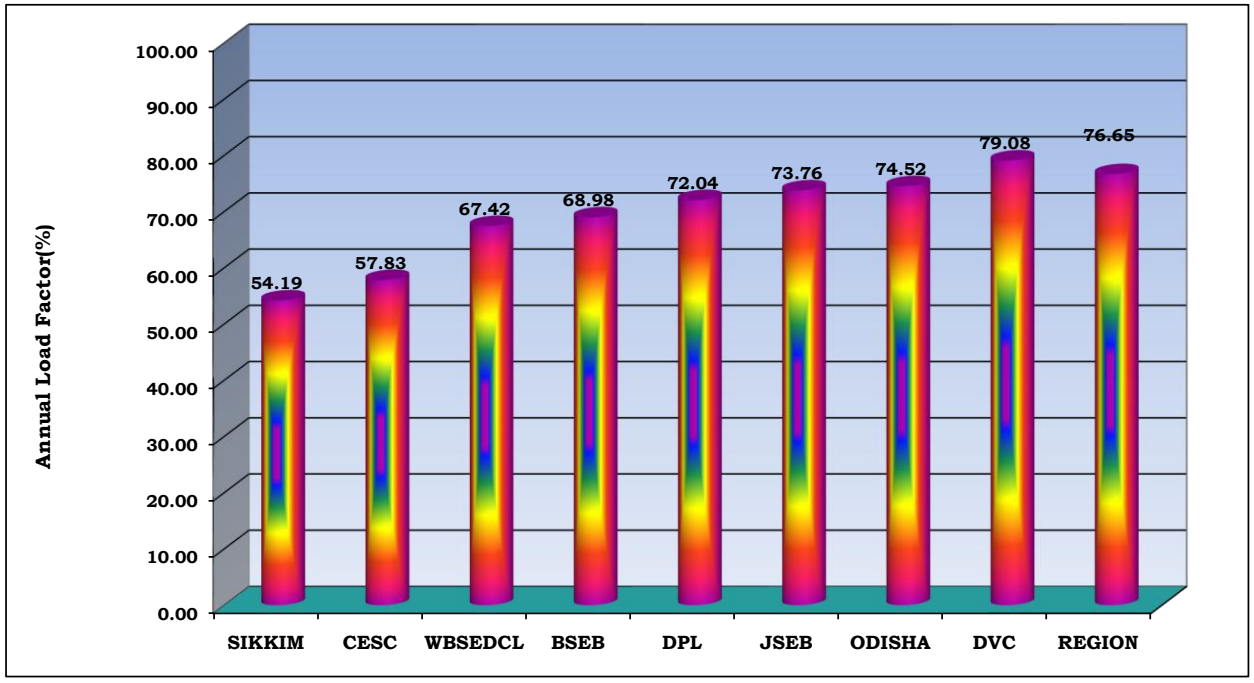
FUEL WISE INSTALLED GENERATING CAPACITY AS ON 31-03-2018



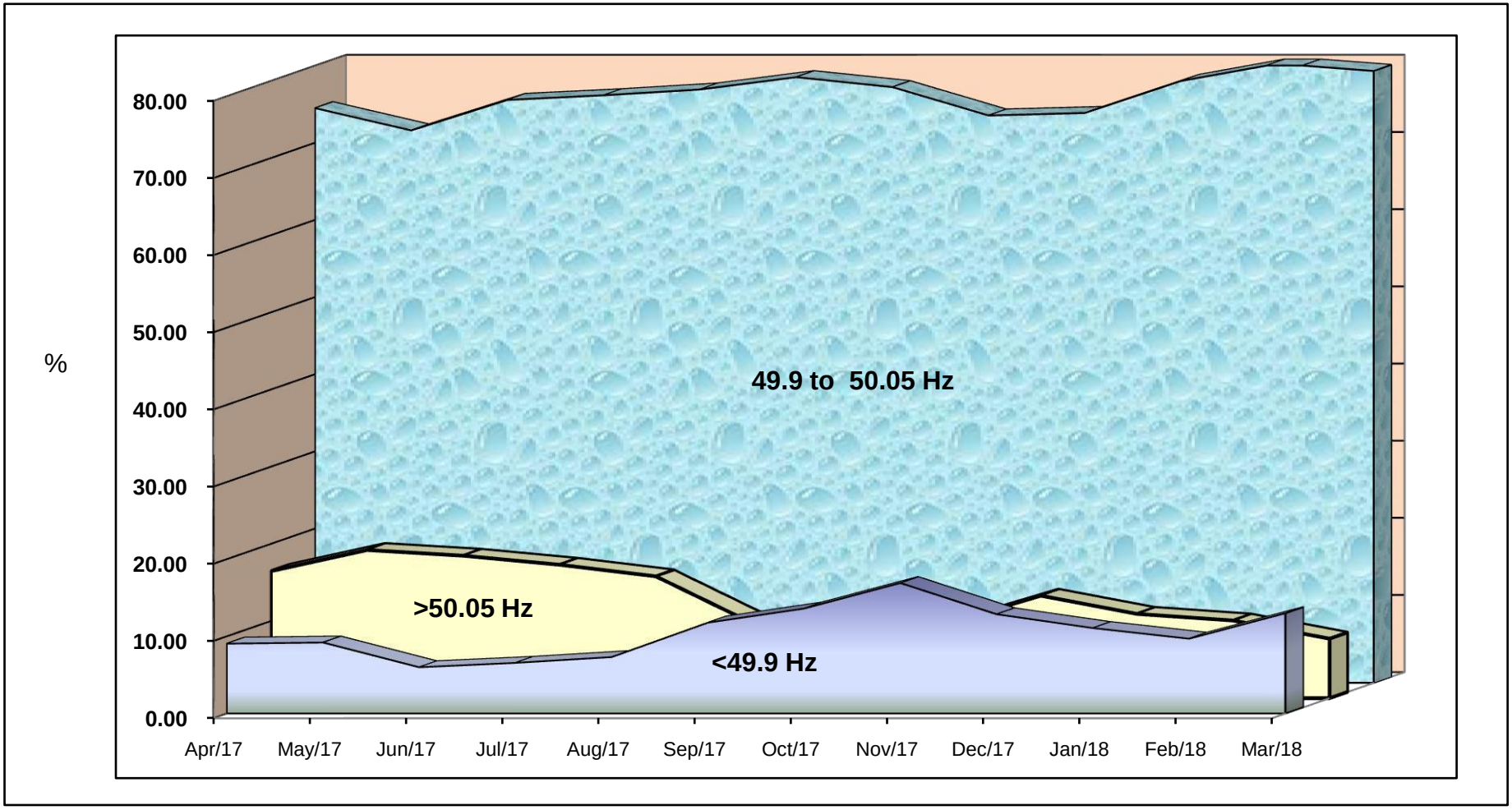
ANNUAL PLF OF THERMAL POWER STATION IN EASTERN REGION DURING 2017-18



ANNUAL LOAD FACTOR OF THE CONSTITUENTS IN EASTERN REGION DURING 2017-18



EASTERN GRID FREQUENCY REGIME DURING THE YEAR 2017-18



CHAPTER-1

CONSTITUTION, FUNCTIONS AND ORGANISATIONAL SETUP

1.1 INTRODUCTION

Growth of Power sector is the key to economic development of the country and is one of the most essential elements for growth of a country and development of modern society. Accordingly electricity demand is increasing day by day with improvement in living standards as the nation modernizes and its economy develops. To meet the challenges of ever growing demand, power sector has become the key area for reforms as well as to attract investment. Enactment of Electricity Act, 2003, has brought revolutionary changes in almost all the areas of the power sector. Through implementation of this Act conducive environment has been created to promote private sector participation and competition in the sector. This has led to significant investment in generation, transmission and distribution areas.

For efficient & integrated system planning and operational purposes, the power system of the country has been divided into five regions namely Northern Region, Southern Region, Western Region, Eastern Region and North-Eastern Region. Each region has its own regional power grid. Initially, State grids were inter-connected to form the regional grid. The integration of regional grids, and thereby establishment of National Grid, was conceptualized in early nineties. Initially inter-regional links were planned for exchange of operational surpluses amongst the regions. Subsequently felt that synchronisation of all regional grids would help in optimal utilization of scarce natural resources by transfer of power from resource centric regions to load centric regions. Further, this should pave way for establishment of vibrant electricity market facilitating trading of power across regions. 'One Nation One Grid' should synchronously connect all the regional grids and there would be one national frequency.

The integration of regional grids which began with asynchronous HVDC back-to-back inter-regional links facilitating limited exchange of regulated power subsequently graduated to high capacity synchronous links between the regions. In October, 1991 North Eastern and Eastern grids were connected. In March, 2003 WR and ER-NER were interconnected. On 26th August, 2006 North and East grids were interconnected thereby four regional grids Northern, Eastern, Western and North-Eastern grids were synchronously connected forming Central Grid (NEW GRID) operating at one frequency. On 31st December, 2013 Southern Region was connected to Central Grid (NEW GRID) in synchronous mode with the commissioning of 765kV Raichur-Solapur Transmission line thereby achieving 'ONE NATION'-'ONE GRID'-'ONE FREQUENCY'.

The Eastern Region comprises of the States of Bihar, Jharkhand, Odisha, West Bengal and Sikkim. The region has an area of 4,25,432 Sq. km which is about 13% of the total area of the country.

The Regional Power Committees have been established by Central Government for a specified region for facilitating the integrated operation of the power system of that region. The Eastern Regional Power Committee (ERPC) is one out of five (5) Regional Power Committees.

The Organisation Chart of ERPC Secretariat is given at **Exhibit-I** & Power Maps showing transmission system of the Eastern Region are given at **Exhibit - II & III**

1.2 CONSTITUTION

Eastern Regional Power Committee (ERPC) is the present form of erstwhile Eastern Regional Electricity Board (EREB). Initially EREB came into operation on 01.06.1965 in accordance with the Govt. of India's resolution no. EL-II-35 (7)/63 dated 6th March, 1964 in order to promote integrated operation of the power systems in the region and to ensure optimum utilisation of the generation in the region. Government of India, under the provision of Sub-Section 55 of Section 2 of the Electricity Act 2003 vide Resolution F.No.23/1/2004-R&R dated 25th May, 2005 had established Eastern Regional Power Committee comprising the states of Bihar, Jharkhand, Orissa, West Bengal and Sikkim with following members and was subsequently amended from time to time on 29.11.2005, 08.05.2008 and 21.12.2017.

i) Member (Grid Operation), Central Electricity Authority (CEA).
ii) One representative each of Central Generating Companies, Central Transmission Utility (CTU), National Load Despatch Centre (NLDC) and the Eastern Regional Load Despatch Centre (ERLDC).
iii) From each of the States in the region, the State Generating Company, State Transmission Utility (STU), State Load Despatch Centre (SLDC), one of the State owned distribution companies as nominated by the State Government and one Distribution Company by alphabetical rotation out of the private distribution companies functioning in the region.
iv) A representative each of every generating company (other than central generating companies or State Government owned Generating Companies) having more than 1000 MW installed capacity in the region.
v) A representative of the generating companies having power plants in the region [not covered in (ii) to (iv) above] by alphabetical rotation.
vi) One member representing the electricity traders in the region by alphabetical rotation which has trading volume of more than 500 million units during the previous financial year.
via) A representative each of every Nodal Agency appointed by the Government of India for coordinating cross-border power transactions with the countries having electrical inter-connection with the region.
vii) Member Secretary, ERPC – Convenor.

It is further stated in the notification that wherever a member is represented by rotation, the nomination would be for a period of one year. The representative from respective organizations should be either the head of the organization or at least a person not below the rank of a Director on the Board of the company / corporate entity except for Central Public Sector Undertaking (CPSUs) where representative could also be at the level of Executive Director.
Chairperson of the ERPC would represent the States of the region by rotation in alphabetical order. Members of the ERPC from the particular State would nominate the Chairperson of ERPC from amongst themselves. Term of the Chairperson would be for a period of one year.

Dr.N.M.Kulkarni, IAS, Secretary Energy Department,Government of Jharkhand and Chairman-cum-Managing Director, Jharkhand Urja Vikas Nigam Ltd. was the Chairperson of ERPC for the year 2017-18. Members of ERPC for the year 2017-18 were as under:

Sl.No.	Name of ERPC Member Organisation	Designation of the Member
1.	Jharkhand Urja Vikas Nigam Limited	Chairman-cum-Managing Director
2.	Jharkhand Urja Sancharan Nigam Limited	Managing Director
3.	Jharkhand Bijli Vitaran Nigam Limited	Managing Director
4.	Tenughat Vidyut Nigam Ltd.	Managing Director
5.	Bihar State Power Holding Company Ltd.	Chairman-cum-Managing Director
6.	Bihar State Power Transmission Company Ltd.	Managing Director
7.	South Bihar Power Distribution Company Ltd.	Managing Director
8.	GRIDCO Ltd.	Chairman-cum-Managing Director
9.	Odisha Power Transmission Corporation Ltd.	Chairman-cum-Managing Director
10.	Odisha Hydro Power Corporation Ltd.	Chairman-cum-Managing Director
11.	Odisha Power Generation Corporation Ltd.	Managing Director
12.	West Bengal State Electricity Distribution Company Ltd.	Chairman & Managing Director
13.	West Bengal State Electricity Transmission Company Ltd.	Managing Director
14.	West Bengal Power Development Corporation Ltd.	Chairman & Managing Director
15.	Durgapur Projects Ltd.	Managing Director
16.	Energy &Power Department, Govt. of Sikkim	Principal Chief Engineer-cum-Secretary
17.	Damodar Valley Corporation	Chairman
18.	Central Electricity Authority	Member (GO&D)
19.	Eastern Regional Load Despatch Centre	Head,ERLDC
20.	National Load Despatch Centre	Head,NLDC
21.	NTPC Ltd.	Director (Commercial)
22.	NHPC Ltd.	Director (Finance)
23.	Power Grid Corporation of India Ltd.	Director (Operations)
24.	PTC India Ltd.	Director (C&O)
25.	NTPC Vidyut Vyapar Nigam Ltd.	Chief Executive Officer
26.	Tata Power Trading Company Ltd.	Managing Director
27.	CESC Ltd.	Managing Director
28.	Maithon Power Ltd.	Chief Executive Officer
29.	Adhunik Power & Natural Resources Ltd.	Managing Director
30.	GMR Kamalanga Energy Ltd.	Chief Operating Officer
31.	Jindal India Thermal Power Ltd.	Chief Executive Officer
32.	Teesta Urja Ltd.	Managing Director

1.3 FUNCTIONS

The functions of ERPC, as per the resolution of Govt. of India dated 25.05.2005, amended vide resolution dated 29.11.2005 and the revised Indian Electricity Grid Code issued by CERC are given below and are effective from 01.04.2006:

- Clause 29 (4) of the Act provides that "the Regional Power Committee in the region may, from time to time, agree on matters concerning the stability and smooth operation of the integrated grid and economy and efficiency in the operation of the power system in that region."
- As per Para (6) of the MOP Resolution dated 25.5.2005, ERPC shall discharge the following functions:-

    - To undertake Regional Level operation analysis for improving grid performance
      .
    - To facilitate inter-state / inter-regional transfer of power.
    - To facilitate all functions of planning relating to inter-state / intra-state transmission system with CTU / STU.
    - To coordinate planning of maintenance of generating machines of various generating companies of the region including those of inter-state generating companies supplying electricity to the Region on annual basis and also to undertake review of maintenance programme on monthly basis.
    - To undertake planning of outage of transmission system on monthly basis.
    - To undertake operational planning studies including protection studies for stable operation of the grid.
    - To undertake planning for maintaining proper voltages through review of reactive compensation requirement through system study committee and monitoring of installed capacitors.
    - To evolve consensus on all issues relating to economy and efficiency in the operation of power system in the region.

- Besides, as per the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010, following specific functions have been entrusted to RPC:
    - RPC Secretariats shall carry out all Regional Energy Accounting calculations.
    - Regional Energy Accounts on monthly basis shall be prepared and issued by the RPC Secretariats for the purpose of billing and payment of various charges.
    - RPC shall prepare and issue the Unscheduled inter-change (UI) account [newly terminology ' Deviation Settlement Mechanism (DSM)] for which RLDC will provide actual net injection / drawal of concerned regional entities, 15 minute-wise, based on the above meter readings on a weekly

basis by each Thursday noon for the seven day period ending on the previous Sunday mid-night.

- RPC shall monitor the status of UI payment and installation of capacitor.

- RPC shall prepare and issue monthly Regional Transmission Accounts (RTA) and Regional Transmission Deviation Accounts (RTDA) based on data supplied by NLDC and ERLDC respectively.

- RPC Secretariats shall also issue the weekly statement for VAR charges, to all regional entities who have a net drawal / injection of reactive energy under low/high voltage conditions.

- RPC shall decide from time to time to utilize the money remaining in the regional reactive account after payout of all VAR charges upto 31st March of every year for training of the SLDC operators and other similar purposes which would help in improving/streamlining the operation of the respective regional grids

- The Regional Power Committee (RPC) in the region shall continuously monitor the instances of non-compliance of the provisions of IEGC and try to sort out all operational issues and deliberate on the ways in which such cases of non-compliance are prevented in future by building consensus.

- RPC shall decide on installation of capacitors by states vis-à-vis the requirement/targets.

- RPC in consultation with RLDC finalise the quantum and time frame for reactive compensation.

- RPC shall regularly monitor the status regarding the installation and healthiness of the reactive compensation equipment.

- RPC shall finalise action plan and give instructions to restore power system elements under prolonged outage in a specified time period.
- RPC will be allowed to carry out checking of Power System Stabilizers (PSS) in AVRs of generating units and further tuning it, whenever considered necessary.

- RPC will finalise the plan for providing automatic under-frequency and df/dt relays for load shedding in respective systems, to arrest frequency decline that could result in a collapse/disintegration of the grid and shall ensure that the above under-frequency and df/dt load shedding/islanding schemes are always functional.

- RPC Secretariat shall carry out periodic inspection of the under frequency relays and maintain proper records of the inspection.

- RPC shall decide and intimate the action required by SEB, distribution licensee and STUs to get required load relief from Under Frequency and df/dt relays.

- RPC shall finalise the voltage control measures through voltage relay to prevent voltage collapse / cascade tripping.

- RPC shall finalise the loads to be shed through under frequency relays / df/dt relays and System Protection Scheme in order to maintain the frequency within the stipulated band and maintaining the network security.

- RPC shall monitor the forced outages of important network elements in the grid.

- The RPC Secretariat shall be primarily responsible for finalization of the annual outage plan for the following financial year by 31st January of each year and reviewed during the year on quarterly and Monthly basis.

- RPCs shall submit quarterly, half-yearly reports to the Commission indicating deviation in outages from the plan along with reasons.

- RPC Secretariat shall provide assistance for finalising detailed plans and procedures for restoration of the regional grid under partial/total blackout and shall be reviewed / updated annually.

- RPC shall initiate investigation/action whether any of the regional entities are indulging in unfair gaming or collusion if such practice is detected and reported.

- RPC shall discharge any other responsibilities assigned by CERC.

Subsequently through further amendments following works were also entrusted to RPCs:

IEGC 2010, 1st Amendment:
The RPC Secretariat shall be primarily responsible for finalization of the Annual Load Generation Balance Report (LGBR) and the annual outage plan for the following financial year by 31st December of each year. The LGBR shall be prepared by the respective RPC secretariat for peak as well as off-peak scenarios.

IEGC 2010, 4th amendment:

The RPCs shall calculate Compensation for generating stations for degradation of Station Heat Rate (SHR), Auxiliary Energy Consumption and Secondary Fuel Consumption due to low unit loading operation as per the mechanism framed by the CERC.

Central Electricity Regulatory Commission (Ancillary Services Operations) Regulations, 2015:

The Regional Power Committees shall issue an Ancillary Services Statement along with the Deviation Settlement Mechanism Account.

ORGANISATIONAL STRUCTURE

Chairperson of ERPC would represent the states of the region by rotation in alphabetical order. Members of ERPC of that particular state would nominate the Chairperson of ERPC from amongst themselves. Term of the Chairperson would be for a period of one year.

Member Secretary who is an officer of Central Power Engineering Services (Group-A), is the administrative and technical head of ERPC Secretariat with the powers of the Head of Department. The other Group-A officers in the ERPC Secretariat also belong to Central Power Engineering Service (Group-A) Cadre.

Group-B officers in ERPC Secretariat are borne on the strength of CPES (Group-B) Cadre of the Govt. of India, while Group – B, C and D (reclassified as Group-C) staff are on the strength of General Central Service of the Govt. of India.

The details regarding the present ERPC Secretariat officers and staff as on 31.3.18 are given at **Annexure-I**.

Names of the Chairpersons and Member Secretaries of the ERPC and erstwhile EREB, since inception, are shown in **Annexure-II** and **Annexure-III** respectively.

1.5 DETAILS OF BUDGET & EXPENDITURE FOR 2017-18

The sanctioned budget (RE) of ERPC for the year 2017-18 vis-à-vis actual expenditure for the same period is given in table (A) & (B):

(A) Major Head 2801 (Non-plan): Regional Co-ordination(RCC)

(Figures in Lac of Rs.)

Sl. No.	Sub-Head	Item	Sanctioned Budget (RE) for 2017-18	Actual Expenditure (RE) for 2017-18
1	07.01.01	Salaries	68.00	67.87
2	07.01.03	OTA	0.00	0.00
3	07.01.06	Medical Treatment	2.64	2.63
4	07.01.11	Domestic TE	5.00	4.99
5	07.01.13	Office Expenses	3.75	3.75
6	07.01.14	Rent/Rates/Taxes	1.00	0.93
7	07.01.20	Other Admtv. Exp.	0.00	0.00
8	07.01.27	Minor Works	5.00	3.60
Total			**85.39**	**83.77**

(B) Major Head 2801 (Non-plan): Regional Load Despatch Station (RLDS)

(Figures in Lac of Rs.)

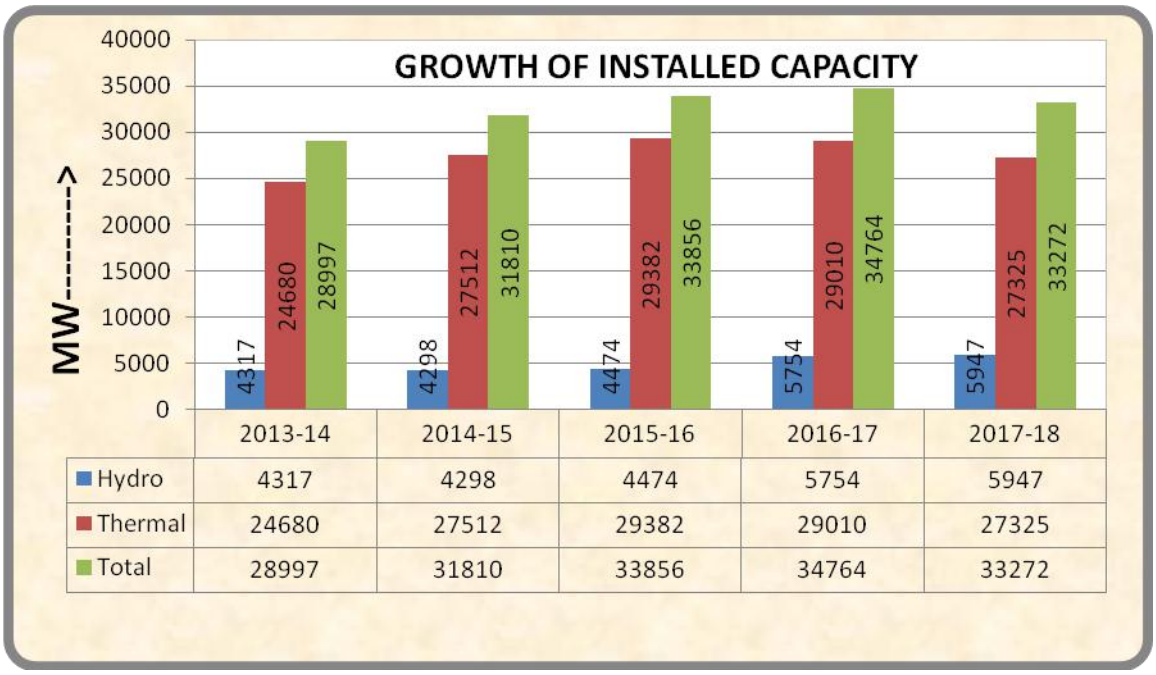
Sl. No.	Sub-Head	Item	Sanctioned Budget (RE) for 2017-18	Actual Expenditure (RE) for 2017-18
1	07.01.01	Salaries	98.00	97.40
2	07.01.03	OTA	0.00	0.00
3	07.01.06	Medical Treatment	1.69	1.63
4	07.01.11	Domestic TE	5.00	4.99
5	07.01.13	Office Expenses	32.10	31.86
6	07.01.50	Other Charges	5.00	0.00
Total			**141.79**	**135.88**

CHAPTER-2

GRID PERFORMANCES

2.1 INSTALLED CAPACITY

The installed capacity of the power generating units in Eastern Region connected to Eastern grid as on 31st March 2018 was 33319 MW, comprising 27325 MW (82 %) of thermal, 5947 MW (18 %) of hydel, 40 MW Solar and 7 MW Diesel. The total effective capacity of the Region as on 31.03.2018 was 33199 MW. In addition to this, Chukkha HEP, Kurichhu HEP, Tala HEP and Daghachu HEP of Bhutan contributed about 360 MW, 60 MW, 1020 MW and 126 MW respectively of hydel power to Eastern Region. PTC is the nodal agency for facilitating power purchase from Chukha, Kurichhu & Tala HPS and TPTCL is the nodal agency for facilitating power purchase from Dagachu HPS in Bhutan. Constituent-wise installed and effective capacity as on 31.03.2018 are shown in **Annexure-IVA. Due to de-commissioning of BTPS"B" (2X210 MW),CTPS U#2(1X140 MW) of DVC and phasing out of Patratu TPS (480 MW) of JUVNL, the installed capacity has been decreased from 2016-17.**. The growth in installed capacity in Eastern Region for last five years (i.e. 2013-2014 onwards) is shown in the diagram below:



	2013-14	2014-15	2015-16	2016-17	2017-18
Hydro	4317	4298	4474	5754	5947
Thermal	24680	27512	29382	29010	27325
Total	28997	31810	33856	34764	33272

The Compounded Annual Growth Rate of installed capacity during the last 5 years was of the order of 3.5 %.

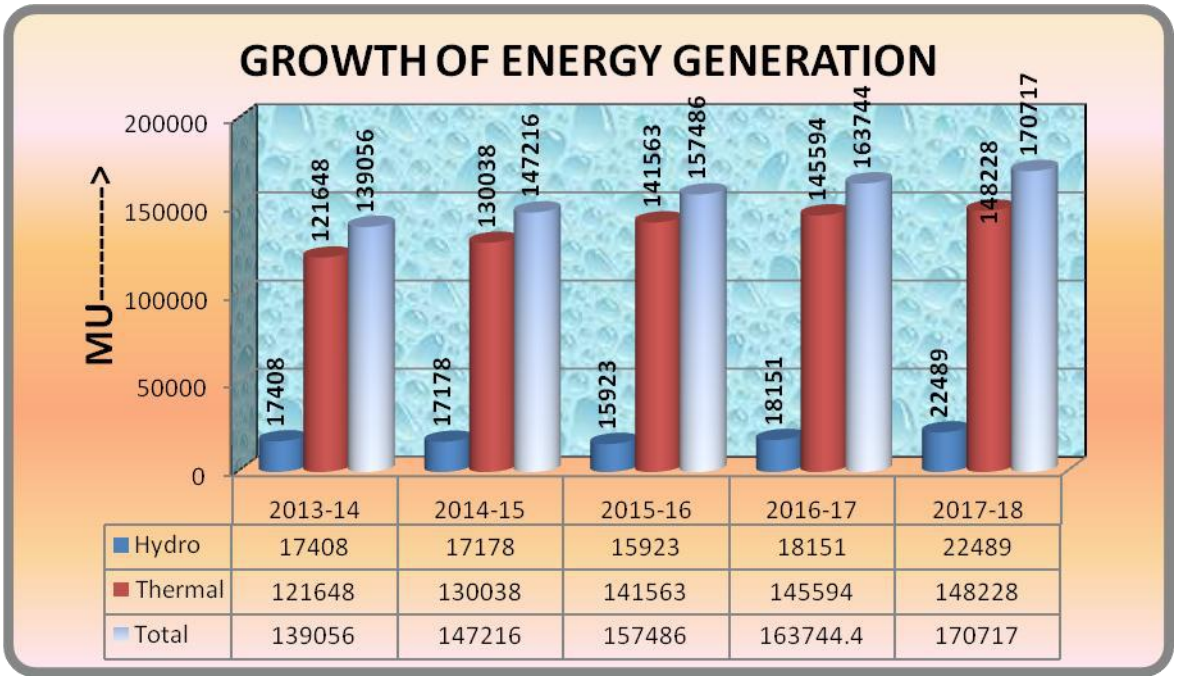
2.2 POWER SUPPLY POSITION

2.2.1 GENERATION:

During the year 2017-18, the total generation availability in ER (excluding generation/import from CPPs but including import from Bhutan) was 170844.42 MU (Gross) comprising of 148227.73 MU of thermal (87 %) and 22489.43 MU, hydel (13 %) and Solar 127.27 MU compared to total generation of 163757 MU in 2016-17 comprising 145593 MU thermal and 18151 MU hydel. The total generation was 7086.98MU more than that of 2016-17. Details of constituent-wise generation and auxiliary consumption are given in **Annexure-V**.

As regards to regional thermal generation, the generation of BSPHCL,TVNL,DVC,DPL,CESC and NTPC have increased reasonably but that of WBPDCL and JUVNL have been declined considerably as compared to last year. Hydro generation of Odisha has been increased significantly as compared to last year.

Generation of last five years (2013-14 to 2017-18) in the region is shown in graph below:



	2013-14	2014-15	2015-16	2016-17	2017-18
Hydro	17408	17178	15923	18151	22489
Thermal	121648	130038	141563	145594	148228
Total	139056	147216	157486	163744.4	170717

As against Compounded Annual Growth Rate *(CAGR)* of installed capacity of 3.5 %, the same of energy generation of the last 5 years is 5.26 % including energy exchange of 5072.08 MU from Bhutan. The growth in generation was mainly due to commissioning of new generating units of 638 MW in Eastern Region in 2017-18. Maximum utilisation of available hydel power from Tala, Kurichhu, Chukha and Daghachu Hydel Power Station of Bhutan was made by import through PTC & TPTCL as nodal agency as per international agreement between Government of India and Royal Government of Bhutan.

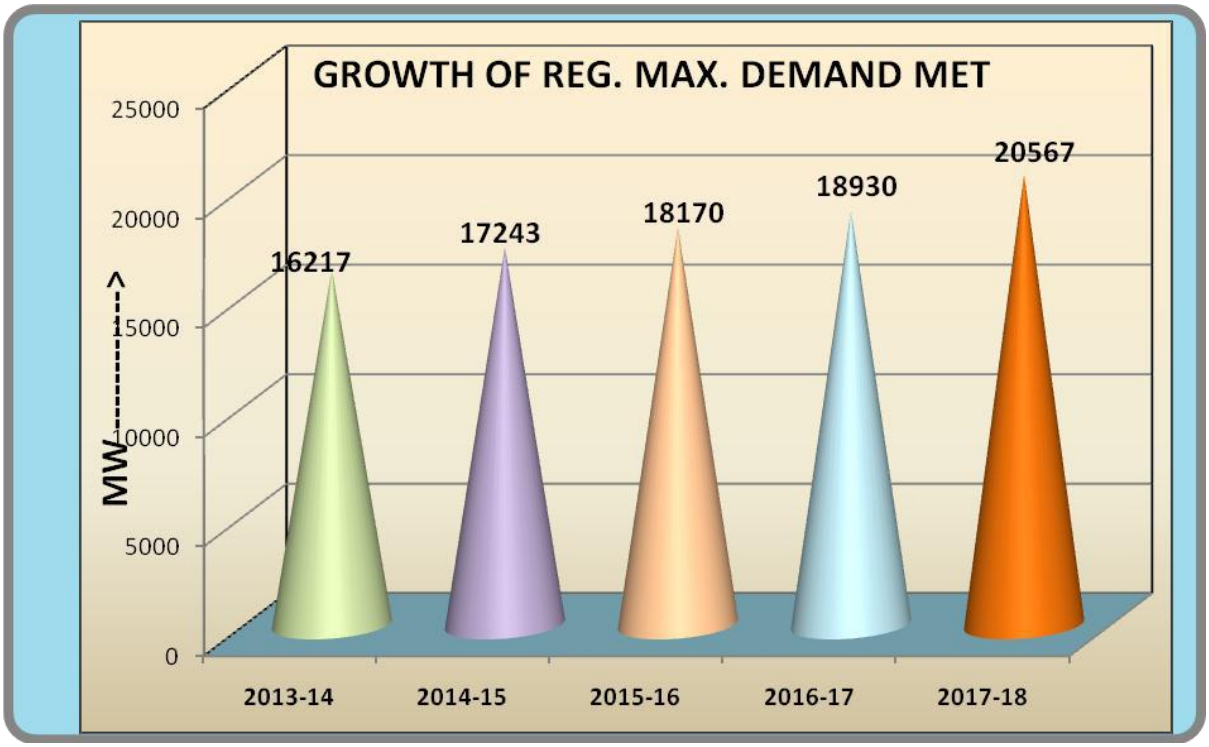
2.2.2 MAXIMUM DEMAND

During the year 2017-18, the maximum coincident demand met in the Eastern Region was 20567 MW (net) compared to demand of 18930 MW (net) during the preceding year. It was 1637 MW (8.65 %) more than the maximum demand of last year. Maximum demand met by the constituents during 2017-18 is given below:

BSEB	**-**	**4527 MW**	**WBSEDCL**	**-**	**6470 MW**
JSEB	**-**	**1314 MW**	**DPL**	**-**	**318 MW**
DVC	**-**	**3079 MW**	**CESC**	**-**	**2148 MW**
GRIDCO	**-**	**4488 MW**	**SIKKIM**	**-**	**108 MW**

EASTERN REGION: - 20567 MW

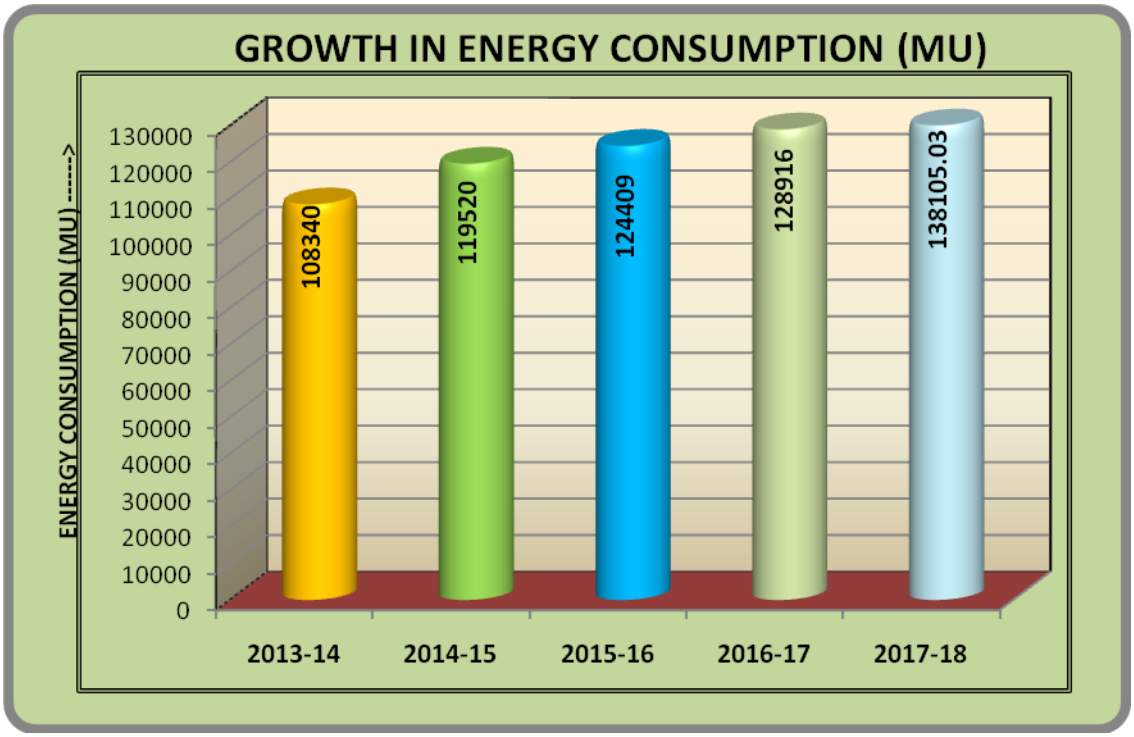
The growth in the maximum demand was restricted mainly due to bottlenecks in sub-transmission and distribution system of respective utility of E.R. The growth in maximum demand in Eastern Region for the last five years is shown below:



Compounded Annual Growth Rate (CAGR) of Peak Demand in ER of last five years was 6.12 %. Constituent & month wise peak demand (MW) met are shown in **Annexure-VI**.

2.2.3 ENERGY CONSUMPTION

During the year 2017-18, the total energy consumption (net) in Eastern Region was 138105 MU compared to consumption of 128916 MU during previous year i,e 9189 MU (7.13 %) more than last year's consumption. The growth in regional energy consumption is mainly due to heavy increase in energy consumption by Bihar, Jharkhand, DVC, Odisha & DPL. The daily average energy consumption in the region was about 378 MU/day compared to about 353 MU/day during the previous year. These figures exclude consumption of different industries from their respective captive power plants.



The energy consumption in Eastern Region for the last five years is shown in the above graph. Compounded Annual Growth Rate (CAGR) of energy consumption of the last five years works out as 6.26 % as compared to the growth of peak demand figure of 6.12 %. Constituent-wise yearly energy consumption has been shown in **Annexure-V** and monthly energy consumption has been shown in **Annexure-VII**.

2.2.4 EXPORT TO OUTSIDE REGION

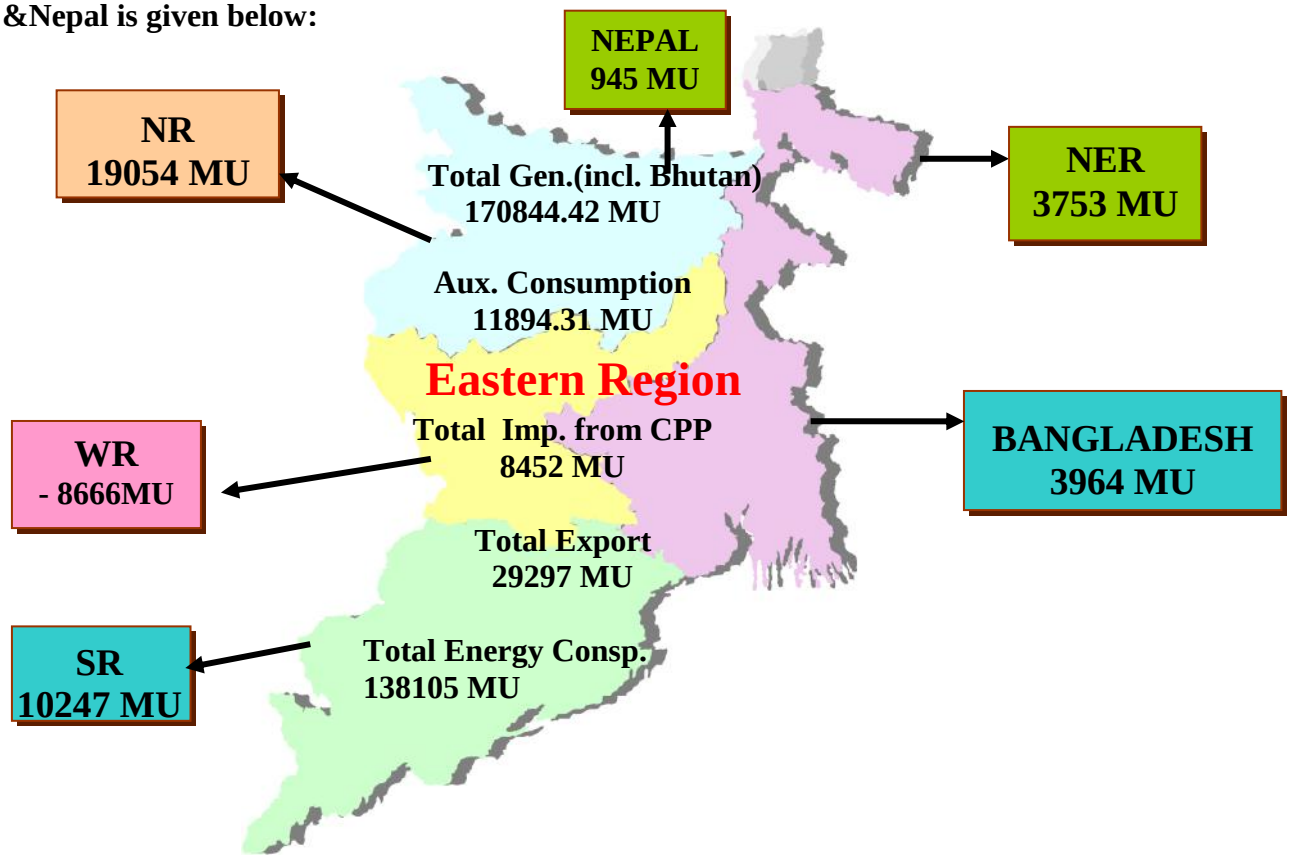
During the year 2017-18, the total net export of energy outside the region was 29297 MU compared to export of 31956 MU in the last year, which is 2659 MU less than the last year's export. Decrease in export is due to increased in energy consumption of Eastern Region. As per decision of the MoP, GoI power export to Bangladesh has been undertaken and regular supply has been commenced from October'2013 through 400 kV Berhampur – Bheramara line with HVDC (B-t-B 2x500 MW) station at Bheramara (Bangladesh). Also power flow from ER grid to Nepal has been started from February'2016 through 400 kV (charged at 132 kV) Mazaffarpur-Sursand -Dhalkheber (Nepal) line. Growth of export of Energy (MU) outside Eastern Region during last five years is given below:

EXPORT OF NET ENERGY (MU) FROM ER GRID								
Year	**NR**	**SR**	**WR**	**NER**	**B'DESH**	**NEPAL**	**TOTAL EXPORT**	**Growth ***
2013-14	**13892**	**6711**	**1727#**	**2267**	**1492**		**26088**	**4.2%**
2014-15	**11848**	**6254**	**780.5#**	**2368.4***	**3346.6**		**24597**	**-5.7%**
2015-16	**12435**	**7037**	**1777**	**1182**	**3764**	**76**	**26271**	**6.8%**
2016-17	**20093**	**5676**	**-386**	**2124**	**3782**	**666**	**31955**	**21.6%**
2017-18	**19053.7**	**10247**	**-8666.4**	**3753.4**	**3964**	**944.7**	**29297**	**-8.32**

(*)- After adjustment of 538.7 MU import from NER i.e. net export to NER.
(#)- After adjustment of 386 MU import from WR i.e. net export to WR.

The details of inter/intra regional exchange of energy during 2017-18 are shown in **Annexure-VIII**.

A schematic diagram showing inter-regional exchange & exchange with Bangladesh &Nepal is given below:



2.2.5 FREQUENCY

Duration of different frequency blocks in terms of percentage (%) of time during the period 2017-18 and 2016-17 are given below:-

YEAR	< 49.9 Hz	49.9 – 50.05 Hz	> 50.05 Hz
2016-2017	**7.68**	**72.20**	**20.12**
2017-2018	**10.58**	**76.28**	**13.14**

During the year 2017-18, for **76.28** % time the frequency remained in the IEGC Frequency Band i.e. between 49.90 to 50.05 Hz. Month wise average frequency in different period of the day and average frequency in % of time during 2017-18 are given at **Annexure IX A** and **IX B** respectively.

2.2.6 VOLTAGE

During the year 2017-18, the voltage profile except a few important 400 kV sub–stations and 220 kV sub-stations remained satisfactory. Maximum & Minimum Voltage touched during 2017-18 at some of the important 765 Kv & 400 kV sub-stations are shown below:

SUB-STATION	MAXIMUM VOL (kV)	MINIMUM VOLTAGE (kV)
NEW RANCHI 765 KV	804	744
BINAGURI	434	384
SUBHASGRAM	436	372
JEERAT	432	374
BIHARSHARIFF	424	391
MUZAFFARPUR	425	380
JAMSHEDPUR	434	404
ROURKELA	422	394
JEYPORE	436	367
MAITHON	423	396
MERAMUNDALI	422	398
SASARAM	428	382

2.3 PLANT LOAD FACTOR

The average annual Plant Load Factor (PLF) of the thermal power stations in the Eastern Region for the year 2017-18 was 63.31% (without considering the IPP) against 60.19% for 2016-17 and after considering the IPP the Regional PLF during 2017-18 was 62.12 % against that of 61.79 % for 2016-17. The PLF has been calculated based on the capacity and generation of the commercially declared units only. Infirm generation and theirs period not considered for PLF calculations. As the IPPs were generating with restrictions for transmission & other constraints, the regional PLF has been reduced while those IPPs are being taking into account for Regional PLF calculations. Details of PLF have been shown in **Annexure - X**.

The average PLF (excluding IPP) of ER for the last five years is shown below:-

Period	PLF (in %)
2013-14	61.67
2014-15	63.00
2015-16	59.78
2016-17	60.19
2017-18	**63.31**

2.4 SYSTEM LOAD FACTOR

The Annual Load Factor of the Eastern Region during 2017-18 was 76.65 % compared to 77.74 % in the preceding year. The load factor was highest in DVC areas (79.08 %) due to mostly industrial flat load and the load factor was 2nd lowest in CESC (57.83 %) mainly due to domestic & commercial load. 1st lowest was Sikkim (54.19 %) whose base data for calculation was only the estimated one as the actual data were not available and mainly consisting of domestic loads.

2.5 INTERNATIONAL EXCHANGE

Eastern Region has a unique geographical advantage of having inter-Regional links with all the regions of the country along with international lines to Nepal, Bhutan and Bangladesh. Eastern Region exports power to the rest of the country. Eastern Region receives power from Chukha, Kurichhu, Tala and Daghachu HPS of Bhutan and exports power to Nepal & Bangladesh. Power export to Bangladesh is through 400 kV Berhampur – Bheramara (Bangladesh) line. Power export from ER grid to Nepal is through 400 kV (charged at 132 kV) Mazaffarpur-Sursand-Dhalkheber (Nepal) line. Also power to Nepal is supplied from Bihar state network which has been shown separately.

The table below depicts quantum of power import from Bhutan and exchange (net) with Nepal & Bangladesh in last five years:

YEAR	IMPORT FROM BHUTAN (CHPC, KHPC, TALA & DAGHACHU) IN MU	NET EXPORT TO NEPAL IN MU		NET EXPORT TO BANGLADESH IN MU
		Through Bihar State network by BSPHCL	Through CTU network by NVVN	
2013-14	5536.34	715.81		1491.78
2015-16	4926.04	1009.79		3346.60
2015-16	5427.04	1210.57	76.0	3764.0
2016-17	5810.27	1197	666.0	3782.0
2017-18	**5072.08**	**1362.87**	**944.74**	**3964.3**

Though all the international lines are not operational all the times however, details of the lines are indicated below:

1. **Between ER – NEPAL**

   (a) **Through Bihar System**

   132 kV Balmiknagar (Bihar) - Surajpura (Nepal)
   132 kV Kataiya (Bihar) - Duhabi (Nepal)
   132 kV Valmikinagar-Surajpura
   132 KVD/C Kataiya – Kusaha
   132 kV Raxual-Parwanipur line
   33 kV Thakurganj (Bihar) - Bhadarpur (Nepal)
   33 kV Raxaul (Bihar) - Birganj (Nepal)
   33 kV Kataiya (Bihar) - Biratnagar (Nepal)
   33 kV Jaynagr (Bihar) - Siraha (Nepal)
   33 kV Kataiya (Bihar) - Rajbiraj (Nepal)
   33 kV Sitamari (Bihar) - Jaleswar (Nepal)
   11 kV Jogbani (Bihar) - Biratnagari (Nepal)
   11 kV Bargania (Bihar) - Gaur (Nepal)

   (b) **Through CTU System**

   400 kV (charged at 132 kV) Mazaffarpur-Sursand-Dhalkheber (Nepal)

2. **Between ER – BHUTAN**

   400 kV Binaguri (PGCIL) - Tala-I (Bhutan)

400 kV Binaguri (PGCIL) -Tala- II (Bhutan)
400 kV Binaguri (PGCIL) -Tala- IV (Bhutan)
400 kV Binaguri (PGCIL) -Malbase-III (Bhutan)
220 kV Birpara (PGCIL) - Chukha - I (Bhutan)
220 kV Birpara (PGCIL) -Chukha - II (Bhutan)
220 kV Birpara (PGCIL) - Malbase (Bhutan)
11 kV Kalchini (WBSETCL) - Phuntsholing (Bhutan)
11 kV Jaldhaka (WBSETCL) -Sibsoo (Bhutan)
11 kV Banarhat (WBSETCL) - Samchi (Bhutan)

3. Between ER – BANGLADESH

400 kV Berhampur (PGCIL) - Bheramara (Bangladesh) D/C

4. Between NER - BHUTAN

Power is also exchanged between Bhutan and India through the following lines of NER but the exchange of power is booked against/from ER only.

132 kV Salakati (Assam, PG) – Gelephu (Bhutan)
132 kV Rangia (AEGCL) – Deothang (Bhutan)
11 kV Bongaigaon (AEGCL) -Gaylegphug (Bhutan)
11 kV Tamalpur (AEGCL) -SamdrupJongkhar (Bhutan)
11 kV Dampuri (AEGCL) -Daifan (Bhutan)

2.6 SALIENT FEATURES OF HYDRO RESERVOIR

Salient data regarding FRL, MDDL and the water level reached on the last day of the month in respect of major hydro reservoirs are given in **Annexure - XI.**

2.7 POWER CUTS IN THE REGION

Power supply position in Eastern Region was by and large satisfactory except for sub-transmission and distribution constraints in some of the constituents and perpetual shortage in area served by SBPDCL, NBPDCL and JBVNL during peak hours.

2.8 UNITS AND TRANSMISSION ELEMENTS COMMISSIONED DURING THE YEAR

Generating units and transmission elements commissioned during the year 2017-18 are given at **Annexure – IV B and IV C** respectively.

2.9 PROGRESS OF CONSTRUCTION OF GENERATING UNITS & TRANSMISSION LINES

List of ongoing Power Projects / Generating Units and progress of construction of ongoing transmission lines are given at **Annexure – XVIII A and XVIII B** respectively**.**

2.10 ALLOCATION OF POWER FROM CENTRAL GENERATING STATIONS.

Allocation of power from Central generating stations in Eastern Region including Chukha HEP, Kurichu HEP, Tala HEP & Daghachu HEP of Bhutan during 2017-18 is given at **Annexure – XIII.**

CHAPTER-3

GRID DISTURBANCES

Grid disturbances which occurred during the year 2017-18 are as follows:

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
1	JUSNL	02-Apr-17	19:01	28	250	GD - I	At 19:01 hrs, 132 kV Ramchandrapur – Adityapur D/C along with 220/132 kV ATR II & III and 220 kV B/C at Ramchandrapur tripped resulting due to B-N fault at 132 kV Adityapur – Ramchandrapur – I (B phase insulator string was completely broken). At the same time, 132 kV Adityapur – Chandil S/C, 132 kV Adityapur– Rajkarswan S/C & 132 kV Chandil – Rajkarswan S/C tripped
2	JUSNL	05-Apr-17	15:52	0	245	GD - I	At 15:37 hrs, 220 kV Ranchi – Chandil tripped due to B- N fault. Remaining 220 kV feeders at Chandil, 220 kV Ramchandrapur – Chandil and 220 kV STPS – Chandil S/C tripped at 15:52 hrs resulting power loss at Chandil and its adjacent areas.
3	BSPTCL/ISTS	09-Apr-17	18:49	0	870	GD - I	At 18:49:50.54 hrs, 400/220 kV ICT – III at Biharshariff tripped from 400 kV side due to operation of o/c protection. After the tripping of 400/220 KV ICT – III, other two ICTs got overloaded and tripped in O/C protection from HV side.
4	JUSNL	13-Apr-17	14:05	0	110	GD - I	At 14:05 hrs, 220 kV Ranchi – Chandil and 220 kV Chandil – STPS S/C tripped from Chandil end due to fault in 220/132 kV ATR – IV at Chandil.
5	BSPTCL	13-Apr-17	15:03	0	112	GD - I	Radial load fed from Hazipur, Vaishali, Chapra and Shetalpur and traction load at Bela and Sonepur was shed due to tripping of 220 kV Muzaffarpur - Hazipur D/C on Y-B-N fault.
6	Sikkim	15-Apr-17	8:48	0	26	GD - I	Due to increment weather condition, 132 kV Chujachen - Gangtok and 132 kV Rangpo Gangtok tripped on R-N fault. 132 kV Rangpo Gangtok tripped from Rangpo only
7							400 kV Muzaffarpur - Darbhanga - I was under s/d. 400 kV Muzaffarpur - Darbhanga - II tripped on B-N fault resulting load

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
	ISTS	18-Apr-17	12:35	0	90	GD - I	loss at radially connected area such as Darbhanga, Sitamari, Pandual, Madhubani etc.
8	ISTS	19-Apr-17	11:50	0	113	GD - I	220 kV Arrah - Sasaram S/C and 220 kV Arrah - Khagul D/C were in opened condition. 220 kV Arrah - Nandokhar tripped due to O/V at Nandokhar.
9	ISTS	19-Apr-17	22:56	0	217	GD - I	400 KV Muzaffarpur-Darbhanga-I was under breakdown. Load at Samastipur, Motipur, Musari and Darbhanga were fed through 400/220 kV ICT - I at Darbhanga. So tripping of ICT resulted loss of all radially connected load (including 15 MW traction load).
10	ISTS	20-Apr-17	4:54	0	30	GD - I	400 KV Muzaffarpur-Darbhanga-I and 400 kV bus - I at Darbhanga were under breakdown. Load at Samastipur, Motipur, Musari and Darbhanga were fed through 400/220 kV ICT - I at Darbhanga. So tripping of ICT resulted loss of all radially connected load.
11	ISTS	20-Apr-17	15:27	0	70	GD - I	400 KV Muzaffarpur-Darbhanga-I and 400 kV bus - I at Darbhanga were under breakdown. Load at Samastipur, Motipur, Musari and Darbhanga were fed through 400/220 kV ICT - I at Darbhanga. So tripping of ICT - I due to hard wire problem at bay 401 resulted loss of all radially connected load.
12	WBSETCL/ ISTS	22-Apr-17	20:04	300	0	GD - I	At 20:04 Hrs, 400 KV Haldia-Subhasgram D/c tripped due to B_N fault. Consequently, 2 running units generating 300 MW tripped at Haldia tripped due to loss of evacuation path. At same time 220 kV CESC - Subhasgram - I also tripped
13	BSPTCL	24-Apr-17	9:42	0	145	GD - I	400/220 kV ICT - I at Darbhanga was out of service due to over flux. Other 400/220 kV ICT at Darbhanga along with 400 kV Muzaffarpur - Darbhanga - II tripped due to LBB operation at Darbhanga.
14	DVC	25-Apr-17	19:09	0	171	GD - I	Due to B phase Bulk oil CB failure in HV side of 132/33 kV ATR - II at Jamshedpur (DVC), both 220 & 132 kV bus became dead at affected s/s
15	WBSETCL	26-Apr-17	16:16	0	300	GD - I	All 220/132 kV ATRs at Lakhikantapur tripped when 132 kV strung bus of 220/132 kV ATR - II fell on main bus. As Lakhikantapur was being radially fed from 220 kV, power

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
							interruption occurred at Lakhikantapur, Joka, Sirakol, Falta, Kakdeep
16	BSPTCL/ISTS	26-Apr-17	20:24	0	400	GD - I	At 20:24 Hrs, 400/220 kV ICT-I,II,III at Biharshariff tripped on o/c. At same time, 220/132 KV ATRs at Biharshariff also tripped. Some part of load was being fed through 220 kV Tenughat - Biharshariff S/C.
17	WBSETCL	28-Apr-17	17:23	220	0	GD - I	At 17:32 Hrs, all running units (2,4,5) at Bandel tripped and generation became zero due to Bus fault at 132kv side for Y-phase CT failure at Bandel.
18	BSPTCL/ISTS	28-Apr-17	0:02	0	275	GD - I	400/220 KV 315*3 MVA ICTs at Biharshariff tripped at 00:02 hrs. At 00:02 hrs, bursting of Y Phase CT of 132 kv side of 220/132 kV ATR - III AT Fatua resulted tripping of all 400/220 kV ICTs at Biharshariff in back up O/C. At same time, 220 kV Biharshariff - Fatua D/C also tripped.
19	ISTS	29-Apr-17	15:57	650	0	GD - I	At 15:57 hrs due to inclement weather around Teesta 3 and Dikchu, 400 kiva Teesta3-Dikchu tripped on R-N fault. At same time 400 KV Teesta3-Rangpo tripped on DT receipt at Rangpo end resulting tripping of all running units at Teesta 3 and Dikchu due to loss of evacuation path
20	BSPTCL	29-Apr-17	20:38	0	216	GD - I	Due to CT failure of 220/132 kV ICT at Bodhgaya, 220 kV Gaya - Bodhgaya D/C tripped from Bodhgaya end only resulting load loss at surrounding areas.
21	BSPTCL	3-May-17	11:45	0	290	GD - I	220 kV Patna - Fatuah S/C and 220 kV Fatuah - Sipara S/C were not in service. Fatuah was radially supplied from Biharshariff. At 11:45 hrs, 220 kV Biharshariff - Fatuah D/C tripped on Y-B phase fault. Radial connected load at Gaighat, Mithapur, Harnaut, Baripahari etc. was shed due to lost of power supply.
22	OPTCL	3-May-17	17:15	0	174	GD - I	At 17:14 hrs, B-N fault occurred at 220 kV Balasore – Baripada – II which tripped from Baripada end only. As fault was being fed from Balasore end, other 220 kV feeders i.e. 220 kV Balasore – Baripada – I (from Baripada), 220 kV Balasore – New Duburi S/C (from New Duburi) and 220 kV Balasore – Bhadrak S/C

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
							(from Balasore) along with 220/132 kV ATR I & II (from 132 kV) at Balasore tripped to clear the fault.
23	ISTS	6-May-17	15:39	74	0	GD - I	220 kV Chukha - Malbase S/C was under s/d. At 15:39hrs, 220 kV Chukha-Birpara-D/C tripped on R-Y phase fault (dist. 46.8km & 45.5km respectively from Birpara) which resulted tripping of all running units at Chukha due to loss of evacuation path. At same time, 220kv Birpara-Malbase S/C also tripped from Malbase end.
24	BSPTCL	10-May-17	20:45	0	450	GD - I	At 20:45 hrs 220/132 kV ATR at Kishangunj & 220/132 kV ATR at Madhepura tripped due to O/C. At same time, 132 kV Purnea - Kishangunj S/C tripped from Purnea end on O/C.220/132 kV ATR - I at Kishangunj was connected through TBC. During connection, master trip relay (86A & 86 B) for main transformer protection panel was not reset. LBB was set at 0.2 A & CT ratio was 1600/1. When current increased more than 320 A through ATR - I, BB/LBB Peripheral unit (installed at 220 kV relay paned) sent trip signal to BB/LBB central unit resulting tripping of all units connected to TCB.After tripping of ATR - I, ATR - II tripped due to O/C protection. After tripping of both ICTs at Kishangunj, 132 kV Supaul - Kataiya(from Supaul) and 132 kV Purnea - Kishangunj (from Purnea) tripped on O/C
25	ISTS	11-May-17	8:28	300	0	GD - I	At 08:28.20.861 hrs, 400 kV Teesta III – Rangpo S/C tripped due to operation of differential protection (87C) at Teesta III end. Breakers at Rangpo end opened at 08:28.21.410 hrs after receiving DT from Teesta III end. In PMU data, R-N fault has been observed. Distance protection at Rangpo end did not sense any type of fault at the time of incident. All running units (2,3 &6) tripped due to loss of evacuation path
26	DVC	12-May-17	13:00	873	0	GD - I	Due to operation of B/B protection, both buses along with all running units and outgoing feeders tripped resulting total power loss at DSTPS.

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
27	BSPTCL	13-May-17	9:20	0	45	GD - I	At 09:20 hrs tripping of 132 kV Arrah - Arrah S/C due to R-N fault (Z-I from PG end) during heavy storm resulted load loss at radially fed areas
28	JUSNL	13-May-17	13:37	0	60	GD - I	132 kV Adityapur - Rajkarswan S/C and 132 kV Chandil - Rajkarswan S/C tripped due to Y-B fault resulting total loss of power supply at Rajkarswan.
29	WBSETC L	13-May-17	16:29	460	0	GD - I	At 16:29 hrs 400 kV HEL - Subhasgram - I tripped due to B-N fault. At same time, 400 kV HEL - Subhasgram - II tripped on O/V at HEL (DT received at Subhasgram). Both the running units at HEL tripped due to loss of evacuation path.
30	OPTCL	13-May-17	22:08	0	135	GD - I	At 22:08 hrs 220 kV Joda – TTPS D/C tripped from both ends on D/P (Z-I at TTPS end and Z-II at Joda end). At same time, 220 kV Ramchandrapur – Joda S/C tripped from Ramchandrapur end on R-N fault and 220 kV Jamshedpur (DVC) – Jindal S/C tripped from Jamshedpur end on O/C protection.
31	ISTS	15-May-17	16:09	0	800	GD - I	At 16:09 hrs 400 kV Rangpo – Teesta III S/C tripped from both ends (Teesta III end: O/C, E/F Ir = 0.9 kA, Iy = 1.3 kA, Ib = 1.2 kA; Rangpo end: DT received) resulting in tripping of all running units (Unit #I, #III, #IV, #V & #VI) at Teesta III due to loss of evacuation path. In PMU data, B phase fault has been observed at same time. Fault clearing time is less than 100 ms
32	WBSETC L	17-May-17	6:28	0	300	GD - I	At 06:28 hrs 220 kV Subhasgram – Subhasgram D/C tripped due to Y phase LA failure (of Circuit II) at PG end (Circuit I tripped from PG end on Z-II). At the same time, 220 kV Kasba – Subhasgram (WB) tripped from Kasba end on Z-II. Due to loss of both supply (Subhasgram (PG) and Kasba), 220/132 kV Subhasgram (WB) s/s became dead and load loss occurred at Lakhikantapur, Sirakol, Falta & Kakdeep.
33							At 23:48 hrs due to CT burst at 33 kV level of 220/132/33 kV Katapalli S/S, 220 kV Katapalli – Lapanga D/C, 220 kV Katapalli – Bolangir (PG) S/C, 220 kV Bolangir (PG) – New Bolangir S/C,

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
	OPTCL	18-May-17	23:48	0	140	GD - I	220 kV Katapalli – Hindalco D/C, 132 kV Katapalli – Burla D/C, 132 kV Katapalli – Chiplima D/C along with 132/33 kV ATR II & III at Katapalli tripped resulting loss of power supply at Katapalli S/S
34	JUSNL	21-May-17	16:39	0	80	GD - I	At 16:39 hrs 220 kV Farakka Lalmatia S/C (O/C E/F protection F/C 4.68 kA in B phase at Farakka), 132 KV Kahalgaon(BSPTCL) - Lalmatia S/C & 132 KV Kahalgaon(NTPC)-Lalmatia S/C (B-N, 88.7 km from KhSTPP but line did not trip from NTPC end) tripped resulting total loss of power supply at Lalmatia & Sahebgunj. Load at Dumka got survived as it was radially fed from Maithon.
35	DVC	23-May-17	14:50	500	300	GD - I	At 14:50 hrs 132 kV CTPS - Putki Q/C, 220/132 kV ATR - I, II & III at CTPS, along with U #2, #7 & #8 at CTPS tripped resulting total loss of power supply at CTPS. In PMU data, more than one voltage dip has been observed in B phase at the time of the disturbance. Inclement weather was reported around CTPS.
36	BSPTCL	25-May-17	13:28	0	30	GD - I	At 13:20 hrs, 132 KV Jamui-Seikhpur S/C tripped from both ends (At Seikhpur it tripped at 13:22 hrs). During Charging of 132 KV Jamui-Seikhpur S/C at 13:28 hrs, 132 KV Lakhisarai(PG) –Jamui D/C tripped from Jamui end, At 13:36 hrs 132 KV Lakhisarai(PG) –Jamui D/C were charged. During second charging attempt of 132 KV Jamui-Seikhpur S/C at 13:56 hrs, 132 kV Lakhisarai - Jamui D/C tripped again (Ckt I from PG end and Ckt II from both ends). At 14:25 hrs 132 kV Lakhisarai - Jamui D/C were charged again. 132 kV Jamui - Seikhpur S/C was charged at 19:19 hrs on 29-05 17.
37	JUSNL	26-May-	15:34	0	62	GD - I	Due to inclement weather condition, 220 kV Ranchi Chandil S/C tripped on R-N fault at 14:37 hrs and 220 kV STPS – Chandil S/C tripped on Y-N fault at 15:04 hrs. Total loss of power supply at Chandil occurred with tripping of 220 kV Ramchandrapur – Chandil S/C from Ramchandrapur end on R phase O/C at 15:34

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
		17					hrs. Y phase conductor at location no. 308 of 220 kV Chandil–STPS line have snapped and fallen on the ground due to heavy lightning.
38	WBSETC L	29-May-17	17:12	20	30	GD - I	Due to Y phase CT and CB burst at NBU end of 132 kV NBU - Rammam, all 132 kV feeders connected at NBU tripped due to operation of bus bar protection. AT NJP (PG) end B/U O/C E/F relay also tripped for 132 kV NBU - NJP (PG) S/C.
39	WBSETC L	31-May-17	15:53	0	40	GD - I	At 15:53 hrs CESC got desynchronized from Kasba end due to fault in 132 kV Kasba Salt Lake S/C.
40	BSPTCL	4-Jun-17	17:28	0	30	GD-I	132 KV Jamui-Seikhpur S/C was under shutdown. Transient R-N fault occurred at 132/33 kV transformer I& II at Jamui. To clear the fault 132 kV Lakhisarai - Jamui D/C tripped from Lakhisarai end on Z-III(Jamui was radially connected to Lakhisarai) resulting total power failure at Jamui. Fault distance is 49 km from Lakhisarai. F/C is 1.745kA.
41	DVC	5-Jun-17	0:05	450	450	GD-I	All 132 kV lines connected to CTPS A S/S along with Unit VII & VIII at CTPS B and 220/132 kV ATR - I, II & III (160 x 2 +150) at CTPS A tripped due to CT failure of 132 kV CTPS A-Rajbera-II at CTPS A end.
42	JUSNL, BSPTCL & ISTS	5-Jun-17	20:27	0	800	GD-I	At 20:27 hrs 220 kV Ranchi – Hatia D/C tripped due to Y-N fault in Circuit I. After tripping of 220 kV Ranchi – Hatia D/C, both ICTs at Biharshariff tripped due to high loading and 220 kV TVNL – Biharshariff S/C tripped only from TVNL end in Y-N, Z-II (F/D 164 km). After tripping of 220 kV TVNL – Biharshariff S/C & 400/220 kV ICTs at Biharshariff, supply to Hatia, Patratu and its surrounding area was lost. 220 kV Patna – Fatuah S/C tripped on overload and 220 kV Darbhanga – Ujiarpur S/C was manually switched off to control line loading.

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
43	ISTS	6-Jun-17	3:27	860	0	GD-I	At 03:27 hrs 400 kV Teesta III – Rangpo S/C tripped from both ends on Y-B-N fault, which resulted tripping of all running units (#I, #II, #IV, #V & #VI) at Teesta III and Dikchu (unit #I & II) due to loss of evacuation path. At same time, 400 kV Teesta III – Dikchu S/C tripped from both ends due to O/V.
44	JUSNL	6-Jun-17	14:05	150	0	GD-I	At 14:05 hrs 220 kV PTPS - Hatia - I tripped from both ends (PTPS end: Z-I & Hatia end: Z-II). At same time 220 kV Tenughat - PTPS S/C tripped from PTPS end on Overload and 220/132 kV ATR - I, II & III at PTPS tripped on operation of E/F, differential protection and master trip relay
45	BSPTCL	11-Jun-17	11:39	0	170	GD-I	At 11:39 hrs 220 KV Muzaffarpur-Hazipur-D/C tripped due to Y-B fault (F/D-69.89 Km, F.C-2.75 KA and 2.45 KA at Muzaffarpur; Y-B, F/C 4.6 kA at Hazipur) resulting total power failure at Hazipur. 220 KV HJP-Amnour - I tripped at same time.
46	BSPTCL	15-Jun-17	6:23	0	60	GD-I	At 06:23 hrs 220 kV Patna - Fatuah S/C (tripped from Patna), 220 kV Sipara - Fatuah S/C (idle charged portion tripped from Fatuah, Y-N, Z-I, 16.5 km from Fatuah, 2.5 kA), 220 kV Biharshariff - Fatuah - I (tripped from Fatuah, Non Dir. O/C& E/F. IY-2.53 kA,IB-2.4 kA) & 220 kV Biharshariff - Fatuah - II (tripped from Biharshariff, Z-II, 58.47 km, IY-2.75 kA, IB-2.564kA) tripped resulting total loss of supply to Fatuah S/S
47	ISTS	17-Jun-17	16:14	773	0	GD-I	400 kV Teesta III - Rangpo S/C tripped during SPS testing at Teesta III. Unit #1, #2, #4, #5 & #6 at Teesta III & Unit #1 & #2 at Dikchu tripped due to loss of evacuation path. DT was received at Rangpo
48	BSPTCL	18-Jun-17	6:15	0	40	GD-I	132/33 kV ATR - I & II at Arrah (BSPTCL) tripped due to operation of overflux operation.
49	ISTS	18-Jun-17	13:42	0	170	GD-I	132 kV Purnea (PG) - Purnea (BSPTCL) - I tripped due to falling of jack bus jumper on Main Bus at Purnea(BSPTCL). At same time 220/132 kV ICT I, II & III at Purnea(PG) & 220KV New Purnea-Purnea D/C line tripped on backup overcurrent.

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
50	ISTS	18-Jun-17	22:37	100	100	GD-I	220 kV Chukha-Malbase was out of service. As per SOE, 220kV Birpara-Malbase S/C, 220kV Birpara-Alipurduar - II & 220kV Birpara-Chukha - II along with 220 kV B/C tripped from Birpara at 22:37:34:680 hrs. Then 220kV Birpara-Alipurduar - I, 220kV Birpara-Binaguri D/C, 220kV Birpara-Chukha - I, 132 kV Birpara - Birpara D/C along with 220/132 kV ATR - I & II tripped from Birpara (PG) within 100 ms. Operation of bus bar protection at Birpara has been reported. Both bus I & II became dead.
51	BSPTCL	19-Jun-17	14:35	0	165	GD-I	220 KV Muzaffarpur-Hazipur-D/C tripped due to Y-B fault. As Hazipur was radially fed from Muzaffarpur, load loss occurred at surrounding area. In PMU data, two Y-B fault have been observed within 1 sec.
52	BSPTCL	23-Jun-17	19:20	0	60	GD-I	220 KV Muzaffarpur-Hazipur D/C are out due to tower collapse. Hazipur was supplied through 132 KV Samastipur-Hazipur S/C. 132 kV Hazipur - Shetalpur - Chapra link (Shetalpur supplied from Vaishali & Chapra supplied from Siwan) and 132 kV Hazipur - Jandaha link was open from Hazipur to control loading at upstream network. At 19:20 hrs, 132 KV Samastipur- Hazipur S/C tripped due to R phase drop jumper snapping at Samastipur S/S.
53	BSPTCL	24-Jun-17	14:25	0	100	GD-I	132/33 kV ATR - I & II at Arrah (BSPTCL) tripped due to operation of overflux operation.
54	ISTS	24-Jun-17	15:49	770	0	GD-I	400 kV Teesta III - Rangpo S/C tripped on O/C from Teesta III end. DT received at Rangpo. Delayed fault clearance has been observed
55	BSPTCL	28-Jun-17	15:02	0	60	GD-I	220 KV Ara-Nandokhar S/C was opened due to O/V. Nandokhar was radially connected to Sasaram. Total power failure at Nandokhar occurred after tripping of 220 kV Sasaram - Nandokhar S/C due to DT received at Nandokhar end. 220KV Ara-Khagul D/C were opened due to O/V prior due to disturbance.
56							220 KV Ara-Nandokhar S/C was opened due to O/V. Nandokhar was radially connected to Sasaram. Total power failure at Nandokhar occurred after tripping of 220 kV Sasaram - Nandokhar

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
	BSPTCL	28-Jun-17	15:52	0	60	GD-I	S/C due to DT received at Nandokhar end. 220KV Ara-Khagul D/C were opened due to O/V prior due to disturbance.
57	JUSNL	3-Jul-17	18:32	0	76	GD-I	Total loss of power supply occurred at Sahebgunj and Lalmatia after hand tripping of all 132 kV & 220 kV lines connected to Lalmatia S/S due to DC failure at Lalmatia.
58	ISTS	3-Jul-17	18:53	0	536	GD-I	On mal-operation of Bucholtz relay due to ingress of moisture through cables during rain, 400/220 kV 500 MVA ICT - I at Patna tripped at 18:53 hrs. Prior to the tripping, total loading of the ICTs was 571 MW. After tripping of ICT - I, loading at other 400/220 kV ICT (315 MVA) at Patna increased to 430 MW. At 19:14 hrs, 400/220 kV ICT - II tripped due to overload resulting load loss at surrounding area.
59	DVC	13-Jul-17	20:18	0	201	GD-I	At 20:18 hrs, all 220 kV feeders along with 400/220 kV ICTs (connected to 400 kV Bokaro A bus) and 220/132 kV ATRs at Bokaro B tripped due to bus bar protection operated for R phase PT failure at 220 kV Bokaro B main bus. Heavy thundering was reported at Bokaro end.
60	JUSNL	15-Jul-17	9:40	0	22	GD-I	132 kV Kahalgaon(BSPTCL) - Lalmatia S/C tripped at 09:50 hrs on E/F causing load loss of 22 MW at Sahebgunj. 132 kV Kahalgaon(NTPC) - Lalmatia S/C also tripped at the same time from Lalmatia on E/F. 132 kV Kahalgaon(BSPTCL) - Lalmatia S/C & 132 kV Kahalgaon(NTPC) - Lalmatia S/C tripped again at 13:54 hrs on E/F.
61	ISTS	16-Jul-17	0:30	100	0	GD-I	400 kV Teesta III - Dikchu S/C (tripped only from Teesta III end) and Unit #I at Dikchu tripped due to operation of cable differential protection (B phase current 1.1 kA at Teesta III) resulting generation loss at Unit # II at Dikchu due to loss of evacuation path.
62	ISTS	24-Jul-17	15:56	670	0	GD-I	400 kV B/C at Teesta III tripped on receipt of SPS signal resulting in tripping of unit I, II & IV. However both circuits of 400 kV Rangpo - Binaguri D/C were in service. Flow in 400 kV Rangpo - Binaguri D/C was around 800 MW/Ckt. Rangpo personnel

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
							verbally confirmed non increment of TX counter dedicated for transmitting SPS signal.
63	ISTS	24-Jul-17	19:11	420	0	GD-I	Due to Rotor Earth Fault in Unit #5, there was a dip in DC Voltage during Unit 5 Start-up (DC Field Flushing) leading other synchronized units to No Load Operation.
64	ISTS	27-Jul-17	10:08	1070	0	GD-I	At 10:08 hrs 400 kV Rangpo – Binaguri – II tripped due to B-N fault. (DEF, F/C at Rangpo and DT received at Binaguri). After tripping of circuit – II, power flow in 400 kV Rangpo – Binaguri – I became more than 850 MW (1700 MW approx.) and SPS – I (generation reduction at Teesta III, Dikchu, JLHEP and Chujachen.) got activated resulting tripping of one unit at each power plant at Chujachen, JLHEP and Dikchu. Due to non-tripping of any unit at Teesta III, power flow in 400 kV Rangpo – Binaguri – I remained more than 850 MW for more than 500 ms and SPS – II got activated resulting tripping of 400 kV Teesta III – Rangpo S/C followed by tripping of remaining units at Teesta III and Dikchu due to loss of evacuation path.
65	OPTCL	31-Jul-17	11:24	0	150	GD-I	B phase isolator drop jumper of 220 kV Tarkera - Chandiposh - Rengali snapped at Tarkera end at 11:24 hrs. But relay at Tarkera end failed to operate due to DC failure in relay panel of same line resulting tripping of all elements connected to 220 kV Bus at Tarkera due to LBB operation.
66	OPTCL	1-Aug-17	13:07	30	120	GD-I	At 13:07 hrs, one mentally challenged person entered into the substation and tried to climb the switchyard tower. To avoid unwanted accident all the emanating lines / ICTs from 220KV Meramundali were hand tripped.
67	JUSNL	3-Aug-17	11:45	0	78	GD-I	220 kV Ranchi - Hatia D/C and 220 kV Patratu - Hatia D/C along with all 220/132 kV ATR at Hatia end tripped due to DC failure of Hatia S/S.
68							400 KV Teesta III-Dikchu S/C tripped at 13:46 Hrs due to operation of directional O/c relay at Teesta III end. Same line did

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
	ISTS	4-Aug-17	13:46	101	0	GD-I	not trip from Dikchu end. In PMU data, no voltage dip has been observed. As per Teesta III end DR of 400 kV Teesta III Dikchu S/C, Dir. O/C picked up at 13:46:27.677 hrs, B phase current was 1.3 kA. As per Teesta III end DR of Teesta III Rangpo Cable, B/up O/C and B/up E/F picked up at 13:46:27.462 hrs. Initially current was high (1.3 kA) in all three phases. Later B phase current reduced. (final f/C 1kA)
69	WBPDCL	11-Aug-17	16:05	284	0	GD-I	At 16:05 hrs all elements connected to Bakreswar 220 kV bus - I along with unit #III & #IV tripped due to operation of bus bar protection (96A) and Bus bar differential (87C, Check zone). At the same time R-N fault has been reported at 0.5 km from Bakreswar in 220 kV Bakreswar - Sadaipur - II. In PMU data, no fault has been captured at 16:05 hrs. However a 23 kV voltage dip in R phase has been observed at 16:01 hrs, which was cleared within 80 ms.
70	ISTS	12-Aug-17	14:51	0	209	GD-I	While availing emergency s/d of 220 kV bus I (East side) at Sasaram, HVDC Sasaram B/B, along with 765/400 kV 1500 MVA ICT - I and 400/220 kV ICT – I & II tripped resulting tripping of all 220 kV feeders eliminating from Sasaram followed by total supply of failure at 220 kV switchyard at Sasaram. As per preliminary information, while transferring all elements to 220 KV Bus II from 220 kV bus I, flashover occurred in 220 kV Bus - I side isolator of 400/220 kV ICT-II. It is suspected that isolator wasn't properly switched off before closing the earth switch.
71	BSPTCL	14-Aug-17	8:55	0	60	GD-I	132 kV Supaul - Phoolparas D/C, 132 kV Kataiya - Duhabi S/C and 132 kV Kataiya - Forbisgunj T/C were under breakdown due to flood condition. At 08:55 hrs 220 kV Purnea - Madhepura D/C tripped on Y-B-N fault causing power failure at Madhepura, Supaul & Kataiya.
72							At 12:18 Hrs, 400 KV RANGPO - TEESTA-3 S/C tripped on B-N fault (Rangpo end: B-N, Z-II, F/C 4.49 kA, 54.7 km; Teesta III end: B-N, Z-I) resulting in outage of units # I, II, III, IV, V & VI (879 MW) at Teesta - III and unit I & II at Dikchu

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
	ISTS	16-Aug-17	12:18	979	0	GD-I	(100 MW) due to loss of evacuation path. Attempt was taken to charge the line from Rangpo end at 12:41 hrs but it immediately tripped in SOTF.
73	ISTS	21-Aug-17	13:50	0	84	GD-I	At 13:04 Hrs, 132 KV Banka-Sultanganj D/C tripped due to B-N fault. While attempting charging of Ckt II at 13:30 Hrs, it tripped on SOTF. Along with this line, both 400/132 KV ICTs at Banka also tripped.
74	DVC	27-Aug-17	7:36	0	323	GD-I	Due to massive fire hazard at 132/33/3.3 kV station transformer # III at Waria all 220 kV and 132 kV feeders are hand tripped resulting in total power failure at surrounding area. In Durgapur PMU data, delayed clearance (700 ms) of Y-B phase fault (15 kV voltage dip) has been observed at 07:35 hrs.
75	DVC	28-Aug-17	13:25	406	0	GD-I	Due to bursting of R phase CT of U # VIII GT at CTPS B, 220 KV CTPS B-CTPS A-I, 220 KV CTPS B-Dhanbad-II, 220 KV CTPS B-Bokaro B-I & CTPS B unit # 7 and # 8 tripped along with bus - I at CTPS - B. Consequently 400/220 kV ICT at Bokaro A loading became more than 299 MW. After opening of 220 kV Bokaro B - Jamshedpur D/C and 220 kV Dhanbad - Giridih D/C at 13:30 hrs, ICT loading got reduced to 255 MW. Further at 15:15 hrs, 132 kV Bokaro - Konar S/C and 132 kV Bokaro - Bari S/C were opened to reduce 400/220 kV ICT loading.
76	ISTS	30-Aug-17	5:15	60	2.5	GD-I	At 5:15 hrs. 132 KV Siliguri-Kurseong S/C, 132 KV Siliguri Melli S/C and 132 KV Rangit-Rangpo S/C tripped on R-B-N fault. As a result, all running units of Rangit(3 x 20 MW) tripped on over frequency and subsequently,132 KV Rangit-Kurseong S/C and 132 KV Rangit-Sagbari S/C were hand tripped.
77	ISTS	31-Aug-17	0:39	60	3.5	GD-I	At 00:39 hrs. 132 KV Siliguri-Kurseong S/C, 132 KV Siliguri Melli S/C and 132 KV Rangit-Rangpo S/C tripped on R-B-N fault. As a result, all running units of Rangit(3 x 20 MW) tripped on over frequency and subsequently,132 KV Rangit-Kurseong S/C and 132 KV Rangit-Sagbari S/C were hand tripped.

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
78	BSPTCL	5-Sep-17	10:17	0	130	GD-I	At 10:17 hrs, 220 kV Darbhanga (DMTCL) - Motipur D/C and 220 kV MTPS - Motipur D/C tripped from DMTCL & MTPS end only in B-N, Z-III due to fault in 220 kV Motipur - Musari section. As Darbhanga (BSPTCL) was being supplied from Motipur, total power failure occurred at Darbhanga (BSTPCL) & Musari and their surrounding area. Gangwara load of Samastipur remained connected via transfer bus at Darbhanga (BSPTCL) with Samastipur' s source.
79	BSPTCL	6-Sep-17	9:52	0	150	GD-I	Tripping of 220 kV Purnea - Madhepura D/C on Y-B-N fault at 09:52 hrs resulted power failure at Madhepura , Supaul, Saharsa and Lahan (Nepal load).
80	BSPTCL	7-Sep-17	18:57	0	210	GD-I	Tripping of 220 kV Muzaffarpur - Hazipur D/C from Hazipur on operation of Bus bar protection at Hazipur at 18:57 hrs resulted power failure at Hazipur which was radially fed from Muzaffarpur.
81	BSPTCL	9-Sep-17	10:42	0	80	GD-I	Tripping of 132 kV Lakhisarai - Lakhisarai D/C at 10:42 hrs resulted total power failure at BSPTCL end which was radially fed from PG end.
82	WBSETC L	9-Sep-17	13:47	0	70	GD-I	Delayed clearance of Y-N fault of 400 kV Arambag - Kolaghat S/C due to stuck breaker at Arambag end resulted operation bus differential protection at 400 kV bus - II followed by tripping of all feeders and 400/220 kV ICTs connected to bus - II.
83	BSPTCL	15-Sep-17	19:25	0	530	GD-I	After tripping of ICT I (500 MVA) due to rebooting of differential relay other ICT at Patna (315 MVA) also tripped due to overloading resulting total power failure at Sipara and Khagul which was radially fed from Patna
84	BSPTCL	17-Sep-17	18:13	0	140	GD-I	At 18:00 Hrs, 220 kv Purnea-Madhepura # I tripped from Madhepura end on B-N fault. At 18:13 Hrs, 220 kv Purnea-Madhepura # II tripped on Y-B-N fault causing power failure at Madhepura,Supaul,Kataiya, Sonbarsa and Udakishanganj (Total 140 MW).

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
85	ISTS	24-Sep-17	0:33	290	0	GD-I	Due to three phase fault in 220 kV Chukha - Birpara D/C (during inclement weather condition) at Birpara S/S, 220 kV Chukha Birpara D/C and 220 kV Chukha - Malbase S/C tripped from Birpara end and 220 kV Birpara - Malbase S/C tripped from Malbase end.
86	DVC	26-Sep-17	13:25	360	0	GD-I	Both the running units at CTPS B tripped due to tripping of bus II at CTPS B.
87	ISTS	12-Oct-17	12:55	170	0	GD-I	At 12:55 hrs, Y-N fault occurred at 400 kv Teesta - Rangpo - II. A/R operation started at Teesta end(As per Teesta V) But before A/R operation, current in Y phase at Teesta was varying between 600 A and 1.2 kA for 600 ms. At same time, voltage dip observed in Y and B phase at Binaguri PMU data. At same time, B/C at Teesta tripped due to E/F protection resulting tripping of unit III due to loss of evacuation path. (Relay Indication at Teesta: Y-N , Z-1 , F/D- 18 KM , F/C - 4.5 KA)
88	ISTS	13-Oct-17	14:39	750	0	GD-I	400 kV Teesta III - Rangpo S/C tripped due to Y-B fault resulting tripping of unit I, III, IV, V & VI at Teesta III and running unit at Dikchu. Relay indication: Y-B, Z-I, 29.4 km from Teesta III, F/C 4.16 kA, 3.22 kA. (Loss of generation at Teesta III: 0.1299 MU)
89	OPTCL	17-Oct-17	10:23	0	230	GD-I	220 kV Mendasal - Chandaka Q/C tripped due to fault in 220 kV Mendasal - Chandaka - I resulting power failure at Chandaka end. Power was extended to Chandaka by charging circuit II
90	BSPTCL	18-Oct-17	18:19	0	200	GD-I	At 18:19 hrs, 132 KV Purnea(PG) - Purnea(BSPTCL) T/C tripped (from PG end only) due to failure of B phase jumper of line isolator at Bihar end (No tripping at Bihar side) of 132 KV Purnea-Purnea - III. Simultaneously 132 KV Purnea (PG) - Phorbisganj S/C tripped on overload resulting total power failure at 132 /33KV Purnea S/S (BSPTCL). 132 KV Khagaria & Naugachia shifted to Barauni source.
91	ISTS	19-Oct-17	11:55	58	0	GD-I	At 11:55 hrs , 400 KV Teesta III Dikchu S/C tripped on Y- B-N fault resulting loss of unit II at Dikchu

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
92	BSPTCL	20-Oct-17	23:53	0	124	GD-I	Total power failure occurred at Madhepura, Saharsa, Sonebarsa and Udaikishanganj after tripping of 220 kV Purnea - Madhepura D/C due to Y-N fault.
93	BSPTCL	26-Oct-17	9:22	0	32	GD-I	Total power failure occurred at Sultanganj, Tarapur and Part of Munger after tripping of 132 kV Banka – Sultanganj D/C in R-N fault (Relay Indication: Ckt II: R- N, F/C 2.19 kA, 41.27 km from Banka, Ckt I: R-N, 2.8 kA, 31.62 km from Banka).
94	ISTS	26-Oct-17	12:02	460	0	GD-I	At 12:02 hrs, 400 kV Teesta III – Dikchu S/C along with all running units at Teesta III tripped on O/V (as reported by Teesta III) at Teesta III end. Running unit (U#1) at Dikchu tripped due to loss of evacuation path. Breaker of 400 kV Teesta III – Dikchu S/C at Dikchu end was manually opened at 12:07 hrs. No fault is observed in PMU data. Voltage at Teesta III is 409 kV(as per ERLDC SCADA data).
95	ISTS	27-Oct-17	13:17	850	0	GD-I	At 13:17 hrs, 400 kV Teesta III – Dikchu S/C along with all running units at Teesta III tripped due to DC earth fault (as reported by Teesta III) at Teesta III end. Running unit (U#1) at Dikchu tripped due to loss of evacuation path. Breaker of 400 kV Teesta III – Dikchu S/C at Dikchu end was manually opened at 13:20 hrs. No fault is observed in PMU data. Voltage at Teesta III is 409 kV(as per ERLDC SCADA data). Both the buses in Teesta III in live condition as 400 kV Teesta III – Rangpo S/C did not trip.
96	BSPTCL	02/11/17	13:18	0	66	GD-I	At 13:18 Hrs total power failure occurred at Motipur, Musari, Darbhanga, Madhubani, Jainagar, Phoolparas due to tripping of 220 KV Darbhanga-Motipur D/C due to Y-B-N fault. At the same time, 220 KV Muzaffarpur (MTPS)- Motipur D/C also tripped.
97	WBSETCL	03/11/17	14:43	0	70	GD-I	Total power failure occurred at 132 KV Birpara S/S (WB) when 132 KV Birpara-Birpara D/C tripped due to failure of B phase LA of 132 KV Birpara-Birpara-II at WB end. At same time, 132 KV Birpara-Birpara-I tripped from WB end on directional E/F

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
98	ISTS	12/11/17	1:36	40	0	GD-I	At 01:30 hrs 220 kV Tashiding - New Melli S/C and 220 kV Tashiding - Rangpo S/C tripped in Y-N fault resulting generation loss of 40 MW due to loss of evacuation path.
99	BSPTCL	13/11/17	2:50	0	38	GD-I	Total power failure occurred at Sultanganj and Hatidah after tripping of 132 kV Banka – Sultanganj D/C, Ckt I tripped from Sultanganj only and Ckt II tripped from Banka only.
100	JUSNL	23/11/17	11:56	0	145	GD-I	220 kV main bus II at Patratu was under shutdown. So all elements were connected to main bus I. At 11:55 hrs 220 kV TVNL - Patratu S/C and 220 kV Hatia - Patratu D/C tripped resulting total loss of power supply at 220/132 kV Patratu S/S. Delayed fault clearance was observed in Y & B phases. During restoration both units at TVNL were tripped at 12:52 hrs. Voltage fluctuation was reported at TVNL bus.
101	Sikkim	29/11/17	5:52	0	32	GD-I	Due to flashing of PG clamp of line bay of 66 kV Kalimpong - Melli S/C, 132 KV Sagbari-Melli S/C, 132 KV Siliguri-Melli S/C and 132 KV Rangpo-Melli S/C were switched off resulting total power failure at 132/66 kV Melli S/S and its surrounding area
102	BSPTCL	6-Dec-17	18:22	0	170	GD-I	At 18:22 hrs, total power failure occurred at 220/132 kV Madhepura S/S due to tripping of 220 kV Madhepura - Purnea D/C resulting interruption of supply at Supaul, Sonebarsa, Madhepura, Saharsa, Kushaha(Nepal) & Udaikashigunj. No load loss occurred at Kataiya & Phorbisganj as they were fed from Old Purnea.
103	ISTS	9-Dec-17	10:57	0	174	GD-I	At 10:57 hrs, all lines connected to 400/132 kV Motihari S/S tipped due to operation of bus bar protection of both bus I & II. It was reported that motorized earth switch connected to main bay of 125 MVAr B/R I (connected to bus II) became grounded resulting operation of bus bar operation at both buses. In PMU data, delayed cleared three phase fault has been observed.
104	BSPTCL	13-Dec-17	16:43	0	226	GD-I	At 16:43 hrs 220 kV Patna - Sipara D/C and 220 kV Khagul Sipara S/C tripped due to spurious bus bar protection operation at Sipara S/S resulting total power failure at Sipara S/S.

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
105	BSPTCL	13-Dec-17	17:19	0	100	GD-I	After the initial disturbance at Sipara at 16:43 hrs, during restoration 220 kV Patna Sipara D/C tipped again at 17:19 hrs while extending power to Khagul and supply to Sipara S/S got interrupted again.
106	WBSETC L	15-Dec-17	6:01	0	55	GD-I	At 06:01 hrs 132 kV Malda - Malda - II tripped from both ends (PG end: R-N, F/C 9 kA; WB end: R-B-N, 11.38 km). At same time 132 kV Malda - Malda - I (R- B-N, 3.69 km from WB end) also tripped from WB end. This circuit was later manually opened from PG end. 220/132 kV ATR I & II at Malda (PG) also tripped on operation of back up directional O/C relay. Line length of 132 kV Malda - Malda D/C is 10 km. It is suspected fault was at 132 kV Malda - Malda - I and this was not cleared from PG end resulting tripping of ICTs in back up O/C. 132 kV Malda - Malda - II tripped due to operation of non directional high set o/c protection.
107	BSPTCL	20-Dec-17	13:52	0	130	GD-I	220 kV Muzaffarpur - Hazipur - I was under shut down. At 13:52 hrs 220 kV Muzaffarpur - Hazipur - II tripped in Y-B-N fault resulting total power loss at Hazipur, Siwan, Chapra & Amnour.
108	ISTS	22-Dec-17	10:49	0	90	GD-I	220/132 kV ICT - II at Purnea (PG), 132 kV Purnea - Purnea - II and 132 kV Purnea - Kishangunj were under shutdown. At 10:49 hrs, 220/132 kV Purnea S/S became dead due to tripping of 132 kV Purnea - Purnea - I & II (Relay indication 67N & 86 at PG end) and 220/132 kV ICT - I & III at Purnea (PG) (Relay indication 67N & 86 for ICT III and O/C & 86 IB = 4.2 kA for ICT I).
109	BSPTCL	22-Dec-17	17:10	0	135	GD-I	220 kV Gaya - Bodhgaya D/C were under shutdown. 220 kV Biharshariff - Khijasarai - II tripped from both ends (BSF end: Y-N, Z-I, 1.6 km, 18 kA; Khijasarai end: Y-N, 36.4 km) due to Y phase jumper snapping at location no 237. At the same time, 220 kV Biharshariff - Khijasarai - I tripped from the both ends (BSF end: Y- N, O/C, fault duration: 18.39 ms; Khijasarai end: E/F) and 220/132 kV ATR - II at Biharshariff tripped due to operation of differential relay (Fault duration 73 ms). As Bodhgaya was radially fed through 220 kV Biharshariff -

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
							Khijasarai - Bodhgaya D/C, total power failure occurred at 220/132 kV Bodhgaya S/S after tripping of 220 kV Biharshariff - Khijasarai D/C.
110	ISTS	10-Jan-18	17:34	1050	0	GD-I	At 17:34 hrs tripping of 400 kV Binaguri - Rangpo - II on R-Y-N fault initiated of SPS - I operation which resulted in tripping of B/C at Teesta III and unit tripping at Tashiding. As only one unit was in service at Chujachen and Dikchu, no generation reduction occurred due to operation of SPS - I. Though power flow through 400 kV Binaguri - Rangpo - I was more than 850 MW for less than 350 ms(as per PMU data), SPS - II operated resulting tripping of 400 kV Teesta III - Rangpo S/C and the running unit at Teesta III and Dikchu.
111	BSPTCL	14-Jan-18	23:20	0	124	GD-I	220/132 kV ICT - II at Purnea, 132 kV Purnea - Kishangunj S/C and 132 kV Purnea - Purnea III were under shut down. At 23:20 hrs 132 kV Purnea - Purnea I & II tripped from BSPTCL end only due to operation of O/C relay.
112	DVC	19-Jan-18	12:23	189	558	GD-I	During normalization of 220 kV bus II at Kalyaneswari, 220 kV bus I failed along with bus tie breaker resulting tripping of all connected lines and ATRs at 12:25 hrs. Subsequently 220/132 kV ATR I, II & III tripped on O/C . DSTPS #4 tripped at same time as its auxiliary power was supplied through 220/132 kV ATRs at DSTPS.
113	JUSNL	20-Jan-18	13:28	0	23	GD-I	At 13:28 Hrs, 132 KV KhSTPP-Lalmatia and 132 KV Kahalgaon (BSPHCL)-Lalmatia tripped from Lalmatia end only, leading to load loss at Sahebgunj.
114	DVC	30-Jan-18	10:46	1273	218	GD-I	Due to problem in tie CB of 400 kV Koderma - Gaya - II and 400 kV Koderma - Biharshariff - II, all 400 kV lines i.e. 400 kV Koderma - Biharshariff D/C, 400 kV Koderma - Gaya D/C & 400 kV Koderma - Bokaro A D/C along with all 400/220 kV ICTs at Bokaro A & Koderma tripped resulting loss of total power supply at Koderma and Bokaro A and running units at Koderma & Bokaro A.

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
115	JUSNL	9-Feb-18	15:00	180	200	GD-I	220/132KV ICT-II at Patratu and 132 KV Namkum Hatia(2) S/C were under shutdown. At 15:00 hrs 220 kV TVNL - Patratu S/C (at Patratu end), 220 kV Patratu - Hatia D/C (Ckt - I at Patratu end and Ckt - II at Hatia end), 132 kV Hatia - Hatia T/C, 132 kV Namkum - Hatia S/C (at Hatia end), 220/132 kV ICT - I at Patratu tripped along with unit - I at TVNL. As per PMU data, initially fault was in B phase (fault clearing time 500ms approx). After (around 200 ms later the initial fault) clearing the fault in B phase, another fault was observed in Y phase (fault clearing time <100 ms)
116	DVC	19-Feb-18	18:12	630	288	GD-I	At 18:12 hrs, all the running units at Mejia (U#2, #3 & #6) along with all connected lines trpped due to bus fault at Mejia S/S
117	DVC	9-Mar-18	17:15	180	300	GD-I	On 09-03-18 at 17:15 hrs, total power failure occurred at 220/132 kV Waria S/S along with tripping of all 220/132 kV ATRs and running units(U #4) at Waria.
118	BSPTCL	21-Mar-18	13:03	0	175	GD-I	On 21-03-18, 220 KV Muzaffarpur-Hazipur-I tripped on B-N fault at 12:57 hrs and 220 KV Muzaffarpur- Hazipur-II tripped due to Y-B at 13:03hrs. As Hazipur was radially fed from Muzaffarpur through 220 KV Muzaffarpur-Hazipur-D/C lines, total power failure occurred at 220/132 kV Hazipur S/S.
119	ISTS	22-Mar-18	20:38	0	0	GD-I	220 kV Jorethang - New Melli D/C tripped at Jorethang end on R-N fault at 20:38 hrs (R/I at Jorethang: Ckt I: R- N, 7.14 km; Ckt II: R-N, Z-I, 7.2 km). At same time 220 kV Rangpo - Tashiding S/C (A/R was successful at Rangpo end; R/I R-N, 22.56 km, 4.2 kA) and 220 kV Tashiding -New Melli S/C (Did not trip from New Melli end) tripped at Tashiding end. 220 kV Rangpo - New Melli S/C successfully auto reclosed at same time at both the ends (Rangpo: R-N, 22.81 km, 6.47 kA; New Melli: R-N, 5.73 km, 1.13 kA)
120	ISTS	26-Mar-18	17:19	0	0	GD-I	At 17:19 hrs 220 kV Tashiding - Rangpo S/C and 220 kV Tashiding - New Melli (Did not trip at New Melli end) S/C tripped at Tashiding end due to Y-N fault resulting S/S dead at Tashiding.

Sl No	Owner/ Agency	Date	Time	Gen. loss (MW)	Load loss (MW)	Category	Reasons
121	ISTS	28-Mar-18	18:43	10	560	GD-I	Due to Y phase jumper snapping of 220 kV side of 400/220 kV ICT - III resulted tripping of all three 400/220 kV ICTs at Biharshariff and 220 kV Tenughat - Biharshariff S/C (From Tenughat in Z-III) resulting load loss at nearby area.
122	ISTS	30-Mar-18	13:57	740	0	GD-I	At 13:57 hrs all main bays connected to 400 kV bus II at Farakka tripped due to Y-N fault resulting tripping of 400 kV Farakka Malda I, unit V at Farakka and 400/220 kV ICT at Farakka. During restoration attempt at 14:29 hrs both 400 kV bus I & II at Farakka tripped along with unit I, II, III & VI at Farakka, 400KV Farakka - Gokarno - I, 400 kV Farakka - Kahalgaon - I, 400 kV Farakka - Malda - II and 400 kV Farakka - Sagardighi S/C. 400 KV Farakka –Baharampur, 400 KV Farakka- Durgapur D/C & Farakka – Kahalgaon –II remain connected through tie breaker at Farakka s/s

CHAPTER-4

COMMERCIAL

4.1 REGIONAL ENERGY ACCOUNTING (REA)

CERC Regulations on Availability Based Tariff (ABT), applicable for accounting of Capacity charges and Energy charges of Central Sector Generating Stations; transmission charges of Central Sector Transmission Systems and transactions of interstate power through exchange and bilateral mechanisms, was implemented in ER w.e.f 01.04.2003. CERC has issued "CERC TARIFF REGULATIONS, 2014 (Terms and Conditions of Tariff)" which has come into force on and from 01.04.2014. This regulation shall remain in force for a period of five years, i.e upto 2019 from the date of commencement unless reviewed earlier or extended by the Commission.

The following are the major components of Availability Based Tariff (ABT):

a. Capacity Charge inclusive of incentive (for recovery of annual fixed cost)
b. Energy Charge (for recovery of primary fuel cost)
c. Transmission Charges (for recovery of annual fixed cost)
d. Deviation Settlement Mechanism, etc

The first three topics would be dealt with in this section and the fourth topic would be dealt with in the next section. The regional energy accounts bring out the transactions/accounts for Central Generating Stations (CGS), IPPs, LTOA, STOA, etc.

4.1.1 SHARE ALLOCATION FROM EASTERN REGIONAL CENTRAL GENERATING STATIONS

Regional Energy Accounting for CGS is based on the allocations from MoP/CEA. The percentage share of total capacity of each ISGS in ER is allocated to the beneficiaries of Eastern, Northern, Western, Southern and North Eastern Region, which is revised from time to time. Allocations of shares from each ISGS in Eastern Region during 2017-18 are given at **Annexure-XII.**

In case of Un-requisitioned surplus (URS), statement of URS is issued based on the data for surrender/avail of URS.

4.1.2 ACCOUNTING OF CENTRAL GENERATING STATIONS

Capacity Charges:

The capacity charge (inclusive of incentive) in the 2014-19 Tariff regulations payable to a thermal or hydro generating station for a calendar month is ensured if availability of 85 % or more is achieved.

For hydro generating stations the Annual Capacity charge is recoverable from the beneficiaries as per percentage share allocation of each beneficiary after adjustment of 12 % free share of home state. The payment of capacity charge is independent of the energy drawn by the beneficiary and is

dependent only on the Plant Availability Factor for the Month (PAFM). To minimize the cost of power procurement, the beneficiary has the option of lower drawal of energy (paying full capacity charge for its share) and meet demand from other source such as bilateral and power exchange.

The indicative annual capacity charges per year for the thermal and hydro power stations of the Central Sector Generating stations in Eastern Region as on 31.03.2018 for all the ISGS are as under (as per CERC orders).

Sl No	Station Name	Annual Fixed Charges (in Lakhs)
		Thermal
1	Talcher STPS Stage I	₹ 59041.24
2	Kahalgaon-I STPS	₹ 55284.37
3	Kahalgaon-II STPS	₹ 127063.80
4	Farakka STPS Stage I & II	₹ 90876.06
5	Farakka STPS Stage III	₹ 56250.28
6	Barh	₹ 176098.00
		Hydro
1	Rangit HPS	₹ 8134.24
2	TEESTA Stage-V HPS	₹ 49709.79

Energy Charges:

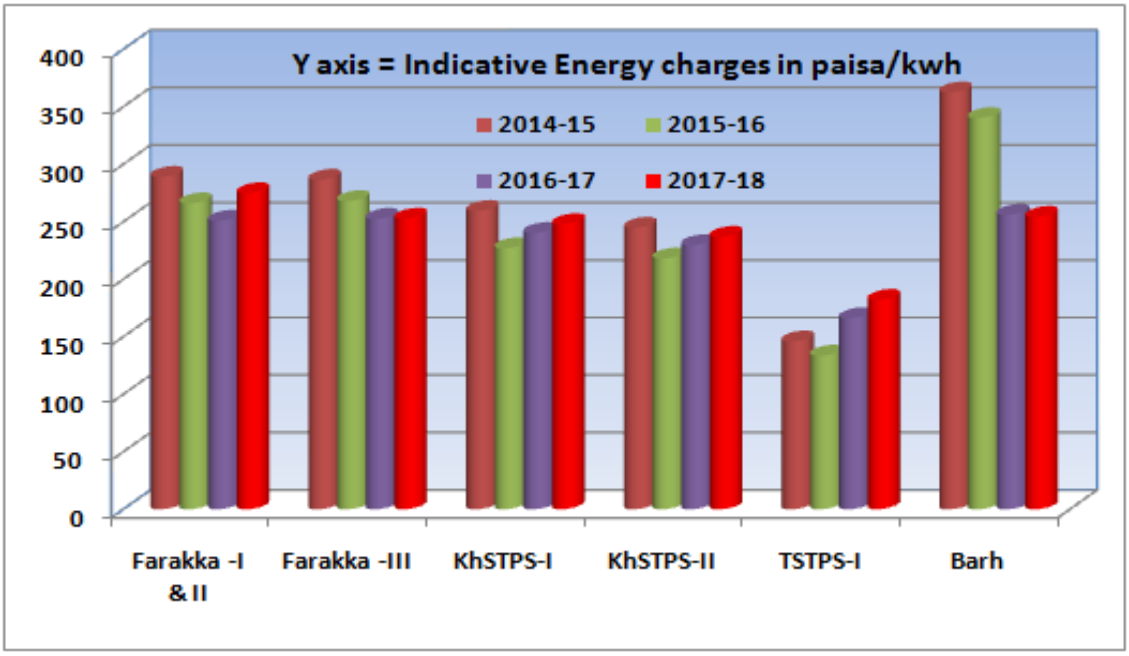
The Energy charges of the Central Generating Thermal Power Stations cover primary fuel cost and monthly fuel price adjustment (FPA). From July, 2011 onwards, the Fuel Price Adjustment has been included in the energy charges. The energy charges payable by every beneficiary, in case of a hydro station, on ex-power plant basis is at the computed Energy Charge Rate (ECR).

The indicative average energy rates for C.S Thermal stations in ER for the year 2017-18 were as under:

Average Energy Charge during 2017-18 (Paise /kWh)

FSTPS Stg- I & II	FSTPS Stg- III	KhSTPS Stg-I	KhSTPS Stg-II	TSTPS Stg-I	Barh Stg-II
274.80	**252.667**	**247.9**	**236.9**	**182.10**	**254.3**

The year wise variation in energy charges for year 2014-15, 2015-16, 2016-17, 2017-18 is given below for reference.



For Rangit HPS & Teesta HPS the indicative energy charge rates were 137.9 paise/kWh and 111.1 paise/kWh respectively for 2017-18 as computed in line with existing CERC Regulation.

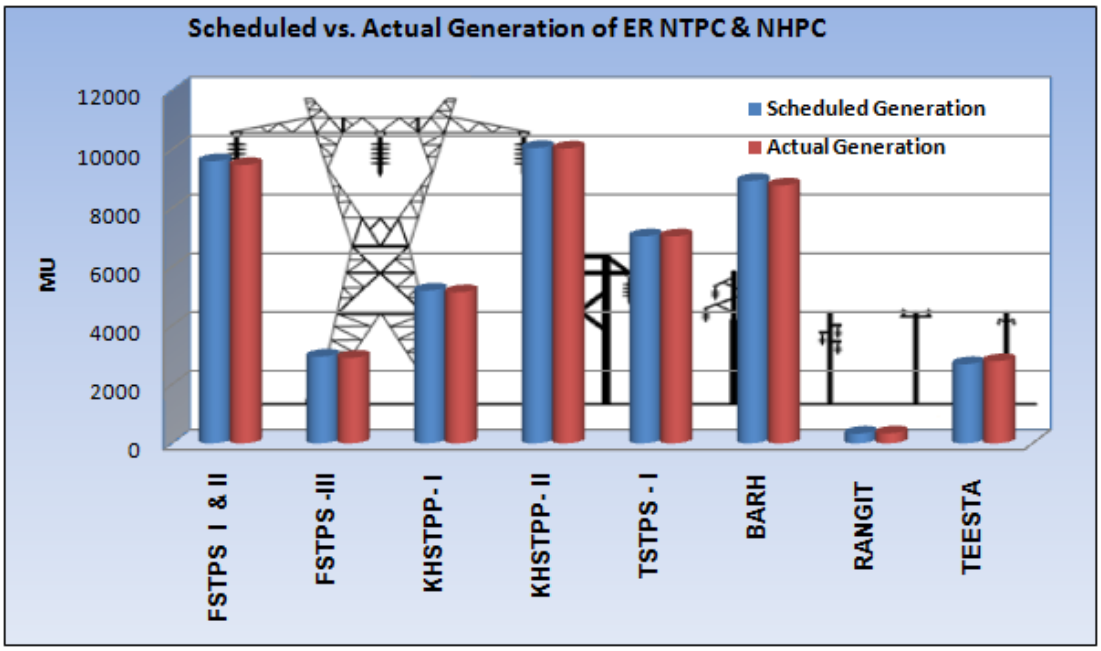
Annual Generation of NTPC and NHPC stations in ER during the year 2017-18:

1. Station wise Generation Scheduled in MU (Ex-Bus)

FSTPS - I & II	FSTPS - III	KHSTPP-I	KHSTPP-II	TSTPS - I	BARH-II	BRBCL	RANGIT HPS	TEESTA HPS
9607.7	2953.7	5200.9	10053.8	7047.8	8936.2	899.04	328.6	2696.3

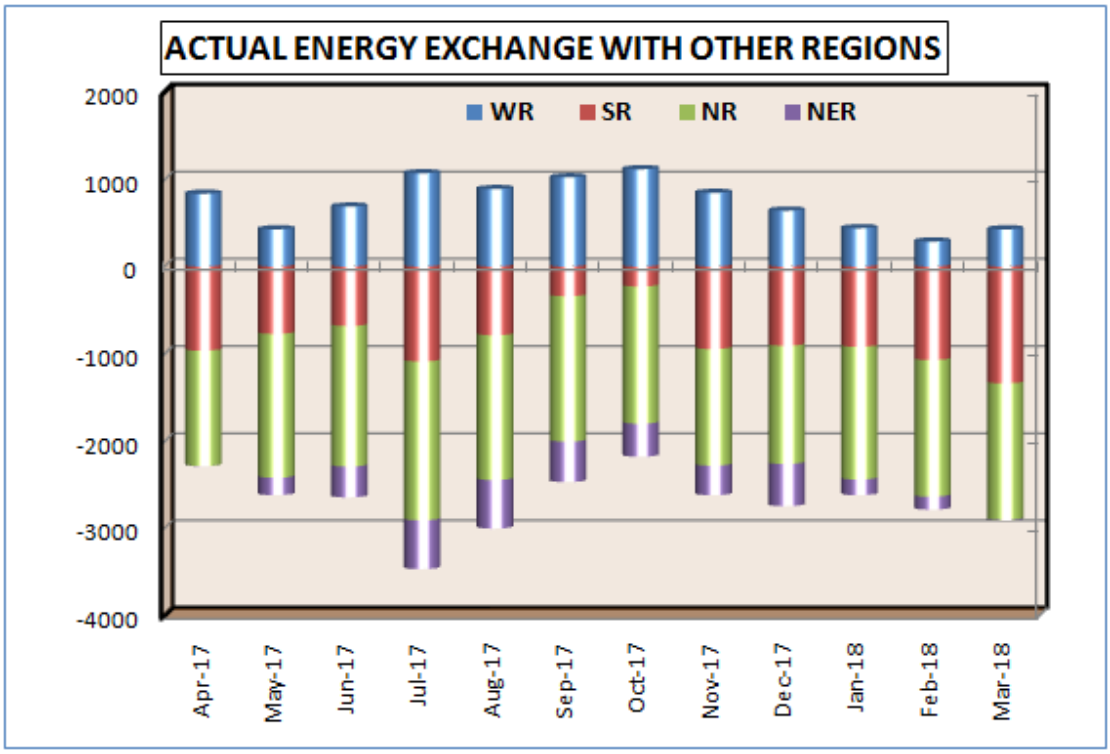
2. Station wise Actual Generation in MU (Ex-Bus)

FSTPS - I & II	FSTPS - III	KHSTPP-I	KHSTPP-II	TSTPS - I	BARH-II	BRBCL	RANGIT HPS	TEESTA HPS
9472.9	2909.2	5143.1	10034.4	7045.4	8778.3	920.9	341.1	2796.9



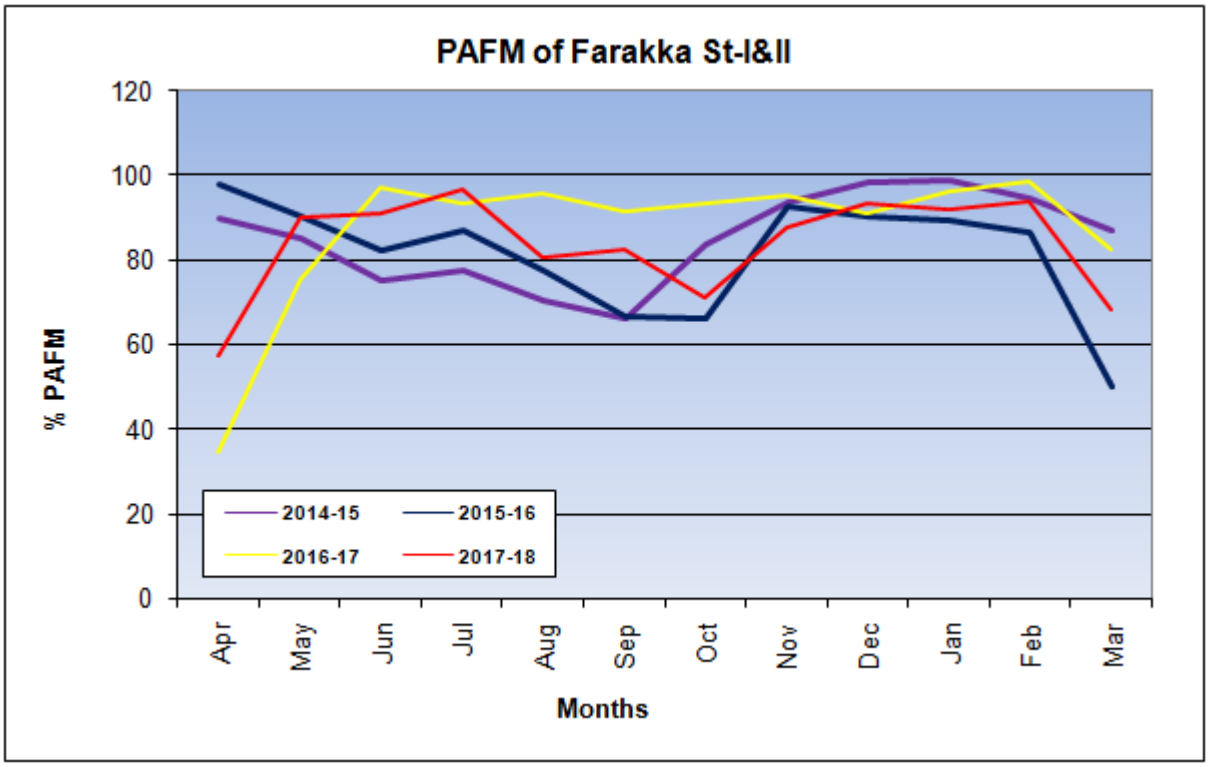
➢ Net scheduled power to other regions (MU) for 2017-18 from NTPC Stations in Eastern Region [Imp. Sch.(+) / Exp. Sch.(-)] :

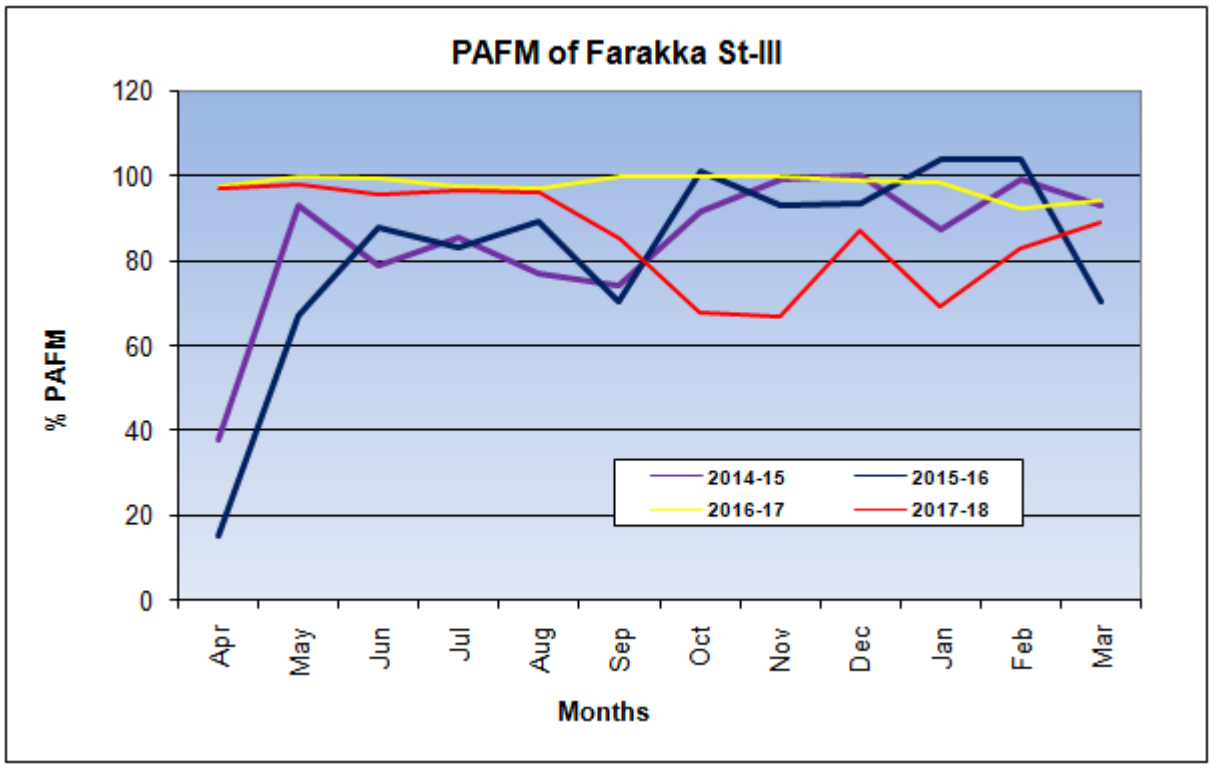
WR	SR*	NR #	NER	TOTAL
-2644.3	-6501.7	-16918.4	-422.7	-26487.1

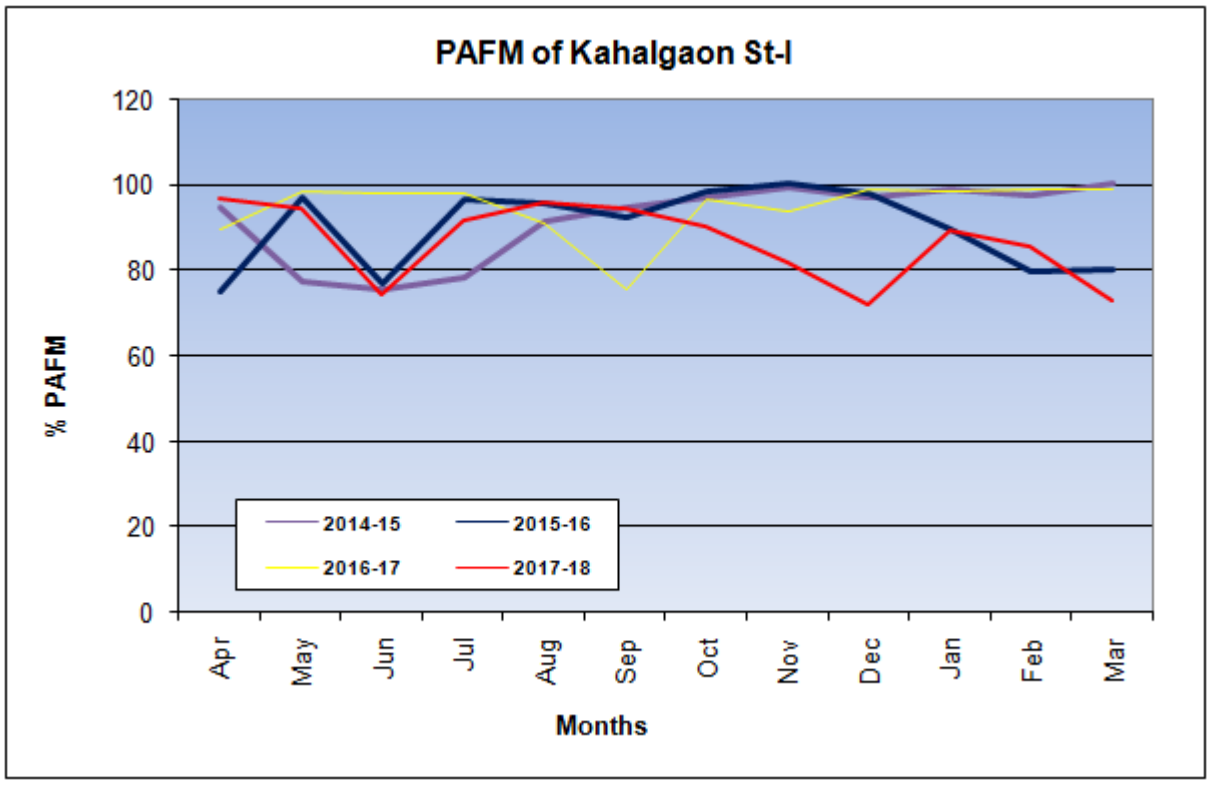


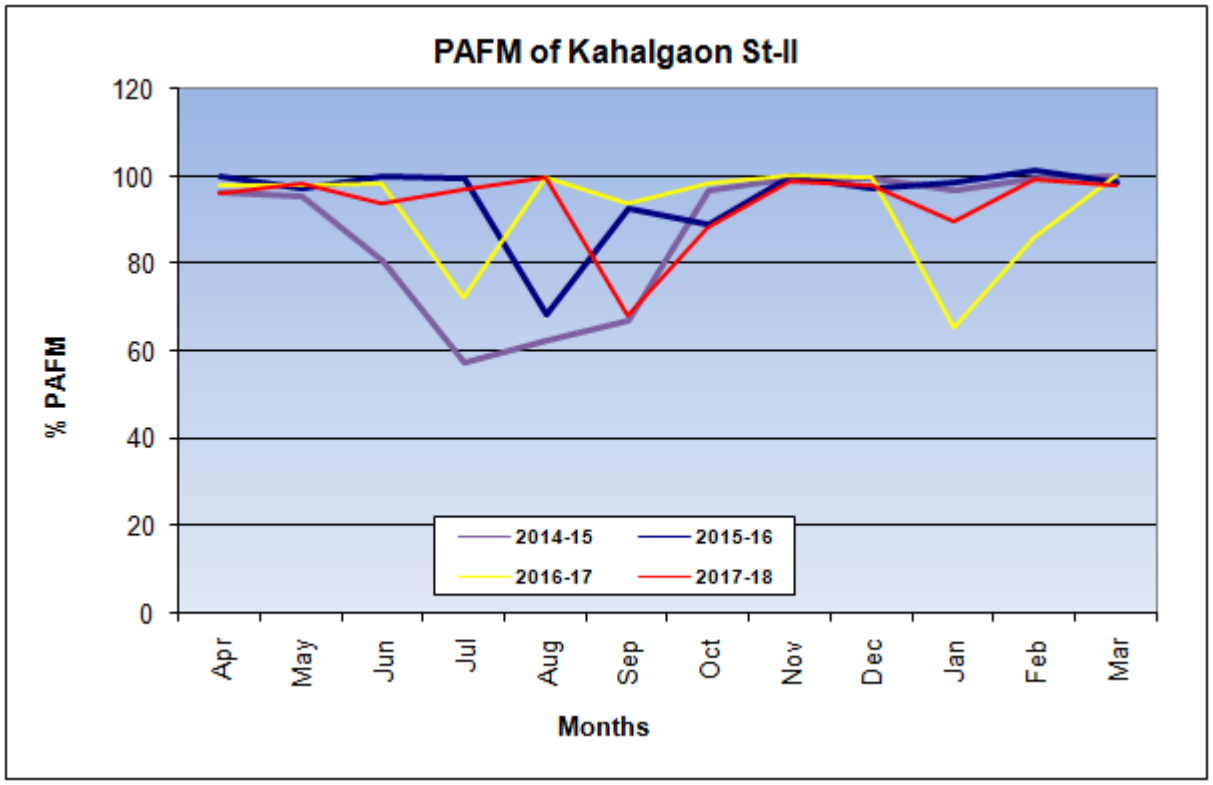
Performance of NTPC Thermal Generating Stations in ER:

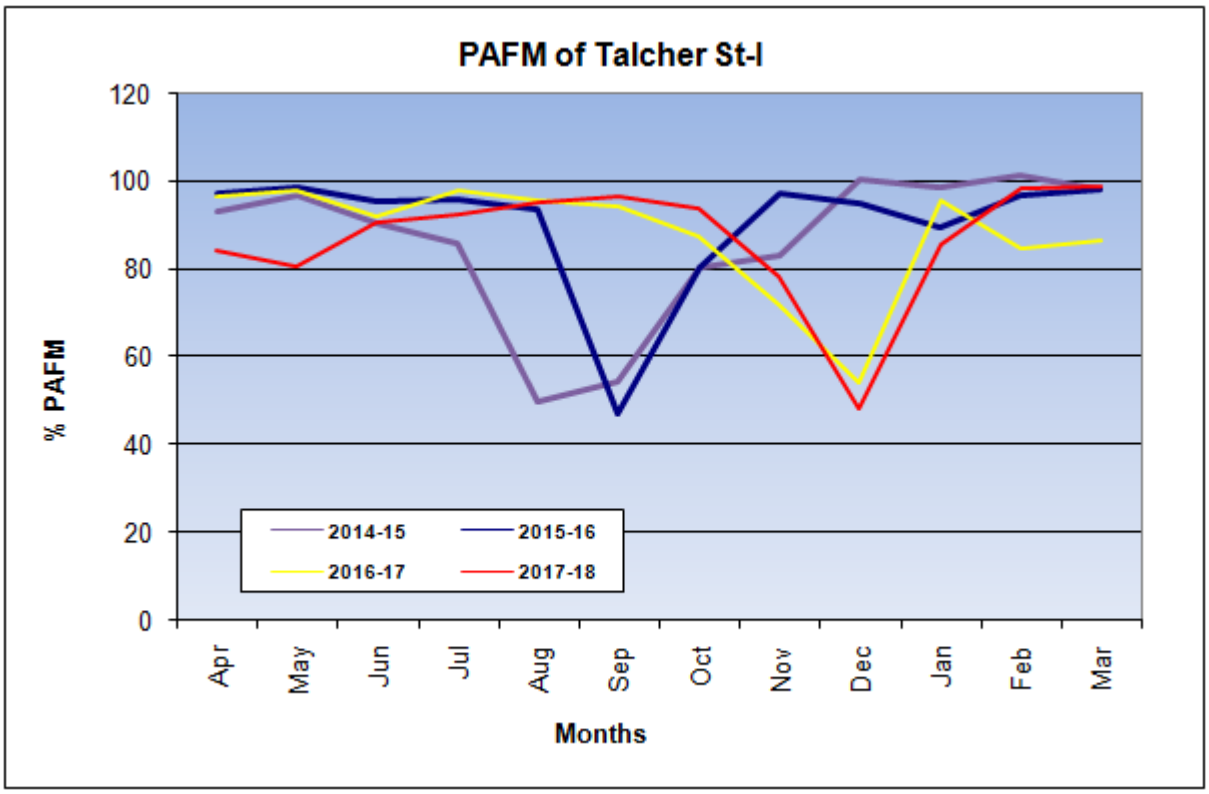
The month wise Plant Availability Factor (PAF) for years 2014-15, 2015-16, 2016-17 & 2017-18 for NTPC stations in Eastern Region is illustrated below:

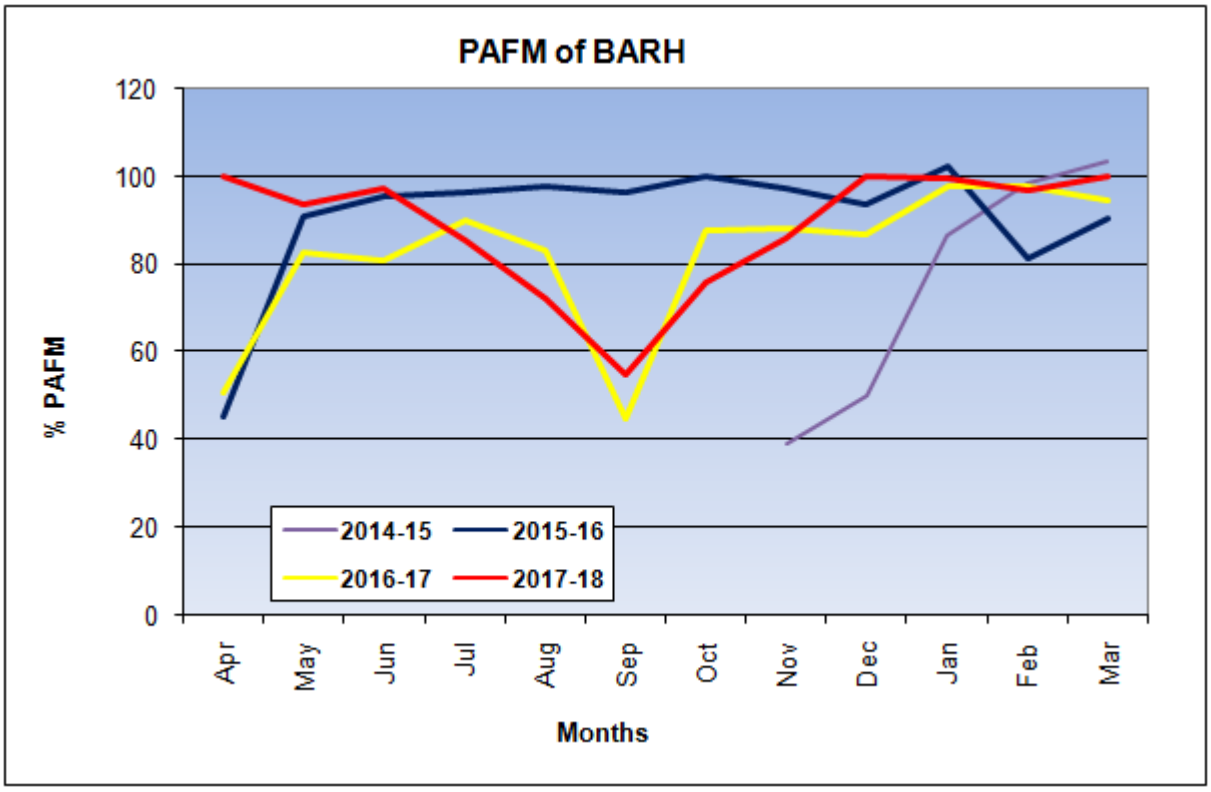




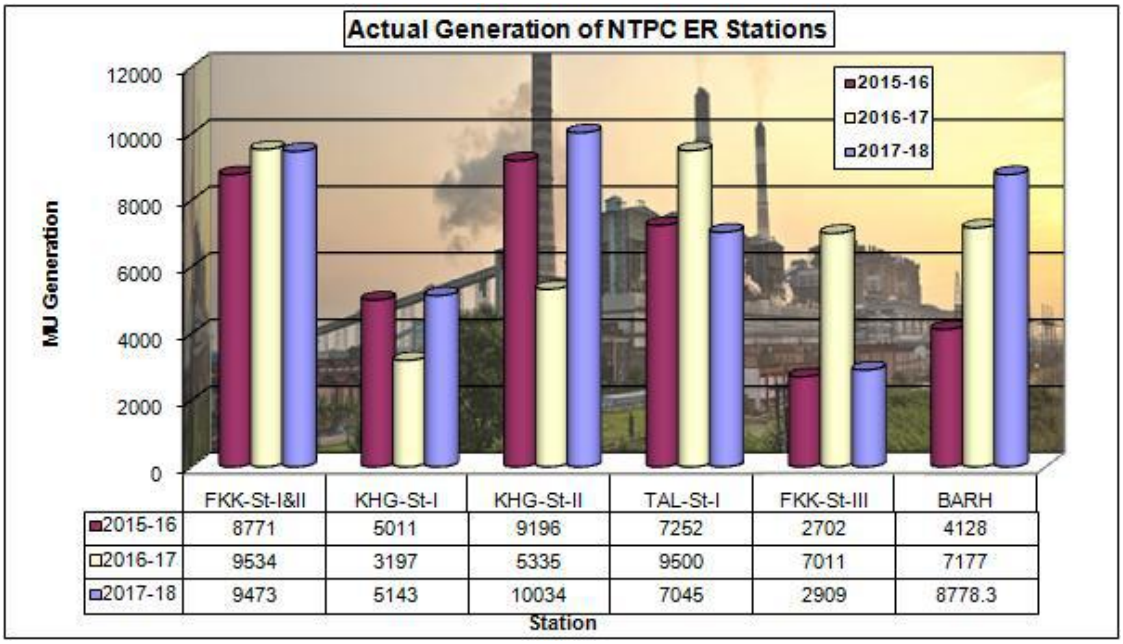

PAFM of Kahalgaon St-I
120
100
80
60
40
20
0
% PAFM
2014-15
2015-16
2016-17
2017-18
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Months


PAFM of Kahalgaon St-II
120
100
80
60
40
20
0
% PAFM
2014-15
2015-16
2016-17
2017-18
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Months


PAFM of Talcher St-I
% PAFM
120
100
80
60
40
20
0
2014-15
2015-16
2016-17
2017-18
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Months


PAFM of BARH
% PAFM
120
100
80
60
40
20
0
2014-15
2015-16
2016-17
2017-18
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Months

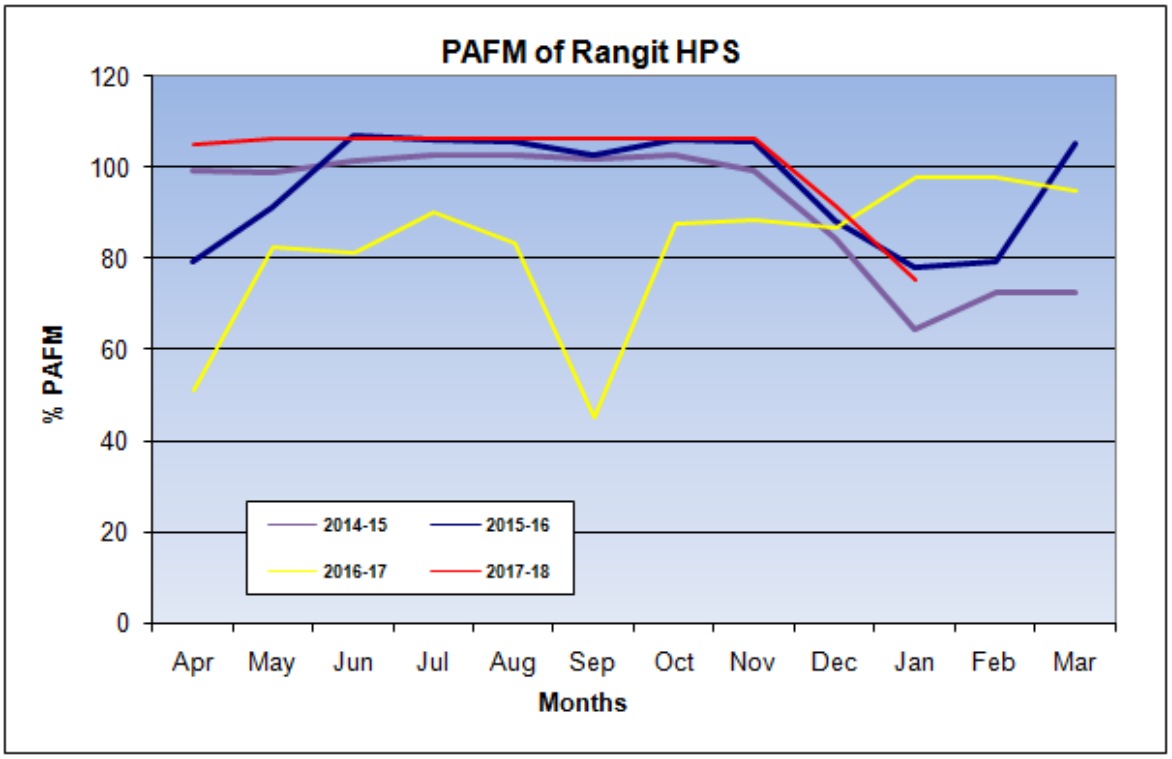
The year on year Actual Generation of NTPC ER Stations are as under:

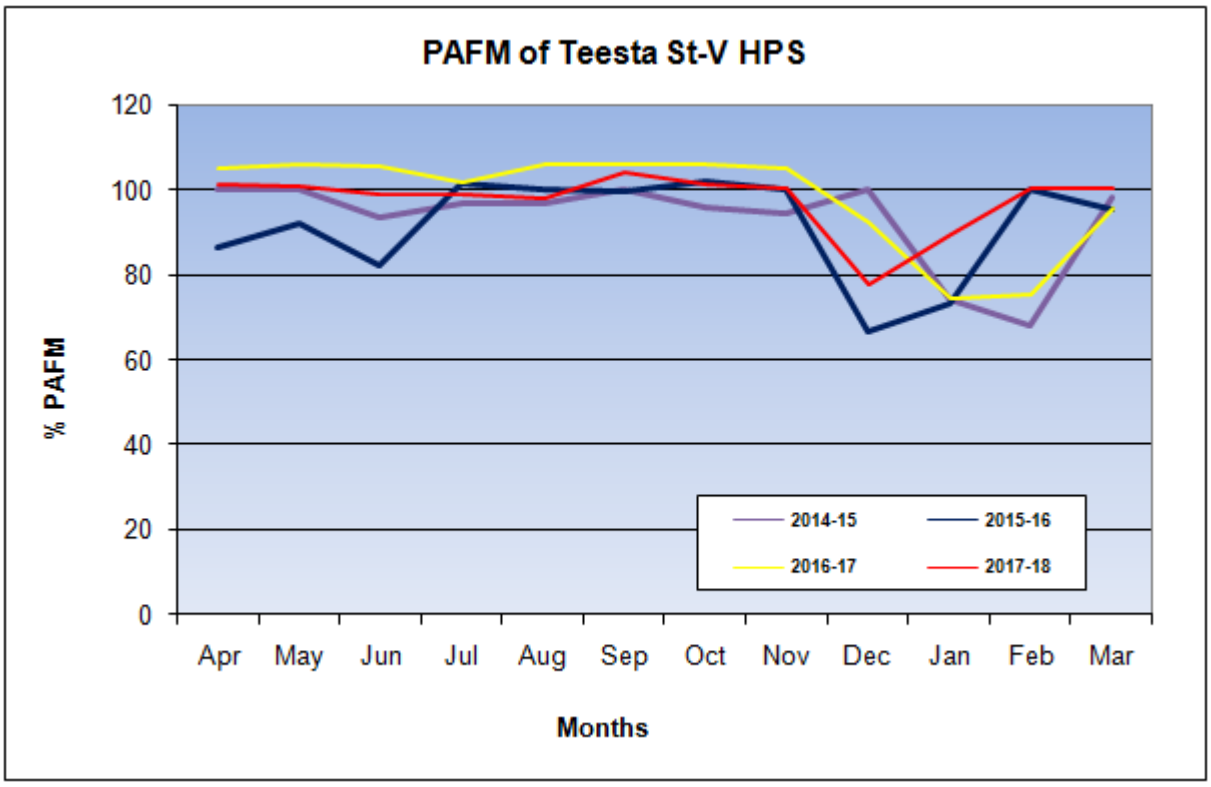


	FKK-St-I&II	KHG-St-I	KHG-St-II	TAL-St-I	FKK-St-III	BARH
2015-16	8771	5011	9196	7252	2702	4128
2016-17	9534	3197	5335	9500	7011	7177
2017-18	9473	5143	10034	7045	2909	8778.3

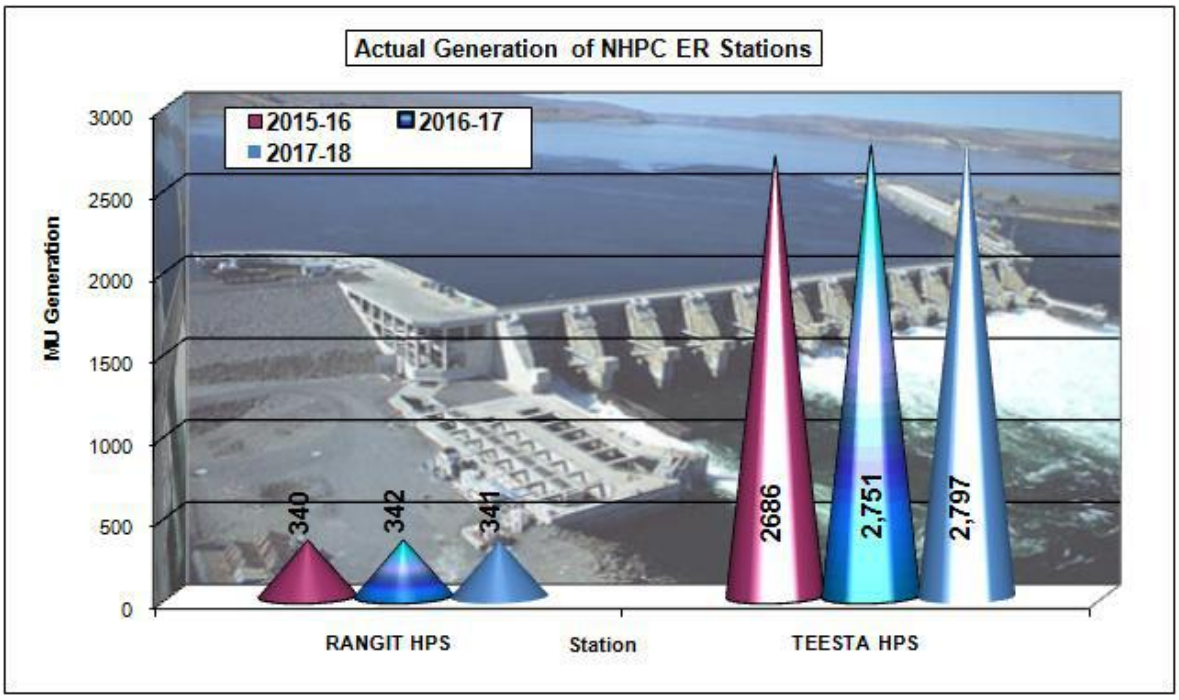
Performance of NHPC stations in ER:

The month wise Plant Availability Factor (PAF) for years 2014-15, 2015-16, 2016-17 & 2017-18 for NHPC stations in Eastern Region is shown below:





The year on year Actual Generation of NHPC ER Hydro Stations are as under:



4.2 TRANSMISSION CHARGE

4.2.1 Regional Transmission Accounts:

From July, 2011 onwards the transmission charges of the beneficiaries is calculated based on CERC (Sharing of Inter State Transmission Charges & Losses), Regulations, 2010. This has brought a new paradigm change in the transmission sector of the country and attempts to make transmission charges sensitive to distance, direction and use.

The objective of the new regulations is to remove pan caking in transmission charges. The new methodology uses load flow studies and point of connection charging method so as to get one injection PoC charge rate and one drawl PoC charge rate for each 400 KV nodes considering the Indian Power system as a whole and does away with the Regional Postal Stamp method used earlier. The above rates are reviewed/revised and approved on quarterly basis by the central Commission and applicable rates as on 31.03.2018 is given at **Annexure - XIII**

The usage of lines by the nodes is calculated based on Hybrid method, which combines Marginal participation and Average Participation approaches. The electrically and physically proximate nodes are then combined to get one injection PoC rate and one drawl PoC rate for each state.

It is expected that the new system would provide signals for generators and bulk consumers and transmission licensees to create infrastructure in profitable locations.

Regional Transmission Accounts is being prepared by ERPC Secretariat based on the new methodology as per the data furnished by NLDC, which is also the Implementing Agency for these new regulations. The Regional Transmission Accounts is issued for the recovery of transmission charges corresponding to Long term open Access and Medium term open Access transactions.

4.2.2 Transmission Charges for Short Term transactions:

In case of bilateral and collective transactions, transmission charges for the energy approved for transmission separately for each point of injection and for each point of drawal, shall be payable in accordance with the provisions of Central Electricity Regulatory Commission (Sharing of Inter State Transmission Charges and Losses) Regulations, 2010 and as amended from time to time.

The intra-State entities shall pay the transmission charges for use of the State network as fixed by the respective State Commission in addition to the charges specified under clauses (1) of the above regulation. Where the State Commission has not determined the transmission charges, the charges for use of respective State network shall be payable at the rate of Rs.80/MWh for the energy approved.

4.3 COLLECTION & DISBURSEMENT OF SHORT TERM TRANSMISSION CHARGES:

The Transmission charges and the operating charges payable by the persons allowed short-term open access shall be indicated by nodal agency while approving the Open Access. The Transmission charges payable for Inter-State Transmission system and Transmission Charges for State network shall be indicated separately. The Transmission Charges and the Operating Charges shall be collected by the nodal agency except for transmission charges for State network in the case of collective transaction.

The transmission charges collected by the nodal agency for use of the transmission system other than State network, for a bilateral or collective transaction for each point of injection and each point of drawl shall be given to Central Transmission Utility (CTU) for disbursement. The CTU shall disburse these transmission charges to the long-term customers of the synchronously connected grid where the point of injection or point of drawal is situated, as the case may be, in proportion to the monthly transmission charges payable by them after making adjustments against Long-term Access to target region in accordance with the Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2010 as amended from time to time. The transmission charges for use of State network shall be disbursed to the State Transmission Utility concerned.

4.4 OPEN ACCESS AND BILATERAL POWER TRANSACTION

4.4.1. Bilateral Trading 2017-18

Short term transactions are governed by "Central Electricity Regulatory Commission (Open Access in inter-State Transmission) Regulations, 2008" as amended from time to time for exchange of energy (MWh) between a specified buyer and a specified seller, directly or through a trading licensee or discovered at power exchange through anonymous bidding.

Trading of power in line with the CERC regulations on Short Term Open Access in transmission system started in Eastern Region with effect from 06.05.2004, and over the years the volume of bilateral trade has seen continuous increase. The number of traders and utilities indulging in bilateral trade and collective transactions through the IEX and PXI has also seen healthy growth. The indicative volume of trade in Eastern Region during 2017-18 by various traders is provided in Table below:

TRADERS/LTOA/MTOA/STOA	EXPORT	IMPORT	TOTAL
BESCOM	2833.9	0.0	2833.9
BSES YM(DTL)_NR	754.0	0.0	754.0
DDR_SOLAR	0.0	7.0	7.0
DTL-NR	2654.5	0.0	2654.5
DVC	2598.0	0.0	2598.0
FBD_SOLAR	6.9	0.0	6.9

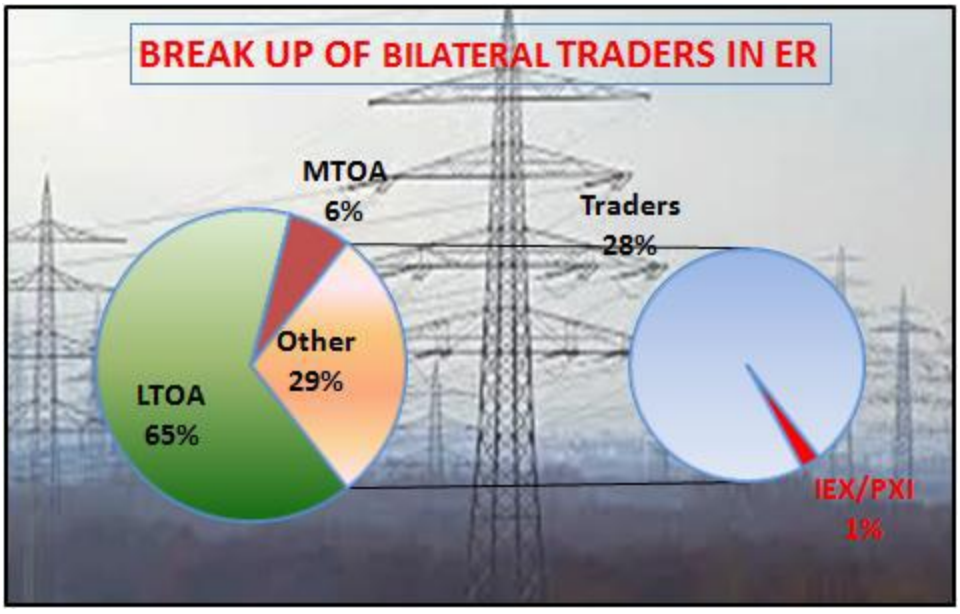
TRADERS/LTOA/MTOA/STOA	EXPORT	IMPORT	TOTAL
GMR	948.2	0.0	948.2
HARYANA_Beneficiary	1217.2	0.0	1217.2
HIRAKUD HEP	15.9	0.0	15.9
JITPL	403.3	0.0	403.3
Kerala_Beneficiary	2716.0	0.0	2716.0
MTPS2_BSEB	1.4	0.0	1.4
NVVNL	0.0	684.6	684.6
ODISHA	0.0	23.2	23.2
PSPCL	27.4	0.0	27.4
PTC	3046.4	0.0	3046.4
PUNJAB_Bficiary	1853.5	0.0	1853.5
RAJ SOLAR	0.0	134.3	134.3
SECI_Trader	0.0	121.6	121.6
TAL SOLAR	13.8	0.0	13.8
TISCO	1042.1	0.0	1042.1
TPDDL	1845.9	0.0	1845.9
UNCH_SOLAR	0.0	15.6	15.6
WEST_BENGAL	2225.4	0.0	2225.4
ASLPUNJAB	76.4	0.0	76.4
JITPL	1497.2	0.0	1497.2
Kerala_Beneficiary	77.6	0.0	77.6
PTC	25.9	863.0	888.8
AACK	0.1	0.0	0.1
ASLPUNJAB	0.9	0.0	0.9
AEL_Trader	47.2	217.5	264.7
APPCPL_Trader	402.6	114.6	517.2
CESC	0.6	3.0	3.6
DB Power	0.0	215.8	215.8
GETL	0.0	0.8	0.8
GMRETL Trader	818.8	214.6	1033.4
IEXL_Trader	117.3	195.7	313.0
IPCL_WB	0.0	1.3	1.3
IPTPL	0.0	31.7	31.7
JHARKHAND	1148.6	0.0	1148.6
JITPL	425.1	0.0	425.1
JSPL Patratu	0.0	4.3	4.3
JSW PTL	0.0	11.8	11.8
MKPL	14.1	697.6	711.7
MPL	10.0	0.0	10.0
MPPL Trader	288.6	111.6	400.2

TRADERS/LTOA/MTOA/STOA	EXPORT	IMPORT	TOTAL
NPCL	3.5	0.0	3.5
NVVNL	633.6	927.8	1561.4
POWER_EXCHANGE	184.4	82.1	266.5
PTC	2327.9	488.3	2816.2
SAILRSP	0.0	115.6	115.6
TATASTEEL	59.1	0.0	59.1
TPTCL_Trader	878.1	214.0	1092.2
TSFAP_JODA	95.0	0.0	95.0
WBSEDCL	92.8	0.0	92.8

The bilateral transactions consist of long term, medium term and short term trades through traders, direct or via IEX/PXI. The participants in the short term market trade electricity to meet short term demand or surplus situation or peaks requirement. It is also helpful in evacuation of generators for which LTA have not yet operationalized due to various constraints.

While short term market helps in balancing the energy pool by making small adjustments, it suffers from lack of assured access in case of congestion and depleted network scenario.

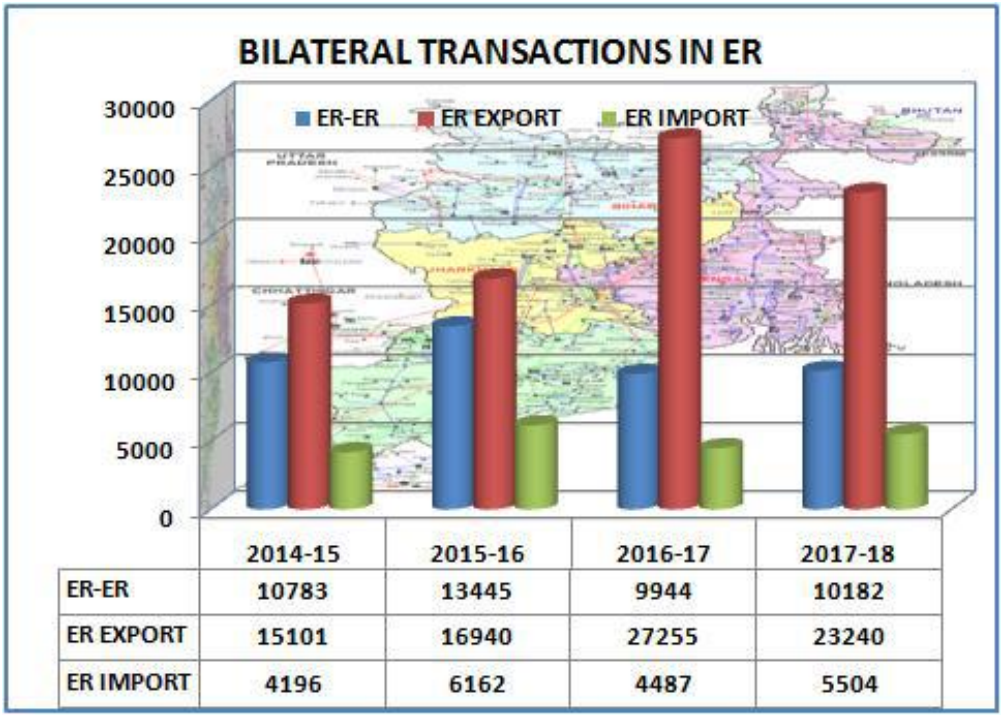
The breakup of bilateral trades in LTOA, MTOA, IEX/PXI, Direct and via Traders in Eastern Region is provided in the Pie-Chart as given below:



Figures in MU

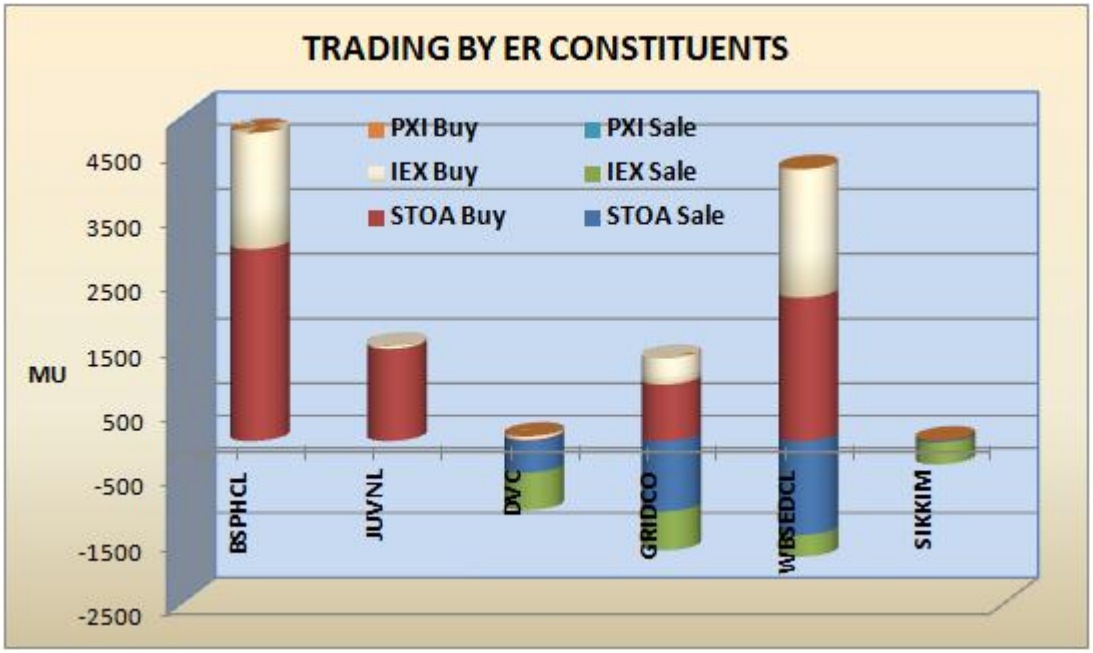
Long Term & Medium Term		Short Term Bilateral Transactions	
LTOA	MTOA	IEX/PXI	Traders
25190	2540	313	10884

During 2017-18, scheduled bilateral transaction of power through ER was to the tune of 38927 MU. The breakup of year on year scheduled bilateral transactions has been indicated below for years 2014-15, 2015-16, 2016-17 & 2017-18:



	2014-15	2015-16	2016-17	2017-18
ER-ER	10783	13445	9944	10182
ER EXPORT	15101	16940	27255	23240
ER IMPORT	4196	6162	4487	5504

During the year substantial amount of transaction took place through IEX/PXI by means of anonymous bidding. Participation of ER states in short term bilateral and anonymous power transaction through exchange for 2017-18 was as follows:



4.4.2 International Trades for year 2017-18

4.4.2.1 Trading of Power with Bangladesh:

Based on MoU between the two countries, MoP, Govt. of India decided to allocate 250 MW power round the clock (in Stages) from coal based NTPC stations in the country to Bangladesh. NTPC Vidyut Vyapar Nigam Ltd. (NVVN) as nodal agency has entered into a Power Purchase Agreement (PPA) with Bangladesh counterpart (BPDB) for cross border trading of power and to facilitate delivery of such power. Accordingly, export of power from India (through 400 kV Behrampur (West Bengal) – Bheramara (Bangladesh) D/C line and 500 MW HVDC back-to-back at Bheramara) to Bangladesh through BPDB commenced from 05.10.2013. Presently, 250 MW power from NTPC Stations (out of which 50 MW from Eastern Region stations) is being exported to Bangladesh with effect from 04.12.2013. The energy exported (scheduled) to Bangladesh during 2017-18 was to the tune of 3904.58 MU from Eastern Region NTPC Stations.

4.4.2.2 Trading of power with Bhutan:

Over and above the availability of power from NTPC and NHPC stations in ER, the region has imported power from Govt. of Bhutan through PTC as below:

POWER STATION	2014-15 (MU)	2015-16 (MU)	2016-17 (MU)	2017-18 (MU)
Chukha HPS (Receipt at Birpara)	1628.75	1729.2	1805	1580.65
Kurichhu HPS	59.88	101.3	368	347.31
Tala HPS	3278.89	3319.1	3248	2702.48
Daghachu		270.8	403	441.65

Additionally, 442 MU was traded by TPTCL from Dagachu HPS in Bhutan which is also under Deviation settlement mechanism.

4.4.2.3 Trading of power with Nepal:

Power was scheduled on short term trading basis to Nepal to the tune of 925 MU. Power was traded through mainly NVVN.

4.5 LONG TERM AND MEDIUM TERM ACCESS

Long term transactions are governed by "Central Electricity Regulatory Commission (Grant of Connectivity, Long-term Access and Medium-term Open Access in inter-State Transmission and related matters) Regulations, 2009" on 07.08.2009.

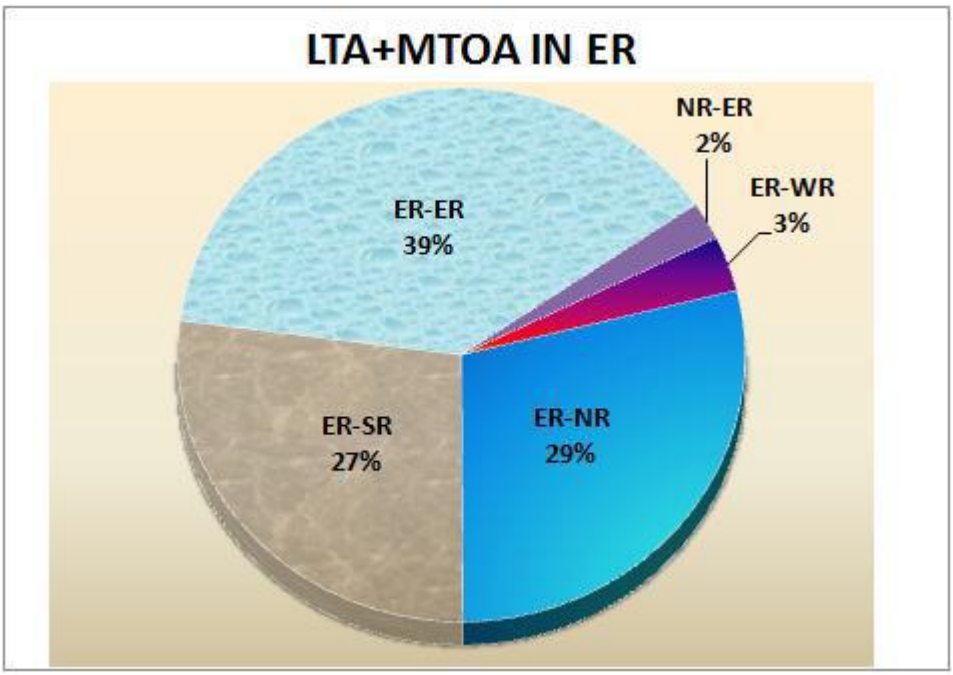
The LTA to / from Eastern Region informed by NLDC as on 31.03.2018 is provided in Table below (except CGS):

LTA Status as on March, 2018

Sl. No.	Name of LTA Customer (Injecting utility)	Generator/Load/ Trader	Region	Quantum of LTA granted	Name of the beneficiaries	Region To
1	BRPL(DVC Power)	Load	ER	31	BRPL	NR
2	BYPL(DVC Power)	Load	ER	19	BYPL	NR
3	DVC(Durgapur U#2)	Generator	ER	100	PSPCL	NR
4	DVC (Koderma U#1)	Generator	ER	50	Haryana	NR
5	DVC (DVC Mejia U#7)	Load	ER	12.5	DVC	ER
6	DVC (DVC Mejia U#8)	Load	ER	12.5	DVC	ER
7	DVC (MPL U#1)	Load	ER	140.5	DVC	ER
9	NDPL(DVC Power)	Load	ER	20	NDPL	NR
10	WBSEDCL(MPL U #1&2)	Load	ER	140.5	WBSEDCL	ER
11	WBSEDCL(MPL U #1)	Load	ER	70	WBSEDCL	ER
12	WBSEDCL(MPL U #2)	Load	ER	70	WBSEDCL	ER
13	Adhunik Power & Natural Resources Ltd	Generator	ER	100	WBSEDCL	ER
14	Tata Steel(DVC, Mejia B)	Load	ER	100	Tata Steel	ER
15	Tata Steel(DVC, DSTPS)	Load	ER	100	Tata Steel	ER
16	Ind-Barath Energy (Utkal) Ltd, Odisha	Generator	ER	500	TANGEDCO, TN	SR
17	KSEB(Maithon Power Ltd-RBTPP)	Load	ER	140.5	KSEB, Kerala	SR
18	BESCOM(Mejia 7&8, DVC)	Load	ER	200	BESCOM, Karnataka	SR
19	Adhunik Power & Natural Resources Ltd	Generator	ER	100	TANGEDCO, TN	SR
20	DVC, Raghunathpur(U#1,2)	Generator	ER	100	Haryana	NR
21	GMR Kamalanga Energy Ltd	Generator	ER	312	Haryana	NR
22	DVC, Raghunathpur(Unit-1 & 2)	Generator	ER	300	Punjab	NR
23	KSEB(MPL)	Generator	ER	140.5	KSEB	SR
24	BRBCL	Generator	ER	919	Railway & Bihar	ER
25	JITPL, Odisha	Generator	ER	95	KSEB ,Kerala	SR
26	WBSEDCL(1000MW State surplus)	DIC	ER	1000	NR(600MW) WR(400MW)	NR & WR
27	PSPCL(Bokaro DVC power)	Load	ER	200	PSPCL, Punjab	NR

MTOA STATUS as on MARCH 2018					
Sl No.	Injecting Entity	Region	Drawal Entity	Region	MTOA Granted for(MW)
1	SPDC, J & K	NR	WBSEDCL	ER	100
2	Jaypee Nigree STPP	WR	Bangladesh	International	40
3	Aarti Steel	ER	Aarti International	NR	7
4	JITPL, Odisha	ER	WCR, Rajasthan	NR	52
5	JITPL, Odisha	ER	WCR, MP	WR	123
6	JITPL, Odisha	ER	WCR, MP	WR	21.6
7	JITPL, Odisha	ER	WCR, Rajasthan	NR	9.15
8	JITPL, Odisha	ER	NR, Haryana	NR	38
9	JITPL, Odisha	ER	NR, Delhi	NR	9.46

The breakup of approved LTOA and MTOA transactions in ER is illustrated in the pie chart below.



ER-NR	ER-SR	ER-ER	NR-ER	ER-WR
1247.61	1176	1665	100	144.6

4.6 COMMERCIAL DECLARATION OF NEW GENERATING STATIONS IN ER

The following new generating stations in ER were declared under commercial operation during the year 2017-18.

State	Agency	Name of Power Station	Type	Unit No	Capacity (MW)	Date of COD
SIKKIM	IPP	DIKCHU	HYDRO	1	48	12.04.2017
SIKKIM	IPP	DIKCHU	HYDRO	2	48	28.05.2017
BIHAR	NTPC	KBUNL St-II	THERMAL	2	195	01.07.2017
BIHAR	NTPC & RAILWAY	BRBCL	THERMAL	2	250	10.09.2017
SIKKIM	IPP	TASHIDING	HYDRO	1	48.5	18.10.2017
SIKKIM	IPP	TASHIDING	HYDRO	2	48.5	18.10.2017

4.7 SOLAR POWER GENERATION IN THE REGION

The renewable sources of electricity have zero marginal cost and are must run in nature. The development of Solar Power generation in India has been initiated for quite some time. The development of solar power generation process confronts several barriers like financial, investment, technology, institutional and other incidental factors. To overcome these barriers substantial support is required for development of solar power generation. Foremost among them is the relatively high cost of solar generation. Several options were explored to give incentive to the cost of solar power and the option of "bundling" solar power with the power out of the cheaper unallocated quota of Central Coal based Stations and selling this bundled power to state distribution utilities at the CERC regulated price was decided.

In order to facilitate grid connected solar power generation in the first phase, the Mission provides for NTPC Vidyut Vyapar Nigam (NVVN) to be the designated Nodal Agency for procuring the solar power by entering into a Power Purchase Agreement(PPA) with Solar Power Generation Project Developers who will be setting up Solar Projects during the next three years, i.e. Before March 2013 and are connected to a grid at a voltage level of 33 kV and above. For each MW of installed capacity of solar power for which a PPA is signed by NVVN, the Ministry of Power (MoP) shall allocate to NVVN an equivalent amount of MW capacity from the unallocated quota of NTPC coal based stations and NVVN will supply this "bundled" power to the Distribution Utilities.

Solar power bundling implemented in ER at present:

1) Ministry of Power (GoI) has allocated 5 MW of power to Odisha from the un-allocated power of coal based NTPC power stations in Eastern Region for bundling with the power from 5 MW solar PV power project of M/s Aftaab Solar in Odisha [under JNNSM scheme (Phase-I)]. The same has been made effective from 01.05.2012 in the Regional Energy Accounts (REA) of ER.

2) Ministry of Power (GoI) has allocated 5 MW of power to GRIDCO from the un-allocated power of coal based NTPC power stations in Eastern Region for pooling with the power from 5 MW Dadri solar power project of NTPC. The same has been made effective in the Regional Energy Accounts (REA) of ER with effect from 00:00 hrs. of 30.03.2013.

3) Ministry of Power (GoI) has allocated un-allocated power of NTPC stations in ER for bundling with 65 MW of solar power from Rajasthan with effect from 00:00 hrs. of 16.08.2013 in favour of Gridco : 10 MW; West Bengal : 35 MW; DVC : 15 MW; and Assam : 5.

4) Ministry of Power (GoI) has allocated 5 MW of power to DVC from the un-allocated power ofcoal based NTPC power stations in Eastern Region for bundling with the power from 5 MW Talcher solar power project of NTPC. The same has been made effective in the Regional Energy Accounts (REA) of ER with effect from 00:00 hrs. of 28.03.2014.

5) Ministry of Power (GoI) has allocated 10 MW of power to DVC from the un-allocated power of coal based NTPC power stations in Eastern Region for bundling with the power from Unchahar solar power project of NTPC. The same has been made effective in the Regional Energy Accounts (REA) of ER with effect from 00:00 hrs. of 31.03.2014.

6) Ministry of Power (GoI) has allocated 5 MW of power to Gridco from the un-allocated power of coal based NTPC power stations in Eastern Region for bundling with the power from Faridabad solar power project of NTPC. The same has been made effective in the Regional Energy Accounts (REA) of ER with effect from 00:00 hrs. of 31.03.2014.

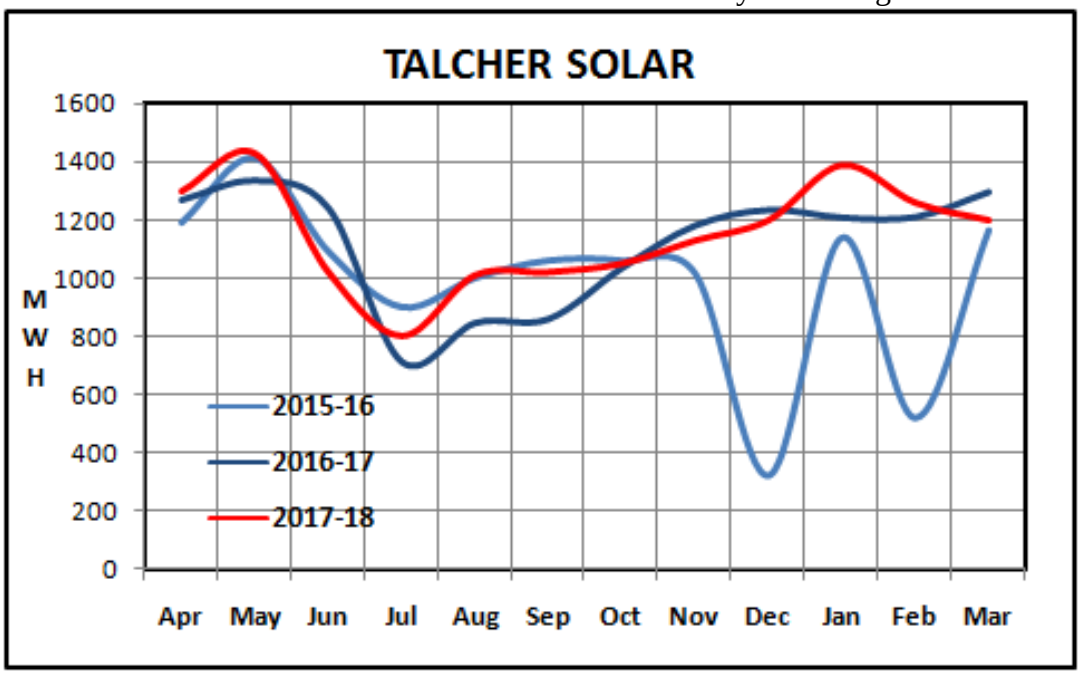
7) 25 MW of Solar Power from Rajasthan (M/s Sun Technique Solar Pvt. Ltd.) under the scheme of JNNSM Phase – I was allocated to West Bengal-15 MW, Odisha-5 MW, DVC-5 MW which which have been implemented w.e.f. 00:00 Hrs. of 05.12.2014.

8) Subsequently, DVC has surrendered its share of 40 MW of coal power from ER NTPC stations and 1.09 MW from MTPS Stg-II, KBUNL w.e.f. 01.12.2017; the same has been allocated to Telengana for bundling with 100 MW of solar power under National Solar Mission Phase-II Batch-II Tranche-I.

9) Ministry of Power (GoI) has allocated 50 MW (41.09 MW surrendered power of DVC and 8.91 MW from Barh STPS) to Telengana for bundling with 100 MW of solar power under National Solar Mission Phase-II Batch-II Tranche-I w.e.f. 00:00 Hrs of 01.12.2017.

10) Total generation from Talcher Solar Station of NTPC for 2017-18 is 13810 MWh.

The variation in Generation of Talcher Solar Station for last three years is as given below:



4.8 FUNDS TRANSFERRED TO POWER SYSTEM DEVELOPMENT FUND FROM EASTERN REGION

The Power System Development Fund (PSDF) Regulations were notified by CERC on 04.06.2010. As per this regulation the following funds are transferred to the PSDF:

1. Congestion charges standing to the credit of the "Congestion Charge Account" after release of amounts payable to Regional Entities entitled to receive congestion charge along with interest, if any, in accordance with the Central Electricity Regulatory Commission (Measures to relieve congestion in real time operation) Regulations, 2009 as amended from time to time;
2. Congestion amount arising from the difference in the market prices of different regions as a consequence of market splitting in power exchanges in accordance with Central Electricity Regulatory Commission (Power Market) Regulations, 2010.

3. Unscheduled Interchange charges standing to the credit of the "Unscheduled Interchange Pool Account Fund" after final settlement of claims of Unscheduled Interchange Charges in accordance with the Central Electricity Regulatory Commission (Unscheduled Interchange Charges and related matters) Regulations, 2009 as amended from time to time;

4. RLDC reactive energy charges standing to the credit of Reactive Energy Charges Account;

5. Such other charges as may be notified by the Commission from time to time
   During the financial year 2017-18 , amount of Rs. 27.86 Cr. has been transferred to PSDF from Eastern Region, hence the total funds transferred to PSDF from Eastern Region upto 31.03.2018 was around Rs 941.06 Crores.

4.9 ANCILLARY SERVICES

Power systems require ancillary services to maintain reliability and support their primary function of delivering energy to customers. Ancillary services are principally real-power generator control capacity services the system operator uses over various time frames to maintain the required instantaneous and continuous balance between aggregate generations and load. Ancillary Services consist of services required for:

a) Maintaining load – generation balance (frequency control)
b) Maintaining voltage and reactive power support
c) Maintaining generation and transmission reserves

Renewable energy generation is variable in nature (diurnal & seasonal) and implementation of ancillary services would facilitate integration of renewable energy generation in the country. Ancillary services will certainly help in controlling the variability of renewable generation.

4.9.1 Primary Control

Continuous load changes result in mismatch of generation and load leading to variation in frequency of interconnected power system. Governors free to operate would enable smooth control of frequency fluctuations as well as security against grid disturbances. Time frame for primary governor control action is about a few seconds i.e. 2- 5 seconds.

4.9.2 Secondary Control

If the load generation imbalance caused by an outage of large generator or load causing sudden variation in frequency of interconnected power system, primary response through governor action described above would help arrest the change fall in frequency. However, the frequency has to be brought back to 50 Hz through corrective action taken by the Control Area within which the generation or load is affected. Supplementary corrective action or secondary control has to be taken to bring frequency back to 50 Hz. For large interconnection system this automatic secondary control is known as Automatic Generation Control (AGC). Time line of secondary control action is a few minutes.

4.9.3 Tertiary Control

Loss of large generator (or load) may cause a large enough system excursion that cannot be handled by regulatory reserve alone. The above secondary control reserves also needs to be restored through tertiary reserves. Tertiary reserve provides significant insurance against wide spread outages.

The ancillary services are a potent tool in the hands of the system operator. The Central Commission is actively considering bringing in regulation to implement full fledged ancillary services in the country.

4.10 DEVIATION SETTLEMENT MECHANISM (DSM)

4.10.1 Introduction

In ABT tariff system apart from Capacity (Fixed) charges and Energy charges the third important component is Deviation charges .It is the payment for deviations from schedule at a rate dependent on system conditions (Frequency) at that time. The deviation from schedule is technically termed as Unscheduled Interchange (UI) in ABT terminology. CERC vide its notification no No.L-1/132/2013/CERC dated 06.01.14 directed for implementation of Deviation **Settlement Mechanism** w.e.f 17.02.2014 in place of UI regulations. With the implementation of this regulation, the UI regulation stood repealed.

For a generator, Deviation is the difference between Actual generation (ex-bus) and Schedule generation (ex-bus), whereas for a beneficiary, it is equal to Actual drawl (periphery) and Schedule drawl (periphery). Deviation charge is obtained by multiplying the Deviation with deviation rate. Deviation rate is a frequency dependent energy rate notified by Central Electricity Regulatory Commission. A constituent may receive/pay Deviation charge depending on whether it has assisted/undermined the grid frequency.

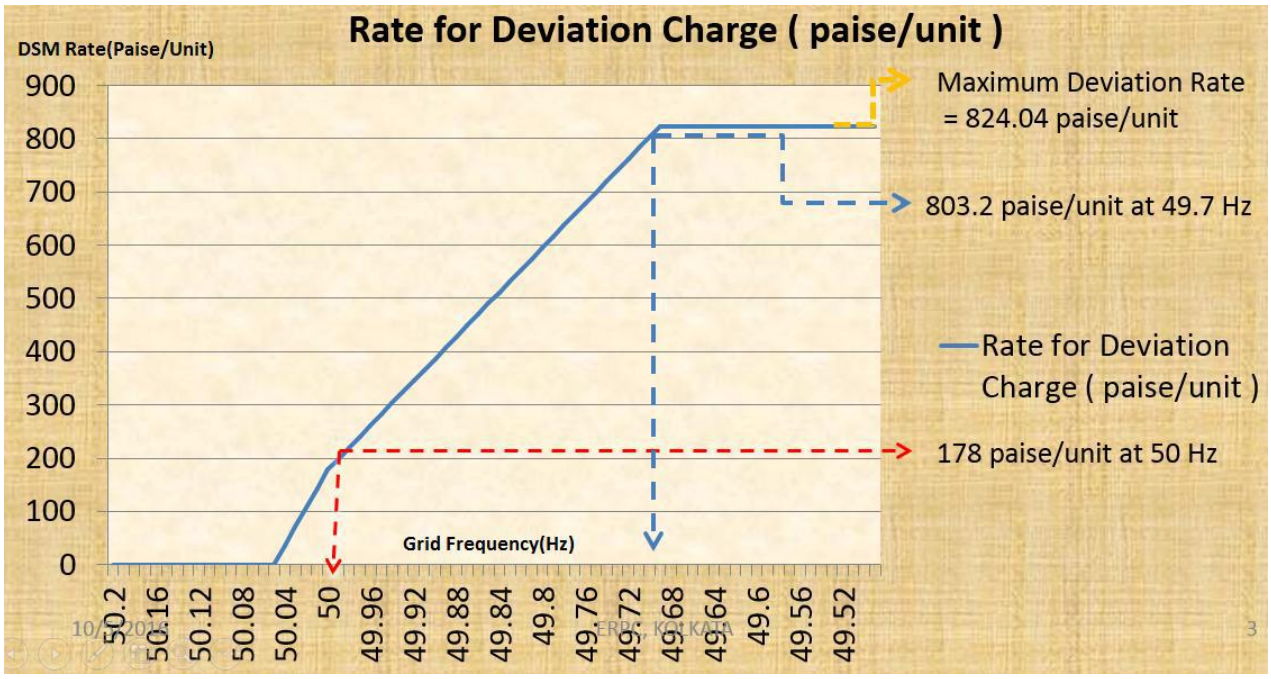
It acts like a financial barometer, which measures a licensee's responsiveness towards healthiness of the regional grid. The DSM mechanism has established a real time balancing market that is workably competitive and provides a powerful force for efficiency and innovation.

4.10.2 Rates for Deviation Charge with effect from 17.02.2014 are as under:-

The Deviation rate is a frequency-actuated signal available at any wall socket. Every utility reacts to this signal in real time and adjusts its generation/ demand and a new equilibrium is achieved. The Deviation curve by virtue of its design empowers every utility that has some means to regulate supply/demand to readjust its interchange with the grid and gain from the migration of frequency/UI rate from the earlier level. The decreasing marginal returns with every additional unit of deviation from the scheduled interchange acts as a counterweight, which forces the utility to seriously weigh the consequences of its actions.

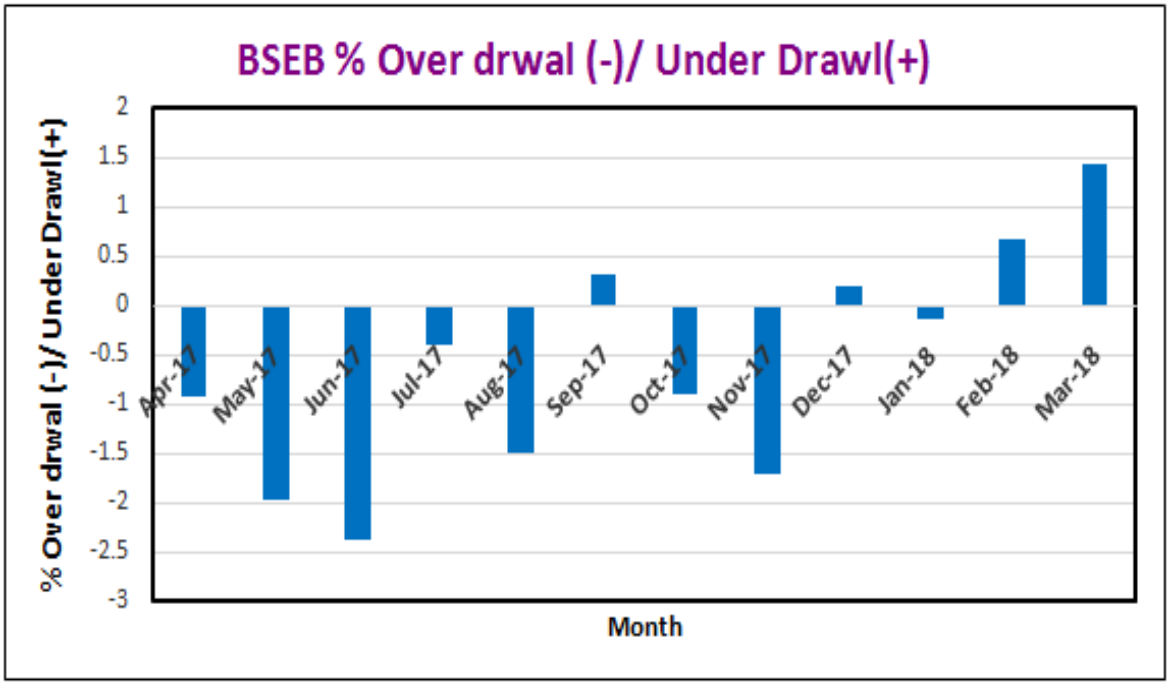
Average frequency of time block	**Rate for Deviation charge (Paise per kWh)**
50.05 Hz and above	0
Below 50.05 Hz and upto 50.00 Hz	35.6
Below 50.01 Hz and upto 50 Hz	178
Between 50.05 Hz and upto 50 Hz	Linear in 0.01Hz step (each 0.01Hz step is equivalent to 35.6 paise/kwh within this range

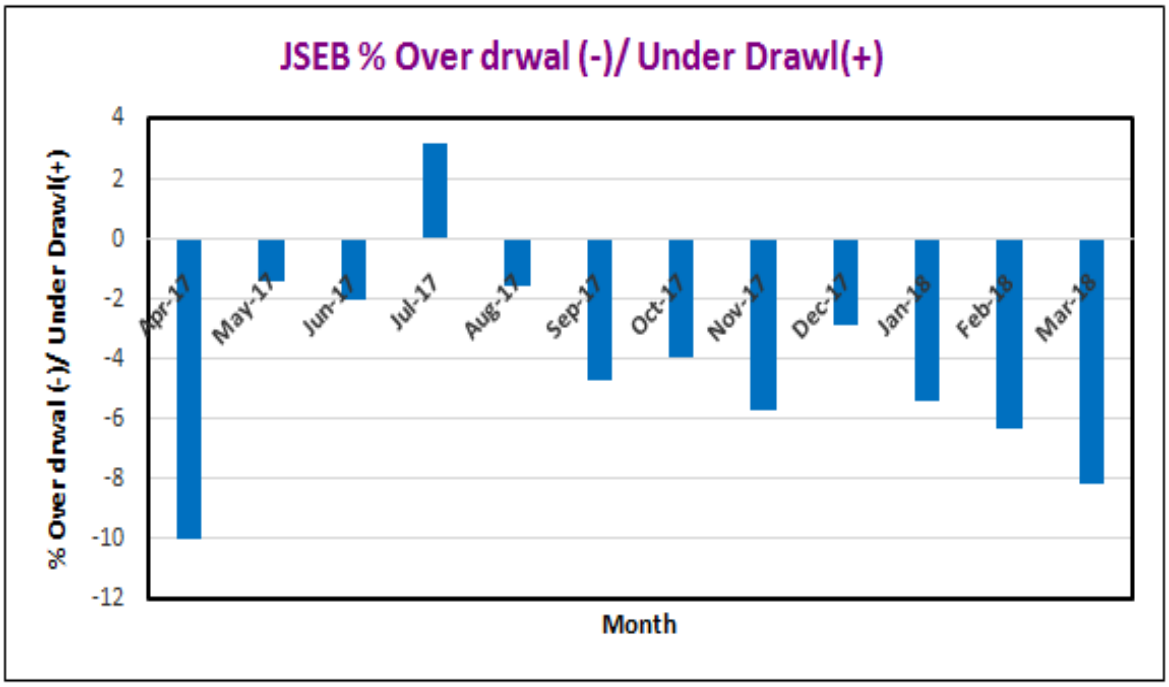
Below 50 Hz and upto 49.99 Hz	198.84
Below 49.71 Hz and upto 49.7 Hz	803.2
Between 50 Hz and upto 49.7 Hz	Linear in 0.01Hz step (each 0.01Hz step is equivalent to 20.84paise/kwh within this range
Below 49.70 Hz	824.04

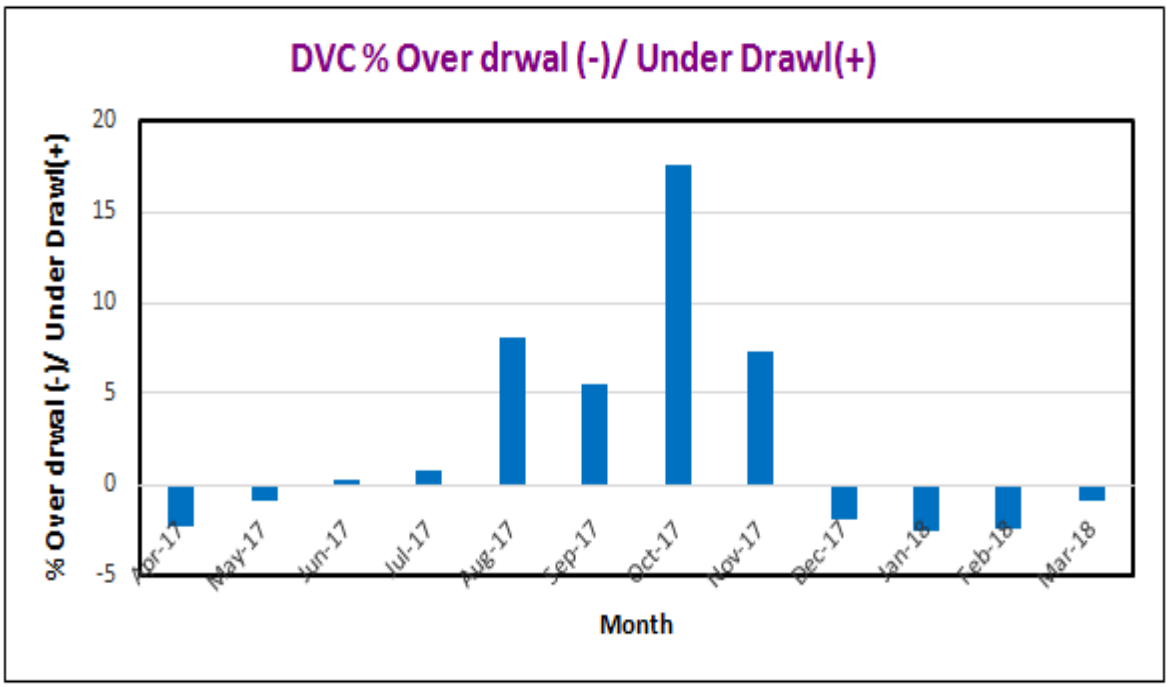


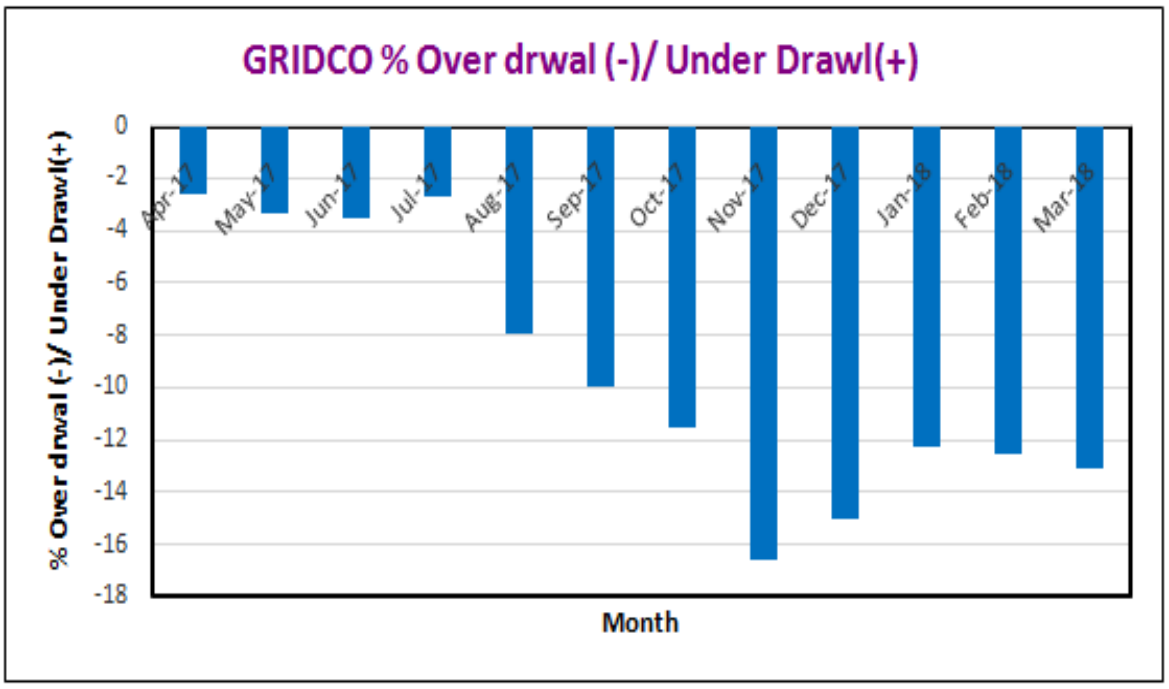
4.10.3 Performance of the constituents:

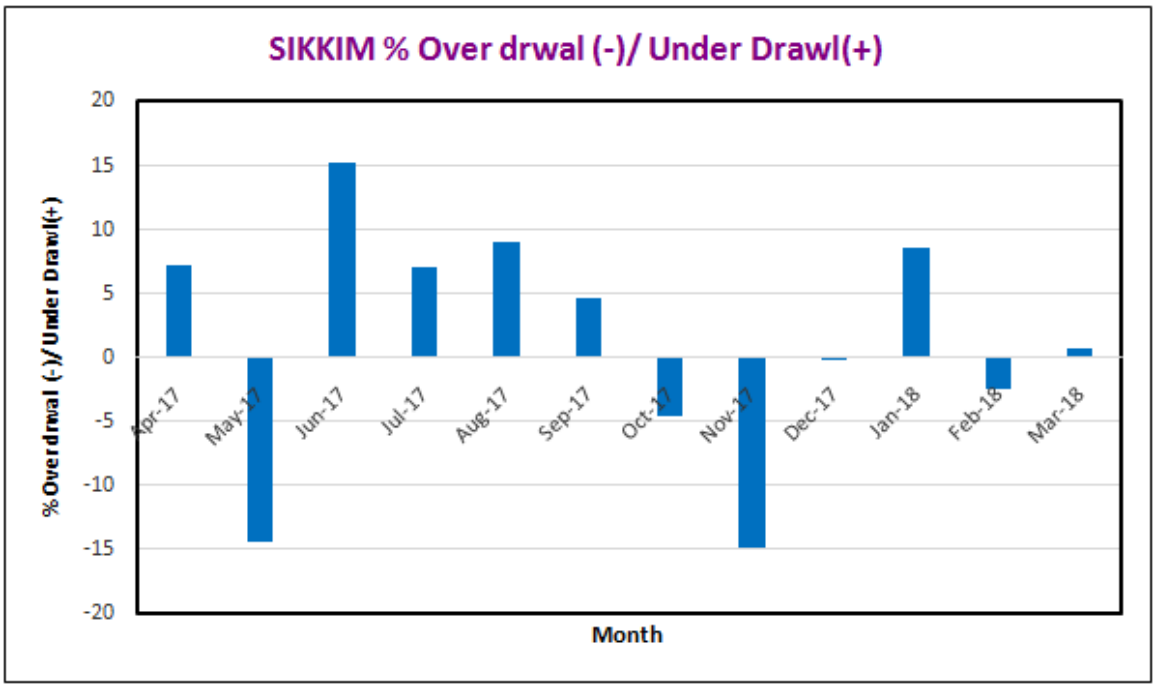
During the financial year 2017-18, the net Deviation Amount payable by Eastern Region to other regions is **Rs 627.08 Crores**. North Eastern Region, Northern Region and Southern Region have total payable Deviation Charge amount of **Rs 738.485** Crores, **Rs 408.361** Crores and **Rs 854.961** Crores to Eastern Region respectively. And Western Region has received Deviation Charge amount of Rs **2628.888 Crores** from Eastern Region. Among the constituents of Eastern Region, maximum UI/Deviation Charge has been received by TEESTA amounting to Rs **22.88** Crores and maximum UI/Deviation Charge has been paid by JUVNL i.e., Rs.**215.52** Crores. Details of Schedule Drawal/Generation, Actual Drawal/Generation, Receivable/Payable of UI/Deviation Charge amount month-wise and year-wise are furnished in **Annexure XIV-A, B**. Graphical representation is given below for ready reference.

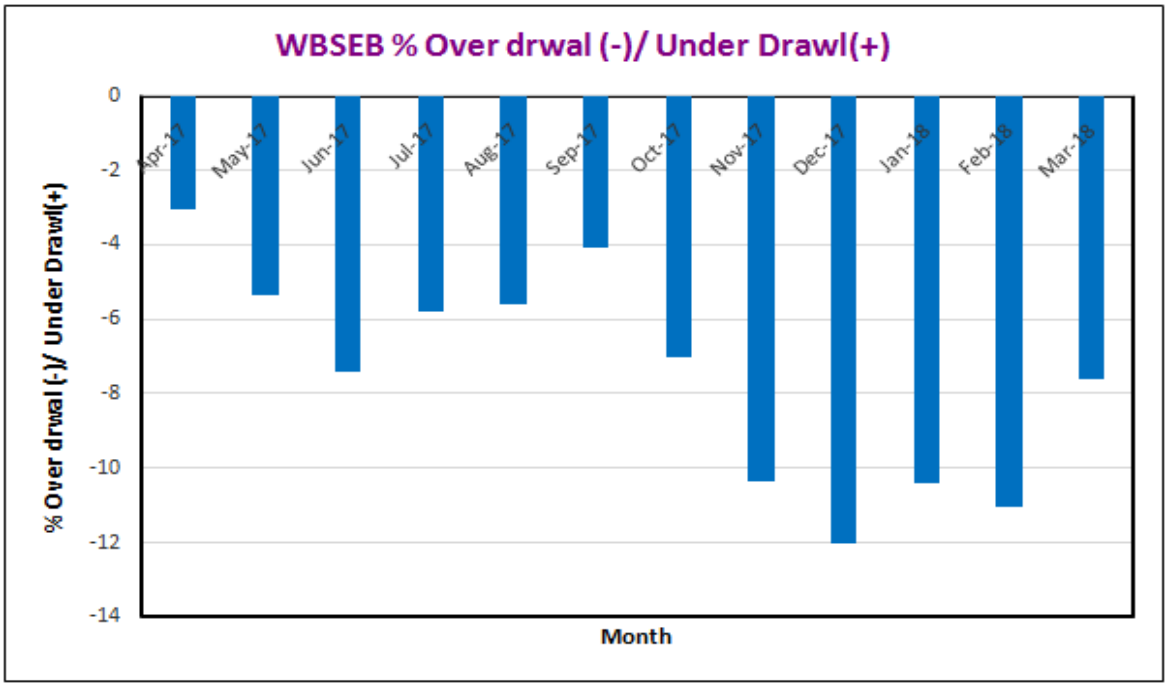

BSEB % Over drwal (-)/ Under Drawl(+)
% Over drwal (-)/ Under Drawl(+)
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
Nov-17
Dec-17
Jan-18
Feb-18
Mar-18
Month

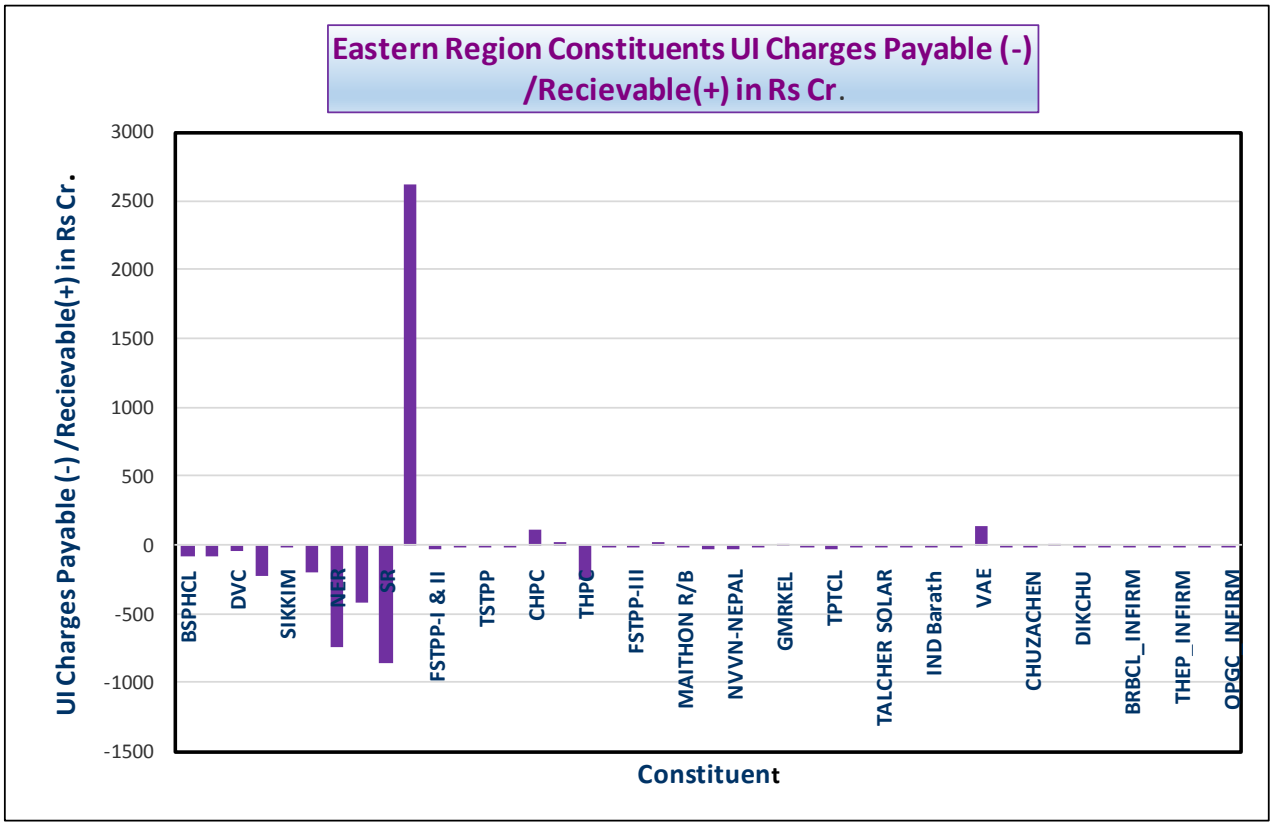

JSEB % Over drwal (-)/ Under Drawl(+)
% Over drwal (-)/ Under Drawl(+)
4
2
0
-2
-4
-6
-8
-10
-12
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
Nov-17
Dec-17
Jan-18
Feb-18
Mar-18
Month


DVC % Over drwal (-)/ Under Drawl(+)
% Over drwal (-)/ Under Drawl(+)
20
15
10
5
0
-5
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
Nov-17
Dec-17
Jan-18
Feb-18
Mar-18
Month


GRIDCO % Over drwal (-)/ Under Drawl(+)
% Over drwal (-)/ Under Drawl(+)
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
Nov-17
Dec-17
Jan-18
Feb-18
Mar-18
Month


SIKKIM % Over drwal (-)/ Under Drawl(+)
% Over drwal (-)/ Under Drawl(+)
20
15
10
5
0
-5
-10
-15
-20
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
Nov-17
Dec-17
Jan-18
Feb-18
Mar-18
Month


WBSEB % Over drwal (-)/ Under Drawl(+)
% Over drwal (-)/ Under Drawl(+)
0
-2
-4
-6
-8
-10
-12
-14
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
Nov-17
Dec-17
Jan-18
Feb-18
Mar-18
Month



4.11 REACTIVE ENERGY CHARGES:

Reactive power compensation should ideally be provided locally, by generating reactive power as close to the reactive power consumption as Possible. The Regional Entities except Generating Stations are therefore expected to provide local VAr compensation/generation such that they do not Draw VArs from the EHV grid, particularly under low-voltage condition. To Discourage VAr drawals by Regional Entities except Generating Stations, VAr Exchanges with ISTS shall be priced as follows:

i) The Regional Entity except Generating Stations pays for VAr drawl when voltage at the metering point is below 97%
ii) The Regional Entity except Generating Stations gets paid for VAr return when voltage is below 97%
iii) The Regional Entity except Generating Stations gets paid for VAr drawl when voltage is above103%
iv) The Regional Entity except Generating Stations pays for VAr return when Voltage is above 103%.

Provided that there shall be no charge/payment for VAr drawl/return by a Regional Entity except Generating Stations on its own line emanating directly from an ISGS.

As per IEGC, the beneficiary states of the region are billed for reactive energy exchange with the CTU system. ERPC also prepares reactive energy exchange for interstate system. The procedure for reactive energy charge calculation is governed by clause 1.6 and 1.7 of IEGC.

The rate for reactive energy charge was 13.5 paise/unit during the year 2017-18. The statement indicating reactive energy charge billing details during the year is enclosed at **Annexure-XV**.

In the year 2017-18 WBSETCL has payable amount of Rs 19.78 Crores, GRIDCO has payable amount of Rs. 6.39 Crores, SIKKKIM has payable amount of Rs 0.028 Crores to the ER Reactive Pool Account. The Total amount deposited in ER Reactive Pool Account for the year 2017-18 is Rs. 26.20 Crores.

4.12 REGIONAL TRANSMISSION DEVIATION CHARGES:

As per the CERC (Sharing of Transmission charges and Losses Regulations), 2016, in case the metered MWs (ex-bus) of a power station or the aggregate demand of a Designated ISTS Customer exceeds, in any time block,

(a) In case of generators: The Approved Injection + Approved Additional Medium Term Injection + Approved Short Term Injection or;

(b) In case of demand customers: The Approved Withdrawal + Approved Additional Medium Term Withdrawal + Approved Short Term Demand,

Then for first 20% deviation in any time block, the Designated ISTS Customer shall be required to pay transmission charges for excess generation or demand at the same rate and beyond this limit, the Designated ISTS Customer shall be required to pay additional transmission charges which shall be 25% above the zonal Point of Connection charges determined for zone where the Designated ISTS Customer is physically located. Such additional charges shall not be charged to the generators in case of rescheduling of the planned maintenance program which is beyond the control of the generator and certified to be so by the appropriate RPC. Further, any payment on account of additional charges for deviation by the generator shall not be charged to its long term customer and shall be payable by the generator.

CHAPTER-5

ISSUES ON OPERATION, PROTECTION, COMMUNICATION AND SYSTEM STUDIES

ERPC Secretariat in general does not involve in day to day real time grid operation. However, it resolves the Operational issues including Protection, Communication, System Study etc. in the meetings of various sub-committees working under ERPC viz Technical Coordination Sub-committee (TCC), Operation Coordination Sub-Committee (OCC), Protection Coordination Sub-Committee (PCC) etc. Further for any emergent operational matters, it is resolved through mutual discussion between the ERPC Secretariat and concerned utilities. Sometimes Special committees/groups are formed comprising members from utilities to resolve/investigate/study such issues. Third Party Protection Audit, Under Frequency Relay (UFR) Audit etc. are such issues which were taken up by the various audit groups as formed by OCC/PCC. In view of smooth functioning of the regional grid and uninterrupted power supply to the core sectors i.e. Railways, Coal etc. healthy protection system has become an integral part of power system operation. Some major operational/protection issues which were taken up are placed below:

5.1 MOCK BLACKSTART EXERCISES IN EASTERN REGION

After any major grid disturbance causing total black out, restoration procedure starts with the Black Start operation of power stations which supply the initial power to neighbouring load centres and the system gradually restored. Mainly the hydro units, due to their flexibility in many fronts, are used as the main source for black start operation. Hence, it is given top priority to keep ready the hydro power stations of the region for any eventuality so that they could be used for black start operation. In line with directives of IEGC, every year OCC plans to conduct mock black start of hydro generating stations. During the year 2017-18, following hydro plants conducted the mock black start exercises.

Sl. No.	Power Plant	Organisation	Date of mock black start
1	Subarnarekha HPS	Jharkhand	14.10.2017
2	Upper Indravati HPS	OHPC	09.03.2018
3	Upper Kolab HPS	OHPC	09.01.2018
4	Rengali HPS	OHPC	29.06.2017 & 30.11.2017
5	Maithon HPS	DVC	04.04.2017
6	Balimela HPS	OHPC	09.03.2018
7	TLDP-IV	West Bengal	22.03.2018
8	Burla HPS	OHPC	29.01.2018
9	Teesta-V	NHPC	26.12.2017
10	TLDP-III	West Bengal	20.12.2017
11	Teesta-III	Teesta Urja Ltd.	08.01.2018

As per the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010, under clause 5.8 (b) "Diesel Generator sets for black start would be tested on weekly basis and test report shall be sent to RLDC on quarterly basis".Test run of Diesel Generator sets on weekly basis for black start in Eastern Region were generally conducted and test reports were submitted by the concerned utility to ERLDC. Status reports are being regularly reviewed in OCC meetings.

5.2 REACTIVE CAPABILITY TESTING OF GENERATORS IN EASTERN REGION

A large number of transmission corridors of Eastern Region were facing high voltage problem due to various reasons, amongst which, insufficient VAR absorption by the generators was one of such causes. It led to sustained high voltage condition thereby causing unnecessary line tripping on over voltage. In view of above, OCC decided to carry out Reactive Capability Testing of Generators connected to 400 & 220 kV systems to check the present reactive capability so that the same can be harnessed when required.

During the year following generating station has carried out reactive capability tests:

Sl. No.	Power Plant	Organisation	Date of test
1	Haldia TPS	HEL	6th September 2017 & 1st October 2017

The reactive performances of all generators (including IPPs) during high voltage conditions are being regularly monitored and reviewed for their improvement in OCC meetings.

5.3 RESTRICTED GOVERNOR MODE OF OPERATION (RGMO)

IEGC has made it mandatory that all thermal generating units of 200 MW & above and all hydro units of 25 MW & above, which are synchronized with the grid, irrespective of their ownership, shall be in RGMO at all times, if not exempted for any specific/technical reason by CERC, for taking care of fluctuation of system frequency due to some or other reason and save the system in an emergent condition by contributing automatic control of generation.

Accordingly, performances of eligible generators are regularly reviewed in OCC meeting. Status of the RGMO of the generating units of Eastern Region is enclosed at **Annexure-XVI.**

5.4 UNDER FREQUENCY RELAY (UFR) OPERATION

In 2nd National Power Committee (NPC) meeting held on 16.07.2013, it was decided that total quantum of load relief based on UFR operation would be 3320 MW for ER. It was also decided that UFR would be operational in 4 (four) stages, where Stage –I would be operated at 49.2 Hz, Stage-II at 49.0 Hz, Stage-III at 48.8 Hz and Stage-IV at 48.6 Hz. Accordingly, OCC distributed and implemented the total quantum of load relief as per existing proportion for ER constituents as given below:

Control Area	Stage-I (49.2 Hz) (MW)	Stage-II (49.0 Hz) (MW)	Stage-III (48.8Hz) (MW)	Stage-IV (48.6Hz) (MW)	Total Relief by Control Area
BSEB	98	99	99	101	397
JSEB	61	62	61	62	246
DVC	134	135.5	136	137	542.5
Odisha	181.5	183.5	184	186	735
WBSETCL & CESC	345.5	350	350	354	1399.5
Total	**820**	**830**	**830**	**840**	**3320**

The operation of UFRs, if any, in the constituent systems is reviewed regularly in the monthly OCC meetings of ERPC.

5.5 INSPECTION OF UNDER FREQUENCY RELAYS (UFR)

The enquiry committee constituted by MoP after the major grid disturbances during 30th & 31st July'2012 recommended in its report (9.3) for ensuring proper function of defence mechanism like UFR etc. Also, as per section 5.2(n) IEGC, RPC Secretariat shall have to carry out periodic testing of UFR relays. In the 22nd TCC & ERPC meeting it was decided that UFR Audit of the ER constituents would be taken up by the UFR Audit group, nominated by the respective constituents.

Accordingly, a sub-group is constituted and carrying out inspection of UFR relays installed in Eastern Region regularly in the following manner:

i. In case secondary injection kit is available, frequency setting and ability of the Under Frequency Relay to actuate may be tested with the injection kit.
ii. In case secondary injection kit is not available, then frequency setting of UFR may be reset within the operating frequency available at the time of testing and the ability of UFR to actuate may be checked.
iii. The previous history of relay operation along with requisite load relief may also be checked from log book register maintained in the sub-station.

Following UFRs were inspected during the year 2017-18.

Sl No	Date	Substation/feeder inspected by the sub-group
1	18.05.2017	132/33 kV Koderma of DVC
2	19.05.2017	132/33kV Kumardhubi of DVC
3	31.05.2017	132/33 kV Putki of DVC
4	31.05.2017	132/33kV Patherdih of DVC
5	02.01.2018	220/132/33kV Jayanagar of OPTCL
6	02.01.2018	132/33kV Sunabeda of OPTCL
7	05.01.2018	220/132/33kV Terubali of OPTCL

All the inspected UFRs are found working as per the requirement.

5.7 THIRD PARTY PROTECTION AUDIT OF EASTERN REGION

As a follow up of one of the recommendations of Enquiry Committee headed by Chairman, CEA on grid disturbances that took place in Indian grid on 30th and 31st July 2012, Ministry of Power constituted a 'Task Force on Power System Analysis under Contingencies' in December 2012. As per the recommendations of Task force the third party audit of the protection system needs to be carried out periodically.

The checklist of ERPC used in its 1st third party protection audit was modified in line with the recommendation by the Task Force committee and a road map for 2nd Protection Audit of ER was finalized in OCC & PCC meetings.

The latest status of 2nd Third Party Protection audit during the year 2017-18 is as follows:

1) 400kV Maithon (PG)	Completed on 18th May, 2017
2) 132kV Gola (DVC)	Completed on 17th May, 2017
3) 132kV Barhi (DVC)	Completed on 18th May, 2017
4) 132kV Koderma (DVC)	Completed on 18th May, 2017
5) 132kV Kumardhubi (DVC)	Completed on 19th May, 2017
6) 132kV Ramkanali (DVC)	Completed on 19th May, 2017
7) 220kV Ramchandrapur	Completed on 1st June, 2017
8) 400kV Jamshedpur (PG)	Completed on 1st June, 2017
9) 132kV Patherdih (DVC)	Completed on 31st May, 2017
10) 132kV Kalipahari (DVC)	Completed on 30th May, 2017
11) 132kV Putki (DVC)	Completed on 31st May, 2017
12) 132kV ASP (DVC)	Completed on 30th May, 2017
13) 132kV Mosabani (DVC)	Completed on 2nd June, 2017
14) 132kV Purulia (DVC)	Completed on 1st June, 2017
15) 400kV Jaypore(PG)	Completed on 2nd January, 2018
16) 220kV Jeynagar (OPTCL)	Completed on 2nd January, 2018
17) 400kV Indravati (PG)	Completed on 4th January, 2018
18) 400kV Indravati (OHPC)	Completed on 4th January, 2018
19) 220kV Theruvali (OPTCL)	Completed on 5th January, 2018

5.6 PROTECTION PHILOSOPHY OF EASTERN REGION

Several special PCC meetings were convened to review the zone settings based on CEA recommendations at ERPC, Kolkata. In the Special meetings of PCC held on 30.12.2014, 10.04.2015 & 20.07.2015 the Protection Philosophy for Eastern Region was agreed which is as given below:

Sl. No.	Zone	Direction	Protected Line Reach Settings	Time Settings (in Seconds)	Remarks
1	Zone-1	Forward	80%	Instantaneous (0)	As per CEA
2a	Zone-2	Forward	For single ckt- 120 % of the protected line	0.5 to 0.6 - if Z2 reach overreaches the 50% of the shortest line ; 0.35- otherwise	As per CEA
			For double ckt- 150 % of the protected line		As per CEA
2b	Zone-2 (for 220 kV and below voltage Transmission lines of utilities)	Forward	120 % of the protected line, or 100% of the protected line + 50% of the adjacent shortest line	0.35	As per CEA with minor changes
3	Zone-3	Forward	120 % of the (Protected line + Next longest line)	0.8 - 1.0	As per CEA
4	Zone-4	Reverse	10%- for long lines (for line length of 100 km and above) 20%- for shot lines (for line length of less than 100 km)	0.5	As per CEA

Note:

1) **Zone-2:- Z2 Reach should not encroach the next lower voltage level.**
2) **Zone-3:- If Z3 reach encroaches in next voltage level (after considering "in-feed"), then Z3 time must be coordinated with the fault clearing time of remote end transformer.**
3) **Zone-4:- If utility uses carrier blocking scheme, then the Z4 reach may be increased as per the requirement. It should cover the LBB of local bus bar and should be coordinated with Z2 time of the all other lines.**
4) **The above settings are recommended primarily (exclusively) for uncompensated lines.**

Subsequently, all the constituents were requested to adopt the above philosophy for their inter as well as intra state lines for better protection co-ordination of their systems and Eastern Regional system as a whole.

5.8 ISLANDING SCHEMES

After the last major grid disturbances occurred simultaneously in NR, ER & NER on 30th & 31st July, 2012, the enquiry committee constituted by MoP has made a number of recommendations in its report published on 16.08.2012. One of the recommendations (no. 9.12 of the report) suggested planning for implementation of islanding schemes.

New Islanding schemes for ER were proposed, approved & monitored by the TCC/ ERPC in its meeting. The latest status of the same are placed below:

(i) Bakreswar TPS of WBPDCL – Operational w.e.f. 31.03.2015
(ii) Chandrapura TPS (132 kV) of DVC - Operational w.e.f. 15.06.2015
(iii) Farakka STPS of NTPC – Operational w.e.f . 02.04.2017
(iv) Tata Power, Haldia – Operational w.e.f. 24.04.2015.
(v) Bandel TPS of WBPDCL- Under implementation
(vi) IB TPS Islanding Scheme of OPGC- Scheme finalized
(vii) Kanti Islanding Scheme of KBUNL – Under planning stage

The Islanding Scheme of CESC system is also operational in Eastern Region and successfully operated in the past.

5.9 SYSTEM (SPECIAL) PROTECTION SCHEME (SPS)

Due to enhanced complexity of electrical grid with the formation of 'NEWS' grid through addition of interconnectivity & use of high capacity transmission lines etc., System (Special) Protection Scheme (SPS) has been envisaged for safety & security of integrated grid operation. SPS is designed to detect abnormal system conditions such as outage of large generating units, high capacity corridors or HVDC interconnections. SPS preserve the integrity of electric system by using predetermined corrective measures that are simple, reliable and safe for the system as a whole and provide acceptable system performance against all possible extreme credible contingencies. SPS has an advantage of wide-area coverage and it is pre-emptively sense the danger in the system and takes corrective actions. SPS has also been evolved to prevent system deterioration i.e. to reduce the impact of power failure and ensure early restoration.

Eastern Region has also adopted the SPS. Presently there are 5 (five) nos. approved SPS in Eastern Region.

a) Tripping of Talcher - Kolar HVDC Bipole (s) - SPS at Talcher stage-II, NTPC (SPS 450 & SPS 1000)

Talcher Super thermal power station having a capacity of 3000 MW (6x500 MW) is located in Orissa of Eastern Region. The station was commissioned with 2x500 MW capacity and subsequently its second stage was commissioned and station capacity was augmented to 3000 MW with commissioning of its further 4x 500 MW machines.

The station is the largest capacity station in the region. However, the capacity of the entire stage II (4x500 MW) was allocated to the beneficiaries of southern region.

Subsequently, 10% of the capacity was allocated to the Orissa, in Eastern region. For evacuation of Talcher STPS –II generation to Southern Region, +/- 500kV HVDC bipole transmission system was commissioned right upto the load centre of Southern Region at Kolar. The HVDC substation at Talcher has two pole blocks 1000 MW capacity each (subsequently augmented to 1250 MW).

The very basic design of the evacuation system of Talcher stage II to SR poses a major threat to Eastern Region and subsequently to the New Grid as any sudden forced outage of one or both the poles would mean that Eastern Grid has to initially absorb a jerk of load throw off to the tune of 1800-2000 MW. The surplus power would get wheeled through 400kV Talcher- Rourkella D/C and Rengali –Baripada-Kolaghat S/C. During monsoon as such these corridors remain heavily loaded and such contingency of pole block at Talcher would lead to a definite cascade tripping leading to isolation /possible collapse of Orissa system including TSTPP station.

In order to avoid such contingency two automatic special protection schemes were envisaged and have been implemented at Talcher Super Thermal power station. The 1st scheme as commonly known as SPS 450 was first implemented and subsequently a further improvised 2nd scheme was devised as known as SPS 1000 scheme. Both the schemes and their modalities of arming and disarming is described below:

SPS 450: This scheme was originally implemented with a view that Eastern and Western Region would absorb a jerk of 450 MW, therefore rest of the generation as available at Talcher stage II generation must be shed in order avoid a cascade tripping of the network. However, during monsoon, from Eastern Regional point of view at times absorbing even 450MW under N-1 contingency criteria of Talcher-Rourkella 400kV D/C Line becomes critical when major generation at Talcher stage II must be shed in order to avoid further criticality of the Grid. Further under any critical outage condition in the rest of the New Grid outage of HVDC bipole might pose a serious threat when it might necessitate arming of SPS 450 scheme with due coordination with NLDC. Under this mode of SPS the power injection to N-E-W grid is limited to 450 MW. The actual generation by the generators is considered for building the logic.

SPS 1000: Post formation of the NEW Grid this scheme was subsequently envisaged in order to minimise shedding of generation at Talcher STPP. The basic philosophy of this scheme is to absorb 1000MW in place of 450 MW as the Grid size increased. However, as one of the prerequisites for arming this scheme Eastern Regional operator has to ensure that sufficient evacuation margin (approx 1000 MW) is available at the AC evacuation system of TSTPP. Under this mode of SPS the power injection to N-E-W grid is limited to 1000 MW. The actual injection to the HVDC system (by measuring the flow on four a/c lines between TSTPS and Talcher HVDC station) is

considered for building the logic. Under SPS 1000 scheme no generation shedding is required for a single pole tripping. For contingencies of both pole tripping and for single pole tripping with the HVDC system going to ground return mode, generation shedding will be done. Extent of generation shedding depends on the actual power flow through the HVDC link and to limit the actual injection to N-E-W grid to 1000 MW.

b) Modification in Talcher-Kolar SPS in ER Region due to Synchronisation of SR grid with NEW grid (Additional 600MW Gen Reduction)

Background:

In Southern Region, there is a provision for load shedding in three groups depending on the power loss on HVDC (Trip Signal 1 for 800 MW load shedding, Trip Signal 2 for 700 MW additional load shedding, Trip signal 3 for 500 MW additional load shedding considering extended operation of HVDC in the 2000-2500 MW range). So a total of 2000 MW shedding is envisaged in Southern Region.

In the NEW grid side of Talcher-Kolar HVDC bipole, there is automatic reduction/tripping of generation at Talcher Stage-II of NTPC. Two schemes are available at Talcher Stage-II; SPS 450 and SPS 1000 where the number indicates the quantum of power injected into the NEW grid after tripping of Talcher-Kolar HVDC pole or bipole. In SPS 450, three units are tripped at Talcher Stage-II while in SPS 1000, a maximum of one unit is tripped and the balance reduction in generation achieved through fast automatic reduction of generation.

In normal operation, SPS 1000 is armed and in some exceptional cases such as an outage of elements in the NEW grid, SPS 450 is activated. There are instances when a single pole trips on line fault and the other pole goes to ground return. In such cases, the healthy pole retries thrice for going to metallic return and in case it fails, it goes in ground return mode where there is a restriction of 150 MW.

There have been instances when the Talcher-Kolar SPS fails to operate leading to high frequency in the NEW grid and low frequency in the Southern Grid. Post 765 kV Sholapur-Raichur in operation, the impact of any failure of Talcher-Kolar SPS would lead to wheeling of additional power to Southern Region through the NEW grid creating insecure conditions. In fact, even injection of 1000 MW into NEW grid and inadequate load shedding in Southern Region can lead to insecure conditions as the entire power would be wheeled through 765 kV Sholapur-Raichur. So, additional safeguards are required.

Triggering the SPS and SPS action:

In case of single pole or bipole outage or blocking of Talcher-Kolar HVDC sensed at Talcher HVDC terminal, it is proposed that a trip signal be extended to nearby generators such as Vedanta, GMR, JITPL ensuring minimum communication so that the objective of restricting injection to NEW grid to 450 MW is achieved. The reduction in generation to be achieved through these stations is 600 MW so that the injection into NEW grid is restricted to 450 MW. This would be in addition to SPS 1000 already in operation at Talcher-II.
SPS 1000 will be functional as it is with additional relief of 600 MW in the event of Talcher- Kolar pole tripping to ensure grid security.

In 108th OCC held on 17.04.2015 it was decided that the generation relief during HVDC Talcher-Kolar pole tripping will be shared among GMR, Vedanta & JITPL as follows: Vedanta - 200 MW, GMR-200 MW and JITPL- 200 MW.

c) SPS for Chuzachen HPS in Sikkim

Chuzachen HPS is connected with Rangpo through 132 kV Zebra S/C line and with Melli through 132 kV Panther S/C line. Chuzachen was allowed to enhance their generation upto 99 MW with SPS operation of one unit tripping (whichever is generating more). SPS is installed at Chuzachen to reduce generation at hydro power station in event of contingency to avoid high loading and cascading tripping of neighbouring 132 kV transmission lines.

Sl No.	Event	Sensing at	Action
1	Tripping of 132 kV Rangit-Rammam	132 kV Rangit	Trip One unit at CHEP
2	Tripping of 132 kV Rangit-Kerseong	132 kV Rangit	Trip One unit at CHEP
3	Flow of Rangit-Rammam crosses 70 MW or 320 Amps	132 kV Rangit	Trip One unit at CHEP
4	Flow of Rangit-Kerseong crosses 70 MW or 320 Amps	132 kV Rangit	Trip One unit at CHEP
5	Flow of Chuzachen-Melli crosses 75 MW	132 kV Chuzachen	Trip One unit at CHEP
6	Flow of Chuzachen-Rangpo crosses 75 MW	132 kV Chuzachen	Trip One unit at CHEP

Thereafter, the scenario has been changed due to commissioning of LILO of 400 kV Teesta - Binaguri line at Rangpo 400/132 kV sub-station. Chuzachen authority requested for removal of following signals from the schemes as in the present scenario these incidences will not endanger the grid:

i. Tripping of 132 Rangit- Rammam line
ii. Tripping of 132 kV Rangit- Kurseong line
iii. Loading of 132 Melli- Chuzachen line

In 29th PCC held on 20.03.2015, PCC agreed to waive the tripping of one Chuzachen Unit from SPS on following contingencies:

- Tripping of 132kV Rangit – Rammam Line CB at Rangit End
- Tripping of 132kV Rangit – Kurseong Line CB at Rangit End

However, PCC felt that N-2 contingency may occur in North Bengal and Sikkim area and PCC decided to continue the SPS with following conditions:

- Power flow > 70 MW or Line Current > 320 A in Rangit-Rammam Feeder
- Power flow > 70 MW or Line Current > 320 A in Rangit-Kurseong Feeder
- Power flow > 75 MW in Chuzachen –Melli Feeder

d) SPS for Power Export to Bangladesh

As per decision of the MoP, GoI power export to Bangladesh has been explored and regular supply has been commenced from October'2013 through 400 kV Farakka – Berhampur – Bheramara line with HVDC (2x500 MW) station at Bheramara (Bangladesh). During 2017-18 ER exported 3964 MU power to Bangladesh.

The details of SPS implemented to facilitate power transfer to Bangladesh are provided below for ready reference:

S. No.	Triggering Criteria for SPS	SPS actions (signal shall be generated to do following)	Signal to be sent Bheramara (Yes/No)
1	Tripping of 400kV Farakka-Behrampur, the SPS shall generate a signal	To trip 80 MVAR Bus reactor at 400kV Behrampur.	No, Local action at Behrampur.
		To ramp down HVDC set-point to 350 MW (with Appropriate Filter switching to maintain Bheramara Voltage)	Yes
	Voltage at 400kV Behrampur going below 390kV	To trip 80 MVAR Bus reactor at 400kV Behrampur.	No, Local action at Behrampur.
2	Voltage at 400kV Behrampur going below 380kV, the SPS shall generate a signal.	To ramp down HVDC set-point to 350 MW (with Appropriate Filter switching to maintain Bheramara Voltage)	Yes
3	If the frequency goes below 49.5 Hz.	To ramp down HVDC set-point to 350 MW (with Appropriate Filter switching to maintain Bheramara Voltage)	Yes
4	If the 400kV Farakka-Behrampur line flow goes above 780 MW (Flow may touch 800 MVA).	To ramp down HVDC set-point to 350 MW (with Appropriate Filter switching to maintain Bheramara Voltage)	yes

In order to avoid high loading of 400 kV Farakka – Berhampur – Jeerat S/C line section particularly during peak hours as well as lower voltage/frequency at 400 kV Berhampur Sub-station, SPS has been envisaged to reduce the export quantum to Bangladesh.

e) **SPS for Vedanta Limited (formerly known as SSL)**

Principle and working:

Actuates in event of tripping of any 400 kV outgoing line from Vedanta i.e either of 400 kV Vedanta-Rourkela line-I, or 400 kV Vedanta-Raigarh line-I.
Backing down of generation or tripping of unit is done to reduce injection in grid for controlling line loading.

Assumptions:

Unit 1, 3 & 4 are connected to PGCIL bus (400 kV). Unit 2 is connected to OPTCL bus (400 kV).
Both the buses are decoupled

Principle of operation:

i) Overloading of 400 kV Vedanta – Rourkela line – I (beyond 650 MW) or tripping

ii) Overloading of 400 kV Vedanta – Raigarh line – I (beyond 650 MW) or tripping

5.11 SCADA DATA

For effective management and monitoring of the grid parameters availability of various live data viz generation of power stations, line flows and voltages at important sub-stations are the vital inputs to the grid operators. All the required data should be made available on real time basis in the control room through SCADA system. OCC/TCC advised all constituents to do the needful for restoration of SCADA data at the earliest and the status of availability of SCADA data are monitored regularly by the OCC/SCADA O&M meetings. Apart from the concerned utility, CTU/Powergrid plays a major role in availability of the SCADA data as installation of RTU are done by them.

CHAPTER-6

MEETINGS, REPORTS, CERTIFICATION AND WORKSHOP

6.1 MEETINGS HELD DURING 2017-18

In order to discharge various duties entrusted to ERPC as per Indian Electricity Act 2003 and IEGC, various meetings were organised during 2017-18 and detail of meetings are given at **Annexure-XVII**.

6.2 REPORTS ISSUED

ERPC has been issuing various reports regarding system operational data, load generation balance data, system studies data, etc. The details of various reports issued during 2017-18 by ERPC are given below:

- Monthly Progress Reports
- Monthly Power Supply Position Reports
- Load Generation Balance Report for the year 2018-19
- Annual Report for the year 2017-18

6.3 CERTIFICATION OF TRANSMISSION AVAILABILITY

In line with CERC order, ERPC Secretariat has certified availability of transmission system for the year 2017-18

6.4 TRAINING / WORKSHOP HELD

As a follow up of one of the recommendations of Enquiry Committee headed by Chairperson, CEA on grid disturbances that took place in India on 30th & 31st July'2012, Ministry of Power constituted a "Task Force on Power System Analysis and Contingencies". The Task Force strongly recommended for training in protection related issues.

Following training programmes/workshops were held during 2017-18:

Training Programme of Protection Engineer	03.04.2017 to 07.04.2017	AIPM, CESC, Kolkata
PDMS Training Programme	22-05.2017 to 24.05.2017	ERPC, Kolkata
2nd PSCT training	17.07.2017 to 21.07.2017	ERPC, Kolkata
Verification and updation of the protection related data in PDMS of the Protection Database project of ERPC	07.09.2017	ERPC, Kolkata
3rd PSCT training	05.02.2018 to 09.02.2017	ERPC, Kolkata
Training on Optimum calculation of transfer capability(ATC,TTC and TRM) by International Consultant	**19.02.2018-21.02.2018**	**ERPC, Kolkata**

CHAPTER-7

IMPORTANT DECISIONS TAKEN IN VARIOUS MEETINGS OF ERPC DURING 2017-18

1. **Issue:** ***Enabling of 3-phase auto reclose at 132 kv North Bengal and Sikkim areas to minimize element outages due to transient faults***

Decision: In 132nd OCC meeting dated 21.04.2017, OCC agreed in principle for implementation of 3-pase auto-reclosure scheme for 132 kV lines. Further, it was decided that the implementation would start with North Bengal and Sikkim area.

2.Issue: Performance of hydro generators in peaking mode

Decision: In 135th OCC meeting dated 24.07.2017, OCC decided to review the performance of hydro generators in peaking mode in monthly OCC meetings.

3.Issue :Accounting of Tertiary Loading Arrangement at PGCIL Sub-Station in ER

Auxiliary consumption of PGCIL EHV AC Sub-stations are usually met from HT feeders of the state Discom. In few sub stations of PGCIL, auxiliary consumption is met through tertiary winding(as alternate supply for reliability). At present State net drawal through Powergrid substation in ER is being computed considering meter installed at feeders after LV side of Transformer and auxiliary consumption through tertiary.

Decision: ERPC in its 35th Commercial Sub-committee meeting dated 02.08.2017 decided that auxiliary power from tertiary winding by Powergrid substations would be treated as state drawal for inter-regional accounting. Powergrid and the stateswould make back to back commercial arrangement for this power.ERLDC requested Powergrid to submit the requisite information such as meter no CTR,PTR etc.. in respect of those meters and also make meter readings available on time.

Powergrid agreed to make the necessary data available before the ensuing TCC/ERPC meetings.

4.Issue: Implementation of Automatic Meter Reading in Eastern Region

With the completion of 3rd Phase of AMR project, ERLDC have been receiving data from 125 locations out of 147 locations. It reduces a lot of difficulties faced by drifting and time correction by the meters

Decision: ERPC in its 35th Commercial Sub-committee meeting dated 02.08.2017 decided that16 new locations with 68 meters & 25 existing locations with 68 meters to be implemented through 4th Phase of AMR project.

5.Issue: Bus Splitting of Powergrid Sub-stations

As per decision of Standing Committee of ER, CTU was entrusted to do bus splitting at Maithon,Durgapur & Biharsariff Sub-station of ER.

During third party protection of 400 KV Maithon S/s on 18th May,2017,it was observed that bus splitting scheme at 400 KV Maithon S/s has been commissioned but not in service.

Deliberation in the 36thTCC meeting: CTU informed that they have carried out the study and decided to operationalize bus splitting scheme at 400 KV Maithon and Biharsariff S/s. They will issue the letter to ERLDC for operationalization within a day.

CTU informed that as the fault level is not severe at 400 KV Durgapur Sub-station, so it is not required for the time being.

ERLDC informed that they will carry out internal study and operationalize the bus splitting schemes at 400 KV Maithon & Biharsariff Sub-stations one by one with close monitoring of the system behaviour.

6. ***Issue: Bus Splitting of Kahalgaon STPS Stage-I&II,NTPC***

Deliberation in the 36thTCC meeting: NTPC informed that the work is in progress as per the schedule and the bus splitting will be completed by December,2018.

7. ***Issue: Bus Bar protection at important 220 KV Sub-stations.***
It has been observed that at many 220KV Sub-stations particulary that of STU, bus-bar protection is either not commissioned or non- functional. The non-availability/ non –functional of bus-bar protection results in delayed,multiple and un coordinated trippings in the event of a bus-bar faults. This in turn not only results in partial local black out but also jeopardises the security of inter connected national grid as a whole. The matter was also pointed out during the third party protection audit which is being carried out regularly.Constituents are required to meet the audit compliance and commission or make bus-bar protection functional wherever it is not available.

Deliberation in the 36thTCC meeting: DVC informed that they have already covered the upgradation of busbar protection for 220 KV Kalyaneswari and Durgapur in PSDF proposal.They will place their action plan for 220KV Bokaro and chandrapura in the upcoming PCC meeting.

8. Issue: Flexible jumpering arrangement for bypassing substations, prone to inundation during monsoon, for ensuring continuity of important corridors and power evacuation from power stations--ERLDC

During the current monsoon season, quite a few substations in Eastern Region viz. Alipurduar(PG), Kishanganj(PG), Dalkhola(PG) and Motihari(DMTCL) had to be completely shutdown, due to massive waterlogging. Outage of Kishanganj S/Stn posed constraint in power evacuation of Sikkim generators and surplus power of NER while outage of Alipurduar S/stn weakened the inter-regional connectivity between ER and NER. Such substations typically have 2 nos incoming and 2 nos outgoing lines and lie either along a major intra/inter-regional corridor or along the evacuation route of a major power station. Under the above mentioned situation, it is desirable that continuity of the transmission corridor be maintained by directly connecting the incoming and outgoing lines, bypassing the inundated substation. However, such network re-configuration is possible only if facility for jumpering conductors at appropriate locations is already in place. This practice is already being followed at a number of locations in Western Region. Members may please identify the substations where the above proposed arrangement can be utilised for maintaining grid security under flood situations

.

In 136thOCC, ERLDC explained that the flexible jumpering arrangement may be done for 400 kV Binaguri-Kisheenganj-N.Purnea D/C and 400kV Binaguri-Alipurduar-Bongaigaon D/C lines for bypassing the LILO points i.e. 400kV Kishanganj(PG) and Alipurduar(PG) S/s so that the same lines may be directly connected during the emergencies like flood situations at LILO points. The possibility may be explored as these elements are very important in terms of hydro power evacuation and long outages of these elements may endanger the grid security. The other such elements (LILOed at Dalkhola, Motihari (DMTCL) etc) may also be explored which are under threat during flood and other emergencies. OCC felt that such kind of bypassing arrangement will help the grid to improve the reliability during emergencies when substation is not available in service.

Decision: 137th,OCC advised Powergrid to explore the possibilities of implementing such bypassing arrangement for above elements and for other important elements, if any. Powergrid agreed to do the survey and explore the possibilities. Powergrid informed that first they will implement the flexible jumper arrangement at Alipurduar(PG) S/s then they will implement at Kishanganj(PG) and Dalkhola(PG).

9.Issue: Implementation of Automatic Demand Management Scheme (ADMS)

Decision: In 142nd OCC meeting dated 23.02.2018, OCC opined that uniform logic should be implemented for all the states. OCC decided to review the logic of ADMS after implementation of the scheme by all the states.

अध्याय-8

पूर्वी क्षेत्रीय विद्युत् समिति में राजभाषा नीति का कार्यान्वयन

वर्ष 2017-18 के दौरान पूर्वी क्षेत्रीय विद्युत् समिति में राजभाषा नीति के अनुपालन में निम्नलिखित कार्य किये गए है :-

8.1 हिन्दी पत्राचार

- ओ.सी.सी., प्रोटेक्शन उप समिति, वाणिज्यिक उप-समिति, तकनीकी समन्वय उप-समिति और इ.आर.पी.सी. की बैठकों के कार्यवृत्त एवं कार्यवाही के अग्रेषण पत्र को द्विभाषी रूप में जारी किये गए |
- राजभाषा अधिनियम के नियम-5 के अनुपालन में, हिन्दी में प्राप्त पत्रों के उत्तर हिन्दी में ही दिए जाते हैं |

8.2 राजभाषा कार्यान्वयन समिति की बैठकें

राजभाषा नीति के अनुसार वर्ष 2017-18 में राजभाषा कार्यान्वयन समिति की बैठकें 17-04-17, 04-07-17 और 18-10-17 को हुई | इन बैठकों में गृह मंत्रालय, राजभाषा विभाग से प्राप्त हिन्दी के प्रगामी प्रयोग से संबंधित तिमाही प्रगति रिपोर्ट की समीक्षा पर चर्चा की गई, वार्षिक कार्यक्रम को लेकर चर्चा हुई एवं तदनुसार निर्णय लिए गए |

8.3 प्रोत्साहन योजना

हिन्दी के प्रयोग को बड़ावा देने एवं हिन्दी में काम करने के लिए प्रोत्साहित करने हेतु, इस कार्यालय में विभिन्न प्रकार के प्रोत्साहित योजना लागू है | हिन्दी में टिप्पण-आलेखन करना एबं कंप्यूटर पर हिन्दी में टंकन का काम करने के लिए प्रोत्साहित योजनायें लागू है |

8.4 हिन्दी दिवस / हिन्दी सप्ताह / हिन्दी पखवाड़ा का आयोजन

14 सितम्बर 2017 को इस कार्यालय में हिन्दी दिवस मनाया गया एवं 11-09-17 से 25-09-17 के दौरान हिन्दी पखवाड़ा का आयोजन किया गया | इस अवसर पर आयोजित विभिन्न प्रकार की प्रतियोगितायों में अधिकारीयों और कर्मचारियों ने बड़े उत्साह के साथ भाग लिया |

8.5 राजभाषा कार्यान्वयन से संबंधित अन्य कार्य

- हिन्दी के प्रगामी प्रयोग से संबंधित तिमाही एवं अर्ध-वार्षिक प्रगति रिपोर्ट नियमित रूप से मुखालय, के.वी.प्राधिकरण, नई दिल्ली एवं राजभाषा विभाग के क्षेत्रीय कार्यालय, कोलकाता को प्रेषित किया गया |
- सेवा पुस्तिकाओं में प्रविष्टियाँ ज्यादा से ज्यादा हिन्दी में किये गए |
- कार्यालय में नियमित रूप से उपयोग होने वाले मानकीकृत प्रपत्र को द्विभाषी रूप में इस्तेमाल किया जाता है।
- इन्टरनेट पर उपलब्ध विभिन्न प्रकार हिन्दी साफ्टवेयर को इस्तेमाल करके कार्यालय में सभी कंप्यूटर पर आधिकारिकों ने आवश्यकता के अनुसार काम करते हैं |
- भारतीय राजभाषा परिषद् द्वारा पूरी, ओडीसा में आयोजित दिनांक 07-06-17 से 09-06-17 तक विज्ञानं और राजभाषा पर हुई एक राष्ट्रीय संगोष्ठी में इस कार्यालय के श्री सुमन कुमार झा, अ.श्रे.लिपिक ने भाग लिया |
- वर्ष 2017-18 में गृह मंत्रालय, राजभाषा विभाग, केन्द्रीय, हिन्दी प्रशिक्षण उप-संस्थान, कोलकाता द्वारा आयोजित दिनांक 07-08-17 से 11-08-17 तक हुई कम्पूटर पर हिन्दी में काम करने के लिए “बेसिक प्रशिक्षण कार्यक्रम” में इस कार्यालय के श्री अशोक कुमार, अ.श्रे.लिपिक ने भाग लिया |
- वर्ष 2017-18 के दौरान कार्यालय में नया सदस्य सचिव के कार्यभार ग्रहण करने के पश्चात उनके अध्यक्षता में दिनांक 13-12-2017 को एक विशेष बैठक का आयोजन किया गया जिसमें कार्यालयों के दैनिक कामकाज में हिंदी का प्रयोग के वारे में समीक्षा किया गया और कार्यालयों के दैनिक कामकाज में अधिक से अधिक सरल और सहज हिन्दी का प्रयोग के लिए निर्णय लिया गया |
- राजभाषा विभाग, गृह मंत्रालय द्वारा जारी वर्ष 2017-18 के वार्षिक कार्यक्रम में निर्धारित किये गए लक्ष की प्राप्ति हेतु मुख्यालय, केन्द्रीय विद्युत् प्राधिकरण के द्वारा दिनांक 03-01-2018 को इस कार्यालय का निरीक्षण किये गए |

इस कार्यालय में राजभाषा नीति और नियमों के उपबंधो के अधीन जारी किए गए निदेशों का समुचित रूप से अनुपालन तथा गृह मंत्रालय, राजभाषा विभाग द्वारा जारी वार्षिक कार्यक्रम में निर्धारित लक्ष्यों की प्राप्ति के लिए हर संभव प्रयास किया जा रहा है |

ANNEXURE-I

MANPOWER STRENGTH OF ERPC SECRETARIAT

The status of posts of various grades at ERPC Secretariat (**as on 31st March 2018**) is given below:

POST	SANCTIONED	FILLED	VACANT
GAZETTED			
Member Secretary	1	1	0
Superintending Engineer/Director	3	0	3
Executive Engineer/Dy. Director	4	4	0
Assistant Executive Engineer / AD-I	4	3	1
Assistant Engineer / AD-II	2	0	2
Private Secretary	1	0	1
NON-GAZETTED			
Foreman	1	0	1
Head Clerk	1	1	0
Hindi Translator	1	0	1
Electrician	2	1	1
Upper Division Clerk	3	1	2
Draftsman Gr. II	1	0	1
Stenographer Gr. I	1	0	1
Stenographer Gr. II	1	0	1
Lower Division Clerk	4	2	2
Driver	2	0	2
MTS	6	2	4
TOTAL	**38**	**15**	**23**

Note:

i) One post of Driver has been temporarily transferred to RPSO (W), Mumbai.
ii) One post of peon has been temporarily transferred to SRPC, Bangalore.
iii) Post of Foreman has been temporarily transferred to RPSO, Bangalore
iv) One Addl. Gen. Manger of NVVN is posted in ERPC on informal deputation.

ANNEXURE – II (Page-1/2)

CHAIRPERSONS / CHAIRMEN OF EASTERN REGIONAL POWER COMMITTEE (ERPC) & ERSTWHILE EASTERN REGIONAL ELECTRICITY BOARD (EREB) SINCE ITS INCEPTION

Period	Constituent	Name of the Chairmen/Chairpersons
01.06.65 to 31.05.66	BSEB	Sh. R.S. Mishra, IAS Sh. R. Prasad, IAS
01.06.66 to 31.05.67	DVC	Sh. T. Sivasankara, ICS
01.06.67 to 31.05.68	OSEB	Sh. V.V. Ananthakrishnan, IAS
01.06.68 to 31.05.69	WBSEB	Sh. Dutta Mazumdar, IAS
01.06.69 to 31.05.70	BSEB	Sh. H.N. Thakur, IAS
01.06.70 to 31.05.71	DVC	Sh. N.E.S. Raghavachari, ICS
01.06.71 to 31.05.72	OSEB	Sh. A.K. Mazumdar, IAS Sh. A.C. Bandyopadhyay, IAS
01.06.72 to 31.05.73	WBSEB	Sh. S.K. Mukherjee, IAS Sh. J.C. Talukdar, IAS
01.06.73 to 31.05.74	BSEB	Sh. B.N. Ojha
01.06.74 to 31.05.75	DVC	Sh. S.J. Majumdar, ICS Lt. Gen. P.S. Bhagat, VC, PVSM
01.06.75 to 31.05.76	OSEB	Sh. K.C. Gantayet
01.06.76 to 31.05.77	WBSEB	Brig. D.N. Mallick
01.06.77 to 31.05.78	BSEB	Sh. K.P. Sinha, IAS Sh. J.D. Sahay Brig. S.P. Kochar
01.06.78 to 31.05.79	DVC	Sh. A.C. Bandyopadhyay, IAS
01.06.79 to 31.05.80	OSEB	Sh. J.M. Patnaik Sh. B.N. Dash
01.06.80 to 31.05.81	WBSEB	Sh. N.C. Basu
01.06.81 to 31.05.82	BSEB	Sh. Z.S. Haque Sh. S.K. Chaturvedi, IAS Sh. R.P. Khanna, IAS
01.06.82 to 31.05.83	DVC	Sh. P.C. Luthar
01.06.83 to 31.05.84	OSEB	Sh. A. Panda Sh. S.K.Nanda
01.06.84 to 31.05.85	WBSEB	Sh. A. Ghatak
01.06.85 to 31.05.86	BSEB	Sh. S. Kumar Sh. I.C. Kumar, IAS
01.06.86 to 31.05.87	DVC	Lt. Gen. M.M.L. Ghai, PVSM Sh. A. Ghatak
01.06.87 to 31.05.88	OSEB	Sh. P.K. Kar
01.06.88 to 31.05.89	WBSEB	Dr. B.P. Banerjee Dr. D.K. Bose, (from 1.5.89)
01.06.89 to 31.05.90	BSEB	Sh. J.C. Jetli, IAS Sh. J.C. Kundra (from 26.12.89) Sh. P.K. Misra (from 3.4.90)

ANNEXURE – II (Page-2/2)

01.06.90 to 31.05.91	DVC	Sh. P.K. Sarkar, IAS
01.06.91 to 31.05.92	OSEB	Sh. K.C. Mahapatra Sh. S.K. Mahapatra (from 22.12.91)
01.06.92 to 31.05.93	WBSEB	Sh. D.K. Bose Sh. S.K. Dasgupta
01.06.93 to 31.05.94	BSEB	Sh. B. Prasad
01.06.94 to 31.05.95	DVC	Sh.Maj.Gen. Sharad Gupta,V.S.M Sh. A.K. Misra, IAS (from 1.5.95)
01.06.95 to 31.05.96	OSEB	Sh. M.Y. Rao, IAS
01.06.96 to 31.05.97	WBSEB	Sh. S.R. Sikdar
01.06.97 to 31.05.98	BSEB	Sh. R.P. Yadav Sh. A.K. Upadhyay (from 18.5.98)
01.06.98 to 31.05.99	DVC	Sh. A.K. Misra, IAS
01.06.99 to 31.05.00	GRIDCO	Sh. B.C. Jena
01.06.00 to 31.05.01	WBSEB	Dr. G.D. Gautama, IAS
01.06.01 to 31.05.02	BSEB	Sh. C.M. Jha, IAS Sh. N.K. Agrawal (from 22.10.01)
01.06.02 to 31.05.03	DVC	Sh. J.C. Jetli, IAS
01.06.03 to 31.05.04	GRIDCO	Sh. S.C. Mahapatra, IAS
01.06.04 to 31.05.05	JSEB	Sh. B.K. Chauhan Dr. H.B. Lal (from 18.10.2004)
01.06.05 to 31.03.06	WBSEB	Sh. M. K. De, IAS
01.04.06 to 31.03.07	BSEB	Sh. M. M. Singh, IAS Sh. Swapan Mukherjee (from 01.03.07)
01.04.07 to 31.03.08	JSEB	Sh. V. N. Pandey Sh. B. M. Verma (from 29.12.07)
01.04.08 to 31.03.09	OPTCL & GRIDCO	Sh. C.J.Venugopal, IAS
01.04.09 to 31.03.10	Energy and Power Deptt., Govt. of Sikkim	Sh. Pema Wangchen
01.04.10 to 31.03.11	WBSEDCL & WBSETCL	Sh. M. K. De, IAS
01.04.11 to 31.03.12	BSEB	Sh. P. K. Rai
01.04.12 to 31.03.13	JSEB	Sh. S. N. Verma
01.04.13 to 31.03.14	OPTCL & GRIDCO	Sh. P. K. Jena, IAS Sh. Hemant Sharma, IAS (from 16.07.13)
01.04.14 to 05.07.15 (contd. beyond Mar'15 due to late receipt of new nomination)	Energy and Power Deptt., Govt.of Sikkim	Sh. P. B. Subba, Principal Chief Engg.-cum-Secretary Shri N. T. Bhutia, Principal Chief Engg.-cum-Secretary (w.e.f. 1.4.15 to 5.7.15)
06.07.15 to 31.03.16	WBSEDCL	Shri Narayan Swaroop Nigam, IAS Shri Rajesh Pandey, IAS (from 04.01.16)
01.04.16 to 31.03.17	BSPHCL	Shri Prataya Amrit, IAS
01.04.17 to 31.03.18	JUVNL	Shri N.M.Kulkarni, IAS

ANNEXURE - III

MEMBER SECRETARIES OF EASTERN REGIONAL POWER COMMITTEE (ERPC) & ERSTWHILE EASTERN REGIONAL ELECTRICITY BOARD (EREB) SINCE ITS INCEPTION

Sl. No.	Names of Member Secretaries	From	To
1	Shri Z.S. Haque	1964	1965
2	Shri G. Mukherjee	1965	1967
3	Shri B. Choudhury	1971	1977
4	Shri M.M. Turabi (I/C)	1977	1978
5	Shri B.C. Ghosh (I/C)	06.03.78	06.04.82
6	Shri U.V. Senoy	08.04.82	31.08.82
7	Shri B.C. Ghosh (I/C)	06.09.82	12.12.82
8	Shri P.K.Kar	13.12.82	15.10.85
9	Shri B.C. Ghosh (I/C)	16.10.85	01.12.87
10	Shri B.C. Ghosh	31.12.87	09.03.88
11	Shri B. Sengupta (I/C)	28.03.88	26.03.89
12	Shri B. Sengupta	27.03.89	31.05.93
13	Shri A. Roy (I/C)	01.06.93	17.07.93
14	Dr. S. Mukhopadhyay	18.07.93	03.08.95
15	Shri P. Ray (I/C)	04.08.95	04.02.96
16	Shri S. Santhanam	05.02.96	16.08.96
17	Shri P. Ray (I/C)	17.08.96	26.11.97
18	Shri V.S. Verma	27.11.97	30.07.98
19	Shri P. Ray (I/C)	30.07.98(A/N)	06.07.99
20	Shri B.K. Misra	07.07.99	28.11.03
21	Shri R.B. Sharma	27.11.03	31.01.05
22	Shri M.K.Mitra (I/C)	01.02.05	05.12.05
23	Shri M.K.Mitra	06.12.05	31.02.06
24	Shri K. N. Garg (I/C)	01.04.06	30.04.06
25	Shri Raffi-ud-din	01.05.06	10.09.06
26	Shri R. K. Grover	11.09.06	17.09.09
27	Shri A. K. Rampal	18.09.09	06.09.11
28	Shri A. K. Bandyopadhyaya (I/C)	07.09.11	30.09.14
29	Shri A. K. Bandyopadhyaya	01.10.14	31.10.2017
30	Shri J. Bandyopadhyay	01.11.17	Continuing

INSTALLED AND EFFECTIVE CAPACITY OF POWER STATIONS IN THE EASTERN REGION AS ON 31.03.2018

SL. N0.	NAME OF THE POWER SYSTEM/ STATION	INSTALLED CAPACITY (MW)			PRESENT CAPACITY (AFTER DERATION) (MW) AS ON 31.03.2018	EFFECTIVE CAPACITY (MW) AS ON 31.03.18
		NO. & CAPACITY OF UNITS 31.03.17	Commissioned(+)/ De-commissioned(-) 2017-18	TOTAL AS ON 2017-18		
I	**BSPGCL+BSPHCL**					
	THERMAL:					
1	BARAUNI	2x110		220	**2x105**	210
2	MUZAFFARPUR (Kanti, operated by NTPC	2x110+1x195	1x195	610	2x110+2x195	610
	SUB TOTAL (THERMAL)	**635**		**830**	**820**	**820**
	HYDRO					
3	KOSI	4x5		20	4x5	20
4	SONE WESTERN LINK CANAL HEP	4x1.65		6.6	4x1.65	6.6
5	EASTERN GANDAK CANAL HEP	3x5		15	3x5	15
6	SONE WESTERN LINK CANAL HEP	2x1.65		3.3	2x1.65	3.3
	SUB TOTAL (HYDRO)	**44.9**		**44.9**	**44.9**	**44.9**
	GRAND TOTAL (TH+HY) (BSPHCL	**680**	**195**	**875**	**865**	**865**
II	**JUSNL**					
7	PATRATU(THERMAL)*	1x50+1x100+3x110	-(1*50+1*100+3*110)	0		
	SUB TOTAL (THERMAL)	**480**		**0**	**0**	**0**
8	SUBERNREKHA (HYDRO)	2x65		130	2x65	130
	SUB TOTAL (HYDRO)	**130**		**130**	**130**	**130**
	GRAND TOTAL (TH+HY) (JUVNL)	**610**	**-480**	**130**	**130**	**130**
	TVNL					
9	**TENUGHAT TPS (THERMAL)**	**2x210**		420	**2x210**	420
	TOTAL	**420**		**420**	**2x210**	**420**
III	**D V C**					
	THERMAL :					
10	BOKARO "B"(U#3)	3x210	-(2*210)	210	1x210	210
11	CHANDRAPURA (U#2,3,7&8) **	2x140+2x250	-(1*140)	640	**1x130**+2x250	630
12	DURGAPUR(U#4)	1x210		210	1x210	210
13	MEJIA(U#1-4, 5-6, 7-8)	4x210+2x250+2x500		2340	4x210+2x250+2x500	2340
14	DURGAPUR STEEL TPS (U#1 & 2))	2x500		1000	2x500	1000
15	KODERMA STPS (U# 1& 2)	2x500		1000	2x500	1000
16	RAGHUNATHPUR(U# 1&2)	2x600		1200	2x600	1200
17	BOKARO "A"(U#1)	500		500	1x500	500
	SUB TOTAL (THERMAL)	**7660**	**-560**	**7100**	**7090**	**7090**
	HYDRO					
18	MAITHON	2x20+1x23.2		63.2	2x20+1x23.2	63.2
19	PANCHET	2x40		80	2x40	80
20	TILAIYA	2x2		4	2x2	4
	SUB TOTAL(HYDRO)	**147.2**		**147.2**	**147.2**	**147.2**
	GRAND TOTAL (TH+HY) (DVC)	**7807.2**	**-560**	**7247.2**	**7237.2**	**7237.2**

* Patratu #1,2,3,5 &8 retired on 21.12.2016 . Patratu #4,6,7,9 &10 Phase out during 2017-18.

DVC, DTPS U#3(140 MW) decommissioned on 10.03.2016

DVC, CTPS U#1 (140 MW) decommissioned on 13.01.2017

DVC, BTPS-B U#1&2(2X210 MW) & CTPS U#2 (130 MW) each decommissioned on 30.07.2017

ANNEXURE - IV A (Page-2/3)

SL. N0.	NAME OF THE POWER SYSTEM/ STATION	INSTALLED CAPACITY (MW)			**PRESENT CAPACITY (AFTER DERATION)**	**EFFECTIVE CAPACITY**
		NO. & CAPACITY OF UNITS **ON 31-03-17**	**Commissioned(+)/ De-commissioned(-) 2017-18**	**TOTAL AS ON 2017-18**	(MW) AS ON **31.03.2018**	**(MW) AS ON 31.03.18**
IV	**ODISHA**					
	THERMAL					
21	TALCHER TPS	4x62.5+2x110		470	**4x60**+2x110	460
22	IB TPS	2x210		420	2x210	420
	SUB TOTAL (THERMAL)	**890**		**890**	**880**	**880**
	HYDRO					
	OHPC					
25	BURLA (Hirakud-I)*	2x49.5+2x32+3x37.5		275.5	2x49.5+2x32+3x37.5	275.5
26	CHIPLIMA (Hirakud-II)	3x24		72	3x24	72
27	BALIMELA	6x60+2x75		510	6x60+2x75	510
28	RENGALI	5x50		250	5x50	250
29	UPPER KOLAB	4x80		320	4x80	320
30	INDRAVATI	4x150		600	4x150	600
31	MACHKUND (Odisha Share)**	57.38		57.38	57.38	57.38
	SUB TOTAL (HYDRO)	**2084.88**		**2084.88**	**2084.88**	**2084.88**
	RES(Solar)	**1X20+1x10**		30	**1X20+1x10**	30
	GRAND TOTAL (TH+HY) (ODISHA	**3004.9**		**3004.9**	**2994.9**	**2994.9**
V	**WBPDCL**					
	THERMAL					
32	BANDEL @	4x82.5+1x210		540	**4x60**+1x210	450
33	SANTALDIH (U#5&6)	2x250		500	2x250	500
34	KOLAGHAT	6x210		1260	6x210	1260
35	BAKRESHWAR	4x210+1x210		1050	5x210	1050
36	SAGARDIGHI (U# 1,2,3&4)	2x300+2x500		1600	2x300+2x500	1600
	TOTAL THERMAL(WBPDCL)	**4950**		**4950**	**4860**	**4860**
VI	**WBSEDCL**					
37	JALDHAKA-I	3x9		27	3x9	27
38	JALDHAKA-II	2x4		8	2x4	8
39	MASSANJORE	2x2		4	2x2	4
40	MICRO HYDEL	8		8	8	8
41	RAMAM HYDEL	4x12.73		51	4x12.73	51
42	TISTA CANAL FALLS	9x7.5		67.3	9x7.5	67.3
43	PURULIA PUMP STORAGE	4x225		900	4x225	900
	TOTAL HYDRO (WBSEDCL)	**1065.30**		**1065.30**	**1065.30**	**1065.30**
	GRAND TOTAL (TH+HY) (WB)	**6015.30**		**6015.30**	**5925.30**	**5925.30**

SL. NO.	NAME OF THE POWER SYSTEM/ STATION	INSTALLED CAPACITY (MW)			PRESENT CAPACITY (AFTER DERATION) (MW) AS ON 31.03.2018	EFFECTIVE CAPACITY (MW) AS ON 31.03.18
		NO & CAPACITY OF UNITS ON 31-03-17	Commissioned(+)/ De-commissioned(-) 2017-18	TOTAL AS ON 2017-18		
VII	**DPL THERMAL**					
44	DPPS *	1x110+1x300+1x250		660	1x110+1x300+1x250	660
	TOTAL(DPL)	**660**		**660**	**660**	**660**
VIII	**CESC THERMAL**					
45	SOUTHERN	2x67.5		135	135	135
46	TITAGARH	4x60		240	240	240
47	BUDGE BUDGE	3x250		750	750	750
	TOTAL (CESC)	**1125**		**1125**	**1125**	**1125**
48	**HALDIA ENERGY LTD. (HEL)**	600		**600**	600	**600**
IX	**SIKKIM**					
49	**HYDRO**	**14**		**14**	**14**	**14**
50	**DIESEL**	**7**		**7**	**7**	**7**
	TOTAL (SIKKIM)	**21**		**21**	**21**	**21**
X	**NTPC**					
51	FARAKKA STPS - I&II	3x200+2x500		1600	3x200+2x500	1600
52	FARAKKA STPS - III (U# 6)	1x500		500	1x500	500
53	KAHALGAON STPS - I&II	4x210+3x500		2340	4x210+3x500	2340
54	TALCHER STPS - I	2x500		1000	2x500	1000
55	BARH (U# 4&5)	2x660		1320	2x660	1320
	TOTAL (NTPC)	**6760**		**6760**	**6760**	**6760**
XI	**NHPC**					
56	RANGIT HPS	3x20		60	3x20	60
57	TEESTA HPS	3x170		510	3x170	510
58	TLDP-III @@	4x33		132	4x33	132
59	TLDP-IV @@	4x40		160	4x40	160
	TOTAL	**862**		**862**	**862**	**862**
XII	**IPP**					
60	**MPL (Thermal U#1,2)**	2x525		1050	2x525	1050
61	**APNRL (Thermal U# 1,2)**	2x270		540	2x270	540
62	**GMR (Thermal U# 1,2&3)**	2x350		700	2x350	700
63	**JITPL(Thermal U# 1,2)**	2x600		1200	2x600	1200
64	**BRBCL(Thermal U# 1,2)**	1x250	1x250	500	2x250	500
65	**CHUZACHEN (Hydro U#1,2)**	2x55		110	2x55	110
66	**JORETHANG(Hydro U#1,2)**	2x48		96	2x48	96
67	**TEESTA URJA St III (6x200)**	6x200		1200	6x200	1200
68	**DICKCHU HEP(2x 48)**		2x48	96	2x48	96
69	**TASHIDING(2x 48.5)**		2x48.5	97	2x48.5	97
	TOTAL IPP (THERMAL + HYDRO	**5146**	**443**	**5589**	**5589**	**5589**
XIII						
68	**TALCHER SOLAR**	**10**		**10**	**10**	**10**
XIV	**BHUTAN IMPORT**					
69	**CHPS**	4x90		360	4x90	270
70	**KURICHHU HPS**	4x15		60	4x15	60
71	**TALA HPS**	6x170		1020	6x170	867
72	**DAGHACHU**	2x63		126	2x63	126
	TOTAL BHUTAN IMPORT	**1566**		**1566**	**1556**	**1323**
XV	**EASTERN REGION(Excluding Bhutan import)**					
	THERMAL	**27920**	**-595**	**27325**	**27205**	**27205**
	HYDRO	**5754**	**193**	**5947**	**5947**	**5947**
	DIESEL	**7**		**7**	**7**	**7**
	SOLAR	**40**		**40**	**40**	**40**
	ER GRAND TOTAL (Excl. Bhutan	**33721**	**-402**	**33319**	**33199**	**33199**

Allocated import by ER from Bhutan (90 MW of Chukha power is for own consumption of Bhutan & 15% of Tala power allocated to NR)
100% power of TLDP under NHPC is allocated for West Bengal.
TSTPS Stage-II (4x500 MW) though geographically situated in Orissa but it is meant for SR, hence not considered for I.C. of ER.
Capacity of A&N Island (Installed & Effective Capacity of DG 28.03 MW & 23.56 MW respectively) not considered
Lachung HEP (3MW), Mangley HEP (2 MW), Rangia HEP (5 MW), Meyong Chu HEP (4 MW) are considered in Sikkim Hydro
Gangtok Diesel Power House (4 MW), Ranipool DPH (1 MW) and Jali Power House St.-I (2.1 MW) are considered for Sikkim Diesel

ANNEXURE - IV B

NEW UNITS DECLARED COMMERCIAL IN EASTERN REGION DURING 2017-18

Sl. No.	Power Station	Agency	State	Type	Unit No	Unit Capacity (MW)	Date of Commercial
1	DIKCHU	IPP	SIKKIM	HYDRO	1	48	12.04.2017
2	DIKCHU	IPP	SIKKIM	HYDRO	2	48	28.05.2017
3	KBUNL St-II	NTPC	BIHAR	THERM	2	195	01.07.2017
4	BRBCL	NTPC & RAILWAY	BIHAR	THERM	2	250	10.09.2017
5	TASHIDING	IPP	SIKKIM	HYDRO	1	48.5	18.10.2017
6	TASHIDING	IPP	SIKKIM	HYDRO	2	48.5	18.10.2017

ANNEXURE - IV C (Page-1/2)

NEW TRANSMISSION ELEMENTS COMMISSIONED DURING 2017-18

A. TRANSMISSION LINES ADDITION DURING THE YEAR

Sl. No.	Name of the lines	Organisation	No. of Circuit	Date of Commissioning
1	400kV Darbhanga-Muzaffarpur-I	DMTCL	I	07-Apr-17
2	220kV Samastipur-Darbhanga-S/C	BSPTCL	I	16-Apr-17
3	220kV Motipur-Darbhanga	BSPTCL	I & II	17-Apr-17
4	400kV Kolaghat- New Chanditala (WBSETCL) (LILO of 400kV Jeerat- Kolaghat	WBSETCL	I	03-Jul-17
5	400kV Jeerat-New Chanditala (WBSETCL) (LILO of 400kV Jeerat- Kolaghat SC at New Chandita	WBSETCL	I	03-Jul-17
6	New PPSP-Arambag Ckt-1 (LILO of 400kV PPSP-Arambag Ckt-1 at New PPSP)	WBSETCL	I	15-Jul-17
7	PPSP-New PPSP Ckt-1 (LILO of 400kV PPSP-Arambag Ckt-1 at New PPSP)	WBSETCL	I	15-Jul-17
8	400kV New Ranchi-New PPSP-I & II	PKTCL	I & II	24-Jul-17
9	400kV Gorakhpur-Motihari (DMTCL) ckt-2 (LILO of 400kV Barh-Gorakhpur ckt-2)	PGCIL	II	31-Jul-17
10	400kV Barh- Motihari Ckt-II (LILO of 400kV Barh-GorakhPur II at Motihari)	PGCIL	II	01-Aug-17
11	132kV Motihari-Bettiah I & II	BSPTCL	I & II	04-Aug-17
12	132Kv Motihari-Motihari (BSPHCL) II	BSPTCL	II	06-Aug-17
13	400kV Gorakhpur- Motihari ckt-I (LILO of 400kV Barh-Gorakhpur-I at Motihari)	PGCIL	I	07-Aug-17
14	400kV Barh- Motihari ckt-I (LILO of 400kV Barh Gorakhpur-I at Motihari)	DMTCL	II	07-Aug-17
15	400kV RTPS-Ranchi Ckt.-II & III	DVC	II & III	28-Aug-17
16	400kV Kharagpur-New Chanditala I	WBSETCL	I	06-Sep-17
17	400kV Kharagpur-New Chanditala II	PGCIL	II	07-Sep-17
18	132 kV Baripada - Jaleswar charged for the first Time	OPTCL	I	23-Sep-17
19	132 kV Baripada- Bhograi first time charged.	OPTCL	I	25-Sep-17
20	220 KV New Melli-Tashiding ckt (SIKKIM) charged for the first time	SIKKIM	I	12-Oct-17
21	132kV Motihari-Raxual	BSPTCL	I	18-Oct-17
22	132kV Motihari-Raxual	BSPTCL	II	20-Oct-17
23	220kV Tashiding-Rangpo	SIKKIM	I	30-Oct-17
24	400kV Jharsuguda-Veedanta I & II (Sterlite)	OGPTCL	I & II	06-Nov-17
25	132 kV Manjhaul-Bakhri	BSPTCL	I	15-Nov-17
26	132 kV Saharsa-Udakishanganj	BSPTCL	II	16-Nov-17
27	132 kV Balia-Bakhri	BSPTCL	I	16-Nov-17
28	132 kV Purnea -Manihari S/C	BSPTCL	I	19-Nov-17
29	132 kV Manihari - Katihar S/C	BSPTCL	I	19-Nov-17
30	Banka (old) - Banka(New)	BSPTCL	II	22-Nov-17
31	400 kV Jharsuguda – IB_OPGC # I & II	OPTCL	I & II	19-Dec-17
32	220 kV Atri - Pandiabili # II	OPTCL	II	19-Dec-17
33	220 kV Samagara - Pandiabili # II	PGCIL	II	19-Dec-17
34	132 kV Nawada - New Shekpura	BSPTCL	I & II	21-Dec-17
35	132 kV New Sheikpura - Sheikpura	BSPTCL	I & II	21-Dec-17
36	132 kV Amnour(BGCL)- Chapra	BSPTCL	I & II	26-Dec-17
37	400kV Raigarh – Jhasuguda 4 (LILO of 400kV Rourkela- Raigarh 4 at Jhasuguda)	PGCIL	III	31-Dec-17
38	400kV Rourkela – Jhasuguda 4 (LILO of 400kV Rourkela- Raigarh 4 at Jhasuguda)	PGCIL	I	02-Jan-18
39	400kV Jharsuguda-Rourkela-III Powergrid	PGCIL	IIII	05-Jan-18
40	400kV Jharsuguda-Raigarh-III	PGCIL	IIII	05-Jan-18
41	400kV Sasaram-Daltonganj-II	PGCIL	II	31-Jan-18
42	220 kV Patna Sipara 3 BSPTCL	BSPTCL	I	05-Mar-18
43	132 kV Daltonganj (JUSNL) –Daltonganj (PG) # II	JUSNL	II	07-Mar-18
44	132 kV Daltonganj (JUSNL) – Daltonganj (PG) # I	JUSNL	I	10-Mar-18

ANNEXURE - IV C (Page-2/2)

B. SUB-STATIONS / ATRS / REACTORS ADDITION DURING THE YEAR 2017-18

Sl. No.	Substation/ATRS/Reactors	Utility	Voltage (kV)	Date of Commissioning
1	132 kV Muniguda S/S	OPTCL	132	29-Nov-17
1	500MVA ICT-I at Darbhanga	DMTCL	400/220	09-Apr-17
2	200MVA ICT I at Motihari S/Stn	DMTCL	400/132	01-Aug-17
3	315 MVA, 400/220/33 kV ICT # II at New Chanditala	WBSETCL	220/132	15-Sep-17
4	500MVA ICT-II at Maithon (old 315MVA Replacement) charged	PGCIL	220/132	13-Oct-17
5	500MVA ICT II at Pandiabili	PGCIL	400/220	17-Nov-17
6	315 MVA ICT # 3 at Jamshedpur (PG)	PGCIL	400/220	11-Dec-17
7	315 MVA ICT # 3 at New Chanditala (WBSETCL)	WBSETCL	400/220	20-Dec-17
8	315 MVA, ICT # I at Daltonganj	PGCIL	400/220	08-Mar-18
1	125MVAR BR-II at Alipurduar (PG)	PGCIL	400	7-Apr-2017
2	125 MVAR Bus Reactor at Darbhanga	DMTCL	400	10-Apr-2017
3	80MVAR switchable Line Reactor with 400kV Farakka- Gokarna-I at FSTPS, NTPC	PGCIL	765	28-Apr-2017
4	80MVAR Bus Reactor-1 at New PPSP Substation	WBSETCL	400	15-Jul-2017
5	125 MVAR Bus Reactor I & II at Rengali	PGCIL	400	1-Aug-2017
6	80MVAR Bus Reactor at New Chanditala S/Stn	WBSETCL	400	18-Aug-2017
7	125 MVAR Bus Reactor at Jamshedpur	PGCIL	400	15-Nov-2017
8	125 MVAr B/R III at Jamshedpur (PG)	PGCIL	400	2-Dec-2017
9	125MVAR Bus reactor at Rourkela Powergrid Replacement of old 50MVAR Bus Re	PGCIL	400	5-Jan-2018
10	63MVAr line Reactor Sasaram-Daltonganj-II at Daltonganj	PGCIL	400	31-Jan-2018
11	80 MVAr Bus reactor at Daltangunj	PGCIL	400	20-Mar-2018
12	240 MVAR L/R 3 of 765 KV Angul- Jharsuguda 3	PGCIL	765	31-Mar-2018

ANNEXURE-V

CONSTITUENT-WISE PERFORMANCE DATA DURING 2017-18

SYSTEM	Gross Generation(MU)				Auxiliary power Consumption(MU)			Net Generation (MU)				Import from	Net Exchang	Energy	**Net Peak**
	HYDRO	Thermal	RES (Hy+Solar)	Total	HYDRO	Thermal	Total	HYDRO	Thermal	RES (Hy+Solar)	Total	Captive (MU	Import(+)	Consum-	DEMAND
													Export(-)	ption(MU)	MET (MW)
BIHAR	14.37	1790.43	0.00	1804.80	0.00	220.86	220.86	14.37	1569.58	0.00	1583.94	325.38	25445.27	27354.60	4527
JSEB	190.28	1933.31	0.00	2123.59	0.00	258.06	258.06	190.28	1675.25	0.00	1865.53	554.67	6070.16	8490.36	1314
DVC	267.20	35692.11	10.92	35970.22	1.57	2730.97	2732.53	265.63	32961.14	10.92	33237.69	194.39	-12103.32	21328.76	3079
ODISHA(OPGC+OHPC+TTPS)	5792.02	6623.09	96.50	12511.61	20.04	712.23	732.27	5771.98	5910.86	96.50	11779.34	5950.25	11567.75	29297.34	4488
WBPDCL+WBSEDCL	1413.02	23445.96	0.00	24858.98	0.00	2339.37	2339.37	1413.02	21106.59	0.00	22519.61	1427.24	14264.07	38210.92	6470
DPL	0.00	2524.46	6.04	2530.50	0.00	266.27	266.27	0.00	2258.20	6.04	2264.23	0.00	-257.52	2006.71	318
CESC	0.00	6337.13	0.00	6337.13	0.00	499.08	499.08	0.00	5838.05	0.00	5838.05	0.00	5044.14	10882.20	2148
Haldia Energy limited	0.00	4525.90	0.00	4525.90	0.00	350.60	350.60	0.00	4175.30	0.00	4175.30	0.00	-4175.30		
SIKKIM	30.00	0.00	0.00	30.00	0.00	0.00	0.00	30.00	0.00	0.00	30.00	0.00	482.66	512.66	108
NTPC	0.00	46624.98	0.00	46624.98	0.00	3241.77	3241.77	0.00	43383.21	0.00	43383.21	0.00	-43383.21		
BRBCL	0.00	1060.29	0.00	1060.29	0.00	101.61	101.61	0.00	958.68	0.00	958.68	0.00	-958.68		
MPL	0.00	7406.14	0.00	7406.14	0.00	408.99	408.99	0.00	6997.15	0.00	6997.15	0.00	-6997.15		
APNRL	0.00	2909.92	0.00	2909.92	0.00	247.63	247.63	0.00	2662.29	0.00	2662.29	0.00	-2662.29		
GMR	0.00	3687.57	0.00	3687.57	0.00	255.01	255.01	0.00	3432.56	0.00	3432.56	0.00	-3432.56		
JITPL	0.00	3666.43	0.00	3666.43	0.00	240.25	240.25	0.00	3426.18	0.00	3426.18	0.00	-3426.18		
NHPC (Inc TLDP=859.01MU)	3997.04	0.00	0.00	3997.04	0.00	0.00	0.00	3997.04	0.00	0.00	3997.04	0.00	-3997.04		
CHPC(Birpara Receipt)	1580.65	0.00	0.00	1580.65	0.00	0.00	0.00	1580.65	0.00	0.00	1580.65	0.00	-1580.65		
KHPS	347.31	0.00	0.00	347.31	0.00	0.00	0.00	347.31	0.00	0.00	347.31	0.00	-347.31		
THPS	2702.48		0.00	2702.48	0.00	0.00	0.00	2702.48	0.00	0.00	2702.48	0.00	-2702.48		
DAGACHU HPS	441.65	0.00	0.00	441.65	0.00	0.00	0.00	441.65	0.00	0.00	441.65	0.00	-441.65		
CHUZACHEN HPS	442.46	0.00	0.00	442.46	0.00	0.00	0.00	442.46	0.00	0.00	442.46	0.00	-442.46		
JORTHANG HPS	405.56	0.00	0.00	405.56	0.00	0.00	0.00	405.56	0.00	0.00	405.56	0.00	-405.56		
TEESTA-III HPS	4392.65	0.00	0.00	4392.65	0.00	0.00	0.00	4392.65	0.00	0.00	4392.65	0.00	-4392.65		
DIKCHU HPS	379.97	0.00	0.00	379.97	0.00	0.00	0.00	379.97	0.00	0.00	379.97	0.00	-379.97		
TASHIDING HPS	92.78	0.00	0.00	92.78	0.00	0.00	0.00	92.78	0.00	0.00	92.78	0.00	-92.78		
TALCHER SOLAR	0.00	0.00	13.81	13.81	0.00	0.00	0.00	0.00	0.00	13.81	13.81	0.00	-13.81		
Total Drawal by BRBCL,Indbharat , OPGC and consumption at HVDC Sasaram& Alipurduar.													21.49	21.49	
Total	22489.43	148227.73	127.27	170844.42	21.61	11872.70	11894.31	22467.82	136355.03	127.27	158950.12	8451.93	**-29297.02**	**138105.03**	**20567**
													138105.03		

		BSEB	**JSEB**	**DVC**	**ODISHA**	**WBSEDCL**	**CESC**	**SIKKIM**	**REGION**
ANNUAL LOAD FACTOR:		**68.98**	**73.76**	**79.08**	**74.52**	**67.42**	**57.83**	**54.19**	**76.65**

Note: 1. BSPHCL exchange inclusive the drawal of Nepal from BSPHCL network .

2. Sikkim's generarion figure is estimated

3. Net Exchange of Energy is inclusive Transmission loss at the periphery of respectives system.

ANNEXURE-VI

CONSTITUENT WISE PEAK DEMAND MET DURING 2017-18

(All figures in Net MW)

MONTH	BSEB	JSEB	DVC	ODISHA	WBSEDCL	CESC	DPL	SIKKIM	ER
	Peak Demand Met	Peak Demand Met	Peak Demand Met	Peak Demand Met	Peak Demand Met	Peak Demand Met	Peak Demand Met	Peak Demand Met	Peak Demand Met
Apr-17	3923	1177	2803	4262	6247	1980	276	88	19164
May-17	4062	1217	2726	4149	5877	2110	274	83	19509
Jun-17	4151	1214	2746	3902	6067	2148	276	83	18994
Jul-17	4134	1216	2761	4247	6102	1742	290	78	19110
Aug-17	4101	1245	2721	4254	6151	1790	273	78	19221
Sep-17	4437	1232	2851	4365	6470	1964	257	85	20283
Oct-17	4527	1254	2700	4488	6098	1848	243	99	19882
Nov-17	3919	1314	2957	4191	4998	1643	252	108	18377
Dec-17	3969	1235	2944	4254	4836	1391	242	107	17837
Jan-18	4359	1233	3079	4232	4931	1306	256	104	18238
Feb-18	4146	1220	2989	4213	5316	1563	264	103	18918
Mar-18	4487	1223	2997	4475	6456	1738	318	92	20567
MAXIMUM	**4527**	**1314**	**3079**	**4488**	**6470**	**2148**	**318**	**108**	**20567**
MINIMUM	**3919**	**1177**	**2700**	**3902**	**4836**	**1306**	**242**	**78**	**17837**
AVERAGE	**4185**	**1232**	**2856**	**4253**	**5796**	**1769**	**268**	**92**	**19175**
% AVG. Growth wrt 16-17	***19.76***	***9.96***	***13.07***	***9.33***	***3.82***	***4.53***	***11.97***	***12.50***	***8.65***

(All Figures in Net MW)

Constituent wise Peak Demand Met during 2016-17									
MONTH	BSEB	JSEB	DVC (OWN)	ODISHA	WBSEDCL (OWN)	CESC	DPL	SIKKIM	ER (TOTAL)
Apr-16	3518	1192	2518	3965	6038	2055	284	84	18607
May-16	3634	1116	2493	3965	5820	2009	274	79	18306
Jun-16	3520	1110	2608	4052	5976	1943	271	80	18302
Jul-16	3583	1122	2428	4072	5862	1722	284	76	18338
Aug-16	3529	1162	2382	4105	6079	1837	262	78	18418
Sep-16	3623	1138	2723	3936	5968	1846	253	82	18469
Oct-16	3699	1195	2493	3999	6232	1926	245	81	18930
Nov-16	3780	1159	2332	3861	5637	1685	234	86	18239
Dec-16	3520	1161	2265	3830	4667	1404	258	91	17019
Jan-17	3698	1184	2502	3794	5379	1316	230	96	17556
Feb-17	3536	1165	2474	3847	5429	1531	222	95	17901
Mar-17	3710	1143	2500	4013	6193	1721	230	96	18225
MAXIMUM	3780	1195	2723	4105	6232	2055	284	96	18930
MINIMUM	3518	1110	2265	3794	4667	1316	222	76	17019
AVERAGE	3613	1154	2477	3953	5773	1750	254	85	18193

ANNEXURE-VII

Constituent wise net energy consumption during 2017-18										(All Figures in Net MU)
MONTH	BSEB	JSEB	DVC (OWN)	ODISHA	WBSEDCL (OWN)	DPL	CESC	WEST BENGAL (TOTAL)	SIKKIM	ER (TOTAL)
Apr-17	2099	731	1732	2541	3500	170	1009	4679	39	11821
May-17	2289	718	1747	2601	3398	175	1122	4695	40	12090
Jun-17	2439	685	1734	2325	3495	167	1077	4739	37	11959
Jul-17	2317	661	1728	2468	3438	171	992	4602	37	11813
Aug-17	2449	740	1770	2493	3542	174	1036	4751	36	12239
Sep-17	2582	724	1786	2654	3581	162	1034	4777	37	12560
Oct-17	2532	706	1769	2759	3219	159	932	4310	42	12117
Nov-17	1932	675	1723	2156	2527	155	748	3431	50	9965
Dec-17	2027	726	1866	2206	2493	165	682	3341	51	10216
Jan-18	2338	743	1923	2361	2712	172	670	3554	52	10972
Feb-18	1977	648	1706	2180	2733	159	669	3560	47	10118
Mar-18	2373	734	1846	2553	3573	177	913	4662	45	12213
TOTAL	**27355**	**8490**	**21329**	**29297**	**38211**	**2007**	**10882**	**51100**	**513**	**138105**
AVERAGE	2280	708	1777	2441	3184	167	907	4258	43	11507
MAXIMUM	2582	743	1923	2759	3581	177	1122	4777	52	12560
MINIMUM	1932	648	1706	2156	2493	155	669	3341	36	9965
% Growth wrt 16-17	***14.62***	***5.62***	***6.59***	***12.39***	***0.81***	***9.24***	***1.88***	***1.34***	***9.56***	***7.13***
Per day Consumption	**74.94**	**23.26**	**58.43**	**80.27**	**104.69**	**5.50**	**29.73**	**139.62**	**1.40**	**378.37**

Constituent wise net energy consumption during 2016-17										(All Figures in Net MU)
MONTH	BSEB	JSEB	DVC (OWN)	ODISHA	WBSEDCL (OWN)	DPL	CESC	WEST BENGAL (TOTAL)	SIKKIM	ER (TOTAL)
Apr-16	1964	732	1738	2295	3543	175	1080	4798	35	11562
May-16	1932	662	1542	2153	3301	173	1055	4529	35	10853
Jun-16	2035	637	1685	2249	3439	173	1048	4660	36	11302
Jul-16	2166	674	1547	2339	3455	174	992	4621	39	11386
Aug-16	2150	639	1690	2273	3465	155	1017	4637	35	11424
Sep-16	2031	622	1694	2009	3392	144	957	4493	36	10885
Oct-16	2176	649	1836	2341	3572	150	952	4674	38	11714
Nov-16	1876	656	1593	1977	2486	137	721	3344	39	9485
Dec-16	1874	694	1635	2000	2475	133	678	3286	43	9532
Jan-17	1951	703	1721	2074	2746	143	667	3556	45	10050
Feb-17	1763	665	1591	2021	2791	137	680	3608	42	9690
Mar-17	1948	706	1741	2337	3241	143	834	4218	45	10995
TOTAL	**23866**	**8039**	**20010**	**26068**	**37904**	**1837**	**10681**	**50424**	**468**	**128916**
AVERAGE	1989	670	1668	2172	3159	153	890	4202	39	10740
MAXIMUM	2176	732	1836	2341	3572	175	1080	4798	45	11714
MINIMUM	1763	622	1542	1977	2475	133	667	3286	35	9485
% Growth wrt 15-16	***4.14***	***9.98***	***4.91***	***0.44***	***5.36***	***-7.88***	***-1.12***	***3.38***	***22.24***	***3.62***
Per day Consumption	**65.39**	**22.02**	**54.82**	**71.42**	**103.85**	**5.03**	**29.26**	**137.77**	**1.28**	**353.19**

INTER-REGIONAL,INTRA-REGIONAL AND INTERNATIONAL EXCHANGE OF ENERGY DURING 2017-18

(All figures in net MU)

Month	DRAWAL					ER TO	ER TO	ER TO	NVVN	NVVN	HVDC	HVDC	BRBCL	BRBCL	IND	OPGC	Total Drawal	Transmissi	% age
	BSEB	JSEB	ODISHA	WBSEDCL	SIKKIM	NER	NR	SR	NEPAL	BANGLADESH	SASARAM	ALIPURDUA	U#1	U#2	BHARAT	INFIRM	(Without Loss)	Loss	Tr.loss
Apr-17	1960.59	579.06	699.24	1430.00	35.78	2.97	1322.11	963.11	92.15	344.38	0.73	0.00	0.47	1.50	0.00	0.00	7432.09	161.48	2.17
May-17	2142.38	545.48	811.32	1217.80	36.29	199.18	1649.94	770.15	94.19	352.66	0.76	0.00	0.37	1.47	0.16	0.00	7822.14	168.77	2.16
Jun-17	2296.52	518.35	525.03	1467.51	33.55	353.63	1611.60	679.95	86.41	351.34	0.62	0.00	0.39	1.56	1.52	0.00	7927.98	169.23	2.13
Jul-17	2185.41	480.03	859.19	1455.60	33.79	559.88	1821.00	1086.23	78.93	363.57	0.47	0.00	1.08	0.00	0.96	0.00	8926.13	201.79	2.26
Aug-17	2269.71	518.18	838.04	1714.77	33.07	557.16	1658.21	787.06	72.77	362.24	0.03	0.00	0.00	0.00	0.55	0.00	8811.79	189.40	2.15
Sep-17	2350.86	533.83	1098.76	1580.80	33.34	463.24	1667.35	338.64	63.74	350.65	0.03	0.26	0.00	1.91	0.34	0.00	8483.76	177.00	2.09
Oct-17	2255.21	492.51	1318.47	1329.79	38.26	378.54	1572.78	227.50	49.50	342.77	0.02	0.76	0.00	0.00	0.36	0.00	8006.47	164.46	2.05
Nov-17	1740.84	451.75	1122.43	830.80	46.75	338.44	1337.59	943.82	65.69	297.52	0.02	0.50	0.00	0.00	0.19	0.00	7176.34	134.78	1.88
Dec-17	1795.20	430.80	1046.69	573.70	47.86	483.33	1356.03	905.83	82.14	234.85	0.02	0.46	0.00	0.00	0.22	0.00	6957.12	153.15	2.20
Jan-18	2091.42	462.41	850.96	520.37	48.47	179.99	1521.40	918.60	92.67	277.65	0.40	0.41	0.00	0.00	0.25	0.01	6964.99	190.93	2.74
Feb-18	1735.70	449.01	987.47	580.61	43.56	148.87	1566.53	1069.95	81.44	267.77	0.42	0.38	0.00	0.00	0.26	0.02	6932.01	157.72	2.28
Mar-18	2079.75	479.53	1163.91	1016.27	41.67	8.29	1563.51	1338.28	64.99	334.52	0.41	0.48	0.00	0.00	0.24	0.03	8091.89	165.70	2.05
TOTAL	24903.59	5940.94	11321.49	13718.01	472.39	3673.52	18648.07	10029.12	924.63	3879.92	3.93	3.24	2.31	6.44	5.06	0.0595	93532.71	2034.41	2.18
Drawal including Trans. Loss	25445.27	6070.16	11567.75	14016.38	482.66	3753.43	19053.68	10247.26	944.74	3964.31	4.01	3.31	2.36	6.58	5.17	0.06	95567.12		

ANNEXURE-VIII (Page-2/6)

(All figures in net MU)

Month	Net Generation (MU)									
	FSTPP	FSTPP	KhSTPP	KhSTPP	TSTPP	Barh STPS	Total	TALCHER	RHPS	TEESTA
	I&II	III	I	Stage-II			NTPC	SOLAR		HPS
Apr-17	540.29	285.05	466.45	833.53	562.89	776.70	3464.91	1.30	20.06	230.48
May-17	842.62	276.08	479.09	895.31	546.16	759.11	3798.37	1.43	25.22	277.11
Jun-17	736.59	211.61	334.86	748.12	583.15	708.17	3322.50	1.02	37.60	342.21
Jul-17	756.95	214.41	405.60	728.84	616.85	643.16	3365.80	0.80	43.54	364.34
Aug-17	740.12	237.36	474.87	866.09	658.37	602.34	3579.14	1.01	42.45	362.95
Sep-17	829.81	247.88	488.67	633.86	647.39	464.72	3312.32	1.02	42.45	371.35
Oct-17	711.11	211.01	483.24	871.70	650.27	630.24	3557.57	1.05	43.04	331.10
Nov-17	871.76	202.28	427.88	940.15	531.75	739.44	3713.26	1.13	29.31	154.08
Dec-17	919.25	261.87	378.06	883.51	336.62	898.43	3677.74	1.20	19.46	111.41
Jan-18	897.14	213.70	449.96	824.03	597.20	874.69	3856.72	1.39	14.49	81.38
Feb-18	886.26	245.84	374.56	835.84	621.76	787.14	3751.40	1.26	11.05	68.30
Mar-18	741.05	302.06	379.82	973.45	692.98	894.11	3983.48	1.20	12.49	102.17
TOTAL	9472.94	2909.15	5143.06	10034.40	7045.39	8778.26	43383.21	13.81	341.14	2796.90

(All figures in net MU)

Month	IMPORT FROM BHUTAN HPS				TOTAL	Net Generation (MU)						
	CHPC	KHPS	TALA HPS	DHPS	BHUTAN	CHUZACHEN	JORETHANG HP	TEESTA URJA	DIKCHU HPS	DIKCHU HPS	TASINGDIH HPS	
	Import	Import	Import	Import	IMPORT	HPS	HPS	LIMITED	FIRM	INFIRM	FIRM	INFIRM
Apr-17	129.86	8.53	60.81	15.59	214.80	29.68	16.11	151.00	10.50	3.30	0.00	0.00
May-17	114.23	26.56	151.49	18.07	310.34	45.33	20.35	436.80	12.69	9.07	0.00	0.00
Jun-17	167.36	41.87	284.35	30.99	524.58	51.62	43.38	537.60	50.99	0.00	0.00	0.00
Jul-17	294.71	69.88	617.94	72.68	1055.20	71.62	67.80	646.18	72.50	0.00	0.00	0.00
Aug-17	290.15	66.34	625.38	82.61	1064.47	68.54	65.53	549.57	60.85	0.00	0.00	0.00
Sep-17	249.53	68.68	536.90	76.94	932.04	71.52	70.56	623.07	66.73	0.00	0.00	0.00
Oct-17	206.43	57.49	301.72	55.41	621.05	48.73	53.95	549.64	45.73	0.00	16.87	3.08
Nov-17	89.18	20.43	92.11	29.06	230.77	19.29	25.28	274.51	17.51	0.00	25.79	0.00
Dec-17	41.63	3.24	34.85	20.63	100.35	12.49	16.44	198.56	6.37	0.00	17.88	0.00
Jan-18	11.34	-5.04	6.33	15.67	28.31	9.00	7.06	145.80	6.41	0.00	7.75	0.00
Feb-18	-9.04	-6.30	-6.33	11.96	-9.70	3.47	9.08	121.75	5.75	0.00	10.37	0.00
Mar-18	-4.74	-4.36	-3.06	12.03	-0.13	11.16	10.03	158.18	11.57	0.00	11.03	0.00
TOTAL	1580.65	347.31	2702.48	441.65	5072.08	442.46	405.56	4392.65	367.60	12.37	89.69	3.08

ANNEXURE-VIII (Page-4/6)

								(All figures in net MU)		
	Net Generation (MU)							**INJECTION BY**		**TOTAL**
Month	**APNRL**	**GMR KEL**	**JITPL**	**MAITHAN**	**BRBCL**	**BRBCL U#2**	**TOTAL**	**DVC**	**WR**	**(MU)**
				R/B TPP	**Firm (U#1,2)**	**Infirm**				
Apr-17	**254.36**	**369.84**	**284.97**	**588.11**	**0.00**	**0.00**	**5639.42**	**1120.22**	**833.93**	**7593.57**
May-17	**333.77**	**295.74**	**32.90**	**634.18**	**0.00**	**0.00**	**6233.30**	**1332.08**	**425.53**	**7990.91**
Jun-17	**300.87**	**218.86**	**310.91**	**623.10**	**0.00**	**0.00**	**6365.23**	**1045.96**	**686.03**	**8097.21**
Jul-17	**274.92**	**292.60**	**258.48**	**610.57**	**0.00**	**5.85**	**7130.20**	**929.74**	**1067.97**	**9127.92**
Aug-17	**266.53**	**299.60**	**263.51**	**699.37**	**99.38**	**31.97**	**7454.86**	**659.82**	**886.50**	**9001.19**
Sep-17	**208.56**	**189.43**	**241.48**	**686.48**	**116.02**	**0.00**	**6933.03**	**706.96**	**1020.77**	**8660.76**
Oct-17	**151.07**	**198.86**	**319.63**	**571.13**	**107.47**	**0.00**	**6619.99**	**436.53**	**1114.41**	**8170.93**
Nov-17	**154.84**	**380.22**	**296.82**	**316.49**	**101.19**	**0.00**	**5740.49**	**727.26**	**843.38**	**7311.12**
Dec-17	**183.93**	**236.28**	**290.62**	**342.68**	**115.13**	**0.00**	**5330.53**	**1140.25**	**639.49**	**7110.27**
Jan-18	**183.15**	**222.77**	**317.46**	**626.30**	**106.53**	**0.00**	**5614.51**	**1103.76**	**437.66**	**7155.93**
Feb-18	**165.99**	**298.90**	**299.19**	**618.13**	**125.52**	**0.00**	**5480.48**	**1323.51**	**285.73**	**7089.73**
Mar-18	**184.30**	**429.47**	**510.20**	**680.61**	**149.62**	**0.00**	**6255.39**	**1577.22**	**424.98**	**8257.59**
TOTAL	**2662.29**	**3432.56**	**3426.18**	**6997.15**	**920.87**	**37.82**	**35041.37**	**12103.32**	**8666.38**	**95567.12**

	IMPORT BY ODISHA FROM CAPTIVE STATIONS DURING 2017-18 All Figs in MU												
		IMPORT BY ODISHA FROM											
SN.	Name of IPP / CGPs	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Total
1	Aarti Steel Ltd, ghantikhal	12.29	13.48	11.76	16.05	11.64	8.93	7.70	7.53	6.08	6.58	7.90	13.32	123.25
2	ACC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	Action Ispat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	Aryan Ispat,	4.51	3.02	2.23	0.86	0.71	1.70	4.01	3.87	2.63	1.55	1.57	1.64	28.31
3	BPPL	69.67	59.97	67.25	56.67	46.96	52.50	57.03	69.52	69.54	71.54	56.60	56.60	733.86
5	BPSL, Jharsuguda	17.80	11.56	15.85	14.47	19.11	8.35	10.07	15.47	16.78	11.52	9.75	10.05	160.78
6	BSL, Meramundali	15.95	14.43	17.04	6.57	10.45	6.26	4.91	5.30	6.42	0.00	6.15	2.64	96.12
7	GMR Kamalanga Energy Ltd	180.37	164.03	158.41	140.52	167.15	172.56	152.10	76.38	122.60	157.71	76.91	104.42	1673.17
8	HINDALCO, Hirakud	1.49	1.55	1.04	1.73	1.59	1.80	1.57	1.82	1.89	1.91	1.76	0.00	18.15
9	IFFCO, Paradeep	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
10	IMFA , Choudwar	33.83	27.00	15.76	24.80	27.29	26.28	29.27	28.62	27.39	28.71	0.00	29.55	298.49
11	JINDAL, New Duburi	12.31	12.09	9.14	12.58	12.04	8.96	9.73	11.02	12.41	10.93	9.27	7.77	128.24
12	JSPL, Angul	22.60	30.14	29.85	31.11	28.48	40.11	31.10	30.79	26.41	0.00	47.28	62.10	379.97
13	Mahavir Ferro Alloys	0.04	0.06	0.08	0.08	0.14	0.13	0.00	0.00	0.12	0.02	0.04	0.07	0.79
14	Maithan Ispat Ltd.	0.57	0.42	0.33	0.66	0.33	0.13	0.44	0.62	0.22	0.24	0.36	0.62	4.95
15	Meenakshi Power Ltd. (SH)	9.65	13.26	18.47	27.48	13.48	29.13	26.75	12.11	7.51	4.76	5.27	5.19	173.06
16	MSP, Jharsuguda	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	NALCO , Angul	27.20	26.86	22.26	28.19	28.07	27.26	31.65	10.59	22.20	20.77	17.87	17.02	279.93
18	Narbheram	0.03	0.03	0.00	0.08	0.05	0.08	0.09	0.02	0.03	0.05	0.08	0.06	0.61
19	NBVL , Kharag Prasad	32.12	7.68	10.70	1.20	23.28	32.44	9.09	8.40	6.14	7.21	9.33	18.93	166.53
21	NINL , Duburi	1.37	1.26	1.92	0.31	0.00	0.00	0.54	1.19	1.43	2.28	2.32	1.08	13.70
22	OCL	5.33	6.29	5.79	4.67	4.53	8.15	6.34	3.01	6.04	6.23	2.06	6.45	64.89
23	OPCL, Samal (SH)	4.82	9.16	7.31	5.98	10.23	8.94	13.11	3.37	3.01	3.04	4.00	7.16	80.15
26	PSAL, Keonjhar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	RSP , Rourkela	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	Shree Ganesh	0.62	0.89	0.67	0.79	0.80	0.91	1.01	0.72	1.06	0.84	0.64	0.99	9.94
29	Shyam Metallics	0.43	0.08	0.22	0.09	0.29	0.36	1.27	1.17	1.07	1.08	0.78	0.98	7.84
30	SMC Power	0.78	0.94	0.09	0.08	0.14	0.03	0.09	0.09	0.11	0.03	0.01	0.03	2.43
31	TSIL, Joda	11.98	12.94	12.91	6.05	10.85	13.22	13.82	14.09	11.43	11.92	10.54	14.21	143.97
32	Vedanta Ltd. (IPP-Unit-2)	121.53	38.50	43.03	0.00	0.00	0.00	0.00	0.00	0.00	122.08	51.35	0.00	376.50
33	Vedanta, Jharsuguda	29.62	19.52	30.82	2.40	28.86	6.88	8.11	12.76	20.94	120.60	60.06	45.52	386.09
36	Vedanta, Lanjigarh	0.00	0.00	0.57	0.68	0.81	0.75	0.59	0.76	0.72	0.85	0.60	0.61	6.96
37	VISA Steel	0.02	0.06	0.08	0.08	0.04	0.03	0.07	0.06	0.08	0.09	0.04	0.08	0.73
38	Yazdani Steel & Power Ltd.	0.00	0.00	0.00	0.16	0.01	0.00	0.20	0.30	0.61	0.61	0.67	0.89	3.46
39	Vedanta Ltd. (3*600)	95.63	84.17	142.36	0.00	29.33	4.69	0.00	11.99	38.19	148.26	1.42	31.34	587.39
	Total support from CPPs	712.60	559.39	625.95	384.34	476.66	460.59	420.67	331.57	413.09	741.41	384.64	439.34	5950.25

ANNEXURE-VIII (Page-6/6)

Month	Import by BSEB FromSolar	Import by BSEB Sug. Mill/CPP	Import by JSEB From CPP/IPP	Import by DVC From TISCO	IMPORT BY WBSEDCL										
					PCBL	Renuka	Tata Power HALDIA	ELEC STEEL(H)	CONCAST BENGAL	HIMADRI CHEMICAL LTD.	BENGAL ENERGY LTD	CRECSENT POWER	IPCL	Total Import from Captive (MU)	Import from *DPL*
Apr-17	14.12	4.47	48.64	17.26	10.03	0.60	59.62	5.07	0.31	3.75	6.99	25.07	1.64	113.07	46.691
May-17	14.84	4.96	55.16	33.07	7.17	3.08	66.75	5.39	0.43	5.17	8.22	24.95	0.89	122.05	146.947
Jun-17	13.68	6.77	37.10	29.20	3.69	4.08	60.37	4.71	0.36	3.93	7.20	23.95	3.66	111.93	57.062
Jul-17	10.25	2.35	51.65	26.02	6.07	2.43	59.88	4.49	0.42	5.59	14.23	26.66	7.01	126.78	51.551
Aug-17	9.81	3.35	34.18	36.20	0.00	3.58	62.44	5.09	0.34	5.36	16.07	27.01	10.96	130.84	-25.875
Sep-17	9.28	4.22	40.18	27.30	2.86	4.73	60.57	5.20	0.18	4.85	15.20	25.37	0.00	118.95	22.208
Oct-17	12.84	6.47	45.09	5.22	5.03	2.22	56.35	5.35	0.27	4.96	11.02	26.04	0.00	111.23	15.522
Nov-17	13.25	2.65	38.07	5.67	0.91	4.60	51.38	3.44	0.52	5.04	16.11	24.70	9.96	116.65	-31.536
Dec-17	10.53	31.13	59.67	5.90	9.40	0.53	59.59	5.46	0.34	2.01	14.51	23.99	6.49	122.32	-32.678
Jan-18	12.53	35.85	51.10	1.17	12.35	1.13	59.65	5.44	0.32	4.22	17.59	26.81	0.00	127.50	-23.068
Feb-18	14.55	31.87	54.40	0.11	9.82	0.89	55.79	5.32	0.32	4.33	1.62	24.46	0.00	102.56	-24.937
Mar-18	20.74	34.89	39.46	7.28	10.04	0.00	60.02	5.59	0.61	4.41	15.44	27.25	0.00	123.36	55.632
TOTAL	156.41	168.97	554.67	194.39	77.36	27.87	712.39	60.54	4.40	53.62	144.20	306.26	40.61	1427.24	257.519

FREQUENCY SUMMARY OF THE EASTERN REGION DURING 2017-18

AVERAGE FREQUENCY IN DIFFERENT PERIODS OF THE DAY

	< -----HOURS----->					
	00-05	**05-10**	**10-17**	**17-22**	**22-24**	**OO-24**
Apr-17	49.97	50.00	49.97	49.98	49.94	49.98
May-17	49.99	50.01	49.98	49.97	49.98	49.99
Jun-17	49.99	50.01	49.98	49.98	49.97	49.99
Jul-17	49.99	50.00	49.99	49.96	49.97	49.98
Aug-17	49.99	50.00	49.99	49.96	49.97	49.98
Sep-17	49.97	49.97	49.96	49.96	49.96	49.97
Oct-17	49.96	49.96	49.96	49.97	49.96	49.96
Nov-17	49.97	49.93	49.95	49.98	49.98	49.96
Dec-17	49.99	49.94	49.95	49.98	50.00	49.97
Jan-18	49.99	49.95	49.97	49.97	49.98	49.97
Feb-18	49.98	49.96	49.97	49.97	49.97	49.97
Mar-18	49.50	49.50	49.50	49.50	49.50	49.50
MAXIMUM	**49.99**	**50.01**	**49.99**	**49.98**	**50.00**	**49.99**
MINIMUM	**49.50**	**49.50**	**49.50**	**49.50**	**49.50**	**49.50**
AVERAGE	**49.94**	**49.94**	**49.93**	**49.93**	**49.93**	**49.93**

ANNEXURE - IX B

AVERAGE FREQUENCY IN PERCENTAGE OF THE TIME (%) INCLUDING MAX. AND MIN. FREQUENCY DURING 2017-18

	EQUENCY (HZ) IN % OF TI			INST. FREQ. (HZ)						15 MINUTES INTEGRATED	
	<49.9	49.9-50.05	>50.05	MAX	Date	HRS.	MIN	Date	HRS.	MAX	MIN
Apr-17	9.05	**74.49**	16.46	50.26	30-Apr	18:02	49.66	18-Apr	19:15	50.17	49.77
May-17	9.20	**71.60**	19.20	50.32	21-May	18:03	49.64	11-May	15:11	50.2	49.73
Jun-17	5.99	**75.55**	18.46	50.24	19-Jun	18:46	49.72	2-Jun	22:11	50.18	49.81
Jul-17	6.56	**76.15**	17.29	50.23	6-Jul	08:00	49.69	8-Jul	20:56	50.16	49.75
Aug-17	7.31	**76.90**	15.79	50.20	20-Aug	06:03	49.65	8-Aug	07:01	50.13	49.75
Sep-17	11.77	**78.50**	9.73	50.32	17-Sep	6:04	49.62	23-Sep	19:26	50.16	49.75
Oct-17	13.60	**77.21**	9.19	50.20	10-Oct	13:02	49.65	13-Oct	18:10	50.11	49.77
Nov-17	16.91	**73.53**	9.56	50.27	19-Nov	06:02	49.62	7-Nov	06:40	50.13	49.7
Dec-17	12.86	**73.86**	13.28	50.25	3-Dec	22:00	49.7	15-Dec	09:19	50.18	49.76
Jan-18	11.07	**78.01**	10.92	50.29	31-Jan	21:59	49.62	31-Jan	20:48	50.18	49.75
Feb-18	9.69	**80.25**	10.06	50.21	17-Feb	13:02	49.69	17-Feb	06:43	50.13	49.79
Mar-18	12.99	**79.30**	7.71	50.25	21-Mar	13:03	49.67	14-Mar	21:19	50.11	49.79
MAX	**16.91**	**80.25**	**19.20**	**50.32**			**49.72**			**50.20**	**49.81**
MIN	**5.99**	**71.60**	**7.71**	**50.20**			**49.62**			**50.11**	**49.70**
AVG	**10.58**	**76.28**	**13.14**	**50.25**			**49.66**			**50.15**	**49.76**

Note: New IEGC Frequency Band is 49.90 Hz to 50.05 Hz with effect from 00:00 Hrs. of 17.02.2014

ANNEXURE-X (Page-1/2)

ENERGY GENERATION BY VARIOUS POWER STATIONS AND PLANT LOAD FACTOR OF THERMAL STATIONS OF EASTERN REGION FOR THE YEAR 2016-17 & 2017-18

(Comparison Statement)

SYSTEM	TYPE	POWER STATION	INSTALLED CAPACITY IN MW as on 31.03.2018	EFFECTIVE CAPACITY IN MW aS on 31.03.2018	2016-17		2017-18	
					Generation (MU)	PLF (%)	Generation (MU)	PLF (%)
BSPHCL	Th	Barauni	220.00	210.00	**139.00**	**7.56**	**39.44**	**2.14**
		Muzaffarpur Stg-I	220.00	220.00	**707.00**	**36.69**	**752.16**	**39.03**
		Muzaffarpur Stg-II	390.00	390.00			**998.83**	**32.66**
		Thermal Total	**830.00**	**820.00**	**846.00**	**22.46**	**1790.43**	**26.17**
	Hy	Kosi	20.00	20.00	**13.67**		**0.00**	
		Dehri & others	24.90	24.90	**0.00**		**14.37**	
		Hydro Total	**44.90**	**44.90**	**13.67**		**14.37**	
	Total BSEB		**874.9**	**864.9**	**859.67**		**1804.80**	
JUVNL	Th	Patratu	Phase Out	Phase Out	**386.00**	**9.68**	**0.00**	
	Hy	Subarnrekha	130.00	130.00	**30.13**		**190.28**	
	Total JSEB		**130.00**	**130.00**	**416.13**		**190.28**	
TVNL	Th		**420.00**	**420.00**	**1422.60**	**38.67**	**1933.31**	**52.55**
DVC	Th	Bokaro-B (U #3)	210.00	210.00	**1456.68**	**26.39**	**573.94**	**18.82**
		Chandrapura(U#3)	140.00	130.00	**1897.83**	**83.33**	**321.10**	**21.22**
		Chandrapura(U 7-8)	500.00	500.00	**3744.94**	**85.50**	**3754.87**	**85.73**
		Durgapur(U #4)	210.00	210.00	**592.73**	**19.33**	**947.05**	**51.48**
		Mezia(U 1-6)	1340.00	1340.00	**6426.20**	**54.75**	**7109.48**	**60.57**
		Mezia(U 7-8)	1000.00	1000.00	**6510.58**	**74.32**	**5368.97**	**61.29**
		Durgapur STPS (U 1-2)	1000.00	1000.00	**6655.74**	**75.98**	**6503.95**	**74.25**
		Koderma STPS (U 1-2)	1000.00	1000.00	**3801.74**	**43.40**	**5911.25**	**67.48**
		Raghunathpur (U 1-2)	1200.00	1200.00	**2016.51**	**19.18**	**2277.30**	**21.66**
		Bokaro-A (U 1)	500.00	500.00	**294.19**	**66.26**	**2924.19**	**66.76**
		Thermal Total*	**7100.00**	**7090.00**	**33397.15**	**51.68**	**35692.10**	**56.04**
	Hy	Maithon	63.20	63.20	**122.02**		**114.40**	
		Panchet	80.00	80.00	**133.15**		**141.95**	
		Tilaya	4.00	4.00	**14.07**		**10.85**	
		Hydro Total	**147.20**	**147.20**	**269.24**		**267.20**	
		RES(Small Hy+Solar)					**10.92**	
	Total DVC		**7247.20**	**7237.20**	**33666.39**		**35970.21**	
WBPDCL	Th	Bandel	540.00	450.00	**1885.02**	**47.82**	**1926.03**	**48.86**
		Santaldih(U 5-6)	500.00	500.00	**3667.31**	**83.73**	**2941.58**	**67.16**
		Kolaghat	1260.00	1260.00	**6037.97**	**54.70**	**4749.84**	**43.03**
		Bakreswar	1050.00	1050.00	**7050.51**	**76.65**	**7486.39**	**81.39**
		Sagardighi TPS	1600.00	1600.00	**4877.53**	**49.39**	**6342.12**	**45.25**
	Total WBPDCL		**4950.00**	**4860.00**	**23518.35**	**61.19**	**23445.96**	**55.07**
WBSEDCL	Hy	Jaldhaka	35.00	35.00	**205.49**		**145.18**	
		Ramam	51.00	51.00	**248.00**		**122.46**	
		Teesta CF	67.30	67.30	**46.71**		**131.02**	
		Micro Hydel	12.00	12.00	**0.00**		**0.00**	
		Purulia PSP	900.00	900.00	**1107.00**		**1014.36**	
	Total WBSEDCL		**1065.30**	**1065.30**	**1607.20**		**1413.01**	
DPL	Th	DPPS	**660.00**	**660.00**	**2143.69**	**37.08**	**2524.46**	**43.66**
		RES(Solar)					**6.04**	
		Total	***660***	***660***	***2,143.69***		***2530.50***	

DVC, DTPS U#3(140 MW) decommissioned on 10.03.2016

DVC, CTPS U#1 (140 MW) decommissioned on 13.01.2017

DVC, BTPS-B U#1&2(2X210 MW) & CTPS U#2 (140 MW) each decommissioned on 30.07.2017

ENERGY GENERATION BY VARIOUS POWER STATIONS AND PLANT LOAD FACTOR OF THERMAL STATIONS OF EASTERN REGION FOR THE YEAR 2016-17 & 2017-18

(Comparison Statement)

SYSTEM	TYPE	POWER STATION	INSTALLED CAPACITY IN MW	EFFECTIVE CAPACITY IN MW	2016-17		2017-18	
					Generation (MU)	PLF (%)	Generation (MU)	PLF (%)
CESC	Th	Titagarh	240.00	240.00	229.34	10.91	0.00	0.00
		Southern	135.00	135.00	409.69	34.64	303.75	25.68
		Budge-Budge	750.00	750.00	5412.09	82.38	6033.39	91.83
	Total CESC		1125.00	1125.00	6051.12	61.40	6337.14	64.30
HEL	Th	Haldia	600.00	600.00	3968.69	75.51	4525.90	86.11
ODISHA	NTPC	Talcher-I	250.00	240.00	2016.66	95.92	2058.16	97.90
		Talcher-II	220.00	220.00	1743.10	90.45	1722.58	89.38
		Thermal Total	470.00	460.00	3759.76	93.30	3780.74	93.82
	OPGC	IB TPS	420.00	420.00	3234.89	87.92	2842.35	77.25
	HYDRO	Burla (Hirakud-I)	275.50	275.50	536.41		613.63	
		Chiplima (Hirakud-II)	72.00	72.00	200.57		249.40	
		Balimela	510.00	510.00	1000.81		1477.33	
		Rengali	250.00	250.00	553.53		762.57	
		Upper Kolab	320.00	320.00	619.31		706.85	
		Indravati HPS	600.00	600.00	1521.62		1742.51	
		Mckd.(Orissa dr)	57.38	57.38	341.99		239.73	
		Hydro Total	2084.88	2084.88	5009.25		5792.02	
		RES(Solar)	30.00	30.00			96.45	
Total ODISHA (NTPC +OPGC+ OHPC+RES)			3004.88	2994.88	12003.89		12511.56	
SIKKIM*	Hy	Total	14.00	14.00	36.00		30.00	
NTPC	Th	Diesel	7.10	7.10				
		FSTPS - I&II	1600.00	1600.00	10307.47	73.54	10229.34	72.98
		FSTPS - III (U#6)	500.00	500.00	3456.74	78.92	3127.43	71.40
		KhSTPP-I & II	2340.00	2340.00	16037.63	78.24	16316.76	79.60
		TSTPP - I	1000.00	1000.00	7579.74	86.53	7679.19	87.66
		BARH HPS - II	1320.00	1320.00	7758.79	67.10	9272.26	80.19
	Total NTPC		6760.00	6760.00	45140.36	76.23	46624.98	78.73
		Talcher Solar	10	10	13.00		13.81	
NHPC	Hy	Rangit	60	60	342.09		341.14	
		Teesta HEP	510	510	2743.74		2796.90	
		TLDP (NHPC)	292	292	978.34		859.01	
	Total NHPC		862.00	862.00	4064.17		3997.04	
EASTERN REGION								
		THERMAL (EXCL. IPP)	23335.00	23215.00	123868.59	60.81	129497.37	63.31
		HYDRO	4348.28	4348.28	11029.65		11703.91	
		RES(Small Hy+Solar)	40	40	13.00		127.26	
IPP	Th	MPL (U 1&2)	1050	1050	7406.64	80.52	7406.14	80.52
		APNRL (U 1&2)	540	540	3256.12	68.83	2909.86	61.51
		GMR (U 1-2)	700	700	3946.00	64.35	3687.57	60.14
		JITPL(U 1-2)	1200	1200	6537.18	62.19	3666.42	34.88
		BRBCL(U 1-2)	500	500	71.00	15.78	1060.29	24.21
	Hy	CHUZACHEN (U 1-2)	110	110	494.50		442.46	
		JORTHANG (U# 1&2)	96	96	405.43		405.56	
		Teesta Urja St III	1200	1200	263.00		4392.65	
		DIKCHU(U 1-2)	96	96			379.97	
		TASHIDING (U 1-2)	97	97			92.78	
EASTERN REGION			27325.00					
		THERMAL (INCL. IPP)	27325.00	27205.00	145085.62	61.79	148227.73	62.12
		HYDRO	5947.28	5947.28	12192.58		17417.34	
		DIESEL	7.0	7.0			0.00	
		SOLAR	40	40	13.00		127.26	
		TOTAL(TH+HY+RES)	33319.28	33199.28	157291.20		165772.33	
IMPORT FROM BHUTAN	Hy	CHPC	360.00	270**	1804.49		1580.65	
		KHPS	60.00	60**	355.71		347.31	
		TALA HPS	1020.00	867**	3247.24		2702.48	
		DAGACHU	126.00	126.00	402.84		441.65	
GRAND TOTAL (TH+HY) INCLUDING IMPORT FROM BHUTAN					163101.47		170844.42	

* Sikkim's data are estimated as actual data not received.

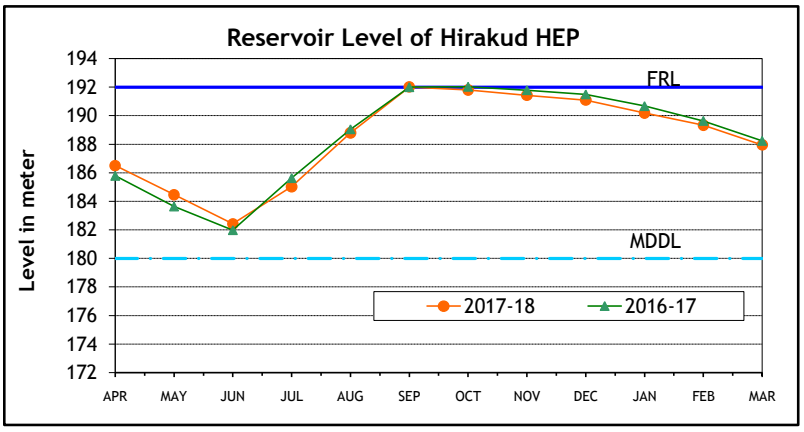
** Actual import by ER from HPS of Bhutan

NOTE: PLF has been calculated based on the capacity and generation of the commercially declared units only.
Vedanta generation not been considered, now it is under the control of jurisdiction area of Odisha as CPP.

WATER LEVEL IN THE MAJOR HYDRO RESERVOIRS IN THE REGION DURING 2017-18

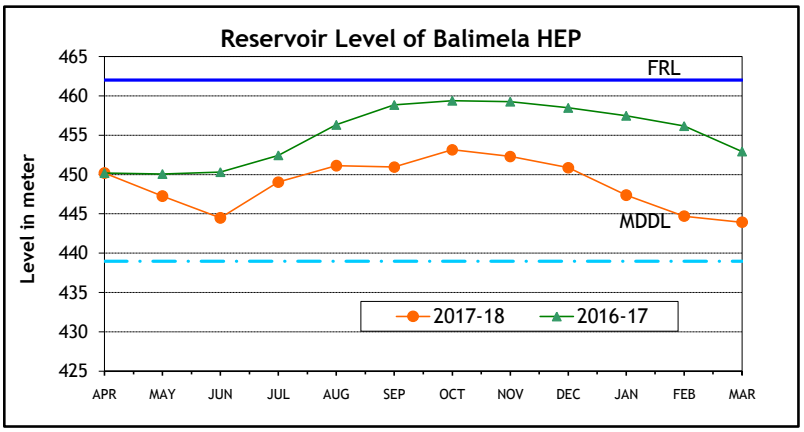
Reservoir Level of Hirakud HEP

Month	FRL	MDDL	**2017-18**	2016-17
APR	192.00	180.00	**186.51**	185.79
MAY	192.00	180.00	**184.47**	183.64
JUN	192.00	180.00	**182.43**	181.98
JUL	192.00	180.00	**185.03**	185.63
AUG	192.00	180.00	**188.81**	189.06
SEP	192.00	180.00	**192.02**	192.01
OCT	192.00	180.00	**191.81**	192.04
NOV	192.00	180.00	**191.44**	191.80
DEC	192.00	180.00	**191.10**	191.51
JAN	192.00	180.00	**190.20**	190.68
FEB	192.00	180.00	**189.35**	189.65
MAR	192.00	180.00	**187.96**	188.24



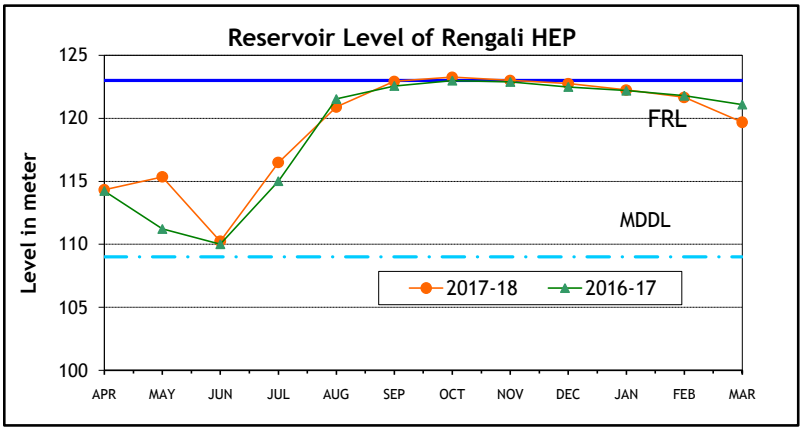
Reservoir Level of Balimela HEP

Month	FRL	MDDL	**2017-18**	2016-17
APR	462.00	439.00	**450.19**	450.19
MAY	462.00	439.00	**447.26**	450.07
JUN	462.00	439.00	**444.49**	450.31
JUL	462.00	439.00	**449.03**	452.45
AUG	462.00	439.00	**451.13**	456.32
SEP	462.00	439.00	**450.95**	458.85
OCT	462.00	439.00	**453.15**	459.39
NOV	462.00	439.00	**452.29**	459.27
DEC	462.00	439.00	**450.86**	458.48
JAN	462.00	439.00	**447.39**	457.47
FEB	462.00	439.00	**444.70**	456.16
MAR	462.00	439.00	**443.94**	452.93



Reservoir Level of Rengali HEP

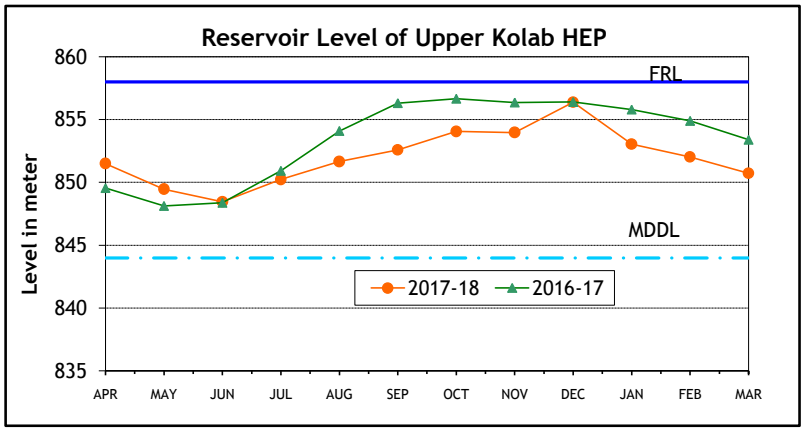
Month	FRL	MDDL	**2017-18**	2016-17
APR	123.00	109.00	**114.33**	114.24
MAY	123.00	109.00	**115.36**	111.22
JUN	123.00	109.00	**110.25**	110.01
JUL	123.00	109.00	**116.50**	115.02
AUG	123.00	109.00	**120.90**	121.54
SEP	123.00	109.00	**122.93**	122.58
OCT	123.00	109.00	**123.26**	123.00
NOV	123.00	109.00	**123.01**	122.90
DEC	123.00	109.00	**122.76**	122.50
JAN	123.00	109.00	**122.25**	122.20
FEB	123.00	109.00	**121.67**	121.80
MAR	123.00	109.00	**119.69**	121.10



WATER LEVEL IN THE MAJOR HYDRO RESERVOIRS IN THE REGION DURING 2017-18

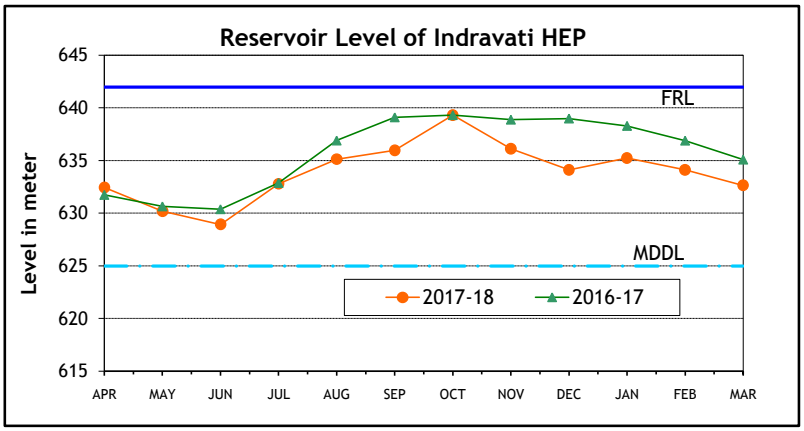
Reservoir Level of Upper Kolab HEP

Month	FRL	MDDL	**2017-18**	2016-17
APR	858.00	844.00	**851.51**	849.56
MAY	858.00	844.00	**849.47**	848.14
JUN	858.00	844.00	**848.47**	848.39
JUL	858.00	844.00	**850.24**	850.93
AUG	858.00	844.00	**851.67**	854.10
SEP	858.00	844.00	**852.60**	856.31
OCT	858.00	844.00	**854.06**	856.66
NOV	858.00	844.00	**853.98**	856.36
DEC	858.00	844.00	**856.39**	856.40
JAN	858.00	844.00	**853.05**	855.80
FEB	858.00	844.00	**852.03**	854.90
MAR	858.00	844.00	**850.74**	853.40



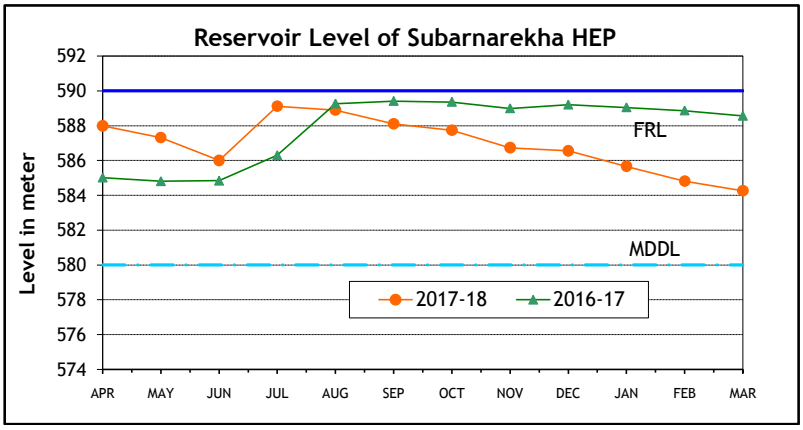
Reservoir Level of Indravati HEP

Month	FRL	MDDL	**2017-18**	2016-17
APR	642.00	625.00	**632.5**	631.8
MAY	642.00	625.00	**630.20**	630.66
JUN	642.00	625.00	**628.94**	630.39
JUL	642.00	625.00	**632.80**	632.88
AUG	642.00	625.00	**635.14**	636.91
SEP	642.00	625.00	**635.97**	639.11
OCT	642.00	625.00	**639.32**	639.32
NOV	642.00	625.00	**636.12**	638.89
DEC	642.00	625.00	**634.12**	639.00
JAN	642.00	625.00	**635.24**	638.30
FEB	642.00	625.00	**634.12**	636.90
MAR	642.00	625.00	**632.65**	635.10



Reservoir Level of Subarnarekha HEP

Month	FRL	MDDL	**2017-18**	2016-17
APR	590.00	580.00	**587.99**	585.03
MAY	590.00	580.00	**587.32**	584.82
JUN	590.00	580.00	**586.01**	584.85
JUL	590.00	580.00	**589.12**	586.31
AUG	590.00	580.00	**588.90**	589.27
SEP	590.00	580.00	**588.11**	589.42
OCT	590.00	580.00	**587.75**	589.37
NOV	590.00	580.00	**586.74**	589.00
DEC	590.00	580.00	**586.56**	589.21
JAN	590.00	580.00	**585.67**	589.06
FEB	590.00	580.00	**584.82**	588.87
MAR	590.00	580.00	**584.27**	588.57



% WEIGHTED AVERAGE OF SHARE ALLOCATION FOR THE MONTH OF APRIL,2017 (FIRST MONTH OF F.Y 2017-18)

CONSTITUENT	TPS STAGE - I &	STPS STAGE - II	KhSTPS STAGE-	KhSTPS STAGE-II	TSTPS STAGE-	BARH STPS STAGE-I	TALA	CHUKHA	KIRICHU	TEESTA-STG-V	RANGIT
ER:											
BIHAR	31.397866	25.315145	41.858038	4.979865	41.245379	76.564706	25.500000	29.630000	0.000000	21.260000	35.000000
JHARKHAND	8.574292	8.174000	3.200751	1.248565	7.667664	7.129412	11.460000	10.740000	0.000000	12.340000	13.330000
DVC	0.000000	7.482353	0.000000	0.000000	0.310000	0.000000	5.540000	10.370000	50.000000	8.640000	10.000000
DVC (COAL POWER - Rajasthan)	0.275735	0.432526	0.275735	0.275735	0.275735	0.000000					
DVC (COAL POWER - Raj-II Sun Tech)	0.091912	0.000000	0.091912	0.091912	0.091912	0.000000					
DVC (COAL POWER - Talcher)	0.192231	0.215971	0.157197	0.197531	0.172303	0.000000					
DVC (COAL POWER - Unchahar)	0.191680	0.214951	0.157306	0.197934	0.172920	0.000000					
ODISHA	13.630000	19.552941	15.240000	2.050000	31.800000	14.788235	4.250000	15.190000	0.000000	20.590000	0.000000
ODISHA (COAL POWER - AFTAB)	0.099049	0.000000	0.098249	0.106629	0.099049	0.000000					
ODISHA (COAL POWER - DADRI)	0.082937	0.191369	0.082268	0.089285	0.082937	0.000000					
ODISHA (COAL POWER - Rajasthan)	0.183824	0.324395	0.183824	0.183824	0.183824	0.000000					
ODISHA (COAL POWER - Raj-II SunTech)	0.091912		0.091912	0.091912	0.091912	0.000000					
ODISHA (COAL POWER - Faridabad)	0.095840	0.107475	0.078653	0.098967	0.086460	0.000000					
WEST BENGAL	30.540000	36.798753	0.000000	0.000000	9.100000	0.000000	38.250000	31.850000	50.000000	23.980000	28.340000
West Bengal (COAL POWER - Rajasthan)	0.643382	1.081314	0.643382	0.643382	0.643382	0.000000					
West Bengal (COAL POWER- Raj-II SunTech)	0.275735	0.000000	0.275735	0.275735	0.275735	0.000000					
SIKKIM	1.630000	0.000000	1.550000	0.330000	2.400000	1.517647		2.220000	0.000000	13.190000	13.330000
SUB-TOTAL	87.996395	99.891193	63.984962	10.861276	94.699212	100.000000					
SR:	1.290000	0.000000	0.700000	0.000000	0.850000	0.000000					
WR :	0.000000	0.000000	0.000000	26.530000	0.000000	0.000000					
NR:	7.090000	0.000000	31.020000	56.090000	0.000000	0.000000	15.000000				
NER :	3.311105	0.108132	2.954562	5.185391	2.950788	0.000000					
NVVN POWER - A/C BPDB	0.312500	0.000000	1.190476	1.333333	1.500000	0.000000					
POWERGRID(PUSAULI)			0.150000								
GRAND TOTAL (%)	**100.000**	**100.00**	**100.000**	**100.000**	**100.000**	**100.000**	**100.000**	**100.000**	**100.000**	**100.000**	**100.000**

% WEIGHTED AVERAGE OF SHARE ALLOCATION FOR THE MONTH OF MARCH-2018 F.Y 2017-18

CONSTITUENT	TPS STAGE - I &	STPS STAGE - II	KhSTPS STAGE-I	KhSTPS STAGE-II	TSTPS STAGE-	BARH STPS STAGE-II	TALA	CHUKHA	KIRICHU	TEESTA-STG-V	RANGIT	BRBCL	
ER:													
BIHAR	31.397866	26.517874	41.858038	4.979865	41.245379	76.047894	25.500000	29.630000	0.000000	21.260000	35.000000	BIHAR	10.00
JHARKHAND	8.574292	16.948474	3.200751	1.248565	7.667664	7.081288	11.460000	10.740000	0.000000	12.340000	13.330000		
DVC	0.000000	6.360000	0.000000	0.000000	0.310000	0.000000	5.540000	10.370000	50.000000	8.640000	10.000000	RAILWAY (ECR) ER:	
DVC (COAL POWER - Rajasthan)	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000						BIHAR	0.00
DVC (COAL POWER - Raj-II Sun Tech)	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000							
DVC (COAL POWER - Talcher)	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000						JHARKHAND	0.00
DVC (COAL POWER - Unchahar)	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000							
ODISHA	13.630000	16.620000	15.240000	2.050000	31.800000	14.688415	4.250000	15.190000	0.000000	20.590000	0.000000	DVC	32.93
ODISHA (COAL POWER - AFTAB)	0.099049	0.000000	0.098249	0.106629	0.099049	0.000000							
ODISHA (COAL POWER - DADRI)	0.082937	0.162663	0.082268	0.089285	0.082937	0.000000						ODISHA	0.00
ODISHA (COAL POWER - Rajasthan)	0.183824	0.183823	0.183824	0.183824	0.183824	0.000000							
ODISHA (COAL POWER - Raj-II SunTech)	0.091912	0.091912	0.091912	0.091912	0.091912	0.000000						WEST BENGAL	0.00
ODISHA (COAL POWER - Faridabad)	0.095840	0.091354	0.078653	0.098967	0.086460	0.000000							
WEST BENGAL	30.540000	31.278940	0.000000	0.000000	9.100000	0.000000	38.250000	31.850000	50.000000	23.980000	28.340000		
West Bengal (COAL POWER - Rajasthan)	0.643382	0.643382	0.643382	0.643382	0.643382	0.000000							
West Bengal (COAL POWER- Raj-II SunTech)	0.275735	0.275735	0.275735	0.275735	0.275735	0.000000							
SIKKIM	1.630000	0	1.550000	0.330000	2.400000	1.318009		2.220000	0.000000	13.190000	13.330000	RAILWAY (ECR) WR:	
SUB-TOTAL	87.244837	99.1742	63.302812	10.098164	93.986342	99.135606						CHHATTISGARH	
												GUJARAT	
												MADHYA PRADESH	4.39
SR:	2.041600	0.7339300	1.382150	0.763112	1.562870	0.675000						MAHARASTRA	52.68
WR :	0.000000	0.0000000	0.000000	26.530000	0.000000	0.000000							
NR:	7.090000	0.0000000	31.020000	56.090000	0.000000	0.000000	15.000000						
NER :	3.311105	0.0919120	2.954562	5.185391	2.950788	0.000000							
NVVN POWER - A/C BPDB	0.312500	0.0000000	1.190476	1.333333	1.500000	0.000000							
POWERGRID(PUSAULI) /ALIPURDUAR			0.150000			0.189394							
GRAND TOTAL	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.00	0.00	100.0

SLABs for PoC RATES IN EASTERN REGION

QTR.	SL NO.	Name of Entity	PoC Slab Rate (₹/MW/Month)	Reliability Support Charges Rate(₹/MW/Month)	HVDC Charges Rate for ER (₹/MW/Month)
April 17 - June 17	1	GMR Kamalanga	317357	27764	8880
	2	Odisha	289275	27764	8880
	3	Bihar	261193	27764	8880
	4	West Bengal	261193	27764	8880
	5	DVC	233111	27764	8880
	6	Jharkhand	176947	27764	8880
	7	MPL	120783	27764	8880
	8	Bangladesh	92701	27764	8880
	9	Farakka	92701	27764	8880
	10	Sikkim	92701	27764	8880

QTR.	SL NO.	Name of Entity	PoC Slab Rate (₹/MW/Month)	Reliability Support Charges Rate(₹/MW/Month)	HVDC Charges Rate for ER (₹/MW/Month)
July 17 - Sep 17	1	West Bengal	291637	27284	8507
	2	Odisha	254038	27284	8507
	3	Bihar	216438	27284	8507
	4	DVC	216438	27284	8507
	5	GMR Kamalanga	178839	27284	8507
	6	Jharkhand	178839	27284	8507
	7	Bangladesh	103640	27284	8507
	8	Farakka	103640	27284	8507
	9	Sikkim	66040	27284	8507

QTR.	SL NO.	Name of Entity	PoC Slab Rate (₹/MW/Month)	Reliability Support Charges Rate(₹/MW/Month)	HVDC Charges Rate for ER (₹/MW/Month)
Oct 17 - Dec 17	1	Odisha	293699	24271	7459
	2	Bihar	238477	24271	7459
	3	West Bengal W	183255	24271	7459
	4	DVC	155644	24271	7459
	5	Jharkhand	128033	24271	7459
	6	Bangladesh	100422	24271	7459
	7	GMR Kamalanga	72811	24271	7459
	8	Sikkim	72811	24271	7459
	9	West Bengal Inj	72811	24271	7459

QTR.	SL NO.	Name of Entity	PoC Slab Rate (₹/MW/Month)	Reliability Support Charges Rate(₹/MW/Month)	HVDC Charges Rate for ER (₹/MW/Month)
Jan 18 - Mar 18	1	Bihar	266935	25899	7935
	2	Odisha	266935	25899	7935
	3	GMR Kamalanga	204337	25899	7935
	4	West Bengal	204337	25899	7935
	5	DVC	173038	25899	7935
	6	Jharkhand	141740	25899	7935
	7	Bangladesh	110441	25899	7935
	8	Sikkim	79142	25899	7935
	9	West Bengal Inj	79142	25899	7935

Monthwise statement of over/under generation of ISGS & over/under drawal by the constituents

MONTH	BENEFICIARY	SCHEDULE (MWH)	ACTUAL (MWH)	UI Charges (Rs.) (-) payable (+) receivable
Apr-17	BSPHCL	-1942507.3	-1960591.722	-83753981.2
	JUVNL	-526444.921	-579059.413	-135205013.01
	DVC	1095596.731	1120221.356	50155404.47
	GRIDCO	-681783.36	-699237.562	-2492680.04
	SIKKIM	-38556.540	-35781.602	3166534.91
	WBSETCL	-1387827.378	-1429997.786	-114041071.25
	NER	-94205.116	-2970.755	196048298
	NR	-1018013.637	-1322112.020	-621863600.6
	SR	-835604.389	-963108.945	-271132298.6
	WR	335653.551	833925.607	1015155727.8
	FSTPP-I & II	555000.557	540293.965	-29526126.74
	KHSTPP-I	475383.746	466453.783	-15757719.01
	TSTPP	561797.904	562892.025	5596527.91
	RANGIT	18986	20055.953	3010105.08
	CHPC	28027.75	129864.860	229133496.5
	KHPC	11633.250	8533.7	-6571101.12
	THPC	176763.000	60810.036	-245820282.8
	KHSTPP-II	835782.118	833525.972	567623.64
	FSTPP-III	293525.128	285048.543	-16565775.3
	TEESTA	222708	230480.577	18556329.25
	MAITHON R/B	586191.321	588106.134	7443007.462
	BARH	796789.774	776698.13	-38724875.6
	NVVN-NEPAL	-96197.373	-92153.530	7458109.63
	APNRL	254623.860	254364.686	956768.634
	GMRKEL	364749.949	369835.121	25946064
	JITPL	281523.526	284968.649	8518164.94
	TPTCL	21288.332	15593.753	-13011934.49
	BRBCL	0.00	-467.122	-929394.74
	TALCHER SOLAR	1329	1300.568	-271660.370
	JORETHANG HEP	14832.439	16112.224	3491707.85
	IND Barath	0.000	0.000	0.000
	HVDC SASARAM	-779	-729.8	103388.222
	VAE	-2394	0.0	3649202.440
	NVVN	-349780	-344383.7	2223683.859
	CHUZACHEN	26259.504	29683.179	4525591.139
	TUL	159364.581	151001.78	-32952777.8
	DIKCHU	9446.441	10499.454	2903309.441
	DIKCHU_INFIRM	0.000	3299.454	4957331.917
	BRBCL_INFIRM	0.000	-1497.636	-3314879.905
May-17	BSPHCL	-2100951.0	-2142380.3	-150212372.6
	JUVNL	-537895.8	-545476.021	-53816220.9
	DVC	1319801.980	1332081.286	39990229.22
	GRIDCO	-785185.562	-811322.576	-10824126.57
	SIKKIM	-31738.61	-36291.597	-15876350.48
	WBSETCL	-1155990.646	-1217799.063	-136153945.42
	NER	-142946.010	-199177.194	-87880460.54
	NR	-1521418.619	-1649940.257	-280684337
	SR	-537949.862	-770146.548	-574708637.1
	WR	-114052.150	425534.366	1186177866.5
	FSTPP-I & II	854069.371	842617.104	-30524616.5
	KHSTPP-I	488590.619	479090.124	-17495648.82
	TSTPP	546812.099	546160.608	2896734.30
	RANGIT	23681.250	25219.367	3673354.62
	CHPC	41570	114227.701	163480388.65
	KHPC	12851.00	26561.657	29066592.4
	THPC	240774.563	151486.1	-189291573.58
	KHSTPP-II	902175.465	895306.983	-6652194.4
	FSTPP-III	283991.404	276082.694	-15670064.68
	TEESTA	260457.000	277108.322	21567256.3
	MAITHON R/B	634960	634179.915	1284210.63
	BARH	778182.342	759113.005	-35829445.612
	NVVN-NEPAL	-102261.386	-94192.62	13634203.2
	APNRL	335341.461	333772.939	-845893.14
	GMRKEL	297084.448	295740.503	9300684.703
	JITPL	32415.303	32904.147	239985
	TPTCL	30119.030	18065.434	-26267836.85
	BRBCL	0.000	-368.409	-695630.85
	TALCHER SOLAR	1435.21	1429.867	-71992.24
	JORETHANG HEP	23743	20345.888	-2978204.303
	IND Barath	0.000	-160.072	-293517.64
	HVDC SASARAM	-784.023	-757.476	68214.979
	VAE	-77652.915	0.000	140816869.665
	NVVN	-359141.564	-352657.121	3937169.965
	CHUZACHEN	42041	45328.1	7039969.658
	TUL	435018.947	436797.813	7576472.963
	DICKCHU	12007.862	12688.690	1180247.872
	DIKCHU_INFIRM	0.000	9069.946	11852151.360
	BRBCL_INFIRM	0.000	-1473.640	-3007649.678

MONTH	BENEFICIARY	SCHEDULE (MWH)	ACTUAL (MWH)	UI Charges (Rs.) (-) payable (+) receivable
Jun-17	BSPHCL	-2242896.59	-2296516.672	-135256686.00
	JUVNL	-508002.811	-518352.724	-44517362.47
	DVC	1048511.8002	1045959.0151	15564580.23
	GRIDCO	-507210.3317	-525029.8411	-16334104.71
	SIKKIM	-39543.71780	-33553.7694	10541784.352
	WBSETCL	-1366424.569	-1467505.565	-210322194.43
	NER	11894.103	-353631.59558	-715640006.7
	NR	-1628184.650	-1611601.599	48615261.6
	SR	-388890.80	-679951.6959	-545796746.4
	WR	-141029.6236	686026.1307	1532000826.42
	FSTPP-I & II	748656.7671	736594.6845	-24028082
	KHSTPP-I	340966.063	334861.5228	-9946902.61
	TSTPP	585776.2299	583150.8504	-2234958.62
	RANGIT	36424.25	37599.8862	2211758.030
	CHPC	85694.2500	167359.3604	183746498.4
	KHPC	17208.00000	41871.1032	52285778.78
	THPC	399882.5000	284352.8096	-244922943.7
	KHSTPP-II	749635.0717	748116.8107	-325542.82
	FSTPP-III	211767.6850	211608.9451	-1143897.36
	TEESTA	335508	342209.0120	14893427.51
	MAITHON R/B	620846.1032	623099.5518	5577979.75
	BARH	741642.6282	708169.6960	-64227921.56
	NVVN-NEPAL	-93239.0577	-86410.493	11572626.97
	APNRL	299866.7176	300867.485	2039216.22
	GMRKEL	223016.77	218857.304	-2362504.17
	JITPL	306284.1113	310914.7577	12523005.39
	TPTCL	41213.58	30992.7027	-23712878.48
	BRBCL	0.0000	-390.63765	-705738.18
	TALCHER SOLAR	941	1017.090150	581850.734
	JORETHANG HEP	49998.425697	43379.8720	-9120091.25
	IND Barath	0.00	-1519.562	-2826411.452
	HVDC SASARAM	-601	-615.833550	-83536.685
	VAE	-101543	0	200150810
	NVVN	-352140	-351336	-177742
	CHUZACHEN	47643.8497	51616.0530	6743889.66
	TUL	531371.12	537598.25	12295916.073
	DICKCHU	45658.30	50989.73	10955235.05
	DIKCHU_INFIRM	0.00	0.00	0.00
	BRBCL_INFIRM	0.00	-1562.55	-2958644.93
Jul-17	BSPHCL	-2176541.95	-2185412.284	-57810262.41
	JUVNL	-495519.0351	-480028.9982	-4865748.43
	DVC	936934.7514	929741.5936	-13872974.39
	GRIDCO	-836524.9256	-859186.5164	-10428329.71
	SIKKIM	-36356.0714	-33786.5952	2961610.7
	WBSETCL	-1375762.165	-1455599.20	-160151315.81
	NER	42878.487	-559876.9596	-1189245627
	NR	-1641910.538	-1821003.427	-355177767.3
	SR	-831773.28	-1086225.125	-496138215.6
	WR	-73770.5448	1067973.5613	2203397742.1
	FSTPP-I & II	769513.5395	756947.9768	-25297274.29
	KHSTPP-I	412124.7336	405595.3843	-12266593.33
	TSTPP	619444.1687	616853.6419	-1339463.606
	RANGIT	42024	43538.7864	2682527.311
	CHPC	195647.0000	294712.2207	222896747
	KHPC	32280.000	69879.1428	79710182.74
	THPC	786731.000	617935.5534	-357846346.8
	KHSTPP-II	736182.6112	728838.100	-9595810.644
	FSTPP-III	218129.133	214409.7795	-8167687.981
	TEESTA	358326.00	364344.6844	12810604.61
	MAITHON R/B	608060.3824	610573.188	9588077.887
	BARH	667195	643155.169751	-45840783.3
	NVVN-NEPAL	-74141.0923	-78933.5232	-9736160.86
	APNRL	273400.81	274923.3398	3638030.92
	GMRKEL	296969.2045	292595.9941	1432941.709
	JITPL	252541.932	258480.213	12605571.542
	TPTCL	75640.7074	72677.9278	-8539328.61
	BRBCL	0.000	-1081.15826	-2049312.53
	TALCHER SOLAR	752	798.466050	357341.152
	JORETHANG HEP	67901.8957083	67797.56800	1823108.02
	IND Barath	0.0000	-963.343	-1908048.41
	HVDC SASARAM	-761	-465.83055	596341.09
	VAE	-77218	0.00000	160917591.30
	NVVN	-363529.010100	-363566	-1095009.58
	CHUZACHEN	71031.2472	71621.0460	1147350.075
	TUL	641343.23	646179.485	9689133.935
	DICKCHU	68825.44	72497.91	6901372.81
	DIKCHU_INFIRM	0.00	0.00	0.00
	BRBCL_INFIRM	0.00	5848.20	7688211.72

MONTH	BENEFICIARY	SCHEDULE (MWH)	ACTUAL (MWH)	UI Charges (Rs.) (-) payable (+) receivable
	BSPHCL	-2236286.04	-2269707.63	-89467748.11
	JUVNL	-510025.0778	-518182.98	-30025329.6
	DVC	717880.9184	659823.68	-120979483.4
	GRIDCO	-776518.005	-838038.86	-82943321.86
	SIKKIM	-36318.3	-33069.1	5179941.1
	WBSETCL	-1624111.8	-1714773.4	-182377250.5
	NER	-105222.6	-557158.3	-949409181.2
	NR	-1649335.8	-1658210.0	34914803.3
	SR	-637292.8	-787056.1	-325919565.7
	WR	34834.3	886502.2	1677500984.0
	FSTPP-I & II	759459.7	740115.4	-38628059.4
	KHSTPP-I	483754.3	474870.5	-14325866.5
	TSTPP	661415.5	658365.3	-2984204.8
	RANGIT	41356.9	42449.2	1978332.4
	CHPC	228182.3	290147.4	139421647.0
	KHPC	42945.0	66335.2	49587235.9
	THPC	771655.0	625375.2	-310113214.8
	KHSTPP-II	874600.3	866090.0	-9810013.8
	FSTPP-III	244631.3	237358.3	-15084291.8
Aug-17	TEESTA	355902.0	362951.4	15567119.3
	MAITHON R/B	698267.5	699365.4	6300946.6
	BARH	627733.8	602336.0	-45823513.9
	NVVN-NEPAL	-73292.1	-72772.7	-2518212.1
	APNRL	269613.2	266533.4	-4635635.8
	GMRKEL	300743.5	299601.2	10641367.8
	JITPL	262587.5	263506.0	1428988.4
	TPTCL	91059.3	82607.8	-19165285.5
	BRBCL	94896.9	99384.3	7882346.4
	TALCHER SOLAR	1026.6	1010.0	-262430.0
	JORETHANG HEP	65073.6	65532.3	2145223.7
	IND Barath	0.0	-553.6	-1213716.3
	HVDC SASARAM	-795.6	-29.2	1545027.1
	VAE	-89851.1	0.0	180875208.9
	NVVN	-363538.6	-362240.0	117386.5
	CHUZACHEN	67274.8	68537.7	2712342.8
	TUL	541708.0	549569.9	14232030.5
	DICKCHU	60283.1	60854.0	1626553.0
	DIKCHU_INFIRM	0.0	0.0	0.0
	BRBCL_INFIRM	0.0	31967.9	41906809.9
	BSPHCL	-2357935.3	-2350862.2	-24050563.3
	JUVNL	-509827.1	-533833.9	-70297524.0
	DVC	748471.0	706961.3	-100465602.4
	GRIDCO	-999000.2	-1098758.1	-187537534.5
	SIKKIM	-34975.9	-33341.6	1233627.8
	WBSETCL	-1518687.3	-1580804.4	-152580503.8
	NER	-38154.2	-463244.4	-1037863451.3
	NR	-1388657.6	-1667353.3	-768362651.2
	SR	-287985.2	-338642.5	-71045338.7
	WR	30164.1	1020769.3	2409256150.1
	FSTPP-I & II	839756.4	829811.8	-23451145.3
	KHSTPP-I	494333.6	488665.2	-9674569.3
	TSTPP	647990.0	647388.3	-234688.0
	RANGIT	41225.0	42446.3	2986614.0
	CHPC	215121.3	249525.4	77409232.6
	KHPC	41760.0	68679.2	57068600.5
	THPC	653254.5	536901.4	-246668522.9
	KHSTPP-II	638130.0	633859.9	-5918033.4
	FSTPP-III	252135.1	247875.0	-9940990.6
Sep-17	TEESTA	360267.0	371349.5	28557969.1
	MAITHON R/B	685433.1	686482.6	5050949.4
	BARH	473675.9	464724.7	-17857249.6
	NVVN-NEPAL	-57716.4	-63742.7	-14402482.6
	APNRL	209398.0	208558.9	-2126030.9
	GMRKEL	187130.1	189425.8	13591899.7
	JITPL	242435.3	241483.7	-2848283.5
	TPTCL	86928.8	76939.0	-23940168.6
	BRBCL	113444.8	116018.4	5948845.2
	TALCHER SOLAR	1082.3	1017.0	-674092.3
	JORETHANG HEP	67296.6	70562.7	8905730.6
	IND Barath	0.0	-337.6	-745587.9
	HVDC SASARAM	-764.6	-27.9	1800417.0
	VAE	-55798.8	0.0	128051485.1
	NVVN	-350996.1	-350653.6	481221.6
	CHUZACHEN	69638.7	71522.9	4718946.3
	TUL	608933.9	623070.1	33666249.1
	DICKCHU	63002.2	66726.0	8527677.7
	DIKCHU_INFIRM	0.0	0.0	0.0
	BRBCL_INFIRM	0.0	-1906.0	-5321577.6
	HVDC ALIPURDUAR	-254.7	-255.2	-18555.3

MONTH	BENEFICIARY	SCHEDULE (MWH)	ACTUAL (MWH)	UI Charges (Rs.) (-) payable (+) receivable
	BSPHCL	-2235062.3	-2255211.0	-80441733.3
	JUVNL	-473863.5	-492505.8	-58746023.6
	DVC	529924.9	436528.1	-251009926.1
	GRIDCO	-1182037.3	-1318472.4	-316481965.3
	SIKKIM	-36598.9	-38257.8	-6944283.9
	WBSETCL	-1242344.7	-1329786.7	-224825953.6
	NER	70116.7	-378541.0	-1158251024.9
	NR	-1326305.9	-1572777.8	-652773010.3
	SR	220582.0	-227500.1	-1075926797.8
	WR	-369258.7	1114414.3	3717997562.2
	FSTPP-I & II	725971.7	711105.7	-35424673.2
	KHSTPP-I	488219.5	483242.4	-9008996.3
	TSTPP	648214.0	650271.8	7515804.1
	RANGIT	42171.3	43037.5	2298643.5
	CHPC	145384.0	206430.2	137353931.8
	KHPC	33877.0	57488.6	50056656.4
	THPC	432792.3	301718.2	-277877050.3
	KHSTPP-II	877192.3	871695.3	-7087808.6
	FSTPP-III	214853.1	211013.7	-9035347.5
Oct-17	TEESTA	320348.0	331101.1	28725452.0
	MAITHON R/B	570505.5	571132.0	3344185.6
	BARH	635160.1	630243.3	-8350299.4
	NVVN-NEPAL	-42390.6	-49498.5	-17401660.3
	APNRL	152967.2	151065.9	-3484498.4
	GMRKEL	195833.4	198861.2	16372923.0
	JITPL	318013.6	319630.0	5628938.4
	TPTCL	62332.7	55413.7	-16887100.9
	BRBCL	104783.0	107473.2	6791366.7
	TALCHER SOLAR	1074.9	1053.5	-298587.5
	JORETHANG HEP	61754.7	53945.4	-15083093.2
	IND Barath	0.0	-362.1	-913585.7
	HVDC SASARAM	-755.2	-20.8	1864925.3
	VAE	-73304.1	0.0	171020347.0
	NVVN	-353830.6	-342772.2	10604609.8
	CHUZACHEN	47470.2	48733.5	3022453.9
	TUL	542644.4	549644.5	25861035.3
	DICKCHU	45653.2	45730.2	567266.6
	THEP_INFIRM	0.0	3084.4	4691180.0
	THEP	16409.6	16871.5	1633767.3
	HVDC_ALIPURDUAR	-1299.4	-760.0	1344055.0
	BSPHCL	-1711552.5	-1740842.6	-92450107.8
	JUVNL	-427380.6	-451748.3	-79171908.2
	DVC	784067.7	727255.4	-164375585.1
	GRIDCO	-962623.4	-1122431.2	-412663404.4
	SIKKIM	-40717.1	-46754.3	-17761778.4
	WBSETCL	-752924.6	-830800.6	-199958551.0
	NER	109805.4	-338440.4	-1198781426.3
	NR	-1169016.6	-1337591.1	-391624078.1
	SR	-465885.2	-943825.0	-1342164797.9
	WR	-622522.8	843376.1	3905287882.6
	FSTPP-I & II	885438.1	871756.2	-32501799.5
	KHSTPP-I	429396.8	427881.3	-2571094.4
	TSTPP	529291.9	531754.0	6454841.3
	RANGIT	28145.5	29309.7	3535823.0
	CHPC	33849.3	89176.7	124486701.3
	KHPC	18120.0	20426.6	4889980.1
	THPC	184034.5	92106.2	-194887993.6
	KHSTPP-II	939261.6	940145.5	4746019.9
	FSTPP-III	204382.6	202281.1	-4678406.7
Nov-17	TEESTA	146452.0	154084.6	20575157.2
	MAITHON R/B	316170.8	316491.4	1325013.9
	BARH	743123.4	739443.3	-3543521.7
	NVVN-NEPAL	-61312.3	-65685.7	-12554953.8
	APNRL	153835.4	154836.7	3241931.7
	GMRKEL	367680.4	380216.9	42111460.5
	JITPL	296453.2	296820.6	-3632643.8
	TPTCL	31412.1	29060.3	-5909398.0
	BRBCL	99159.8	101190.7	4783425.2
	TALCHER SOLAR	1143.4	1125.6	-210684.6
	JORETHANG HEP	32287.2	25279.8	-14790853.8
	IND Barath	0.0	-186.2	-483030.0
	HVDC SASARAM	-661.4	-17.8	1728730.0
	VAE	-24067.9	0.0	60916276.9
	NVVN	-300068.1	-297519.0	832867.7
	CHUZACHEN	18773.1	19289.6	758206.3
	TUL	269215.5	274507.1	19453205.9
	DICKCHU	18362.6	17514.7	-2344586.6
	THEP	29130.9	25787.4	-5215089.2
	HVDC_ALIPURDUAR	-1429.9	-496.2	2415779.3

MONTH	BENEFICIARY	SCHEDULE (MWH)	ACTUAL (MWH)	UI Charges (Rs.) (-) payable (+) receivable
	BSPHCL	-1798706.1	-1795197.0	-20182926.0
	JUVNL	-418824.9	-430795.5	-40622348.0
	DVC	1118175.7	1140250.1	46369699.0
	GRIDCO	-909550.6	-1046687.1	-315956176.2
	SIKKIM	-47777.8	-47855.7	-1017335.6
	WBSETCL	-512006.2	-573700.7	-134310154.8
	NER	18835.4	-483330.4	-1184215042.0
	NR	-1254788.8	-1356032.5	-228754992.1
	SR	-769747.1	-905826.5	-403814368.5
	WR	-363902.1	639491.9	2400284835.3
	FSTPP-I & II	927418.5	919253.8	-20575564.4
	KHSTPP-I	378891.6	378058.2	-50649.8
	TSTPP	337312.8	336615.8	352248.2
	RANGIT	18591.5	19455.5	2433570.1
	CHPC	22963.8	41632.6	42005024.0
	KHPC	12360.0	3235.4	-19344230.0
	THPC	95233.0	34853.0	-128005680.7
	KHSTPP-II	882816.5	883507.8	4248932.7
	FSTPP-III	263881.9	261870.6	-4236840.1
Dec-17	TEESTA	103213.0	111408.9	20694950.0
	MAITHON R/B	345077.5	342681.0	-5197745.8
	BARH	907106.9	898430.5	-10774839.6
	NVVN-NEPAL	-73948.8	-82143.2	-19231812.8
	APNRL	182894.2	183925.6	3110702.9
	GMRKEL	229926.7	236283.5	27222678.6
	JITPL	286372.7	290619.4	8767589.9
	TPTCL	27496.4	20629.3	-15830423.6
	BRBCL	111811.6	115126.7	5858083.0
	TALCHER SOLAR	1193.5	1201.2	63922.1
	JORETHANG HEP	19357.0	16438.1	-4473990.1
	IND Barath	0.0	-220.9	-509646.5
	HVDC SASARAM	-600.9	-23.3	1358656.1
	VAE	-17161.3	0.0	54703953.5
	NVVN	-232185.9	-234846.2	-7483022.6
	CHUZACHEN	12241.2	12493.9	484101.1
	TUL	199705.6	198555.1	1911625.1
	DICKCHU	6129.9	6370.7	651689.7
	THEP	18414.6	17880.1	-762229.8
	HVDC_ALIPURDUAR	-1723.9	-463.8	2991490.4
	BSPHCL	-2088506.892	-2091415.351	-48322217.12
	JUVNL	-438620.9813	-462413.48	-68719660.93
	DVC	1076224.771	1103759.642	60314082.14
	GRIDCO	-758139.3853	-850955.7509	-212032109
	SIKKIM	-52980.5683	-48465.32896	8955046.451
	WBSETCL	-471270.6659	-520367.925	-110547588.7
	NER	-80934.56277	-179993.1179	-222509405.3
	NR	-1529522.441	-1521398.28	21371865.16
	SR	-487154.8952	-918604.4502	-1084518475
	WR	-322025.7134	437659.42	1856145515
	FSTPP-I & II	903106.1952	897138.682	-16229814
	KHSTPP-I	450655.653	449958.3409	-211456.1442
	TSTPP	597597.7286	597195.9447	1163596.967
	RANGIT	13745	14488.0188	1963492.729
	CHPC	22835.04	11343.35485	-25856291.6
	KHPC	10476.08	-5042.0448	-32898424.58
	THPC	56250.24	6333.681092	-105823104.9
	KHSTPP-II	824804.9695	824028.6126	1545323.961
	FSTPP-III	214692.5332	213702.2366	-2012914.507
Jan-18	TEESTA	75089	81383.05262	16393434.89
	MAITHON R/B	625337.3597	626295.1151	2913726.65
	BARH	879231.2	874693.9	-2532643.0
	NVVN-NEPAL	-87494.70528	-92667.7344	-12620981.27
	APNRL	182820.7181	183145.8133	1583797.778
	GMRKEL	227827.8652	222765.4493	-3763622.247
	JITPL	313114.2524	317462.5394	7849599.09
	TPTCL	28143.16457	15673.28347	-29539171.01
	BRBCL	102599.354	106529.3051	7830446.407
	TALCHER SOLAR	1319.83	1394.6157	644126.4088
	JORETHANG HEP	7961.46116	7057.472	-1564948.164
	IND Barath	0	-252.799052	-595206.6698
	HVDC SASARAM	-740.0042595	-399.7566	830607.1392
	VAE	-22324.9675	0	56668677.73
	NVVN	-273940.7352	-277647.1944	-12039641.6
	CHUZACHEN	8822.656562	9002.0316	472072.2219
	TUL	146171.6551	145802.1799	1540481.086
	DICKCHU	6400.393772	6405.090603	-523.7536336
	THEP	8579.724411	7749.792	-1481061.75
	HVDC_ALIPURDUAR	-1708.103475	-407.4414	3104748.296
	OPGC_INFIRM	0	-5.672706	-13641.51975

MONTH	BENEFICIARY	SCHEDULE (MWH)	ACTUAL (MWH)	UI Charges (Rs.) (-) payable (+) receivable
Feb-18	BSPHCL	-1747518.0	-1735703.4	4351695.0
	JUVNL	-422174.7	-449012.2	-72226456.6
	DVC	1292385.2	1323514.8	68438558.6
	GRIDCO	-877206.8	-987467.9	-254712712.1
	SIKKIM	-42471.5	-43558.5	-4542209.7
	WBSETCL	-522742.1	-580605.1	-136455236.8
	NER	-108016.8	-148873.1	-114452496.0
	NR	-1485850.7	-1566532.2	-204563459.6
	SR	-745536.7	-1069952.1	-777401675.8
	WR	-389038.0	285734.5	1615061818.6
	FSTPP-I & II	891521.6	886255.6	-11489062.1
	KHSTPP-I	376996.6	374561.8	-4829464.4
	TSTPP	621378.0	621756.6	1873716.5
	RANGIT	10358.3	11048.7	1704345.1
	CHPC	23117.1	-9035.3	-72342787.1
	KHPC	10393.4	-6299.9	-35389940.2
	THPC	29610.2	-6325.6	-76183974.3
	KHSTPP-II	837928.7	835843.6	-1868871.9
	FSTPP-III	245954.1	245838.4	191027.2
	TEESTA	63318.0	68303.1	11572085.7
	MAITHON R/B	615389.1	618132.2	7765157.6
	BARH	790823.8	787144.4	-1670280.7
	NVVN-NEPAL	-68772.9	-81443.7	-31418704.8
	APNRL	165182.2	165989.1	2704484.7
	GMRKEL	303505.4	298904.3	-334949.5
	JITPL	302771.1	299192.3	-12303415.7
	TPTCL	14455.0	11961.3	-6011417.2
	BRBCL	124404.9	125522.9	2680604.0
	TALCHER SOLAR	1268.0	1263.9	-44295.9
	JORETHANG HEP	11056.2	9076.1	-3298029.8
	IND Barath	0.0	-262.7	-615387.5
	HVDC SASARAM	-639.8	-424.9	513273.0
	VAE	-39126.0	0.0	98654254.3
	NVVN	-267703.4	-267771.4	-3362279.3
	CHUZACHEN	3421.3	3470.6	60888.9
	TUL	121447.0	121748.4	2550386.0
	DICKCHU	5278.1	5751.9	1235544.5
	THEP	12786.1	10373.6	-3914162.9
	HVDC_ALIPURDUAR	-1496.7	-375.2	2661028.7
	OPGC_INFIRM	0.0	-23.8	-55264.4
Mar-18	BSPHCL	-2109839.8	-2079753.9	31556897.3
	JUVNL	-443218.0	-479528.8	-106406449.0
	DVC	1563980.8	1577224.5	35241858.5
	GRIDCO	-1029306.5	-1163906.1	-332809651.2
	SIKKIM	-41966.3	-41670.5	390073.4
	WBSETCL	-944397.1	-1016265.2	-194141688.2
	NER	-106779.4	-8286.9	277346947.5
	NR	-1305387.3	-1563514.3	-684706059.1
	SR	-734504.0	-1338284.8	-1581047052.7
	WR	-649326.7	424975.6	2770608136.6
	FSTPP-I & II	748330.6	741052.2	-17270350.6
	KHSTPP-I	382666.0	379822.4	-6256685.9
	TSTPP	690806.7	692984.2	5304298.5
	RANGIT	11676.7	12486.5	2260734.4
	CHPC	24141.4	-4736.7	-64975619.2
	KHPC	8787.1	-4362.6	-27877434.4
	THPC	37291.6	-3061.6	-85548816.7
	KHSTPP-II	974590.4	973445.0	610941.7
	FSTPP-III	305040.6	302061.9	-6975219.8
	TEESTA	94670.0	102171.6	18909503.8
	MAITHON R/B	680747.3	680611.6	-300.3
	BARH	895494.9	894109.4	3572671.9
	NVVN-NEPAL	-17219.0	-64987.4	-124165573.0
	APNRL	182997.9	184304.2	4362623.0
	GMRKEL	435956.4	429471.0	-1725688.5
	JITPL	512518.4	510196.3	-5650956.6
	TPTCL	16935.0	12031.7	-12912894.5
	BRBCL	147940.2	149620.9	4172318.4
	TALCHER SOLAR	1229.7	1198.5	-295742.8
	JORETHANG HEP	12354.1	10033.7	-4439361.0
	IND Barath	0.0	-241.3	-601729.3
	HVDC SASARAM	-610.4	-413.5	485726.4
	VAE	-41778.4	0.0	109731317.8
	NVVN	-337729.2	-334523.7	-3669951.7
	CHUZACHEN	10490.4	11162.3	2118014.6
	TUL	155121.5	158177.8	11790586.1
	DICKCHU	9578.6	11573.6	4760859.3
	THEP	13162.3	11031.5	-3530230.5
	HVDC_ALIPURDUAR	-1718.6	-481.8	3188774.6
	OPGC_INFIRM	0.0	-30.0	-74190.9

ANNEXURE-XIV-B

Details of DSM Transactions from April 2017- March 2018

BENEFICIARY	SCHEDULE (MWH)	ACTUAL (MWH)	UI Charges (Rs.) (-) payable (+) receivable
BSPHCL	-24748303.7	-24903594.0	-746040005.5
JUVNL	-5711797.4	-5940938.1	-764620044.8
DVC	12231956.1	12103320.7	-334629159.2
GRIDCO	-10305086.2	-11321494.1	-2155216115.6
SIKKIM	-480001.3	-472386.4	-13713339.4
WBSPHCL	-12874489.2	-13718005.8	-1955865454.3
NER	-422728.6	-3673524.1	-7384852876.1
NR	-16918392.6	-18648066.8	-4083608025.2
SR	-6501742.3	-10029123.9	-8549613969.5
WR	-2644274.4	8666383.2	26288875047.3
FSTPP-I & II	9608243.0	9472943.2	-304946568.1
KHSTPP-I	5201979.2	5143061.0	-102395646.6
TSTPP	7047837.2	7045389.0	24364452.7
RANGIT	328385.8	341135.3	30739300.2
CHPC	1066532.7	1580647.8	1156758968.9
KHPC	252690.9	347305.9	200583896.7
THPC	3864272.4	2702484.9	-2462989505.0
KHSTPP-II	10073100.1	10034403.5	-29539433.6
FSTPP-III	2952984.7	2909151.1	-93320409.1
TEESTA	2696257.5	2796895.9	228823289.6
MAITHON R/B	6986985.6	6997150.1	45395209.4
BARH	8936159.3	8778261.4	-271602702.0
NVVN-NEPAL	-847985.7	-924631.9	-211385601.8
APNRL	2662941.7	2662288.0	10545497.7
GMRKEL	3430424.1	3432558.2	138433255.7
JITPL	3407030.9	3426178.6	33126542.8
TPTCL	527024.2	441646.2	-201727837.8
BRBCL	899040.5	918559.1	41567359.0
TALCHER SOLAR	13795.3	13810.4	-482245.3
JORETHANG HEP	433616.7	405561.2	-39382801.4
IND Barath	0.0	-5060.1	-10705867.4
HVDC SASARAM	-8492.5	-3926.2	10811769.6
VAE	-622220.0	0.0	1366155994.1
NVVN	-3904583.3	-3879916.9	-9630707.2
CHUZACHEN	425107.6	442461.0	33803826.8
TUL	4352045.4	4392652.5	107614344.3
DIKCHU	350626.1	367602.0	36964645.7
DIKCHU_INFIRM	0.0	12369.4	16809483.3
BRBCL_INFIRM	0.0	31376.2	34992269.6
HVDC ALIPURDUAR	-9631.3	-3239.7	15687320.9
THEP_INFIRM	0	3084.432	4691180.032
THEP	98483.25473	89693.76	-13269006.88
OPGC_INFIRM	0	-59.501513	-143096.8901

ANNEXURE-XV

STATUS OF ER REACTIVE POOL ACCOUNT FOR 2017-18

CONSTITUENT	AMOUNT RECEIVABLE IN THE POOL (Rs.)	AMOUNT RECEIVED IN THE POOL (Rs.)	OUTSTANDING (Rs.)
WBSETCL	197783189	191582692	6200497
BSPHCL	0	0	0
GRIDCO	63982649	63982649	0
SIKKIM	283531	0	283531
TOTAL	262049369	255565341	6484028

Details of stations/Units required to operate under RGMO/FGMO as per IEGC							Whether operating under RGMO	indicate in case of status is not available
Name of State	Type	Name of Uitlity	Sector (CS/SS/Private)	Name of Station	Name of Stage/ Unit	Installed capacity (MW)		
JHARKHAND	Thermal	TVNL	SS	Tenughat	1	210	No	Difficulties in implementing RGMO & exemption not
			SS		2	210	No	
	Hydro	JSEB	SS	Subarnrekha	1	65	Yes	
			SS		2	65	Yes	
WEST BENGAL	Termal	WBPDCL	SS	Bandel TPS	1	82.5	No	
			SS		2	82.5	No	
			SS		3	82.5	No	
			SS		4	82.5	No	
			SS		5	210	No	
			SS	Santaldih	5	250	No	Unit#6 could not be implemented because of some technical problem and
			SS		6	250	No	
			SS	Kolaghat	1	210	No	Nil
			SS		2	210	No	Nil
			SS		3	210	No	Nil
			SS		4	210	No	Nil
			SS		5	210	No	Nil
			SS		6	210	No	Nil
			SS	Bakreshwar	1	210	Yes	
			SS		2	210	Yes	
			SS		3	210	Yes	
			SS		4	210	Yes	
			SS		5	210	Yes	
			SS	Sagardighi	1	300	No	Without OEM support it is not possible to put in FGMO/RGMO. At present OEM support is not
			SS		2	300	No	
	Hydro		SS	PPSP	1	225	Yes	In 134th OCC WBPDCL informed that the units are in RGMO/FGMO mode
			SS		2	225	Yes	
			SS		3	225	Yes	
			SS		4	225	Yes	
	Thermal	CESC	SS	Budge-Budge	1	250	Yes	
			SS		2	250	Yes	
			SS		3	250	Yes	
			SS	Haldia	1	300	Yes	
			SS		2	300	Yes	
	Thermal	DPL	SS	DPL	7	300	Yes	
Orissa		OPGC	SS	IB TPS	1	210	No	Not adequate response in RGMO
			SS		2	210	No	
	Hydro	OHPC	SS	Burla	1	49.5	No	
			SS		2	49.5	No	
			SS		3	32	No	
			SS		4	32	No	
			SS		5	37.5	No	
			SS		6	37.5	No	
			SS		7	37.5	No	
			SS	Balimela	1	60	No	
			SS		2	60	No	
			SS		3	60	No	
			SS		4	60	No	
			SS		5	60	No	
			SS		6	60	No	
			SS		7	75	No	
			SS		8	75	No	
			SS	Rengali	1	50	No	
			SS		2	50	No	
			SS		3	50	No	
			SS		4	50	No	
			SS		5	50	No	
			SS	Upper Kolab	1	80	No	
			SS		2	80	No	
			SS		3	80	No	
			SS		4	80	No	
			SS	Indravati	1	150	No	
			SS		2	150	No	
			SS		3	150	No	
			SS		4	150	No	

Central Sector	Thermal	DVC	CS	Bokaro-A	1	500	Yes	
			CS	Bokaro-B	3	210	No	Not possible due to non availability of Electro hydraulic governing. The units will be decommissioned shortly.
			CS	CTPS	3	130	No	Not possible due to non availability of Electro hydraulic governing. The units will be decommissioned shortly.
			CS		7	250	Yes	
			CS		8	250	Yes	
			CS	DTPS	4	210	No	Not possible due to non availability of Electro hydraulic governing. The units will be decommissioned shortly.
			CS	Mejia	1	210	No	Not possible due to non availability of Electro
			CS		2	210	No	
			CS		3	210	No	Action has been initiated to put in RGMO, but testing is not yet completed.
			CS		4	210	Yes	
			CS		5	250	Yes	
			CS		6	250	Yes	
			CS	Mejia - B	7	500	Yes	
			CS		8	500	Yes	
			CS	DSTPS	1	500	Yes	
			CS		2	500	Yes	
			CS	KODERMA	1	500	Yes	
			CS		2	500	Yes	
			CS	RTPS	1	600	Yes	
			CS		2	600	Yes	
	Hydro		CS	Panchet	1	40	No	RGMO mode of operation would not be possible for
			CS		2	40	No	
	Thermal	NTPC	CS	Farakka STPP-I	1	200	Yes	
			CS		2	200	Yes	
			CS		3	200	Yes	
			CS	Farakka STPP-II	1	500	Yes	
			CS		2	500	Yes	
			CS	Farakka-U#6		500	Yes	Kept in RGMO mode from April, 2014
			CS	Kahalgoan STPP	1	210	Yes	
			CS		2	210	Yes	
			CS		3	210	Yes	
			CS		4	210	Yes	
			CS		5	500	Yes	
			CS		6	500	Yes	
			CS		7	500	Yes	
			CS	Talcher STPP Stg-I	1	500	Yes	
			CS		2	500	Yes	
			CS	Barh	5	660	Yes	
			CS	Barh	6	660	Yes	
	Hydro	NHPC	CS	Teesta HEP	1	170	Yes	
			CS		2	170	Yes	
			CS		3	170	Yes	
IPP	Thermal	IPP	PS	Maithon RB TPP	1	525	Yes	
			PS		2	525	Yes	
			PS	Sterlite	1	600	Yes	
			PS		2	600	Yes	
			PS		3	600	Yes	
			PS		4	600	Yes	
			PS	Adhunik Power	1	270	Yes	
			PS		2	270	Yes	
	Hydro	IPP	PS	JLHEP	1	48	No	(RoR project with 3 hours pondage)
			PS		2	48	No	
			PS	Chujachen HEP	1	49.5	No	(RoR project with 3 hours pondage)
			PS		2	49.5	No	
			PS	Teesta Urja	1	200	No	could be put in RGMO mode but because of transmission evacuation constraint RGMO/FGMO is disabled
			PS		2	200	No	
			PS		3	200	No	
			PS		4	200	No	
			PS		5	200	No	
			PS		6	200	No	
			PS	Dikchu	1	48	No	(RoR project with 3 hours pondage)
			PS		2	48	No	

ANNEXURE – XVII (Page-1/2)

IMPORTANT MEETINGS HELD DURING 2017-18

Sl. No	Description	Date	Venue
	A. ERPC MEETINGS		
i)	36th ERPC Meeting	14.09.2017	Bhubaneswar
ii)	37th ERPC Meeting	17.03.2018	Goa
	B. TCC MEETINGS		
i)	36th TCC Meeting	13.09.2017	BBSR
ii)	37th TCC Meeting	16.03.2017	Goa
	C. OPERATION COORDINATION SUB-COMMITTEE (OCC) MEETINGS		
i)	132nd OCC Meeting	21.04.2017	ERPC, Kolkata
ii)	133rd OCC Meeting	26.05.2017	ERPC, Kolkata
iii)	134th OCC Meeting	23.06.2017	ERPC, Kolkata
iv)	135th OCC Meeting	24.07.2017	ERPC, Kolkata
v)	136th OCC Meeting	30.08.2017	ERPC, Kolkata
vi)	137th OCC Meeting	21.09.2017	ERPC, Kolkata
vii)	138th OCC Meeting	30.10.2017	ERPC, Kolkata
viii)	139th OCC Meeting	27.11.2017	ERPC, Kolkata
ix)	140th OCC Meeting	19.12.2017	ERPC, Kolkata
x)	141st OCC Meeting	18.01.2018	ERPC, Kolkata
xi)	142nd OCC Meeting	23.02.2018	ERPC, Kolkata
xii)	143rd OCC Meeting	26.03.2018	ERPC, Kolkata
	D. COMMERCIAL SUB- COMMITTEE MEETINGS		
i)	35th CC Meeting	02.08.2017	ERPC, Kolkata
ii)	36th CC Meeting & presentation on 5min scheduling	13.02.2018	ERPC, Kolkata
	E. PROTECTION COORDINATION SUB-COMMITTEE (PCC) MEETINGS		
i)	54th PCC Meeting	24.04.2017	ERPC, Kolkata
ii)	55th PCC Meeting	25.05.2017	ERPC, Kolkata
iii)	56th PCC Meeting	22.06.2017	ERPC, Kolkata
iv)	57th PCC Meeting	25.07.2017	ERPC, Kolkata
v)	58th PCC Meeting	29.08.2017	ERPC, Kolkata
vi)	59th PCC Meeting	20.09.2017	ERPC, Kolkata
vii)	60th PCC Meeting	24.10.2017	ERPC, Kolkata
viii)	61st PCC Meeting	28.11.2017	ERPC, Kolkata
ix)	62nd PCC Meeting	18.12.2017	ERPC, Kolkata
x)	63rd PCC Meeting	19.01.2017	ERPC, Kolkata
xi)	64th PCC Meeting	22.02.2017	ERPC, Kolkata
xii)	65th PCC Meeting	28.03.2017	ERPC, Kolkata

F. SPECIAL MEETINGS

i)	Training Programme of Protection Engineer	03.04.2017 to 07.04.2017	AIPM CESC, Kolkata
ii)	Load Generation data of Peak for OLFA	04.05.2017	ERPC, Kolkata
iii)	PDMS Training Programme	22-05.2017 to 24.05.2017	ERPC, Kolkata
iv)	Special meeting on IBUNL	22.05.2017	ERPC, Kolkata
v)	Evacuation of Power from HEPS of Sikkim	13.06.2017	ERPC, Kolkata
vi)	Workshop on web portal for weather information.	07.07.2017	ERPC, Kolkata
vii)	Scheduling of power from Nabinagar TPS	11.07.2017	ERPC, Kolkata
viii)	Review of removal of LILO of Vedanta Ltd.	14.07.2017	ERPC, Kolkata
ix)	2nd PSCT training	1707.2017 to 21.07.2017	ERPC, Kolkata
x)	5th meeting on standing committee for transmission planning for state sector.	03.08.2017	ERPC, Kolkata
xi)	Verification and updation of the protection related data in PDMS of the Protection Database project of ERPC	07.09.2017	ERPC, Kolkata
xii)	On outage of 220 Kv D/C Rangpoo-New Melli T/L for rectification of bend tower	11.12.2017	ERPC, Kolkata
xiii)	On issues related to Charging of 220Kv Tenughat-Biharsariff line at 400 KV	14.12.2017	ERPC, Kolkata
xiv)	LGBR for the year 2018-19	20.12.2017	ERPC, Kolkata
xv)	Workshop on CERC regulation for DSM and compensation mechanism of ISGS/CGS	21.12.2017	ERPC, Kolkata
xvi)	3rd PSCT training	05.02.2018 to 09.02.2017	ERPC, Kolkata
xvii)	Meeting to discuss draft CERC regulation on GNA to Inter-State Transmission System	14.02.2018	ERPC, Kolkata
xviii)	Training on Optimum calculation of transfer capability(ATC,TTC and TRM) by International Consultant	19.02.2018-21.02.2018	ERPC, Kolkata
xix)	On issues raised by Railway Board regarding BRBCL.	26.02.2018	ERPC, Kolkata
xx)	Implementation of new environment norms for thermal power plant in Eastern Region and providing incentive for early installation	27.02.2018	ERPC, Kolkata
xxi)	CERC (Terms and Condition on tariff Regulation-2014-2019) discussion on various aspect	12.03.2018	ERPC, Kolkata
xxii)	On issues related to MTPS Stage-II of KBUNL.	23.03.2018	ERPC, Kolkata
xxiii)	On issues related to Bhutan HEPS	27.03.2018	ERPC, Kolkata

ANNEXURE - XVIII A

THERMAL POWER PROJECT UNDER CONSTRUCTION IN THE ER

State	Project Name	Impl. Agency	Unit No.	Capacity (MW)	Expected date of Synchronisation
	Nabi Nagar TPP	Joint Venture of NTPC and Railways	U-3	250	2018-19
			U-4	250	2018-19
	New Nabi Nagar STPP	Joint Venture of NTPC and Bihar	U-1	660	2018-19
			U-2	660	2018-19
			U-3	660	2018-19
	Barh-St-II	NTPC	U-1	660	
			U-2	660	
			U-3	660	

HYDRO POWER PROJECT UNDER CONSTRUCTION IN THE ER

State	Project Name	Impl. Agency	Unit No.	Unit Size & Capacity (MW)	Likely Commissioning Year
	Teesta- VI	Lanco	U-1 to U-4	4x125	
	Rangit-IV	Jal Power corp. Ltd.	U-1 to U-3	3x40	
	Bhasmey	Gati Infrastructure	U-1 to U-3	3x17	
	Rangit-II	Sikkim Hydro Power Ltd.	U-1 to U-2	2x33	2018-19
	Rongnichu	Madhya Bharat Power Corp. Ltd.	U-1 to U-2	2x48	2018-19
	Panan	Himgiri Hydro Energy Pvt. Ltd.	U-1 to U-4	4x75	2018-19

ANNEXURE – XVIII B

STATUS OF IMPORTANT TRANSMISSION LINES/ ICTs UNDER CONSTRUCTION

क्रमांक Sl. No.	पारेषण लाईन का नाम Name of the Trans line	लंबाई (सीकेएम) Length (CKM)	भा.स./नि.मं अनुमोदन GoI / BoD Appl.	लागत (अनुमोदित) /प्रत्याशित Cost (Appd.) /Ant.	संचयी व्यय (मार्च'17 तक) Cumml Exp. till prev. Year Mar'17(Provisional)	चालु वर्ष का व्यय Current year Expen.		संचयी व्यय Cumml	निर्माण की प्रगती Progress of Construction				संपूर्ति लक्ष्य Completion Tgt.		Remarks / Constraints & assistance required.
						अनुमनित बजट (17-18) B.E. (17-18)	Actual upto prev. month (Feb'18)	पिछले माह तक upto prev. month (Feb'18)	*लोकशन Locs. (no.)*	*स्टब सेटिंग Stubs Setting (no.)*	*टावर ईरेकशन Tower Erect. (no.)*	*स्टीरिंग Strng. (ckm)*	Latest Approved Schedule	*प्रत्या./ वास्त. Ant./ Act.*	
1.3	**Common System Associated with East Coast Energy Pvt. Ltd and NCC Power Projects Ltd. LTOA Gen. Proj. in Srikakulam area - Part - B**	**890**	**Mar'13/ Mar'18**	**3190.27**	**1865.05**	**240.1**	**313.70**	**2178.75**	**1197**	**1166**	**1136**	**704**	**Jun'18**	**Jun'18**	**Associated Gen.Project delayed/ Uncertain**
1.3.1	765KV D/C Angul - Jharsauguda line	590							790	772	759	449		Jun'18	Severe ROW being faced near Angul end. Huge forest involvement (461.13 Ha.). Working permission issued from Apr'17 to Aug'17.
1.3.2	**765 KV D/C Jharsuguda - Dharamjaygarh line ***	**300**							**407**	**394**	**377**	**255**		**Jun'18**	**Huge forest involvement (213 Ha.). Working permission issued in Nov'17 for WR portion.**
1.9	**Transmission System Strengthening in Indian System for Transfer of Power from Mangdechhu Hydroelectric Proj, in BHUTAN.**	**316**	**Mar'16 / Mar'18**	**808.63**	**95.3**	**234**	**177.40**	**272.7**	**449**	**280**	**203**	**3**	**Mar'19**	**Mar'19**	**Gen. Project ant. by Nov'18.**
1.9.1	**400KV D/C Jagmeling - Alipurduar line (Q) (india Side) ***	**316**							**449**	**280**	**203**	**3**		**Mar'19**	**Line passing through Tiger reserve area. Wildlife clearance proposal submitted. Clearance awaited. Critical. Alternate arrangements made for evacuation (contigency through Punatsangchu ATS ready)**
5.0	**EASTERN REGION**														
5.1	**Transmission System for Development of Pooling Station in Northern region Part of West Bengal and Transfer of Power from BHUTAN to NR/WR.**	**190**	**Apr'10/ Mar'18**	**5135.01**	**3282.55**	**529**	**418.40**	**3700.95**	**272**	**272**	**272**	**190**	**Nov'18**	**Mar'18**	PROJECT COMPLETED.
5.1.3	400KV D/C Punatsangchu-1 (Gen. Proj. in Bhutan) - Alipurduar line - India Portion.	128							178	178	178	128		Mar'18 *	* Line completed & charged in Mar'18 (up to Indo-Bhutan border). Line proposed to be used as contigency arrangement for evacuation of power of Mangdechhu HEP (Gen. delayed, now ecpected by Nov'18). Commissioning matching with Generation.
5.2	**Eastern Region Strengthening Scheme - III**	**772**	**July'10/ Mar'16/ Mar'18**	**1731.1**	**1381.93**	**97.09**	**58.10**	**1440.03**	**1027**	**1027**	**1027**	**772**	**Sep'18**	**Sep'18***	* Matching with Daltonganj sub station (balance ICT).

5.3	**Split Bus Arrangement for avrious Sub Stations in Eastern Region**	**56**	**Mar'13 / Jan'16**	**146.73**	**115.67**	**3.36**	**3.20**	**118.87**	**97**	**92**	**91**	**50**	**Mar'16**	**Jun'18**	
5.3.3	400KV D/C trans. Line for reconfiguration of Biharshariff Ckt III&IV from its present position to St.-II side of Kahalgaon Sw. yd. of NTPC	26							42	37	36	20		Jun'18	Completion of bay by NTPC delayed.
5.4	**Eastern Region Strengthening Scheme-V**	**963**	**Oct'13/ Mar'18**	**1891.41**	**1110.64**	**89**	**73.50**	**1184.14**	**1348**	**1322**	**1313**	**842**	**Dec'18**	**Dec'18**	
5.4.1	400KV D/C Rajarhat - Purnea line (Triple Snowbird)	881							1223	1197	1188	760		Dec'18	Farakka - Gokarna portion of 400KV D/C Rajarhat - Purnea line (236 Ckm) including both LILO's at Farakka & Gokarna commissioned in Mar'17. Severe ROW problem at Rajarhat area. Processing of forest case in Jharkhand slow. Work in Rajarhat was hold since last 12 months. Work resumed in Oct'17 again stopped on 01.12.2017 due to protest. Matter being folowed up at all levels for early resolution.
5.6.4	LILO of Subhashgram -Jeerat 400KV S/C line at Rajarhat	8							16	16	16	8		Dec'18	Line completed. Commisisonin matching with S/stn. Work at Rajarhat S/S. held up due to persistent protest by locals.
5.5	**Transmission System Associated with Darlipalli TPS**	**41**	**Jan'16**	**187.04**	**54.6**	**35**	**38.20**	**92.8**	**61**	**61**	**61**	**41**	**Jun'18**	**May'17**	**PROJECT COMPLETED.**
5.6	**Eastern Region Strengthening Scheme-XV**	**204**	**Apr'16**	**454.11**	**28.5**	**165**	**170.20**	**198.7**	**288**	**238**	**221**	**70**	**Apr'18**	**May'18**	
5.6.1	400KV D/C Farakka - Baharampur Line (Twin HTLS)	164							229	187	174	47		May'18	
5.6.2	LILO at 400KV S/C Farakka - Jeerat line at Sagardighi	38							54	51	47	23		May'18	
5.6.3	LILO at 400KV S/C Sagardighi - Subhasgram line at Jeerat	2							5					May'18	
5.6.4	Removal of the existing LILO of Farakka - Jeerat S/C line at Baharampur													May'18	
5.7.1	**Powergrid Works associated with Common Trans. System for Phase-II Gen. Proj. in Odisha.**	**130**	**Apr'16**	**844.64**	**44.8**	**185**	**163.10**	**207.9**	**122**	**122**	**122**	**130**	**Apr'19**	**Apr'19***	*Associated augmentation/ Split bus at Jharsaguda ant. by Apr'19.
5.8	**Associated Transmission System for NABINAGAR -II TPS.**	**466**	**Apr'16**	**790.3**	**129.4**	**240**	**239.30**	**368.7**	**635**	**590**	**559**	**318**	**Jun'19**	**Jun'19**	
5.8.2	400KV D/C Nabinagar-II -Patna line (Q)	282							390	345	314	134		Jun'19	
5.9	**Eastern Region Strengthening Scheme-XVII (Part-B)**	**63**	**Feb'17**	**235.53**		**40.1**	**8.00**	**8**					**Jun'19**	**Jun'19**	
5.9.1	Re-conductoring of Maithon RB - Maithon 400KV D/C line	63												Jun'19	Award placed in Oct'17. Engg. & survey in progress.

5.9.2	Bypassing arrangement of LILO of 400KV lines at Angul.													Jun'19	Award placed in Mar'17.
5.10	**400KV D/C Baharampur (PG) - Bheramera (B'desh) line (IInd Ckt) - India portion**	**166**	**Sep'17**	**198.49**			**0**		**208**				**Sep'19**	**Sep'19**	Award placed in Feb'18. (BPTA signing with Bangladesh critical).
5.11	**Eastern Region Strengthening Scheme - XX**	**222**	**Nov'17**	**358.83**		**5**	**0**						**May'20**	**May'20**	30 Month from IA.
5.11.1	Re-conductoring of Rangpo - New Siliguri 400KV D/C line (The existing Twin ACSR Moose line to be re-conductored with Twin HTLS conductor)	220												May'20	Award placed in Jan'18. Engg. in progress.
5.11.2	Re-conductoring of New Purnea - Purnea 220KV D/C line (The existing New Purnea (400/220KV) - Purnea (220/132KV) 220KV D/C line needs to be re-conductored with Single HTLS conductor)Twin ACSR Moose line to be re-conductored with Twin HTLS conductor)	2												May'20	Award placed in Jan'18. Engg. in progress.
5.12	**TS for transfer of Power from Gen. Proj. in Sikkam to NR/WR (Part-B1)**	**15**	**Dec'17**	**75.39**			**0**		**20**				**Jun'20**	**Jun'20**	30 Month from IA.
5.12.1	LILO of IInd Ckt of Teesta-III - Kishanganj 400KV D/C line at Rangpoo (Q) - Twin HTLS cond.	15							20					Jun'20	Award placed in Dec'17. Engg. & survey in progress.
9	**Eastern Region strengthening Scheme - XVIII**								1802	356	66		**Jul'20**	**Jul'20**	
	765KV D/C Ranchi (New) - Medinipur line	562							764	273	45			Jul'20	Award placed in Mar'17. Work under progress.
	765KV D/C Medinipur - Jeerat (New) line	300							401	38	8			Jul'20	Award placed in Mar'17. Work under progress.
	400KV D/C Jeerat (New) - Subhashgram line	180							292					Jul'20	Award placed in Mar'17. Engg. & survey under progress.
	400KV D/C Jeerat (New) - Jeerat (WBSETCL) line	48							71	5				Jul'20	Award placed in Mar'17. Work under progress.
	LILO of 400KV D/C both ckt of Chandithala - Kharagpur at Medinipur	168							237	40	13			Jul'20	Award placed in Mar'17. Work under progress.
	LILO of 400KV S/C Jeerat (WBSETCL) - Subhashgram at Rajarhat (PG)	24							37					Jan'20	Award placed in Mar'17. Line under deletion.
10	**Eastern Region Strengthening Scheme - XXI**	**472**	**Sep'17**	**1255**									**Mar'21**	**Mar'21**	**Compln. Sch:- 38 month from date of SPV.(SPV acquired on 12.01.18).**
	400KV D/C Darbhanga - Sitamarhi (New) line (Triple Snowbird)	**132**							178					Mar'21	Award placed in Jan'18.
	400KV D/C Sitamarhi (New) - Motihari line (Triple Snowbird)	**186**							247					Mar'21	Award placed in Jan'18.
	LILO of bith ckt of Nabinagar-II - Gaya 400KV D/C (Q) line at Chandauti	**24**							37					Mar'21	Award placed in Jan'18.
	LILO of bith ckt of Kishanganj - Patna 400KV D/C (Q) line at Saharsa	**130**							190					Mar'21	Award placed in Jan'18.

PART - II : सब स्टेशन SUBSTATION

क्रमांक Sl. No.	सब स्टेशन का नाम Name of the Sub -Station	एम.वी.ए अनुपात MVA Ratio	भा.स./नि.मं अनुमोदन GoI / BoD Approval	ईरेकशन ठेकेदार Erection Contractor	जमीन की स्थिति Status of land	निर्माण की स्थिति Status of Construction			ट्रांस्फारमर Transformer		संपूर्ति लक्ष्य Completion Tgt.		Remarks
						Civil works compln. (%)	Str. & Eqpt. Received (%)	Str. & Eqpt. Erection (%)	सप्लाई Supply (Nos)	ईरेक्शन Erection	Latest approved Schedule	प्रत्याशित/ वास्तविकAnt./ Act	
1.3	**Common System Associated with East Coast Energy Pvt. Ltd and NCC Power Projects Ltd. LTOA Gen. Proj. in Srikakulam area-Part-B**		**Mar'13/ Mar'18**								**Jun'18**	**Jun'18**	
1.3.1	Extn. of 765/400KV Angul S/stn.			Techno	Available	99%	99%	98%				Jun'18	Supply, civil works & erection under progress. Completion matching with line.
1.3.2	Extn. of 765/400KV Jharsuguda S/stn.			Techno	Available	100%	100%	100%				Jun'18	Completion matching with line.
1.3.3	Extn. of 765/400KV Dharamjaigarh S/s.			Techno	Available	99%	99%	98%				Jun'18	Supply, civil works & erection under progress. Completion matching with line.
1.10	**Transmission System Strengthening in Indian System for Transfer of Power from Mangdechhu Hydroelectric Proj, in BHUTAN.**		**Mar'16 / Mar'18**								**Mar'19**	**Mar'19**	
1.10.1	Extn at 400KV bays at Alipurduar S/stn.				Available	99%	99%	99%				Mar'19	Bay available. Commissioning matching with line.
5.0	**EASTERN REGION**												
5.2	**Eastern Region Strengthening Scheme - III**		**July'10/ Mar'18**								**Sep'18**	**Sep'18**	
5.2.1	400/220 KV Daltonganj	2x315		Alstom	Acquired	98%	98%	87%	2	1		Sep'18	Sub station with ICT-I commissioned in Mar'18. Balance work under progress.
5.3	**Split Bus Arrangement for avrious Sub Stations in Eastern Region**	-	**Mar'13/ Jan'16**								**Mar'16**	**Jun'18***	*** Matching with line.**
5.3.1	Spliting arrangement with tie line breaker for 400KV Maithon & Durgapur S/stn.			BHEL	Available	Compltd	Compltd	Compltd				Jan'16	Extn. at Durgapur completed in Oct'15. Balance work completed in Jan'16.
5.3.2	Spliting arrangement with tie line breaker for 400KV Biharshariff Sub station			BHEL	Available	Compltd	Compltd	Compltd				May'17	Commissioned in May'17.
5.4	**Eastern Region Strengthening Scheme-V**		**Oct'13/ Mar'18**								**Dec'18**	**Dec'18**	
5.4.1	400/220KV Rajarhat S/Stn. (GIS)	2x500		Siemens	Acquired	90%	95%	85%	2	2		Dec'18	Work under completion. However, work was standstill due to severe ROW problem since Jan'17 & protest by locals, who were not allowing to enter in Rajarhat S/S. Land acquired in Feb'14. work resumed in Oct/Nov'17 but again stalled from 01.12.17 due to protest by locals.
5.5	**Eastern Region Strengthening Scheme-IX**		**Feb'14/ Mar'18**								**Sep'18**	**Sep'18**	

क्रमांक Sl. No.	सब स्टेशन का नाम Name of the Sub -Station	एम.वी.ए अनुपात MVA Ratio	भा.स./नि.मं अनुमोदन GoI / BoD Approval	ईरेकशन ठेकेदार Erection Contractor	जमीन की स्थिति Status of land	निर्माण की स्थिति Status of Construction			ट्रांस्फारमर Transformer		संपूर्ति लक्ष्य Completion Tgt.		Remarks
						Civil works compln. (%)	Str. & Eqpt. Received (%)	Str. & Eqpt. Erection (%)	सप्लाई Supply (Nos)	ईरेक्शन Erection	Latest approved Schedule	प्रत्याशित/ वास्तविकAnt./ Act	
5.5.1	Installation of 125 MVAR Bus Reactor at Gazwaka (1 no.), Rengali (2 nos.), Maithon (1 no.), Biharshariff (1 no.), Jamshedpue (2 nos.), Rourkela (1 no.) and Durgapur (2 nos.) Converting 2x80 MVAR LR at Gorakhpur end of Barh-II - Gorakhpur 400KV D/C line to 2x80MVAR Switchable LR.			BHEL	Available	Compltd	Compltd	Compltd				Jan'18	IInd Reactor at Durgapur charged in Dec'16. Line Reactor at Gorakhpur commissioned in Feb'17 & BR at Rengali & Gazwaka in Aug'17. Rengali (2 nos. BR commissioned in Aug'17. Extn. at Biharshariff in Oct'17. Extn. at Jamshedpur commisisoned in Nov'17. BR at Rourkela commissioned in Jan'18.
5.5.5	Procur. 500MVA ICT at 765/400KV Gaya S/stn.			Alstom	Available	100%						Sep'18	ICT now to be kept at Ranchi. ICT expected to be dispatched by Aug'18.
5.6	**Eastern Region Strengthening Scheme-XII**	**2100**	**May'14/ Mar'18**								**Jun'19**	**Jun'19**	
5.6.4	Repl. 2 nos. ICT's, 315MVA to 500MVA at 400/220KV Pusali S/stn.	370		Alstom	Available	78%	70%	60%	1	1		Jun'18	ICT- I commissioned in Mar'16. Balance work under progress. Transformer supply delayed due to failure in testing. Now supply expected by Apr'18.
5.6.5	Repl. 2 nos. ICT's, 315MVA to 500MVA at 400/220KV Patna S/stn. & 3rd new ICT 500MVA Installation	870		Alstom	Available	68%	72%	60%	1	1		Jun'18	ICT-I commissioned in Sep'16. Balance work under progress. Transformer supply delayed due to failure in testing. *3rd ICT added as per MoP order no; 15/2/2017 (Part-I)- Trans. dated 10.01.18.* 3rd ICT commissioned in Feb'18. Balance work (ICT repl.) under progress.
5.6.7	Shifting of 1x315MVA 400/220KV ICT from any suitable location (after replacement by 1x500MVA & install it at 400/220KV Farakka S/S. as 2nd ICT alongwith associated bays.	-		Alstom	Available	85%	75%	50%				Jun'19	Supply, civil work & erection under progress. Shifting of ICT from Pusali under progress. However, ICT held up at bridge near Farakka. Permission to cross bridge rfeused by MoST, W.B. ICT was delivered to Durgapur. *Scope was earlies proposed to be deleted from scheme. Now again proposal to be transporated via different route & commissioned at Farakka.
5.6.11	Modification of 132KV Bus arrangement at 220/132 KV Siliguri & Purnea S/stn. with GIS bays.	-		Hysoung & L&T	Available	Compltd	Compltd	Compltd				Mar'18	Siliguri commissioned in Nov'16 & balance commissioned in Mar'18.
5.6.12	02nos. 500MVA, 765/400KV Spare Transformers in ER.	-										May'18	Work under progress.
5.7	**Sub station extn. works associated with Eastern Region Strengthening Scheme -VII**		**Mar'15/ Jun'17**								**Mar'17/ Jul'17**	**Jul'17**	**PROJECT COMPLETED**

क्रमांक Sl. No.	सब स्टेशन का नाम Name of the Sub -Station	एम.वी.ए अनुपात MVA Ratio	भा.स./नि.मं अनुमोदन GoI / BoD Approval	ईरेकशन ठेकेदार Erection Contractor	जमीन की स्थिति Status of land	निर्माण की स्थिति Status of Construction			ट्रांस्फारमर Transformer		संपूर्ति लक्ष्य Completion Tgt.		Remarks
						Civil works compln. (%)	Str. & Eqpt. Received (%)	Str. & Eqpt. Erection (%)	सप्लाई Supply (Nos)	ईरेक्शन Erection	Latest approved Schedule	प्रत्याशित/ वास्तविकAnt./ Act	
5.7.1	Extn at 400KV bays at 400/220KV Purulia PSPP Sw.Yd., Kharagpur, Chaibasa and 765/400KV Ranchi S/stn. (02 nos. each)				Available	Compltd	Compltd	Compltd				Jul'17	Extn. at Chaibasa S/stn. commissioned in May'16 (under TBCB route). Bays at Kharagpur & Ranchi commissioned. Purulia bay commissioned with final arrangement in Jul'17.
5.7.2	Extn at 765/400KV Ranchi S/stn. end (2x50 MVAR LR) and 400/220KV Chaibasa S/stn. end (2x63 MVAR LR)			Empower	Available	Compltd	Compltd	Compltd				Oct'16	Chaibasa Reactor commissioned in May'16 & Ranchi commissioned in Oct'16.
5.8	**Transmission System Associated with Darlipalli TPS**		**Jan'16**								**Jun'18**	**May'17**	**PROJECT COMPLETED**
5.8.1	Extn. at 765KV at Jharsaguda (Sundergarh) Pooling Station.			Techno	Available	Compltd	Compltd	Compltd				May'17	Commisisoning in April'17.
5.9	**Eastern Region Strengthening Scheme-XV**		**Apr'16**								**Apr'18**	**Apr'18**	Agreement between WBSETCL & PGCIL signed on 22.08.17. Work has to be executed on deposit work basis by WBSETCL. Due to addl. Scope at Jeerat compln. Sch. extended 01 yeari.e Apr'19.
5.9.1	Extn at 400/220KV at Farakka S/stn.			GE	Available	95%	80%	50%				Apr'18	Award Placed in Aug'16. Engg. & civil work under progress.
5.9.2	Extn at 400/220KV at Sagardighi S/stn.			GE	Available	92%	80%	50%				Apr'18	Award Placed in Aug'16. Engg., supply, civil work & erection under progress.
5.9.3	Extn at 400/220KV at Jeerat S/stn.			GE	Available							Apr'18	
5.9.4	Extn at 400KV at Baharampur S/stn.			GE	Available	95%	80%	60%				Apr'18	Work under progress.
5.9.5	Extn at 400KV at Subhashgram S/stn.			GE	Available	100%	100%	100%				Mar'18	Commissioned in Mar'18.
5.10	**Powergrid Works associated with Common Trans. System for Phase-II Gen. Proj. in Odisha.**		**Apr'16**								**Apr'19**	**Apr'19**	**Compln Sch.- 36 months from IA. (02 nos 400KV bay under TBCB) - 16 months from IA.**
5.10.1	Extn. at 765/400KV Jharsuguda S/stn. (Sundargarh) with split Bus Arrangement	2x1500		Xin/ Techno	Available	70%	70%	50%				Apr'19	Supply, civil work & erection under progress. 400KV portion commissioned.
5.10.2	765/400KV Angul S/stn. with split Bus Arrangement												**Scope deleted**
5.11	**Associated Transmission System for NABINAGAR -II TPS.**										**Jun'19**	**Jun'19**	**Compln Sch.- 38 months from IA.**
5.11.1	Extn. at 765/400KV at Gaya S/stn. alongwith 765/400KV ICT.	1x1500		Siemens	Available	35%	25%	10%				Jun'19	Engg & civil work under progress.
5.11.2	Extn. at 765/400KV at Gaya S/stn. for Nabinagar-Gaya line	-			Available	100%	100%	100%				Mar'18	Commissioned in Mar'18.
5.11.3	Extn. at 765/400KV at Patna S/stn.	-		GE	Available	20%						Jun'19	Award placed in Mar'17. Engg. & civil work under progress.

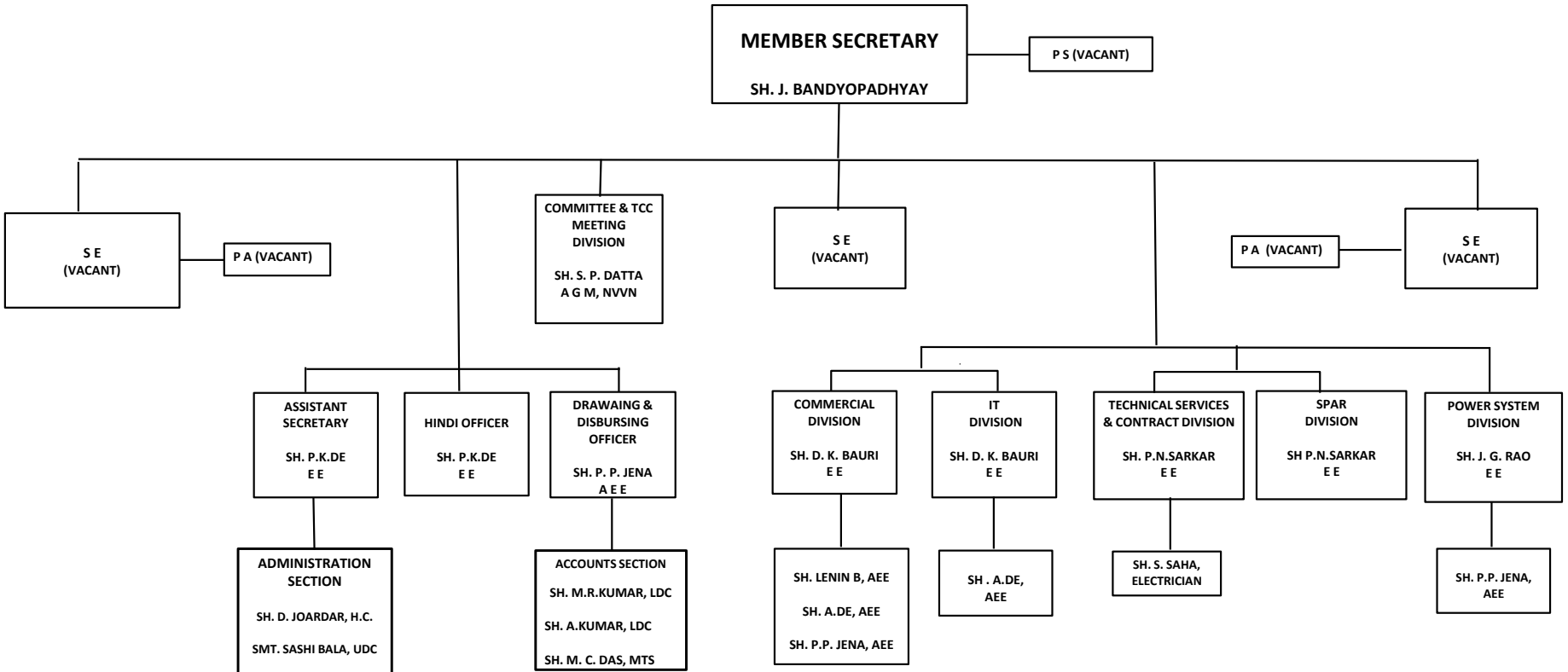
क्रमांक Sl. No.	सब स्टेशन का नाम Name of the Sub -Station	एम.वी.ए अनुपात MVA Ratio	भा.स./नि.मं अनुमोदन GoI / BoD Approval	ईरेकशन ठेकेदार Erection Contractor	जमीन की स्थिति Status of land	निर्माण की स्थिति Status of Construction			ट्रांस्फारमर Transformer		संपूर्ति लक्ष्य Completion Tgt.		Remarks
						Civil works compln. (%)	Str. & Eqpt. Received (%)	Str. & Eqpt. Erection (%)	सप्लाई Supply (Nos)	ईरेक्शन Erection	Latest approved Schedule	प्रत्याशित/ वास्तविकAnt./ Act	
5.12	**Eastern Region Strengthening Scheme-XIV**		**May'16**								**Nov'18**	**Nov'18**	
5.12.1	Extn. at 400/220KV Banka S/Stn. (Installation of 125 MVARBus Reactor)	-		GE	Available	80%	50%	40%				Nov'18	Engg., supply, civil work & erection under progress
5.12.2	Extn. at 400/220KV Bolangir S/Stn. (Installation of 125 MVARBus Reactor)	-		GE	Available	80%	50%	50%				Nov'18	Engg., supply, civil work & erection under progress
5.12.3	Extn. at 400/220KV Lakhisari S/Stn. (Installation of 125 MVARBus Reactor)	-		GE	Available	70%	50%	40%				Nov'18	Engg., supply, civil work & erection under progress
5.12.4	Extn. at 400/220KV Chaibasa S/Stn. (Installation of 125 MVARBus Reactor)	-		GE	Available	85%	50%	40%				Nov'18	Engg., supply, civil work & erection under progress
5.12.5	Extn. at 400/220KV Keonjhar S/Stn. (Installation of 125 MVARBus Reactor)	-		GE	Available	85%	50%	50%				Nov'18	Engg., supply, civil work & erection under progress
5.12.6	Extn. at 400/220KV Durgapur S/Stn. (Installation of 125 MVARBus Reactor)	-		GE	Available	95%	50%	40%				Nov'18	Award placed in Jun'16. Engg., supply, civil work & erection under progress
5.12.7	Extn. at 400/220KV Baripada S/Stn. GIS (Installation of 125 MVARBus Reactor)	-		GE	Available	95%	98%	90%				Nov'18	Award placed in May'16. Engg., supply, civil work & erection under progress
5.13	**Eastern Region Strengthening Scheme-XI**		**May'16**								**Nov'18**	**Nov'18**	
5.13.1	STATCOM in Rourkela S/stn.	-		Siemens	Available	100%	100%	100%				Mar'18	Commissioned in Mar'18.
5.13.2	STATCOM in Ranchi (New) S/stn.	-		Siemens	Available	75%	65%	50%				Nov'18	Work under progress
5.13.3	STATCOM in Kishanganj S/stn.	-		Siemens	Available	60%	25%	15%				Nov'18	Work under progress
5.13.4	STATCOM in Jeypore S/stn.	-		Siemens	Available	68%	85%	50%				Nov'18	Award placed in May'16. Engg., supply, civil work & erection under progress
5.14	**Eastern Region Strengthening Scheme-XVII (Part-A)**		**Jul'16**								**Nov'17**	**Mar'18**	**PROJECT COMPLETED**
5.14.1	Extn. at 400/220KV Daltonganj S/stn. (2x160, 220/132/33KV, 3 Ph. (ICTs)	2x160		GE	Available	Compltd	Compltd	Compltd	2	2		Mar'18	Commissioned in Mar'18.
5.15	**Eastern Region Strengthening Scheme-XVII (Part-B)**		**Feb'17**								**Jun'19**	**Jun'19**	
5.15.1	Extn. at 400/220KV Gaya S/stn.	500			Available	20%	5%					Jun'19	Award placed in Jun'17. Engg., supply & civil work under progress.
5.15.2	Extn. at 400/220KV New Siliguri S/s (3rd ICT)	315			Available	5%						Jun'19	Award placed in Jun'17. Engg. & civil work under progress.
5.15.3	Extn. at 400/220KV Durgapur S/stn. (3rd ICT)	315		SPML	Available		35%	20%				Jun'19	Award placed in Mar'17. Engg. & supply under progress.
5.15.4	Extn. at 400/220KV Jeypore S/stn.	630		SPML	Available	20%	10%					Jun'19	Award placed in Mar'17. Engg. & civil work under progress.
5.15.5	Extn. at 400/220KV Rourkela S/stn.	630		SPML	Available	30%	10%					Jun'19	Award placed in Mar'17. Engg., supply & civil work under progress.

क्रमांक Sl. No.	सब स्टेशन का नाम Name of the Sub -Station	एम.वी.ए अनुपात MVA Ratio	भा.स./नि.मं अनुमोदन GoI / BoD Approval	ईरेकशन ठेकेदार Erection Contractor	जमीन की स्थिति Status of land	निर्माण की स्थिति Status of Construction			ट्रांस्फारमर Transformer		संपूर्ति लक्ष्य Completion Tgt.		Remarks
						Civil works compln. (%)	Str. & Eqpt. Received (%)	Str. & Eqpt. Erection (%)	सप्लाई Supply (Nos)	ईरेक्शन Erection	Latest approved Schedule	प्रत्याशित/ वास्तविकAnt./ Act	
5.15.6	Repl. of 400/220KV Malda S/st. (2x315MVA to 2x500 MVA)	370		SPML	Available	15%						Jun'19	Award placed in Mar'17. Engg. & civil work under progress.
5.16	**PG work associated with immediate evacuation for North Karanpura Gen. Proj. of NTPC.**		**Feb'17**								**Sep'19**	**Sep'19**	**Compln. Sch. - Sep'17 & Sep'19 matching with TBCB lines.**
5.16.1	Extn. at 400/220KV Gaya S/stn.	-		GE	Available	15%						Sep'19	Award placed in Mar'17. Engg. & civil works under progress.
5.16.2	Extn. at 400/220KV Chandwa (Jharkhand Pool) GIS	-		Hyosung	Available	20%	40%					Jun'18	Award placed in Feb'17. Engg.,supply & civil work under progress.
5.17	**PG work associated with TBCB lines under common Transmission System for Ph-II Gen. Proj. in Odisha.**		**Mar'17**								**Mar'19**	**Mar'19**	**Compln. Sch. - 24 months from IA matching with TBCB lines.**
5.17.1	Extn. at 765/400KV Jharsaguda (Sundergarh) S/stn.	-		GE	Available	15%	5%					Mar'19	Award placed in Mar'17.Civil work & supply under progress.
5.17.2	Extn. at 765/400KV Raipur S/stn.	-		GE	Available							Mar'19	Award placed in Mar'17. Engg. in progress.
5.18	**PG work associated with Transmission System Strengthening in Indian System for transfer of Power from New HEP's in BHUTAN.**		**Mar'17**								**Mar'19**	**Mar'19**	**Compln. Sch. - 24 months from IA matching with TBCB lines.**
5.18.1	Extn. at 400/220KV Alipurduar S/stn.	-			Available							Mar'19	Bay available at Alipurduar.
5.18.2	Extn. at 400/220KV Siliguri S/stn.	-			Available	5%						Mar'19	Award placed in Mar'17. Work in progress.
5.18.3	Extn. at 400/220KV Kishenganj S/stn.	-			Available							Mar'19	Award placed in Jun'17. Engg. in progress.
5.19	**Eastern Region Strengthening Scheme - XX**		**Nov'17**								**May'20**	**May'20**	**Compln. Sch. - 30 months from IA**
5.19.1	Extn. at 400/220KV Biharshariff S/Stn.	500			Available							May'20	Award placed in Dec'17. Engg. in progress.
5.19.2	Extn. at 400/220KV Maithon S/Stn.	500			Available							May'20	Award placed in Dec'17. Engg. in progress.
5.19.3	Extn. at 400/132KV Banka S/Stn.	315			Available							May'20	Award placed in Dec'17. Engg. in progress.
5.19.4	Extn. at 400/220KV Lakhisarai S/Stn.	315			Available							May'20	Award placed in Dec'17. Engg. in progress.
5.19.5	Extn. at 220/132KV Rangpo S/Stn.	100			Available							May'20	Award placed in Dec'17. Engg. in progress.
5.19.6	Repl. 220/132KV 50MVA to 160MVA at Malda S/stn.	110			Available							May'20	Award placed in Dec'17. Engg. in progress.
5.19.7	Extn. at 220KV Biharshariff (BSPTCL) S/S.	-			Available							May'20	Award placed in Dec'17. Engg. in progress.
5.19.8	Extn. at 400/220KV New Siliguri S/s	-			Available							May'20	Award placed in Dec'17. Engg. in progress.
5.19.9	Extn. at 400KV Subhashgram S/Stn.	-			Available							May'20	Award placed in Dec'17. Engg. in progress.
5.19.10	Extn. at 765/400KV Ranchi (New) S/Stn.	-			Available							May'20	Award placed in Dec'17. Engg. in progress.
5.19.11	Extn. at 400/220KV New Purnea S/Stn.	-			Available							May'20	Award placed in Dec'17. Engg. in progress.

क्रमांक Sl. No.	सब स्टेशन का नाम Name of the Sub -Station	एम.वी.ए अनुपात MVA Ratio	भा.स./नि.मं अनुमोदन GoI / BoD Approval	ईरेकशन ठेकेदार Erection Contractor	जमीन की स्थिति Status of land	निर्माण की स्थिति Status of Construction			ट्रांस्फारमर Transformer		संपूर्ति लक्ष्य Completion Tgt.		Remarks
						Civil works compln. (%)	Str. & Eqpt. Received (%)	Str. & Eqpt. Erection (%)	सप्लाई Supply (Nos)	ईरेक्शन Erection	Latest approved Schedule	प्रत्याशित/ वास्तविकAnt./ Act	
5.19.12	Extn. at 220/132 KV Purnea S/Stn.	-			Available							May'20	Award placed in Dec'17. Engg. in progress.
5	***Eastern Region strengthening Scheme - XVIII***		**Dec'15**								**Jul'20**	**Jul'20**	
	765/400KV Medinipur Sub station (7x500)	2x1500			Acquired							Jul'20	Award placed in Sep'17. Engg. in progress.
	765/400KV Jeerat (New) Sub station (7x500)	2x1500			U/a							Jul'20	Award placed in Sep'17. Engg. in progress.
	Extn. at 400KV Jeerat S/stn (WBSETCL)				Available							Jul'20	Sign. of agreement with WBSETCL under progress. (To be exectued by WBSETCL).
6	***Eastern Region strengthening Scheme - XXI***		**Sep'17**								**Mar'21**	**Mar'21**	
	400/220/132KV Sitamarhi Sub station	2x500 & 2x200	KEC		U/a							Mar'21	Award placed in Mar'18.
	400/220/132KV Chandauti Sub station	3x500 & 3x200	ABB		U/a							Mar'21	Award placed in Mar'18.
	400/220/132KV Saharsa Sub station	2x500 & 2x200	ABB		U/a							Mar'21	Award placed in Mar'18.
	Extn. at 400KV Darbhanga S/stn		KEC		Available							Mar'21	Award placed in Mar'18.
	Extn. at 400KV Motihari S/stn		KEC		Available							Mar'21	Award placed in Mar'18.

EXHIBIT - I

ORGANISATION CHART OF ERPC, KOLKATA
AS ON 31.03.2018



EASTERN REGION POWER MAP

NOT TO SCALE

SIKKIM
1. MELLI
2. MAMRING
3. NAMCHI
4. ROTHAK
5. SORENG
6. GAZING
7.SAGBARI
8. RABANGLA

9. ODLABARI
10. CHALSA
11. NAGRAKATA
12. BANARHAT
13. KHEJURIA
14.KUMARDHUBI
15. RAMKANALI
16. KALIPAHARI
17. UKHRA
17a.BURNPUR
18. MUCHIPARA
18a. DHANBAD
19.BOLPUR
20.SATGACHIA
21.BURDWAN
22.ADISAPTAGRAM
23. DHARAMPUR
24. CHANDITALA
24a.BAGHATI
25.MANIQUE(DVC)
26. GOLMURI
27. JADUGUDA
28. ADITYAPUR
29.PATNA
30.MITHAPUR
31.GAIGHAT
32.BARIPAHARI
33.SULTANGANJ

34. BARAJAMDA
35. BHALULATA
36. ROURKELA
37.RSP
38.RAIRANGPUR
39. RENGALI (PG)
40. RENGALI (O)
41. RENGALI (PS)
42. NANDIRA
43. JAYPORE TR.
44. CH. KUSUMI
45. MALIGUDA
46. MANBAR
47.MACHKUND
48.JAGATS'PUR
49.KHANDAGIRI
50. P.KHEMUNDI
51. NEW DHUBURI
51a. JINDAL
52.JAKHAPURA Tr.
52a. MAHESWARI
53. D. Pahandi

66 KV
132 KV
220 KV
400 KV
765 KV
THERMAL
HYDRO

EASTERN REGIONAL POWER COMMITTEE
14, GOLF CLUB ROAD, KOLKATA - 700 033

220 KV AND ABOVE E.R. TRANSMISSION SYSTEM