भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
पूर्वी क्षेत्रीय विद्युत समिति
Eastern Regional Power Committee
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संख्या: पू.क्षे.वि.स./एएआर/2021-22/ 1083-1116 दिनांक :08/11/2021

सेवा में ,

संलग्न सूची के अनुसार सभी के लिए

विषय :पूर्वी क्षेत्रीय विद्युत समिति, कोलकाता की वार्षिक प्रशासन रिपोर्ट वर्ष 2020-21 ।

महोदय,

पूर्वी क्षेत्रीय विद्युत समिति, कोलकाता की वार्षिक प्रशासन रिपोर्ट वर्ष 2020-21 की एक प्रति आपकी जानकारी एवं रिकॉर्ड हेतु संलग्न है । यह रिपोर्ट कार्यालय की वेबसाइट (www.erpc.gov.in) में भी उपलब्ध है ।

संलग्नक : यथोपरी ।

भवदीय

स्वपन राय
08/11/2021

(स्वपन राय)
अधीक्षण अभियंता

Distribution: ERPC Members

1. Chairperson, ERPC & Chairman-cum- Managing Director, Bihar State Power Holding Company Ltd., Vidyut Bhavan, Bailey Road, Patna-800001.
2. Managing Director, Bihar State Power Transmission Company Limited, Vidyut Bhavan, Bailey Road, Patna-800001.
3. Managing Director, North Bihar Power Distribution Company Limited, Vidyut Bhavan, Bailey Road, Patna-800001.
4. Chairman-cum-Managing Director, Jharkhand Urja Vikas Nigam Limited, Engineering Building, HEC, Dhurwa, Ranchi-834004.
5. Managing Director, Jharkhand Urja Sancharan Nigam Limited, Engineering Building, HEC, Dhurwa, Ranchi-834004.
6. Managing Director, Jharkhand Bijli Vitaran Nigam Limited, Engineering Building, HEC, Dhurwa, Ranchi-834004.
7. Managing Director, Tenughat Vidyut Nigam Ltd., Hinoo, Doranda, Ranchi – 834002
8. Chairman & Managing Director, West Bengal State Electricity Distribution Company Ltd., Vidyut Bhavan, 7th Floor, Block-DJ, Sector-II, Bidhannagar, Kolkata-700091.
9. Managing Director, West Bengal State Electricity Transmission Company Ltd., Vidyut Bhavan, 8th Floor, Block-DJ, Sector-II, Bidhannagar, Kolkata-700091.
10. Chairman & Managing Director, West Bengal Power Development Corporation Ltd., Bidyut Unnayan Bhavan, 3/C, Block LA, Sector-III, Bidhannagar, Kolkata-700098.
11. Managing Director, Durgapur Projects Ltd., Administrative Building, Durgapur-713201, West Bengal.
12. Principal Chief Engineer-cum-Secretary, Energy & Power Department, Govt. of Sikkim, Kazi Road, Gangtok – 737101, Sikkim.
13. Chairman-cum-Managing Director, Odisha Power Transmission Corporation Ltd., Janpath, Bhubaneswar - 751022.
14. Chairman-cum-Managing Director, GRIDCO Ltd., Janpath, Bhubaneshwar-751022.
15. Chairman-cum-Managing Director, OHPC Ltd., Orissa State Police Housing & Welfare Corporation Bldg. Vanivihar, Janpath, Bhubaneswar- 751022.
16. Managing Director, OPGC Ltd., Zone-A, 7th Floor, Fortune Towers, Chandrasekharpur, Bhubaneswar-751023.
17. Chairman, Damodar Valley Corporation, DVC Towers, VIP Road, Kolkata -700054.
18. Member (GO&D), Central Electricity Authority, Sewa Bhawan, R.K. Puram, New Delhi-110066.
19. Director (Commercial), NTPC Ltd., Core-7, SCOPE Complex, Lodhi Road, New Delhi -110003.
20. Director (Technical), NHPC Ltd., NHPC Office Complex, Sector-33, Faridabad, Haryana-121003.
21. Director (Operations), Power Grid Corporation of India Ltd., Saudamini, Plot No. 2, Sector-29, Gurgaon-122001.
22. Executive Director, ERLDC, POSOCO, 14 Golf Club Road, Tollygunge, Kolkata – 700033.
23. Chairman-cum-Managing Director, POSOCO, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi-110016.
24. Director (C&O), PTC India Ltd., 2nd floor, NBCC Tower,15 Bhikaji Cama Place, New Delhi-110066.
25. Chief Executive Officer, NTPC Vidyut Vyapar Nigam Limited, SCOPE Complex, Core-3, 7th Floor, Lodhi Road, New Delhi-110003.
26. Managing Director, Tata Power Trading Company Limited, B12/13, 2nd Floor, Shatabdi Bhavan, Sector-4, Noida-201301, Uttar Pradesh.
27. Managing Director (Generation), CESC Ltd., CESC House, 1 Chowringhee Square, Kolkata-700001.
28. Chief Executive Officer, Maithon Power Ltd., Village-Dambhui, P.O. Barbindia, Dist.-Dhanbad, Jharkhand-828205.
29. Managing Director, Adhunik Power & Natural Resources Ltd., Lansdowne Towers, 5th Floor, 2/1A Sarat Bose Road, Kolkata-700020.
30. Chief Operating Officer, GMR Kamalanga Energy Ltd., AT/PO-Kamalanga, PS-Kantabania, Via-Meramundali, Dist.-Dhenkanal, Odisha-759121.
31. Chief Executive Officer, Jindal India Thermal Power Limited, Plot No-12, Sector-B1, Local Shopping Complex, Vasant Kunj, New Delhi-110070.
32. Managing Director, Teesta Urja Limited, 2nd Floor, Vijaya Building, 17 Barakhamba Road, New Delhi-110001.

Central Electricity Authority, Sewa Bhawan, R. K. Puram, New Delhi-110066.

1. The Chairperson
2. Chief Engineer (GM Division)

Ministry of Power, Shram Shakti Bhawan, Rafi Marg, New Delhi-110001.

1. Joint Secretary (OM)

वार्षिक प्रशासन रिपोर्ट

Annual Administration Report

2020-21

भारत सरकार

विद्युतमंत्रालय

पूर्वी क्षेत्रीय विद्युत समिति

कोलकाता, सितंबर–2021

GOVT. OF INDIA

MINISTRY OF POWER

EASTERN REGIONAL POWER COMMITTEE

KOLKATA, SEPTEMBER - 2021

Eastern Regional Power Committee
Kolkata

FOREWORD

Power is an inevitable input for economic growth and development of any country. The Indian power sector is reverberating with action, hope and optimism today. India's fast pace economic growth and its rapid rate of industrialization and urbanization depends on growth of electricity demand. Eastern Region having a population of 22% of the country, has generation capacity of 9.83% only. During the year 2019-20, per capita electricity consumption of Eastern Region was only 731kWh against 1208 kWh of the country.

Since last several years, Eastern Region has witnessed a drastic growth in electricity demand. The regional peak demand and average energy consumption per day during the year 2020-21 has touched 24016 MW and 406 MU, respectively against 18930 MW and 353 MU in the year 2016-17.

During the Year 2020-21, total energy generation in ER was 198 BU which includes 84.3 % from thermal, 15.2% from hydro and 0.6% from RES. Eastern Region shares electricity exchange with all the regions of India including neighbouring countries like Bhutan, Bangladesh and Nepal. In the year 2020-21, Eastern Region exported around 48.8 BU of energy outside the region which was 41% more than the previous year (i.e. 34.6 BU) including export to Nepal and Bangladesh.

I hope, this trend of increasing electricity demand and consumption will continue for the years to come.

To keep pace with electricity growth of India, Eastern Region needs to focus and address the issues which are impediment in the growth of power sector. It has also to explore the possibilities of RE power generation in a big way to minimize the carbon foot print.

Annual Administration Report of ERPC for the year 2020-21 has been possible with the concerted efforts of all the constituents/stakeholders and the officials of ERPC Secretariat. I express my sincere thanks to all the Members of ERPC and officials of ERPC Secretariat for timely preparation of the report.

(Sanjeev Hans), IAS
CMD (BSPHCL) & Chairman (ERPC)

Govt. of India
Ministry of Power
ERPC Secretariat, Kolkata

PREFACE

The year 2020-21 was not conducive for the power sector of the country due to devastating impacts of COVID-19 pandemic. The pandemic has been affecting every sphere of human life across the globe. Power sector is not an exception. The initial months of the year 2020-21 has seen a drastic decline in the power demand mainly in industrial and commercial sector. However, in the later period of the year (from September, 2020 onwards), power demand has achieved its pace.

The Annual Administrative Report of Eastern Regional Power Committee (ERPC) for the year 2020-21 has been prepared based on the data provided by various utilities, Grid operators and after analysing and compiling the data. It gives a useful insight into the grid parameters, major achievements, important incidents and various affairs of Eastern Regional Power Committee.

Eastern Regional Power Committee (ERPC) was formed by Govt. of India vide resolution dated 25th May, 2005 under the provision of Electricity Act, 2003.Various important functions like regional level operation analysis, inter-state/inter regional exchange 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.

As such, ERPC plays a pivotal role in planning & operation of the regional grid and it has to resolve many issues involving operational, technical, economic and regulatory aspects of the grid. Eastern Region transmission network is connected with all other regions and also international connections exist with neighbouring countries like Bhutan, Nepal and Bangladesh for exchange of electricity.

The various profiles of the grid parameters in the Eastern Region (ER) have registered improvements in the year 2020-21. After fulfilment of requirement of Eastern Region, the region exported around 48827 MU of energy which was 41% more than the previous year (i.e. 34576 MU) including export to Nepal and Bangladesh. During the year 2020-21, total transformation capacity of 1700 MVA and total reactive capacity of 375 MVA at 400 kV level have been added in ER. Eastern Region achieved a transmission line addition of 2155 Ckt. km. which includes 765 kV New Ranchi – Medinipur Ckt-II. Thus, the total length of transmission line in ER stands to 51348 Ckt. km.

Maximum Net demand met in ER was 24016 MW on 23.03.2021at 21:00 Hrs. which was 2.64 % more than the previous year. Daily net average energy consumption in the region was about 406 MU, which was marginally (0.63 %) higher than the previous year in spite of prevailing COVID-19 pandemic.

Around 6680 MU energy was exported to Bangladesh through 400 kV D/C Berhampur (WB) – Bheramara (Bangladesh) transmission line.

Export of power from ER grid to Nepal through 400 kV (charged at 220 kV) Muzaffarpur – Dhalkheber (Nepal) line started from February'2016. The energy exported to Nepal during the year was 1026 MU through this line. Apart from this, 593 MU of energy exported to Nepal through Bihar network.

I believe that the Annual Administrative Report contains valuable data which 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 to prepare the report. ERPC would continuously strive to improve this Report. For this I would like to invite suggestions for making this report more informative and attractive.

Disclaimer: This is an operational report. Data/information furnished in this report should not be used for any commercial purposes.

Mondal
6/9/2021

(N. S. Mondal)
Member Secretary

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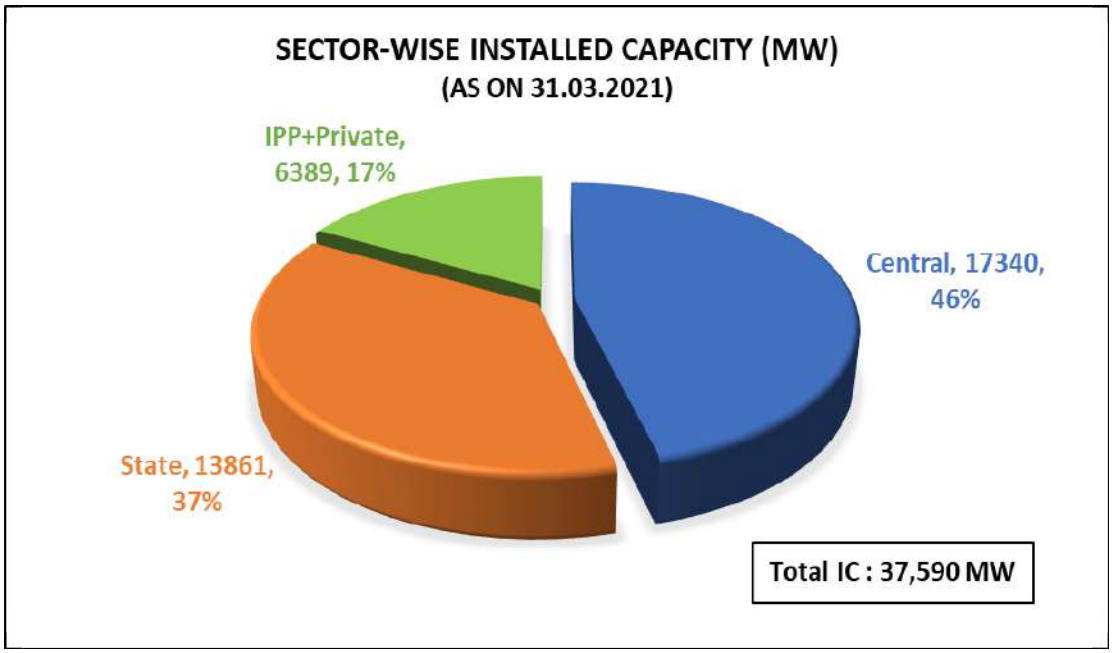
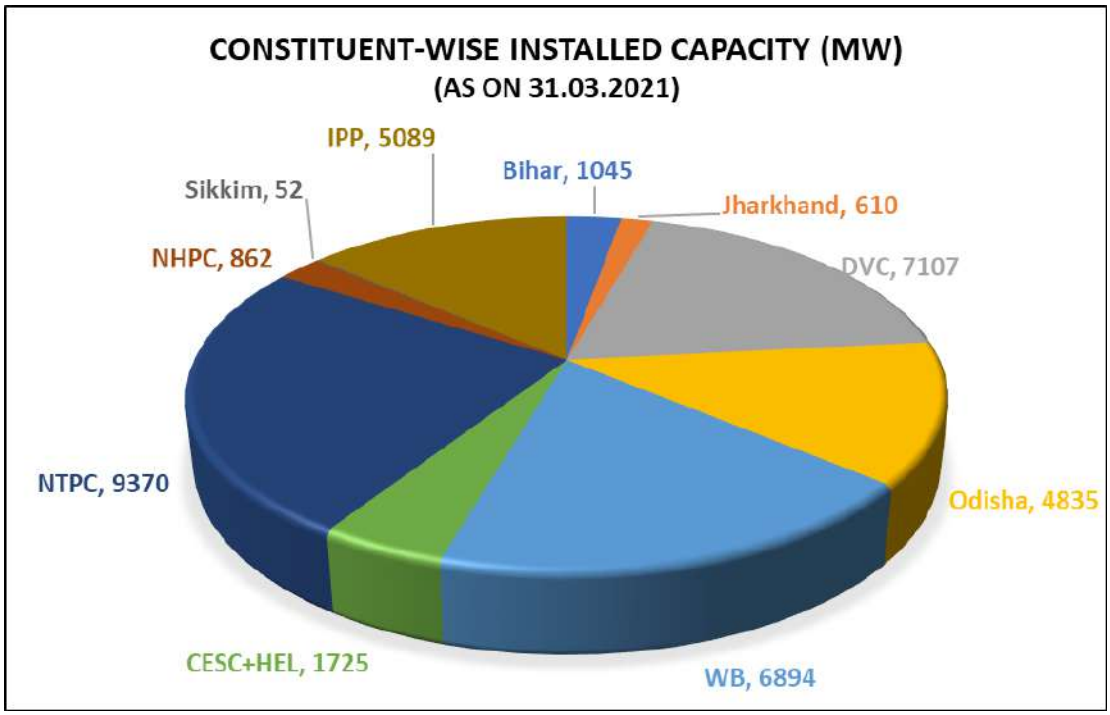
HIGHLIGHTS

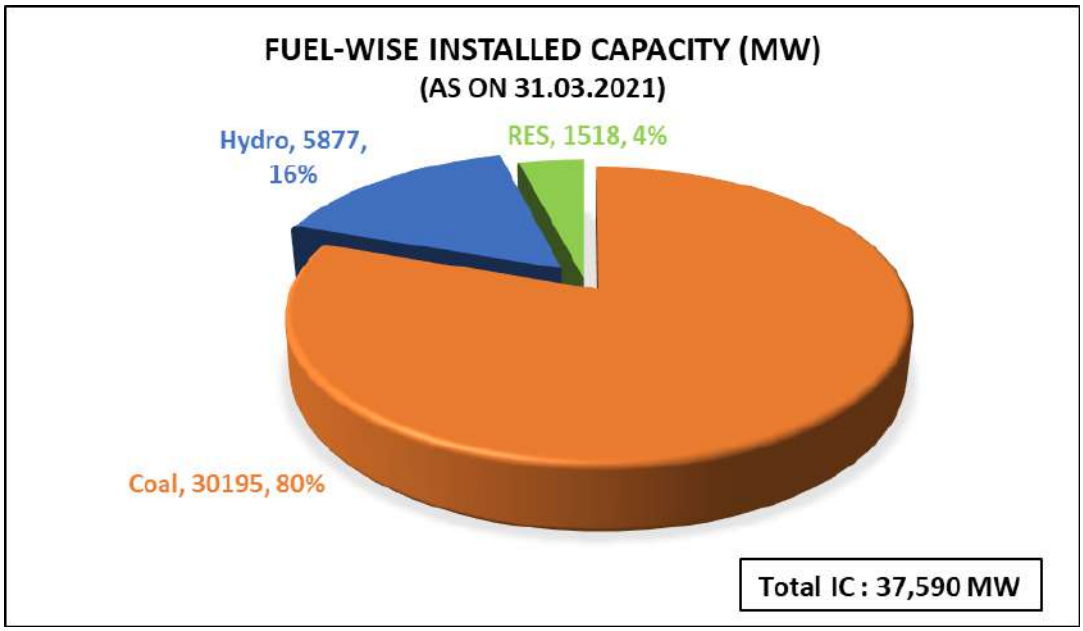
Salient features of ER Grid During 2020-21

Installed Capacity (As on 31.03.2021)	
Thermal	30195 MW
Hydro	5877 MW
Solar	1518 MW
Capacity addition (Thermal) During 2020-21	NIL
Capacity Phase out (Thermal) during 2020-21	NIL
Total Installed Capacity (Thermal + Hydro + Solar)	**37590 MW**
Total Effective Capacity (Thermal + Hydro + Solar)	**37525 MW**
Total length of Transmission Line (220kV & Above)	**51348 Ckt. km**
Transmission Line Addition During 2020-21	**2155 Ckt. Km**
Demand	
Max. of monthly Peak Demand Met (on 23.03.2021 at 21:00 Hrs.)	**24016 MW**
Increase Over Previous Year	2.64 %
Min. of monthly Peak Demand Met (on 14.04.2020 at 22:00 Hrs.)	18093 MW
ER System Load Factor (%)	**70.36 %**
Energy Requirement	**148427 MU**
Energy Generation (Gross) (incl. Bhutan Imp, Excl. CPP)	198040 MU
Increase over previous year	7.0 %
Net Energy Met	**148022 MU**
Frequency Regime	
% Time frequency remained Below 49.9 Hz	5.24 %
Between 49.9-50.05 Hz (IEGC Band)	**77.84 %**
Above 50.05 Hz	16.92 %
Inter-regional / Outside Country Energy Exchange	
Net Energy export to WR	-9664 MU
Net Energy export to SR	22069 MU
Net Energy export to NR	27179 MU
Net Energy export to NER	893.5 MU
Net Energy export to Bangladesh	6680 MU
Net Energy export to Nepal	1026 MU
Net Energy Export to Nepal through Bihar System	593 MU
Total Net Energy Export to Nepal	1619 MU
Total Net Regional Export (Incl. Kuruchhu HEP drawl of 53 MU)	**48827** MU

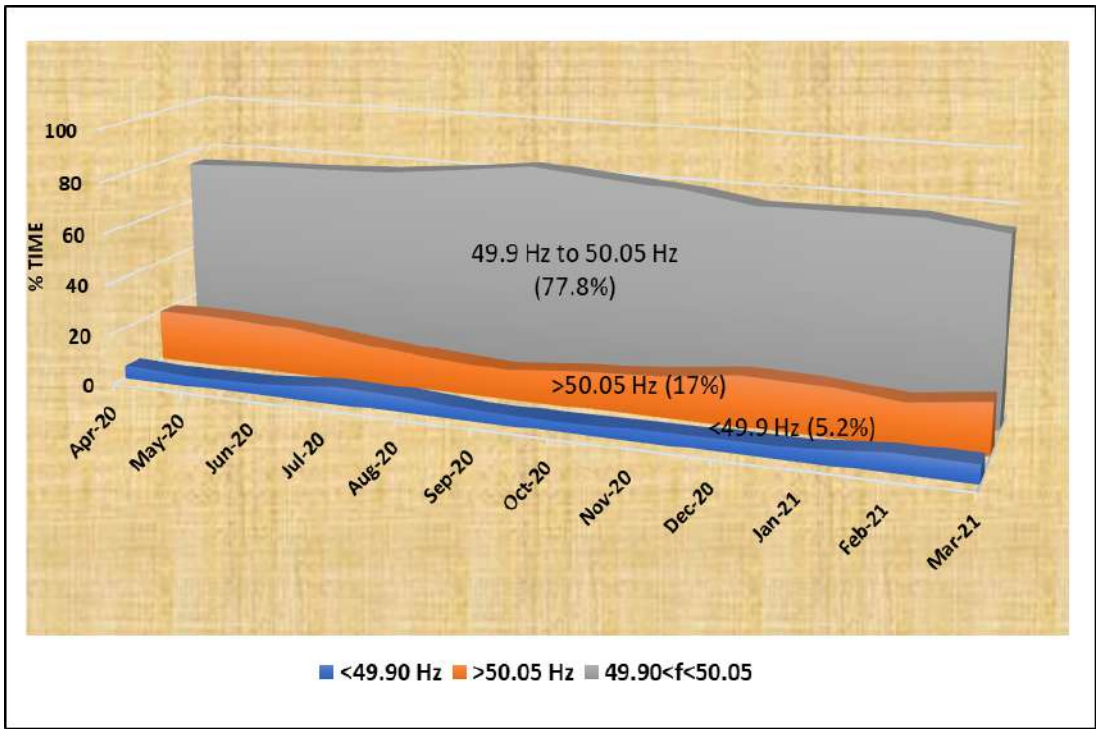
INSTALLED CAPACITY IN EASTERN REGION AS ON 31.03.2021



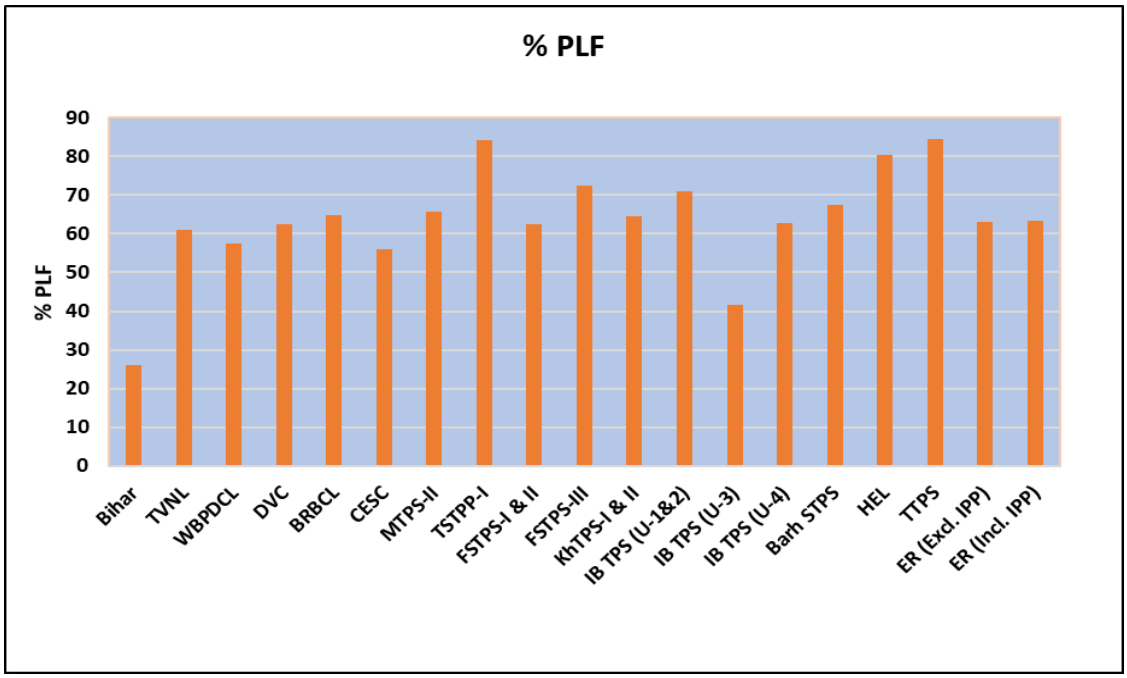




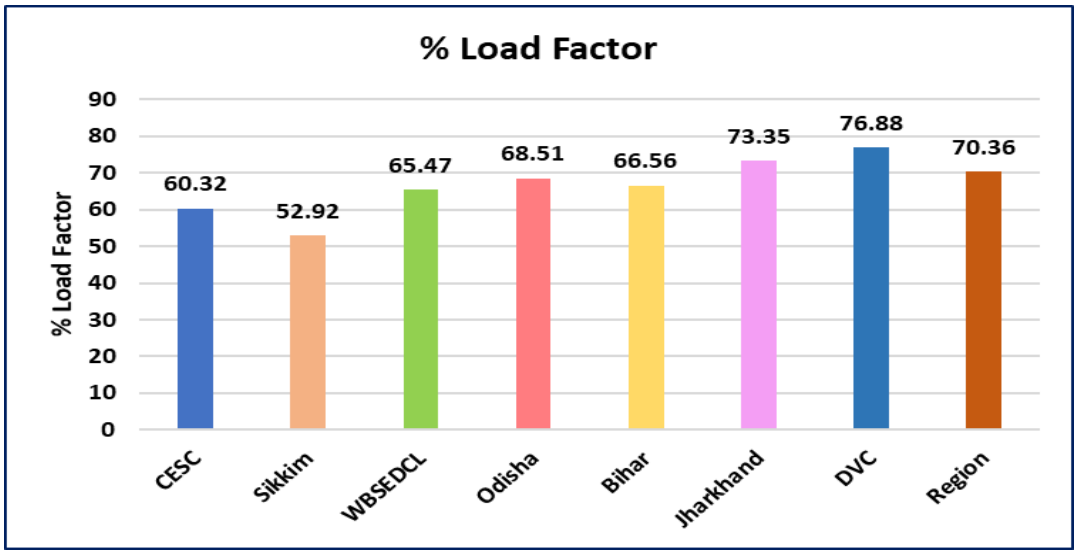
EASTERN GRID FREQUENCY REGIME DURING THE YEAR 2020-21



ANNUAL PLF OF THERMAL POWER STATIONS IN EASTERN REGION DURING THE YEAR 2020-21



ANNUAL LOAD FACTOR OF THE CONSTITUENTS IN EASTERN REGION DURING THE YEAR 2020-21



CHAPTER-1

CONSTITUTION, FUNCTIONS AND ORGANISATIONAL SETUP

1.1 INTRODUCTION

Electricity 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, it was 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 the way for establishment of vibrant electricity market facilitating trading of power across regions.

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.**

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.
vii) 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.
viii) Member Secretary, ERPC – Convener.

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.

Shri Santanu Basu (IAS), CMD, West Bengal State Distribution Company Ltd. was the Chairperson of ERPC for the year 2020-21. Members of ERPC for the year 2020-21 were as under:

Sl.No.	Name of ERPC Member Organisation	Designation of the Member
1.	West Bengal State Electricity Distribution Company Ltd.	Chairman-cum-Managing Director
2.	Energy &Power Department, Govt. of Sikkim	Principal Chief Engineer-cum-Secretary
3.	GRIDCO Ltd.	Chairman-cum-Managing Director
4.	Odisha Power Transmission Corporation Ltd.	Chairman-cum-Managing Director
5.	Odisha Hydro Power Corporation Ltd.	Chairman-cum-Managing Director
6.	Odisha Power Generation Corporation Ltd.	Managing Director
7.	Bihar State Power Holding Company Ltd.	Chairman-cum-Managing Director
8.	Bihar State Power Transmission Company Ltd.	Managing Director
9.	North Bihar Power Distribution Company Ltd.	Managing Director
10.	Jharkhand Urja Vikas Nigam Limited	Chairman-cum-Managing Director
11.	Jharkhand Urja Sancharan Nigam Limited	Managing Director
12.	Jharkhand Bijli Vitaran Nigam Limited	Managing Director
13.	Tenughat Vidyut Nigam Ltd.	Managing Director
14.	West Bengal State Electricity Transmission Company Ltd.	Managing Director
15.	West Bengal Power Development Corporation Ltd.	Chairman & Managing Director
16.	Durgapur Projects Ltd.	Managing Director
17.	Damodar Valley Corporation	Chairman
18.	Central Electricity Authority	Member (GO&D)
19.	Eastern Regional Load Despatch Centre	ED, ERLDC
20.	National Load Despatch Centre	ED, 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 effective from 01.04.2006 are given below:

- 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 Secretariat 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 Secretariat:

    - 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 Secretariat 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 days period ending on the previous Sunday mid-night.

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

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

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

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

- RPC Secretariat shall finalise action plan and give instructions to restore power system elements under prolonged outage in a specified time period.

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

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

- RPC Secretariat 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 Secretariat 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.

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

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

- RPC Secretariat 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 Secretariat 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 RPC Secretariat 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.

1.4 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 other 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 31.03.2021 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 2020-21

The sanctioned budget (RE) of ERPC for the year 2020-21 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 2020-21	Actual Expenditure (RE) for 2020-21
1	07.01.01	Salaries	100.00	74.85
2	07.01.03	OTA	0	0
3	07.01.06	Medical Treatment	2.80	0.03
4	07.01.11	Domestic TE	5.00	2.33
5	07.01.13	Office Expenses	3.00	2.99
6	07.01.14	Rent/Rates/Taxes	1.50	1.44
7	07.01.27	Minor Works	6.00	0.46
Total			**118.3**	**82.1**

(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 2020-21	Actual Expenditure (RE) for 2020-21
1	07.01.01	Salaries	190.00	155.86
2	07.01.03	OTA	0	0
3	07.01.06	Medical Treatment	3.40	11.07
4	07.01.11	Domestic TE	8.00	2.85
5	07.01.13	Office Expenses	46.76	40.46
6	07.01.50	Other Charges	4.00	0.00
Total			**252.16**	**210.24**

CHAPTER-2

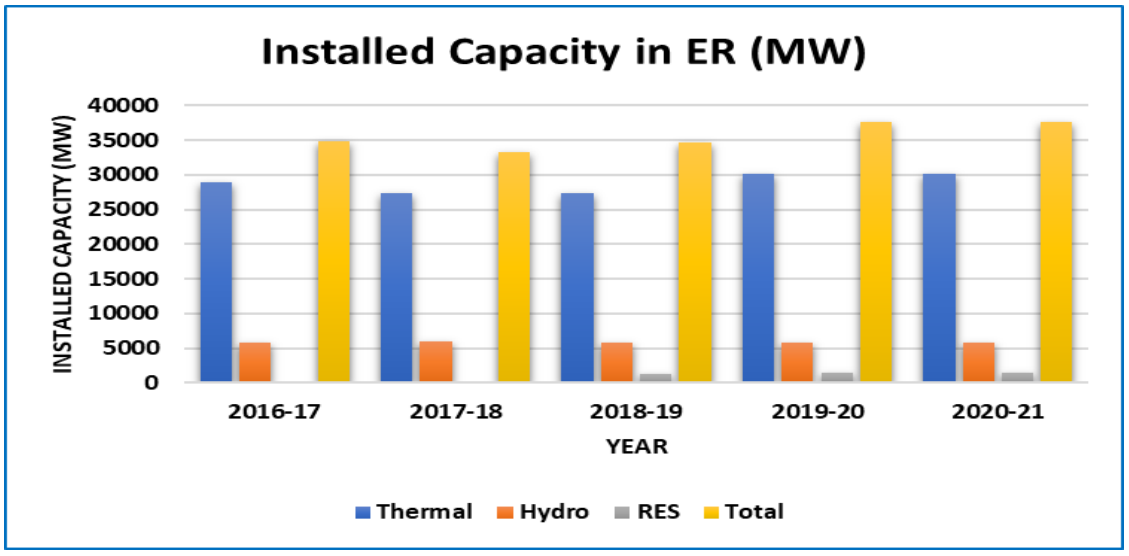
GRID PERFORMANCES

2.1 INSTALLED CAPACITY

The installed capacity of the power generating units in Eastern Region connected to Eastern grid as on 31st March 2021 was 37590 MW, comprising 30195 MW (80%) of thermal, 5877 MW (16 %) of hydel, 1518 MW (4 %) RES. The total effective capacity of the Region as on 31.03.2021 was 37525 MW. In addition to this, Chukkha HEP, Kurichhu HEP, Tala HEP, Daghachu HEP & Mangdechhu HEP of Bhutan contributed about 270 MW, 60 MW, 1020 MW, 126 MW & 720 MW respectively of hydro power to Eastern Region. PTC is the nodal agency for facilitating power purchase from Chukha, Kurichhu, Tala & Mangdechhu HEPs and Tata Power Transmission Company Limited is the nodal agency for facilitating power purchase from Dagachu HEP in Bhutan. Constituent-wise installed and effective capacity as on 31.03.2021 are shown in **Annexure-IVA**. The growth in installed capacity in Eastern Region for last five years (i.e. 2016-2017 onwards) is given in Table and shown in the graph below:

Table: Installed capacity (MW) in Eastern Region for last five years

Type	2016-17	2017-18	2018-19	2019-20	2020-21
Thermal	29010	27325	27415	30195	30195
Hydro	5754	5947	5876	5876.58	5877
RES			1336	1488.68	1518
Total	**34764**	**33272**	**34627**	**37560.3**	**37590**



The Compounded Annual Growth Rate of installed capacity in Eastern region during the last 5 years was 1.97 % as compared to 4 % nationwide.

2.2 POWER SUPPLY POSITION

2.2.1 GENERATION:

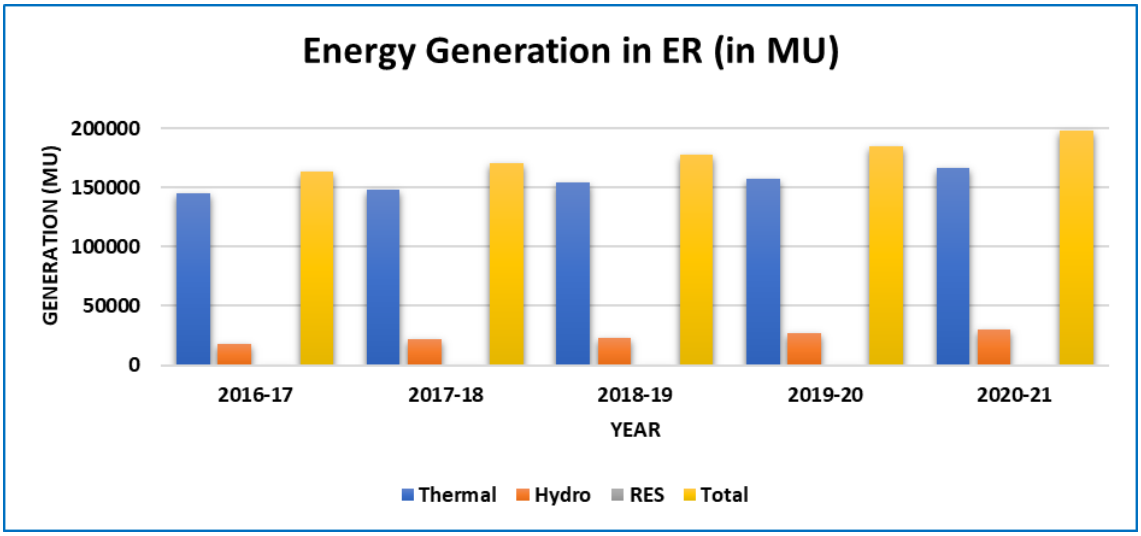
During the year 2020-21, the total generation availability in ER (including import from Bhutan but excluding generation/import from CPPs) was 1,98,040 MU (Gross) comprising of 1,66,906.1 MU from thermal (84.3 %), 30012.0 MU from hydro (15.2 %) and 1121.4 MU (0.6 %) from RES compared to total generation of 185095.07 MU in 2019-20 comprising 157454.14 MU from thermal, 26735.74 MU from hydro and 905.19 MU from RES. The total generation was 12945 MU (7%) more than that of 2019-20. Details of constituent-wise generation and auxiliary consumption are given in **Annexure-V**.

As regards to regional thermal generation, the generation of BSPHCL, DVC, WBPDCL, IB TPS, NTPC and IPP have increased considerably but that of Tenughat TPS, CESC, HEL and NHPC have been declined considerably as compared to last year. Hydro generation of IPPs has been decreased marginally as compared to last year.

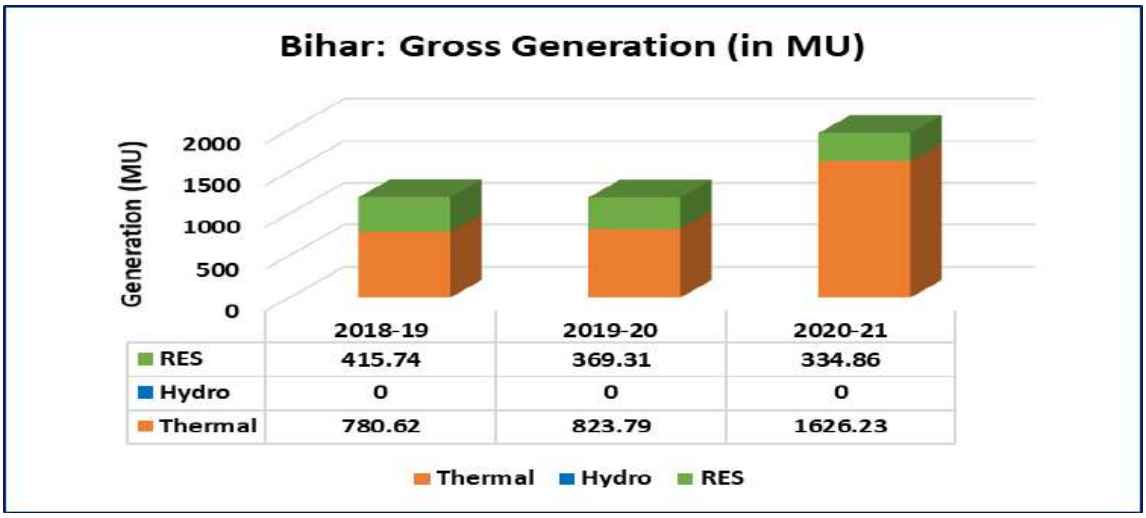
Generation of last five years (2016-17 to 2020-21) in the region is given in Table and shown in the graph below:

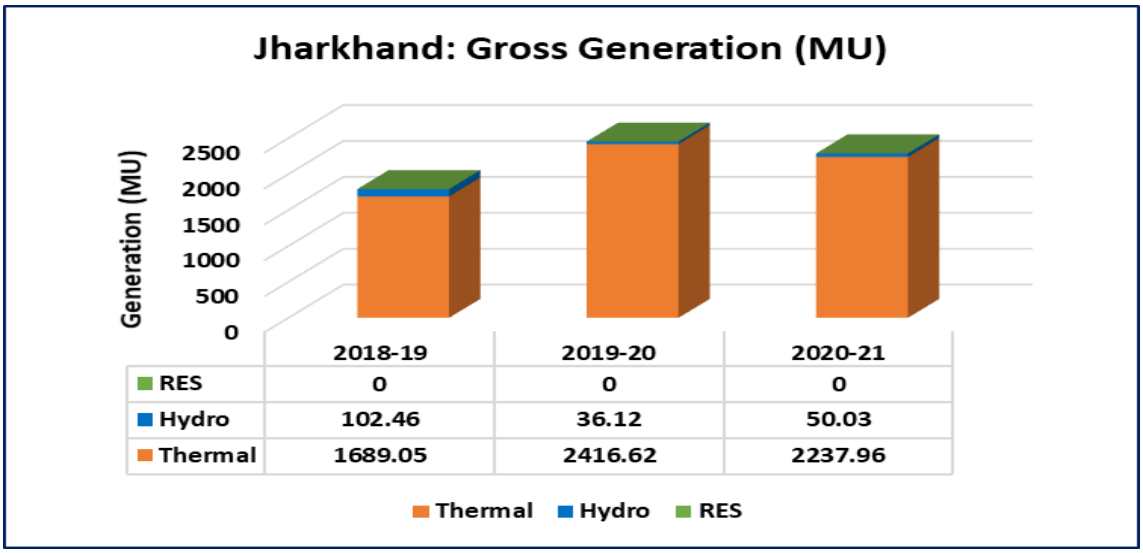
Table: Energy Generation in ER (in MU)

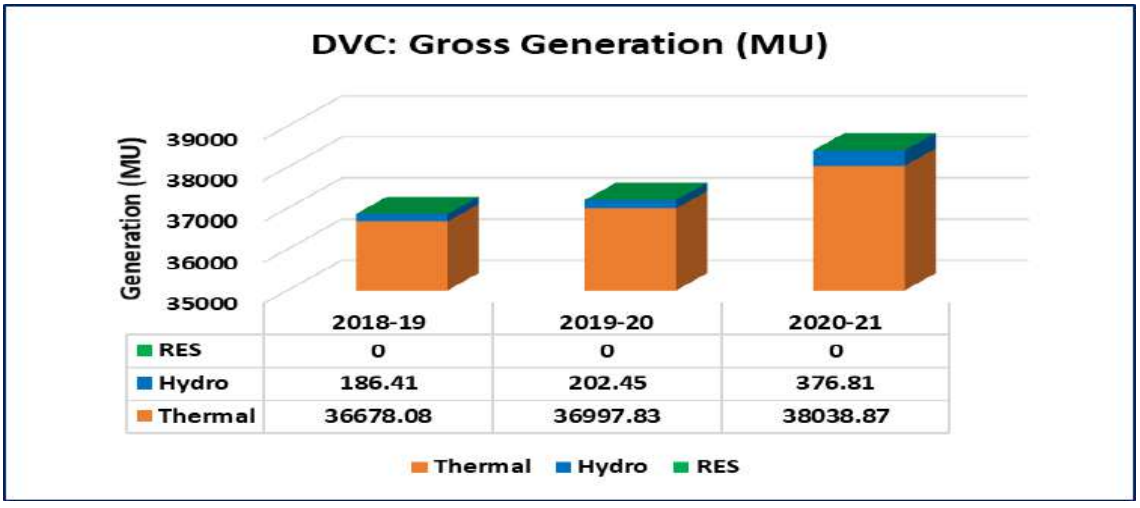
	2016-17	2017-18	2018-19	2019-20	2020-21
Thermal	145593.5	148227.7	153810.6	157454.14	166906
Hydro	18150.9	22445.05	22968.09	26735.74	30012
RES	13	171.63	657.48	905.19	1121
Total	163757.4	170844.4	177436.2	185095.07	198040



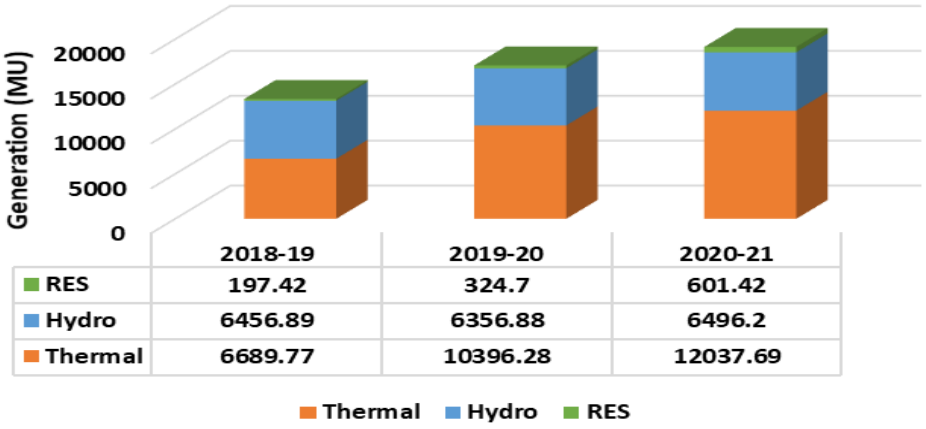
Constituent-wise & source-wise gross generation for the last three years has been shown below:







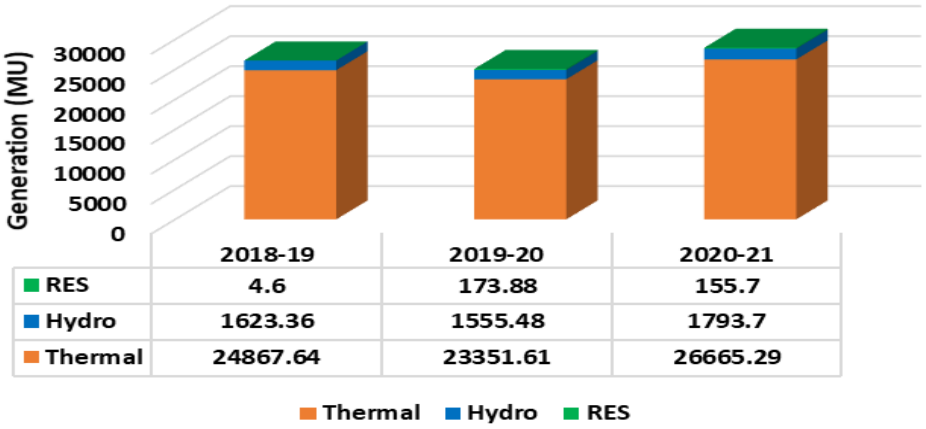
Odisha: Gross Generation (MU)



	2018-19	2019-20	2020-21
RES	197.42	324.7	601.42
Hydro	6456.89	6356.88	6496.2
Thermal	6689.77	10396.28	12037.69

Thermal Hydro RES

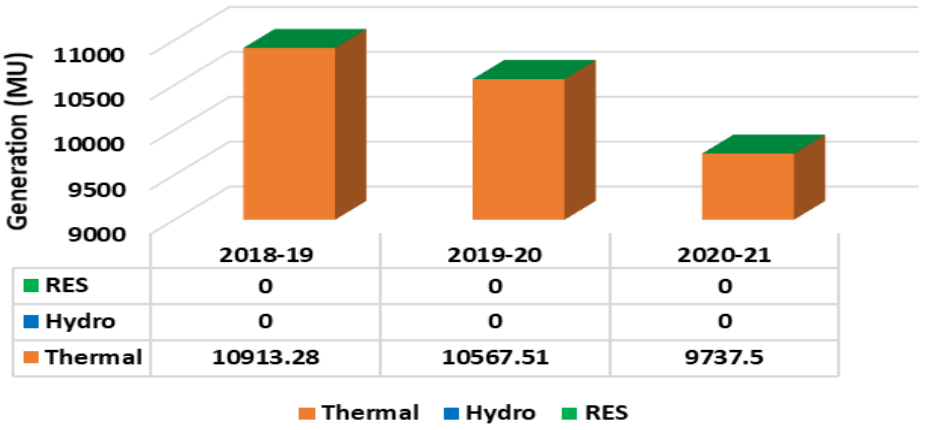
WB : Gross Generation (MU)



	2018-19	2019-20	2020-21
RES	4.6	173.88	155.7
Hydro	1623.36	1555.48	1793.7
Thermal	24867.64	23351.61	26665.29

Thermal Hydro RES

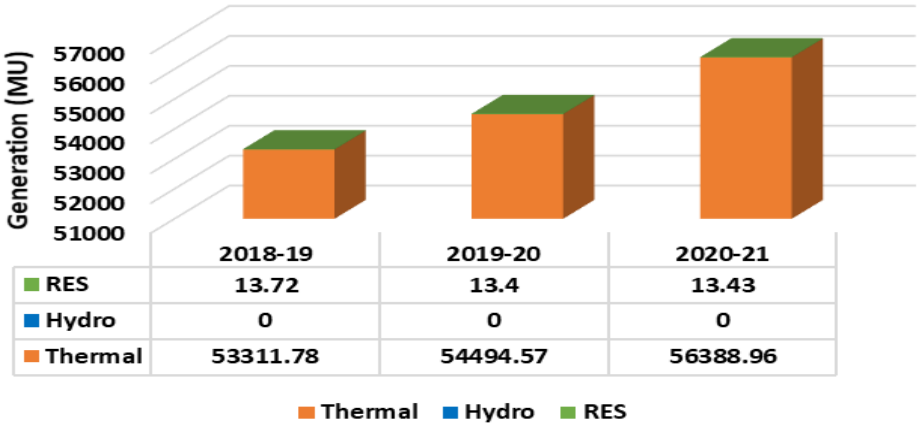
CESC (incl. HEL): Gross Generation (MU)



	2018-19	2019-20	2020-21
RES	0	0	0
Hydro	0	0	0
Thermal	10913.28	10567.51	9737.5

Thermal Hydro RES

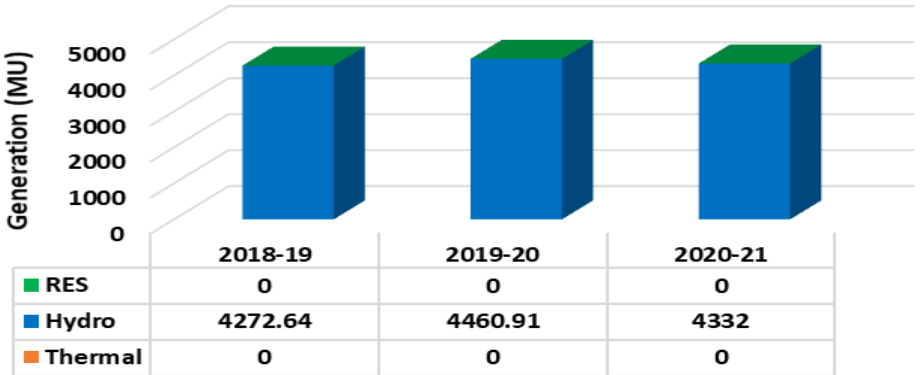
NTPC : Gross Generation (MU)



	2018-19	2019-20	2020-21
RES	13.72	13.4	13.43
Hydro	0	0	0
Thermal	53311.78	54494.57	56388.96

Thermal Hydro RES

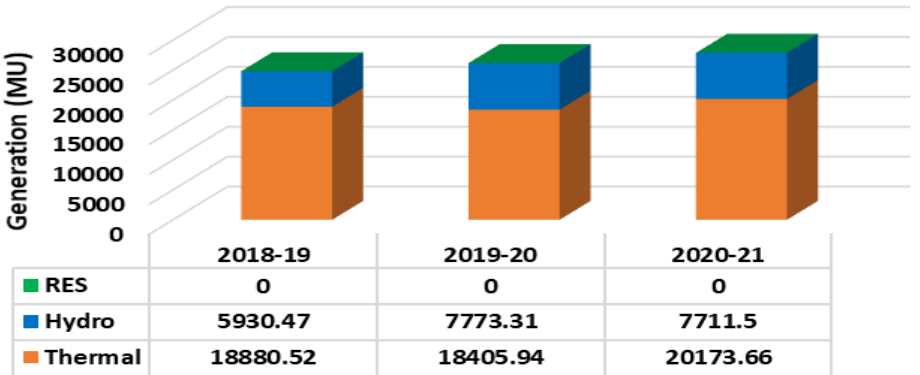
NHPC : Gross Generation (MU)



	2018-19	2019-20	2020-21
RES	0	0	0
Hydro	4272.64	4460.91	4332
Thermal	0	0	0

Thermal Hydro RES

IPP : Gross Generation (MU)



	2018-19	2019-20	2020-21
RES	0	0	0
Hydro	5930.47	7773.31	7711.5
Thermal	18880.52	18405.94	20173.66

Thermal Hydro RES

As against Compounded Annual Growth Rate (CAGR) of installed capacity of 1.97 %, the same of energy generation of the last 5 years is 4.87 % including energy import of 9252 MU from Bhutan. Maximum utilisation of available hydel power from Tala, Kurichhu, Chukha, Mangdechhu HEP of Bhutan was made by import through PTC and from Daghachu Hydel Power Station of Bhutan through TPTCL as nodal agency as per international agreement between Government of India and Royal Government of Bhutan.

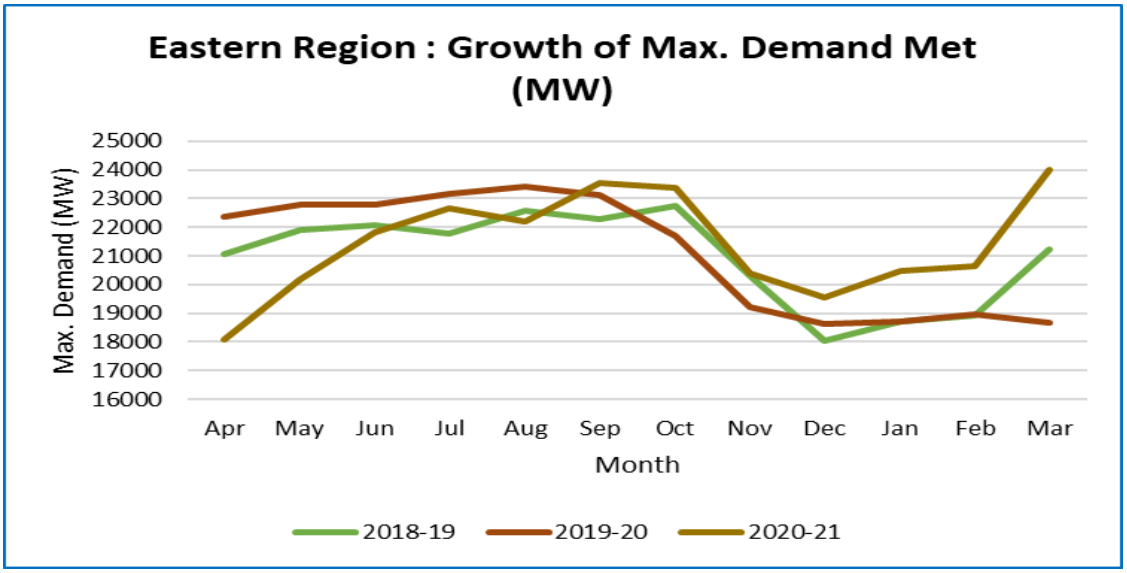
2.2.2 MAXIMUM DEMAND

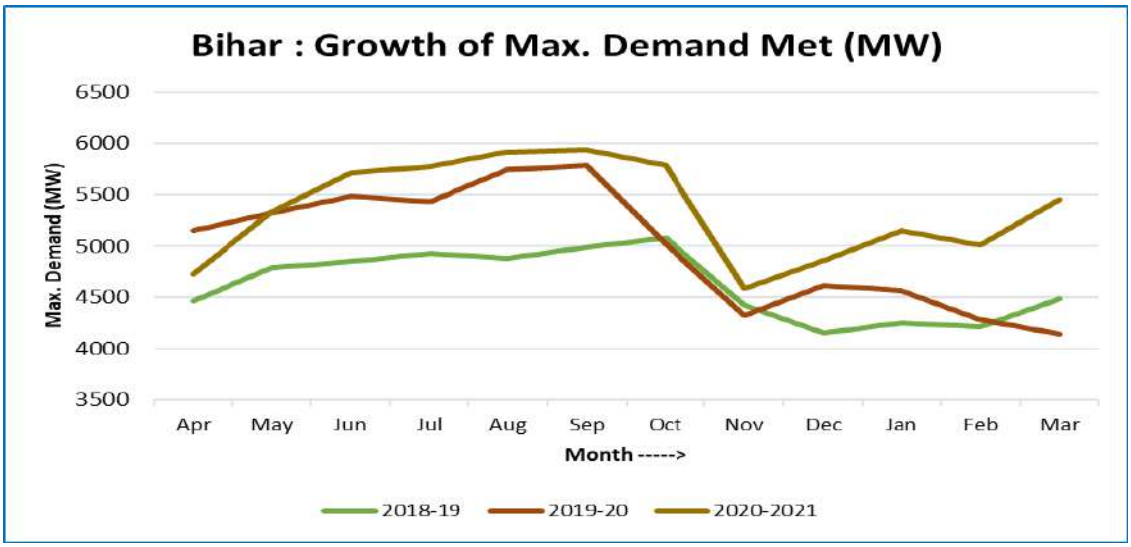
During the year 2020-21, the maximum coincident demand met in the Eastern Region was 24016 MW (net) compared to 23398 MW (net) during the preceding year. It was 618 MW (2.64%) more than the maximum demand of last year. Maximum demand met by the constituents during 2020-21 is given in Table below:

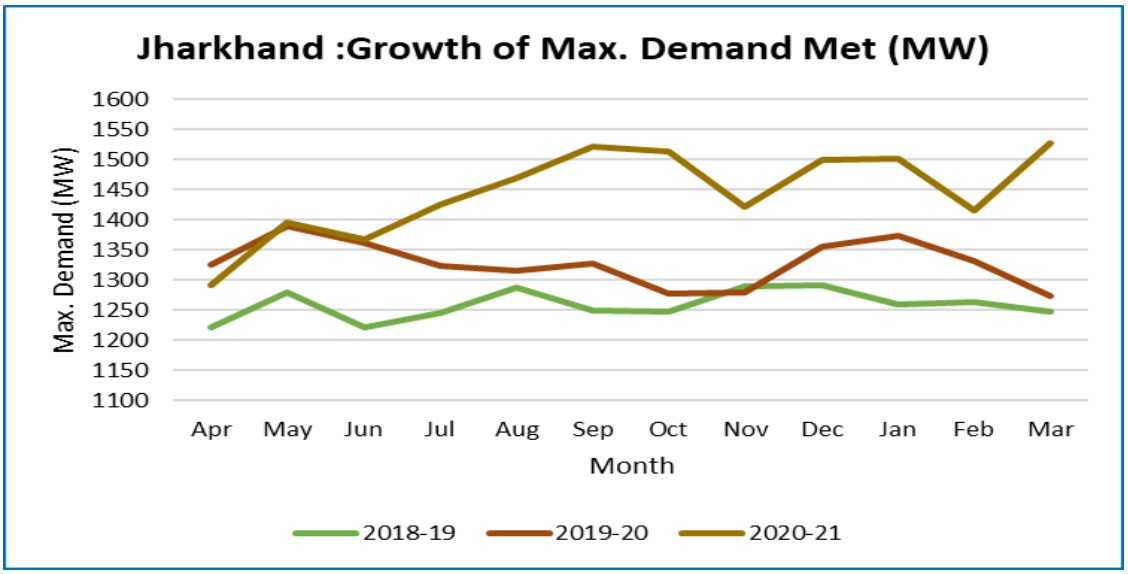
Table: Maximum Demand (in MW) of Constituents of Eastern Region

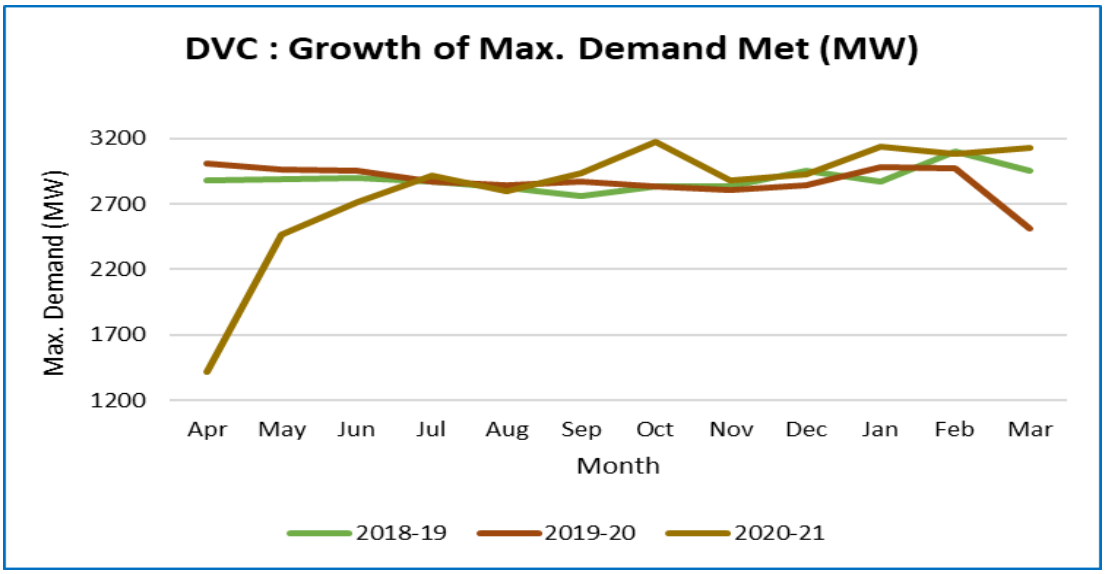
System	Max. Demand (MW)	System	Max. Demand (MW)
BSPHCL	5936	WBSEDCL	7291
JUVNL	1527	CESC	1853
DVC	3173	SIKKIM	120
GRIDCO	4984		
Max. Demand of Eastern Region: - 24016 MW			

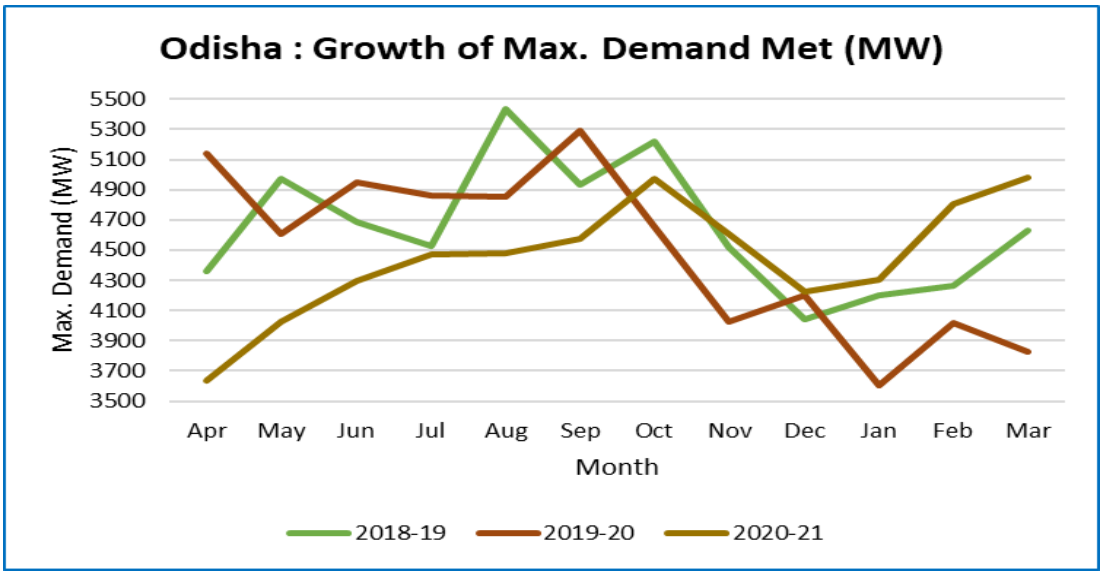
The growth in the maximum demand was somewhat restricted mainly due to COVID pandemic and also due to bottlenecks in sub-transmission and distribution system of respective utility of E.R. The growth in Max. Demand Met (MW) in Eastern Region and its constituents for the last three years are shown below:

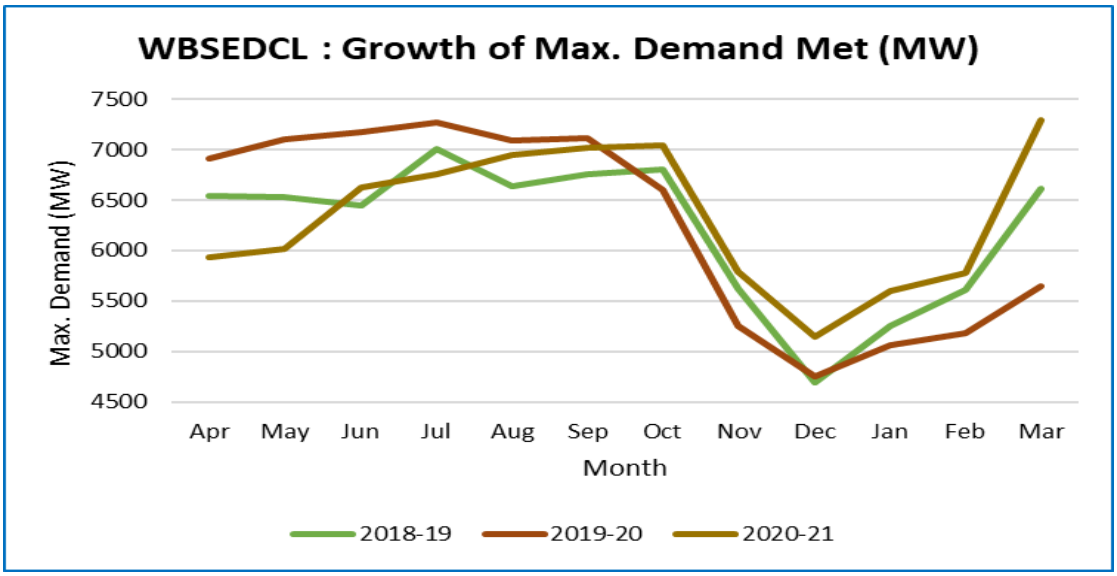


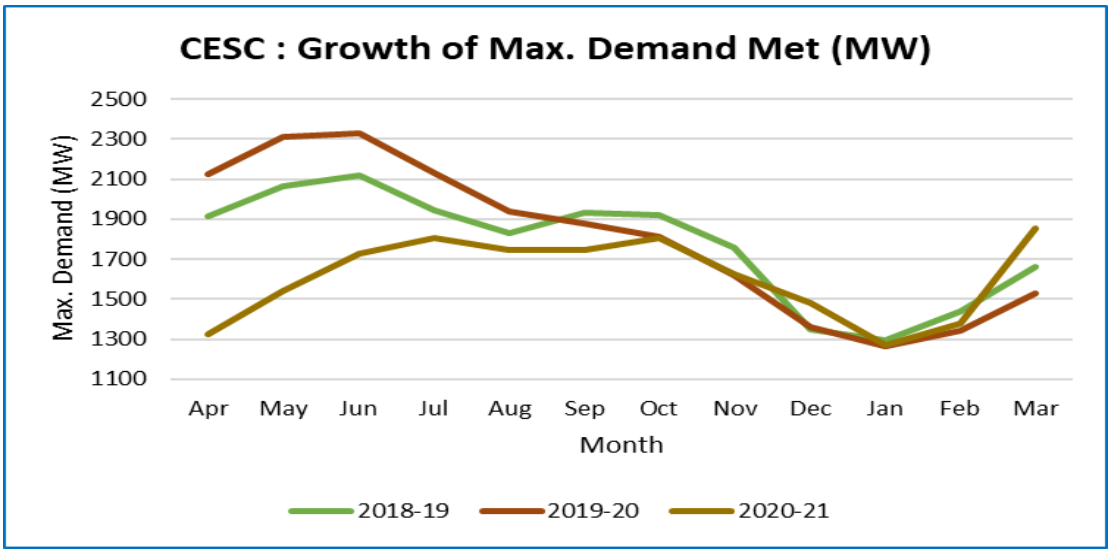

Bihar : Growth of Max. Demand Met (MW)
Max. Demand (MW)
6500
6000
5500
5000
4500
4000
3500
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month ----->
2018-19
2019-20
2020-2021

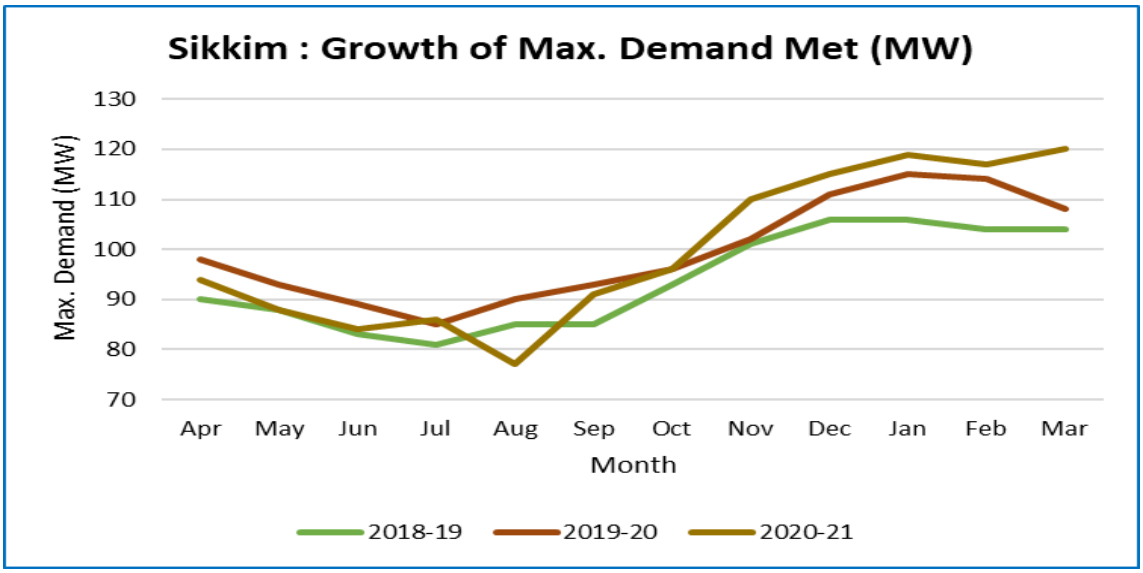

Jharkhand :Growth of Max. Demand Met (MW)
Max. Demand (MW)
1600
1550
1500
1450
1400
1350
1300
1250
1200
1150
1100
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2018-19
2019-20
2020-21


DVC : Growth of Max. Demand Met (MW)
Max. Demand (MW)
3200
2700
2200
1700
1200
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2018-19
2019-20
2020-21


Odisha : Growth of Max. Demand Met (MW)
Max. Demand (MW)
5500
5300
5100
4900
4700
4500
4300
4100
3900
3700
3500
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2018-19
2019-20
2020-21


WBSEDCL : Growth of Max. Demand Met (MW)
Max. Demand (MW)
7500
7000
6500
6000
5500
5000
4500
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2018-19
2019-20
2020-21


CESC : Growth of Max. Demand Met (MW)
Max. Demand (MW)
2500
2300
2100
1900
1700
1500
1300
1100
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2018-19
2019-20
2020-21

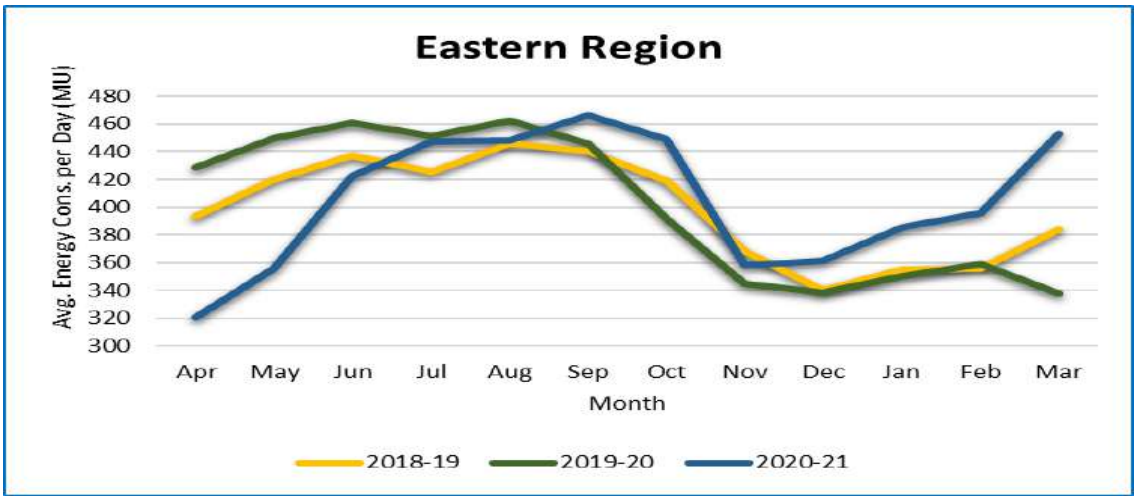


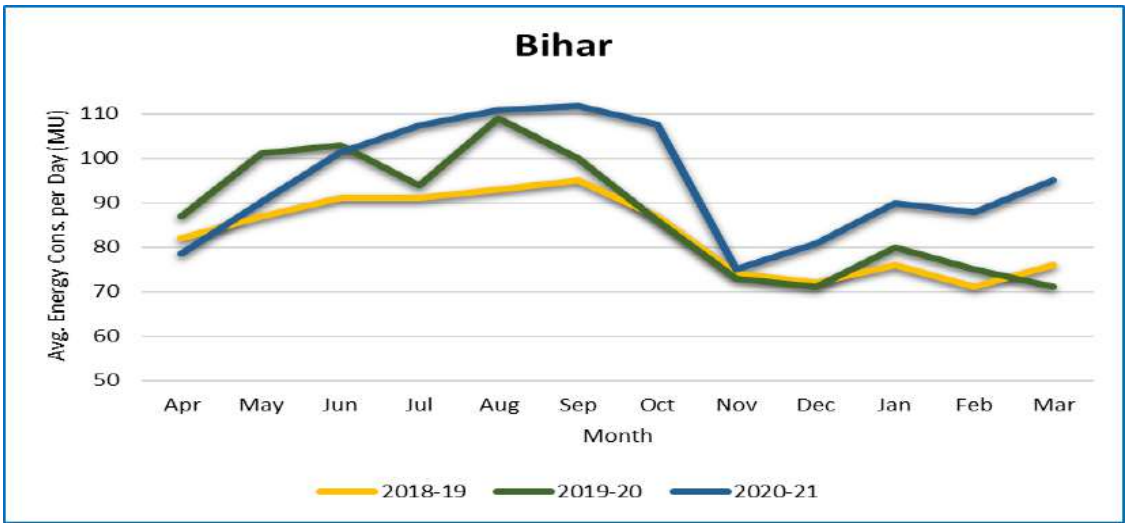
Compounded Annual Growth Rate (CAGR) of Peak Demand in ER for last five years was 6.13 %. Constituent-wise & month-wise peak demand met (MW) are shown in **Annexure-VI (A) & Annexure-VI(B)**.

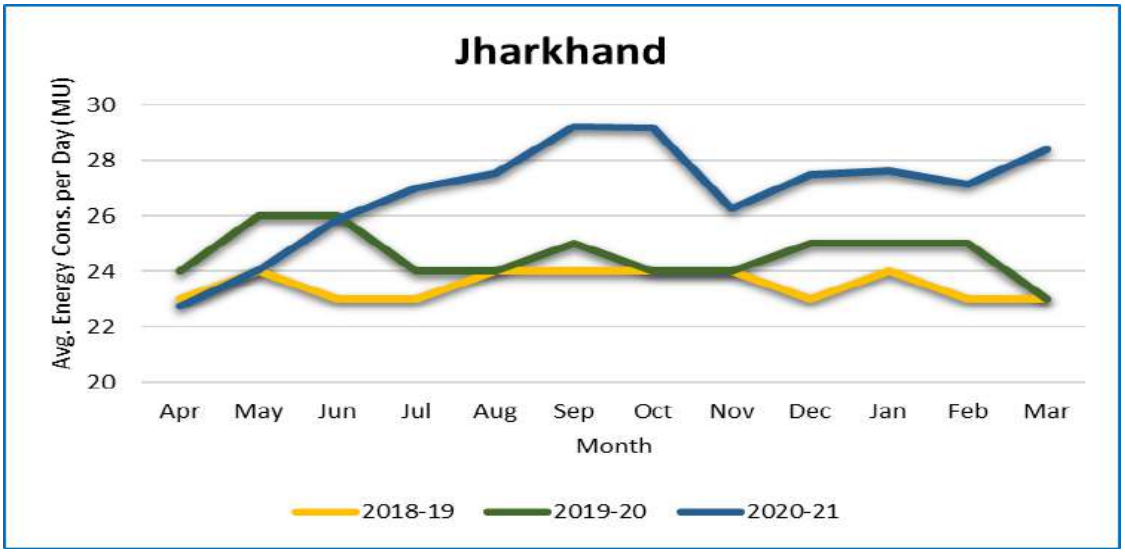
2.2.3 ENERGY CONSUMPTION

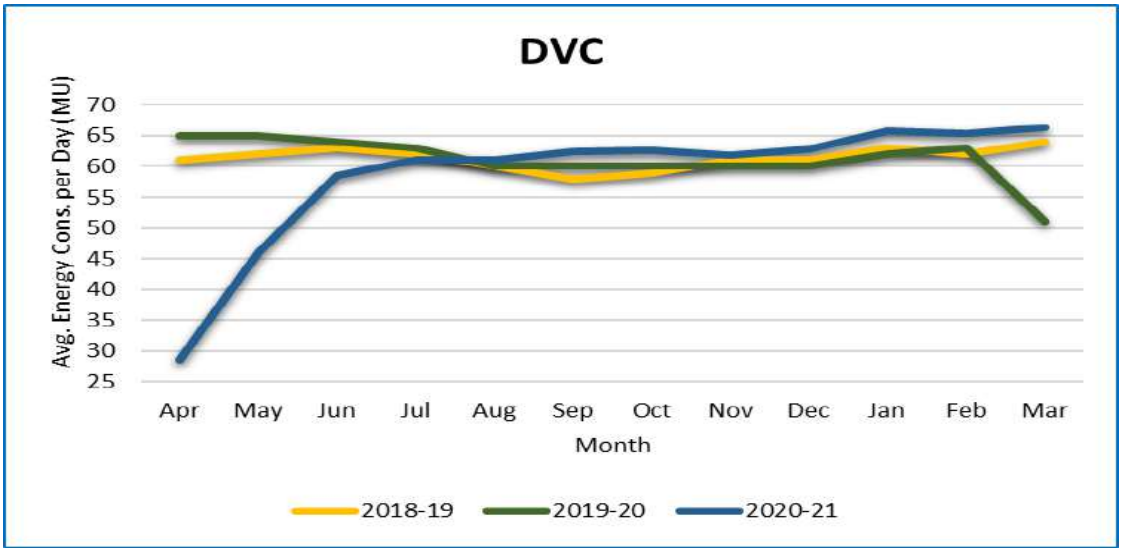
During the year 2020-21, the total energy consumption (net) in Eastern Region was 148022 MU compared to consumption of 147090 MU during previous year i.e. 932 MU (0.63 %) more than last year's consumption. The daily average energy consumption in the region was about 405.5 MU/day compared to about 402 MU/day during the previous year. These figures exclude consumption of different industries from their respective captive power plants.

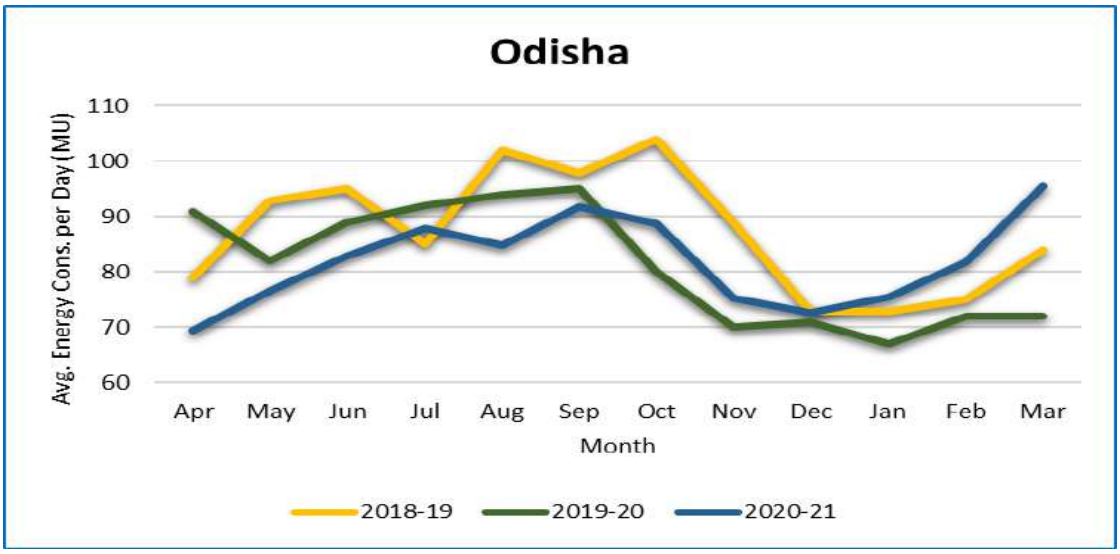
Compounded Annual Growth Rate (CAGR) of energy consumption of the last five years works out as 3.5 % as compared to the growth of peak demand figure of 6.13 %. Constituent-wise & month-wise energy consumption has been shown in **Annexure-VII(A) & Annexure-VII(B).** The growth in energy consumption in Eastern Region and its constituents for the last three years are shown below:

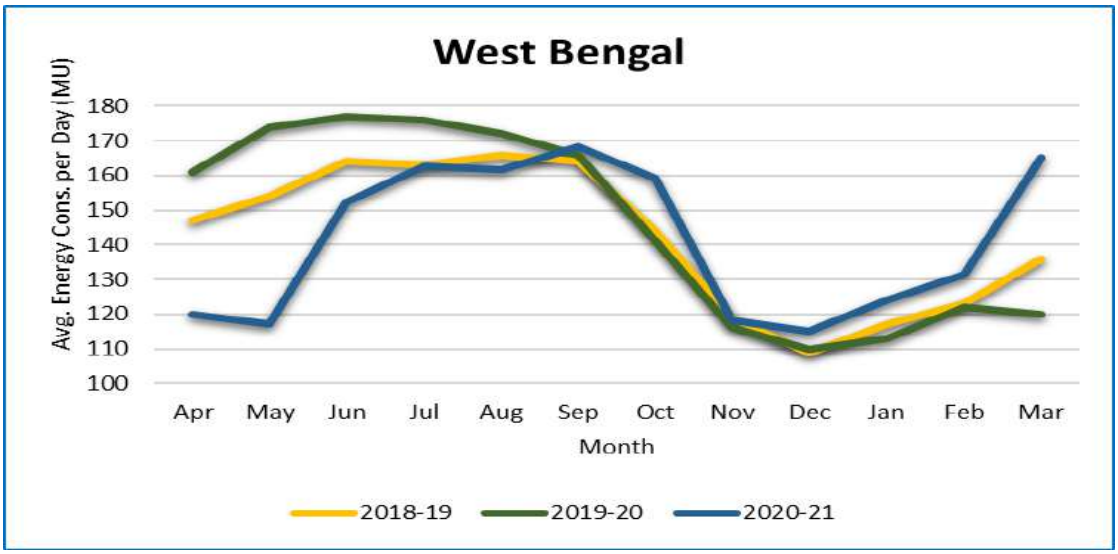


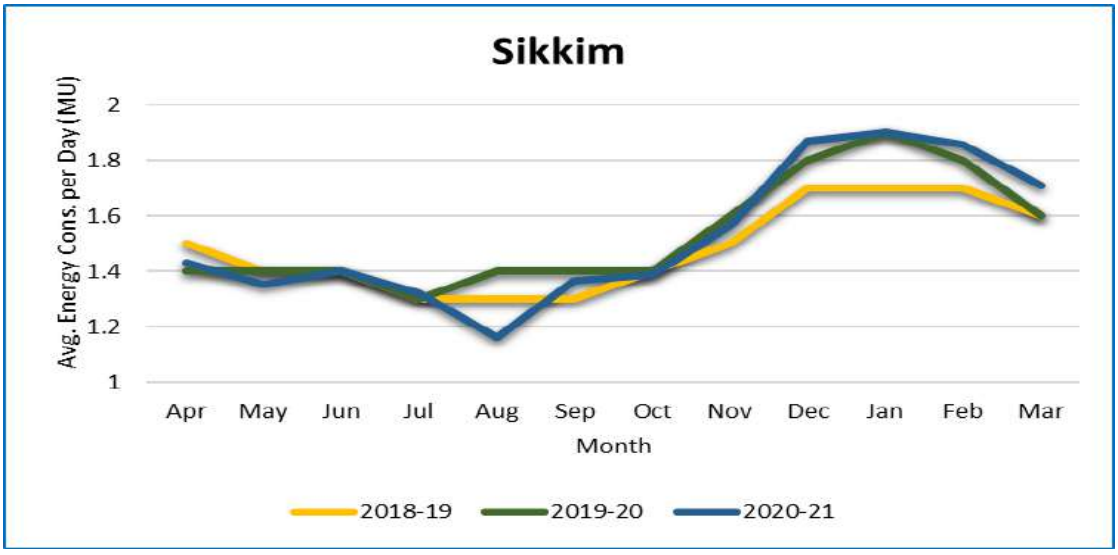

Bihar
Avg. Energy Cons. per Day (MU)
110
100
90
80
70
60
50
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2018-19
2019-20
2020-21


Jharkhand
Avg. Energy Cons. per Day (MU)
30
28
26
24
22
20
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2018-19
2019-20
2020-21


DVC
Avg. Energy Cons. per Day (MU)
70
65
60
55
50
45
40
35
30
25
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2018-19
2019-20
2020-21


Odisha
Avg. Energy Cons. per Day (MU)
110
100
90
80
70
60
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2018-19
2019-20
2020-21


West Bengal
Avg. Energy Cons. per Day (MU)
180
170
160
150
140
130
120
110
100
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2018-19
2019-20
2020-21


Sikkim
Avg. Energy Cons. per Day (MU)
2
1.8
1.6
1.4
1.2
1
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
Month
2018-19
2019-20
2020-21

2.2.4 EXPORT TO OUTSIDE REGION

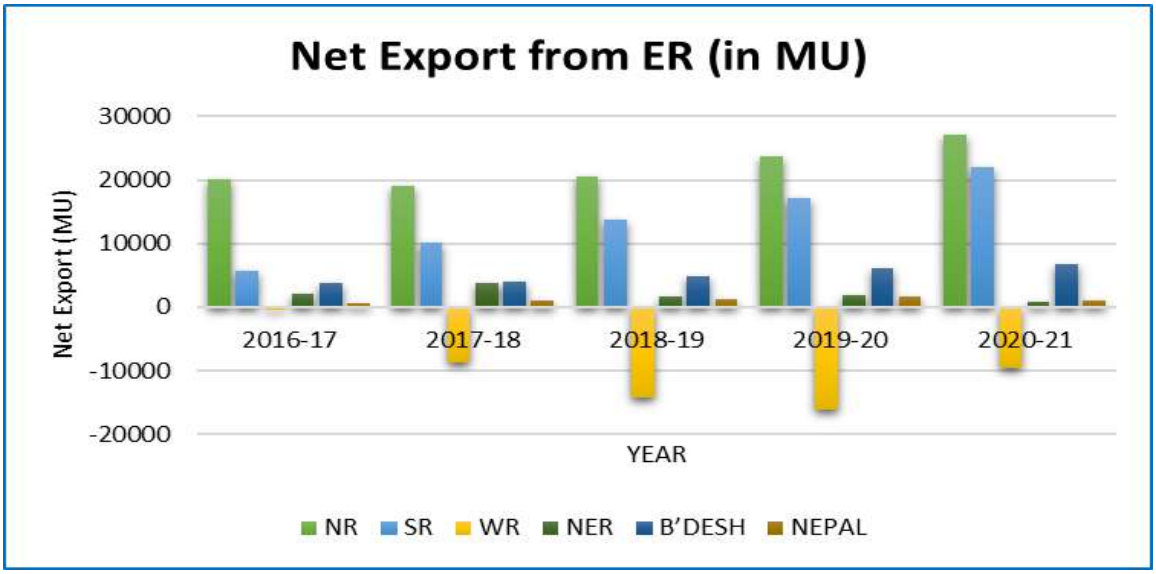
During the year 2020-21, the total net export of energy outside the region was 48,235 MU compared to export of 33,976.24 MU in the last year, which is 14,258.76 MU (i.e. 42%) more than the last year's export. Increase in export is due to increase of energy generation of Eastern Region. As per decision of the MoP, GoI, the power export to Bangladesh has been undertaken and regular supply has been commenced from October'2013 through 400 kV D/C Berhampur – Bheramara line with HVDC (B-t-B 2x500MW) station at Bheramara (Bangladesh). Also, power flow from ER grid to Nepal has been started from February'2016 through 400 kV (charged at 220 kV) Mazaffarpur - Dhalkheber (Nepal) line. The details regarding export of net energy from ER Grid including transmission loss are shown in table below:

Table: Net Energy Export (in MU) From Eastern Grid

Year	NR	SR	WR	NER	B'Desh	Nepal	Net Export	Growth
2016-17	20093	5676	-386	2124	3782	666	31955	21.6%
2017-18	19054	10247	-8666	3753	3964	945	29297	-8.3%
2018-19	20491	13783	-14311	1685	4808	1340	27796	-5.1%
2019-20	23613.2	17122.2	-16194	1816.38	6046.8	1571.71	33976.24	22.2%
2020-21	27179	22068.5	-9664.4	893.5	6680.0	1025.6	48182*	41.8%

*excluding 53 MU drawal by Kuruchhu HEP of Bhutan

Growth of net export of Energy (MU) outside Eastern Region including transmission loss during last five years is given below:



2.2.4 VOLTAGE

During the year 2020-21, the voltage profile except a few important 400 kV sub–stations and 220 kV sub-stations remained satisfactory. Maximum & Minimum Voltage touched during 2020-21 at some of the important 765 kV & 400 kV sub-stations are shown below:

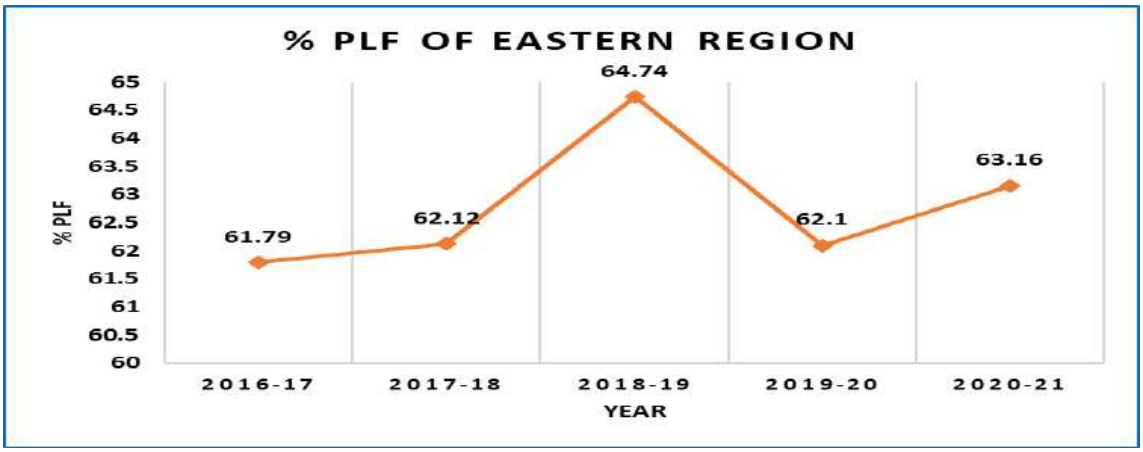
Sub-Station	Max. Voltage (kV)	Min. Voltage (kV)
New Ranchi 765 kV	799	753
Binaguri	427	399
Subhasgram	428	369
Jeerat	434	384
Biharshariff	423	396
Muzaffarpur	424	385
Jamshedpur	424	391
Rourkela	422	393
Jeypore	426	401
Maithon	425	383
Meramundali	425	386
Sasaram	430	376

2.3 PLANT LOAD FACTOR (PLF)

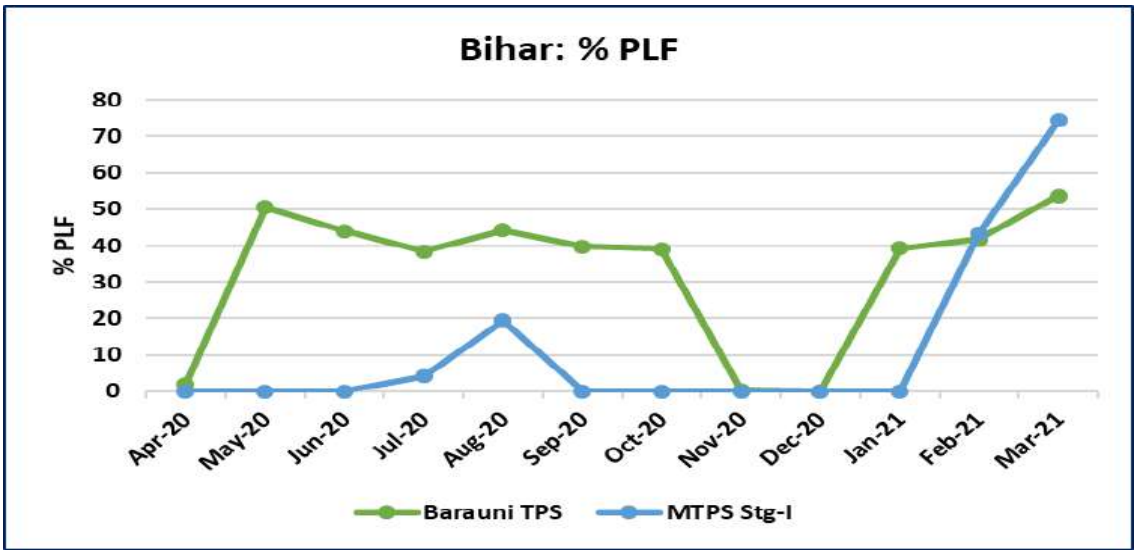
The average annual Plant Load Factor (PLF) of the thermal power stations in the Eastern Region for the year 2020-21 was 63.16% against 62.10% for 2019-20. The PLF has been calculated based on the capacity and generation of the commercially declared units only. Infirm generation and their injection period have not been considered for PLF calculations. Details of PLF have been shown at **Annexure-X.**

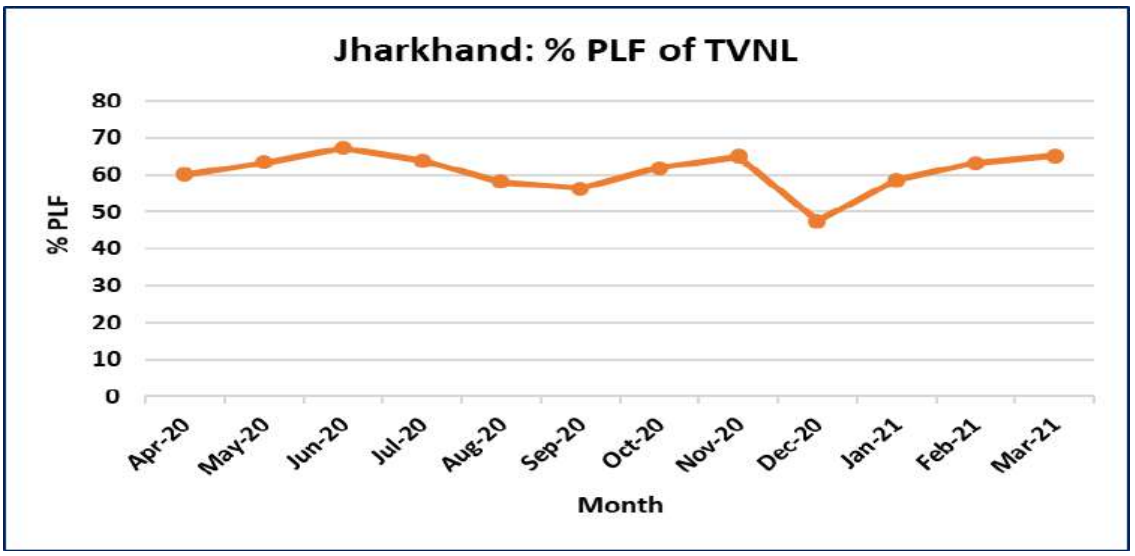
The average PLF of ER for the last five years is shown below: -

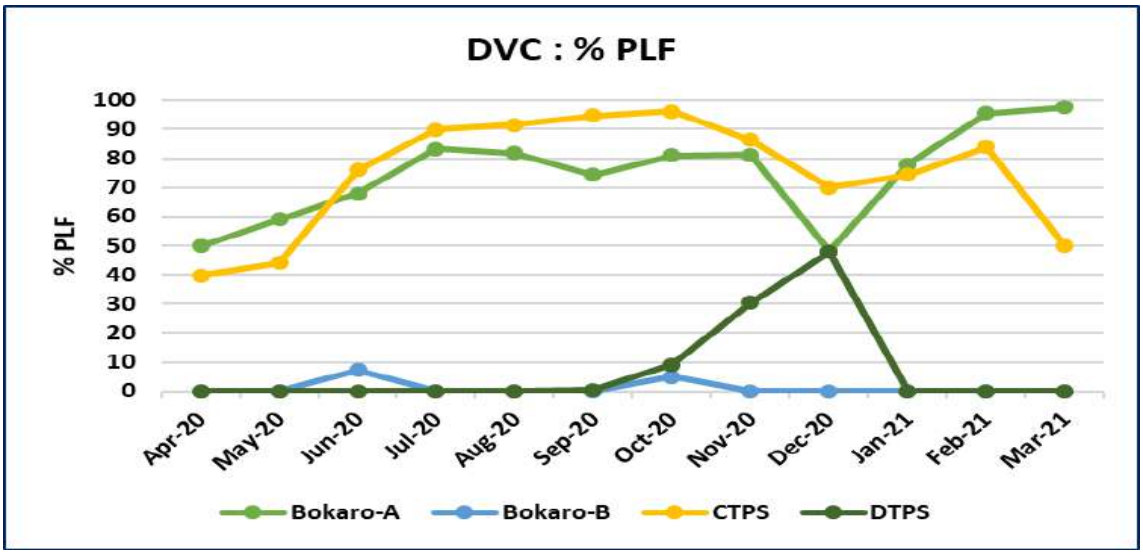
YEAR	Avg. PLF (in %)
2016-17	61.79
2017-18	62.12
2018-19	64.74
2019-20	62.10
2020-21	63.16

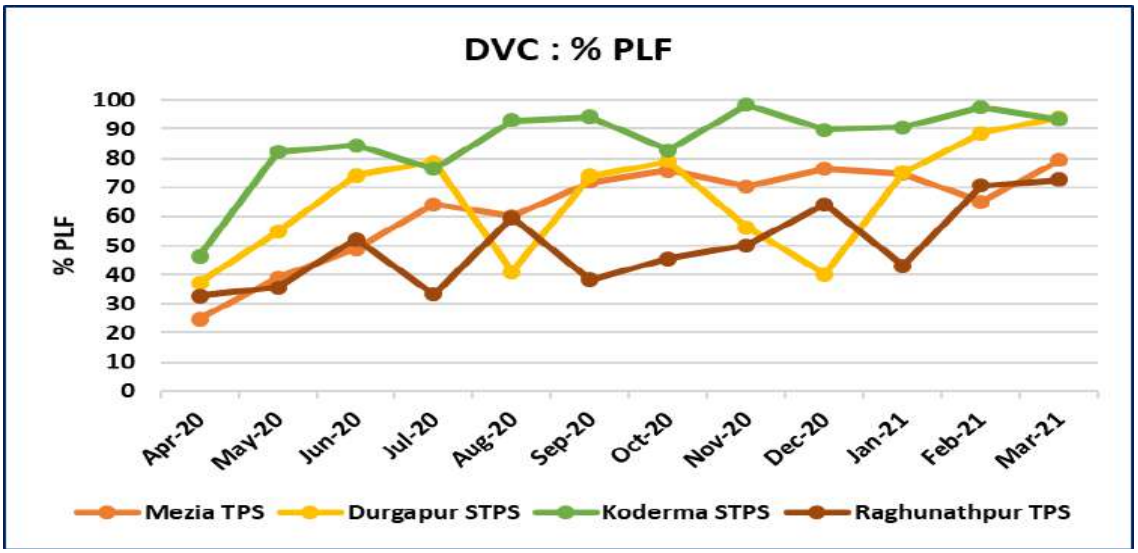


Constituent-wise & Plant-wise average thermal PLF is shown below:








DVC : % PLF
% PLF
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May-20
Jun-20
Jul-20
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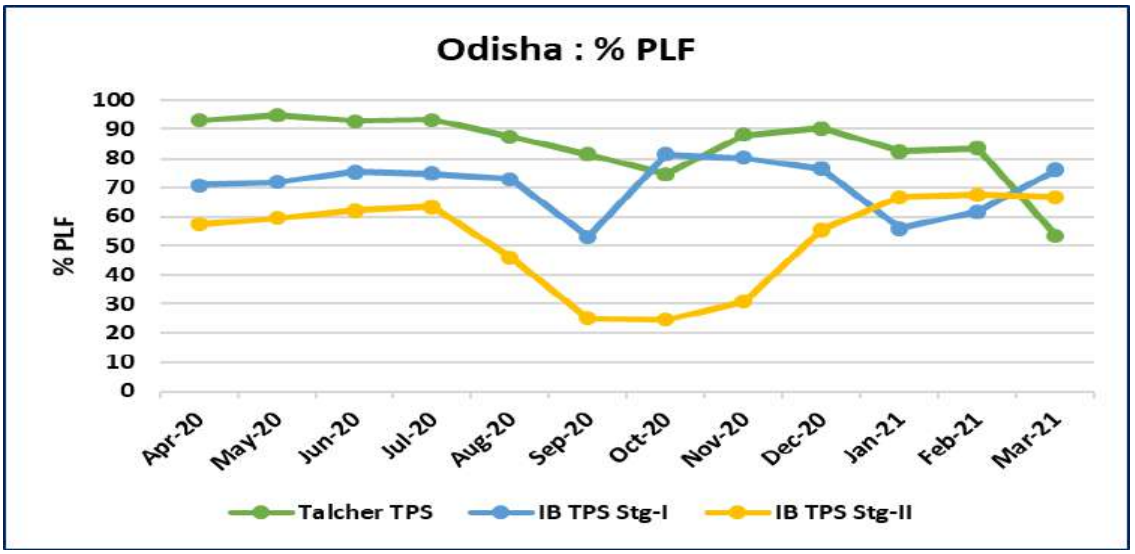
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Mezia TPS
Durgapur STPS
Koderma STPS
Raghunathpur TPS


Odisha : % PLF
% PLF
100
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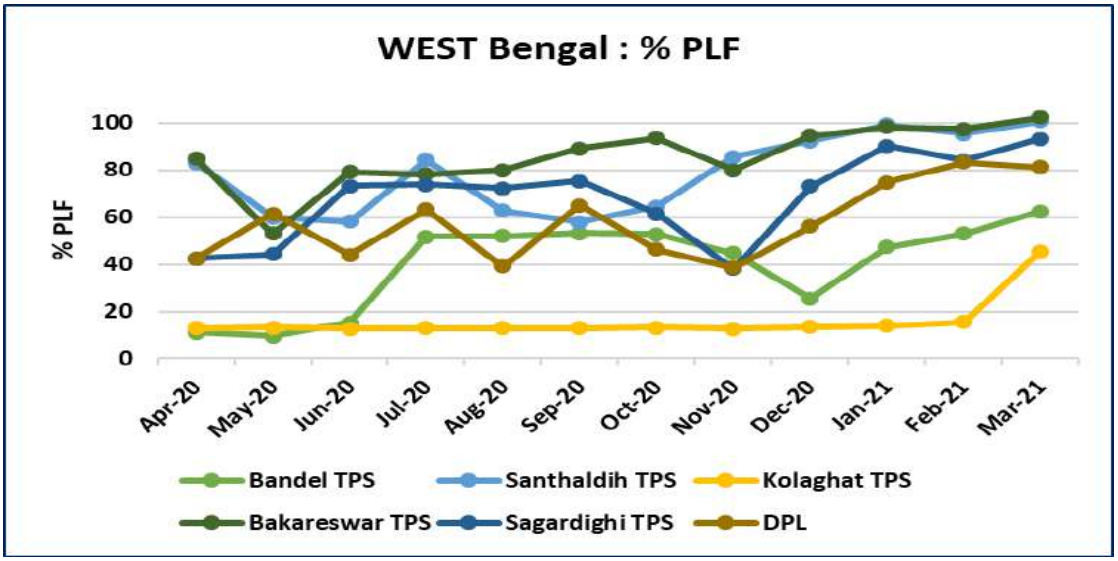
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Talcher TPS
IB TPS Stg-I
IB TPS Stg-II


WEST Bengal : % PLF
% PLF
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0
Apr-20
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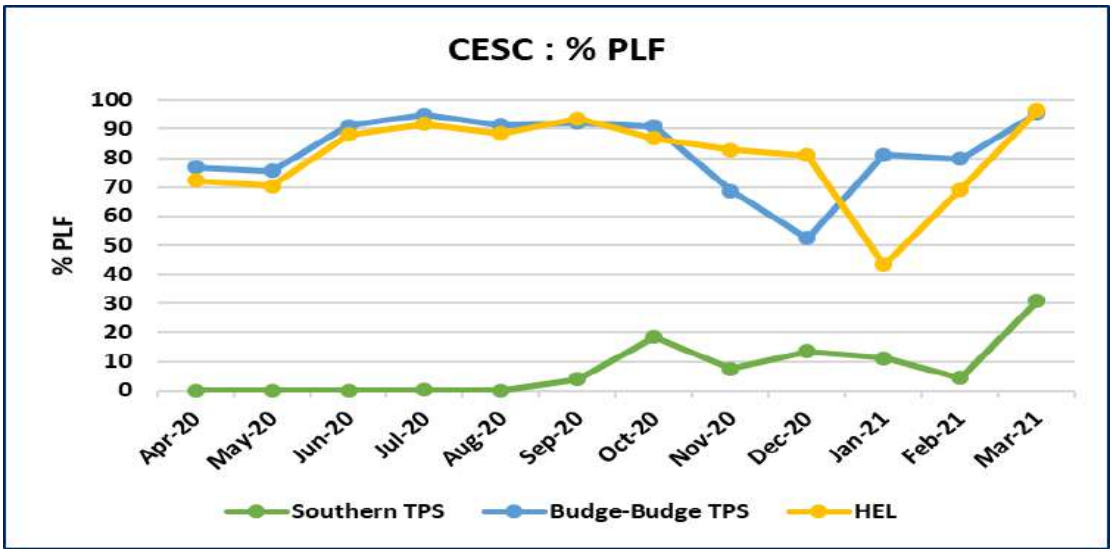
Feb-21
Mar-21
Bandel TPS
Santhaldih TPS
Kolaghat TPS
Bakareswar TPS
Sagardighi TPS
DPL


CESC : % PLF
% PLF
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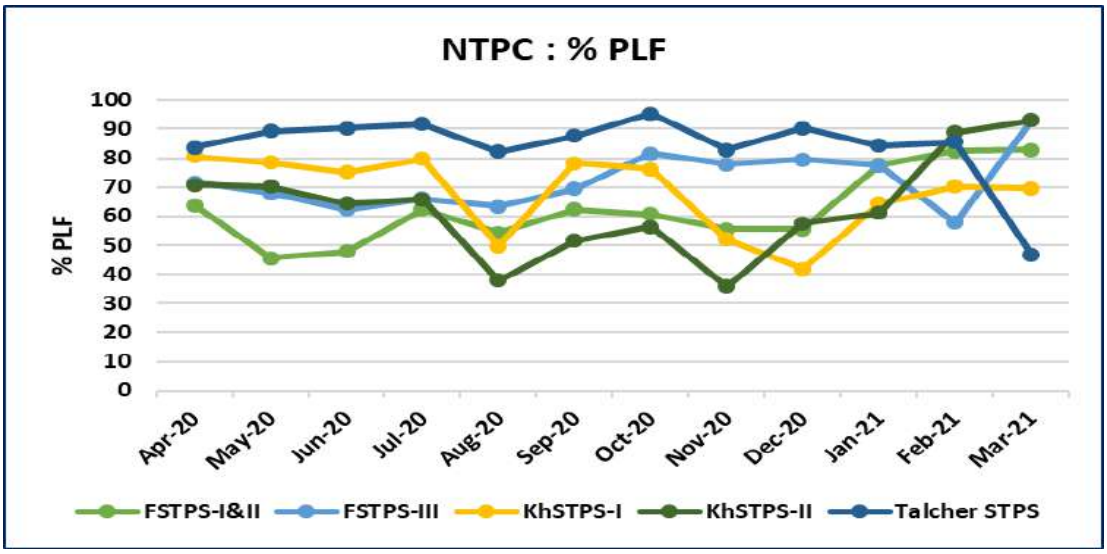
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Southern TPS
Budge-Budge TPS
HEL


NTPC : % PLF
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Jul-20
Aug-20
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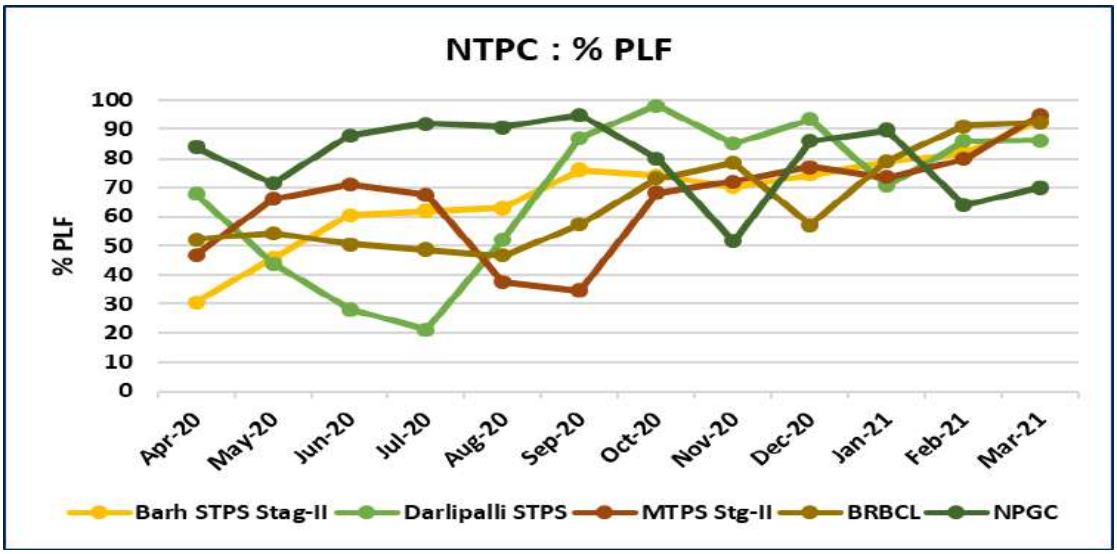
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
FSTPS-I&II
FSTPS-III
KhSTPS-I
KhSTPS-II
Talcher STPS


NTPC : % PLF
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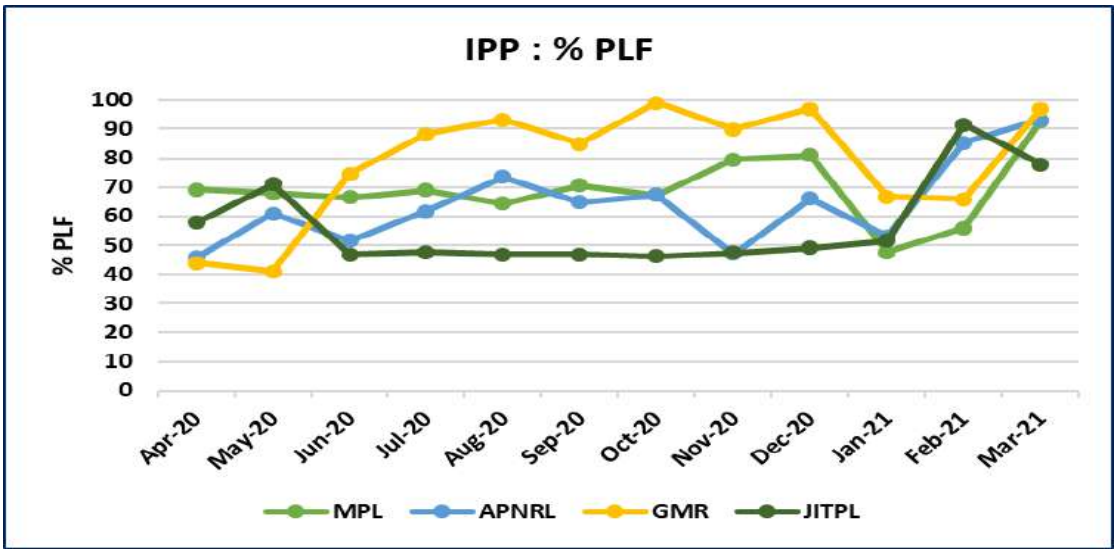
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Barh STPS Stag-II
Darlipalli STPS
MTPS Stg-II
BRBCL
NPGC



2.4 SYSTEM LOAD FACTOR

The Annual Load Factor of the Eastern Region during 2020-21 was 70.36% compared to 71.57% in the preceding year. The load factor was highest in DVC areas (76.88%) due to mostly industrial flat load and it was lowest in Sikkim (52.92%) mainly due to domestic & commercial load.

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 neighbouring countries namely Nepal, Bhutan and Bangladesh. Eastern Region exchanges power to the other regions of the country. It imports power from Chukha, Kuruchhu, Tala, Daghachu and Mangdechhu HEPs of Bhutan and exports power to Nepal & Bangladesh. Power export to Bangladesh is through 400 kV D/C Berhampur (WB) – Bheramara (Bangladesh) line. Power export from ER grid to Nepal is through 400 kV (charged at 220 kV) Mazaffarpur - Dhalkheber (Nepal) line. In addition to this, Bihar state network also supplies power to Nepal 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 (Chukha, Kuruchhu, Tala, Mangdechhu & Daghachhu) (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	
2016-17	5824.00	1197	666.0	3782.0
2017-18	5072.08	1362.87	944.74	3964.3
2018-19	4395.87	1335.62	1340.43	4808.11
2019-20	6350.63	599.84	1571.71	6046.81
2020-21	9251.7	592.65	1025.6	6680

Excluding 53.05 MU export to Kuruchhu HEP of Bhutan.

Though all the international lines are not operational all the times however, details of existing 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 D/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 220 kV) Mazaffarpur-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)
   400 Kv Alipurduar(PGCIL)- Jigmelling Ckt-I
   400 Kv Alipurduar(PGCIL)- Jigmelling Ckt-II
   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 D/C Berhampur (PGCIL) - Bheramara (Bangladesh)

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 shortage in area served by SBPDCL, NBPDCL and JBVNL during peak hours.

2.8 UNITS AND TRANSMISSION ELEMENTS COMMISSIONED DURING THE YEAR

New Generating units which has been test synchronised during the year 2020-21 and transmission elements commissioned during the year 2020-21 are given at **Annexure – IV B and Annexure –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 – XXI and Annexure –XXII** 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 & Mangdechhu HEP of Bhutan during 2020-21 is given at **Annexure – XII.**

CHAPTER-3

GRID INCIDENTS / DISTURBANCES

3.1 INTRODUCTION:

As per the Central Electricity Authority (Grid Standards), 2010, "Grid Disturbance (GD)" means tripping of one or more power system elements of the grid like a generator, transmission line, transformer, shunt reactor, series capacitor and static VAR compensator, resulting in total failure of supply at a sub-station or loss of integrity of the grid, at the level of transmission system at 200kV and above (132kV and above in the case of North-Eastern Region).

Based on the severity of tripping, grid disturbance has been categorised in increasing order of severity as follows:

1. **Category GD-I**: when less than 10% of the antecedent generation or load in a regional grid is lost;
2. **Category GD-2**: when 10% to less than 20% of the antecedent generation or load in a regional grid is lost;
3. **Category GD-3**: when 20% to less than 30% of the antecedent generation or load in a regional grid is lost;
4. **Category GD-4**: when 30% to less than 40% of the antecedent generation or load in a regional grid is lost;
5. **Category GD-5**: when 40% or more of the antecedent generation or load in a regional grid is lost;

"Grid Incidence (GI)" means tripping of one or more power system elements of the grid like a generator, transmission line, transformer, shunt reactor, series capacitor and static VAR compensator, which requires re-scheduling of generation or load without total loss of supply at a sub-station or loss of integrity of the grid at 220 kV and above (132kV and above in the case of North-Eastern Region).

Similar to the Grid Disturbances, Grid Incident has also been categorised based on the severity of incidents, as follows:

1. **Category GI-1**: tripping of one or more power system elements of the grid like a generator, transmission line, transformer, shunt reactor, series capacitor and static VAR compensator, which requires re-scheduling of generation or load, without total loss of supply at a sub-station or loss of integrity of the grid at 220 kV and above (132kV and above in the case of North-Eastern Region).

2. **Category GI-2**: tripping of one or more power system elements of the grid like a generator, transmission line, transformer, shunt reactor, series capacitor and static VAR compensator, which requires re-scheduling of generation or load, without total loss of supply at a sub-station or loss of integrity of the grid at 400 kV and above (220kV and above in the case of North-Eastern Region).

3.2 GRID INCIDENTS/ GRID DISTURBANCES IN EASTERN REGION

Details of major grid disturbances and grid incidents occurred in Eastern region during the year 2020-21 are given at **Annexure-XIII** & **Annexure-XIV**, respectively.

A summary of the grid incidents and grid disturbances in Eastern Region during the year 2020-21 is given the table below:

Year	Total No. of Grid Disturbances	Category of Grid Disturbance					Total No. of Grid Incidents	Category of Grid Incidents	
		GD-1	GD-2	GD-3	GD-4	GD-5		GI-1	GI-2
2020-21	77	77	0	0	0	0	17	6	11

3.3 REMEDIAL ACTION

The grid disturbances and grid incidents were discussed in the Protection Coordination Sub-committee (PCC) meeting and Operation Coordination Sub-committee (OCC) held every month. The analysis of these incidents/disturbances was carried out and remedial measures were suggested. Implementation of suggested remedial measures was also being monitored in PCC and OCC meetings.

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 Eastern Region (ER) w.e.f. 01.04.2003. CERC has issued "*CERC Tariff Regulations, 2019-24 (Terms and Conditions of Tariff)"* which has come into force on and from 01.04.2019. This regulation shall remain in force for a period of five years i.e. up to 31.03.2024 from the date of commencement unless reviewed earlier or extended by the Commission.

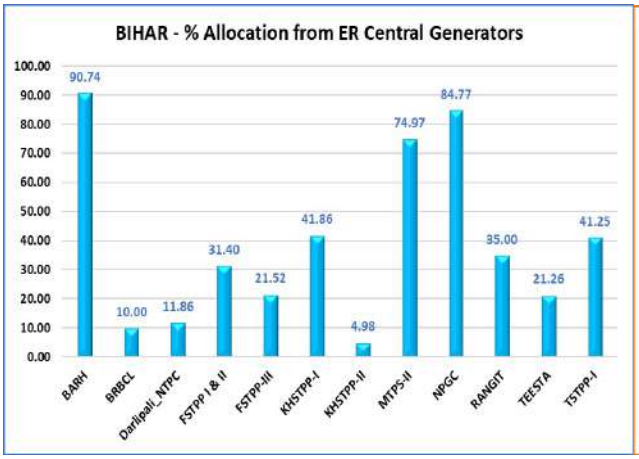
The following are the major components of Availability Based Tariff (ABT):

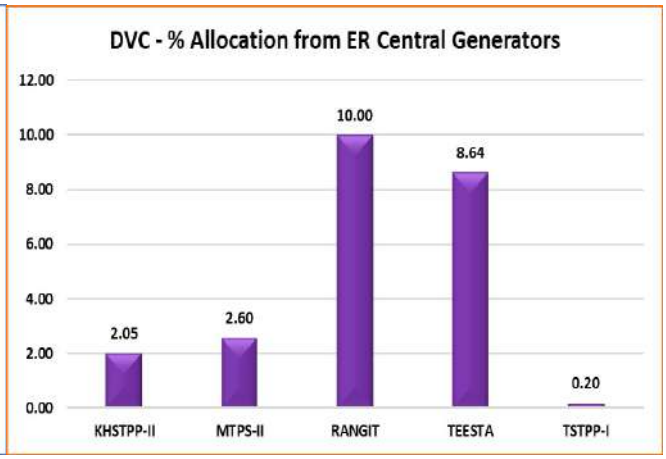
i) Capacity Charge inclusive of incentive (for recovery of Annual fixed cost)
ii) Energy Charge (for recovery of primary fuel cost)
iii) Transmission Charges (for recovery of annual fixed cost of transmission system)
iv) Deviation Settlement Mechanism, etc.

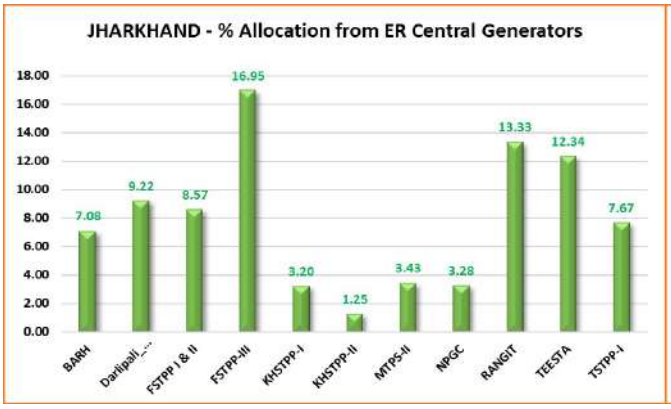
The first three topics would be dealt in this section and the fourth topic would be dealt in the next section. The regional energy accounts bring out the transactions/accounts for Central Generating Stations (CGSs), IPPs, LTOA, STOA, etc.

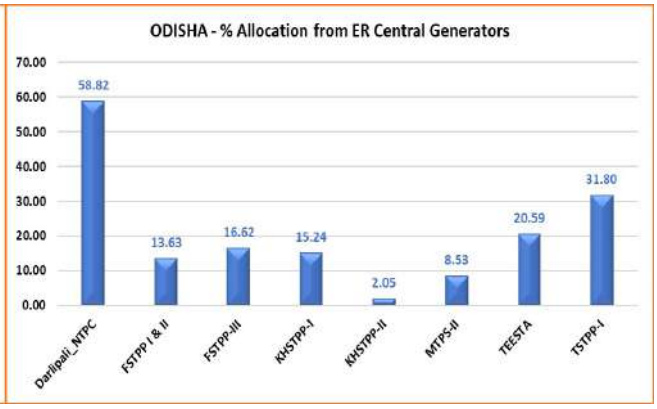
4.1.1 SHARE ALLOCATION OF ER STATES FROM CENTRAL GENERATING STATIONS

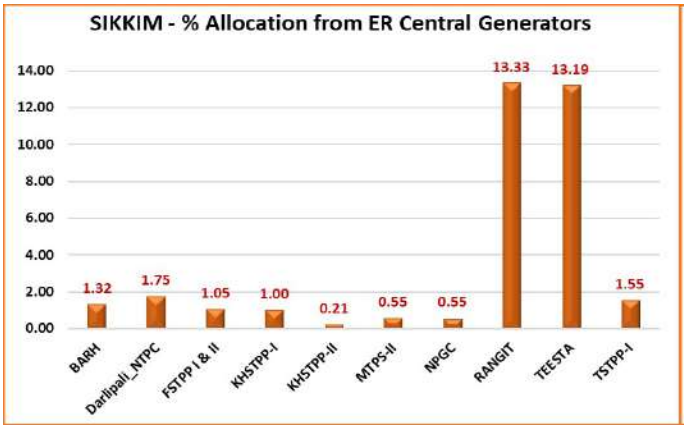
Regional Energy Accounting for central generating stations is based on the allocation orders from Ministry of Power /Central Electricity Authority. The percentage share of total capacity of each ISGS in eastern region is allocated to the beneficiaries of Eastern, Northern, Western, Southern and North Eastern Region, which is revised from time to time. Weighted average allocation of shares from each ISGS in Eastern Region during 2020-21 are given at **Annexure-XII.** The percentage share allocation of ER states from ER Central Generating Stations for F.Y 2020-21 has been shown below.

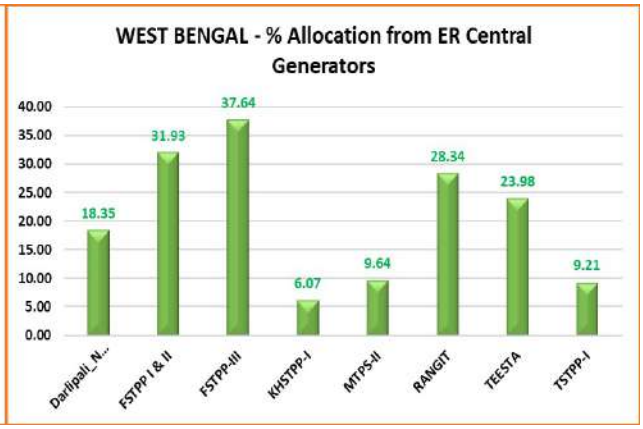












In case of Un-requisitioned surplus (URS) power, the statement of URS is being issued for adjustment of share allocation of the month based on the surrender/avail of URS power.

4.1.2 ACCOUNTING OF CENTRAL GENERATING STATIONS

Capacity Charges:

The capacity charge (inclusive of incentive) payable to a thermal or hydro generating station for a calendar month is ensured if availability of 85% or more is achieved in line with the prevailed tariff regulations.

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 drawl of energy (paying full capacity charge for its share) and to meet demand from other source such as bilateral exchange and through power exchanges such as IEX/PXIL.

The indicative annual capacity charge per year for the Central Sector thermal and hydro Generating stations of the Eastern Region for F.Y 2020-21 for all the ISGS as shown below (as per CERC orders).

Sl. No	Station Name (CGS/ISGS)	Installed Capacity (MW)*	Annual Fixed Charges (₹ Cr/Year)
Thermal:			
1	Farakka STPS-Stg I & II	1600 MW (3x200 +2x500)	**₹ 915.5649**
2	Farakka STPS- Stg III	500 MW (1x500)	**₹ 520.5885**
3	Kahalgaon STPS -I	840 MW (4x210)	**₹ 596.4837**
4	Kahalgaon STPS -II	1500 MW (3x500)	**₹ 1140.36**
5	Talcher STPS -I	1000 MW (2x500)	**₹ 663.6738**
6	Barh STPS -II	1320 MW (2x660)	**₹ 1695.83**
7	BRBCL	750 MW (3x250)	**₹ 1270.72**
8	MTPS (KBUNL) - II	390 MW (2x195)	**₹ 724.46**
9	Darlipalli STPS -I	800 MW (1x800)	**₹ 1180.94**
10	NPGC STPP	660MW (1x660)	**₹ 1169.93**
Hydro:			
1	TEESTA Stage-V HPS	510 MW (3x170)	**₹ 520.3158**
2	Rangit HPS	60 MW (3x20)	**₹ 112.1775**

* Units under Commercial Operation

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 for the total energy scheduled to be supplied to such beneficiaries during the month on ex-power plant basis. In case of Hydro Generating stations, the energy charge shall be payable by beneficiaries in proportional to their respective allocation in the saleable capacity of the generating station.

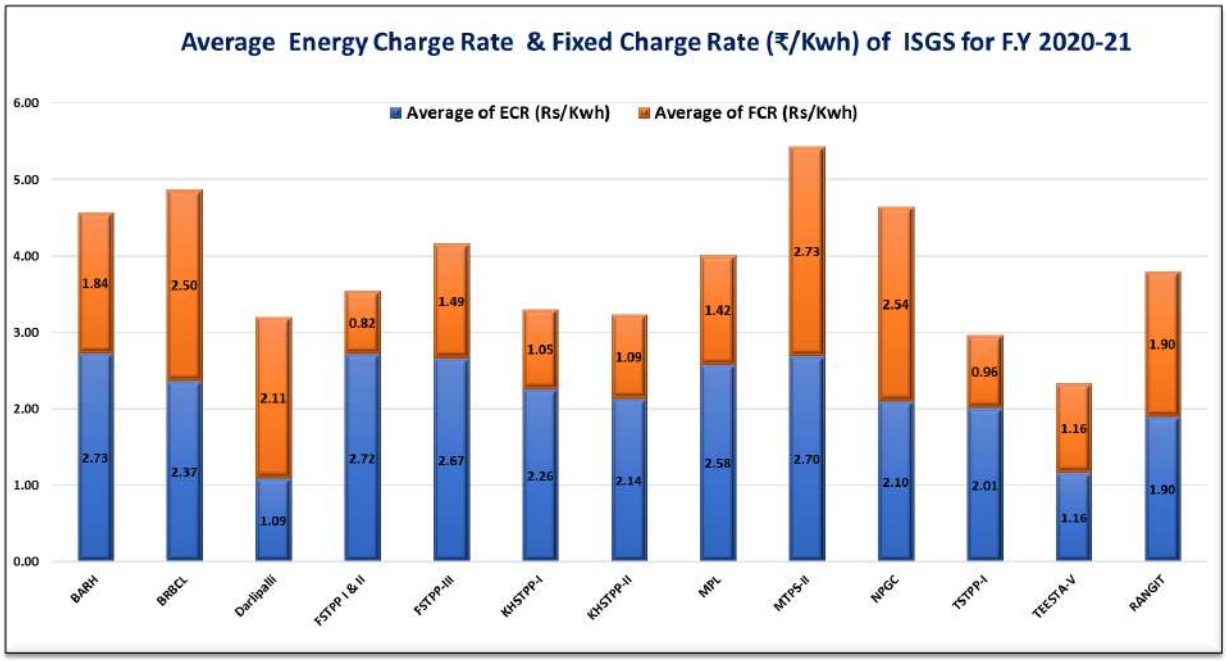
The indicative average energy rate for Central Sector Thermal stations in ER for the year 2020-21 were as under:

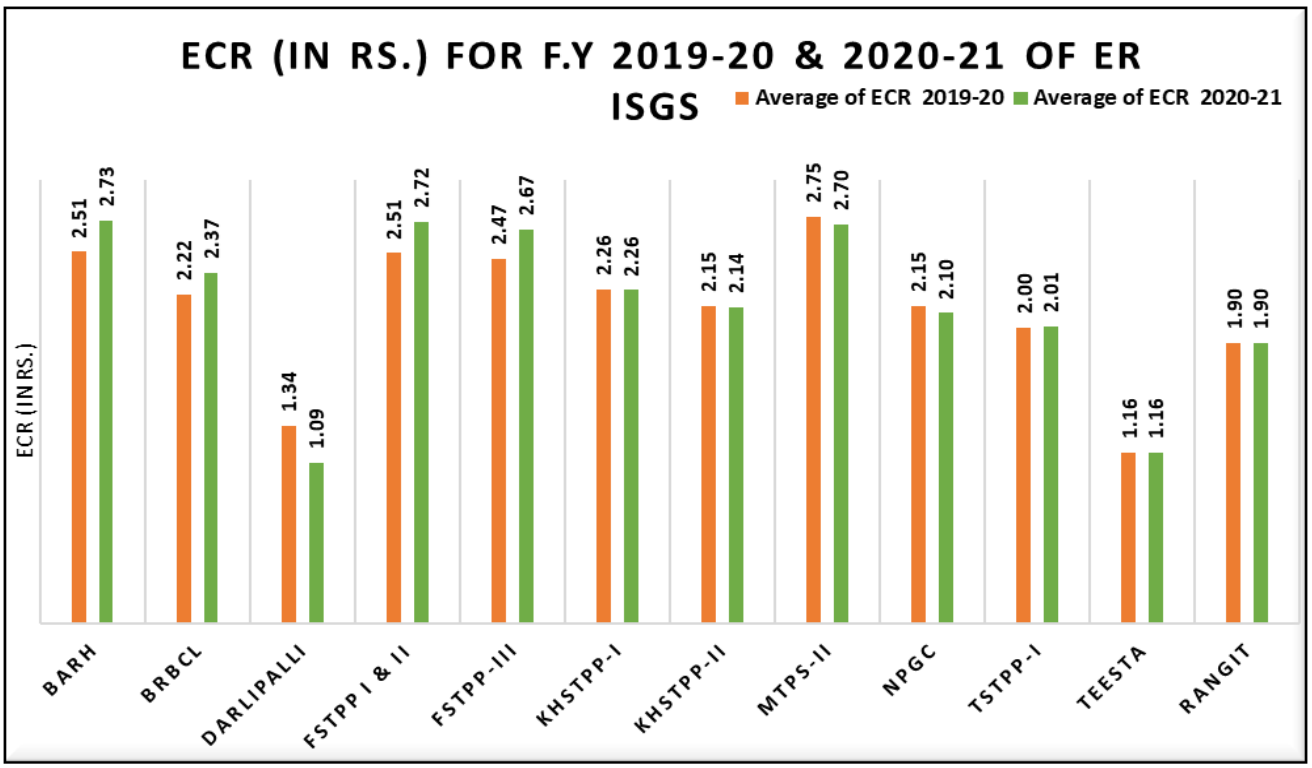
Average unit rate (₹ /kWh) during 2020-21:

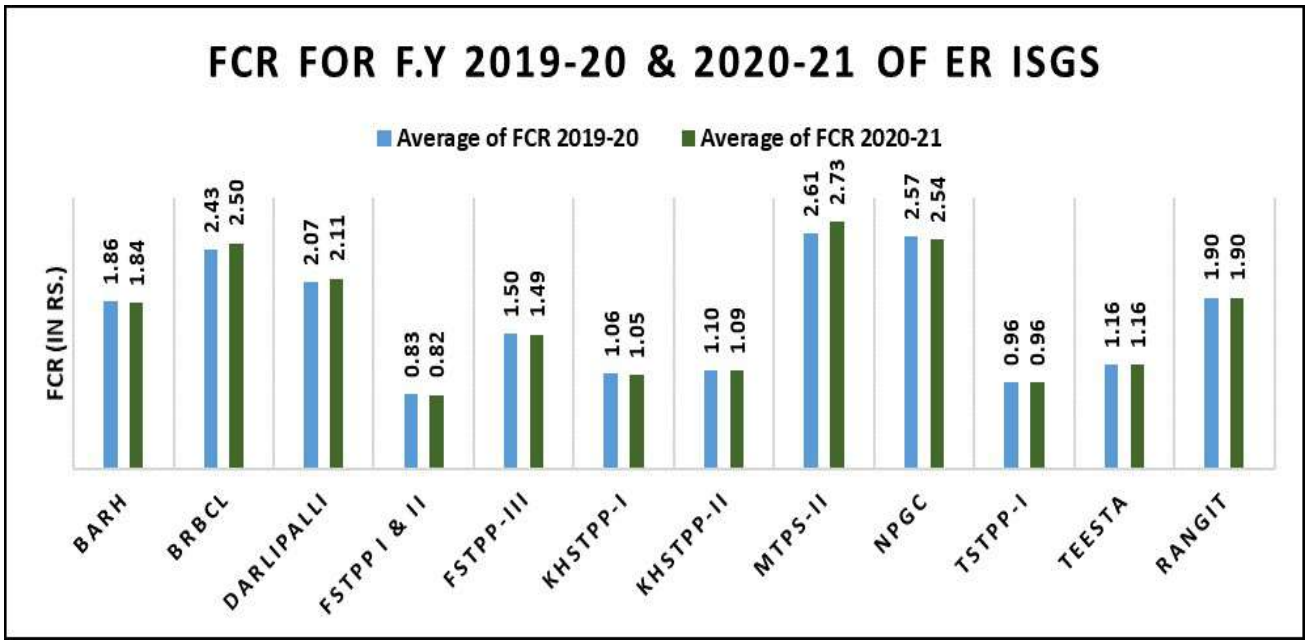
Generator(ISGS)	Average of ECR (Rs/Kwh)	Average of FCR (Rs/Kwh)	Average Unit Rate (Rs./Kwh)
BARH	2.73	1.84	4.57
BRBCL	2.37	2.50	4.87
Darlipalli	1.09	2.11	3.20
FSTPP I & II	2.72	0.82	3.54
FSTPP-III	2.67	1.49	4.16
KHSTPP-I	2.26	1.05	3.30
KHSTPP-II	2.14	1.09	3.23
MPL	2.58	1.42	4.00
MTPS-II	2.70	2.73	5.43
NPGC	2.10	2.54	4.64
TSTPP-I	2.01	0.96	2.97
TEESTA-V	1.16	1.16	2.33
RANGIT	1.90	1.90	3.80

ECR: Energy Charge Rate; FCR: Fixed Charge Rate.

The year-wise variation in energy charge rate as well as fixed charge rate for ISGS of ER for the year 2019-20 & 2020-21 are given below for reference.

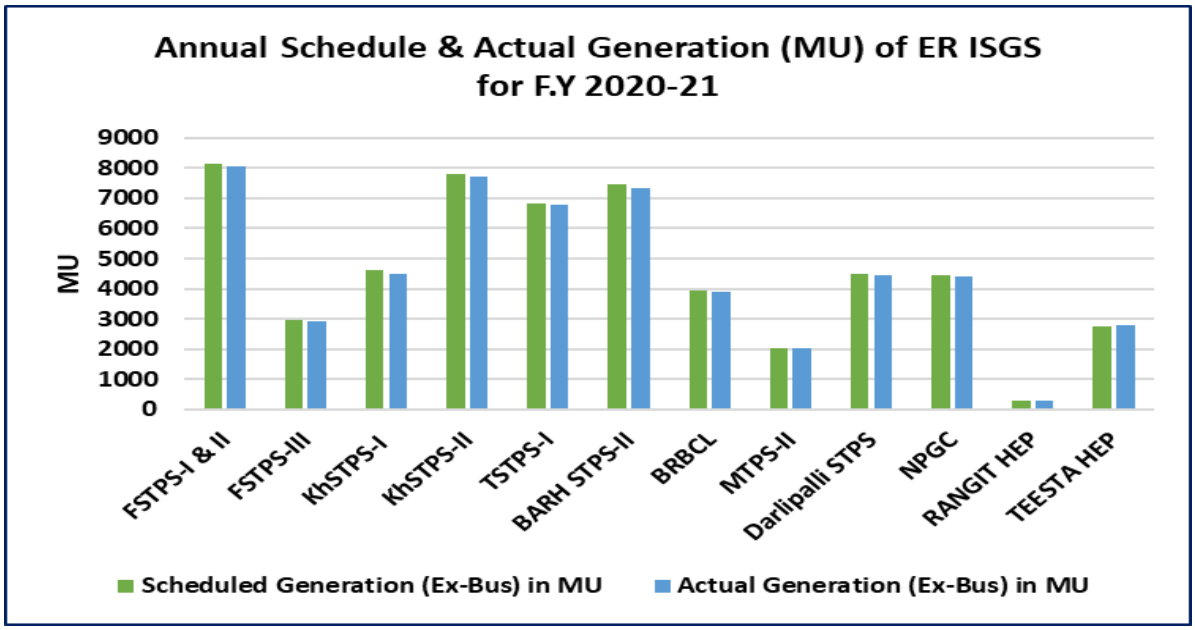



ECR (IN RS.) FOR F.Y 2019-20 & 2020-21 OF ER ISGS
Average of ECR 2019-20
Average of ECR 2020-21
ECR (IN RS.)
2.51
2.73
2.22
2.37
1.34
1.09
2.51
2.72
2.47
2.67
2.26
2.26
2.15
2.14
2.75
2.70
2.15
2.10
2.00
2.01
1.16
1.16
1.90
1.90
BARH
BRBCL
DARLIPALLI
FSTPP I & II
FSTPP-III
KHSTPP-I
KHSTPP-II
MTPS-II
NPGC
TSTPP-I
TEESTA
RANGIT


FCR FOR F.Y 2019-20 & 2020-21 OF ER ISGS
Average of FCR 2019-20
Average of FCR 2020-21
FCR (IN RS.)
1.86
1.84
2.43
2.50
2.07
2.11
0.83
0.82
1.50
1.49
1.06
1.05
1.10
1.09
2.61
2.73
2.57
2.54
0.96
0.96
1.16
1.16
1.90
1.90
BARH
BRBCL
DARLIPALLI
FSTPP I & II
FSTPP-III
KHSTPP-I
KHSTPP-II
MTPS-II
NPGC
TSTPP-I
TEESTA
RANGIT

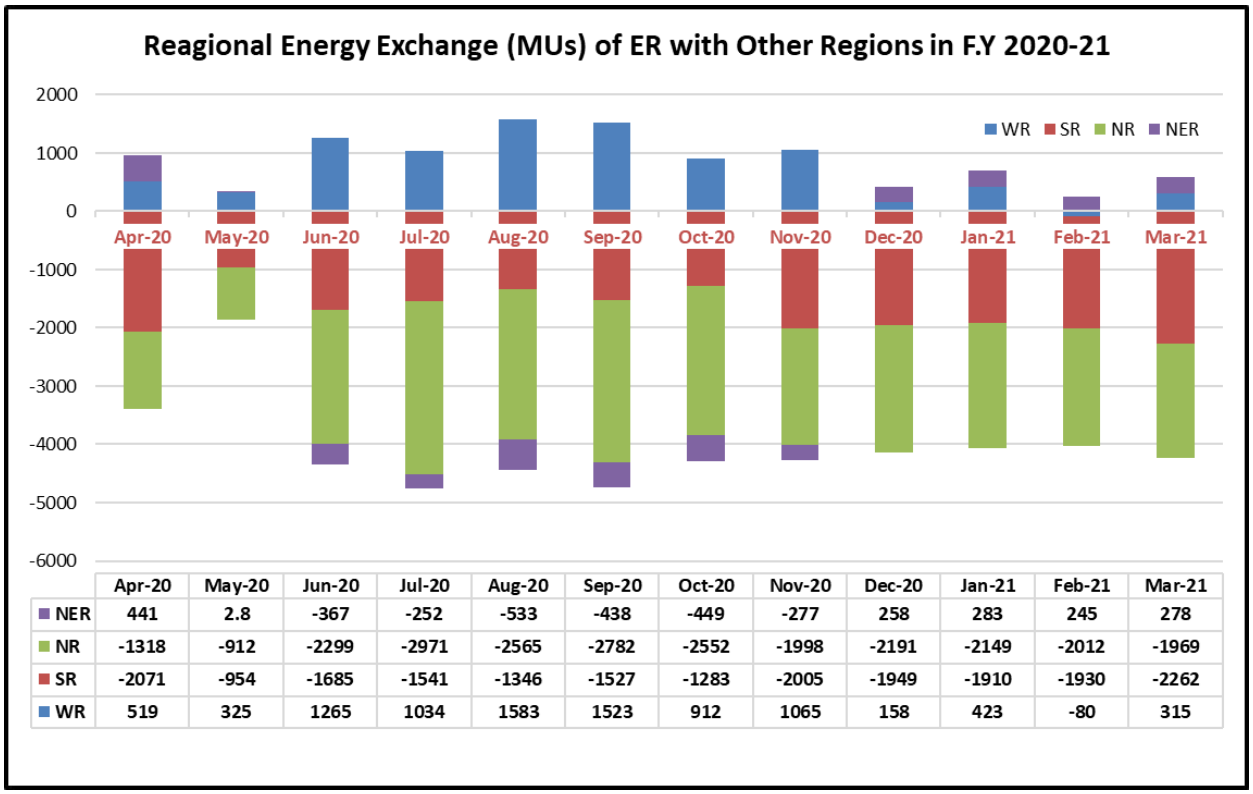
4.1.3 Annual Generation of NTPC and NHPC stations in ER during the year 2020-21:

Generating Station (ISGS)	Scheduled Generation (Ex-Bus) in MU	Actual Generation (Ex-Bus) in MU
FSTPS-I & II	8134	8053
FSTPS-III	2952	2930
KhSTPS-I	4613	4481
KhSTPS-II	7797	7727
TSTPS-I	6824	6800
BARH STPS-II	7446	7336
BRBCL	3934	3912
MTPS-II	2024	2009
Darlipalli STPS	4491	4458
NPGC	4446	4398
RANGIT HEP	281	283
TEESTA HEP	2742	2808



The details of net exchange of actual energy (MU) from Eastern Region including transmission loss with other regions for the year 2020-21 [Import (+) / Export (-)] is furnished below:

WR	SR	NR	NER	TOTAL
9664.4	-22068.5	-27179	-893.5	-40476.6



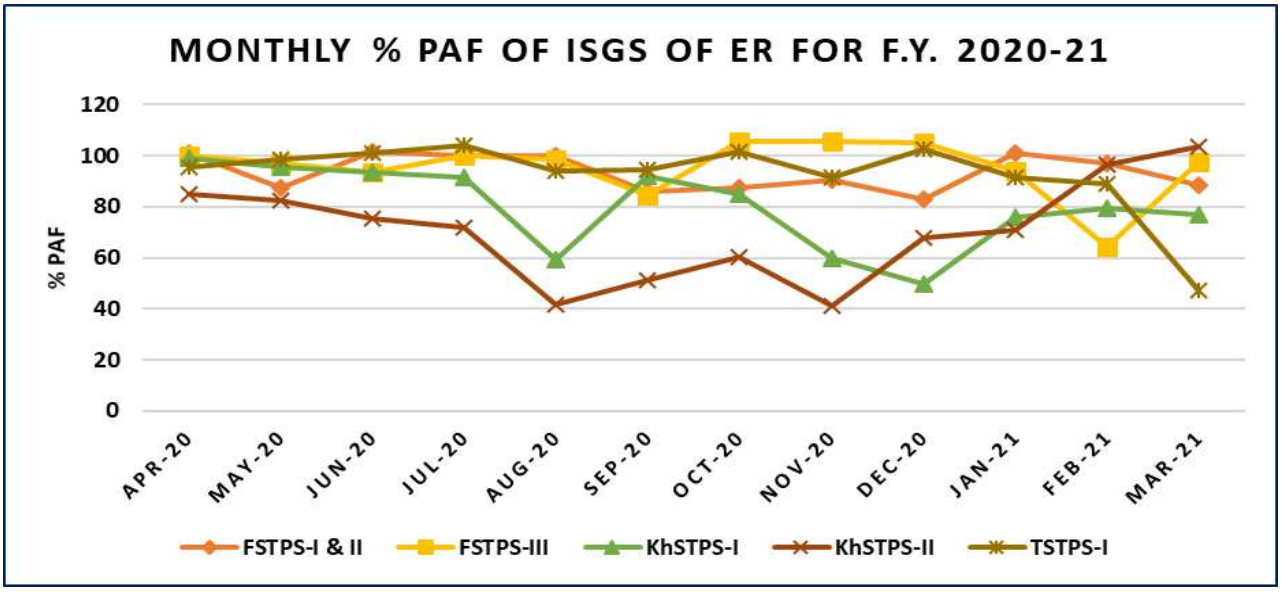
	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
NER	441	2.8	-367	-252	-533	-438	-449	-277	258	283	245	278
NR	-1318	-912	-2299	-2971	-2565	-2782	-2552	-1998	-2191	-2149	-2012	-1969
SR	-2071	-954	-1685	-1541	-1346	-1527	-1283	-2005	-1949	-1910	-1930	-2262
WR	519	325	1265	1034	1583	1523	912	1065	158	423	-80	315

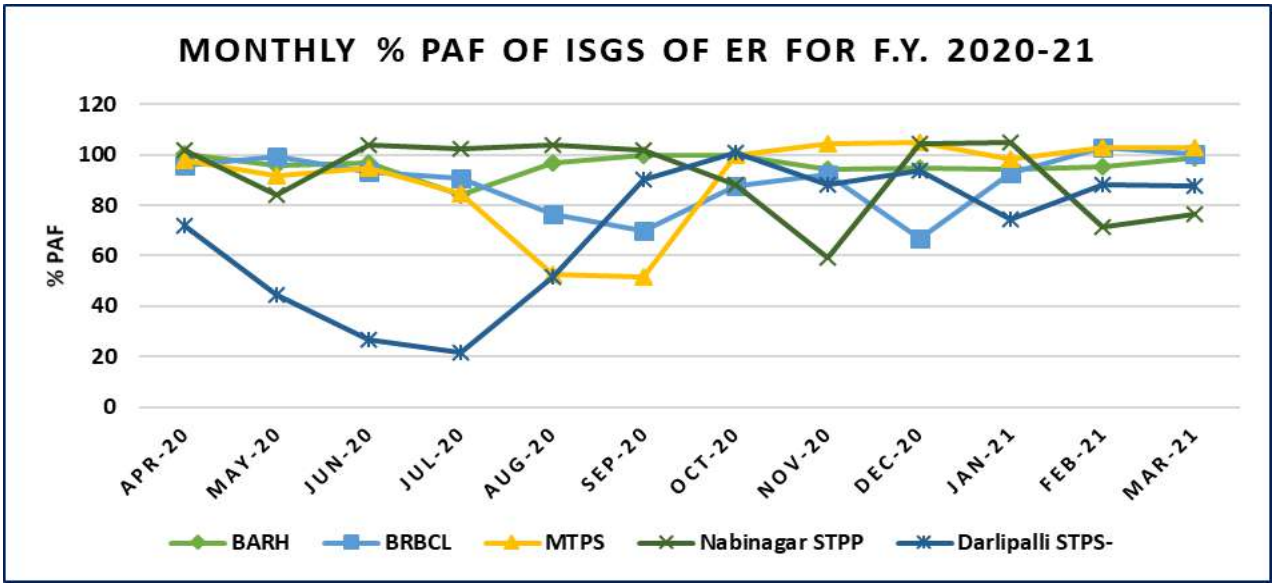
4.1.4 PAF & Schedule PLF of ISGS Thermal Stations in ER in F.Y 2020-21:

Plant Availability Factor (PAF) refers to whether a plant is available for generation or not. PAF of a generating station means the average of the daily declared capacities (DCs) for the period expressed as a percentage of the installed capacity in MW less the normative auxiliary consumption. The annual fixed cost (AFC) of a generating station would be recovered based on the cumulative availability of station.

Schedule PLF of a plant refers to percentage schedule generation against its schedule generating capacity. It is used for recovery of primary and secondary fuel cost of station and charged to beneficiaries to the extent of their drawl schedule.

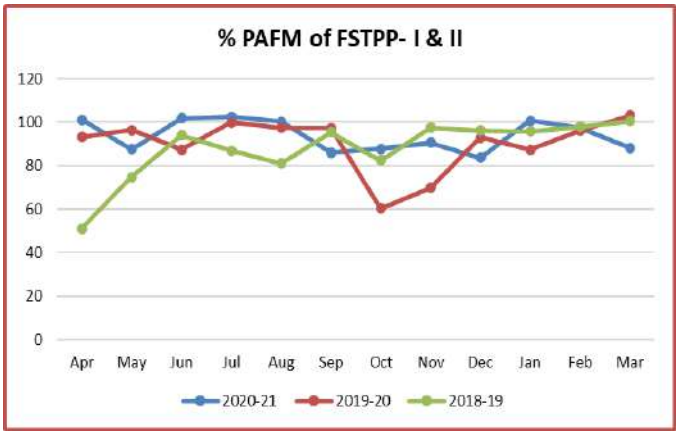
The month wise Plant Availability Factor (PAF) & Schedule PLF for year 2020-21 for NTPC stations in Eastern Region is shown below:

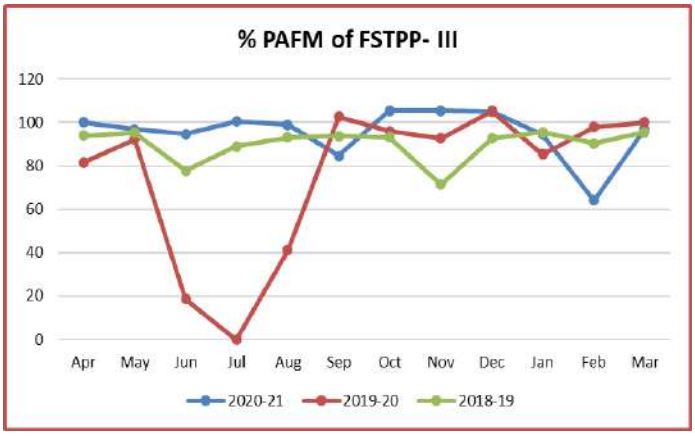


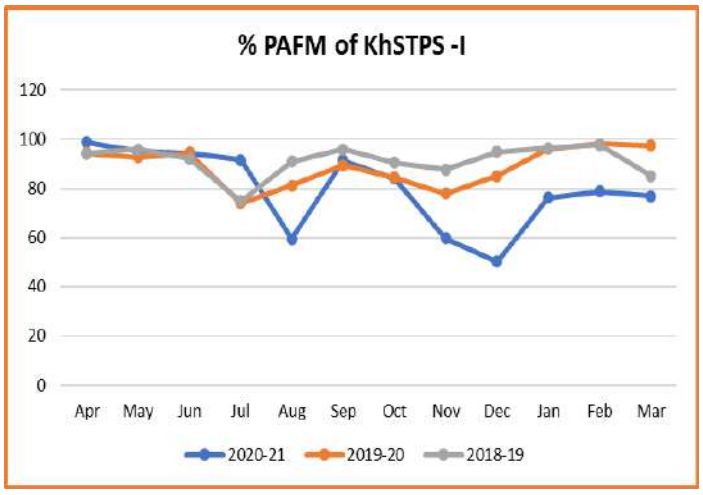


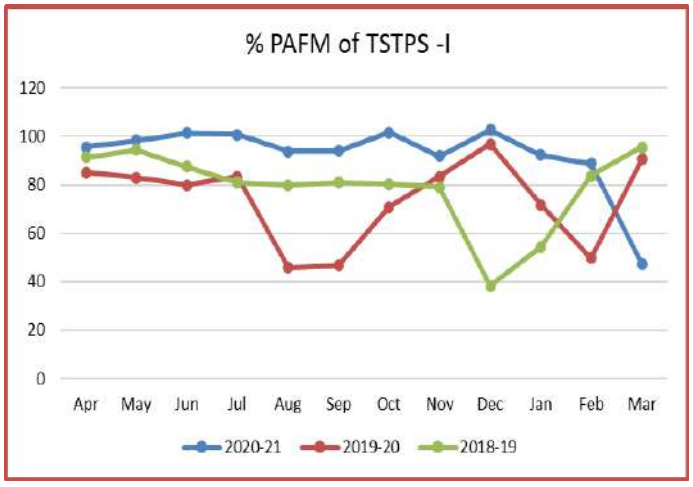
Comparative Performance of NTPC Thermal Generating Stations in ER:

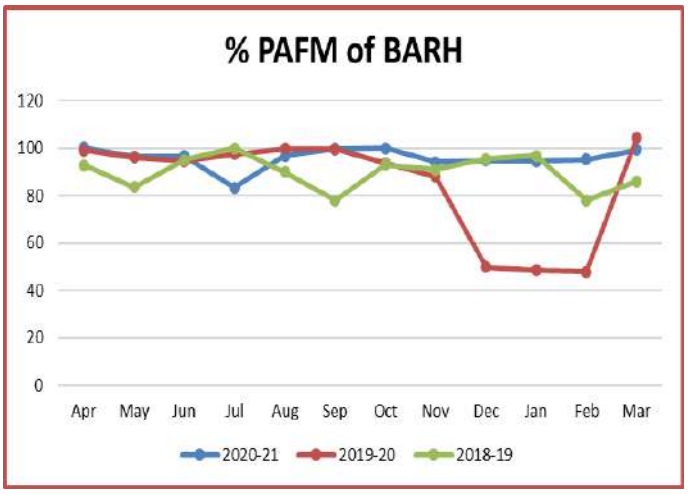
The month wise Plant Availability Factor (PAF) for years 2018-19, 2019-20 & 2020-21 for NTPC stations in Eastern Region is illustrated below:

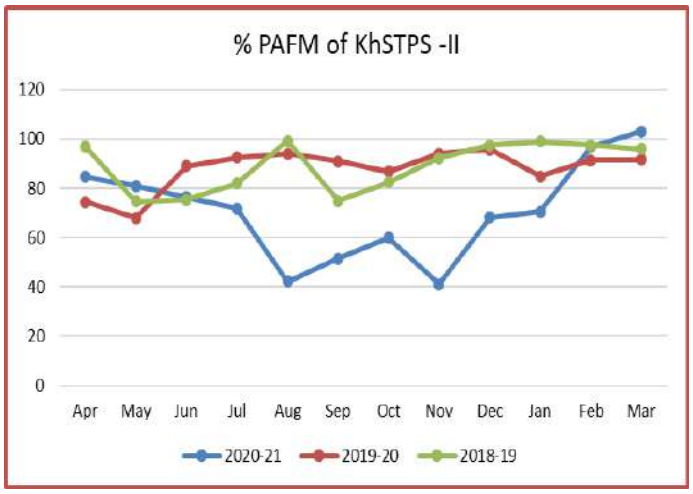

% PAFM of FSTPP- I & II
120
100
80
60
40
20
0
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
2020-21 2019-20 2018-19

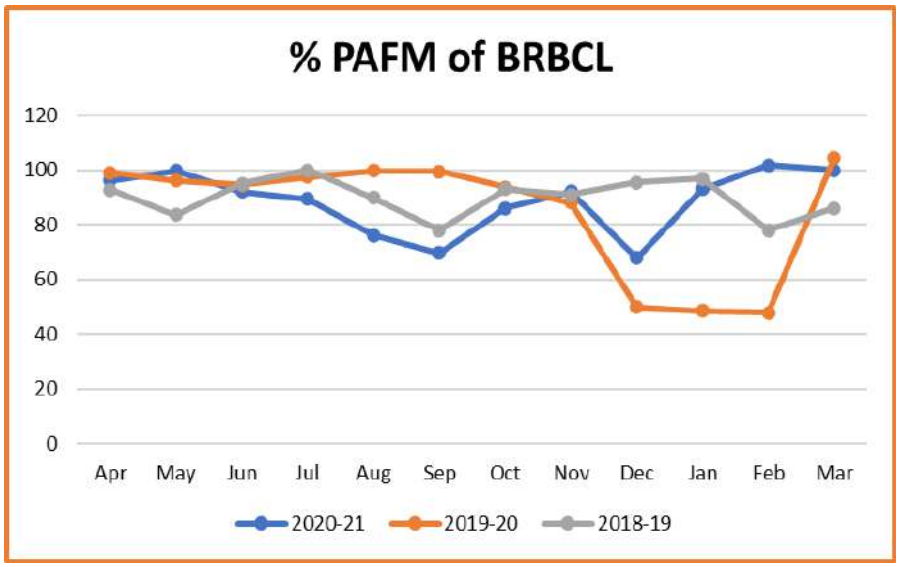

% PAFM of FSTPP- III
120
100
80
60
40
20
0
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
2020-21 2019-20 2018-19


% PAFM of KhSTPS -I
120
100
80
60
40
20
0
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
2020-21 2019-20 2018-19

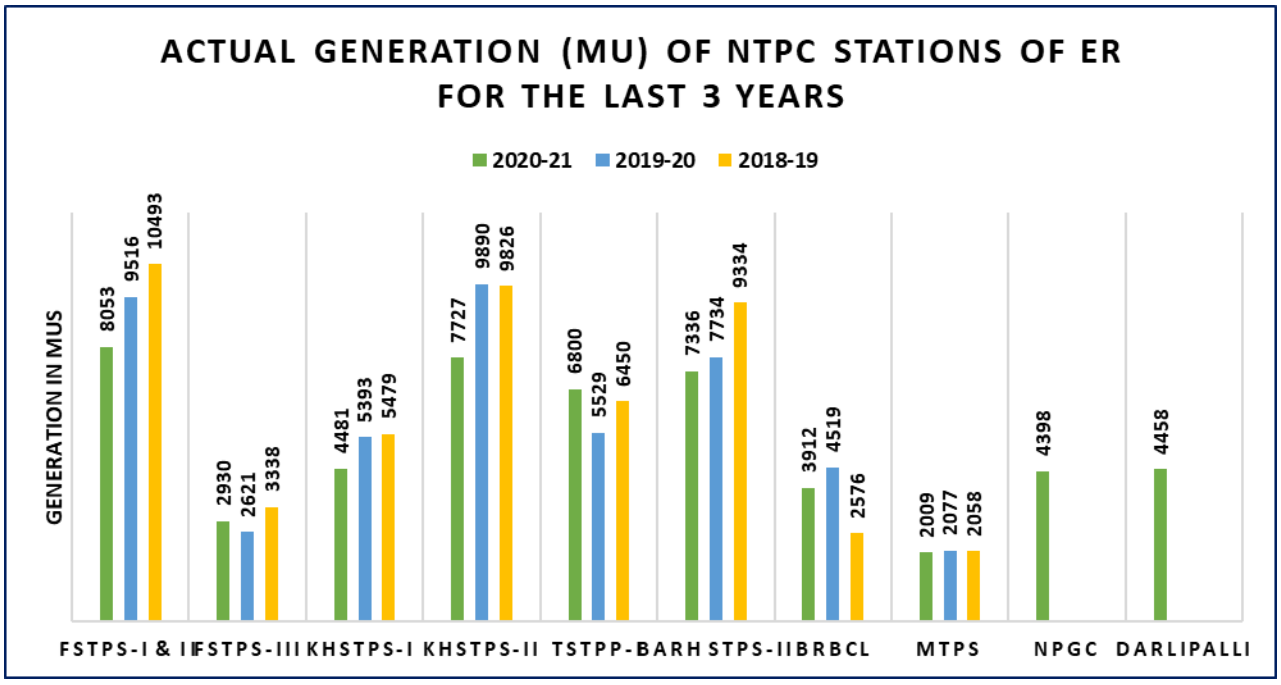

% PAFM of TSTPS -I
120
100
80
60
40
20
0
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
2020-21 2019-20 2018-19


% PAFM of BARH
120
100
80
60
40
20
0
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
2020-21 2019-20 2018-19


% PAFM of KhSTPS -II
120
100
80
60
40
20
0
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
2020-21 2019-20 2018-19

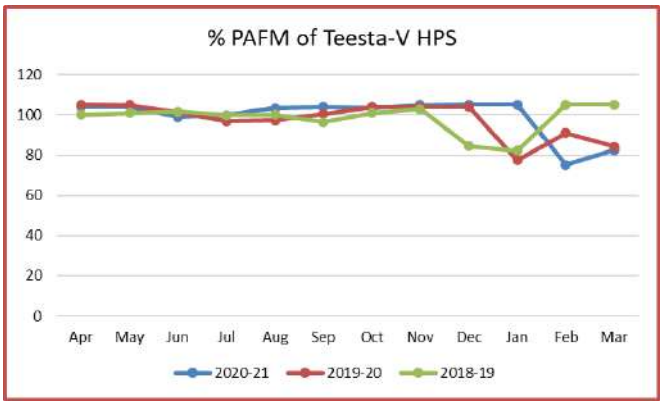


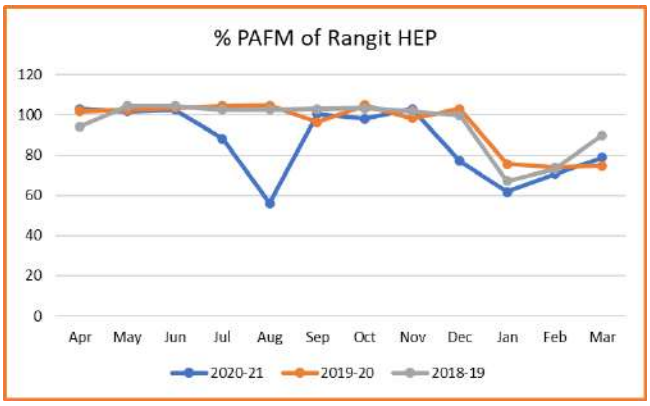
Actual Generation of NTPC Stations of ER for the last three years has been shown below:



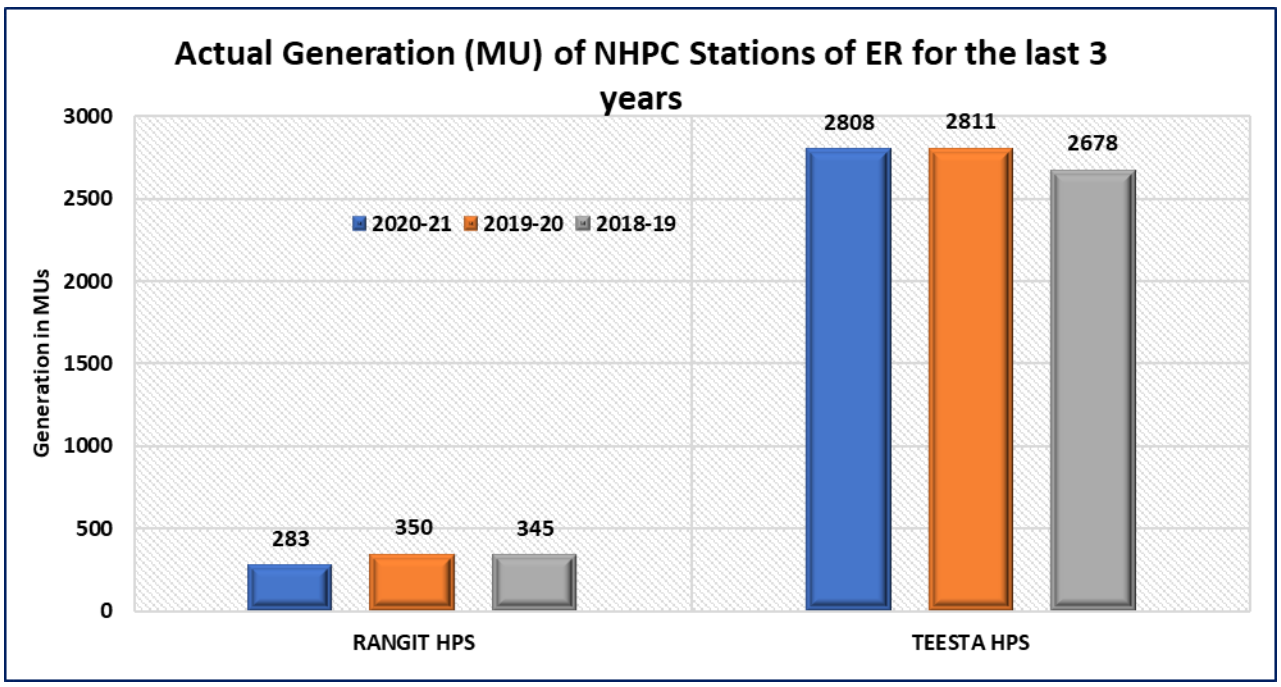
4.1.5. Performance of NHPC stations in ER:

The month wise Plant Availability Factor (PAF) for years 2018-19, 2019-20 & 2020-21 for NHPC stations in Eastern Region is shown below:



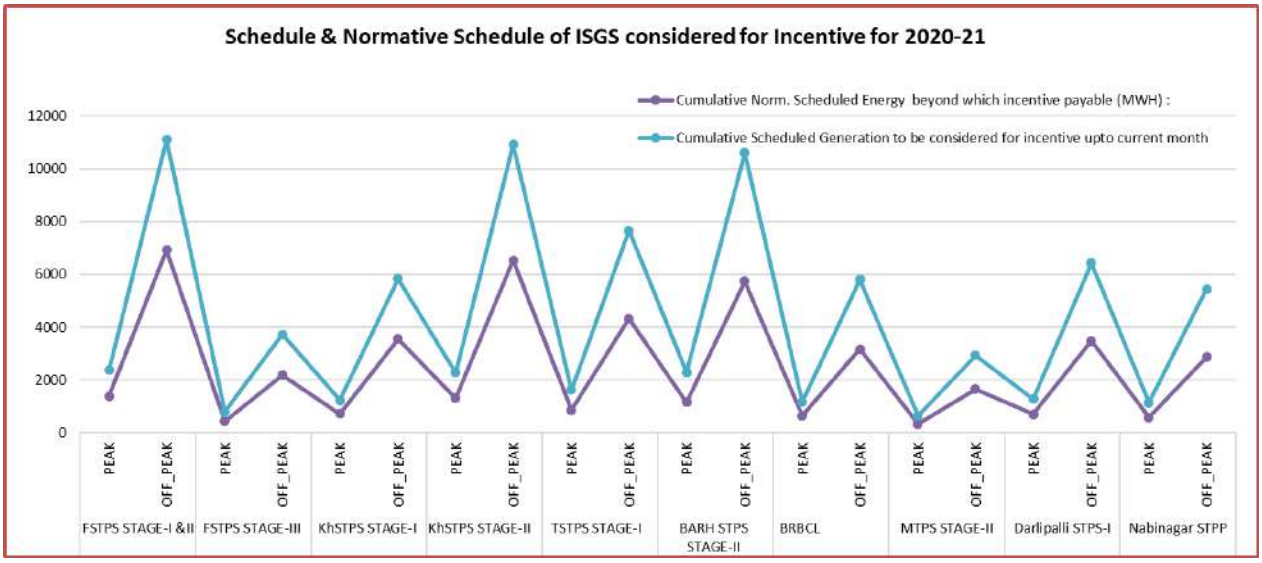


Actual Generation of NHPC stations of ER for the last three years has been shown below:



4.1.6 Incentive to a Thermal Station:

If the cumulative schedule Energy of a generating station is above the Cumulative Normative Scheduled Energy for the financial year, then the Incentive shall be given to that generating station. The Cumulative Scheduled Generation considered for the financial year should not be included with RRAS schedule, SCED Schedule and Power Exchange (IEX & PXIL) schedule Energy.

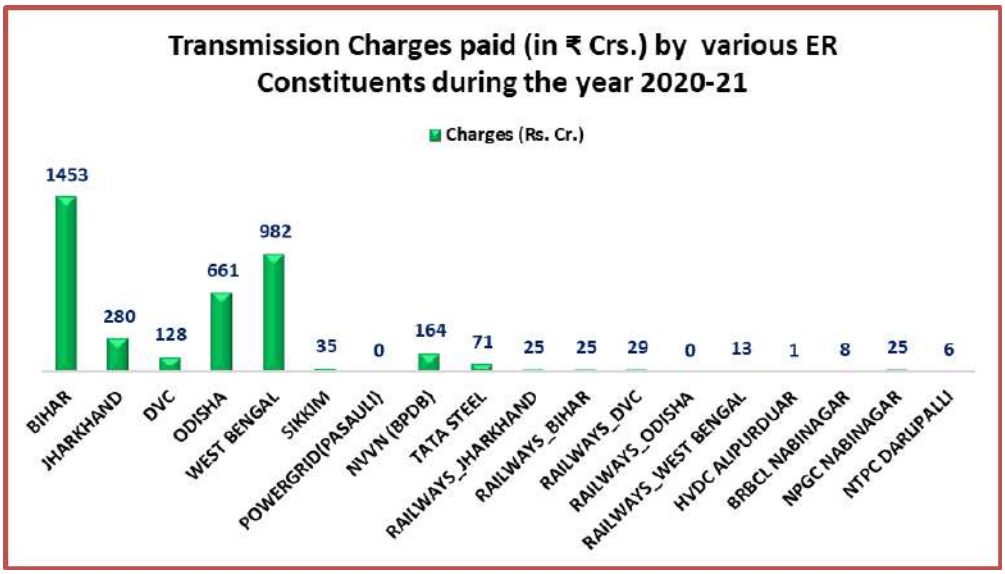


Incentive to a generating station shall be payable at a flat rate of 50 Paisa/kWh for ex-bus scheduled energy corresponding to scheduled generation in excess of ex-bus energy corresponding to Normative Annual Plant Load Factor (NAPLF) of 85%.

The Cumulative Normative Scheduled Energy beyond which incentive payable (MU) and cumulative schedule Energy for F.Y 2020-21 shown in the above graph.

4.2 TRANSMISSION CHARGE

4.2.1 Regional Transmission Account:



The Regional transmission charges are the charges payable for the energy transacted through the Inter State Transmission network which are billed by the CTU as published by the RPC secretariat. The transmission charges of the beneficiaries are calculated based on CERC (Sharing of Inter-State Transmission Charges & Losses) Regulations, 2020 which are notified for implementation from November-2020.

Regional Transmission Account 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. A transmission charge paid by various constituents of Eastern Region during the year 2020-21 is furnished in **Annexure- XV.**

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 drawl, shall be payable in accordance with the provisions of Central Electricity Regulatory Commission (Sharing of Inter State Transmission Charges and Losses) Regulations, 2020 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 utilities allowed for 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 drawl is situated, as the case may be, in proportion to the monthly transmission charges payable by them after adjusting against Long-term Access to target region in accordance with the Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2020 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 ENERGY TRANSACTIONS

4.4.1. Bilateral Trading 2020-21

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.

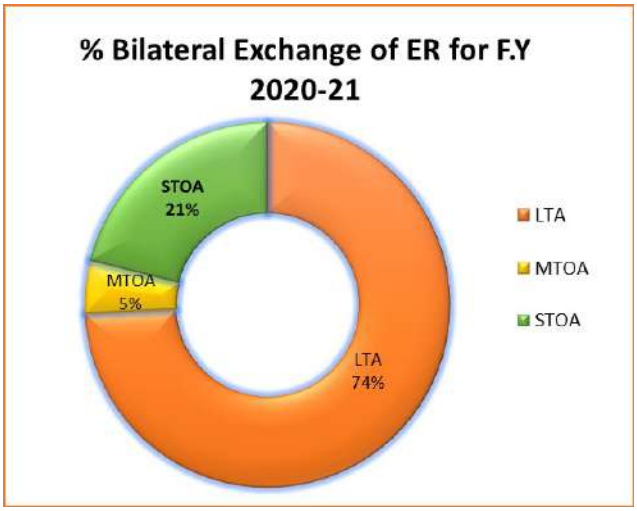
Trading of power in line with the CERC regulations on Short Term Open Access in transmission system started in Eastern Region with effect from 06.05.2004, and over the years the volume of bilateral trade has seen continuous increase. The number of traders and utilities indulging in bilateral trade and collective transactions through the IEX and PXI has also seen healthy growth. The indicative volume of trade in Eastern Region during 2020-21 by various traders through LTA, MTOA & STOA is provided in **Annexure – XVI**.

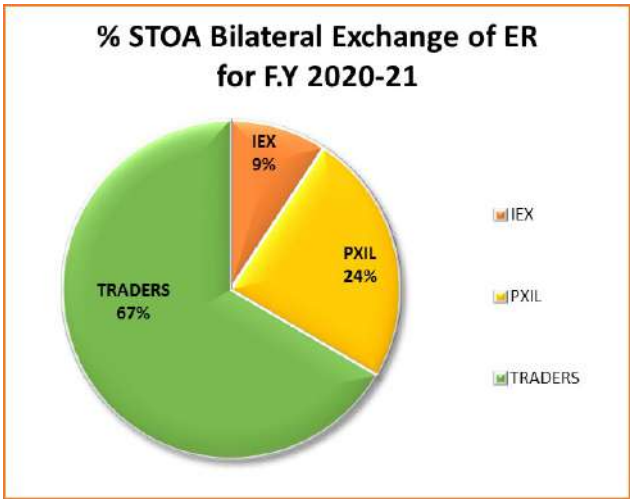
TRADERS involved in Short Term Transactions in ER	
AEL_Trader	MPPL Trader
APPCPL	NPCL(UP)
APPCPL_Trader	NR-DEL
APPL_Trader	NR-UP
BSL	NVVNL
CESC	POWER_EXCHANGE
CHUZACHEN	PTC
DB Power	PXIL
ECRD	RUVNL
ESIL_WR_Beneficiary	SAIL-RSP
GMR	SGPLNLR
GMRETL Trader	TATAHALDIA
IEXL_Trader	TATASTEEL
IPCL	TATASTL_BSL
IPCL_Trader	THEP
ITC_Munger	TPTCL_Trader
JBVNL	TSFAP_JODA
JITPL	TSKPO
JLHEP	TSL Joda
JSWEL	TSPJO
KEIPL	WBSEDCL
MANIKARAN	

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:



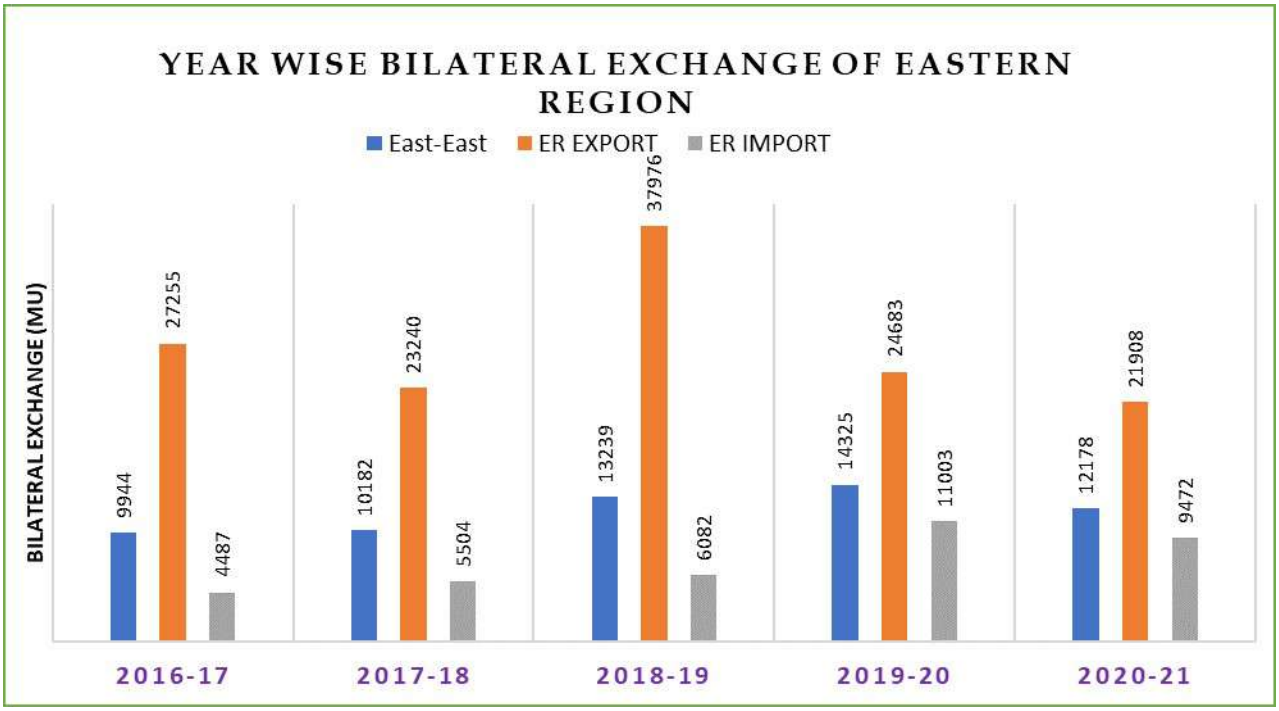


Figures in MU

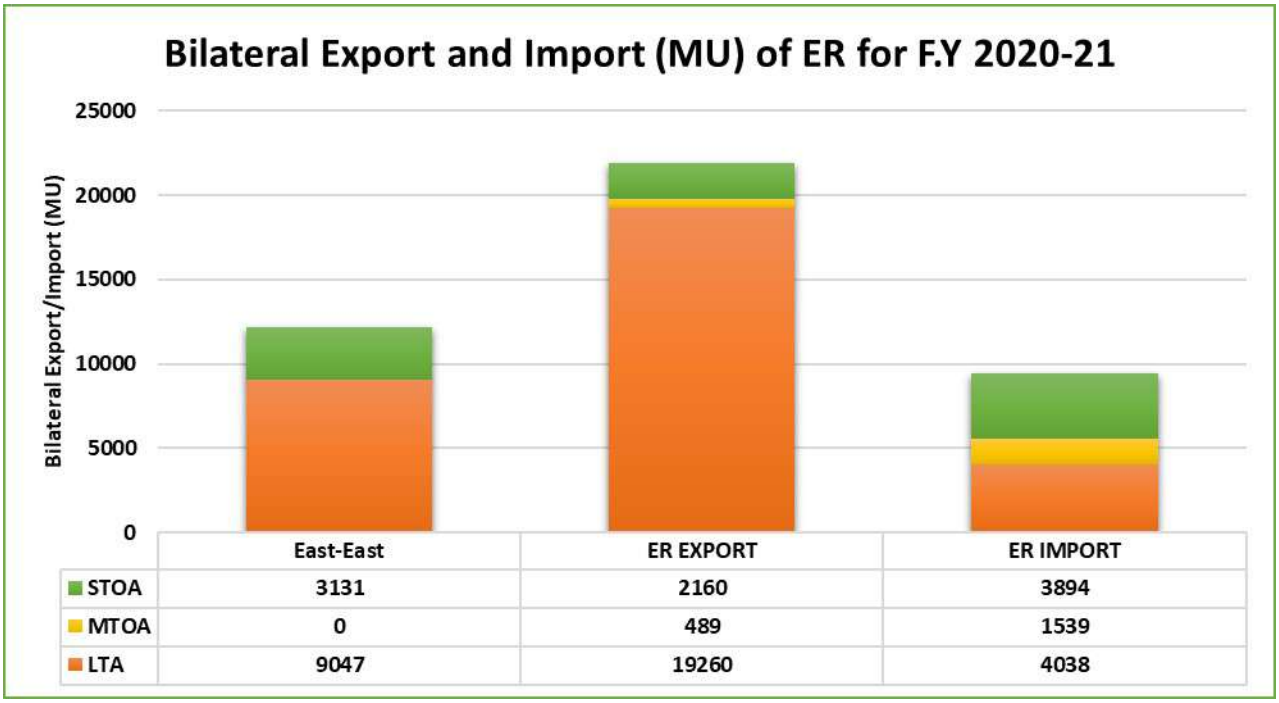
Long Term & Medium Term		Short Term Bilateral Transactions	
LTOA	**MTOA**	**IEX/PXI**	**Traders**
32346	2028	3067	6116

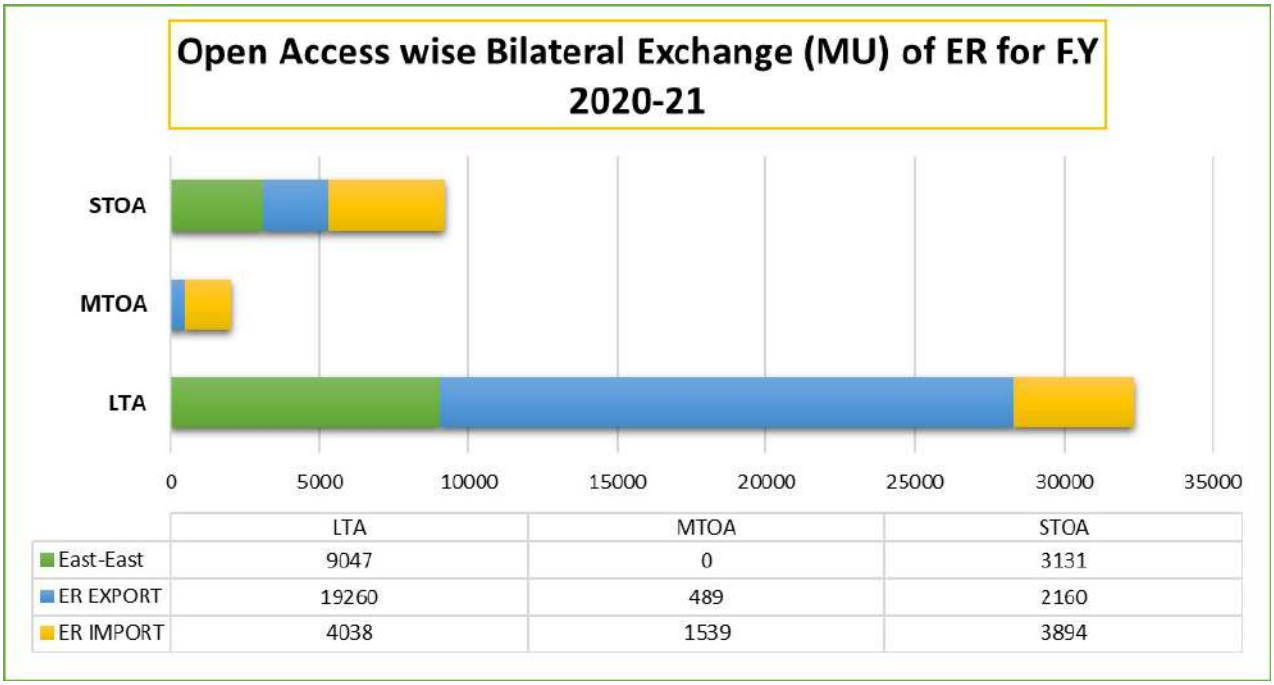
During 2020-21, scheduled bilateral transaction of power through ER was to the tune of 43,559 MU. The breakup of year on year scheduled bilateral transactions has been indicated below for years 2016-17, 2017-18, 2018-19, 2019-20 & 2020-21.

It has been indicated that the out of total bilateral transactions the contribution of short-term open access was 21 %, medium-term open access was 5 % and LTA was about 74 %. Due to introduction of various products of power procurement by power Exchanges like Real time market through which the states are meeting their power demand in shortest possible time. In the short-term market the share of the IEX is 9% and PXIL was 24 % and the bilateral traders is about 67 %.



During the year substantial amount of transaction took place through IEX/PXI by means of anonymous bidding. The quantum of energy transactions in MU through different open access segments such as LTA, MTOA & STOA within ER Export from ER and import to ER has shown.



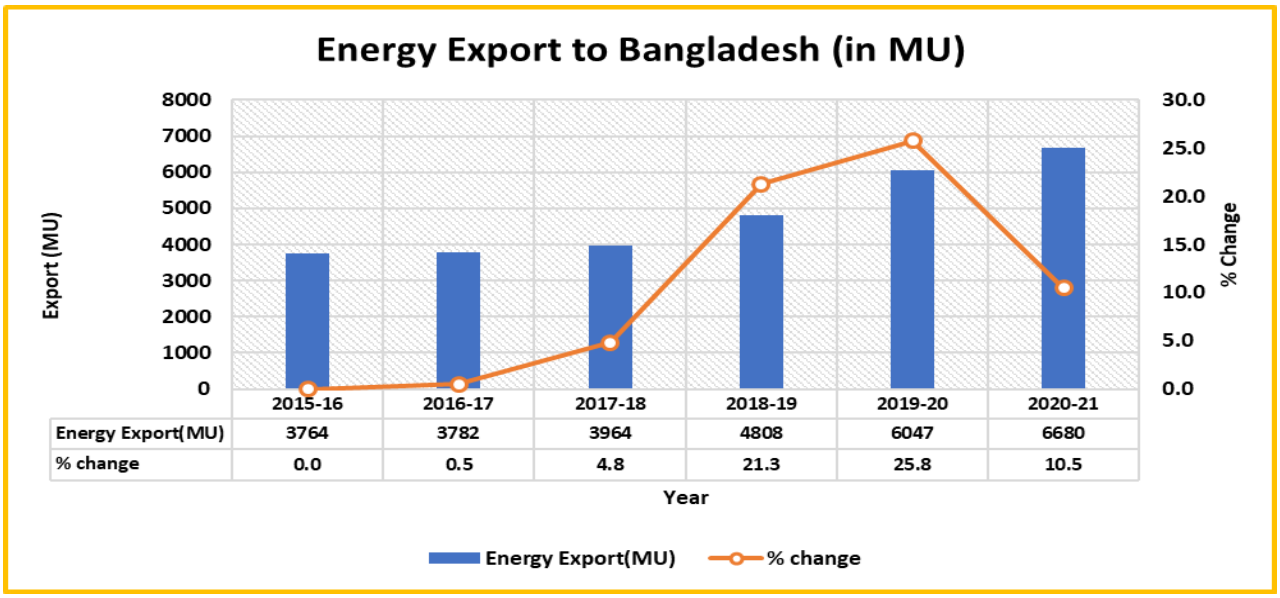


	LTA	MTOA	STOA
East-East	9047	0	3131
ER EXPORT	19260	489	2160
ER IMPORT	4038	1539	3894

4.4.2 International Trades for year 2020-21

4.4.2.1 Trading of Power with Bangladesh:

Based on MoU between the two countries of India and Bangladesh, Ministry of Power, Govt. of India allocated 250 MW power round the clock (in Stages) to Bangladesh from coal based NTPC stations in the country. NTPC Vidyut Vyapar Nigam Ltd. (NVVN) as nodal agency has entered into a Power Purchase Agreement (PPA) with Bangladesh counterpart (BPDB) through cross border trading of power and to facilitate delivery of such power.



	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Energy Export(MU)	3764	3782	3964	4808	6047	6680
% change	0.0	0.5	4.8	21.3	25.8	10.5

Accordingly, the 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. The 2nd 500 MW Back to Bach HVDC block was commissioned in June-2018. Presently 800 MW power is being exported to Bangladesh comprising 250 MW (Net 232.42 MW) power from NTPC Stations, 300 MW Long term power from DVC through NVVNL and 250 MW from SEMBCORP Private power plant. The actual energy (including transmission loss) exported to Bangladesh during 2020-21was to the tune of 6680 MU from Eastern Region.

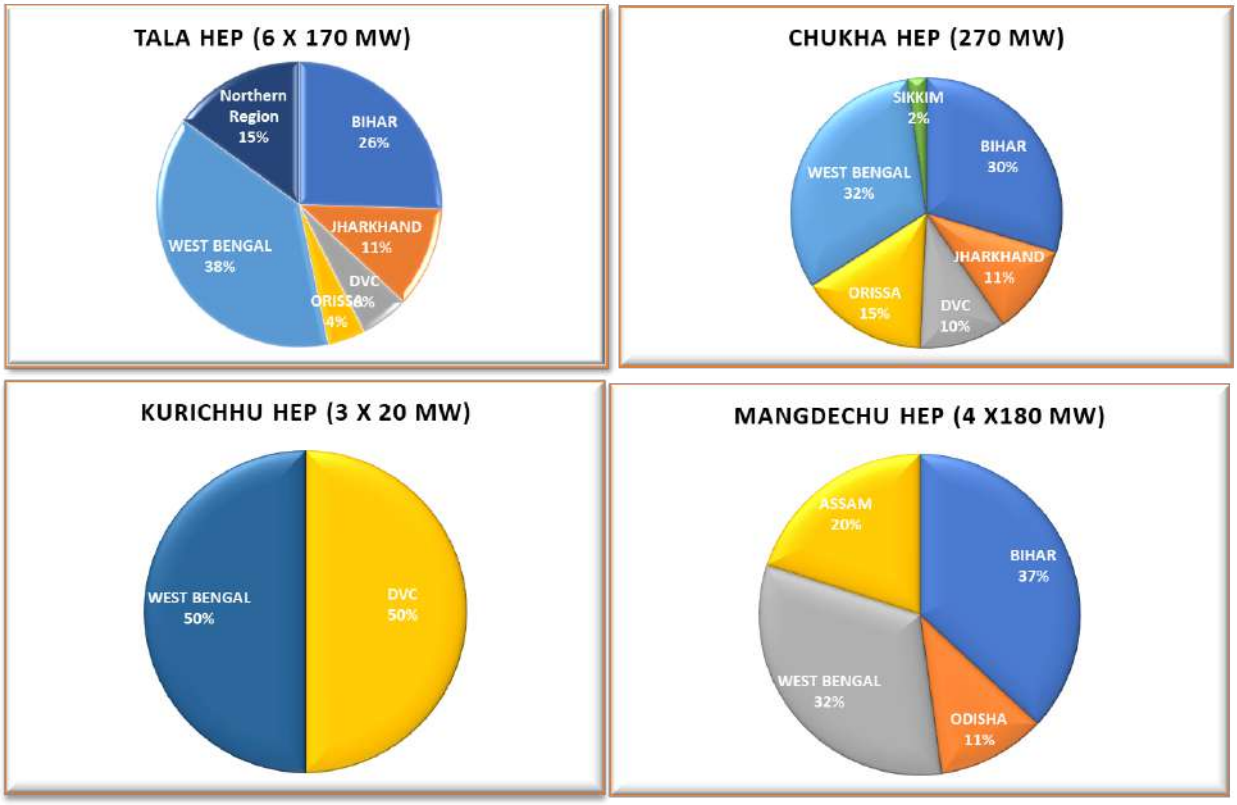
4.4.2.2 Trading of power with Bhutan:

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 and TPTCL as given below:

Import to India from	2015-16 (MU)	2016-17 (MU)	2017-18 (MU)	2018-19 (MU)	2019-20 (MU)	2020-21 (MU)
BHUTAN	5420.4	5824	5072.08	4395.87	6350.6	9251.7*

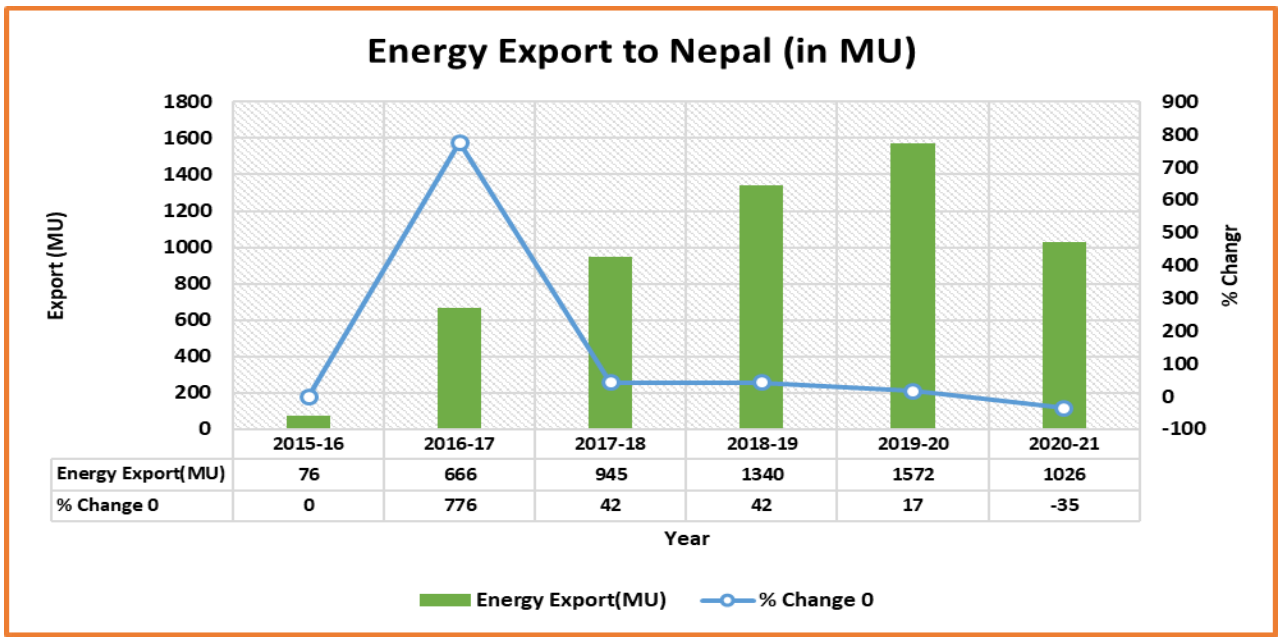
*Excluding export of 53 MU to Kuruchhu HEP of Bhutan. Net Import = 9198.7 MU

As per GoI orders the majority of power from Hydro stations of Bhutan has been allocated to Eastern Region States as shown below:



4.4.2.3 Trading of power with Nepal:

Energy exported to Nepal during 2020-21 to the tune of 1025.6 MU (including transmission loss) mainly through NVVN trader.



	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Energy Export(MU)	76	666	945	1340	1572	1026
% Change 0	0	776	42	42	17	-35

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 up to Nov-2020 is provided in Table below (except CGS):

LTA Status up to Nov-2020:

LTA Status up to Nov' 2020

S. No.	Name of LTA Customer (Injecting utility)	Generator /Load / Trader	Region	Quantum of LTA granted	LTA with tied up beneficiaries	Name of the beneficiaries
1	BRPL (DVC Power)	Load	ER	31	31	BRPL
2	BYPL (DVC Power)	Load	ER	19	19	BYPL
3	DVC (DVC Durgapur U#2)	Generator	ER	100	100	PSPCL
4	DVC (DVC Koderma U#1)	Generator	ER	100	100	Haryana
5	DVC (DVC Mejia U#7)	Load	ER	12.5	12.5	DVC
6	DVC (DVC Mejia U#8)	Load	ER	12.5	12.5	DVC
7	DVC (MPL U#1)	Load	ER	140.5	140.5	DVC
8	NDPL (DVC Power)	Load	ER	19.55	19.55	NDPL
9	WBSEDCL (MPL U #1&2)	Load	ER	141.375	141.375	WBSEDCL
10	WBSEDCL (MPL U#1&2)	Load	ER	141.375	141.375	WBSEDCL
11	Adhunik Power & Natural Resources Ltd	Generator	ER	100	100	WBSEDCL
12	Tata Steel Ltd (DVC, Mejia B)	Load	ER	100	100	Tata Steel
13	Tata Steel Ltd (DVC, DSTPS)	Load	ER	100	100	Tata Steel
14	Ind-Barath Energy (Utkal) Ltd, Odisha	Generator	ER	500	500	TANGEDCO, TN
15	KSEB (Maithon Power Ltd-RBTPP)	Load	ER	140.625	140.625	KSEB
16	BESCOM, Karnataka (Mejia 7&8, DVC)	Load	ER	200	200	BESCOM, Kar
17	Adhunik Power & Natural Resources Ltd	Generator	ER	100	100	TANGEDCO, TN
18	DVC, Raghunathpur (Unit-1 & 2)	Generator	ER	100	100	Haryana (U1-50MW & U2-50MW)
19	GMR Kamalanga Energy Ltd	Generator	ER	387	312	Haryana (312 MW)
20	DVC, Raghunathpur (Unit-1 & 2)	Generator	ER	300	300	Punjab (U1-150 MW & U2-150 MW)
21	KSEB (Maithon Power Ltd-RBTPP)	Load	ER	140.625	140.625	KSEB
22	GMR Kamalanga Energy Ltd	Generator	ER	260	260	Bihar (260 MW)

23	Bhartiya Rail Bijlee Company Limited (BRBCL)	Generator	ER	910	910	ECR {Bihar-100 MW, West Bengal-45 MW, DVC- 110 MW, Chattisgarh-15 MW, Gujarat-15 MW, Maharashtra-120 MW, MP-154 MW, UP-185 MW, Haryana- 15 MW, Punjab - 35 MW, Rajasthan- 10 MW, Delhi-5 MW. Karnataka -10 MW} & BSP(H)CL, Bihar (91 MW)
24	Jndal India Thermal Power Ltd (JITPL), Odisha (2x600MW)	Generator	ER	95	95	KSEB Ltd, Kerala
25	WBSEDCL, West Bengal (1000MW State Surplus)	DIC	ER	1000	0	NA
26	PSPCL (Bokaro TPS, DVC Power)	Load	ER	200	200	PSPCL
27	Kanti Bijlee Utpadan Nigam Ltd.	Generator	ER	121.59	121.59	As per the MoP allocation to be decided by respective RPC
28	PTC (Teesta-III HEP)	Trader	ER	174	174	UP
29	PTC (Teesta-III HEP)	Trader	ER	87	87	RAJASTHAN
30	Jndal India Thermal Power Ltd (JITPL), Odisha (2x600MW)	Generator	ER	228	228	Bihar Discoms
31	NVVNL (injection is from DVC, West Bengal)	Trader	ER	300	300	NVVNL, BPDB
32	Gati Infrastructure Limited,Chuzachen HEP (2x55MW)	Generator	ER	99		
33	Dans Energy Private Limited,Jorethang HEP (2x48MW)	Generator	ER	86.4		
34	Shiga Energy Private Limite, Tashiding HEP (2x48.5MW)	Generator	ER	87.3		
35	Nabinagar Power Generating Company Limited	Generator	ER	1856.25	1856.25	North Bihar- 543.55 MW, South Bihar - 911.92 MW, Sikkim - 9.37 MW, Jharkhand- 56.25 MW, UP- 195.94 MW, Unallocated - 139.22 MW
36	NTPC Darli Palli	Generator	ER	1498	1498	Bihar, West Bengal, Jharkhand, Sikkim, Odisha

MTOA Status up to Nov-2020:

MTOA Status up to Nov' 2020								
Sl. No.	Name of the Applicant	Injection of Power	Injecting Region	MTOA Granted for (MW)	Date from which MTOA is Granted	Date upto which MTOA Granted	Drawl of Power	Drawl Region
1	Jindal India Thermal power Limited, Odisha	Jindal India Thermal power Limited, Odisha	ER	9.46	01-03-2018	31-01-2021	Northern Railway, Delhi	NR
2	Jindal India Thermal Power Ltd. (JITPL)	Jindal India Thermal Power Ltd. (JITPL), Odisha	ER	59.24	01-08-2020	19-01-2021	West Central Railway, Rajasthan	NR
3	Jindal India Thermal Power Ltd. (JITPL)	Jindal India Thermal Power Ltd. (JITPL), Odisha	ER	142.77	01-09-2020	31-12-2020	West Central Railway, MP	WR

4.6 COMMERCIAL DECLARATION OF NEW GENERATING STATIONS IN ER

During the year 2020-21, there was no addition of new generating power plant in Eastern Region.]

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 Aftab 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 of coal 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.

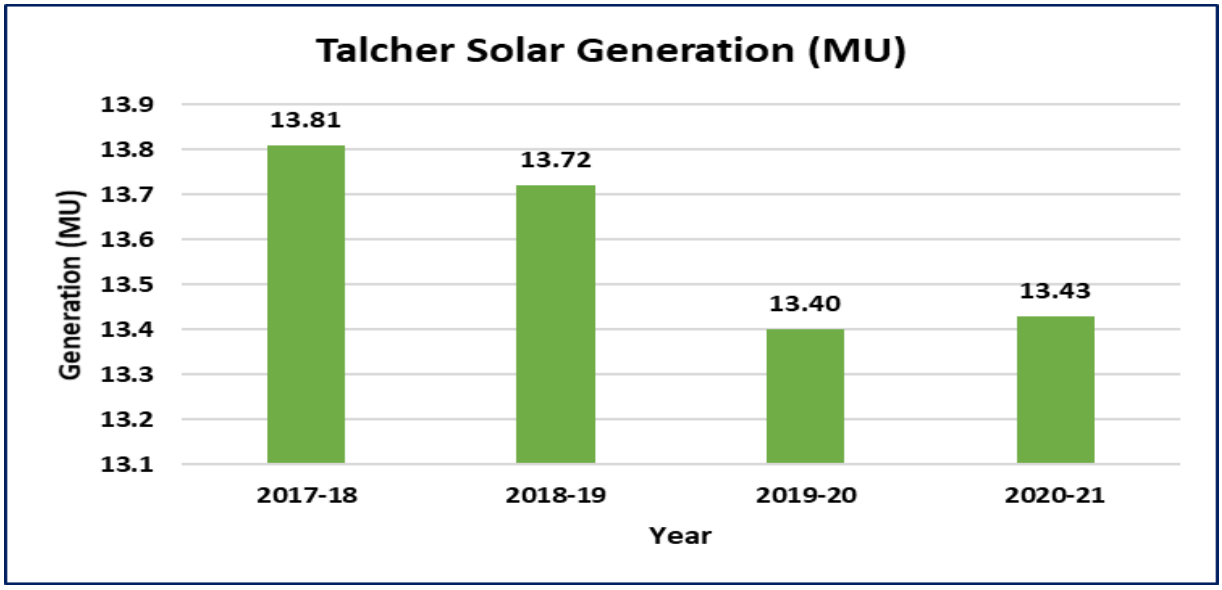
7) 25 MW of Solar Power from Rajasthan (M/s Sun Technique Solar Pvt. Ltd.) under the scheme of JNNSM Phase – I was allocated to West Bengal-15 MW, Odisha-5 MW, DVC-5 MW which have been implemented w.e.f. 00:00 Hrs. of 05.12.2014.

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 Telangana 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 Telangana 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 2020-21 is 13.43 MU.

The variation in Generation of Talcher Solar Station for last four 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. During the year 2020-21, an amount of Rs. 29.57 Cr. has been transferred to PSDF.

4.9 DEVIATION SETTLEMENT MECHANISM (DSM)

4.9.1 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.

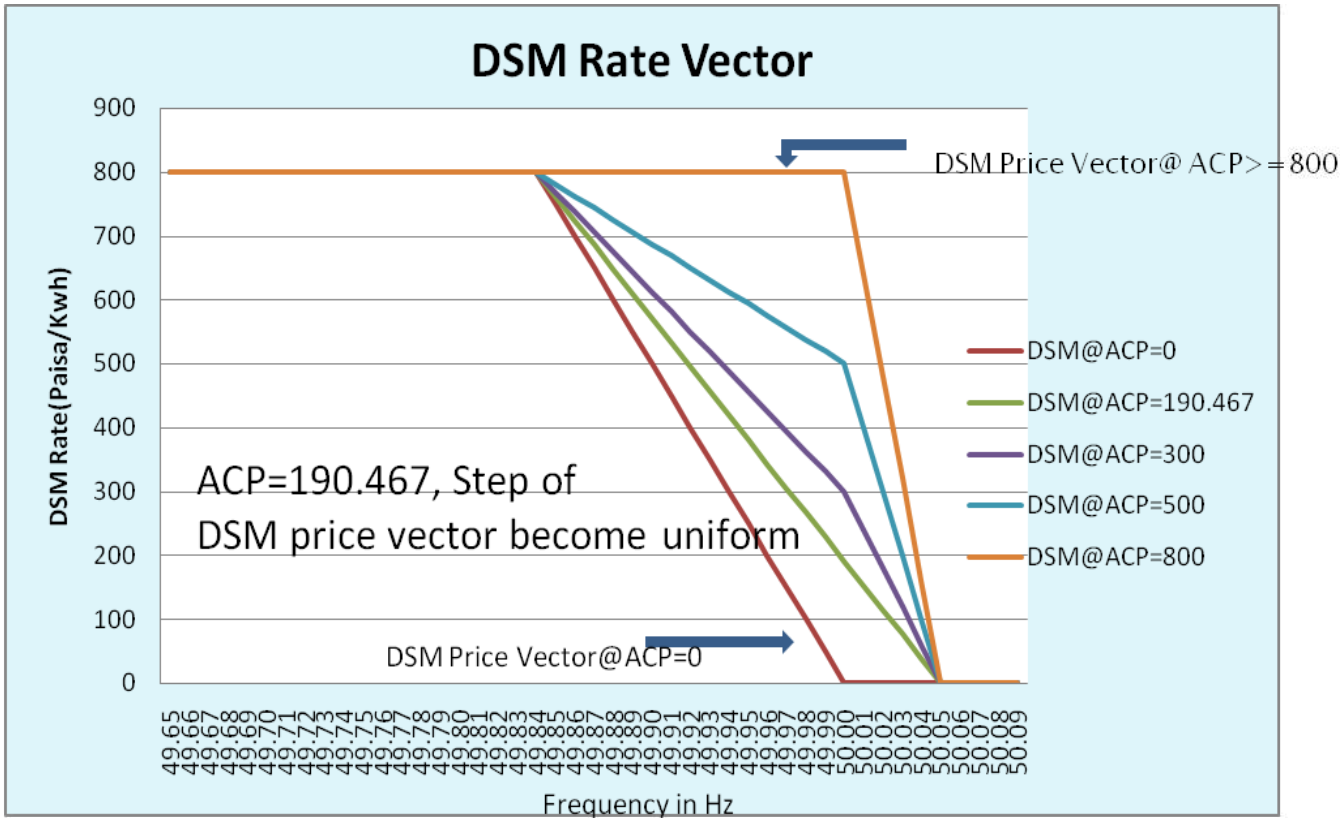
It acts like a financial barometer, which measures a licensee's responsiveness towards healthiness of the regional grid. The DSM mechanism has established a real time balancing market that is workably competitive and provides a powerful force for efficiency and innovation.

4.9.2 Rates for Deviation Charge with effect from 01.01.2019 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 the time block (Hz)		Charges for Deviation
Below	Not below	Paise/kWh
	50.05	0.00
50.05	50.04	1x(P/5)
50.04	50.03	2x(P/5)
------	------	------
50.01	50.00	P
50.00	49.99	50.00+15x(P/16)
49.99	49.98	100.00+14x(P/16)
------	-----	------
49.87	49.86	700.00+2x(P/16)
49.86	49.85	750.00+1x(P/16)
49.85		800.00

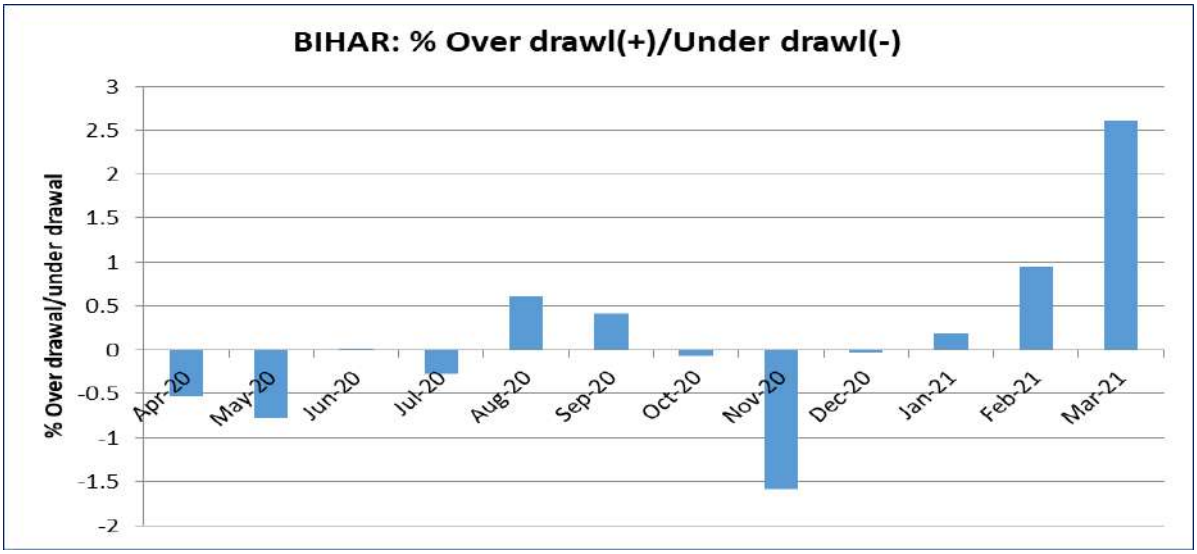
P= Average Area Clearing Price

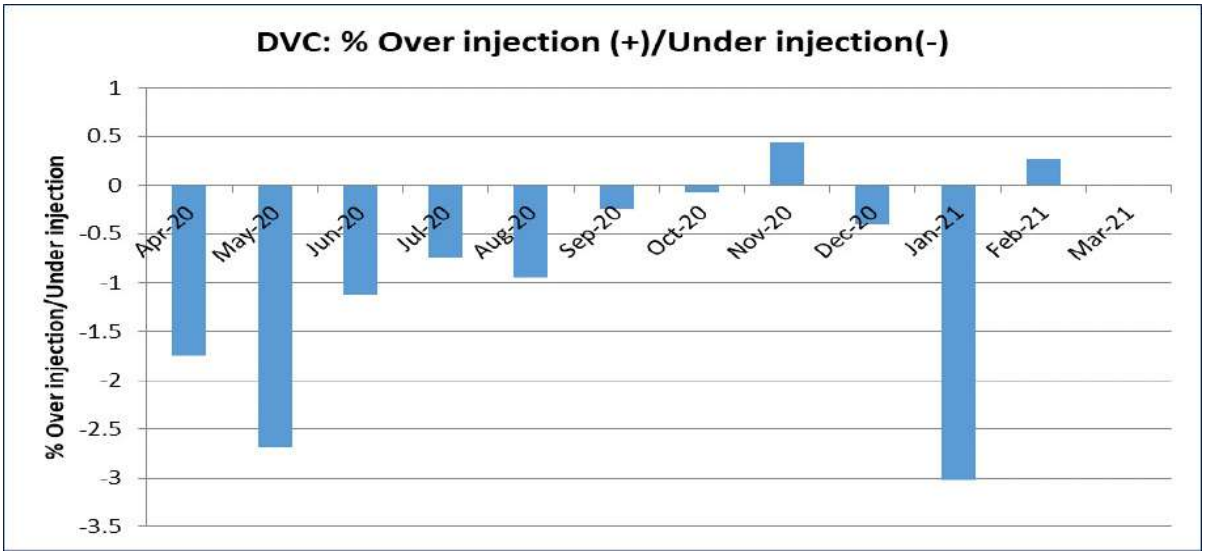


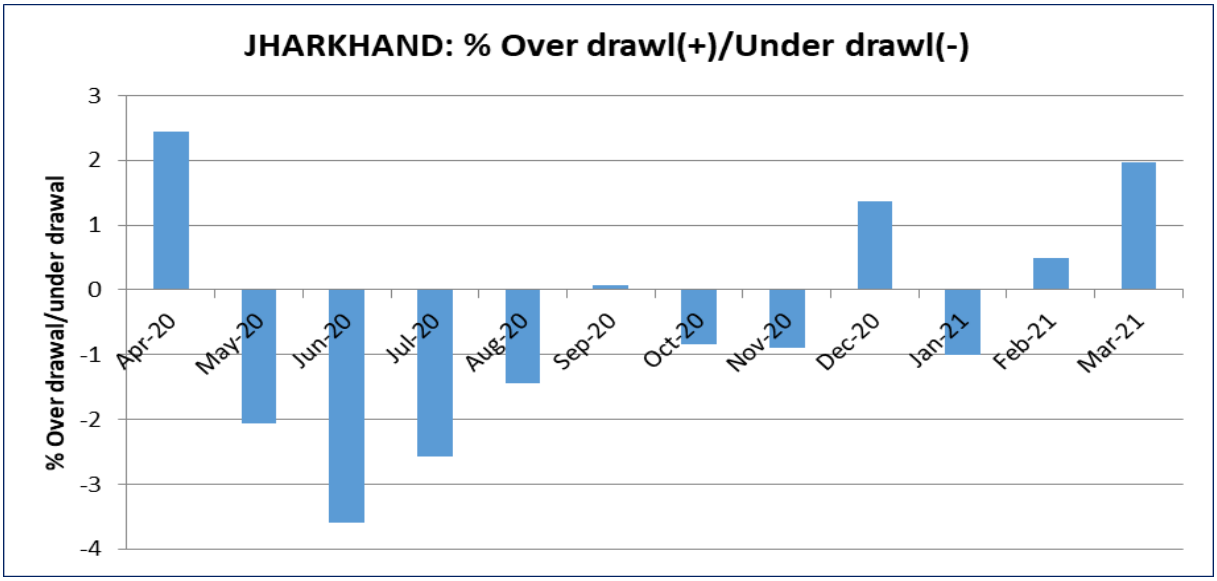
- As per DSM 4th Amendment, Charges for deviation below 49.85 Hz is fixed at 800p/u, for frequency 50.05 Hz and above, charges for deviation is 0 p/u.
- Charges for deviation at 50.00 Hz will be Daily Average Area Clearing Price (ACP) discovered at DAM (Max ceiling being 800 p/u).
- The Day-ahead market price of the Power Exchange having a market share of 80% or more in energy terms on a daily basis shall be taken into consideration for linking to the DSM price vector.
- If no single Power Exchange is having a market share of 80% or more, the weighted average day-ahead price of power Exchange of having market share of 20% & more shall be used for linking to the DSM price vector.
- DSM rate vector will have a dynamic slope determined by joining the identified price points at 50 Hz (daily avg. ACP),frequency below 49.85 (800p/u) and 50.05 Hz (0p/u) on daily basis.

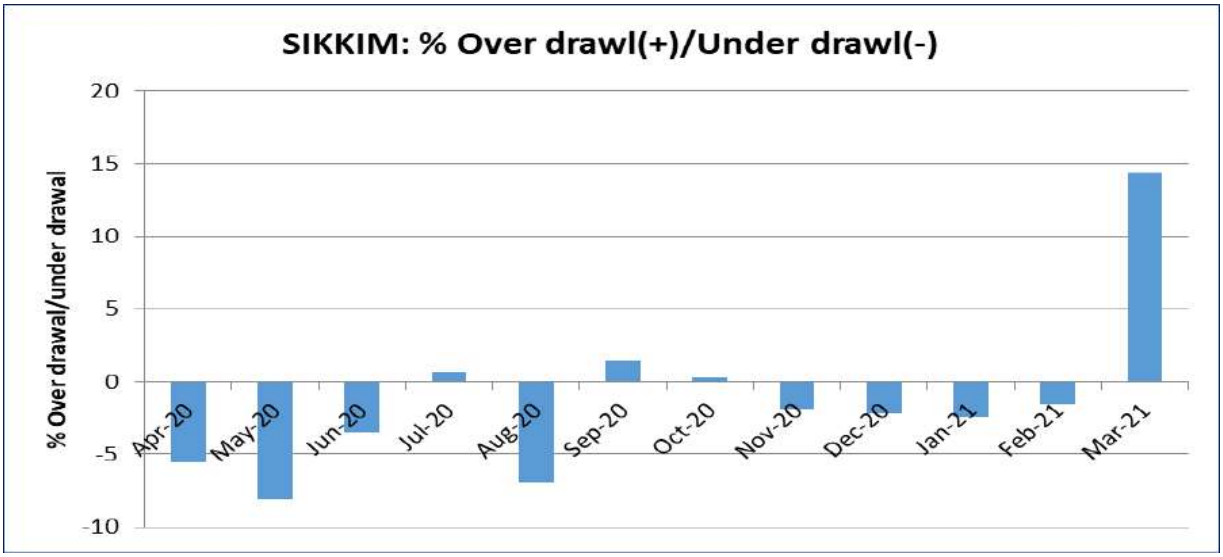
4.9.3 Performance of the constituents:

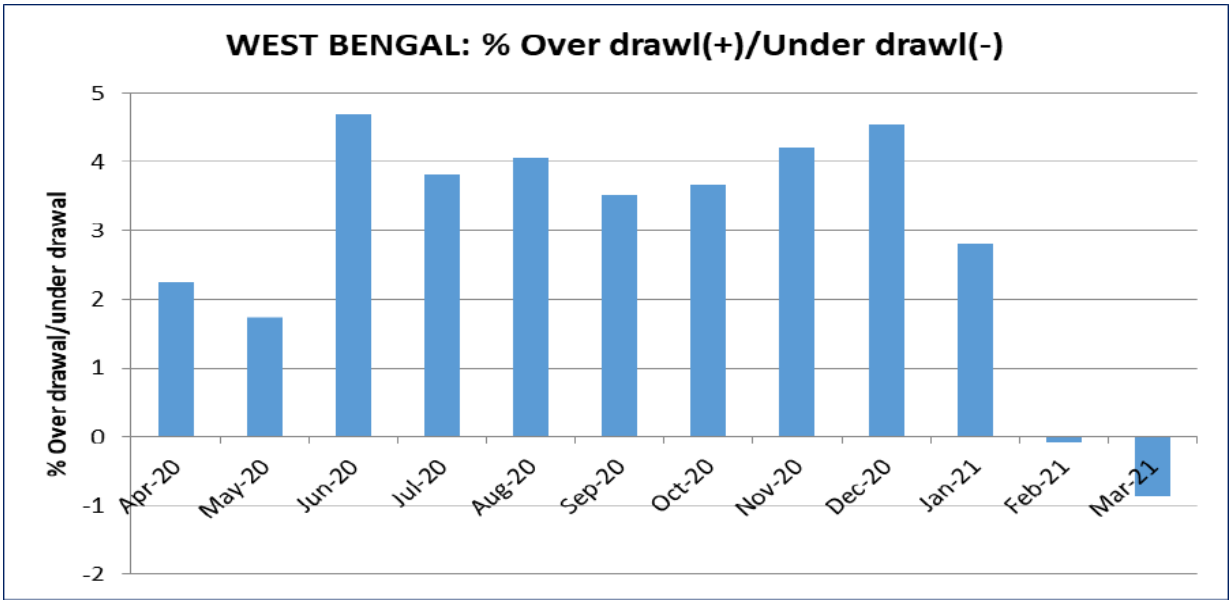
Details of month-wise Schedule Drawal/Generation, Actual Drawal/Generation, Receivable/Payable of UI/Deviation Charge amount for the year 2020-21 are furnished in **Annexure-XVII-A & Annexure-XVII-B**. Graphical representation is given below for ready reference.




DVC: % Over injection (+)/Under injection(-)
% Over injection/Under injection
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
Apr-20
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21


JHARKHAND: % Over drawl(+)/Under drawl(-)
% Over drawal/under drawal
3
2
1
0
-1
-2
-3
-4
Apr-20
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21


SIKKIM: % Over drawl(+)/Under drawl(-)
% Over drawal/under drawal
20
15
10
5
0
-5
-10
Apr-20
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21



4.10 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 14.5 paisa/unit during the year 2020-21. The statement indicating reactive energy charge billing details during the year is enclosed at **Annexure-XVIII**.

4.11 REGIONAL TRANSMISSION DEVIATION CHARGES:

As per the CERC (Sharing of Transmission charges and Losses Regulations), 2020, the 'Regional Transmission Deviation Account (RTDA)' means the monthly account of Transmission Deviation charges issued by the Secretariat of respective Regional Power Committee on the basis of which the Central Transmission Utility shall raise the third bill in the billing month under prevailing regulations

Transmission Deviation, in MW, shall be computed as under:

a) *For a generating station:* The net metered ex-bus injection, in a time block in excess of the sum of Long-Term Access, Medium Term Open Access and Short-Term Open Access.

(b) *For a State*: The net metered ex-bus injection or net metered drawal, in a time block, in excess of the sum of Long-Term Access and Medium-Term Open Access.

(c) *For any drawee DIC*: This is a regional entity other than distribution licensees, net metered drawl in a time block in excess of the sum of Long-Term Access, Medium Term Open Access and Short-Term Open Access.

Transmission Deviation Rate in Rs./MW, for a State or any other DIC located in the State, for a time block during a billing month shall be computed as under:

TDR = 1.05 X (transmission charges of the State for the billing month in Rs.)/ (quantum in MW of Long-Term Access plus Medium-Term Open Access of the State for the corresponding billing period X 2880)

The transmission Deviation charges shall be recovered through the third bill and shall be reimbursed to the DICs in proportion to their share in the first bill in the following billing month.

4.12 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.

- **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.

- **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.

- **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.

4.13 RESERVE REGULATORY ANCILLIARY SERVICES (RRAS)

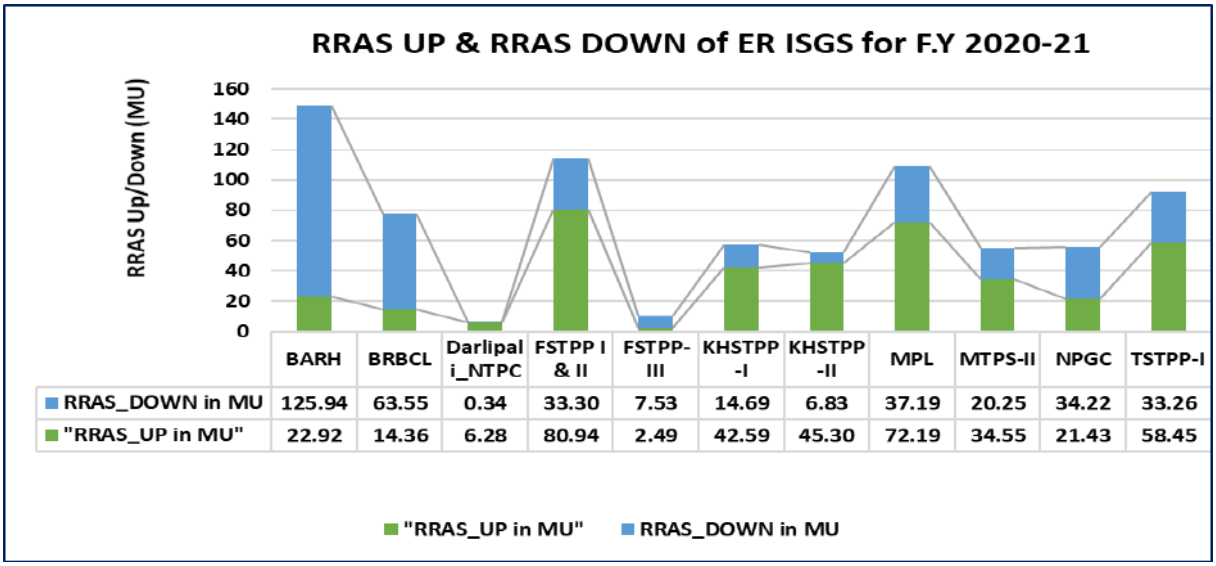
Ancillary services refer to functions that help grid operators maintain a reliable electricity system. Ancillary services maintain the proper flow and direction of electricity, address the imbalances between supply and demand, and help the system recover after a power system event. In the present system with significant variable renewable energy (RE) penetration, additional ancillary services may be required to manage increased variability and uncertainty.

Currently, the reserve capacity of Central generators i.e. URS power has been considered as the tertiary reserve of the generators. Tertiary reserve provides significant insurance against wide spread outages. Tertiary reserve had been a luxury in our system that was perennially short of generation. Since generators reserve situation is getting better, it is proposed to use

such surplus reserve by procuring tertiary reserve which can be utilised for frequency regulation of the national grid to avoid the deviation from desired frequency of 50 Hz.

As per Regulation 12 of the CERC (Ancillary Services Operations) Regulations 2015, the secretariat of Regional Power Committees (RPCs) is required to issue the weekly accounts for RRAS along with the weekly DSM accounts. The RRAS account include the fixed charges, variable charges and mark up charges. RRAS provider shall refund back the fixed charge to the original beneficiaries in proportion to the quantum surrendered from its generating station. The payments made from/to the DSM pool.

Energy scheduled to/from Virtual Ancillary Entity (VAE) for each ISGS station of ER under RRAS ancillary services during 2020-21 has been shown below:

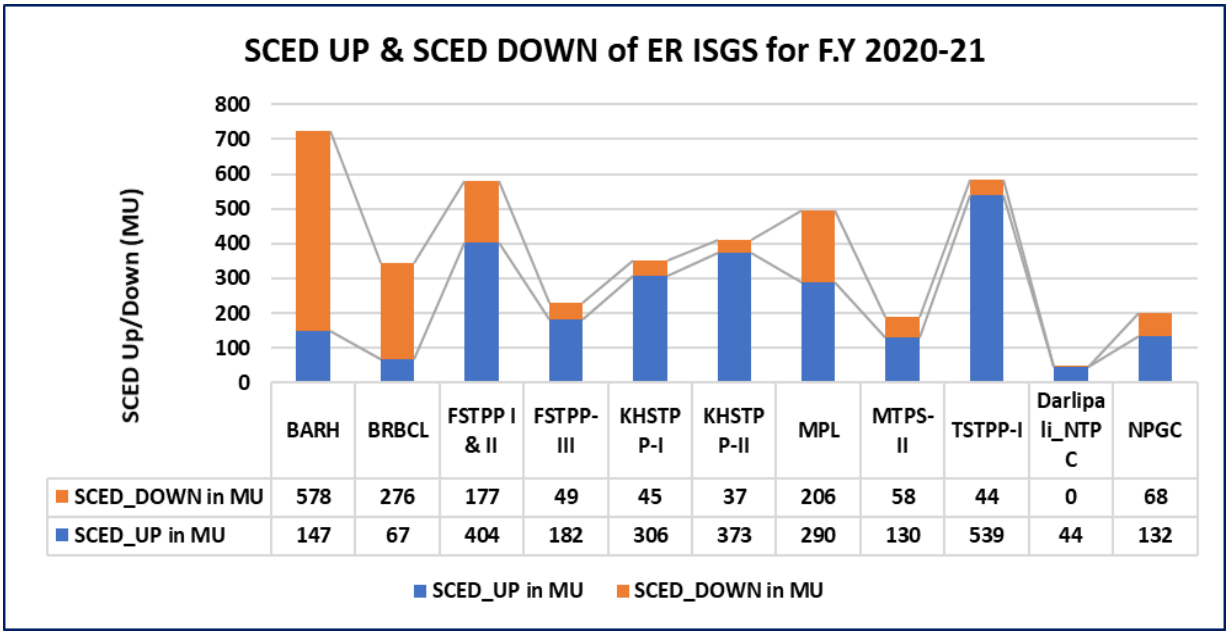


	BARH	BRBCL	Darlipali_NTPC	FSTPP I & II	FSTPP-III	KHSTPP-I	KHSTPP-II	MPL	MTPS-II	NPGC	TSTPP-I
RRAS_DOWN in MU	125.94	63.55	0.34	33.30	7.53	14.69	6.83	37.19	20.25	34.22	33.26
"RRAS_UP in MU"	22.92	14.36	6.28	80.94	2.49	42.59	45.30	72.19	34.55	21.43	58.45

4.14 SECURITY CONSTRAINED ECONOMIC DISPATCH

CERC vide Suo-Motu order dated 31.01.2019 in petition no. 02/SM/2019 has directed Implementation of SCED for the Inter-State Generating Stations on pilot basis w.e.f. 01.04.2019. RPCs and POSOCO have been directed to conduct stakeholder awareness programs for smooth implementation of SCED pan-India. Hon'ble Commission, vide Order in Petition No. 02/SM/2019 (Suo-Motu) dated 31st January, 2019, directed for Pilot on SCED of Inter-State Generating Stations (ISGS) Pan India.

The Central Commission observed that there is an overarching objective to optimize the Scheduling and dispatch of the generation resources and reduce the overall cost of Production of electricity without major structural changes in the existing System/framework. SCED is a desired step in the Indian grid operation towards optimization methodologies.



4.15 FAST RESPONSE ANCILLARY SERVICE

Hon'ble CERC vide its order dated 16.07.2018 in petition No.07/SM/2018/Suo-Motu directed for implementation of FRAS on pilot basis. FRAS pilot service implemented w.e.f. 26.11.2018. Fast Response Ancillary Services (FRAS) is a Frequency Regulation service. FRAS instruction has been given for every discrete 5-min time block starting from 0000 hrs of the day (e.g. 1000-1005, 1005-1010…). Central sector Hydro Generating Station with pondage/Storage facility will participate in FRAS pilot service (i.e. TEESTA-V & RANGIT of Eastern Region).

For implementing Hydro Power as FRAS, all constraints and commitments declared by the hydro stations shall be honoured and the total energy delivered over the day shall be maintained as declared by the hydro station. The total energy dispatched under FRAS shall be squared off by the end of the day. Triggering of FRAS shall be done on the stack prepared based on the balance energy available in the hydro station. The Schedules of the beneficiaries shall not be disturbed in the despatch of FRAS and the Payment for FRAS shall be based on "mileage" basis. The mileage during the day shall be computed as follows:

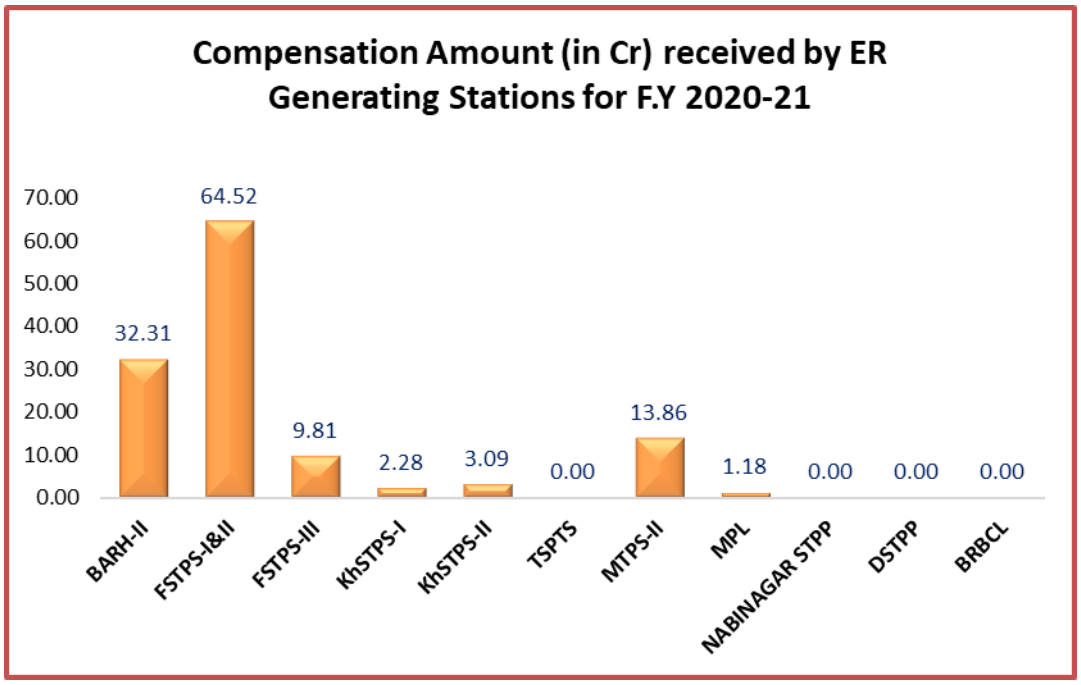
Net energy Enet = S(Eup) - S(Edown) (in MWh) (should be zero over the day)

Mileage Em = S | Eupt |+ S | Edownt| (in MWh)

No additional fixed charge or variable charges shall be paid for providing FRAS support. Existing fixed charges and variable charges shall continue to be paid by the beneficiaries for the normal schedules as per existing practice. The total energy despatched for hydro under FRAS shall be made zero and hence, no energy charges shall be payable to the hydro stations. Incentive shall be paid from the DSM pool on mileage basis at the rate of 10 paisa per kWh for both "up" and "down" regulation provided by Hydro station.

4.16 COMPENSATION FOR DEGRADATION OF HEAT RATE, AUX CONSUMPTION AND SECONDARY FUEL OIL CONSUMPTION, DUE TO PART LOAD OPERATION AND MULTIPLE START/STOP OF UNITS

Central Electricity Regulatory Commission (Indian Electricity Grid Code) (Fourth Amendment) Regulations, 2016, was notified on 6th April 2016. The Amendment Regulations contained provisions relating to Technical Minimum Schedule for operation of Central Generating Stations (CGS) and Inter-State Generating Stations (ISGS), whose tariff is either determined or adopted by the Central Commission. The Amendment Regulations further provided for compensation to Generating Stations for degradation of Heat Rate, Auxiliary Consumption and Secondary Fuel Oil consumption due to part load operation and multiple start-ups of units.



This Compensation Mechanism is applicable to Coal/Gas based Central Generating Stations and Coal/Gas based Inter-State Generating Stations, whose tariff is either determined or adopted by the Central Commission (hereinafter "designated generating stations"). In case of generating stations, whose tariff is neither determined nor adopted by the Commission but which is a regional entity, they shall be required to make appropriate provisions in their PPAs or any other supplementary agreement in the light of the Compensation Mechanism. Compensation received by various generating stations of Eastern Region during the year 2020-21 is furnished in **Annexure- XIX.**

4.17 Automatic Generation Control (AGC):

Automatic generation control (AGC), is a major control function within a utility's energy control centre whose purpose is the tracking of load variations while maintaining system frequency, net tie-line (tie line flow within a specified parameters) interchanges, and optimal generation levels close to scheduled (or specified) values. Automatic generation control (AGC) regulates power generation in response to load changes through local feedback control measurements. Its main objective is to maintain system frequency (through variation in generation) and keep energy balanced within each control area in order to maintain the scheduled net interchanges between control areas.

Hon'ble CERC vide its order dated 6.12.2017 in petition no 79/RC/2017, directed for implementation of Automatic Generation Control. In compliance to CERC's direction, AGC was first implemented in NTPC Barh STPP in Eastern Region on 01st August 2019 and made operational since 23rd August, 2019.Vide order dated 28th August 2019, CERC in Petition No.: 319/RC/2018 directed that all the ISGS Stations whose tariff is determined or adopted by CERC shall be AGC-enabled and the ancillary services including secondary control through AGC shall be implemented.

All thermal ISGS stations with installed capacity of 200 MW and above and all hydro stations having capacity exceeding 25 MW excluding the Run-of-River Hydro Projects irrespective of size of the generating station and whose tariff is determined or adopted by CERC are directed to install equipment at the unit control rooms for transferring the required data for AGC as per the requirement to be notified by NLDC. AGC Settlement account of BARH STPS is at **Annexure-XX.**

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 2020-21, following hydro plants conducted the mock black start exercises.

Sl. No.	Power Plant	Organisation	Date of mock black start
1	Subarnarekha HPS	Jharkhand	12.02.2021
2	Rengali HPS	OHPC	23.11.2020

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 UNDER FREQUENCY RELAY (UFR) OPERATION

In 9th National Power Committee (NPC) meeting held on 22.11.2019, 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 49.4 Hz, Stage-II at 49.2 Hz, Stage-III at 49.0 Hz and Stage-IV at 48.8 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 (49.4 Hz) (MW)	Stage-II (49.2 Hz) (MW)	Stage-III (49.0 Hz) (MW)	Stage-IV (48.8Hz) (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.

5.4 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 have been 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 logbook register maintained in the sub-station.

In 2020-21, due to Covid Pandemic situation in all over India, It was not possible to inspect UFR relays in ER. The inspection of UFRs would be planned and carried out as soon as the Covid situation improves.

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.

In 2020-21, due to Covid Pandemic situation in all over India, It was not possible to inspect UFR relays in ER. The inspection of UFRs would be planned and carried out as soon as the Covid situation improves.

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 upon 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 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. This has been implemented in the constituent's systems of ER since 2015.

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:

1. Bakreswar TPS of WBPDCL – Operational w.e.f. 31.03.2015
2. Tata Power, Haldia – Operational w.e.f. 24.04.2015.
3. Farakka STPS of NTPC – Operational w.e.f. 02.04.2017
4. Bandel TPS of WBPDCL- Operational w.e.f. 15.12.2018
5. CESC as a whole Islanding Scheme, CESC-Operational
6. Chandrapura TPS of DVC – Under Implementation with CTPS-B units
7. IB TPS Islanding Scheme of OPGC- Scheme finalized. to be implemented
8. Kanti Islanding Scheme of KBUNL – Under implementation stage

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 sensing 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 2 nos. of 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 up to 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-Rourkela 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 minimize 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.

Further after Synchronisation of SR grid with NEW grid, it is proposed that in case of single pole or bipole outage or blocking of Talcher-Kolar HVDC sensed at Talcher HVDC terminal, 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.

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.

b) Modification in Talcher-Kolar SPS in ER Region.

Background:

The SPS associated with HVDC Talcher-Kolar Bipole was implemented long back in the year 2003 as per system requirements at that time. The addition of high- capacity AC lines in the corridor parallel to this HVDC link have strengthened the ER-SR &WR-SR corridors for exchange of power to/from southern region (SR). The newly commissioned HVDC Raigarh-Pugalur Pole-I has also been commissioned recently. Presently, in cases of HVDC Talcher-Kolar Pole blocking, SPS as per design operates with load disconnection in SR and generation backing down/outage in ER. In view of strengthening of transmission system as stated above, the scheme was reviewed by NLDC in consultation with RLDC's.

It was proposed that

• GMR and JITPL thermal power plants are radially connected to 765/400 kV Angul pooling station and 765/400 kV Angul station is strongly connected to western region and southern region through765 kV lines. The tripping of HVDC Talcher-Kolar does not cause any constraint in evacuation of GMR and JITPL. Therefore, the SPS for 600 MW generation backing down at thesestations would not be required and the same may be disabled.

• It was observed that 400 kV Talcher-Meramundali D/C Lines are getting heavily loaded (beyond 874 MW) after the tripping of HVDC Talcher-Kolar in some cases. Therefore, the loading of 400 kV Talcher-Meramundali lines may also be included in the SPS logic (SPS 1000 and SPS 450) installed at Talcher STPS, NTPC.

In 175th OCC meeting held on 20.02.2021, the followings were agreed:

- To disable SPS logic for additional 600 MW generation backing down at JITPL and GMR.

- To implement revised SPS for Talcher-Kolar HVDC considering the loading of 400 kV TSTPP-Meramundali D/C line into the SPS logic.

The logic in brief is given below:

- 400 kV Talcher-Meramundali Line current logic would have three Imax settings out of which one will be active depending on the season.
- The Imax current settings have been calculated based on thermal ratings of the lines.
- This Talcher-Meramundali Current logic would be ANDed with existing TalcherKolar HVDC SPS logic.

c) 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 Berhampur – Bheramara line with HVDC (2x500 MW) station at Bheramara (Bangladesh). 400 kV Berhampur is connected with 400 kV Farakka and Sagardighi station through 400 kV Berhampur-Farakka D/C and 400 kV Berhampur-Sagardighi D/C.

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

Sl. no.	Condition	Action
1	400 kV Bus Voltage at Behrampur < 390 kV	Tripping of 125 MVAR Bus Reactor at Behrampur
2	400 kV Bus Voltage at Behrampur < 380 Kv	Automatic Reduction of Behrampur HVDC setpoint to 350 MW with appropriate capacitor switching to maintain voltage at 400 kV Behermara s/s.
3	If Indian Grid Frequency is < 49.5 Hz	Automatic Reduction of Behrampur HVDC setpoint to 350 MW with appropriate capacitor switching to maintain voltage at 400 kV Behermara s/s.
4	If any circuit of 400 kV Beherampur-Behermara trips	Automatic Reduction of Behrampur HVDC setpoint to 350 MW with appropriate capacitor switching to maintain voltage at 400 kV Behermara s/s.
5	If 400 kV Sagardighi-Behrampur D/C and 400 kV Farakka-Bherampur S/C trips (Sending of CB status at Behrampur)	Total HVDC power to be ramped down to 750 MW with appropriate capacitor switching to maintain voltage at 400 kV Behermara s/s.

In order to address low Frequency, low voltage and high line loading issue in Indian Side, SPS has been envisaged to reduce the export quantum to Bangladesh.

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 2020-21

In order to discharge various duties entrusted to ERPC as per Indian Electricity Act, 2003 and IEGC, various meetings were organised during 2020-21 and detail of meetings are given at **Annexure-XXIII**.

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 2020-21 by ERPC are given below:

- Monthly Progress Reports
- Monthly Power Supply Position Reports
- Load Generation Balance Report for the year 2021-22
- Annual Report for the year 2019-20

6.3 CERTIFICATION OF TRANSMISSION AVAILABILITY

In line with CERC order, ERPC Secretariat has certified availability of transmission system for the year 2020-21.

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.

Due to the COVID-19 pandemic prevailing in the country, training/workshop could not be arranged.

CHAPTER-7

IMPORTANT DECISIONS TAKEN IN VARIOUS MEETINGS OF ERPC DURING 2020-21

7.1 Issue: Establishment of State-of-the-Art Unified Centralized Network Management System U-NMS for ISTS and State Utility Communication Network in Eastern Region

CERC notified Communication Regulation which envisages Centralized Supervision System for ISTS Communication.

As per the regulation clause no 7.2 (vii):

"CTU shall be the Nodal Agency for supervision of communication system in respect of inter-State communication system and will implement centralized supervision for quick fault detection and restoration."

In this regard, a Committee was formed in October, 2019 and found that the U-NMS proposal is technically feasible. All Constituents had given their consent for implementation of U-NMS Project for Central Sector as well as for the State Sector/Constituents.

Thereafter, POWERGRID submitted the cost of implementation of UNMS in state sector as per data provided by constituents which is ₹ 97.93 crores for Regional U-NMS and ₹ 2 crores for State sector U-NMS and proposed that estimated cost for Central sector portion to be apportioned between the constituents in PoC mechanism. All constituents agreed to implement the UNMS system within the state along with the Central Sector UNMS project and subsequently Commercial Sub-Committee has given in principle approval of the cost break up of UNMS project as submitted by POWERGRID.

The Cost of Regional U-NMS component i.e. ₹ 97.93 Crs. shall be recovered through tariff as per as per the existing CERC (Sharing of ISTS charges and losses) Regulations, 2020.

In the 43rd TCC Meeting, POWERGRID proposed that the AMC cost will be Rs. 5.63 Cr per annum which includes provision of annual cyber security audit, 24x7 manning for managing the system (in MCC as well as BCC) and availability of engineers from contractor on round the clock basis. POWERGRID further informed that the above price is for 1 yr. of warranty period and 6 years of AMC.

POWERGRID also proposed that since the cost for State Sector UNMS is meager the same may be merged with the cost of Regional U-NMS.

TCC recommended following proposals for approval:

1) Regional U-NMS (Including State sector U-NMS) with a cost of ₹ 99.93 Cr.
2) AMC of UNMS with a cost of Rs. 5.63 Cr per annum for 7 years (1 yr. of warranty period and 6 years beyond warranty period)

Decision:

43rd ERPC approved the above proposal of U-NMS for Eastern Region along with its cost implication as follows:

3) Regional U-NMS (Including State sector U-NMS) with a cost of ₹ 99.93 Cr.
4) AMC of UNMS with a cost of Rs. 5.63 Cr per annum for 7 years (1 yr. of warranty period and 6 years beyond warranty period)

7.2 Issue: Periodic Audit for Communication system in line with CERC regulation & guidelines regarding use of ULDC network for other purposes.

In the 8thTeST Meeting held on 11.03.2021, the Technical Committee submitted the recommendations regarding Periodic Audit for Communication system in line with CERC regulation and Guidelines for utilization of Inter-state OPGW network which are as follows:

Recommendation	Details
Periodic Audit for Communication system in line with CERC regulation	Periodic audit must be carried out in all sub-stations, generating stations, SLDCs, RLDC, RTAMCs etc. in line with CERC Communication regulation-2017. Cyber security audit shall also be conducted out periodically for the Communication System as decided by RPC in line with CERC Communication regulation-2017. The audit shall be conducted by CERT-In certified third-party auditors.
Guidelines for utilization of Inter-state OPGW network.	Any services, other than the listed OT applications, needs permission of ERPC. Further, usage of the Inter-state OPGW network for the purpose of internet access, which is a public network, will have an extremely high security threat to the power operation. 1. SCADA 2. Inter-Control Centre Communication Protocol (ICCP) 3. Phase Measurement Unit 4. Digital Protection used by Substation 5. Travelling Wave Fault Locator 6. Voce Over Intranet Phone 7. EPAX 8. Automatic (Energy) Meter Reading 9. Automatic Gain Control (of Gen. Stations) 10. Video Conferencing (between users) 11. Security Constrained Economic Dispatch 12. Disturbance Recorder relay data for centralize acquisition. 13. ADMS 14. SAMAST 15. UNMS 16. Centralize monitoring of Firewall in all site locations. Note: Any of the above OT system LAN should not be having connection with IT network.

The TeST Committee accepted the recommendation and referred the same to TCC for further approval.

Decision:

TCC accepted the procedure for periodic audit for communication system as well as guidelines for utilization of Inter-state OPGW network. Further, TCC advised all the utilities to follow the guidelines for utilization of Inter-state OPGW network to prevent any interruption in the availability of services.

7.3 Issue: Review of Methodology of Reactive Energy Accounting and Billing

As per ERPC weekly Reactive Charge Statement, Reactive Charges are billed to only those states that have to pay the reactive charges in the Reactive pool account as per the computation while total pay-out to the States from the Reactive Pool is reduced to zero.

This is being done as per the decision taken in the "Meeting of the Group for Fixing Methodology for computation of Reactive Energy on the Inter-state Lines" held on 15.09.2006 at ERPC.

The above methodology needs to be reviewed in line with IEGC and harmonized with other regions.

Subsequently, a committee was formed to review the existing methodology for Reactive Energy accounting.

In 43rd TCC meeting, it was agreed upon to implement the revised methodology for Reactive Energy Accounting as recommended by the committee. The recommendations are as follows:

1. If all the States have to receive from Reactive Pool in any week, receivable amount of the respective State shall be reduced to zero.
2. If payable by States to Reactive Poll is more than or equal to receivable amount by States from Reactive Pool, then settlement will be done as per actual and treatment of any surplus amount shall be done as per relevant CERC Regulations.
3. If payable by States to Reactive pool is less than receivable by States from Reactive Pool, then the total amount payable to the pool shall be apportioned among the States who have to receive from the pool in pro rata basis.
4. If all the States have to pay to Reactive Pool, the total amount received in the pool shall be treated as per guidelines of relevant CERC Regulations.
5. ERPC will issue weekly Reactive Energy charge statement and billing & settlement will be done in the same week. There shall be no carry forward.
6. ERPC shall also issue a statement detailing Var exchange between two States through inter-state tie lines (excluding inter-regional tie lines). The statement shall also reflect the reactive charges as computed. However, payment & settlement of such charges shall not be done from the Reactive pool but shall be done mutually by the respective States. This shall be done as per existing CERC (IEGC) Regulations.
7. This methodology shall be implemented w.e.f. 06.04.2020. Retrospective revision of accounts due to change in methodology, as suggested, shall be done.

Decision:

43rd TCC approved the recommendation and it was decided to implement the methodology from the beginning of next financial year 2021-22 i.e. w.e.f. 05.04.2021.

अध्याय–8

पूर्वी क्षेत्रीय विद्युत समिति में राजभाषा नीति का कार्यान्वयन

वर्ष 2020-21 के दौरान पूर्वी क्षेत्रीय विद्युत समिति में राजभाषा नीति के अनुपालन में निम्नलिखित कार्य किये गए है :

8.1 हिन्दी पत्राचार

- राजभाषा अधिनियम के नियम-5 के अनुपालन में, हिन्दी में प्राप्त पत्रों के उत्तर हिन्दी में ही दिए जाते हैं |

- ओ.सी.सी., प्रोटेक्शन उप समिति, वाणिज्यिक उप-समिति, तकनीकी समन्वय उप-समिति और ई.आर.पी.सी. की बैठकों के कार्यवृत्त एवं कार्यवाही के अग्रेषण पत्र को द्विभाषी रूप में जारी किये गए |

8.2 राजभाषा कार्यान्वयन समिति की बैठकें

राजभाषा नीति के अनुसार वर्ष 2020-21 में राजभाषा कार्यान्वयन समिति की बैठकें प्रत्येक तिमाही में क्रमशः दिनांक 10-08-20, 02-09-20, 16-12-20 तथा 22-02-21, कुल चार बैठकें का आयोजन किया गया था | इन बैठकों में गृह मंत्रालय, राजभाषा विभाग से प्राप्त हिन्दी के प्रगामी प्रयोग से संबंधित तिमाही प्रगति रिपोर्ट की समीक्षा पर चर्चा की गई, कार्यालय में हिंदी के प्रयोग को बढ़ने से संबंधित निर्णय लिए गए,वार्षिक कार्यक्रम को लेकर चर्चा एवं तदनुसार निर्णय लिए गए |

8.3 कार्यशाला का आयोजन

वर्ष 2020-21 में कोरोना काल के कारण केवल एक हिन्दी कार्यशाला आयोजित किया जा सका | कार्यालय में राजभाषा कार्यान्वयन के अनुपालन पर कार्मिकों को हिन्दी में दिन-प्रतिदिन के कार्यालय कार्य करने की झिझक दूर करना और हिन्दी में काम करना आसान बनाने हेतु विभिन्न विषयों पर चर्चा करने के लिए कार्यशाला आयोजित किया जाता है |

8.4 प्रोत्साहन योजना

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

8.5 हिन्दी दिवस / हिन्दी सप्ताह / हिन्दी पखवाड़ा का आयोजन

दिनांक:-14-09-2020 से 18-09-2020 के दौरान इस कार्यालय में हिन्दी सप्ताह मनाया गया | इस अवसर पर विभिन्न प्रकार की प्रतियोगितओं का आयोजन किया गया था जिसमें कार्यालय के सभी अधिकारियों और

कर्मचारियों ने बड़े उत्साह के साथ भाग लिया | सफल प्रतिभागियों को प्रथम, द्वितीय एवं तृतीय पुरस्कार प्रदान किया गया एवं भाग लेने वाले सभी प्रतिभागियों को प्रतिभागिता पुरस्कार प्रदान किया गया |

8.6 राजभाषा कार्यान्वयन से संबंधित अन्य कार्य

- हिन्दी के प्रगामी प्रयोग से संबंधित तिमाही एवं अर्ध-वार्षिक प्रगति रिपोर्ट नियमित रूप से मुख्यालय, 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 के हिन्दी साफ्टवेयरों का इस्तेमाल करके कार्यालय में कंप्यूटर पर सभी अधिकारी एवं कर्मचारी आवश्यकता के अनुसार काम करते हैं |

- वर्ष के दौरान कार्यालय में प्रत्येक तिमाही में सदस्य सचिव की अध्यक्षता में एक कार्यशाला आयोजित किया जाता है। जिसमें कार्यालयों के दैनिक कामकाज में हिंदी के प्रयोग को बढ़ने के बारें में समीक्षा किया गया और कार्यालयों के दैनिक कामकाज में अधिक से अधिक सरल और सहज हिन्दी का प्रयोग के लिए निर्णय लिया गया |

- दिनांक 05-02-2021 को आयोजित हिन्दी कार्यशाला में केन्द्रीय अनुवाद ब्यूरो, के वरिष्ठ हिंदी सलाहकार एवं डी.वी.सी. में उप महाप्रबंधक, श्री नवीन कुमार प्रजापति,जी को “टिप्पण,आलेखन एवं रिपोर्ट लेखन में अनुवाद की भूमिका” विषय पर व्याख्यान हेतु आमंत्रित किया गया था। श्री नवीन कुमार प्रजापति द्वारा उक्त विषय पर बहुमूल्य ज्ञान प्रदान किया गया, उन्होंने power point presentation के माध्यम से टिप्पण ,आलेखन एवं रिपोर्ट लेखन की विधि, नियम एवं कार्यालय में इनका उपयोग तथा महत्त्व स्पष्ट समझाते हुए अनुवाद के आवश्कता पर प्रकाश डाला। उन्होंने कुछ विषयों पर टिप्पण, आलेखन एवं रिपोर्ट लेखन की प्रक्रिया स्पष्ट किया साथ ही बीच–बीच में उपस्थित कार्मिकों से मौखिक रूप से प्रश्न-उत्तर भी किया, जो उपस्थित सभी कार्मिकों के लिए ज्ञानवर्धक रहा।

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 जारी है |

ANNEXURE-I

Manpower Strength of ERPC Secretariat

The status of posts of various grades at ERPC Secretariat (**as on 31st March, 2021)** is given below:

POST	SANCTIONED	FILLED	VACANT
GAZETTED			
Member Secretary	1	1	0
Superintending Engineer/Director	3	3	0
Executive Engineer	4	3	1
Assistant Executive Engineer/AD-I	4	2	2
Assistant Engineer/ AD-II	2	2	0
Private Secretary	1	0	1
NON-GAZETTED			
Draftsman Gr. II	1	0	1
Head Clerk	1	1	0
J. T. O	1	1	0
Stenographer Gr. I	1	0	1
Stenographer Gr. II	1	0	1
Electrician	2	0	2
Upper Division Clerk	3	1	2
Lower Division Clerk	3	1	2
Driver	2	1	1
MTS	6	0	6
TOTAL	**36**	**16**	**20**

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)
01.06.90 to 31.05.91	DVC	Sh. P.K. Sarkar, IAS

Period	Constituent	Name of the Chairmen/Chairpersons
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 15.07.13 16.07.13 to 31.03.14	OPTCL & GRIDCO	Sh. P. K. Jena, IAS Sh. Hemant Sharma, IAS (from 16.07.13)
01.04.14 to 31.03.15 01.04.15 to 05.07.15)	Energy and Power Deptt., Govt.of Sikkim	Sh. P. B. Subba, Principal Chief Engr.-cum-Secretary Shri N. T. Bhutia, Principal Chief Engr.-cum-Secretary (w.e.f. 1.4.15 to 5.7.15)
06.07.15 to 03.01.16 04.01.16 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
01.04.18 to 31.03.19	OPTCL & GRIDCO	Shri Hemant Sharma, IAS
01.04.19 to 31.10.19	Energy and Power Deptt., Govt.of Sikkim	Shri K. B. Kunwar, Principal Chief Engineer-cum-Secretary
01.11.19 to 31.03.20	Energy and Power Deptt., Govt.of Sikkim	Shri A B. Rai, Principal Chief Engineer-cum-Secretary
01.04.20 to 31.03.21	WBSEDCL	Shri Santanu Basu, IAS

ANNEXURE-III

Member Secretaries of Eastern Regional Power Committee (ERPC) & Erstwhile Eastern Regional Electricity Board (EREB) since its Inception

SI.	Name	From	To
1	Sh. Z.S. Haque	1964	1965
2	Sh. G. Mukherjee	1965	1967
3	Sh. B. Choudhury	1971	1977
4	Sh. M.M. Turabi (I/C)	1977	1978
5	Sh. B.C. Ghosh (I/C)	06.03.1978	06.04.1982
6	Sh. U.V. Senoy	08.04.1982	31.08.1982
7	Sh. B.C. Ghosh (I/C)	06.09.1982	12.12.1982
8	Sh. P.K. Kar	13.12.1982	15.10.1985
9	Sh. B.C. Ghosh (I/C)	16.10.1985	01.12.1987
10	Sh. B.C. Ghosh	31.12.1987	09.03.1988
11	Sh. B. Sengupta (I/C)	28.03.1988	26.03.1989
12	Sh. B. Sengupta	27.03.1989	31.05.1993
13	Sh. A. Roy(I/C)	01.06.1993	17.07.1993
14	Dr. S. Mukhopadhyay	18.07.1993	03.08.1995
15	Sh. P. Ray (I/C)	04.08.1995	04.02.1996
16	Sh. S. Santhanam	05.02.1996	16.08.1996
17	Sh. P. Ray (I/C)	17.08.1996	26.11.1997
18	Sh. V.S. Verma	27.11.1997	30.07.1998
19	Sh. P. Ray (I/C)	30.07.1998	06.07.1999
20	Sh. B.K. Mishra	07.07.1999	28.11.2003
21	Sh. R.B. Sharma	27.11.2003	31.01.2005
22	Sh. M.K. Mitra (I/C)	01.02.2005	05.12.2005
23	Sh. M.K. Mitra	06.12.2005	31.03.2006
24	Sh. K. N. Garg (I/C)	01.04.2006	30.04.2006
25	Sh. Raffi-ud-din	01.05.2006	10.09.2006
26	Sh. R. K. Grover	11.09.2006	17.09.2009
27	Sh. A. K. Rampal	18.09.2009	06.09.2011
28	Sh. A. K. Bandyopadhyaya (I/C)	07.09.2011	30.09.2014
29	Sh. A. K. Bandyopadhyaya	01.10.2014	31.10.2017
30	Sh. J. Bandyopadhyay	01.11.2017	22.05.2020
31	Sh. N. S. Mondal	09.09.2020	Contd.

INSTALLED AND EFFECTIVE CAPACITY OF POWER STATIONS
IN THE EASTERN REGION AS ON 31.03.2021

SL. N0.	NAME OF THE POWER SYSTEM/ STATION	INSTALLED CAPACITY (MW)			PRESENT CAPACITY (AFTER DERATION)	EFFECTIVE CAPACITY
		NO. & CAPACITY OF UNITS 31.03.2020	Commissioned(+)/ De-commissioned(-) 2020-21	TOTAL	(MW) AS ON 31.03.2021	(MW) AS ON 31.03.2021
I	**BSPGCL+BSPHCL**					
	THERMAL:					
1	NTPC, BARAUNI	2x110 + 1x250		470	**2x105+1x250**	460
2	NTPC MUZAFFARPUR TPS Stg.I	2x110		220	2x110	220
	SUB TOTAL (THERMAL)	**690**		**690**	**680**	**680**
3	**RES**	341.25	13.66	354.91	354.91	354.91
	GRAND TOTAL (TH+HY) (BSPHCL)	**1031.3**	**13.66**	**1044.91**	**1034.91**	**1034.91**
II	**JUSNL**					
4	TENUGHAT TPS (THERMAL)	2x210		420	2x210	420
5	SUBERNREKHA (HYDRO)	2x65		130	2x65	130
6	RES	46.75	13.66	60.41	60.41	60.41
	GRAND TOTAL (HY+RES) (JUVNL)	**596.75**	**13.66**	**610.41**	**610.41**	**610.41**
III	**D V C**					
	THERMAL :					
7	BOKARO "B"(U#3)	1x210		210	1x210	210
8	CHANDRAPURA (U# 3,7&8)	2x250		500	2x250	500
9	DURGAPUR(U#4)	1x210		210	1x210	210
10	MEJIA(U#1-4, 5-6, 7-8)	4x210+2x250+2x500		2340	4x210+2x250+2x500	2340
11	DURGAPUR STEEL TPS (U#1 & 2))	2x500		1000	2x500	1000
12	KODERMA STPS (U# 1& 2)	2x500		1000	2x500	1000
13	RAGHUNATHPUR(U# 1&2)	2x600		1200	2x600	1200
14	BOKARO "A"(U#1)	500		500	1x500	500
	SUB TOTAL (THERMAL)	**6960**		**6960**	**6960**	**6960**
	HYDRO					
15	MAITHON	2x20+1x23.2		63.2	2x20+1x23.2	63.2
16	PANCHET	2x40		80	2x40	80
17	TILAIYA	2x2		4	2x2	4
	SUB TOTAL(HYDRO)	**147.2**		**147.2**	**147.2**	**147.2**
	GRAND TOTAL (TH+HY) (DVC)	**7107.2**		**7107.2**	**7107.2**	**7107.2**

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 , CTPS U#2(140 MW) on 30.07.2017& CTPS U#3(140 MW) on 19.03.2020 respectively.
DVC, BTPS-B U#1&2(2X210 MW) each decommissioned on 30.07.2017

SL. N0.	NAME OF THE POWER SYSTEM/ STATION	INSTALLED CAPACITY (MW)			PRESENT CAPACITY (AFTER DERATION)	EFFECTIVE CAPACITY
		NO. & CAPACITY OF UNITS 31.03.2020	Commissioned(+)/ De-commissioned(-) 2020-21	TOTAL	(MW) AS ON 31.03.2021	(MW) AS ON 31.03.2021
IV	**ODISHA**					
	THERMAL					
17	NTPC TALCHER TPS	4x62.5+2x110		470	**4x60**+2x110	460
18	IB TPS STG-I	2x210		420	2x210	420
	IB TPS STG-II	2x660		1320	2x660	1320
	SUB TOTAL (THERMAL)	**2210**		**2210**	**2200**	**2200**
	HYDRO ,OHPC					
19	BURLA (Hirakud-I)	2x49.5+2x32+3x37.5		275.5	2x49.5+2x32+3x37.5	275.5
20	CHIPLIMA (Hirakud-II)	3x24		72	3x24	72
21	BALIMELA	6x60+2x75		510	6x60+2x75	510
22	RENGALI	5x50		250	5x50	250
23	UPPER KOLAB	4x80		320	4x80	320
24	INDRAVATI	4x150		600	4x150	600
25	MACHKUND (Odisha Share)	57.38		57.38	57.38	57.38
	SUB TOTAL (HYDRO)	**2084.88**		**2084.88**	**2084.88**	**2084.88**
	RES(Solar)	**511.21**	28.36	539.57	**539.57**	539.57
	GRAND TOTAL (TH+HY+RES) (ODIS	**4806.09**	**28.36**	**4834.5**	**4824.5**	**4824.5**
V	**WBPDCL**					
	THERMAL					
26	BANDEL @	2x82.5+1x215		380	**2x60**+1x215	335
27	SANTALDIH (U#5&6)	2x250		500	2x250	500
28	KOLAGHAT	6x210		1260	6x210	1260
29	BAKRESHWAR	5x210		1050	5x210	1050
30	SAGARDIGHI (U# 1,2,3&4)	2x300+2x500		1600	2x300+2x500	1600
31	DPPS (U#6,7,8)	1x300+1x250		550	1x300+1x250	550
	TOTAL THERMAL(WBPDCL)	**5340**		**5340**	**5295**	**5295**
VI	**WBSEDCL**					
32	JALDHAKA-I	3x9		27	3x9	27
33	JALDHAKA-II	2x4		8	2x4	8
34	RAMAM HYDEL	4x12.73		50.92	4x12.73	50.92
35	TISTA CANAL FALLS	9x7.5		67.5	9x7.5	67.5
36	PURULIA PUMP STORAGE	4x225		900	4x225	900
	TOTAL HYDRO (WBSEDCL)	**1053.42**		**1053.42**	**1053.42**	**1053.42**
	RES	527.29	-26.53	500.76	500.76	500.76
	GRAND TOTAL (TH+HY+RES) (WB)	**6920.71**		**6894.18**	**6849.18**	**6849.18**

WBPDCL, Bandel TPS U#3&4 (2X82.5 MW) each decommissioned in the month of April-2018

SL. NO.	NAME OF THE POWER SYSTEM/ STATION	INSTALLED CAPACITY (MW)			PRESENT CAPACITY (AFTER DERATION)	EFFECTIVE CAPACITY
		NO & CAPACITY OF UNITS 31.03.2020	Commissioned(+)/ De-commissioned(-) 2020-21	TOTAL	(MW) AS ON 31.03.2021	(MW) AS ON 31.03.2021
VII	**CESC THERMAL**					
37	SOUTHERN	2x67.5		135	135	135
40	TITAGARH	4x60		240	240	240
41	BUDGE BUDGE	3x250		750	750	750
	TOTAL (CESC)	**1125**		**1125**	**1125**	**1125**
42	**HALDIA ENERGY LTD. (HEL)(2X300 MW)**	600		**600**	600	**600**
IX	**SIKKIM**					
43	**RES**	**52.18**		**52.18**	**52.18**	**52.18**
	TOTAL (SIKKIM)	**52.18**		**52.18**	**52.18**	**52.18**
X	**NTPC**					
44	FARAKKA STPS - I&II	3x200+2x500		1600	3x200+2x500	1600
45	FARAKKA STPS - III (U# 6)	1x500		500	1x500	500
46	KAHALGAON STPS - I&II	4x210+3x500		2340	4x210+3x500	2340
47	TALCHER STPS - I	2x500		1000	2x500	1000
48	BARH (U# 4&5)	2x660		1320	2x660	1320
49	MTPS Stg-II	2X195		390	2X195	390
50	BRBCL,Nabi Nagar TPS	3X250		750	3X250	750
51	NPGCL,NSTPP	1x660		660	1X660	660
52	NTPC, Darlipali STPP	1x800		800	1X800	800
	TOTAL (NTPC)	**9360**		**9360**	**9360**	**9360**
	NTPC TALCHER SOLAR	**10**	**0**	**10**	**10**	**10**
XI	**NHPC**					
51	RANGIT HPS	3x20		60	3x20	60
52	TEESTA HPS	3x170		510	3x170	510
53	TLDP-III*	4x33		132	4x33	132
54	TLDP-IV*	4x40		160	4x40	160
	TOTAL	**862**		**862**	**862**	**862**
XII	**IPP**					
55	MPL (Thermal U#1,2)	2x525		1050	2x525	1050
56	APNRL (Thermal U# 1,2)	2x270		540	2x270	540
57	GMR (Thermal U# 1&2)	2x350		700	2x350	700
58	JITPL(Thermal U# 1,2)	2x600		1200	2x600	1200
	TOTAL IPP (THERMAL)	**3490**		**3490**	**3490**	**3490**
59	CHUZACHEN (Hydro U#1,2)	2x55		110	2x55	110
60	JORETHANG(Hydro U#1,2)	2x48		96	2x48	96
61	TEESTA URJA St III (6x200)	6x200		1200	6x200	1200
62	DICKCHU HEP(2x 48)	2x48		96	2x48	96
63	TASHIDING(2x 48.5)	2x48.5		97	2x48.5	97
	TOTAL IPP (HYDRO)	**1599**		**1599**	**1599**	**1599**
XIV	**BHUTAN IMPORT ****					
65	CHPS	4x90		360	4x90	270
66	KURICHHU HPS	4x15		60	4x15	60
67	TALA HPS	6x170		1020	6x170	1020
68	DAGHACHU	2x63		126	2x63	126
69	MANGDECHHU HEP	4x180		720	4x180	720
	TOTAL BHUTAN IMPORT	**1566**		**2286**	**2286**	**2196**
XV	**EASTERN REGION(Excluding Bhutan import)**					
	THERMAL	**30195**		**30195**	**30130**	**30130**
	HYDRO	**5877**		**5877**	**5877**	**5877**
	SOLAR (RES)	**1489**	**29**	**1518**	**1518**	**1518**
	ER GRAND TOTAL (Excl. Bhutan)	**37561**	**29**	**37590**	**37525**	**37525**

*100% power of TLDP-III & IV under NHPC is allocated for West Bengal.

** Allocated import by ER from Bhutan (90 MW of Chukha power is for own consumption of Bhutan & 15% of Tala power allocated to NR)

TSTPS Stage-II (4x500 MW) of NTPC though geographically situated in Orissa but it is meant for SR, hence not considered for I.C. of ER.

ANNEXURE-IV B

New Thermal Units Test Synchronisation/Operation during the year 2020-21

State	Project Name	Implementing Agency	Unit No.	Capacity (MW)	Expected date of Synchronisation	Date of Test Synchronisation	Remarks
Bihar	New Nabi Nagar STPP (NPGC)	Joint Venture of NTPC and Bihar	U-2	660	2021-22	March, 2021	COD is yet to be declared
	Barh-St-I	NTPC	U-1	660	2021-22	27.09.2020	COD is yet to be declared
	Barauni TPP	NTPC	U-9	250	2021-22	12.01.2021	COD is yet to be declared
Odisha	Darlipalli STPP	NTPC	U-2	800	2021-22	March, 2021	COD is yet to be declared

New Transmission Elements Commissioned During 2020-21

A. TRANSMISSION LINES ADDITION DURING THE YEAR 2020-21

SI. No.	Name of the Lines	VOLTAGE (kV)	OWNER	Date of Commissioning
1	400 kV Baharampur-Bheramara Ckt-III	400	PGCIL	06.05.2020
2	400 kV Baharampur-Bheramara Ckt-IV	400	PGCIL	07.05.2020
3	400 kV Gaya-NPGC Ckt-I (Modified)	400	PGCIL	24.06.2020
4	400 kV Gaya-NPGC Ckt-II (Modified)	400	PGCIL	24.06.2020
5	400 kV Rajarhat-FSTPP	400	PGCIL	20.06.2020
6	400 kV Rajarhat Gokarna-I	400	PGCIL	12.07.2020
7	400 kV Rajarhat-FSTPP-I	400	PGCIL	12.07.2020
8	220 kV Purnea-Khagaria-LILO	220	BSPTCL	28.07.2020
9	400 kV New Bolangir-Bolangir PGCIL Ckt-II	400	GRIDCO	30.07.2020
10	220 kV Daltonganj-Garhwa-I	220	JUVNL	16.08.2020
11	220 kV Daltonganj-Garhwa-II	220	JUVNL	16.08.2020
12	400 kV Sagardighi-Gokarna-I	400	WBSETCL	27.10.2020
13	400 kV Sagardighi-Gokarna-II	400	WBSETCL	28.10.2020
14	400 kV Muzaffarpur-Dhalkebar-I	400	CBTP	11.11.2020
15	400 kV Muzaffarpur-Dhalkebar-II	400	CBTP	11.11.2020
16	220 kV Arrah(PG)-Dumrao New-I	220	BSPTCL	11.12.2020
17	220 kV Arrah(PG)-Dumrao New-II	220	BSPTCL	11.12.2020
18	220 kV Nadokhar (BSPTCL)-Dumrao New-I	220	BSPTCL	10.12.2020
19	220 kV Nadokhar (BSPTCL)-Dumrao New-II	220	BSPTCL	11.12.2020
20	400 kV New Duburi-TSL-I	400	OPTCL	19.01.2021
21	220 kV Subhasgram-Baruipur D/C	220	WBSETCL	28.01.2021
22	400 kV Medinipur-Chanditala TL-I	400	PMJTL	05.02.2021
23	400 kV Medinipur-Chanditala TL-II	400	PMJTL	05.02.2021
24	400 kV Medinipur-Kharagpur TL-I	400	PMJTL	05.02.2021
25	400 kV Medinipur-Kharagpur TL-II	400	PMJTL	05.02.2021
26	765 kV New Ranchi-Medinipur TL-II	765	PMJTL	07.02.2021
27	220 kV Chandauti-Sonenagar-II	220	PMTL	19.03.2021
28	400 kV Rangpo-Binaguri D/C	400	PGCIL	24.03.2021
29	400 kV Alipurduar(PG)-Jigmelling-I	400	PGCIL	26.03.2021
30	400 kV Alipurduar(PG)-Jigmelling-II	400	PGCIL	26.03.2021
31	220 kV Gaya-Chandauti-I	220	PMTL	27.03.2021
32	220 kV Rongnichu-Rangpo-I	220	MBPCL	28.03.2021
33	220 kV Rongnichu-Rangpo-II	220	MBPCL	28.03.2021
34	220 kV Gaya-Chandauti-II	220	PMTL	29.03.2021
35	400 kV Sitamarhi-Darbhanga(DMTCL)-I	400	PMTL	31.03.2021

ANNEXURE-IV C

New Transmission Elements Commissioned During 2020-21

B. Substations /ATRs/Reactors addition During the Year 2020-21

SI. No.	Substations/ATRs	Volatge Level (kV)	Utility	Date of Commissioning
1	400/220 kV, 500 MVA ICT-III at Maithon (PG)	400	PGCIL	29.07.2020
2	400/220 kV, 500 MVA ICT-III at Malda	400	PGCIL	29.03.2021
3	220/132 kV, 150 MVA ICT-I at Godda	220	JSUNL	11.05.2020
4	220/132 kV, 150 MVA ICT-II at Godda	220	JSUNL	11.05.2020
5	220/132 kV, 200 MVA ICT-I at Chandauti	220	PMTL	05.03.2021
6	220/132 kV, 200 MVA ICT-III at Chandauti	220	PMTL	05.03.2021

SI. No.	Substations/Reactors	Volatge Level (kV)	Utility	Date of Commissioning
1	125 MVAR 400kV Bus Reactor-1 at Chandauti	400	PMTL	01.03.2021
2	125 MVAR 400kV Bus Reactor-2 at Chandauti	400	PMTL	01.03.2021
3	125 MVAR 400kV Bus reactor-2 at Sitamarhi	400	PMTL	31.03.2021

SUMMARY

1. Transformation Capacity (in MVA)

Total Transformation Capacity added at 400/220 kV	1000 MVA
Total Transformation Capacity added at 220/132 kV	700 MVA
Total	**1700 MVA**

2. Total Reactor capacity added at 400 kV level **375 MVAr**

ANNEXURE-V

CONSTITUENT-WISE PERFORMANCE DATA DURING 2020-21

SYSTEM	Gross Generation(MU)				Auxiliary power Consumption(MU)				Net Generation (MU)				Import from Captive (MU	Net Exchang Import(+) Export(-)	Energy Consum-ption(MU)	Net Peak DEMAND MET (MW)
	HYDRO	Thermal	RES (Hy+Solar)	Total	HYDRO	Thermal	RES (Hy+Solar)	Total	HYDRO	Thermal	RES (Hy+Solar)	Total				
BSPHCL	0.0	1626.2	334.9	1961.1	0.0	214.6	0.00	214.6	0.0	1411.6	334.9	1746.5	0.0	32863.42	34610	5936
JUSNL	50.0	2238.0	0.0	2288.0	0.0	265.2	0.00	265.2	50.0	1972.8	0.0	2022.8	538.1	7250.76	9812	1527
DVC	376.8	38038.9	0.0	38415.7	1.4	2620.6	0.00	2622.0	375.4	35418.3	0.0	35793.7	154.9	-14580.47	21368	3173
ODISHA(OPGC+OHPC+TTPS)	6496.2	12037.7	601.4	19135.3	55.3	1104.1	0.00	1159.4	6440.9	10933.6	601.4	17975.9	8636.9	3298.08	29911	4984
WBPDCL+WBSEDCL	1793.7	26665.3	155.7	28614.7	0.0	2309.9	0.00	2309.9	1793.7	24355.4	155.7	26304.8	1704.4	13806.18	41815	7291
CESC	0.0	5512.6	0.0	5512.6	0.0	427.9	0.00	427.9	0.0	5084.7	0.0	5084.7	0.0	4706.96	9792	1853
Haldia Energy limited	0.0	4224.9	0.0	4224.9	0.0	320.7	0.00	320.7	0.0	3904.2	0.0	3904.2	0.0	-3904.20		
SIKKIM	0.0	0.0	16.0	16.0	0.0	0.0	0.00	0.0	0.0	0.0	16.0	16.0	0.0	539.72	556	120
NTPC	0.0	56389.0	13.4	56402.4	0.0	4199.3	0.00	4199.3	0.0	52189.7	13.4	52203.1	0.0	-52203.10		
MPL	0.0	6383.2	0.0	6383.2	0.0	392.0	0.00	392.0	0.0	5991.2	0.0	5991.2	0.0	-5991.20		
APNRL	0.0	3034.3	0.0	3034.3	0.0	228.1	0.00	228.1	0.0	2806.2	0.0	2806.2	0.0	-2806.20		
GMR	0.0	4819.7	0.0	4819.7	0.0	312.7	0.00	312.7	0.0	4507.0	0.0	4507.0	0.0	-4507.00		
JITPL	0.0	5936.3	0.0	5936.3	0.0	366.2	0.00	366.2	0.0	5570.1	0.0	5570.1	0.0	-5570.10		
NHPC (Inc. TLDP=1241 MU)	4332.0	0.0	0.0	4332.0	0.0	0.0	0.00	0.0	4332.0	0.0	0.0	4332.0	0.0	-4332.00		
CHPC(Birpara Receipt)	1979.3	0.0	0.0	1979.3	0.0	0.0	0.00	0.0	1979.3	0.0	0.0	1979.3	0.0	-1979.30		
KHPS	402.9	0.0	0.0	402.9	0.0	0.0	0.00	0.0	402.9	0.0	0.0	402.9	0.0	-402.90		
THPS	3182.7	0.0	0.0	3182.7	0.0	0.0	0.00	0.0	3182.7	0.0	0.0	3182.7	0.0	-3182.70		
DAGACHU HPS	502.1	0.0	0.0	502.1	0.0	0.0	0.00	0.0	502.1	0.0	0.0	502.1	0.0	-502.10		
Mangdechhu HEP	3184.8	0.0	0.0	3184.8	0.0	0.0		0.0	3184.8	0.0	0.0	3184.8	0.0	-3184.80		
CHUZACHEN HPS	482.7	0.0	0.0	482.7	0.0	0.0	0.00	0.0	482.7	0.0	0.0	482.7	0.0	-482.70		
JORTHANG HPS	397.6	0.0	0.0	397.6	0.0	0.0	0.00	0.0	397.6	0.0	0.0	397.6	0.0	-397.60		
TEESTA-III HPS	5997.9	0.0	0.0	5997.9	0.0	0.0	0.00	0.0	5997.9	0.0	0.0	5997.9	0.0	-5997.90		
DIKCHU HPS	464.8	0.0	0.0	464.8	0.0	0.0	0.00	0.0	464.8	0.0	0.0	464.8	0.0	-464.80		
TASHIDING HPS	368.5	0.0	0.0	368.5	0.0	0.0	0.00	0.0	368.5	0.0	0.0	368.5	0.00	-368.50		
Total Drawal by NPGCL,Barh STg-I,DSTPP & OPGC and consumption at HVDC Sasaram& Alipurduar.														157.83	157.83	
Total	30012.0	166906.1	1121.4	198039.5	56.7	12761.3	0.0	12818.0	29955.3	154144.8	1121.4	185221.5	11034.3	-48234.62	148022	24016

		BSPHCL	JUSNL	DVC	ODISHA	WBSEDCL	CESC	SIKKIM	REGION
ANNUAL LOAD FACTOR:		66.56	73.35	76.88	68.51	65.47	60.32	52.92	70.36

Note: 1. BSPHCL exchange inclusive of the drawal of Nepal from BSPHCL network .
2. Sikkim's generarion figure is estimated
3. Net Exchange of Energy is inclusive of Transmission loss at the periphery of respectives system.
4. All the figures considered above for operational data,need not to be used for any commercial purposes

वर्ष 2020-21 के दौरान राज्यवार मासिक वास्तविक अधिकतम मांग (मे.वा. में)
CONSTITUENT WISE MONTHLY PEAK DEMAND MET DURING 2020-21

(All figures in Net MW)

MONTH	BSPHCL Peak Demand Met	JUSNL Peak Demand Met	DVC Peak Demand Met	ODISHA Peak Demand Met	WBSEDCL Peak Demand Met	CESC Peak Demand Met	SIKKIM Peak Demand Met	ER Peak Demand Met	% Growth w.r.t 2019-20
Apr-20	4725	1291	1417	3636	5937	1325	94	18093	-19.15
May-20	5330	1396	2462	4024	6014	1539	88	20166	-11.48
Jun-20	5718	1368	2715	4293	6626	1728	84	21832	-4.28
Jul-20	5774	1426	2918	4474	6754	1804	86	22643	-2.21
Aug-20	5915	1470	2801	4476	6950	1744	77	22192	-5.15
Sep-20	5936	1522	2933	4575	7015	1744	91	23561	1.88
Oct-20	5783	1513	3173	4973	7044	1806	96	23374	7.68
Nov-20	4590	1422	2884	4609	5788	1628	110	20406	6.21
Dec-20	4856	1500	2925	4224	5140	1481	115	19546	5.04
Jan-21	5153	1501	3141	4306	5600	1269	119	20496	9.52
Feb-21	5009	1416	3084	4803	5781	1377	117	20643	8.87
Mar-21	5452	1527	3129	4984	7291	1853	120	24016	28.65
MAXIMUM	**5936**	**1527**	**3173**	**4984**	**7291**	**1853**	**120**	**24016**	**2.64**
MINIMUM	**4590**	**1291**	**1417**	**3636**	**5140**	**1269**	**77**	**18093**	**-2.77**
AVERAGE	**5353**	**1446**	**2799**	**4448**	**6328**	**1608**	**100**	**21414**	**1.36**
% Avg.Peak Growth wrt 2019-20	**7.27**	**8.90**	**-2.55**	**-1.21**	**1.04**	**-10.83**	**0.25**	**1.36**	**82.99**

वर्ष 2019-20 के दौरान राज्यवार मासिक वास्तविक अधिकतम मांग (मे.वा. में)
CONSTITUENT WISE MONTHLY PEAK DEMAND MET DURING 2019-20

(All figures in Net MW)

MONTH	BSPHCL Peak Demand Met	JUSNL Peak Demand Met	DVC Peak Demand Met	ODISHA Peak Demand Met	WBSEDCL Peak Demand Met	CESC Peak Demand Met	SIKKIM Peak Demand Met	ER Peak Demand Met
Apr-19	5155	1325	3014	5140	6913	2124	98	22378
May-19	5326	1389	2963	4606	7104	2312	93	22781
Jun-19	5483	1362	2950	4949	7169	2329	89	22808
Jul-19	5433	1323	2871	4861	7269	2131	85	23154
Aug-19	5748	1316	2848	4856	7091	1940	90	23398
Sep-19	5789	1328	2868	5292	7117	1876	93	23126
Oct-19	5020	1277	2831	4656	6597	1810	96	21706
Nov-19	4323	1280	2807	4026	5257	1621	102	19212
Dec-19	4614	1356	2848	4198	4754	1359	111	18608
Jan-20	4571	1373	2979	3605	5064	1266	115	18714
Feb-20	4280	1331	2973	4017	5177	1345	114	18962
Mar-20	4146	1274	2509	3824	5650	1528	108	18668
MAXIMUM	**5789**	**1389**	**3014**	**5292**	**7269**	**2329**	**115**	**23398**
MINIMUM	**4146**	**1274**	**2509**	**3605**	**4754**	**1266**	**85**	**18608**
AVERAGE	**4991**	**1328**	**2872**	**4503**	**6264**	**1803**	**100**	**21126**
% Avg.Peak Growth wrt 2018-19	**7.87**	**5.50**	**-0.65**	**-3.14**	**-3.51**	**1.95**	**6.04**	**0.74**

वर्ष 2018-19 के दौरान राज्यवार मासिक वास्तविक अधिकतम मांग (मे.वा. में)
CONSTITUENT WISE MONTHLY PEAK DEMAND MET DURING 2018-19

(All figures in Net MW)

MONTH	BSPHCL Peak Demand Met	JUSNL Peak Demand Met	DVC Peak Demand Met	ODISHA Peak Demand Met	WBSEDCL Peak Demand Met	CESC Peak Demand Met	DPL Peak Demand Met	SIKKIM Peak Demand Met	ER Peak Demand Met
Apr-18	4463	1222	2877	4358	6546	1917	264	90	21058
May-18	4790	1279	2890	4974	6533	2063	283	88	21902
Jun-18	4851	1222	2901	4684	6449	2120	287	83	22080
Jul-18	4931	1245	2874	4526	7009	1943	288	81	21790
Aug-18	4876	1287	2827	5434	6643	1832	275	85	22580
Sep-18	4992	1250	2764	4936	6759	1932	273	85	22286
Oct-18	5084	1247	2837	5219	6809	1923	278	93	22733
Nov-18	4425	1289	2837	4516	5627	1758	273	101	20322
Dec-18	4151	1291	2957	4042	4688	1346	289	106	18023
Jan-19	4249	1260	2871	4198	5259	1292		106	18702
Feb-19	4216	1264	3098	4264	5611	1439		104	18921
Mar-19	4489	1248	2954	4632	6618	1662		104	21245
MAXIMUM	**5084**	**1291**	**3098**	**5434**	**7009**	**2120**	**289**	**106**	**22733**
MINIMUM	**4151**	**1222**	**2764**	**4042**	**4688**	**1292**	**264**	**81**	**18023**
AVERAGE	**4626**	**1259**	**2891**	**4649**	**6213**	**1769**	**279**	**94**	**20970**
% Avg. Growth wrt 2017-18	**10.56**	**2.19**	**1.20**	**9.31**	**7.19**	**0.02**	**3.90**	**1.62**	**9.36**

From 01.01.2019 DPL generating capacity is taken over by WBPDCL where as distribution is taken over by WBSEDCL

वर्ष 2020-21 के दौरान राज्यवार मासिक वास्तविक अधिकतम मांग (मे.वा. में)

Statewise Monthly Actual Peak Demand in MW during 2020-21

(Ex-Bus Figs)

महिना / Month	States / Actual / UR	BIHAR	JHARKHAND	DVC	ODISHA	WBSEDCL	CESC	SIKKIM	EASTERN REGION
		1	2	3	4	5	6	7	8
अप्रैल / Apr-20	Actual	4725	1291	1417	3636	5937	1325	94	18093
	Unrestricted	4725	1292	1417	3636	5942	1325	94	18302
मई / May-20	Actual	5330	1396	2462	4024	6014	1539	88	20166
	Unrestricted	5332	1397	2462	4024	6023	1540	88	20306
जून / June-20	Actual	5718	1368	2715	4293	6626	1728	84	21832
	Unrestricted	5721	1370	2715	4297	6639	1732	84	21989
जुलाई / July-20	Actual	5774	1426	2918	4474	6754	1804	86	22643
	Unrestricted	5913	1431	2925	4480	6782	1804	86	22735
अगस्त / Aug-20	Actual	5915	1470	2801	4476	6950	1744	77	22192
	Unrestricted	5995	1643	2805	4493	6966	1746	78	22399
सितंबर / Sep-20	Actual	5936	1522	2933	4575	7015	1744	91	23561
	Unrestricted	5973	1619	2934	4582	7031	1744	91	23617
अक्तूबर / Oct-20	Actual	5783	1513	3173	4973	7044	1806	96	23374
	Unrestricted	5783	1644	3173	4984	7049	1807	96	23374
नवम्बर / Nov-20	Actual	4590	1422	2884	4609	5788	1628	110	20406
	Unrestricted	4590	1454	2884	4609	5788	1632	110	20465
दिसम्बर / Dec-20	Actual	4856	1500	2925	4224	5140	1481	115	19546
	Unrestricted	5060	1595	2925	4226	5147	1481	115	19696
जनवरी / Jan-21	Actual	5153	1501	3141	4306	5600	1269	119	20496
	Unrestricted	5231	1651	3141	4310	5600	1269	119	20703
फरवरी / Feb-21	Actual	5009	1416	3084	4803	5781	1377	117	20643
	Unrestricted	5009	1632	3084	4819	5782	1380	117	20854
मार्च / March-21	Actual	5452	1527	3129	4984	7291	1853	120	24016
	Unrestricted	5679	1639	3129	4984	7291	1856	120	24016

वर्ष 2020-21 में विद्युत की राज्यवार मासिक उपभोग (मि.यू. में)

Constituent wise net monthly energy consumption during 2020-21										(All Figures in Net MU)	
MONTH	BSPHCL	JUSNL	DVC (Own)	ODISHA	WBSEDCL (Own)	CESC	WEST BENGAL (Total)	SIKKIM	Eastern Region (Total)	Avg. Consumption (MU) Per day	% Growth w.r.t 2019-20
Apr-20	2358	683	857	2081	2931	663	3594	43	9626	321	-25.2
May-20	2793	746	1424	2376	2917	720	3637	42	11024	356	-20.9
Jun-20	3042	776	1753	2484	3659	909	4568	42	12675	423	-8.4
Jul-20	3331	837	1892	2722	4067	979	5046	41	13878	448	-0.8
Aug-20	*3440*	*853*	*1894*	*2632*	*4083*	*934*	5017	*36*	13887	448	-2.9
Sep-20	3355	877	1876	2756	4064	989	5053	41	13977	466	4.4
Oct-20	3334	905	1942	2755	3950	983	4933	43	13928	449	14.6
Nov-20	2251	788	1854	2257	2814	734	3548	47	10757	359	3.9
Dec-20	2509	852	1948	2252	2905	658	3563	58	11199	361	6.6
Jan-21	2791	857	2039	2342	3188	656	3844	59	11956	386	10.2
Feb-21	2459	760	1831	2290	3050	629	3679	52	11083	396	10.2
Mar-21	*2948*	*880*	*2059*	*2963*	*4187*	*938*	5125	*53*	14032	453	33.8
TOTAL	34610	9812	21368	29911	41815	9792	51607	556	148022	406	0.9
AVERAGE	2884	818	1781	2493	3485	816	4301	46	12335	405	
MAXIMUM	3440	905	2059	2963	4187	989	5125	59	14032	466	
MINIMUM	2251	683	857	2081	2814	629	3548	36	9626	321	
% Growth wrt 2019-20	*7.94*	*9.27*	*-4.48*	*0.63*	*-1.07*	*-11.13*	*-3.15*	*-1.44*	*0.63*		
Per day Consumption	95	27	58	82	114	27	141	2	404		

वर्ष 2019-20 में विद्युत की राज्यवार मासिक उपभोग (मि.यू. में)

Constituent wise net monthly energy consumption during 2019-20									(All Figures in Net MU)	
MONTH	BSPHCL	JUSNL	DVC (Own)	ODISHA	WBSEDCL (Own)	CESC	WEST BENGAL (Total)	SIKKIM	Eastern Region (Total)	Avg. Consumption (MU) Per day
Apr-19	2621	715	1942	2719	3801	1017	4817	43	12862	429
May-19	3132	818	2015	2539	4177	1206	5382	44	13943	450
Jun-19	3104	768	1924	2668	4174	1143	5317	43	13843	461
Jul-19	2918	750	1954	2852	4310	1161	5471	41	13992	451
Aug-19	*3383*	*758*	*1875*	*2924*	*4257*	*1060*	5317	*44*	*14307*	462
Sep-19	2988	743	1797	2836	3958	1022	4980	43	13384	446
Oct-19	2663	730	1855	2495	3436	924	4359	43	12149	392
Nov-19	2189	724	1793	2111	2723	754	3477	48	10348	345
Dec-19	2195	767	1872	2205	2718	684	3403	57	10506	339
Jan-20	2494	788	1933	2072	2822	673	3496	58	10846	350
Feb-20	2185	715	1829	2086	2886	649	3535	53	10419	359
Mar-20	*2194*	*707*	*1583*	*2217*	*3007*	*724*	*3731*	*50*	*10490*	*338*
TOTAL	32066	8982	22372	29724	42268	11018	53286	565	147090	402
AVERAGE	2672	748	1864	2477	3522	918	4441	47	12258	402
MAXIMUM	3383	818	2015	2924	4310	1206	5471	58	14307	462
MINIMUM	2185	707	1583	2072	2718	649	3403	41	10348	338
% Growth wrt 18-19	*5.95*	*4.44*	*-0.21*	*-7.03*	*2.74*	*2.74*	*2.74*	*4.32*	*0.91*	
Per day Consumption	88	25	61	81	115	30	146	2	402	

वर्ष 2018-19 में विद्युत की राज्यवार मासिक उपभोग (मि.यू. में)

Constituent wise net monthly energy consumption during 2018-19										(All Figures in Net MU)	
MONTH	BSPHCL	JUSNL	DVC (Own)	ODISHA	WBSEDCL (Own)	DPL	CESC	WEST BENGAL (Total)	SIKKIM	Eastern Region (Total)	Avg. Consumption (MU) Per day
Apr-18	2462	680	1841	2372	3277	177	955	4409	45	11809	394
May-18	2682	732	1923	2888	3503	192	1071	4766	43	13036	421
Jun-18	2743	702	1879	2847	3655	190	1064	4909	41	13123	437
Jul-18	2821	722	1931	2635	3802	192	1055	5050	42	13204	426
Aug-18	2898	746	1853	3163	3907	181	1044	5132	40	13837	446
Sep-18	2843	733	1750	2932	3710	176	1027	4912	39	13216	441
Oct-18	2694	730	1838	3223	3347	178	944	4470	44	13009	420
Nov-18	2218	721	1823	2662	2638	178	761	3578	46	11058	369
Dec-18	2223	727	1904	2268	2501	187	676	3364	53	10556	341
Jan-19	2347	749	1966	2259	2956		667	3623	53	11009	355
Feb-19	1987	642	1740	2111	2810		637	3447	47	9986	357
Mar-19	2348	716	1972	2615	3384		823	4207	49	11917	384
TOTAL	30265	8600	22419	31973	39490	1650	10725	51866	542	145761	399
AVERAGE	2522	717	1868	2664	3291	183	894	4322	45	12147	399
MAXIMUM	2898	749	1972	3223	3907	192	1071	5132	53	13837	446
MINIMUM	1987	642	1740	2111	2501	176	637	3364	39	9986	341
% Growth wrt 17-18	10.64	1.28	5.11	9.13	3.35	9.66	-1.45	1.50	5.66	5.54	
Per day Consumption	83	24	61	88	108	6	29	142	1	399	

From 01.01.2019 DPL generating capacity is taken over by WBPDCL where as distribution is taken over by WBSEDCL

वर्ष 2020-21 में विद्युत की राज्यवार मासिक आवश्यकता एवं उपभोग (मि.यू. में)

Statewise Monthly Energy Requirement and Consumption in MU during 2020-21

(EX-Bus Figs)

राज्य / States →	BIHAR		JHARKHAND		DVC		ODISHA		WBSEDCL		CESC		SIKKIM		Eastern Region	
मास / Month ↓	Actual Consumption	Unrestricted Requirement	Actual Consumption	Unrestricted Requirement	Actual Consumption	Unrestricted Requirement	Actual Consumption	Unrestricted Requirement	Actual Consumption	Unrestricted Requirement	Actual Consumption	Unrestricted Requirement	Actual Consumption	Unrestricted Requirement	Actual Consumption	Unrestricted Requirement
	1	2	3	4	5	6	7	8	9	10	11	12	13		14	
अप्रैल / Apr-20	2358	2359	683	704	857	857	2081	2081	2931	2943	663	663	43	43	9626	9653
मई / May-20	2793	2801	746	770	1424	1424	2376	2376	2917	2968	720	720	42	42	11024	11100
जून / June-20	3042	3052	776	781	1753	1754	2484	2484	3659	3673	909	910	42	42	12675	12695
जुलाई / July-20	3331	3352	837	841	1892	1893	2722	2722	4067	4072	979	979	41	41	13878	13899
अगस्त / Aug-20	3440	3498	853	863	1894	1895	2632	2633	4083	4088	934	935	36	36	13887	13947
सितंबर / Sep-20	3355	3365	877	883	1876	1876	2756	2756	4064	4072	989	989	41	41	13977	13983
अक्तूबर / Oct-20	3334	3335	905	914	1942	1943	2755	2756	3950	3953	983	984	43	45	13928	13931
नवम्बर / Nov-20	2251	2255	788	801	1854	1854	2257	2258	2814	2816	734	734	47	47	10757	10763
दिसम्बर / Dec-20	2509	2514	852	891	1948	1948	2252	2252	2905	2907	658	658	58	58	11199	11223
जनवरी / Jan-21	2791	2804	857	900	2039	2039	2342	2341	3188	3191	656	656	59	59	11956	11989
फरवरी / Feb-21	2459	2473	760	808	1831	1832	2290	2291	3050	3053	629	629	52	52	11083	11135
मार्च / March-21	2948	2969	880	933	2059	2059	2963	2964	4187	4191	938	938	53	53	14032	14109
Total	**34610**	**34775**	**9812**	**10089**	**21368**	**21374**	**29911**	**29915**	**41815**	**41927**	**9792**	**9795**	**556**	**558**	**148022**	**148427**

Note : Drawl from Central Sector is at ISGS periphery.

INTER-REGIONAL AND INTRA-REGIONAL EXCHANGE OF ENERGY DURING THE YEAR 2020-21

(All fig. in MU)

	SYSTEM	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Total Net Drawl (MU)	Total Drawl incl. T. Losses (MU)
Drawl	BSPHCL	2287.34	2578.88	2848.59	3139.77	3200.44	3170.98	3143.11	2197.20	2420.72	2522.53	2177.14	2581.81	32268.53	32863.42
	JUVNL	477.75	526.50	542.28	599.36	619.56	654.87	673.74	554.78	672.18	624.04	541.49	632.95	7119.51	7250.76
	GRIDCD	0.00	27.44	215.11	173.49	296.82	549.27	362.29	226.21	126.16	78.97	293.45	889.17	3238.38	3298.08
	WBSEDCL	1082.57	1194.61	1517.87	1585.02	1696.47	1631.25	1566.63	886.53	303.76	298.10	444.08	919.11	13126.00	13367.98
	SIKKIM	41.05	39.90	39.02	37.91	33.19	38.77	41.34	45.27	55.31	56.80	49.94	51.45	529.95	539.72
	NR	1317.58	1883.48	2298.76	2970.69	2564.52	2781.88	2551.96	1997.47	2190.87	2149.00	2012.15	1968.63	26686.99	27178.99
	SR	2070.71	2160.49	1685.45	1540.91	1345.83	1527.28	1282.53	2004.67	1948.78	1910.23	1930.09	2262.07	21669.02	22068.50
	WR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.49	0.00	80.49	81.97
	NER	0.00	39.64	367.25	252.39	532.54	437.79	448.54	276.68	0.00	0.00	0.00	0.00	2354.83	2398.24
	NEPAL	43.32	7.95	23.55	19.59	52.90	37.32	23.29	21.63	155.86	196.41	190.03	235.18	1007.03	1025.60
	BANGLADESH	338.97	494.78	655.50	681.64	691.26	669.49	679.32	474.09	375.43	474.53	456.33	567.09	6558.43	6679.34
	Barh STPS Stg-I	4.10	3.53	4.33	5.35	8.72	10.46	3.11	3.79	7.91	6.30	0.39	0.00	57.98	59.05
	HVDC SASARAM	0.56	0.62	0.59	0.63	0.64	0.58	0.62	0.56	0.53	0.52	0.50	0.58	6.94	7.07
	ALIPURDUAR	0.39	0.52	0.49	0.86	0.87	0.80	0.75	0.46	0.36	0.40	0.32	0.38	6.59	6.71
	NPGC (U#2)	1.13	1.30	1.20	2.73	3.19	1.93	3.08	2.24	1.97	10.72	11.08	0.00	40.56	41.31
	Darlipali STPS (U#2)	0.23	1.11	0.66	0.86	1.59	6.54	7.47	6.25	6.82	6.91	2.46	4.21	45.11	45.94
	BRBCL (U#4)	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	0.00
	Kuruchhu HEP									4.71	15.86	17.55	13.98	52.10	53.06
Total Drawl		7665.70	8960.75	10200.66	11011.20	11048.53	11519.21	10787.77	8697.83	8271.37	8351.30	8207.49	10126.62	114848.43	116965.74

INTER-REGIONAL AND INTRA-REGIONAL EXCHANGE OF ENERGY DURING THE YEAR 2020-21

(All fig. in MU)

	SYSTEM	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Total Net Injection (MU)
Injection	FSTPS I&II	673.38	494.43	503.22	679.45	586.42	656.09	664.02	591.72	612.68	857.19	820.66	913.97	8053.21
	FSTPS- III	238.19	231.49	204.96	226.04	215.88	229.91	280.18	258.58	273.56	267.69	181.17	322.53	2930.18
	KhSTPP-I	436.32	437.40	405.43	445.64	274.81	423.84	427.21	282.10	234.11	363.17	357.95	392.56	4480.54
	KhSTPP-II	719.00	734.60	650.07	688.31	389.30	519.23	588.66	358.71	606.43	642.49	848.04	982.32	7727.19
	TSTPS-I	555.40	614.35	601.57	631.11	562.51	579.90	657.20	548.68	620.10	578.93	531.15	319.39	6800.30
	Barh STPS	267.56	416.87	535.92	569.04	578.91	679.46	684.91	628.39	687.79	733.50	686.03	868.09	7336.45
	MTPS-II	116.61	170.86	178.16	174.53	96.12	84.47	176.39	181.48	201.28	191.68	188.05	249.59	2009.22
	BRBCL	256.35	277.23	246.95	245.88	234.92	283.29	373.71	390.58	292.57	407.09	425.92	477.59	3912.09
	NSTPS (firm)	376.47	331.79	395.93	429.71	424.63	424.73	368.96	228.61	399.71	423.19	271.21	323.10	4398.05
	Darlipali STPS	361.38	239.16	146.05	109.10	286.47	470.38	550.82	461.50	524.03	392.75	434.76	481.37	4457.78
	BRBCL (Infirm)	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
	NSTPS (Infirm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76.20	76.20
	Darlipali STPS (Infirm)	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
	Barh STPS Stg-1												8.43	8.43
	TOTAL NTPC	4000.66	3948.17	3868.27	4198.81	3649.98	4351.31	4772.07	3930.35	4452.26	4857.69	4744.94	5415.15	52189.65
	TALCHER Solar	1.24	1.36	0.98	1.04	0.80	1.02	1.09	1.15	1.21	1.11	1.26	1.17	13.43
	Maithon Right Bank	491.67	497.14	470.33	504.63	469.59	499.35	492.67	565.61	595.85	348.55	370.71	685.17	5991.26
	APNRL	164.42	224.81	183.33	228.26	271.91	231.78	249.75	175.69	246.45	197.34	289.13	343.38	2806.25
	GMR KEL	206.39	196.75	349.41	428.10	453.40	399.95	482.55	425.62	475.78	325.98	288.56	474.55	4507.03
	JITPL	466.46	594.21	377.42	398.63	391.22	377.85	386.12	386.31	412.97	430.66	695.72	652.54	5570.10
	RHPS	16.94	30.07	39.82	31.27	21.61	36.61	35.40	20.19	12.66	12.78	10.41	15.44	283.19
	TEESTA HPS	188.26	307.33	352.86	367.68	382.01	370.50	315.17	160.40	106.44	83.30	68.39	105.48	2807.81
	CHUZACHEN HPS	18.52	40.74	70.28	87.82	85.31	83.05	45.41	18.22	11.69	8.46	0.75	12.43	482.67
	DIKCHU HPS	20.60	36.09	76.98	81.75	78.75	75.44	43.28	15.79	10.32	7.41	4.67	13.77	464.84
	JORETHANG HEP	12.39	26.35	54.59	65.07	57.72	60.53	50.74	23.16	15.24	11.38	8.24	12.21	397.61
	TASINGDIH HPS	11.21	25.82	58.02	80.92	57.69	60.58	29.01	2.79	12.45	11.68	7.97	10.36	368.51
	TEESTA URJA	297.30	594.15	920.23	891.79	898.25	802.00	635.06	295.84	208.62	166.24	126.34	162.05	5997.87
	Chukha HEP	79.72	189.84	278.79	305.60	308.49	293.71	253.35	116.90	83.44	33.06	16.99	19.37	1979.25
	Kuruchhu HEP	-0.20	35.50	59.11	76.32	76.54	72.67	64.00	18.94	0.00	0.00	0.00	0.00	402.88
	Tala HEP	38.65	251.43	444.15	627.31	632.72	615.18	358.85	134.46	37.06	18.46	11.90	12.52	3182.69
	DAGACHHU HEP	12.43	29.47	55.66	87.57	85.55	79.26	59.06	30.32	21.61	16.47	12.14	12.58	502.10
	Mangdechhu HEP	135.00	307.28	432.50	531.37	542.93	470.22	284.47	142.38	102.16	83.33	64.55	88.59	3184.78
	DVC	681.09	838.98	1028.74	1177.21	1194.75	1302.82	1486.54	1316.17	1229.25	1232.99	1410.03	1681.90	14580.47
	NER	440.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	257.83	283.14	245.30	277.58	1504.75
	WR	519.40	949.66	1264.58	1034.13	1582.58	1523.19	912.23	1064.53	158.12	423.26	0.00	314.65	9746.32
	Odisha	2.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.25
Total Injection		7805.32	9125.14	10386.05	11205.30	11241.79	11707.00	10956.81	8844.82	8451.38	8553.28	8378.00	10310.86	116965.74
Transmission loss		139.61	164.39	185.39	194.10	193.26	187.79	169.04	146.99	180.02	201.97	170.51	184.24	2117.31
% Transmission loss		1.82	1.83	1.82	1.76	1.75	1.63	1.57	1.69	2.18	2.42	2.08	1.82	1.84
Export by NBPDCL	Export	7.88	7.34	14.03	23.43	23.28	23.28	9.45	32.16	58.36	136.92	148.02	163.56	647.71
	Import	0.30	0.10	0.00	18.32	18.04	18.04	0.13	0.13	0.00	0.00	0.00	0.00	55.06
	Total	7.57	7.25	14.03	5.11	5.24	5.24	9.32	32.02	58.36	136.92	148.02	163.56	592.65

ANNEXURE-VIII (B)

IMPORT BY ODISHA FROM CAPTIVE STATIONS AND IPPs DURING 2020-21 **(ALL Figs in MU)**

SN.	Name of IPP / CGPs	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Total
1	Aarti Steel Ltd, ghantikhal	0.104	1.781	3.329	4.040	3.310	0.000	1.885	0.794	2.859	4.093	5.090	5.851	33.136
2	ACC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	Action Ispat	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	Aryan Ispat,	0.214	0.255	0.000	0.318	4.500	0.743	0.000	0.753	0.775	1.495	0.232	0.938	10.223
5	BPPL	49.543	73.402	70.875	82.533	79.652	74.258	82.604	29.426	64.572	73.997	69.031	60.644	810.537
6	BPSL, Jharsuguda	4.149	15.600	13.470	16.965	15.775	15.110	19.661	12.545	16.025	18.501	14.093	5.603	167.497
7	BSL, Meramundali	12.287	5.538	13.164	13.225	13.799	15.332	16.518	17.865	14.010	16.948	26.042	27.378	192.106
8	GMR Kamalanga Energy Ltd.(IPP)	158.934	154.774	143.800	80.195	200.319	209.802	233.999	212.380	226.671	234.602	22.293	243.132	2120.901
9	HINDALCO, Hirakud	1.238	1.002	2.534	2.250	1.672	1.3500	0.830	2.800	2.624	2.990	1.688	1.738	22.716
10	IFFCO, Paradeep	0.000	0.0002	0.0000	0.0002	0.0002	0.000	0.0001	0.0001	0.0001	0.0001	0.0000	0.0001	0.001
11	IMFA , Choudwar	11.338	8.005	17.024	17.024	24.139	19.609	25.976	21.987	27.576	28.580	25.975	16.507	243.740
12	JINDAL, New Duburi	0.000	3.220	0.209	4.171	4.589	4.395	5.674	5.501	4.652	5.439	3.542	5.202	46.594
13	JSPL, Angul	38.623	39.071	39.645	40.552	15.461	25.648	32.960	38.147	22.894	32.210	20.136	18.843	364.190
14	Mahavir Ferro Alloys	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	Maithan Ispat Ltd.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	Meenakshi Power Ltd. (SH)	13.016	13.644	14.105	25.251	29.548	29.562	29.339	15.443	9.048	7.011	6.845	5.879	198.691
17	MSP, Jharsuguda	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18	NALCO , Angul	9.010	10.54	10.45	13.82	7.70	10.834	6.46	18.82	38.72	20.43	11.79	19.18	177.749
19	Narbheram	0.000	0.068	0.068	0.026	0.128	0.021	0.066	0.026	0.014	0.034	0.024	0.007	0.482
20	NBVL , Kharag Prasad	0.226	3.715	5.287	6.401	5.878	1.017	6.898	7.685	3.708	4.878	25.285	32.890	103.868
21	NINL , Duburi	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22	OCL	0.023	0.113	0.278	0.598	0.210	0.763	0.573	1.865	1.382	1.562	1.637	0.488	9.492
23	OPCL, Samal (SH)	7.431	7.584	7.584	7.551	5.858	9.250	10.904	9.582	6.464	6.508	5.318	6.395	90.429
	BPPLT	0.000	0.000	0.000	0.000	0.000	14.892	14.892	3.594	1.789	1.237	0.735	0.380	37.519
24	PSAL, Keonjhar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25	RSP , Rourkela	0.000	0.006	0.040	0.000	0.000	0.000	0.000	0.850	0.011	0.000	0.000	0.000	0.907
26	Shree Ganesh	0.000	0.543	0.518	0.661	0.387	0.227	0.416	0.145	0.124	0.057	0.133	0.070	3.281
27	Shyam Metallics	0.303	0.331	0.411	0.742	0.571	0.795	0.849	0.989	0.764	0.115	0.552	0.343	6.765
28	SMC Power	0.030	0.021	0.020	0.001	0.015	0.019	0.033	0.050	0.125	0.093	0.065	0.008	0.480
29	TSIL, Joda	3.441	10.181	11.128	12.886	12.341	15.332	11.368	8.982	12.161	11.771	10.614	13.120	133.325
31	Vedanta Ltd. (IPP-Unit-2)	163.851	271.494	251.540	296.810	216.701	279.586	242.220	232.477	298.220	291.202	258.281	0.000	2802.382
31	Vedanta, Jharsuguda	1.515	19.128	20.800	56.185	40.982	144.399	210.440	73.501	70.542	80.393	109.165	130.913	957.963
32	Vedanta, Lanjigarh	0.630	0.639	0.000	0.678	0.707	0.502	0.286	0.047	0.673	0.562	0.235	0.081	5.040
33	VISA Steel, New-Duburi	1.960	0.745	0.859	1.208	1.191	1.205	0.876	1.194	1.237	0.152	0.244	0.263	11.134
34	Yazdani Steel & Power Ltd., J.J Rd	0.000	0.000	0.000	0.000	0.000	0.023	0.863	0.220	0.220	0.000	0.000	0.463	1.789
35	Vedanta Ltd. (3*600)	3.448	4.818	5.680	5.687	6.059	1.854	0.131	4.888	0.222	0.188	0.188	0.012	33.175
	Total support from CPPs & IPPs	**481.31**	**647.21**	**632.82**	**689.78**	**691.49**	**876.53**	**956.72**	**772.15**	**828.27**	**845.05**	**619.23**	**596.33**	**8636.89**

ANNEXURE-VIII (C)

	IMPORT BY JHARKHAND FROM CAPTIVE STATIONS AND IPPs DURING 2020-21											ALL Figs in MU	
SN.	**Name of IPP / CGPs**	**Apr-20**	**May-20**	**Jun-20**	**Jul-20**	**Aug-20**	**Sep-20**	**Oct-20**	**Nov-20**	**Dec-20**	**Jan-21**	**Feb-21**	**Mar-21**	**TOTAL**
1	INLAND POWER LIMITED(1x63 MW)	25.647	25.597	31.609	32.168	28.402	34.701	34.053	34.719	17.490	30.439	35.700	32.492	363.017
2	RUNGTA (Mines)	2.379	2.266	0.935	4.246	2.543	1.654	0.501	0.346	1.271	2.744	2.213	2.101	23.199
3	AAPL-R	1.305	1.428	2.235	2.899	1.111	1.645	2.559	3.634	3.476	2.891	1.715	1.655	26.553
4	UML-R	2.706	0.351	0.172	1.119	1.179	1.706	2.397	0.658	1.635	2.006	1.824	0.019	15.772
5	UML-J (Tata Sponge Limited)	2.427	2.863	1.096	1.831	1.242	1.412	0.673	4.450	2.393	7.872	5.295	8.871	40.425
6	ABCIL	3.862	3.611	6.761	6.266	6.625	5.887	7.656	6.989	7.601	7.156	0.053	5.968	68.435
7	**TOTAL**	**38.33**	**36.12**	**42.81**	**48.53**	**41.10**	**47.01**	**47.84**	**50.80**	**33.87**	**53.11**	**46.80**	**51.11**	**538.10**

	IMPORT BY DVC FROM TISCO DURING 2020-21											ALL Figs in MU	
SN.	**Name of IPP / CGPs**	**Apr-20**	**May-20**	**Jun-20**	**Jul-20**	**Aug-20**	**Sep-20**	**Oct-20**	**Nov-20**	**Dec-20**	**Jan-21**	**Feb-21**	**Mar-21**	**TOTAL**
1	TISCO injection wheeling at Jamshedpur point	18.99	12.02	12.35	12.87	13.91	11.29	13.43	15.38	19.15	11.63	6.00	7.88	154.92

	IMPORT BY WEST BENGAL SETCL FROM CPP & IPPs DURING 2020-21											ALL Figs in MU	
SN.	**Name of IPP / CGPs**	**Apr-20**	**May-20**	**Jun-20**	**Jul-20**	**Aug-20**	**Sep-20**	**Oct-20**	**Nov-20**	**Dec-20**	**Jan-21**	**Feb-21**	**Mar-21**	**TOTAL**
1	PCBL	0.00	5.40	6.57	12.16	10.55	8.23	8.67	9.40	11.61	11.10	9.27	9.28	102.249
2	RENUKA	0.00	0.00	0.00	0.00	0.00	0.00	1.56	3.39	4.33	1.32	0.00	0.00	10.594
3	TATA POWER HALDIA	34.30	27.93	42.69	50.97	52.31	50.73	62.04	67.17	67.98	68.74	60.68	69.92	655.463
4	ELEC. STEEL (H)	4.49	1.77	3.41	1.29	1.38	1.18	1.90	1.72	1.67	1.56	1.41	1.66	23.434
5	CONCAST BENGAL	0.00	0.00	0.26	0.60	0.43	0.71	0.00	0.00	0.00	0.00	0.00	0.00	1.990
6	HIMADRI CHEMICAL LTD	0.00	0.41	2.40	4.61	4.23	2.28	3.00	2.68	3.27	3.00	2.96	3.08	31.915
7	BENGAL ENERGY LIMITED	11.25	9.93	3.94	12.23	17.91	17.33	19.20	19.18	19.37	17.25	15.45	23.07	186.116
8	HIRRANMOYEE IMPORT	0.00	0.00	0.00	0.00	0.00	13.13	74.27	74.49	89.63	40.66	37.28	59.45	388.902
9	CRECSENT POWER	25.09	24.21	24.42	26.63	26.66	25.25	26.80	25.82	26.92	26.86	24.15	20.63	303.438
10	IPCL													0.000
	TOTAL	**75.12**	**69.655**	**83.689**	**108.506**	**113.465**	**118.847**	**197.431**	**203.850**	**224.776**	**170.481**	**151.198**	**187.079**	**1704.101**
1	Teesta Low Dam Project U#3&4	59.91	117.17	175.51	161.30	191.29	178.00	157.95	64.58	42.77	32.34	22.79	37.40	1241.00
2	Haldia Energy Limited	287.22	289.83	350.92	378.19	364.61	373.86	357.70	331.75	335.31	178.51	257.61	398.69	3904.20
	Grand Total Import	**422.25**	**476.66**	**610.12**	**648.00**	**669.37**	**670.71**	**713.08**	**600.18**	**602.86**	**381.33**	**431.60**	**623.17**	**6849.31**

	EXPORT BY WEST BENGAL SETCL DURING 2020-21											ALL Figs in MU		
1	Calcutta Electric Supply Corporation	281.74	332.46	454	488.89	463.5	526.93	497.75	386.47	379.36	226.85	253.68	415.33	4706.96
1	Dishergarh Power Supply Company	15.50	43.70	63.17	67.06	66.95	62.23	71.76	83.98	80.84	83.61	73.55	77.59	789.93
2	Purilia Pump Storage Plant	86.85	120.87	113.61	147.00	156.67	152.73	131.61	102.45	204.61	203.25	159.54	105.65	1684.87
	TOTAL	**384.09**	**497.03**	**630.79**	**702.96**	**687.12**	**741.90**	**701.12**	**572.90**	**664.81**	**513.71**	**486.77**	**598.57**	**7181.76**

ANNEXURE - IXA

Frequency Summary of the Eastern Region during the year 2020-21

Average Frequency (Hz) in different Periods of the Day

MONTH	< -----HOURS----->					
	00-05	**05-10**	**10-17**	**17-22**	**22-24**	**00-24**
April-20	49.99	50.00	50.00	50.00	49.99	50.00
May-20	50.00	50.01	49.99	50.01	49.98	50.00
June-20	50.00	50.00	50.00	49.99	49.99	50.00
July-20	49.99	49.99	49.99	49.97	49.98	49.99
August-20	49.98	49.99	49.99	49.97	49.99	49.99
September-20	49.99	50.00	49.99	49.98	49.99	49.99
October-20	49.99	50.00	49.99	50.00	50.00	50.00
November-20	49.98	49.99	49.99	50.00	50.01	49.99
December-20	49.99	49.99	50.00	50.00	50.00	50.00
January-21	49.99	49.99	50.00	50.00	50.00	49.99
February-21	49.98	49.99	49.98	50.00	49.98	49.99
March-21	50.00	50.01	49.98	49.99	49.98	49.99
MAXIMUM	**50.00**	**50.01**	**50.00**	**50.01**	**50.01**	**50.00**
MINIMUM	**49.98**	**49.99**	**49.98**	**49.97**	**49.98**	**49.99**
AVERAGE	**49.99**	**50.00**	**49.99**	**49.99**	**49.99**	**49.99**

ANNEXURE - IXB

Average Frequency in Percentage of the Time (%)including Max. & Min. Frquency during 2020-21

	Frequency Range (Hz) in % of Time			Instantaneous Frequency (Hz)						15 Minutes Integrated frequency (Hz)	
	<49.9	49.9-50.05	>50.05	MAX	Date	HRS.	MIN	Date	HRS.	MAX	MIN
April-20	4.99	75.18	19.83	50.3	04.04.2020	18:02	49.61	01.04.2020	22:07	50.19	49.75
May-20	3.94	76.24	19.82	50.29	28.05.2020	19:01	49.57	28.05.2020	17:27	50.21	49.75
June-20	4.49	76.93	18.58	50.31	21.06.2020	15:07	49.63	09.06.2020	22:12	50.25	49.78
July-20	6.68	77.84	15.48	50.39	05.07.2020	03:44	49.62	14.07.2020	22:08	50.33	49.74
August-20	6.09	80.91	13.00	50.23	30.08.2020	14:00	49.6	31.08.2020	19:11	50.16	49.7
September-20	4.22	84.26	11.53	50.20	26.09.2020	06:02	49.64	24.09.2020	18:50	50.12	49.70
October-20	3.92	81.87	14.21	50.27	12.10.2020	10:05	49.7	28.10.2020	18:14	50.14	49.79
November-20	4.46	79.82	15.72	50.27	16.11.2020	00:04	49.68	05.11.2020	17:20	50.18	49.74
December-20	4.79	75.75	19.46	50.26	25.12.2020	14:02	49.66	16.12.2020	09:57	50.15	49.76
January-21	4.86	76.11	19.03	50.24	14.01.2021	18:01	49.7	30.01.2021	05:11	50.18	49.78
February-21	7.27	76.37	16.36	50.31	11.02.2021	18:01	49.60	25.02.2021	06:56	50.13	49.72
March-21	7.13	72.81	20.07	50.32	21.03.2021	18:02	49.66	16.03.2021	22:09	50.17	49.78
MAXIMUM	7.27	84.26	20.07	50.39			49.70			50.33	49.79
MINIMUM	3.92	72.81	11.53	50.20			49.57			50.12	49.70
AVERAGE	5.24	77.84	16.92	50.28			49.64			50.19	49.75

ENERGY GENERATION BY VARIOUS POWER STATIONS AND PLANT LOAD FACTOR OF THERMAL STATIONS OF EASTERN REGION FOR THE YEAR 2017-18, 2018-19, 2019-20 & 2020-21
(Comparative Statement)

SYSTEM	TYPE	POWER STATION	INSTALLED CAPACITY IN MW as on 31.03.2021	EFFECTIVE CAPACITY IN MW (as on 31.03.2021)	2017-18		2018-19		2019-20		2020-21	
					Generation (MU)	PLF (%)	Generation (MU)	PLF (%)	Generation (MU)	PLF (%)	Generation (MU)	PLF (%)
BIHAR	*Thermal*	NTPC, BTPS(U#6&7)	220.00	210.00	39.44	2.14	44.86	2.44	123.68	6.70	60.90	3.31
		NTPC, BTPS(U#8)	250.00	250.00					112.41	28.40	1261.78	57.62
		NTPC, BTPS (U#9)									79.28	
		NTPC, MTPS Stg-I	220.00	220.00	752.16	39.03	735.76	38.18	587.70	30.41	224.27	11.64
		Thermal Total	**690.00**	**680.00**	**791.60**	**13.29**	**780.62**	**20.72**	**823.79**	**19.28**	**1626.23**	**25.97**
	RES		354.91	354.91	**14.37**		**415.74**		**369.31**		**334.86**	
Total BIHAR			**1044.9**	**1034.9**	**805.97**		**1196.36**		**1193.10**		**1961.09**	
JHARKHAND JUVNL	Thermal	Tenughat TPS	420.00	420.00	1933.31	52.55	1689.05	45.91	2416.62	65.50	2237.96	60.83
	Hydro	Subarnrekha	130.00	130.00	190.28		102.46		36.12		**50.03**	
	RES	RES	60.41	60.41	0.00		0.00		0.00		**0.00**	
		Total	**610.41**	**610.41**	**2123.59**		**1791.51**		**2452.74**		**2287.99**	
DVC	*Thermal*	Bokaro-B (U #3)	210.00	210.00	573.94	18.82	688.44	37.42	94.03	5.10	18.59	1.01
		Chandrapura(U#3)			321.10	21.22	0.00	0.00	0.00	0.00	0.00	
		Chandrapura(U 7-8)	500.00	500.00	3754.87	85.73	3562.60	81.34	3425.66	78.00	3268.57	74.62
		Durgapur(U #4)	210.00	210.00	947.05	51.48	981.29	53.34	437.91	23.74	135.82	7.38
		Mezia(U 1-6)	1340.00	1340.00	7109.48	60.57	7025.15	59.85	7263.99	61.71	7009.59	59.72
		Mezia(U 7-8)	1000.00	1000.00	5368.97	61.29	5719.15	65.29	5276.78	60.07	5819.21	66.43
		Durgapur STPS (U 1-2)	1000.00	1000.00	6503.95	74.25	6293.54	71.84	6319.03	71.94	5780.97	65.99
		Koderma STPS (U 1-2)	1000.00	1000.00	5911.25	67.48	6278.77	71.68	6459.72	73.54	7508.96	85.72
		Raghunathpur (U 1-2)	1200.00	1200.00	2277.30	21.66	3208.40	30.52	5030.71	47.73	5225.68	49.71
		Bokaro-A (U 1)	500.00	500.00	2924.19	66.76	2920.73	66.68	2690.01	61.25	3271.48	74.69
		Thermal Total	**6960.00**	**6960.00**	**35692.10**	**56.04**	**36678.08**	**59.05**	**36997.83**	**59.45**	**38038.87**	**62.39**
	Hydro	Maithon	63.20	63.20	114.40		101.33		83.62		194.03	
		Panchet	80.00	80.00	141.95		79.77		114.15		173.09	
		Tilaya	4.00	4.00	10.85		5.30		4.68		9.69	
		Hydro Total	**147.20**	**147.20**	**267.20**		**186.41**		**202.45**		**376.81**	
	RES	RES(Small Hy+Solar)			10.92		**0.00**		**0.00**		**0.00**	
Total DVC			**7107.20**	**7107.20**	**35970.22**		**36864.48**		**37200.28**		**38415.68**	
WBPDCL	*Thermal*	Bandel (1,2,5)	380.00	335.00	1926.03	65.63	1315.38	44.82	861.06	29.26	1170.81	39.90
		Santaldih(U 5-6)	500.00	500.00	2941.58	67.16	3552.62	81.11	3693.93	84.11	3442.94	78.61
		Kolaghat	1260.00	1260.00	4749.84	43.03	4422.85	40.07	2871.40	25.94	1769.36	16.03
		Bakreswar	1050.00	1050.00	7486.39	81.39	7182.22	78.08	6996.73	75.86	7896.54	85.85
		Sagardighi TPS	1600.00	1600.00	6342.12	45.25	6050.92	43.17	6695.28	47.64	9596.13	68.47
		DPPS	550.00	550.00	2524.46	43.66	2343.64	40.54	2233.21	39.68	2789.51	57.90
Total WBPDCL			**5340.00**	**5295.00**	**25970.43**	**55.99**	**24867.64**	**52.52**	**23351.61**	**49.36**	**26665.29**	**57.49**
WBSEDCL	*Hydro*	Jaldhaka	35.00	35.00	145.18		197.02		188.97		201.48	
		Ramam	51.00	51.00	122.46		236.94		247.29		254.70	
		Teesta CF	67.50	67.50	131.02		85.47		43.75		31.08	
		Purulia PSP	900.00	900.00	1014.36		1103.94		1075.47		1306.44	
Total WBSEDCL			**1053.50**	**1053.50**	**1413.01**		**1623.36**		**1555.48**		**1793.70**	
	RES	RES	500.76	500.76	**6.04**		**4.60**		**173.88**		**155.70**	
Total (WBPDCL+WBSEDCL+RES)			***6,894***	***6,849***	***27389.47***		***26495.61***		***25080.97***		***28614.69***	

DVC, DTPS U#3(140 MW) decommissioned on 10.03.2016
DVC, CTPS U#1 ,2,3 (140 MW each) decommissioned on 13.01.2017,30.07.2017 & 19.03.20.
DVC, BTPS-B U#1&2(2X210 MW each) decommissioned on 30.07.2017
WBPDCL, BTPS U#3 &U#4 (82.5 MW each)decommissioned from 01.04.2018
DPL,DPPS U#6 (110 MW) decommissioned on 28.01.2020

ENERGY GENERATION BY VARIOUS POWER STATIONS AND PLANT LOAD FACTOR OF THERMAL STATIONS OF EASTERN REGION FOR THE YEAR 2017-18, 2018-19, 2019-20 & 2020-21
(Comparative Statement)

SYSTEM	TYPE	POWER STATION	INSTALLED CAPACITY IN MW	EFFECTIVE CAPACITY IN MW	2017-18		2018-19		2019-20		2020-21	
					Generation (MU)	PLF (%)	Generation (MU)	PLF (%)	Generation (MU)	PLF (%)	Generation (MU)	PLF (%)
CESC	Thermal	Titagarh	240.00	240.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Southern	135.00	135.00	303.75	25.68	283.78	24.00	339.26	28.61	89.89	7.60
		Budge-Budge	750.00	750.00	6033.39	91.83	6014.68	91.55	5798.16	88.01	5422.68	82.54
	Total CESC		**1125.00**	**1125.00**	**6337.14**	**64.30**	**6298.46**	**63.91**	**6137.42**	**62.11**	**5512.57**	**55.94**
HEL	Thermal	Haldia	600.00	600.00	4525.90	86.11	4614.82	87.80	4430.09	84.06	4224.93	80.38
	Total West Bengal (Incl. CESC & HEL)		8619.26	8574.26	**38252.51**		**37408.89**		**35648.48**		**38352.19**	**59.20**
ODISHA	Thermal (NTPC)	Talcher-I	250.00	240.00	2058.16	97.90	1924.50	91.54	1857.81	88.37	1825.17	86.81
		Talcher-II	220.00	220.00	1722.58	89.38	1680.12	87.18	1520.46	78.89	1580.31	82.00
		Total	**470.00**	**460.00**	**3780.74**	**93.82**	**3604.62**	**89.45**	**3378.27**	**83.84**	**3405.48**	**84.51**
	Thermal (OPGC)	IB TPS (U#1 &2)	420.00	420.00	2842.35	77.25	3085.15	83.85	2643.54	71.85	2609.84	70.93
		IB TPS (U# 3)	660.00	660.00					2293.34	47.85	2401.88	41.54
		IB TPS (U # 4)	660.00	660.00					2081.12	50.25	3620.49	62.62
		Total Thermal	**2210.00**	**2200.00**					**10396.28**	**85.38**	**12037.69**	62.46
	OHPC, HYDRO	Burla (Hirakud-I)	275.50	275.50	613.63		380.29		547.38		628.17	
		Chiplima (Hirakud-II)	72.00	72.00	249.40		168.31		242.65		324.74	
		Balimela	510.00	510.00	1477.33		1734.15		1509.39		1656.10	
		Rengali	250.00	250.00	762.57		837.87		666.25		1013.72	
		Upper Kolab	320.00	320.00	706.85		922.09		828.44		812.82	
		Indravati HPS	600.00	600.00	1742.51		2142.62		2253.60		1757.40	
		Mckd.(Orissa dr)	57.38	57.38	239.73		271.57		309.16		303.25	
		Hydro Total	**2084.88**	**2084.88**	**5792.02**		**6456.89**		**6356.88**		**6496.20**	
	RES	RES	539.57	539.57	96.45		197.42		324.70		601.42	
Total ODISHA (NTPC +OPGC+ OHPC+RES)			**3514.45**	**3504.45**	**12511.56**		**13344.08**		**17077.86**		**19135.31**	
SIKKIM*	RES	Total	52.18	52.18	30.00		26.00		24.60		**16.00**	
NTPC	Thermal	FSTPS - I&II	1600.00	1600.00	10229.34	72.98	11264.02	80.37	10320.79	73.43	8754.84	62.46
		FSTPS - III (U#6)	500.00	500.00	3127.43	71.40	3582.35	81.79	2811.84	64.02	3173.74	72.46
		KhSTPP-I & II	2340.00	2340.00	16316.76	79.60	16486.14	80.43	16504.36	80.30	13231.17	64.55
		TSTPP - I	1000.00	1000.00	7679.19	87.66	7020.94	80.15	6043.30	68.80	7369.73	84.13
		BARH STPS -I									29.32	
		BARH STPS - II	1320.00	1320.00	9272.26	80.19	9845.23	85.14	8219.09	70.89	7803.80	67.49
		Muzaffarpur Stg-II	390.00	390.00	998.83	32.66	2305.61	67.49	2316.90	67.63	2244.68	65.70
		BRBCL	750.00	750.00	1060.29	29.56	2793.94	60.10	4887.10	74.18	4264.44	64.91
		Nabinagar STPP U#1	660.00	660.00			13.55		2783.78	77.85	4639.74	80.25
		Nabinagar STPP U#2									95.11	
		Darlipali STPP U#1	800.00	800.00					607.42	62.66	4775.88	68.15
		Darlipali STPP U#2									6.51	
Total NTPC			**9360.00**	**9360.00**	**48684.10**		**53311.78**	**79.23**	**54494.57**	**73.74**	**56388.96**	**68.61**
	RES	Talcher Solar	10	10	13.81		13.72		13.40		13.43	
NHPC	Hydro	Rangit	60	60	341.14		345.13		349.94		**283.19**	
		Teesta HEP-V	510	510	2796.90		2677.83		2810.78		**2807.81**	
		TLDP (NHPC)	292	292	859.01		1249.67		1300.19		**1241.00**	
Total NHPC			**862.00**	**862.00**	**3997.04**		**4272.64**		**4460.91**		**4332.00**	
EASTERN REGION		THERMAL (exclud.. IPP)	**26705.00**	**26640.00**	**130557.66**	**63.31**	**134930.21**	**65.18**	**139048.22**	**62.38**	**146732.50**	**62.79**
		HYDRO (exclud. IPP)	**4277.58**	**4277.58**	**11659.55**		**12641.76**		**12611.83**		**13048.74**	
		RES(Small Hy+Solar)	**1518**	**1518**	**171.59**	**0.00**	**657.48**		**905.19**		**1121.41**	
IPP	Thermal	MPL (U 1&2)	1050	1050	7406.14	80.52	7267.86	79.02	6488.19	70.35	6383.23	69.40
		APNRL (U 1&2)	540	540	2909.86	61.51	2875.74	60.79	2959.47	62.39	3034.34	64.15
		GMR (U 1-2)	700	700	3687.57	60.14	4523.33	73.77	3758.50	61.13	4819.75	78.60
		JITPL(U 1-2)	1200	1200	3666.42	34.88	4213.59	40.08	5199.78	49.33	5936.34	56.47
		Total IPP (Thermal)	**3490**	**3490**	**17669.99**	**57.80**	**18880.52**	**61.76**	**18405.94**	**60.04**	**20173.66**	**65.99**
	Hydro	CHUZACHEN (U 1-2)	110	110	442.46		413.66		467.19		482.67	
		JORTHANG (U# 1&2)	96	96	405.56		407.97		404.59		397.61	
		Teesta Urja St III	1200	1200	4392.65		4227.22		5996.24		5997.87	
		DIKCHU(U 1-2)	96	96	379.97		460.00		471.71		464.84	
		TASHIDING (U 1-2)	97	97	92.78		421.60		433.58		368.51	
		Total IPP (Hydel)	**1599.00**	**1599.00**	**5713.42**		**5930.47**		**7773.31**		**7711.50**	
EASTERN REGION		THERMAL (INCL. IPP	**30195**	**30130.00**	**148227.73**	**62.12**	**153810.59**	**64.74**	**157454.14**	**62.10**	**166906.16**	**63.16**
		HYDRO	**5877**	**5876.58**	**17372.97**		**18572.22**		**20385.15**		**20760.24**	
		RES	**1518**	**1518**	**171.63**		**657.48**		**905.19**		**1121.41**	
		TOTAL(TH+HY+RES)	**37590**	**37524.41**	**165772.33**		**173040.29**		**178744.47**		**188787.81**	
IMPORT FROM BHUTAN	Hydro	CHPC	360.00	270.00	1580.65		1348.07		1589.99		1979.25	
		KHPS	60.00	60.00	347.31		285.57		235.53		402.88	
		TALA HPS	1020.00	1020.00	2702.48		2411.73		2557.01		3182.69	
		DAGACHU	126.00	126.00	441.65		350.49		391.69		502.10	
		Mangdchhu HEP **	720.00	720.00					1576.38		3184.78	
		Total Bhutan Import	**2286.00**	**2196.00**	**5072.08**		**4395.87**		**6350.60**		**9251.70**	
GRAND TOTAL (TH+HY) INCLUDING IMPORT FROM BHUTAN					**170844.42**		**177436.16**		**185095.07**		**198039.51**	

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

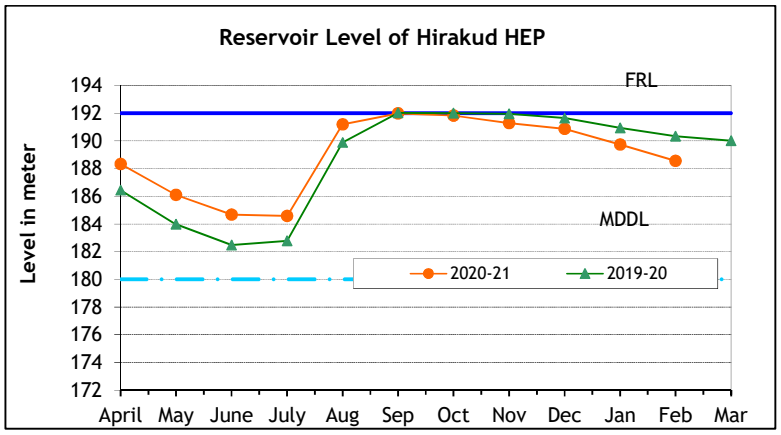
** All the figures considered above for operational data,need not to be used for any commercial purposes

Water Level in the Major Hydro Reservoir in the Region during 2020-21

(On last Day of the Month)

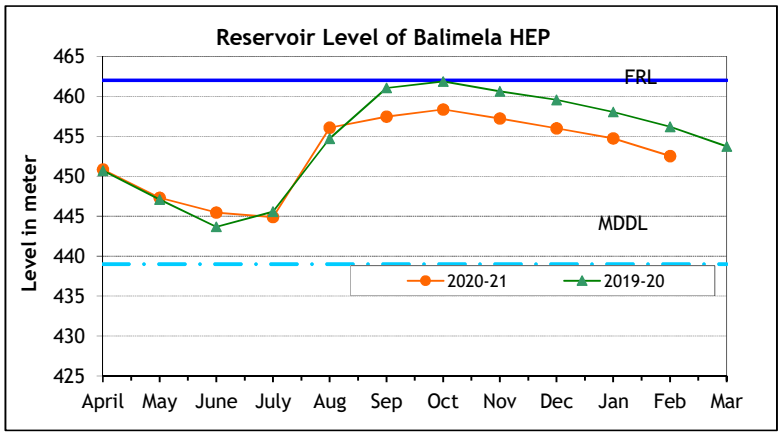
Reservoir Level of Hirakud HEP

Month	FRL	MDDL	2020-21	2019-20
April	192.00	180.00	188.34	186.449
May	192.00	180.00	186.11	183.977
June	192.00	180.00	184.68	182.481
July	192.00	180.00	184.58	182.786
Aug	192.00	180.00	191.2	189.89
Sep	192.00	180.00	191.99	192.024
Oct	192.00	180.00	191.83	192.015
Nov	192.00	180.00	191.29	191.97
Dec	192.00	180.00	190.87	191.66
Jan	192.00	180.00	189.74	190.942
Feb	192.00	180.00	188.56	190.348
Mar	192.00	180.00	186.96	190.021



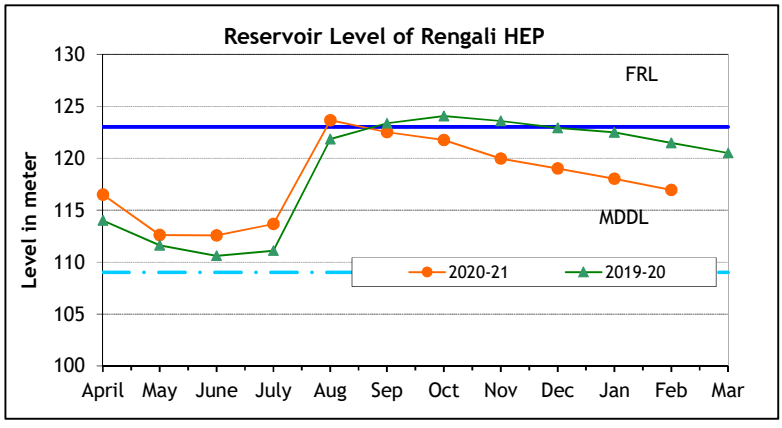
Reservoir Level of Balimela HEP

Month	FRL	MDDL	2020-21	2019-20
April	462.00	439.00	450.83	450.708
May	462.00	439.00	447.32	447.08
June	462.00	439.00	445.47	443.667
July	462.00	439.00	444.89	445.557
Aug	462.00	439.00	456.07	454.701
Sep	462.00	439.00	457.47	461.04
Oct	462.00	439.00	458.36	461.863
Nov	462.00	439.00	457.23	460.614
Dec	462.00	439.00	456.01	459.547
Jan	462.00	439.00	454.73	458.053
Feb	462.00	439.00	452.51	456.194
Mar	462.00	439.00	449.21	453.725



Reservoir Level of Rengali HEP

Month	FRL	MDDL	2020-21	2019-20
April	123.00	109.00	116.49	114.00
May	123.00	109.00	112.60	111.60
June	123.00	109.00	112.56	110.59
July	123.00	109.00	113.66	111.09
Aug	123.00	109.00	123.64	121.82
Sep	123.00	109.00	122.50	123.35
Oct	123.00	109.00	121.75	124.05
Nov	123.00	109.00	119.96	123.58
Dec	123.00	109.00	119.01	122.90
Jan	123.00	109.00	118.02	122.47
Feb	123.00	109.00	116.93	121.47
Mar	123.00	109.00	115.60	120.48



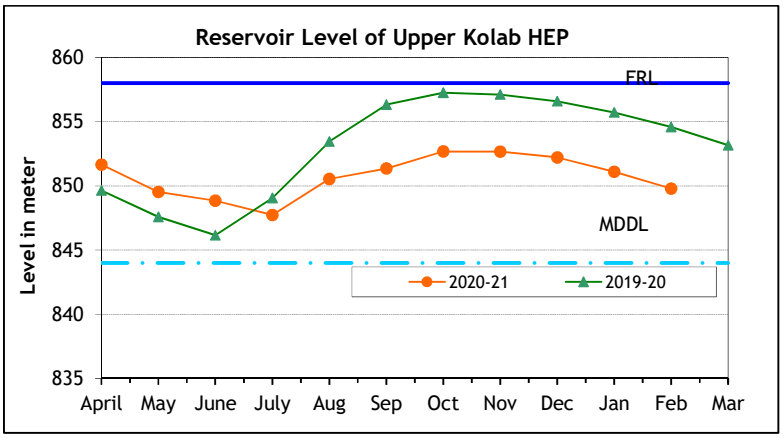
FRL: Full Reservoir Level; **MDDL**: Minimum Drawdown Level

Water Level in the Major Hydro Reservoir in the Region during 2020-21

(On last Day of the Month)

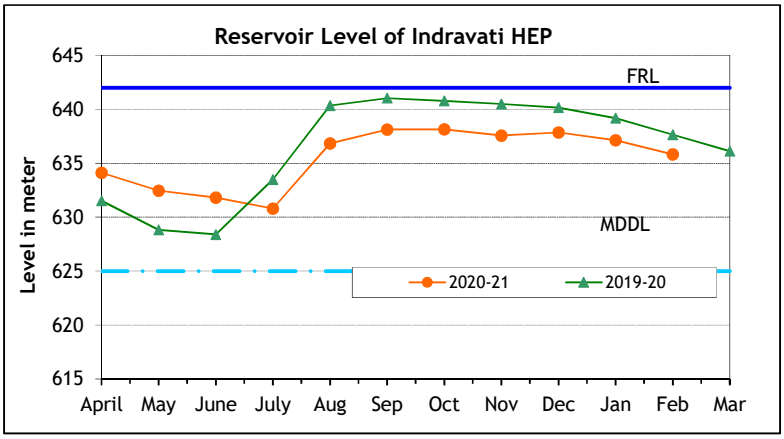
Reservoir Level of Upper Kolab HEP

Month	FRL	MDDL	2020-21	2019-20
April	858.00	844.00	851.66	849.65
May	858.00	844.00	849.52	847.59
June	858.00	844.00	848.84	846.16
July	858.00	844.00	847.73	849.06
Aug	858.00	844.00	850.54	853.46
Sep	858.00	844.00	851.36	856.33
Oct	858.00	844.00	852.68	857.25
Nov	858.00	844.00	852.66	857.12
Dec	858.00	844.00	852.22	856.6
Jan	858.00	844.00	851.09	855.72
Feb	858.00	844.00	849.79	854.58
Mar	858.00	844.00	847.94	853.18



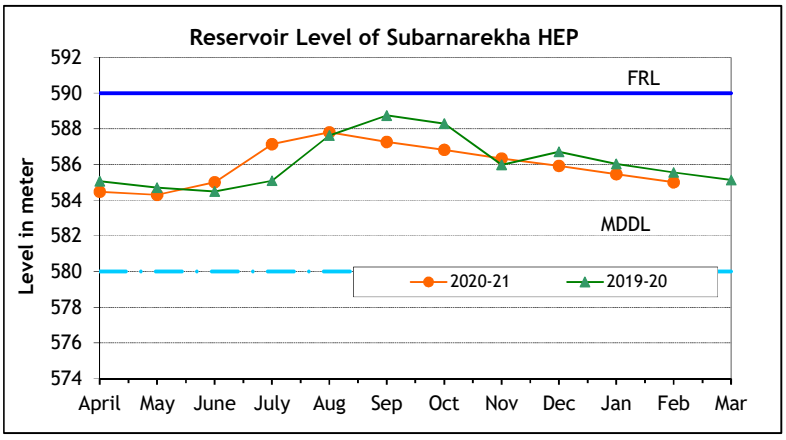
Reservoir Level of Indravati HEP

Month	FRL	MDDL	2020-21	2019-20
April	642.00	625.00	634.13	631.52
May	642.00	625.00	632.47	628.82
June	642.00	625.00	631.82	628.40
July	642.00	625.00	630.80	633.50
Aug	642.00	625.00	636.85	640.34
Sep	642.00	625.00	638.12	641.03
Oct	642.00	625.00	638.14	640.79
Nov	642.00	625.00	637.56	640.50
Dec	642.00	625.00	637.85	640.17
Jan	642.00	625.00	637.14	639.19
Feb	642.00	625.00	635.82	637.66
Mar	642.00	625.00	634.00	636.11



Reservoir Level of Subarnarekha HEP

Month	FRL	MDDL	2020-21	2019-20
April	590.00	580.00	584.48	585.06
May	590.00	580.00	584.30	584.70
June	590.00	580.00	585.00	584.48
July	590.00	580.00	587.14	585.09
Aug	590.00	580.00	587.81	587.62
Sep	590.00	580.00	587.26	588.75
Oct	590.00	580.00	586.83	588.29
Nov	590.00	580.00	586.34	585.98
Dec	590.00	580.00	585.92	586.71
Jan	590.00	580.00	585.46	586.04
Feb	590.00	580.00	585.00	585.55
Mar	590.00	580.00	584.70	585.12



FRL: Full Reservoir Level; **MDDL**: Minimum Drawdown Level

% Weighted Average Share Allocation for the Month of April, 2020 (First month of F.Y. 2020-21)

BENEFICIARIES (as per Excel)	Region	FSTPP-I&II	FSTPP-III	KHSTPP-I	KHSTPP-II	TSTPP-I	BARH	BRBCL	MTPS-II	TEESTA	RANGIT	NPGC	Darlipali_NTPC
BIHAR	ER	31.397866	21.517874	41.858038	4.979865	41.245379	90.736309	10.000	74.972	21.260	35.000	84.766	11.860
JHARKHAND	ER	8.574292	16.948474	3.200751	1.248565	7.667664	7.081288		3.433	12.340	13.330	3.276	9.220
DVC	ER	0.000000	0.000000	0.000000		0.200000	0.000000		2.600	8.640	10.000		
ODISHA	ER	13.630000	16.620000	15.240000	2.050000	31.800000			8.527	20.590	0.000		58.820
ODISHA (COAL POWER - AFTAB)	ER	0.099049		0.098249	0.106629	0.099049							
ODISHA (COAL POWER - DADRI)	ER	0.082937	0.162663	0.082268	0.089285	0.082937							
ODISHA (COAL POWER - Rajasthan)	ER	0.275736	0.183824	0.275736	0.275736	0.275736							
ODISHA (COAL POWER - Raj-II SunTech)	ER		0.091912										
ODISHA (COAL POWER - Faridabad)	ER	0.095840	0.091354	0.078653	0.098967	0.086460							
WEST BENGAL	ER	31.930000	37.638940	6.070000	0.000000	9.210000	0.000000		9.635	23.980	28.340		18.350
West Bengal (COAL POWER - Rajasthan)	ER	0.919117	0.643382	0.919117	0.919117	0.919117							
West Bengal (COAL POWER- Raj-II SunTech)	ER		0.275735										
SIKKIM	ER	1.630000		1.550000	0.330000	2.400000	1.318009		0.554	13.190	13.330	0.546	1.750
RLY BIHAR	ER							14.250					
RLY DVC	ER							15.674					
TELANGANA (NSM-II)	SR	0.751558	0.733930	0.682150	0.763112	0.712870	0.675000		0.279				
TAMILNADU	SR	1.290000		0.700000		0.850000							
CHHATTISGARH	WR				2.000000								
GUJARAT	WR				9.400000								
MADHYA PRADESH	WR				4.930000								
MAHARASHTRA	WR				9.870000								
DADRA & NAGAR HAVELI	WR				0.200000								
DAMAN & DIU	WR				0.130000								
RLY MADHYA PRADESH	WR							7.125					
RLY MAHA RASHTRA	WR							17.100					
UTTAR PRADESH	NR	2.080000		9.120000	16.730000							11.412	
HARYANA	NR	0.690000		3.040000	4.580000								
RAJASTHAN	NR	0.690000		3.040000	7.110000			1.425					
J & K	NR	0.850000		3.680000	5.560000								
HIMACHAL PRADESH	NR				1.530000								
DELHI	NR	1.390000		6.070000	10.490000	0.000000		0.712					
PUNJAB	NR				8.020000			4.987					
UTTARAKHAND	NR	0.000000		0.000000	1.870000								
CHANDIGARH	NR	0.000000		0.000000	0.200000								
RLY UTTAR PRADESH(ISTS Points)	NR							7.838					
UTTAR PRADESH	NR							18.524					
HARYANA	NR							2.138					
ASSAM	NER	2.455737		2.104847	5.093479	2.095419							
ASSAM (COAL POWER - Rajasthan)	NER	0.091912	0.091912	0.091912	0.091912	0.091912							
MEGHALAYA	NER	0.000000											
NAGALAND	NER	0.429803		0.424446		0.424823							
ARUNACHAL PRADESH	NER	0.191917		0.191747		0.196898							
MIZORAM	NER	0.141736		0.141610		0.141736							
NVVN POWER - A/C BPDB	Others	0.312500		1.190476	1.333333	1.500000							
POWERGRID (ALIPURDUAR)	Others			0.150000			0.189394						
KARNATAKA_RLY	SR							0.227					
		100.000000	95.000000	100.000000	100.000000	100.000000	100.000000	100.00000	100.000000	100.000000	100.000000	100.000000	100.000000

% Weighted Average Share Allocation for the Month of March, 2021 (Last month of F.Y. 2020-21)

BENEFICIARIES (as per Excel)	Region	FSTPP-I&II	FSTPP-III	KHSTPP-I	KHSTPP-II	TSTPP-I	BARH	BRBCL	MTPS-II	TEESTA	RANGIT	NPGC	Darlipali_NTPC
BIHAR	ER	31.397866	21.517874	41.858038	4.979865	41.245379	90.736309	10.000	74.972	21.260	35.000	84.766	11.860
JHARKHAND	ER	8.574292	16.948474	3.200751	1.248565	7.667664	7.081288		3.433	12.340	13.330	3.276	9.220
DVC	ER	0.000000	0.000000	0.000000		0.200000	0.000000		2.600	8.640	10.000		
ODISHA	ER	13.630000	16.620000	15.240000	2.050000	31.800000			8.527	20.590	0.000		58.820
ODISHA (COAL POWER - AFTAB)	ER	0.099049		0.098249	0.106629	0.099049							
ODISHA (COAL POWER - DADRI)	ER	0.082937	0.162663	0.082268	0.089285	0.082937							
ODISHA (COAL POWER - Rajasthan)	ER	0.275736	0.183824	0.275736	0.275736	0.275736							
ODISHA (COAL POWER - Raj-II SunTech)	ER		0.091912										
ODISHA (COAL POWER - Faridabad)	ER	0.095840	0.091354	0.078653	0.098967	0.086460							
WEST BENGAL	ER	31.930000	37.638940	6.070000	0.000000	9.210000	0.000000		9.635	23.980	28.340		18.350
West Bengal (COAL POWER - Rajasthan)	ER	0.919117	0.643382	0.919117	0.919117	0.919117							
West Bengal (COAL POWER- Raj-II SunTech)	ER		0.275735										
SIKKIM	ER	1.051613		1.000000	0.213000	1.548000	1.318009		0.554	13.190	13.330	0.546	1.750
RLY BIHAR	ER							12.097					
RLY DVC	ER							13.306					
TELANGANA (NSM-II)	SR	0.751558	0.733930	0.682150	0.763112	0.712870	0.675000		0.279				
TAMILNADU	SR	1.290000		0.700000		0.850000							
CHHATTISGARH	WR				2.000000								
GUJARAT	WR	0.578387	5.000000	0.550000	9.517000	0.852000							
MADHYA PRADESH	WR				4.930000								
MAHARASHTRA	WR				9.870000								
DADRA & NAGAR HAVELI	WR				0.200000								
DAMAN & DIU	WR				0.130000								
RLY MADHYA PRADESH	WR							18.629					
RLY MAHA RASHTRA	WR							14.516					
UTTAR PRADESH	NR	2.080000		9.120000	16.730000							11.412	
HARYANA	NR	0.690000		3.040000	4.580000								
RAJASTHAN	NR	0.690000		3.040000	7.110000			1.210					
J & K	NR	0.850000		3.680000	5.560000								
HIMACHAL PRADESH	NR				1.530000								
DELHI	NR	1.390000		6.070000	10.490000	0.000000		0.605					
PUNJAB	NR				8.020000			4.234					
UTTARAKHAND	NR	0.000000		0.000000	1.870000								
CHANDIGARH	NR	0.000000		0.000000	0.200000								
RLY UTTAR PRADESH(ISTS Points)	NR							6.653					
UTTAR PRADESH	NR							15.725					
HARYANA	NR							1.815					
ASSAM	NER	2.455737		2.104847	5.093479	2.095419							
ASSAM (COAL POWER - Rajasthan)	NER	0.091912	0.091912	0.091912	0.091912	0.091912							
MEGHALAYA	NER	0.000000											
NAGALAND	NER	0.429803		0.424446		0.424823							
ARUNACHAL PRADESH	NER	0.191917		0.191747		0.196898							
MIZORAM	NER	0.141736		0.141610		0.141736							
NVVN POWER - A/C BPDB	Others	0.312500		1.190476	1.333333	1.500000							
POWERGRID (ALIPURDUAR)	Others			0.150000			0.189394						
KARNATAKA_RLY	SR							1.21					
		100.000000	100.000000	100.000000	100.000000	100.000000	100.000000	100.000000	100.000000	100.000000	100.000000	100.000000	100.000000

ANNEXURE-XIII

GRID DISTURBANCES

Grid disturbances which occurred during the year 2020-21 are as follows:

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
1.	ISTS	01/04/2020	18:23	28	35	GD-I	At 18:23 hrs, 220 kV Rangpo - New Melli - S/C got tripped due to R and Y phase to earth fault in the circuit near to Rangpo end. In addition to this, 132 kV Rangpo Gangtok D/C also got tripped simultaneously with this fault. As Gangtok load was radially supplied from Rangpo through 132 kV Rangpo-Gangtok D/C so with their tripping, total power failure occurred at Gangtok city. At same time, 220 kV Rangpo – Tashiding S/C also got tripped only from Tashiding end sensing the same R and Y phase to earth fault in zone – 1 resulting total power failure at Tashiding – Jorethang – New Melli section and tripping of running unit at Tashiding due to loss of evacuation path. After these, at 18:28 hrs. 132 kV Rangpo Chujachen – D/C tripped from both ends on Y and B phase to earth fault. The fault was in circuit 1 based on which Chujachen has issued trip command in zone 1 and send DT to remote end. However, at the same time due to receipt of Direct trip from remote end, circuit 2 got tripped from Rangpo end. This led to black out of 132 kV Chujachen Hydro Power substation.
2.	OPTCL	03/04/2020	03:19	0	245	GD-I	At 03:19 hrs. all running units and connected 220 kV feeders at Balimela HEP tripped on operation of bus bar protection of 220 kV bus 2 at Balimela (only bus 2 was in service at the time of disturbance) due to bursting of B phase bus CT (SLD attached in annexure 1) at Balimela end of 220 kV Balimela – Jayanagar – 1. On inspection, SF6 circuit breaker, post insulator, line isolator (both 3P and 4P) and line CT of 220 kV

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
							Balimela – Jayanagar – 1 at Balimela end were also found in damaged condition.
3.	JUSNL	14/04/2020	12:47	0	299	GD-I	220 KV Tenughat (TTPS) Biharshariff S/C tripped on 12:32 hrs. due to B phase to earth fault. At 12:46 hrs, 220 kV Tenughat (TTPS) – Patratu (PTPS) S/C tripped on earth fault from PTPS end resulting in tripping of both running units at TTPS due to loss of the only available evacuation path. With this 220 kV Tenughat substation got black out.
4.	JUSNL	15/04/2020	17:20	35	0	GD-I	At 17:20 hrs., 220 kV Santaldih TPS (STPS) – Chandil S/C, 220 kV Ranchi – Chandil S/C and 220 kV Ramchandrapur – Chandil S/C tripped. At same time, flush at LT side of one 100 MVA, 220/132 kV ICT was observed and all four 132 kV feeders connected to Chandil were hand tripped resulting total power failure at Chandil end
5.	DVC	17/04/2020	10:50	25	0	GD-I	At 10:49 hrs. 220 kV Waria – Parulia – 1 tripped on B phase to earth fault. At the same time all connected 220 kV lines tripped from Parulia end due to operation of bus bar protection. Around 30 kV dip has been observed in B phase voltage at Durgapur PMU data at the time of the disturbance. No auto-reclose operation has been captured in PMU data.
6.	OPTCL	18/04/2020	19:34	0	249	GD-I	GMR unit # 3 was connected to rest of the grid via 400 kV Meramundali – GMR S/C. At 19:34 hrs, 400 kV GMR – Meramundali S/C tripped on B phase to earth fault (fault location at 4 km from Meramundali) resulting tripping of this unit.
7.	ISTS/BSPTCL	19/04/2020	20:54	140	0		400/132 kV Motihari was connected to rest of the grid via 400 kV Barh – Motihari – 2 (Others lines are under breakdown due to tower-collapse) and radial load of 132 KV Betiya, 132 KV Motihari (Bihar) and 132 KV

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
						GD-I	Raxaul was supplied through 400/132 kV ICT – 2 at Motihari. At 20:54 hrs. 400 kV Barh – Motihari – 2 got tripped due to Y phase to earth fault resulting in total power failure at 400/132 kV Motihari along with 132 kV Motihari, 132 kV Betiya and 132 kV Raxaul and other surrounding areas.
8.	ISTS	21/04/2020	11:00	0	0	GD-I	At 09:30 hrs, 400 kV Teesta III – Dikchu S/C tripped from both ends. Due to problem in relay line could not be charged from Dikchu end and line was idle charged from Teesta III end. At 11:00 hrs, 400 kV Teesta III – Kishangunj S/C tripped from Teesta III end on operation of over voltage stage I protection and from Kishangunj end due to DT receipt.
9.	JUSNL	22/04/2020	20:12	50	313	GD-I	At 20:12 hrs. 220 kV Tenughat (TTPS) – Patratu (PTPS) S/C tripped from PTPS end detecting a B phase to earth fault in zone 1. At same time, 220 kV TTPS – Biharshariff S/C tripped from Biharshariff end in 350 ms on zone – 2 distance protection. Due to tripping of both circuits, both the running units at TTPS tripped due to loss of evacuation path and total power failure occurred at TTPS.
10.	ISTS	26/04/2020	08:42	80	0	GD-I	400/132 kV Motihari was connected to rest of the grid via 400 kV Barh – Motihari – 2 (Others lines are under breakdown due to tower-collapse) and radial load of 132 KV Betiya, 132 KV Motihari (Bihar) and 132 KV Raxaul was supplied through 400/132 kV ICT – 2 at Motihari. During the event, 400 kV Barh – Motihari – 2 got tripped due to Y phase to earth fault resulting in total power failure at 400/132 kV Motihari along with 132 kV Motihari, 132 kV Betiya and 132 kV Raxaul and other surrounding areas.
11.	ISTS	26/04/2020	11:10	80	0		400/132 kV Motihari was connected to rest of the grid via 400 kV Barh – Motihari – 2 (Others lines are under breakdown due to tower-collapse) and radial load of 132

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
						GD-I	KV Betiya, 132 KV Motihari (Bihar) and 132 KV Raxaul was supplied through 400/132 kV ICT – 2 at Motihari. During the event, 400 kV Barh – Motihari – 2 got tripped due to Y phase to earth fault resulting in total power failure at 400/132 kV Motihari along with 132 kV Motihari, 132 kV Betiya and 132 kV Raxaul and other surrounding areas.
12.	JUSNL	30/04/2020	19:37	145	0	GD-I	At 19:37 hrs, all 220 kV lines and 220/132 kV ATRs tripped at Chandil due to burst 100 MVA 220/132 kV ICT - 3 at Chandil and total power failure occurred at Chandil and its nearby areas. Due to testing of other ICTs, initially power was extended to affected area from Manique (DVC) by 21:18 hrs.
13.	BSPTCL	05/05/2020	19:09	180	0	GD-I	On 5th May 2020, at 19:09 Hrs, 220 kV Darbhanga (DMTCL)-Darbhanga (BSPTCL) D/C tripped on Y phase to earth fault. At the same time 220 kV Dharbanga-Mushahari-1 also tripped resulting in load loss at Darbhanga, Madhubani and Pandaul. It was informed by BSPTCL that there was a Y-phase jumper snapping of 220 kV Darbhanga (DMTCL)-Darbhanga (BSPTCL) - 2 which was the root cause of the event.
14.	JUSNL	06/05/2020	01:19	20	0	GD-I	At 01:13 hrs 400/220 kV ICT 1 & 2 at Chaibasa (PG) tripped from 220 kV side due to mal-operation of back up impedance relay. At 01:19 hrs, 220 kV Chaibasa (JUSNL) – Chaibasa (PG) D/C and 220 kV Chaibasa (JUSNL) – Ramchandrapur D/C tripped due to R phase to earth fault resulting in total power failure at 220/132 kV Chaibasa (JUSNL) S/S. 132 kV Rajkharswan – Goelkhera S/C also tripped at same time.
15.	ISTS	07/05/2020	12:51	85	0	GD-I	Tripping of 400 kV Barh - Motihari - 2 due to Y phase to earth fault, had led to loss of supply to Betiah/Raxaul/Motihari as being the single source of supply.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
16.	BSPTCL	10/05/2020	22:51	130	0	GD-I	220 kV Gaya Sonenagar – D/C tripped at 22:51 hrs due to R phase to earth fault resulting total power failure at Sonenagar S/S. Around 130 MW load loss was reported at Aurangabad, Sonenagar, Rafi Ganj, Japla. Around 15 MW traction load loss was reported at Japla, Garwah and Rafi Ganj.
17.	ISTS	10/05/2020	23:56	120	0	GD-I	Tripping of 400 kV Barh - Motihari - 2 due to Y phase to earth fault, had led to loss of supply to Betiah/Raxaul/Motihari as being the single source of supply.
18.	ISTS	11/05/2020	02:48	120	0	GD-I	Tripping of 400 kV Barh - Motihari - 2 due to Y phase to earth fault, had led to loss of supply to Betiah /Raxaul/Motihari as being the single source of supply.
19.	JUSNL	14/05/2020	15:33	161	0	GD-I	220 kV Ranchi Hatia T/C, 220 kV Patratu-Hatia D/C and 220/132KV 150MVA ICT-1, 2 and 3 at Hatia tripped at same time resulting in total power failure at 220/132 kV Hatia S/S. In Jamshedpur PMU data, one R phase to earth fault has been captured. Fault was cleared at around 400 ms.
20.	OPTCL	16/05/2020	19:28	160	230	GD-I	At 19:26 hrs. 400 kV Meramundali – JSPL – 1 tripped due to receipt of DT signal at Meramundali end. After around 1 min, 400 kV Meramundali – JSPL – 2 tripped due to same reason resulting total power failure at JSPL. Inclement weather condition was reported at the time of the event.
21.	ISTS	19/05/2020	20:57	0	55	GD-I	At 20:57 hrs both circuits tripped resulting in total power failure at Dikchu HEP. 400 kV Teesta III – Dikchu S/C tripped due to B phase to earth fault. 400 kV Rangpo – Dikchu S/C tripped due to direct trip signal received at Rangpo.
22.	ISTS	20/05/2020	13:23	110	0	GD-I	Tripping of 400 kV Barh - Motihari - 2 due to R phase to earth fault, had led to loss of supply to Betiah/Raxaul/Motihari as being the single source of supply.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
23.	JUSNL	24/05/2020	12:38	0	292	GD-I	At 12:28 hrs 220 kV TTPS – Bihar Sharif S/C tripped due to R phase to earth fault. The whole power generated by TTPS was being evacuated through 220 kV TTPS – PTPS S/C. At 12:38 hrs, 220 kV TTPS – PTPS S/C tripped due to B phase to earth fault resulting in tripping of both running units at TTPS.
24.	WBSETCL	27/05/2020	00:56	0	280	GD-I	At 00:56 Hrs. all 220 kV lines from 220 kV NJP tripped due to tripping of both 220 kiva Buses ,causing generation loss at TLDP III and TLDP IV on no evacuation path.
25.	ISTS	27/05/2020	04:28	0	110	GD-I	220 kV New Melli - Jorethang - 1 tripped on Y phase to earth fault from Jorethang end. 220 kV New Melli - Jorethang - 2 tripped on overcurrent protection from Jorethang end only. At same time 220 kV Tashiding - New Melli S/C and 220 kV Tashiding - Rangpo S/C tripped from Tashiding end only on Y phase to earth fault.
26.	ISTS/BSPTCL	30/05/2020	19:22	126	0	GD-I	At 19:22 hrs 400 kV Barh – Motihari – 2 tripped due to Y phase to earth fault. The tripping has led to loss of supply to Betiya and Motihari as being the single source of supply causing Grid Disturbance 1 (GD-1) category event.
27.	ISTS/BSPTCL	30/05/2020	22:05	0	0	GD-I	At 22:05 hrs 400 kV Barh – Motihari – 2 tripped due to Y phase to earth fault. The tripping has led to loss of supply to Motihari as being the single source of supply causing Grid Disturbance 1 (GD-1) category event.
28.	BSPTCL	10/06/2020	10:54	135	0	GD-I	On 10th June 2020, at 10:54 Hrs, 220 kV Darbhanga (DMTCL)-Darbhanga (BSPTCL) D/C tripped from BSPTCL end. At the same time 220 kV Darbhanga (BSPTCL) – Mushahari – 1 and 220 kV Darbhanga (DMTCL) – Motipur – 1 also tripped resulting in load loss at Darbhanga, Madhubani and Pandaul.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
29.	ISTS	11/06/2020	22:38	0	166	GD-I	220 kV New Melli - Jorethang – D/C tripped from Jorethang end only resulting tripping of all running units at Jorethang. 220 kV Tashiding Rangpo S/C and 220 kV Tashiding New Melli S/C tripped.
30.	ISTS	13/06/2020	04:54	0	175	GD-I	220 kV New Melli - Jorethang – D/C tripped from Jorethang end only resulting tripping of all running units at Jorethang. 220 kV Tashiding – New Melli S/C tripped from both ends. But both running units at Tashiding tripped on GT O/C protection.
31.	ISTS	13/06/2020	07:18	0	117	GD-I	220 kV New Melli - Jorethang – D/C tripped from Jorethang end only resulting tripping of all running units at Jorethang. 220 kV Tashiding Rangpo S/C and 220 kV Tashiding New Melli S/C tripped.
32.	OPTCL	23/06/2020	11:58	160	0	GD-I	At 11:41 hrs 220 kV Joda – TTPS D/C tripped on B phase to earth fault. At 11:57 hrs, 220 kV Ramchandrapur – Joda S/C tripped on overload. Prior to the tripping, power flow was 160 MW. At same time 220 kV Joda JSPL (Jindal) – Jamshedpur S/C tripped at same time from Ramchandrapur and Jamshedpur end respectively in overcurrent protection.
33.	OPTCL	26/06/2020	18:43	0	180	GD-I	GMR unit # 3 was connected to 400/220 kV Meramundali S/S of OPTCL STU network through 400 kV GMR – Meramundali S/C. At 18:43 hrs, 400 kV GMR Meramundali S/C tripped due to DT received at Meramundali end. This caused total power failure at GMR (OPTCL) section and GMR unit #3 tripped.
34.	ISTS/BRBCL	29/06/2020	21:53	0	422	GD-I	Due to LILO work at Chandauti S/S, 400 kV BRBCL – Sasaram – 2 was under shut down. Unit 1 and 2 were in running condition at BRBCL. At 21:53hrs., 400kV Sasaram-BRBCL #1 tripped on R and Y phase fault. Both the units got tripped due to loss of evacuation path.
35.	ISTS/BRBCL	01/07/2020	05:50	0	410		BRBCL, a 4 x 250 MW thermal power plant is connected to rest of the grid via 400 kV BRBCL – Sasaram D/C. 400 kV BRBCL – Sasaram – 2 was under

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
						GD-I	break down due to rectification of tower bending. Unit 1 and 2 were in running condition at BRBCL. At 05:50 hrs., 400kV Sasaram-BRBCL #1 tripped on R and Y phase fault. Both the units got tripped due to loss of evacuation path. Heavy rain, thundering and lightning was reported at the time of the event.
36.	OPTCL	04/07/2020	13:19	110	0	GD-I	At 12:47 hrs 220 kV Joda – TTPS - 1 tripped on Y and B phase to earth fault. At 13:00 hrs it was charged from Joda end successfully. But while charging this circuit from TTPS end at 13:01 hrs, it tripped on B phase to earth fault from TTPS end. At 13:06 hrs 220 kV Joda – TTPS – 2 tripped from both ends on R phase to earth fault. At 13:19 hrs 220 kV Joda – Ramchandrapur end tripped from both ends on Y phase to earth fault. At same time, 220 kV Jamshedpur – JSPL – Joda feeder tripped from Jamshedpur end in overcurrent protection.
37.	ISTS	04/07/2020	14:24	0	104	GD-I	At 14:24 hrs 400 kV Rangpo – Kishangunj S/C tripped from both ends. Directional Earth fault protection operated at Rangpo and DT was received at Kishangunj. At same time, 220 kV JLHEP – New Melli D/C and 220 kV Tashiding Rangpo S/C tripped on earth fault protection at Jorethang and Tashiding end respectively. As a result, both the running units at Jorethang tripped due to loss of evacuation path.
38.	ISTS/BRBCL	07/07/2020	23:58	0	425	GD-I	BRBCL, a 4 x 250 MW thermal power plant is connected to rest of the grid via 400 kV BRBCL – Sasaram D/C. 400 kV BRBCL – Sasaram – 1 was charged from Sasaram end. During synchronizing this line from BRBCL end, 400 kV bus 1 at Sasaram got tripped resulting in tripping of 400 kV BRBCL – Sasaram – 2, 765/400 kV ICT at Sasaram. Unit 2 and 3 were in running condition at BRBCL prior to the event. Both the units tripped due to loss of evacuation path.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
39.	ISTS/BSPTCL	08/07/2020	02:19	248	0	GD-I	400/132 kV Motihari substation is connected to rest of the grid via 400 kV Barh – Motihari – 2 (Others lines are under breakdown due to tower-collapse) and its radial load of 132 KV Betiya, 132 KV Motihari (Bihar) and 132 KV Raxaul are being supplied through 400/132 kV ICT – 2 at Motihari. At 02:19 hrs 400 kV Barh – Motihari – 2 tripped due to B phase to earth fault. The tripping has led to loss of supply to Betiah/Raxaul/Motihari as being the single source of supply causing Grid Disturbance 1 (GD-1) category event.
40.	ISTS	16/07/2020	16:27	0	1390	GD-I	400 KV Teesta III-Kishanganj S/C was taken under shutdown on emergency basis at 15:49 hrs for gas density monitor replacement work at Kishangunj end. To ensure maximum power evacuation, 400 kV buses at Rangpo were split. Teesta III and Dikchu were connected to 400 kV bus 1 at Rangpo through 400 kV Dikchu – Rangpo S/C. their generation was evacuated through 400 kV Rangpo Kishangunj S/C. All other elements at Rangpo S/S were connected to 400 kV bus 2. Generation at Teesta V, Jorethang, Tashiding, Chujachen HEP was being evacuated through 400 kV Rangpo – Binaguri D/C. At 16:27 hrs, 400 KV Teesta III – Dikchu S/C, 400 KV Rangpo-Dikchu S/C, 400 KV Rangpo-Kishanganj S/C tripped resulting total power failure at Teesta III and Dikchu HEP.
41.	ISTS	19/07/2020	23:18	0	0	GD-I	At 23:18 Hrs, 400 KV Alipurduar-Jigmelling D/c tripped on spurious DT receive at Alipurduar end resulting in tripping of Mangdechu units #1 and #2 due to loss of evacuation path. Generation loss at Mangdechu was 777 MW. No generation or load loss was reported in Indian grid during this event.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
42.	ISTS	20/07/2020	07:06	300	0	GD-I	At 07:06 hrs. B phase to earth fault occurred at 400 kV Muzaffarpur-Gorakhpur – 2. B pole of tie breaker at Muzaffarpur end got did not open. Due to delay in LBB operation, fault was getting fed and to clear the fault, 400 kV Muzaffarpur-Gorakhpur – 1, 400 kV Muzaffarpur-New Purnea-2, 400 kV Muzaffarpur-Biharshariff D/C and 220 kV Muzaffarpur – Hajipur D/C tripped. Tripping of 220 kV Muzaffarpur – Hajipur D/C resulted total power failure at Hajipur and chapra. At 07:08 hrs, 220 kV Darbhanga (DMTCL) – Darbhanga D/C, 220 kV Darbhanga (DMTCL) – Motipur D/C, 220 kV Darbhanga (DMTCL) – Laukahi - 1, 220 kV Darbhanga (DMTCL) – Samastipur S/C tripped due to overvoltage problem resulting total power failure at Darbhanga and its nearby areas.
43.	BSPTCL	22/07/2020	12:15	250	0	GD-I	220 kV Darbhanga (BSPTCL) to Mushahari – 2 was idle charged from Mushahari end. At 12:15 hrs 220 kV Darbhanga (DMTCL) – Darbhanga (BSPTCL) D/C tripped from DMTCL end only. At same time 220 kV Darbhanga (BSPTCL) to Mushahari – 1 also tripped. Later it was reported that Y – Phase Bushing to Gantry tower conductor of 220 kV Darbhanga (DMTCL) – Darbhanga (BSPTCL) – 2 melted and fault occurred.
44.	ISTS	01/08/2020	11:47	0	100	GD-I	400/132 kV Dikchu Hydroelectric Plant is connected to the rest of the grid through 400 kV Teesta III – Dikchu S/C and 400 kV Dikchu – Rangpo S/C. Tie bay of 400/132 kV ICT and 400 kV bus 2 at Dikchu was out of service. Both the running units at Dikchu HEP were connected to bus 1 only at Dikchu via 400/132 kV ICT. Tripping of 400 kV Rangpo – Dikchu S/C (only outgoing feeder connected to 400 kV bus 1 at Dikchu), would result in tripping of any running unit at Dikchu HEP due to opening of both main and tie CB of this line at Dikchu, resulting in complete isolation of Bus-1.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
							At 11:47 hrs, 400 kV Dikchu Rangpo S/C tripped from both ends due to B phase to earth fault resulting in tripping of both the running units at Dikchu. At same time Dikchu end breaker of 400 kV Teesta III – Dikchu S/C tripped after receiving SOTF trip signal from Main-2 relay (ABB REL 670). Consequently, 400kV Bus-2 of Dikchu also became dead.
45.	BSPTCL	03/08/2020	11:05	232	180	GD-I	At 11:01 hrs 220 kV Biharshariff-Barauni D/C tripped from Biharshariff end on B-Phase to earth fault with delayed fault clearance observed in PMU.At the same time 220 KV Barauni-Begusari-1 tripped in zone-2 from Barauni end. At 11:05hrs, 220 KV Begusarai-Khagaria and New Purnea –Khagaria ckt 2 tripped on B phase to earth fault. For 220 KV Begusarai-Khagaria line fault distance was 48.26 km from Begusarai. At 11:05 hrs. Running unit of Barauni (unit no. 8) generating 180 MW tripped due to under frequency and complete blackout in 220 KV Barauni, 220 KV Begusarai & 220 KV Khagaria took place. Load loss of 232 MW in Rosra, Kucheswar, Dalsingsarai, Manjhaul, Samastipur, Khagaria areas took place.
46.	OPTCL	03/08/2020	17:35	0	150	GD-I	220 kV Rengali Power house (PH) – TTPS S/C was under outage since 19:17 hrs on 02nd August 2020. At 16:17 hrs, 220 kV RengaliSwitchyard (OPTCL)-Tarkera S/C tripped due to B phase to earth fault. At 16:58 hrs 220 kV Rengali Switchyard (OPTCL) - Barkote S/C tripped due to R and Y phase fault. At 17:17 hrs 220 kV Rengali Switchyard (OPTCL) - Rengali (PG) - 2 tripped due to Y and B phase fault. At 17:35 hrs 220 kV Rengali Switchyard (OPTCL) - Rengali (PG) - 1 tripped due to B phase fault. At same time, 220 kV TSTPP – Rengali PH S/C tripped from TSTPP end resulting in complete power failure at 220kV Rengali Switchyard (OPTCL) and at 220kV

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
							Rengali PH. All running units at Rengali PH tripped due to loss of evacuation path.
47.	BSPTCL	04/08/2020	19:33	313	0	GD-I	220 KV Barauni-Hajipur-1 was under breakdown and ckt-2 was not in service prior to the event. At 19:33 hrs, while taking charging attempt of 220 KV Barauni-Hajipur 2, 220 KV Muzaffarpur-Hajipur D/C tripped leading to a load loss of 313 MW in Hajipur, Chhapra, Amnour.
48.	BSPTCL	09/08/2020	07:41	175	220	GD-I	At 7:41 hrs, R ph CT blast at Begusarai end of 220 KV BTPS Begusarai ckt 2. Subsequently, all connected 220 KV ckts and 220/132 KV ICTs at Begusarai tripped either on busbar/LBB protection or from remote ends on zone 2. At the same time, running unit 8 at 220 KV Barauni TPS with 220 MW generation tripped on overcurrent.220 kV BTPS –Hajipur 1 was under breakdown due to tower collapse and 220 KV BTPS Hajipur ckt 2 also tripped at the same time on possibly overreach. As a result, there was total voltage loss at 220 KV Begusarai s/s and load loss 175 MW took place in Dalsinghsarai, BTPS (132Kv),Manjhaul, Ballia, Khagaria andBegusarai area.220 KV BTPS remained connected with 220 KV Biharshariff via 220 KV double ckts.
49.	DVC	16/08/2020	01:52	297	0	GD-I	At 01:52 Hrs, 220/132 kV Bokaro B S/S became dead after tripping of all connected 220 kV lines and 400/220 kV ICTs. Y phase CT burst was reported of 220 KV Bokaro B-Jamshedpur 2 at Jamshedpur end.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
50.	OPTCL	19/08/2020	22:04	0	611	GD-I	GMR unit # 3 was connected to 400/220 kV Meramundali S/S of OPTCL STU network through 400 kV GMR – Meramundali S/C. GMR unit#1 and 2 were connected to ISTS network through 400 kV Angul-GMR D/C. The ISTS and STU buses at GMR are electrically isolated from each other, as per the regulatory requirements. At 21:51 hrs, 400 kV GMR Meramundali S/C tripped only from GMR end after receipt of direct trip signal (DT) from remote end. GMR unit # 3 got islanded and remained in house load operation before tripping at 22:04 hrs. 6.6 kV switchgear of unit # 2 and unit # 3 was in coupled condition. This resulted in high circulating current in the unit auxiliary transformer of unit # 2 and tripped tripping of transformer followed by tripping of unit # 2.
51.	ISTS	22/08/2020	16:46	117	0	GD-I	At16:46 hrs 400 kV Barh – Motihari – 2 tripped due to Y to B phase short circuit fault. Other 400kV lines connected to Motihari (DMTCL) are under breakdown since August 2019. The tripping led to loss of supply to 400kV Motihari (DMTCL), & to Betiah/Raxaul/Motihari (BSPTCL).
52.	ISTS	02/09/2020	00:20	280	0	GD-I	At 00:20 hrs, 400 kV Barh-Motihari – 2 tripped due to R phase to earth fault. The tripping led to total power failure at Motihari 400kV s/stn besides loss of supply to Betiya, Raxaul, Ramnagar and Narktiaganj; being the single source of supply causing Grid Disturbance 1 (GD-1) category event.
53.	BSPTCL	04/09/2020	11:30	202	0	GD-I	220 kV MTPS - Gopalganj – 1 was under shutdown. At 11:02 hrs. 220 kV MTPS –Gopalganj - 2 tripped on B phase to earth fault resulting total power failure at 220kV Gopalganj and to the loads supplied radially from this s/stn. At same time 220 kV MTPS – Samastipur – 1 tripped from MTPS end and smoke was noticed around vegetation near pump house of MTPS.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
							As a precautionary measure, 220 kV MTPS – Samastipur – 2 was hand tripped from both ends.
54.	BSPTCL	19/09/2020	16:37	380	0	GD-I	To perform the main breaker timing test at BSPTCL end, 220 kV Darbhanga (DMTCL)– Darbhanga (BSPTCL) – 2 was connected via the transfer bus coupler (TBC) bay at Darbhanga (BSPTCL) S/S. At 16:37 hrs, the above-mentioned line tripped due to Y phase to earth fault. At the same time, 400/220 kV 500 MVA ICT 1 & 2 at Darbhanga (DMTCL) also got tripped on directional earth fault protection from 400 kV side and 220 kV Darbhanga (DMTCL) Mushari D/C tripped on the operation of distance protection from Mushari end. 220 kV Darbhanga (DMTCL)-Darbhanga (BSPTCL) 1 also tripped from BSPTCL end sensing this fault as per preliminary information. This had led to a total power failure at 220/132 kV Darbhanga (BSPTCL) S/s causing load loss of around 380 MW. On investigation, BPI of Y-phase of TBC at Darbhanga (BSPTCL) was found in the flashed conditions at Darbhanga (BSPTCL) substation.
55.	JUSNL	23/09/2020	08:45	0	0	GD-I	At 08:45 hrs, R phase to earth fault occurred at Patratu S/S due to snapping of Shield wire on R – Phase jumper of 50 MVA, 132/33 kV Power Transformer. Transformer relay sensed fault in Differential & REF (field CT is used for Diff & REF) protection and issued trip command instantly but breaker failed to operate due to problem in mechanism. Fault was not cleared from all remote ends due to low fault current. After 8s (approx.) R phase to earth fault got converted into Y phase to earth fault, due to snapping of 220 kV Bus -2 jumper at Patratu and subsequently all the 220 kV feeders connected to Patratu tripped in Zone - 2 from remote end.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
56.	JUSNL	23/09/2020	13:49	0	280	GD-I	At 13:49 hrs 220 KV Patratu-Hatia 2 (circuit-1 was already under breakdown since 08:45 Hrs) and 220 KV Tenughat-Biharshariff S/C tripped due to B phase to earth fault resulting total power failure at 220 kV Tenughat and Patratu thermal power station.
57.	ISTS	24/09/2020	01:33	230	0	GD-I	At 01:33 Hrs, 400 kV Barh Motihari - 2 tripped due to R phase to earth fault resulting total power failure at 400/132 kV S/S along with interruption of power supply to downstream areas. It was restored at 01:58 hrs.
58.	ISTS	24/09/2020	14:19	125	0	GD-I	400 kV Barh Motihari - 2 tripped due to R phase to earth fault, resulting another interruption of power supply at 14:19 hrs.
59.	ISTS	30/09/2020	10:50	0	100	GD-I	At 10:50 hrs 220 KV Jorethang-New Melli - 2 tripped due to B phase to earth fault. 220 KV Jorethang-New Melli - 1 tripped at the same time from Jorethang end only. As a result, both the running units of Jorethang tripped due to loss of evacuation path and total power failure occurred at Jorethang Plant
60.	ISTS	30/09/2020	11:40	0	100	GD-I	After tripping of 220 KV Jorethang-New Melli - D/C at 10:50 hrs, circuit-1 was restored at 11:00 hrs and JLHEP resumed generation from 11:06 Hrs. However, this circuit tripped again at 11:40 hrs resulting in tripping of both the running units and total power failure at Jorethang hydro power plant.
61.	OPTCL	01/10/2020	04:07	280	0	GD-I	On 30th September 2020 at 22:36 hrs, 220 kV Meramundali – NALCO - 1 tripped on overcurrent protection. It was charged at 00:05hrs on the next day i.e. 01st October 2020. At 01:35 hrs, sparking was noticed on this circuit at Meramundali end switchyard due to which GRIDCO SLDC advised NALCO to reduce the loading of this circuit. At 04:07 hrs, Line side pipe bus at Meramundali end of the above-mentioned circuit got broken and fell on the ground along with the breaker jumper causing line fault at Meramundali S/s.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
							Bus jumper of 220 kV bus 1 at Meramundali also got damaged at several places due to this event leading to bus fault at 220 kV bus 1 at Meramundali. All the feeders and ICTs connected with 220 kV bus 1 at Meramundali tripped along with bus coupler tripped one by one. All the feeders and ICTs connected to 220 kV bus 2 at Meramundali remained in service. Prior to the event, 220 kV NALCO and Tata Steel captive load substations were connected to the rest of the grid via 220 kV NALCO Meramundali D/C and 220 kV Tata Steel Meramundali D/C. Tripping of both 220 kV NALCO Meramundali D/C and 220 kV Tata Steel (Bhusan Steel) Meramundali D/C during the event has resulted in the isolation of these loads from the system resulting in GD – 1 category event.
62.	ISTS	01/10/2020	14:47	0	269	GD-I	On 1st Oct 2020 at 14:03 hrs, 132 kV Rangpo-Chujachen - 1 tripped due to B phase to earth fault. Charging attempt was taken at 14:32 hrs but the line could not be charged. Chujachen HEP was connected to the rest of the grid via 132 kV Rangpo-Chujachen – 2. 220 kV Jorethang – New Melli – 1 was under emergency shutdown. Hence, Jorethang HEP was connected to the rest of grid via 220 kV Jorethang – New Melli – 2. At 14:47 Hrs, 400 kV Rangpo-Dikchu S/C tripped due to B phase to earth fault. Tripping of 400 kV Rangpo – Dikchu S/C (only outgoing feeder connected to 400 kV bus 1 at Dikchu), resulted in the isolation of both units from the grid leading to tripping of both running units at Dikchu HEP. At the same time, 220 kV Jorethang – New Melli – 2 and 132 kV Rangpo-Chujachen – 2 also got tripped resulting in total power failure at Jorethang and Chujachen HEP also. System was subsequently restored.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
63.	OPTCL	10/10/2020	16:10	0	190	GD-I	220 kV Rengali Power House (PH) – Rengali Switchyard (OPTCL) – 2 was under shutdown. On 10th October 2020 at 16:08 hrs, 220 kV Rengali Switchyard (OPTCL) - Barkote S/C and 220 kV Rengali Switchyard (OPTCL) Tarkera S/C tripped due to R phase to earth fault and B phase to earth fault respectively. It was reported that top conductor (R phase) of 220 kV Rengali Switchyard (OPTCL) - Barkote S/C snapped at location no 336. At the same time, 220 kV Rengali PH – TSTPP S/C and 220 kV Rengali PH – TTPS S/C and 220 kV Rengali PH – Rengali Switchyard (OPTCL) – 1 tripped on overvoltage from Rengali PH end. Subsequently all the running units at Rengali PH tripped and GD – 1 occurred at Rengali PH. 220 kV Rengali Switchyard remained connected to rest of grid through 220 kV Rengali PG – Rengali SY D/C.
64.	ISTS	30/10/2020	13:15	0	48	GD-I	At 13:15 hrs on 30-10-2020, 400 kV TEESTA V - Rangpo line- 1 tripped. At the same time, 220 KV Jorethang- New Melli D/C tripped at Jorethang end only resulting in total power failure at Jorethang HEP.
65.	JUSNL	13/11/2020	14:36	240	54	GD-I	On 13th November 2020 at 14:36 hrs, B phase CT at Hatia end of 220 kV Ranchi Hatia – 3 blast resulted in tripping of 220 kV Ranchi Hatia – 1 and 2 from Ranchi end and 220 kV Patratu – Hatia D/C from Patratu end. 220/132 kV 150 MVA ICT – 3 Hatia also tripped at same time. 220/132 kV ICT – 1 & 2 and 220 kV Ranchi – Hatia – 1 & 2 were hand tripped at Hatia end after the event. As a result, total power failure occurred at 220/132 kV Hatia S/S.
66.	BSPTCL	24/11/2020	18:28	154	0	GD-I	220 kV Gaya-Dehri D/C was under shutdown prior to the event. On 24th November 2020 at 18:28 hrs, tripping of 220 kV Sasaram – Dehri S/C resulted in total power failure at Dehri, Bikramganj, Banjari, Kudra, Kerpa, Tiro areas.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
67.	BSPTCL	21/12/2020	06:21	184	0	GD-I	On 21-12-2020 at 06:21 hrs, 220 KV Dehri - Gaya D/C and 220 kV Pusauli - Dehri S/C tripped from Gaya and Pusauli end respectively resulting in total power failure at Dehri end. Existence of Y phase to earth fault has been captured by PMU data as well as DR recorded at Gaya end. The fault clearing time as per Gaya PMU is around 800 ms.
68.	HEL/CESC	05/01/2021	13:37	0	280	GD-I	400 kV HEL - Subhasgram - 1 was under shutdown since 04-01-2021 for rectification of damaged OPGW. HEL unit 2 was also not in service due to annual overhauling. HEL was connected to rest of the grid through 400 kV HEL - Subhasgram - 2 with only unit 1 in service at HEL. During relay testing of 400 kV HEL Subhasgram -1 at HEL, CT Switching relay malfunctioned and bus bar protection operated at HEL end. As a result, 400 kV HEL - Subhasgram - 2 tripped and total power failure occurred at HEL. DT signal was also sent to Subhasgram. No fault was observed in PMU data at the time of the fault.
69.	BSPTCL	15/01/2021	05:36	187	0	GD-I	400 kV Motihari-Gorakhpur D/C and 400 kV Motihari Barh 1 were out of service due to tower collapse. Motihari was connected to rest of the grid through 400 kV Barh Motihari - 2. On 15-01-2021 at 05:36 hrs 400 kV Barh Motihari - 2 tripped due to R and B phase to earth fault resulting in total power failure at Motihari S/S and loss of power supply to nearby areas such as Motihari, Bettiah, Raxaul, Ramnagar, Narkatiaganj, Dhaka and Areraj.
70.	BSPTCL	21/01/2021	11:20	215	0		400 kV Motihari-Gorakhpur D/C and 400 kV Motihari Barh 1 were out of service due to tower collapse. Motihari was connected to rest of the grid through 400 kV Barh Motihari - 2. On 21-01-2021 at 11:20 hrs transient Y phase to earth fault occurred at 400 kV Barh Motihari - 2. Successful auto reclose operation occurred

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
						GD-I	at Motihari end. At Barh end, tie breaker was successfully auto reclosed. But main breaker at Barh tripped again after auto-reclose operation. Then 400 kV Barh Motihari - 2 tripped from Motihari end on receipt of DT signal from Barh end. As a result, total power failure occurred at Motihari S/S and loss of power supply occurred at nearby areas such as Motihari, Bettiah, Raxaul, Ramnagar, Narkatiaganj, Dhaka and Areraj.
71.	JUSNL	29/01/2021	10:44	195	54	GD-I	220 kV Ranchi - Hatia - 1 and 220 kV Hatia - Patratu - 2 were under shutdown. 220 kV Ranchi - Hatia - 3 was being shifted from 220 kV bus 1 to 220 kV bus 2 at Hatia. During changeover, sparking was observed in 220 kV bus 2 isolator at Hatia of Ranchi 3 feeder. Bus bar protection was not in service at Hatia at 220 kV voltage level. All 220 kV feeders tripped from remote ends.
72.	ISTS	15/02/2021	14:30	0	34	GD-I	On 15-02-2021, 220 kV THEP – New Melli S/C was under shutdown and unit 1 at Tashiding HEP was under annual overhauling. Tashiding was connected to rest of the grid via 220 kV THEP – Rangpo S/C. At 14:30 hrs, 220 kV THEP – Rangpo S/C tripped on B phase to earth fault resulting in grid disturbance at THEP.
73.	ISTS	17/02/2021	19:56	0	48	GD-I	On 17-02-2021 at 19:56 hrs, 220 kV THEP – New Melli S/C and 220 kV THEP – Rangpo S/C tripped on R and B phase fault resulting in total generation loss and blackout at 220kV THEP.
74.	JSPL	09/03/2021	08:02	333	373	GD-I	At 07:50:45:808 hrs, 400 kV JSPL – Meramundali - 2 got tripped after unsuccessful auto-reclose attempt due to persistent Y phase to earth fault. At 08:02:27:939 hrs, 400 kV JSPL – Meramundali – 1 got tripped after unsuccessful auto-reclose attempt due to persistent Y phase to earth fault resulting in total power failure at JSPL plant. During line patrolling, it was observed that

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
							"Y" Phase Insulators of both the circuits were damaged and conductors were lying on top of Blue Phase cross arms at tower location at 111.
75.	ISTS/Generators of Sikkim Complex	10/03/2021	19:35	54	1560	GD-I	At 10th March 2021 at 19:35 Hrs both the 400 kV circuits tripped due to R and B phase to earth fault resulted in islanding operation of 1560 MW generation at Sikkim hydro complex with 54 MW load at Gangtok. Consequently, all the generators tripped and total power failure occurred.
76.	JUSNL	22/03/2021	11:05	45	0	GD-I	220 kV Godda Dumka D/C were not in service. On 22-03-2021 at 11:05 hrs 220 kV Farakka Lalmatia S/C and 132 kV KhSTPP - Lalmatia S/C tripped resulting in total power failure at Lalmatia and Godda S/S.
77.	BSPTCL	23/03/2021	16:18	300	0	GD-I	400 kV Barh - Motihari - 2 was under shutdown. 400/132 kV Motihari S/S is connected to rest of the grid via 400 kV Gorakhpur - Motihari - 2. On 23-03-2021 at 16:18 hrs 400 kV Gorakhpur - Motihari - 2 tripped from Motihari end due to Overvotlage at Motihari end.Due to outage of radial infeed source, load of 132 kV Motihari , Betiah, Raxaul got Interrupted.. Power supply to Nepal (Surajpura & Ramnagar) also got interrupted. Total load loss was around 300MW out of which Nepal load was around 120MW.

ANNEXURE-XIV

GRID INCIDENTS

Grid incidents which occurred during the year 2020-21 are as follows:

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
1.	ISTS	21/04/2020	18:29	0	749	GI-2	At 18:26 hrs. successful auto-reclose of 400 kV JITPL – Angul – 2 occurred at JITPL end for transient R phase to earth fault. At 18:29 hrs. both running units at JITPL tripped because of operation of bus bar protection of bus 2 at JITPL due to CT failure.
2.	JUSNL	28/04/2020	06:29	50	300	GI-2	At 06:12 hrs,auxiliary transformer of unit# 1 at TTPS tripped due to mal operation of differential relay resulted tripping of Tenughat Unit 1. At 06:29 hrs, all feeders connected to Bus 2 i.e. Tenughat Unit #2, 220 kV TTPS – Patratu (PTPS) S/C, Station Transformer 2 at TTPS and 220 KV Bus coupler beaker at TTPS tripped due to operation LBB operation at TTPS.
3.	ISTS	07/05/2020	18:47	0	0	GI-2	At 18:47 Hrs, 400 KV Alipuduar - Jigmelling D/C tripped on R-Y-N fault caused tripping of Mangdechu units #1 and #2 (At Bhutan).
4.	JUSNL	18/05/2020	00:53	0	302	GI-1	220 kV TTPS – PTPS S/C tripped from PTPS end on B phase to earth fault. 220 kV TTPS – PTPS S/C, unit 2 at TTPS and station transformer 2 at TTPS were connected to 220 kV bus 2 at TTPS. So, both the running units at TTPS and 220 kV bus coupler at TTPS tripped to clear the fault. 220 kV TTPS – Bihar Sharif S/C and 220 kV bus 1 at TTPS did not trip during this event.
5.	JUSNL	19/05/2020	02:56	200	0	GI-1	Fault occurred due to bursting of 132 kV side B phase CT of 220/132 kV ICT – 3 at 220/132 kV Hatia S/s. At same time, 220 kV Ranchi-Hatia 1 and 3, 220/132KV 150MVA ICT-1, 2 and 3 at Hatia tripped resulting total loss of supply at 132 kV voltage level of Hatia S/S. 220 kV bus at Hatia remained in service along with 220 kV

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
							PTPS – Hatia D/C and 220 kV Ranchi – Hatia – 2.
6.	ISTS	24/05/2020	19:51	0	0	GI-1	220 kV Muzaffarpur Dhalkebar D/C tripped due to B phase directional O/C resulting in loss of power supply to Dhalkebar.
7.	ISTS	19/06/2020	12:54	0	109	GI-2	At 12:54 hrs. gas density high alarm initiated in 400 KV Rangpo-Binaguri Ckt-I and tripping command was sent to 400kV Main Bus-I at Rangpo. All feeders connected to 400 kV main bus 1 tripped. Due to unavailability of tie bay of 400/132 kV ICT at Dikchu, both the running units at Dikchu HEP were connected to bus 1 at Dikchu via 400/132 kV ICT.
8.	ISTS	24/06/2020	18:23	0	0	GI-1	220 kV Muzaffarpur Dhalkebar D/C tripped at 18:23 hrs from Muzaffarpur end on R phase directional earth fault. There was no generation or load loss reported in Indian grid at the time of the event.
9.	ISTS	25/06/2020	02:47	0	0	GI-2	400 kV Alipurduar -Jigmelling D/C tripped at 02:47 Hrs due to R phase to earth fault. At Alipurduar, auto reclose was successful for both circuits. But both the circuits tripped from Jigmelling end. Around 590 MW generation loss was reported at the time of the event. There was no generation or load loss reported in Indian grid at the time of the event.
10.	ISTS	26/06/2020	15:40	0	0	GI-2	400 kV Jigmelling - Alipurduar – 1 along with all four running units (generating around 770 MW) of Mangdechu tripped at 15:40 hrs. DT signal was received at Alipurduar end of 400 kV Jigmelling Alipurduar – 1 at the time of the tripping. Later, at 15:53 hrs, 400 kV Jigmelling - Alipurduar – 2 also tripped due to B phase to earth fault. There was no generation or load loss reported in Indian grid at the time of the event.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
11.	ISTS	27/06/2020	14:48	0	161	GI-2	At 14:48 hrs 400 kV Rangpo – Kishangunj S/C tripped due to B phase to earth fault. At same time, unit 1 and 2 at Dikchu HEP and unit 2 at Jorethang tripped due to operation of differential relay.
12.	WBSETCL	10/07/2020	08:45	61	0	GI-2	At 08:45 hrs, 400 kV Arambag – New Chanditala S/C, 400 kV Arambag – Bakreswar S/C, 400 kV Arambag Kolaghat S/C and 400/220 kV ICT – 1, 2, 3 and 4 at Arambag tripped. At same time, all 220 KV lines connected to Arambag s/s and some 132 kV lines also tripped during this event. Flash over was reported at B phase pole of 220 kV side breaker of 315 MVA 400/220 kV ICT – 4 at Arambag.
13.	ISTS	16/07/2020	01:58	0	419	GI-2	At 01:58hrs. both poles of Talcher-Kolar HVDC tripped due to un-availability of 400kV bus voltage at Kolar end. Before tripping flow was 500MW. SPS acted and generation reduction happened at JITPL (150MW) and GMR (269MW). No generaton reduction in Talcher Stg-2.
14.	ISTS	22/07/2020	01:32	0	0	GI-2	At 01:32 hrs 400 kV Alipurduar Jigmelling D/C tripped due to R & B phase fault. Prior to the tripping, schedule to Mangdechu generating units were 762 MW. There was no load or generation loss reported in Indian grid at the time of the event.
15.	BSPTCL	14/08/2020	20:23	332	0	GI-1	At 20:23 hrs 220 kV Tenughat Bihar Sharif S/C tripped due to Y phase to earth fault. At same time, 400/220 kV ICT 2 and 3 at Bihar Sharif, 220/132 kV ICT 1, 2 and 3 at Bihar Sharif, 132 KV Bihar sharif –Sheikhupura S/C also tripped. During line patrolling, it was found that Y phase Conductor of 220 kV Bihar sharif – TTPS S/C snapped at location No. 496-497 and fell on 132 kV Bihar sharif – Sheikhupura D/C at tower loc no. 10 from Bihar Sharif.

Sl. No	Owner/Agency	Date	Time	Load loss (MW)	Gen. loss (MW)	Category	Reasons
16.	ISTS	31/08/2020	22:33	0	520	GI-1	At 22:27 HRs 400 KV Jigmeling-Mangdechu-2 tripped on B phase to earth fault. At 22:33 hrs while taking charging attempt of 400 KV Jigmeling-Mangdechu-2 ,400 KV Alipurduar-Jigmeling D/C tripped on zone-2 in Y to B phase short circuit fault. At the same time all the running units of Mangdechu and 400 KV Mangdechu-Jigmeling-1 tripped.
17.	ISTS	07/11/2020	11:04	0	240	GI-2	On 07-11-2020, 400 kV Alipurduar Jigmelling D/C tripped on R and Y phase fault resulting tripping of both running units at Mangdechu due to loss of evacuation path. Fault location was around 200 km from Alipurduar.

Annexure-XV

Transmission Charges paid by various ER Constituents during the year 2020-21		
SL NO.	**Constituents**	**Charges (Rs. Cr.)**
1	BIHAR	1453
2	JHARKHAND	280
3	DVC	128
4	ODISHA	661
5	WEST BENGAL	982
6	SIKKIM	35
7	POWERGRID(PASAULI)	0
8	NVVN (BPDB)	164
9	TATA STEEL	71
10	RAILWAYS_JHARKHAND	25
11	RAILWAYS_BIHAR	25
12	RAILWAYS_DVC	29
13	RAILWAYS_ODISHA	0
14	RAILWAYS_WEST BENGA	13
15	HVDC ALIPURDUAR	1
16	BRBCL NABINAGAR	8
17	NPGC NABINAGAR	25
18	NTPC DARLIPALLI	6

ANNEXURE-XVI (A)

LTA Energy Transactions (MUs) in F.Y 2020-21

TRADERS	IMPORT to ER (MUs)
AGEMPL	1.090
AlfanarWind_SECI-III	47.638
AWEK1L	2.892
DADRI_SOLAR	5.473
FARIDABAD_SOLAR	1.397
GIWEL_SECI-III_RE	149.597
GIWEL_SECI-II_RE	486.142
HARYANA	5.312
IWISL	100.385
NVVNL	81.415
OKWPL_RE	296.213
PTC	72.700
PTC	116.773
RAJ_SOLAR	25.027
RWE_AP2_SECI-III	14.825
SECI_Trader	31.549
SECI_Trader	135.969
SEILP2	1347.939
SEIL_PROJECT2	239.450
Tuticorin_BETAMWIND	177.534
Tuticorin_GIREL	250.593
Tuticorin_Mytrah	203.172
Tuticorin_Orange	234.140
UNCHAHAR_SOLAR	11.264
Total	**4038.488**

TRADERS	EXPORT to ER (MUs)
APNRL	578.686
BESCOM	2249.494
BYPL	14.087
CHUZACHEN	11.041
CSEB_Beneficiary	12.056
CTPS 7&8	0.000
DELHI	345.313
DSTPS I&II	888.258
DSTPS I&II	0.000
DVC	6428.350
DVC	0.000
HARYANA	290.597
HIRAKUD HEP	2.577
JITPL	124.963
KSEB	3047.981
MPL	1432.588
PTC	3205.049
PTC	108.765
PUNJAB	246.305
TPDDL	274.066
Total	**19260.176**

MTOA Energy Transactions (MUs) in F.Y 2020-21

TRADERS	IMPORT to ER (MUs)
PTC	563.710
PTC	869.018
SECI_Trader	106.769
Total	**1539.497**

TRADERS	EXPORT to ER (MUs)
JITPL	488.735
Total	**488.735**

ANNEXURE-XVI (B)

STOA Energy Transactions (MUs) in F.Y 2020-21

TRADERS	EXPORT to ER (MUs)
AMNSIL	52.422
APPCPL	76.16744
APPCPL_Trader	2.52
CHUZACHEN	159.64896
GMRETL	98.8201
IEXL	19.94025
IEXL_Trader	25.6060475
JITPL	397.1719725
JLHEP	82.9580425
KEIPL	80.172325
MPPMCL	707.0069775
PXIL	26.3476475
REFEX	0.5482
TATASTEEL	41.728
TATASTL_BSL	53.49
THEP	59.1545625
TPTCL	207.4845
Total	**2091.187025**

TRADERS	IMPORT to ER (MUs)
PTC	1432.72784
SECI_Trader	106.7686675
Total	**1539.496508**

Month-wise statement of Over/Under generation of ISGS & Over/Under drawl of Costituents during the year 2020-21

	Constituent	Total Scheduled (MWH)	Total Actual (MWH)	Total Deviation (MWH)	Total Deviation Amount (Rs.)	Total Deviation Amount Cap(Rs.)
Apr-20	RANGIT	16,557.33500000	16,941.00000000	383.66500000	13,30,731.33	9,98,450.80
	TEESTA	1,81,781.04000000	1,88,260.54117400	6,479.50117400	1,83,69,238.31	1,47,06,372.60
	BSPHCL	-22,99,294.53060200	-22,87,344.75431800	11,949.77628400	-3,45,36,353.95	-3,45,36,351.20
	DVC	6,93,212.06356700	6,81,090.26658500	-12,121.79698200	-2,92,40,227.49	-2,92,40,225.20
	HVDC ALIPURDUAR	-401.38139400	-385.35660000	16.02479400	40,122.11	40,122.80
	HVDC SASARAM	-710.92724600	-562.44392600	148.48332000	3,55,649.26	3,55,650.50
	JUVNL	-4,66,371.13690600	-4,77,752.36210300	-11,381.22519700	-4,55,85,573.77	-4,55,85,573.90
	GRIDCO	-12,247.60099100	2,254.05389400	14,501.65488500	2,26,71,942.81	2,26,71,943.60
	SIKKIM	-43,470.75766500	-41,046.18770400	2,424.56996100	53,19,504.61	53,19,502.10
	WBSETCL	-10,58,781.57634400	-10,82,570.72774800	-23,789.15140400	-5,78,95,461.49	-5,78,95,460.30
	NR	-7,48,651.58512900	-13,17,575.86197300	-5,68,924.27684400	-1,34,41,62,160.70	-1,34,41,62,159.40
	NVVN-BD	-3,39,631.54224400	-3,38,974.10282000	657.43942400	-1,39,53,689.57	-1,39,53,690.10
	NVVN-NEPAL	-46,110.90793800	-43,320.43200000	2,790.47593800	28,83,815.47	28,83,813.80
	WR	3,22,294.98351600	5,19,399.04166800	1,97,104.05815200	43,59,88,141.78	43,59,88,143.70
	SR	-20,95,487.88251300	-20,70,710.32540300	24,777.55711000	11,22,65,699.10	11,22,65,700.30
	NER	40,156.77116900	4,40,907.00905700	4,00,750.23788800	96,32,61,518.00	96,32,61,517.40
	BARH	2,70,232.38005700	2,67,558.90933100	-2,673.47072600	-46,82,406.75	-42,37,804.80
	BRBCL	2,56,315.38951700	2,56,353.26733300	37.87781600	-43,85,501.77	-28,93,204.10
	DARLIPALI	3,73,618.70475000	3,61,777.40787800	-11,841.29687200	-2,72,17,858.52	-2,30,41,822.60
	FSTPP I&II	6,78,987.40271000	6,73,378.77873000	-5,608.62398000	-80,24,800.09	-80,14,535.40
	FSTPP-III	2,37,777.02803200	2,38,186.70610900	409.67807700	44,92,419.52	29,44,651.00
	KHSTPP-I	4,38,908.86627200	4,36,317.30721900	-2,591.55905300	-44,31,955.79	-41,81,565.60
	KHSTPP-II	7,23,927.06753500	7,19,004.19702800	-4,922.87050700	-1,33,45,684.22	-1,14,27,040.70
	MAITHON R/B	4,89,494.80750000	4,91,669.37115200	2,174.56365200	1,10,54,131.78	80,52,347.00
	MTPS-II	1,17,429.69241100	1,16,607.52000000	-822.17241100	-15,65,637.82	-14,70,481.10
	NPGC	3,79,082.38333100	3,76,469.28442700	-2,613.09890400	-37,01,997.25	-36,28,750.30
	TSTPP	5,58,321.68733100	5,55,401.72218000	-2,919.96515100	-42,12,740.57	-36,40,192.40
	CHUZACHEN	18,576.17725900	18,522.06720000	-54.11005900	-3,56,876.21	-1,31,377.40
	DIKCHU	20,702.61481400	20,601.81786400	-100.79695000	2,42,749.93	-55,717.00
	JORETHANG LOOP HEI	13,591.33472700	12,394.91200000	-1,196.42272700	-5,66,805.08	-7,51,622.50
	THEP	12,302.20052700	11,213.92000000	-1,088.28052700	-17,12,768.88	-13,90,952.90
	Teesta-III(TUL)	3,01,016.27522400	2,97,304.79543200	-3,711.47979200	8,31,193.24	-1,41,185.10
	APNRL	1,74,910.10600800	1,64,416.57727100	-10,493.52873700	-1,56,30,620.07	-1,50,42,018.70
	GMRKEL	2,10,528.51250000	2,06,387.70436400	-4,140.80813600	-83,68,772.28	-75,23,059.80
	JITPL	4,75,455.61508700	4,66,460.71987400	-8,994.89521300	-2,81,13,649.69	-2,00,15,665.30
	TPTCL	18,072.98601600	12,427.34354400	-5,645.64247200	-1,39,49,417.24	-1,14,00,868.00
	TALCHER SOLAR	1,280.37250000	1,236.18105000	-44.19145000	-4,22,890.40	-4,22,890.40
	CHUKHA	19,786.75000000	79,721.83283900	59,935.08283900	15,28,34,461.24	15,28,34,463.00
	KIRICHU	4,037.91500000	-203.72400000	-4,241.63900000	-89,92,274.68	-89,92,272.90
	MANGDECHHU	1,33,066.77250000	1,34,995.77893500	1,929.00643500	79,47,506.51	79,47,514.90
	TALA	1,17,022.50000000	38,654.65785500	-78,367.84214500	-16,61,39,825.35	-16,61,39,826.10
	VAE	-84,357.08500000	0.00000000	84,357.08500000	14,32,01,036.34	14,32,01,036.00
	BARH SG1_INFIRM	0.00000000	-4,095.35280000	-4,095.35280000	-98,49,855.16	-98,49,855.10
	NPGC_INFIRM	0.00000000	-1,131.91200000	-1,131.91200000	-26,98,850.08	-26,98,850.30
	DSTPS_U#2_INFIRM	0.00000000	-626.47200000	-626.47200000	-14,83,390.51	-14,83,390.10
	Constituent	Total Scheduled (MWH)	Total Actual (MWH)	Total Deviation (MWH)	Total Deviation Amount (Rs.)	Total Deviation Amount Cap(Rs.)
May-20	RANGIT	29,755.37500000	30,067.25880000	311.88380000	9,25,544.08	7,98,134.30
	TEESTA	3,00,944.50000000	3,07,332.97597200	6,388.47597200	1,87,71,428.32	1,52,20,032.30
	BSPHCL	-25,99,137.18247200	-25,78,883.30556300	20,253.87690900	-3,27,96,209.90	-3,27,96,210.30
	DVC	8,62,226.67659900	8,38,982.50195700	-23,244.17464200	-5,29,70,152.42	-5,29,70,152.80
	HVDC ALIPURDUAR	-610.68653800	-524.33580000	86.35073800	1,81,510.47	1,81,507.60
	HVDC SASARAM	-714.70176700	-622.79730200	91.90446500	2,05,574.67	2,05,573.50
	JUVNL	-5,37,535.62218900	-5,26,500.46599500	11,035.15619400	-26,61,521.06	-26,61,520.00
	GRIDCO	-31,798.15565500	-27,441.92178000	4,356.23387500	42,56,539.44	42,56,540.60
	SIKKIM	-43,416.18891900	-39,900.73230300	3,515.45661600	60,36,229.04	60,36,233.70
	WBSETCL	-11,74,184.90053000	-11,94,607.52679100	-20,422.62626100	-11,93,53,532.42	-11,93,53,533.20
	NR	-15,16,363.42510900	-18,83,480.88009500	-3,67,117.45498600	-1,00,22,57,094.58	-1,00,22,57,096.70
	NVVN-BD	-4,96,811.88814100	-4,94,779.99211400	2,031.89602700	-1,14,61,973.97	-1,14,61,975.70
	NVVN-NEPAL	-7,684.30350000	-7,947.58400000	-263.28050000	-5,57,931.76	-5,57,932.30
	WR	5,30,992.05339200	9,49,657.22943800	4,18,665.17604600	1,06,86,79,256.55	1,06,86,79,259.90
	SR	-21,72,056.26974900	-21,60,485.80704400	11,570.46270500	11,03,55,312.88	11,03,55,312.10
	NER	-23,116.14980200	-39,638.98966600	-16,522.83986400	-1,64,64,874.37	-1,64,64,874.30
	BARH	4,17,239.01176300	4,16,866.26974700	-1,057.49201600	-10,00,415.37	-11,10,115.70
	BRBCL	2,77,147.02937900	2,77,232.84875400	85.81937500	-11,36,984.86	-5,54,668.00
	DARLIPALI	2,54,826.58832300	2,39,163.64534500	-15,662.94297800	-3,71,55,406.37	-3,13,33,010.70
	FSTPP I&II	5,03,197.92879100	4,94,425.37181600	-8,772.55697500	-1,94,09,438.26	-1,67,86,731.00
	FSTPP-III	2,33,194.14301700	2,31,487.88177900	-1,706.26123800	-46,241.05	-9,31,022.40
	KHSTPP-I	4,47,441.84326900	4,37,400.78354500	-10,041.05972400	-2,53,41,669.02	-2,08,74,472.60
	KHSTPP-II	7,37,822.15018500	7,34,597.85279900	-3,224.29738600	-45,61,343.65	-46,34,672.50
	MAITHON R/B	4,96,263.70250000	4,97,142.78960500	879.08710500	1,00,51,272.94	64,21,031.30
	MTPS-II	1,73,142.55243600	1,70,862.30800000	-2,280.24443600	-59,20,573.26	-49,19,577.20
	NPGC	3,39,270.28792600	3,31,788.25347900	-7,482.03444700	-1,21,80,634.31	-1,10,40,637.20
	TSTPP	6,15,825.22580200	6,14,345.09705900	-1,480.12874300	-4,27,530.65	-10,41,668.60
	CHUZACHEN	40,174.79449400	40,735.63200000	560.83750600	12,60,438.48	9,29,689.90
	DIKCHU	35,494.45006600	36,093.45410300	599.00403700	2,34,293.58	7,08,163.30
	JORETHANG LOOP HEI	29,441.27917900	26,345.85600000	-3,095.42317900	-51,23,624.18	-48,26,254.00
	THEP	26,152.01365400	25,818.52800000	-333.48565400	23,77,557.43	13,32,101.70
	Teesta-III(TUL)	5,99,850.22095500	5,94,154.90068700	-5,695.32026800	61,88,302.79	38,71,199.70
	APNRL	2,32,428.67168500	2,24,812.57658000	-7,616.09510500	-94,06,350.07	-99,94,140.20
	GMRKEL	1,97,549.80250000	1,96,747.26809700	-802.53440300	-59,510.85	-5,15,391.60
	JITPL	5,96,251.05470100	5,94,207.04564900	-2,044.00905200	-40,77,116.56	-37,65,491.30
	TPTCL	33,439.06761800	29,465.59492800	-3,973.47269000	-1,33,11,987.18	-1,06,34,675.60
	TALCHER SOLAR	1,374.81942200	1,359.39825000	-15.42117200	-1,59,375.03	-1,59,375.03
	CHUKHA	86,600.00000000	1,89,835.83807800	1,03,235.83807800	26,32,51,387.10	26,32,51,388.80
	KIRICHU	16,375.25000000	35,497.76760000	19,122.51760000	4,05,39,737.31	4,05,39,737.00
	MANGDECHHU	3,07,615.57500000	3,07,283.92138100	-331.65361900	-13,66,412.91	-13,66,410.80
	TALA	3,76,653.75000000	2,51,428.37677000	-1,25,225.37323000	-26,54,77,791.25	-26,54,77,789.70
	VAE	-73,746.30000000	0.00000000	73,746.30000000	15,76,08,148.03	15,76,08,148.00
	DSTPS_U#2_INFIRM	0.00000000	-1,111.91760000	-1,111.91760000	-27,55,968.27	-27,55,972.40
	BARH SG1_INFIRM	0.00000000	-3,529.46160000	-3,529.46160000	-87,04,958.07	-87,04,957.90
	NPGC_INFIRM	0.00000000	-1,295.17020000	-1,295.17020000	-31,84,315.40	-32,03,695.20

	Constituent	Total Scheduled (MWH)	Total Actual (MWH)	Total Deviation (MWH)	Total Deviation Amount (Rs.)	Total Deviation Amount Cap(Rs.)
Jun-20	RANGIT	40,138.50000000	39,817.73640000	-320.76360000	-11,37,049.55	-8,19,952.50
	TEESTA	3,51,474.00000000	3,52,861.15732600	1,387.15732600	49,92,397.14	37,59,587.60
	BSPHCL	-28,48,348.00251800	-28,48,593.68393000	-245.68141200	-7,01,90,595.90	-7,01,90,594.70
	DVC	10,40,389.19888400	10,28,738.47870300	-11,650.72018100	-1,61,41,853.19	-1,61,41,855.60
	HVDC ALIPURDUAR	-847.79220300	-488.31228200	359.47992100	7,51,122.94	7,51,125.70
	HVDC SASARAM	-744.67303700	-591.61564100	153.05739600	3,38,615.53	3,38,613.80
	JUVNL	-5,62,551.92303000	-5,42,282.37226100	20,269.55076900	2,61,31,291.08	2,61,31,291.10
	GRIDCO	-2,32,046.53642900	-2,15,113.75548000	16,932.78094900	3,00,37,448.86	3,00,37,449.30
	SIKKIM	-40,413.93320300	-39,019.73323900	1,394.19996400	27,79,028.20	27,79,028.10
	WBSETCL	-14,49,815.31238600	-15,17,873.34200000	-68,058.02961400	-13,57,63,996.92	-13,57,63,995.40
	NR	-20,02,336.16295800	-22,98,761.06553200	-2,96,424.90257400	-77,76,85,358.42	-77,76,85,356.80
	NVVN-BD	-6,52,685.55382700	-6,55,497.08149300	-2,811.52766600	-1,25,23,991.68	-1,25,23,990.50
	NVVN-NEPAL	-24,032.23549800	-23,551.42400000	480.81149800	-16,48,666.42	-16,48,665.00
	WR	1,76,969.24671500	12,64,580.61307300	10,87,611.36635800	2,62,02,87,458.15	2,62,02,87,457.30
	SR	-14,22,772.63586900	-16,85,445.04726500	-2,62,672.41139600	-61,11,57,738.37	-61,11,57,738.60
	NER	35,466.82192500	-3,67,253.22140300	-4,02,720.04332800	-97,25,87,914.60	-97,25,87,912.70
	BARH	5,40,729.39359300	5,35,915.48741000	-5,686.40930800	-1,10,57,355.10	-1,02,59,421.80
	BRBCL	2,51,479.99160300	2,46,953.08595800	-4,526.90564500	-1,28,19,524.51	-1,08,88,344.20
	DARLIPALI	1,54,558.75640200	1,46,054.80518500	-8,503.95121700	-2,22,18,393.95	-1,83,92,567.40
	FSTPP I&II	5,10,434.12459300	5,03,254.03057300	-7,180.09402000	-1,46,48,914.58	-1,30,67,583.00
	FSTPP-III	2,07,656.14030600	2,04,927.22571600	-2,728.91459000	-41,59,928.75	-39,38,404.60
	KHSTPP-I	4,13,909.54894100	4,05,428.53709700	-8,481.01184400	-2,12,40,958.73	-1,73,20,062.80
	KHSTPP-II	6,53,001.61048400	6,50,073.85681400	-2,927.75367000	-46,32,413.63	-44,24,280.20
	MAITHON R/B	4,68,913.63000000	4,70,327.73641500	1,414.10641500	1,30,05,919.11	85,80,780.00
	MTPS-II	1,80,372.94823900	1,78,158.22000000	-2,214.72823900	-52,88,600.42	-45,83,942.70
	NPGC	3,99,799.98395700	3,95,934.72046900	-3,865.26348800	-25,05,592.32	-28,38,105.30
	TSTPP	6,03,637.26352500	6,01,567.87350900	-2,069.39001600	-37,83,506.50	-32,15,708.50
	CHUZACHEN	69,823.51872200	70,277.85600000	454.33727800	14,18,772.04	11,74,033.00
	DIKCHU	72,829.42947800	76,980.36288300	4,150.93340500	1,25,25,211.93	99,36,420.40
	JORETHANG LOOP HEI	59,620.79641400	54,594.49600000	-5,026.30041400	-1,05,65,139.51	-89,33,102.90
	THEP	57,793.55940500	58,017.76000000	224.20059500	35,28,234.66	27,65,086.20
	Teesta-III(TUL)	9,18,289.20022500	9,20,230.24253400	1,941.04230900	1,18,97,354.21	1,00,67,864.60
	APNRL	1,94,638.33804400	1,83,326.90456300	-11,311.43348100	-1,75,93,364.15	-1,60,70,202.80
	JITPL	3,78,283.53177700	3,77,421.22980500	-862.30197200	-20,21,938.44	-18,50,656.80
	TPTCL	64,986.10714500	55,664.97921600	-9,321.12792900	-2,43,13,175.77	-1,99,45,882.10
	GMRKEL	3,49,917.46530000	3,49,408.50275900	-508.96254100	17,75,773.66	8,28,938.40
	TALCHER SOLAR	1,041.65500000	982.67565000	-58.97935000	-6,90,761.50	-6,90,761.50
	CHUKHA	1,53,416.45000000	2,78,793.03623200	1,25,376.58623200	31,97,10,294.89	31,97,10,293.50
	KIRICHU	15,387.00000000	59,114.62800000	43,727.62800000	9,27,02,571.36	9,27,02,573.00
	MANGDECHHU	4,35,621.00000000	4,32,498.35635100	-3,122.64364900	-1,28,65,291.83	-1,28,65,302.70
	TALA	6,14,938.25000000	4,44,148.57671900	-1,70,789.67328100	-36,20,74,107.36	-36,20,74,103.80
	VAE	-33,828.91500000	0.00000000	33,828.91500000	7,02,09,828.33	7,02,09,828.00
	DSTPS_U#2_INFIRM	0.00000000	-659.18160000	-659.18160000	-16,38,888.08	-16,38,888.80
	BARH SG1_INFIRM	0.00000000	-4,330.77120000	-4,330.77120000	-1,05,04,263.63	-1,05,04,264.40
	NPGC_INFIRM	0.00000000	-1,203.67440000	-1,203.67440000	-29,40,644.60	-29,40,642.70

	Constituent	Total Scheduled (MWH)	Total Actual (MWH)	Total Deviation (MWH)	Total Deviation Amount (Rs.)	Total Deviation Amount Cap(Rs.)
Jul-20	RANGIT	31,576.42500000	31,271.31960000	-305.10540000	-5,77,237.99	-5,31,543.20
	TEESTA	3,62,256.50000000	3,67,678.97523200	5,422.47523200	1,86,74,495.03	1,40,72,957.10
	BSPHCL	-31,48,352.14058300	-31,39,768.26270300	8,583.87788000	-6,17,02,603.25	-6,17,02,605.80
	DVC	11,85,996.92051900	11,77,214.51522000	-8,782.40529900	-61,91,219.45	-61,91,220.30
	HVDC ALIPURDUAR	-843.26143700	-861.22860000	-17.96716300	-95,944.16	-95,944.20
	HVDC SASARAM	-749.75460700	-630.23435500	119.52025200	3,19,400.97	3,19,403.10
	JUVNL	-6,15,157.59119200	-5,99,358.70224100	15,798.88895100	1,95,24,114.26	1,95,24,114.30
	GRIDCO	-1,93,388.80000100	-1,73,494.85024100	19,893.94976000	3,19,46,107.60	3,19,46,106.80
	SIKKIM	-37,660.71821500	-37,907.08882300	-246.37060800	-4,76,992.43	-4,76,992.20
	WBSETCL	-15,26,730.82042600	-15,85,019.31099500	-58,288.49056900	-12,09,35,414.08	-12,09,35,414.60
	NR	-25,46,848.70750200	-29,70,692.04193400	-4,23,843.33443200	-1,26,16,44,078.65	-1,26,16,44,079.80
	NVVN-BD	-6,80,332.09681400	-6,81,637.66304200	-1,305.56622800	-1,15,10,000.91	-1,15,10,001.40
	NVVN-NEPAL	-11,276.68939200	-19,593.66400000	-8,316.97460800	-2,48,78,980.55	-2,48,78,978.90
	WR	-1,53,652.55650500	10,34,132.62909200	11,87,785.18559700	3,23,69,92,127.44	3,23,69,92,131.20
	SR	-13,76,028.16695200	-15,40,907.47809500	-1,64,879.31114300	-37,08,25,174.83	-37,08,25,173.60
	NER	1,94,613.51195000	-2,52,388.86265200	-4,47,002.37460200	-1,30,58,25,499.63	-1,30,58,25,499.90
	BARH	5,79,434.54161800	5,69,035.03399900	-10,399.50761900	-2,60,70,533.90	-2,10,80,286.10
	BRBCL	2,49,507.73088000	2,45,881.30398100	-3,626.42689900	-1,17,49,517.97	-88,99,295.70
	DARLIPALI	1,18,899.27125000	1,09,100.15863600	-9,799.11261400	-2,79,14,527.98	-2,20,21,864.80
	FSTPP I&II	6,89,179.71666200	6,79,451.56843100	-9,728.14823100	-2,85,41,195.56	-2,22,66,085.30
	FSTPP-III	2,27,492.58374300	2,26,037.19074800	-1,455.39299500	-7,94,943.57	-18,61,015.30
	KHSTPP-I	4,56,344.64722000	4,45,636.56864000	-10,708.07858000	-2,92,83,282.99	-2,40,34,798.90
	KHSTPP-II	6,90,600.00429600	6,88,313.63841600	-2,286.36588000	99,163.93	-17,32,426.10
	MAITHON R/B	5,03,055.69250000	5,04,625.18988000	1,569.49738000	1,32,91,277.47	80,20,703.00
	MTPS-II	1,76,725.50390500	1,74,530.06800000	-2,195.43590500	-50,01,647.84	-42,20,967.50
	NPGC	4,32,331.79444900	4,29,712.10850000	-2,619.68594900	-18,66,293.85	-27,74,753.80
	TSTPP	6,29,679.85888200	6,31,114.18245400	1,434.32357200	58,97,333.82	45,93,526.80
	CHUZACHEN	87,270.96752400	87,819.16800000	548.20047600	14,53,293.00	11,61,746.30
	DIKCHU	77,303.77881600	81,745.63553400	4,441.85671800	1,51,27,273.80	1,13,63,974.80
	JORETHANG LOOP HEI	72,753.37272000	65,072.06400000	-7,681.30872000	-1,91,07,105.94	-1,56,44,863.40
	Teesta-III(TUL)	9,15,387.53589100	8,91,785.15193500	-23,602.38395600	-6,49,07,717.21	-4,73,25,631.30
	THEP	78,239.47262200	80,923.87200000	2,684.39937800	87,39,147.99	66,19,417.70
	APNRL	2,26,941.92883600	2,28,262.46747200	1,320.53863600	1,40,18,799.30	95,09,682.50
	GMRKEL	4,28,658.84850900	4,28,102.39284500	-556.45566400	12,58,696.17	3,55,157.80
	JITPL	4,00,223.19501900	3,98,633.52041500	-1,589.67460400	-46,76,126.56	-37,04,660.30
	TPTCL	91,044.03427200	87,569.68281600	-3,474.35145600	-81,34,979.91	-65,80,215.60
	TALCHER SOLAR	1,097.89250000	1,044.95685000	-52.93565000	-6,13,574.35	-6,13,574.35
	CHUKHA	2,39,380.75000000	3,05,603.68922900	66,222.93922900	16,88,68,495.03	16,88,68,493.20
	KIRICHU	3,983.50000000	76,323.25800000	72,339.75800000	15,33,60,286.96	15,33,60,286.90
	MANGDECHHU	5,34,207.50000000	5,31,368.60999300	-2,838.89000700	-1,16,96,226.83	-1,16,96,222.00
	TALA	7,84,684.75000000	6,27,309.45492000	-1,57,375.29508000	-33,36,35,625.57	-33,36,35,627.70
	VAE	-15,145.05750000	0.00000000	15,145.05750000	5,66,01,175.63	5,66,01,175.20
	DSTPS_U#2_INFIRM	0.00000000	-858.84480000	-858.84480000	-25,04,636.04	-25,04,636.60
	BARH SG1_INFIRM	0.00000000	-5,349.44447600	-5,349.44447600	-1,59,34,855.32	-1,59,34,858.20
	NPGC_INFIRM	0.00000000	-2,727.86400000	-2,727.86400000	-79,36,533.12	-79,36,533.30

	Constituent	Total Scheduled (MWH)	Total Actual (MWH)	Total Deviation (MWH)	Total Deviation Amount (Rs.)	Total Deviation Amount Cap(Rs.)
Aug-20	RANGIT	21,413.25000000	21,608.16720000	194.91720000	-22,369.27	1,93,537.80
	TEESTA	3,75,180.00000000	3,82,008.97504400	6,828.97504400	2,12,55,450.23	1,71,25,769.00
	BSPHCL	-31,84,605.43177400	-32,00,446.48264600	-15,841.05087200	-14,44,00,833.32	-14,44,00,830.00
	DVC	12,06,230.89367300	11,94,746.34065900	-11,484.55301400	-1,79,85,527.41	-1,79,85,526.60
	HVDC ALIPURDUAR	-857.05557300	-868.78380000	-11.72822700	-41,071.10	-41,071.70
	HVDC SASARAM	-488.83699400	-643.64278900	-154.80579500	-4,54,955.12	-4,54,955.10
	JUVNL	-6,28,656.92285400	-6,19,561.23733700	9,095.68551700	78,40,499.18	78,40,500.60
	GRIDCO	-3,22,820.00567900	-2,96,820.95353500	25,999.05214400	3,49,42,327.85	3,49,42,327.20
	SIKKIM	-35,667.07259700	-33,193.68235400	2,473.39024300	57,03,004.89	57,03,005.20
	WBSETCL	-16,30,168.98371800	-16,96,465.76413200	-66,296.78041400	-15,44,52,523.58	-15,44,52,522.50
	NR	-25,27,018.17277000	-25,64,522.72384600	-37,504.55107600	-21,87,45,888.33	-21,87,45,887.90
	NVVN-BD	-6,87,715.74682700	-6,91,256.13571100	-3,540.38888400	-1,59,82,158.57	-1,59,82,160.90
	NVVN-NEPAL	-41,067.33335200	-52,899.85600000	-11,832.52264800	-3,27,74,032.93	-3,27,74,034.90
	WR	4,32,991.99852700	15,82,581.31178800	11,49,589.31326100	3,16,93,20,727.40	3,16,93,20,729.00
	SR	-8,95,269.87949200	-13,45,827.56860700	-4,50,557.68911500	-1,13,33,32,648.07	-1,13,33,32,645.70
	NER	-55,591.74414500	-5,32,535.26613200	-4,76,943.52198700	-1,34,35,42,394.11	-1,34,35,42,394.50
	BARH	5,83,930.33638000	5,78,905.56238500	-9,302.72712000	-2,22,95,534.82	-1,88,46,484.30
	BRBCL	2,37,040.17306700	2,34,921.52193900	-2,118.65112800	-55,11,049.13	-46,83,361.00
	DARLIPALI	2,93,107.17862500	2,86,471.84603900	-6,635.33258600	-1,88,72,790.12	-1,53,00,673.00
	FSTPP I&II	5,92,731.15796700	5,86,416.51988200	-6,314.63808500	-1,86,26,786.09	-1,29,10,744.80
	FSTPP-III	2,18,407.52794800	2,15,880.36762000	-2,527.16032800	-46,86,599.29	-42,30,548.00
	KHSTPP-I	2,82,929.61835900	2,74,813.98829000	-8,115.63006900	-2,30,63,049.03	-1,86,33,994.00
	KHSTPP-II	4,01,365.67960200	3,89,304.28814700	-12,061.39145500	-3,21,64,856.91	-2,67,27,448.30
	MAITHON R/B	4,66,462.96685500	4,69,587.44795900	3,124.48110400	2,10,66,422.20	1,30,47,980.20
	MTPS-II	97,272.84679700	96,124.33200000	-1,148.51479700	-29,15,447.24	-24,63,184.00
	NPGC	4,26,409.57434700	4,24,634.62690500	-1,774.94744200	21,56,066.94	6,88,587.80
	TSTPP	5,66,573.96847500	5,62,509.75847500	-4,064.21000000	-87,97,251.32	-74,71,613.70
	CHUZACHEN	86,096.91867400	85,307.89440000	-789.02427400	-28,15,788.55	-21,03,827.10
	DIKCHU	77,293.18896000	78,749.90826800	1,456.71930800	62,57,660.44	42,45,025.00
	JORETHANG LOOP HEI	61,839.44274700	57,716.86400000	-4,122.57874700	-1,11,05,995.45	-91,11,985.20
	Teesta-III(TUL)	8,99,841.18438800	8,98,245.15168500	-1,596.03270300	-13,38,603.44	-1,48,059.80
	THEP	59,982.93362300	57,690.11200000	-2,292.82162300	-64,76,341.42	-51,91,875.10
	APNRL	2,66,259.42812500	2,71,907.33982400	5,647.91169900	2,37,86,698.20	1,69,91,325.10
	GMRKEL	4,56,934.75294000	4,53,404.57436000	-3,530.17858000	-55,22,348.58	-57,73,527.30
	JITPL	3,92,123.20039200	3,91,218.90226400	-904.29812800	-12,94,930.95	-15,71,839.60
	TPTCL	90,913.16548800	87,402.75196800	-3,510.41352000	-1,16,18,765.22	-85,71,561.40
	TALCHER SOLAR	794.92500000	797.54445000	2.61945000	-1,08,338.78	-1,08,338.78
	CHUKHA	2,47,105.55000000	3,07,886.63221500	60,781.08221500	15,49,91,759.65	15,49,91,759.90
	KIRICHU	11,683.50000000	76,537.45440000	64,853.95440000	13,74,90,383.33	13,74,90,381.10
	MANGDECHHU	5,42,495.00000000	5,42,934.46426600	439.46426600	18,10,592.78	18,10,591.60
	TALA	7,80,641.50000000	6,31,479.46106300	-1,49,162.03893700	-31,62,23,522.55	-31,62,23,525.70
	VAE	-10,323.07250000	0.00000000	10,323.07250000	2,45,69,009.08	2,45,69,009.30
	DSTPS_U#2_INFIRM	0.00000000	-1,589.31360000	-1,589.31360000	-44,45,100.01	-44,45,101.90
	BARH SG1_INFIRM	0.00000000	-8,715.40771100	-8,715.40771100	-2,55,82,573.40	-2,55,82,573.60
	NPGC_INFIRM	0.00000000	-3,186.92760000	-3,186.92760000	-90,06,155.14	-90,06,156.20

	Constituent	Total Scheduled (MWH)	Total Actual (MWH)	Total Deviation (MWH)	Total Deviation Amount (Rs.)	Total Deviation Amount Cap(Rs.)
Sep-20	RANGIT	36,457.00000000	36,611.92080000	154.92080000	9,47,345.32	5,64,920.90
	TEESTA	3,61,626.50000000	3,70,496.39341800	8,869.89341800	2,86,72,881.56	2,30,85,235.60
	BSPHCL	-31,58,026.57601200	-31,70,982.01207000	-12,955.43605800	-10,77,95,601.96	-10,77,95,602.10
	DVC	13,06,010.88770800	13,02,819.03682800	-3,191.85088000	41,21,039.83	41,21,037.40
	HVDC ALIPURDUAR	-725.96851500	-797.07720000	-71.10868500	-2,16,109.74	-2,16,108.80
	HVDC SASARAM	-702.75236200	-575.10297800	127.64938400	3,32,066.50	3,32,069.00
	JUVNL	-6,54,392.73549800	-6,54,872.19373600	-479.45823800	-1,28,28,883.98	-1,28,28,885.40
	GRIDCO	-5,67,340.40809600	-5,49,267.04339200	18,073.36470400	4,45,10,400.97	4,45,10,402.00
	SIKKIM	-38,227.59421600	-38,771.40333000	-543.80911400	-15,76,825.34	-15,76,826.30
	WBSETCL	-15,75,788.38634100	-16,31,248.23487000	-55,459.84852900	-13,87,27,220.64	-13,87,27,218.60
	NR	-28,05,937.70751400	-27,81,884.57527200	24,053.13224200	9,07,05,299.92	9,07,05,300.70
	NVVN-BD	-6,65,507.74874000	-6,69,490.62667700	-3,982.87793700	-1,16,45,271.71	-1,16,45,272.40
	NVVN-NEPAL	-39,511.09275400	-37,319.96800000	2,191.12475400	-14,86,781.31	-14,86,782.60
	WR	6,60,102.44731500	15,23,192.30169200	8,63,089.85437700	2,30,60,56,312.51	2,30,60,56,313.70
	SR	-12,14,656.04453400	-15,27,277.57532800	-3,12,621.53079400	-81,62,76,990.02	-81,62,76,988.50
	NER	-28,396.09972300	-4,37,793.43981000	-4,09,397.34008700	-1,17,39,35,033.25	-1,17,39,35,033.20
	BARH	6,91,768.08115700	6,79,463.53472800	-12,304.54642900	-2,60,37,970.79	-2,41,63,199.20
	BRBCL	2,84,820.02799800	2,83,288.72149700	-1,531.30650100	-37,54,120.99	-35,21,900.40
	DARLIPALI	4,68,698.35562500	4,70,379.73465900	1,681.37903400	43,67,305.41	40,41,949.30
	FSTPP I&II	6,70,812.34467400	6,56,087.73884000	-14,724.60583400	-3,92,88,217.44	-3,27,35,339.20
	FSTPP-III	2,34,117.85202100	2,29,909.87757600	-4,207.97444500	-1,07,19,027.35	-92,01,288.10
	KHSTPP-I	4,44,672.45537500	4,23,844.45286300	-20,828.00251200	-5,62,87,856.78	-4,76,48,873.30
	KHSTPP-II	5,18,807.34034300	5,19,234.89934800	427.55900500	62,75,376.05	37,09,582.80
	MAITHON R/B	4,96,282.32250000	4,99,352.35508100	3,070.03258100	1,93,29,993.82	1,28,59,635.80
	MTPS-II	86,679.12823300	84,469.09200000	-2,210.03623300	-70,64,375.96	-52,77,715.80
	NPGC	4,31,269.23576100	4,24,732.88825200	-6,536.34750900	-85,66,135.29	-89,08,097.50
	TSTPP	5,84,687.87594400	5,79,899.62632700	-4,788.24961700	-1,39,11,671.61	-1,07,29,286.50
	CHUZACHEN	82,569.50276800	83,048.06400000	478.56123200	15,53,975.92	11,96,427.00
	DIKCHU	74,123.30817000	75,435.27193700	1,311.96376700	48,71,416.25	36,05,655.00
	JORETHANG LOOP HEI	63,975.86972100	60,528.06400000	-3,447.80572100	-98,35,539.54	-79,93,286.00
	Teesta-III(TUL)	8,01,466.64472400	8,02,002.31651600	535.67179200	61,91,890.47	46,45,078.80
	THEP	63,055.45952500	60,583.80800000	-2,471.65152500	-72,80,467.85	-60,46,168.70
	APNRL	2,31,770.89364700	2,31,776.35849000	5.46484300	62,64,180.74	34,86,559.50
	GMRKEL	3,97,927.07360300	3,99,945.88397900	2,018.81037600	71,91,595.79	57,87,473.30
	JITPL	3,80,596.69121200	3,77,849.88445100	-2,746.80676100	-67,72,099.64	-60,51,890.30
	TPTCL	88,940.60102400	79,257.95354400	-9,682.64748000	-2,83,29,451.06	-2,30,61,623.50
	TALCHER SOLAR	1,085.56000000	1,017.61980000	-67.94020000	-7,10,292.15	-7,10,292.15
	CHUKHA	2,37,853.46000000	2,93,705.35346900	55,851.89346900	14,24,22,328.35	14,24,22,327.50
	KIRICHU	18,105.00000000	72,674.02080000	54,569.02080000	11,56,86,324.10	11,56,86,322.60
	MANGDECHHU	4,70,194.95000000	4,70,219.33819800	24.38819800	1,00,479.38	1,00,479.10
	TALA	7,52,405.00000000	6,15,177.06038700	-1,37,227.93961300	-29,09,23,231.98	-29,09,23,232.70
	VAE	-35,495.78250000	0.00000000	35,495.78250000	9,29,03,600.44	9,29,03,600.30
	DSTPS_U#2_INFIRM	0.00000000	-6,544.23840000	-6,544.23840000	-1,81,95,637.87	-1,81,95,636.10
	BARH SG1_INFIRM	0.00000000	-10,461.01992600	-10,461.01992600	-2,93,89,183.89	-2,93,89,182.50
	NPGC_INFIRM	0.00000000	-1,926.09820000	-1,926.09820000	-55,12,733.37	-55,12,733.00

	Constituents	Total Scheduled (MWH)	Total Actual (MWH)	Deviation(MWH)	Deviation Charge in Rs.	Total DSM Charges in Rs.
Oct-20	APNRL	248895.2573	249750.0309	854.773653	5652240.79	5652105.42
	NVVN-BD	-675568.9934	-679321.9537	-3752.960269	-10656708.34	-11107123.91
	BARH	704671.9969	684909.4493	-19762.54765	-34155299.91	-34317881.77
	BARH SG1_INFIRM	0	-3110.3712	-3110.3712	-8553352.19	-8553352.19
	BSPHCL	-3145223.449	-3143111.699	2111.750475	-33152054.07	-45315455.63
	BRBCL	380282.4356	373713.1569	-6569.278693	-15260167.52	-18115602.82
	CHUKHA	186251.75	253345.8661	67094.11611	171089996.1	171089996.1
	CHUZACHEN	44928.30886	45411.1584	482.849536	1095846.55	943197.4
	DARLIPALI	547668.2931	550817.5368	3149.243636	7097072.24	7009553.42
	DARLIPALI_U2_INFIRM	0	-7474.0608	-7474.0608	-19943812.38	-19943812.38
	DIKCHU	43729.58188	43284.27222	-445.309665	-186569.48	-305159.25
	DVC	1487559.747	1486540.376	-1019.371768	4830482.65	2985053.3
	NR	-3032191.384	-2551955.573	480235.8108	1268626572	1268626572
	NER	17271.13327	-448537.1124	-465808.2457	-1244292823	-1244292823
	SR	-876119.2643	-1282524.863	-406405.599	-1127516499	-1127516499
	WR	393743.3368	912225.2275	518481.8907	1359946189	1359946189
	FSTPP - I & II	677630.1372	664017.8319	-13612.30537	-29577571.55	-32068556.79
	FSTPP-III	285009.4288	280179.5657	-4829.863075	-9059012.85	-9141967.85
	GMRKEL	479259.7194	482552.5012	3292.781787	9060472.3	7784964.08
	HVDC ALIPURDUAR	-753.02338	-745.626	7.39738	24451.87	22852.1
	HVDC SASARAM	-629.865008	-623.478916	6.386092	24057.53	22170.87
	JUVNL	-679443.0076	-673740.2147	5702.79289	7121510.53	6016637.63
	JITPL	386428.211	386119.1205	-309.090482	-424896.01	-466380.55
	JORETHANG HEP	55135.19879	50735.168	-4400.030794	-9287424.64	-9623220.67
	KHSTPP-I	441396.7574	427209.8684	-14186.88899	-30840844.61	-31737216.47
	KHSTPP-II	599716.8122	588663.6183	-11053.19383	-24388202.24	-27950873.4
	KURICHU	18708.5	63998.3484	45289.8484	96014478.78	96014478.78
	MANGDECHU	288352.6	284469.3031	-3883.296935	-9902408.34	-9902408.34
	MPL	493406.0225	492664.7915	-741.230999	2123222.72	1892429.15
	MTPS-II	178118.8112	176392.816	-1725.995198	-3611168.6	-4010606.86
	NVVN-NEPAL	-18689.3925	-23291.84	-4602.4475	-11818970.16	-12339576.43
	NPGC	378298.4047	368960.4637	-9337.941049	-14302759.23	-14823443.64
	NPGC-INFIRM	0	-3081.9994	-3081.9994	-8203046.19	-8203046.19
	GRIDCO	-386641.4566	-362287.4162	24354.04039	35795891.08	24284209.05
	RANGIT	34888.5	35399.496	510.996	965625.27	920083.56
	SIKKIM	-41238.8529	-41338.4888	-99.635903	-1501360.69	-1679393.98
	TALCHER SOLAR	1127.3075	1087.18155	-40.12595	-499206.74	-499206.74
	TALA	491617.75	358852.0524	-132765.6976	-281463279	-281463279
	TUL	642254.3468	635064.0636	-7190.283233	-2822190.33	-2831129.17
	TEESTA	307892.5	315174.3576	7281.857597	17056345.01	13991286.51
	THEP	31740.07617	29013.12	-2726.956169	-5688305.33	-5734309.59
	TPTCL	74286.07423	59058.68707	-15227.38716	-34474603.66	-34751344.72
	TSTPP	661829.9794	657203.5732	-4626.406221	-8093075.03	-8181100.19
	VAE_ER	66974.4825	0	-66974.4825	-56217724.6	-102966364.7
	WBSETCL	-1511360.357	-1566627.405	-55267.04778	-119446828.6	-138964805.4
	Constituents	Total Scheduled (MWH)	Total Actual (MWH)	Deviation(MWH)	Deviation Charge in Rs.	Total DSM Charges in Rs.
Nov-20	APNRL	176812.0977	175687.1955	-1124.902209	-101140.03	-101140.03
	NVVN-BD	-467149.4087	-474089.301	-6939.892219	-22459453.77	-25477553.46
	BARH	644508.5695	628393.5262	-16115.04323	-29066276.93	-29765403.8
	BARH SG1_INFIRM	0	-3791.9016	-3791.9016	-10742769.61	-10742769.61
	BSPHCL	-2232670.342	-2197200.887	35469.45563	38795277.02	30584357.91
	BRBCL	391790.1315	390576.7931	-1213.338391	-1465213.84	-1643277.97
	CHUKHA	42288.5	116898.2916	74609.79161	190254968.6	190254968.6
	CHUZACHEN	17789.65606	18219.4272	429.771136	861139.36	856551.94
	DARLIPALI	456468.9575	461501	5032.042526	11873537.03	11602642.27
	DARLIPALI_U2_INFIRM	0	-6248.1084	-6248.1084	-17577348.08	-17577348.08
	DIKCHU	15429.94478	15785.45434	355.509565	851186.53	838052.17
	DVC	1310445.517	1316172.115	5726.598518	14034141.14	5128534.59
	NR	-2254629.256	-1997474.963	257154.2926	645434308.2	645434308.2
	NER	21767.9325	-276678.0453	-298445.9778	-847018787.6	-847018787.6
	SR	-1741980.924	-2004665.528	-262684.6036	-784398296	-784398296
	WR	721801.188	1064531.217	342730.0293	1042008648	1042008648
	FSTPP - I & II	599482.7086	591717.1915	-7765.51703	-15285321.58	-17092032.37
	FSTPP-III	259322.4875	258582.6399	-739.847617	372927.94	365939.25
	GMRKEL	421817.6608	425617.52	3799.859275	10248348.57	10138461.55
	HVDC ALIPURDUAR	-646.377584	-461.4066	184.970984	524260.21	522323.16
	HVDC SASARAM	-459.013178	-559.524161	-100.510983	-271145.45	-274300.3
	JUVNL	-559755.3214	-554775.5326	4979.78878	8965976.88	7500128.28
	JITPL	385446.1985	386313.4478	867.249252	2619171.83	2612944.8
	JORETHANG HEP	25944.55969	23164.16	-2780.399689	-5749686.44	-5768876.64
	KHSTPP-I	291213.3481	282102.0677	-9111.280354	-19923767.33	-21309954.31
	KHSTPP-II	370980.9776	358713.3065	-12267.6711	-27980296.56	-31954861.39
	KURICHU	18105	18942.9408	837.9408	1776434.58	1776434.58
	MANGDECHU	143628.725	142382.9051	-1245.819916	-3176839.7	-3176839.7
	MPL	564390.515	565613.6261	1223.111067	7121831.79	6689973.14
	MTPS-II	183148.0017	181476.468	-1671.53367	-3679610.23	-4088346.52
	NVVN-NEPAL	-17331.6275	-21627.86509	-4296.23759	-11857440.47	-12173383.5
	NPGC	236704.5729	228611.2735	-8093.299357	-15206400.66	-19331173.72
	NPGC-INFIRM	0	-2244.2606	-2244.2606	-6221702.94	-6221702.94
	GRIDCO	-268284.9152	-226213.7669	42071.14829	51361186.48	42914343.57
	RANGIT	19230.75	20190.3228	959.5728	2210986.1	2205717.33
	SIKKIM	-46122.44688	-45269.17994	853.266938	2364457	2232568.17
	TALCHER SOLAR	1161.753	1154.11065	-7.64235	-313467.42	-313467.42
	TALA	249801.25	134463.4471	-115337.8029	-244516142.2	-244516142.2
	TUL	301430.8715	295836.2138	-5594.657793	-4441724	-4443646.92
	TEESTA	153780	160400.6506	6620.650636	15927351.95	15927351.95
	THEP	4751.954248	2785.248	-1966.706248	-4271736.02	-4285024.14
	TPTCL	41300.38704	30315.52894	-10984.8581	-25662206.25	-25791989.65
	TSTPP	550359.8382	548675.0145	-1684.823716	-2302226.49	-3923838.32
	VAE_ER	-16726.635	0	16726.635	-15694023	-38957961.17
	WBSETCL	-850739.4311	-886529.4745	-35790.04339	-76900685.52	-97807595.02

	Constituents	Total Scheduled (MWH)	Total Actual (MWH)	Deviation(MWH)	Deviation Charge in Rs.	Total DSM Charges in Rs.
Dec-20	APNRL	246167.1625	246449.5218	282.359335	4692833.16	4659280.9
	NVVN-BD	-376428.208	-375432.1381	996.069872	-4751373.82	-7717041.45
	BARH	702025.8908	687790.1891	-14235.70172	-24619841.82	-26805112.68
	BARH SG1_INFIRM	0	-7909.02	-7909.02	-21917724.49	-21917724.49
	BSPHCL	-2421562.549	-2420718.933	843.616187	-16027946.09	-45665506.83
	BRBCL	294952.0315	292571.0486	-2380.982814	-3601235.44	-4924027.13
	CHUKHA	19110.55	83437.38273	64326.83273	164033423.5	164033423.5
	CHUZACHEN	11391.83	11689.9296	298.0996	603057.56	579361.15
	DARLIPALI	520288.8701	524031.1936	3742.323452	5852689.03	-1618772.55
	DARLIPALI_U2_INFIRM	0	-6815.9448	-6815.9448	-18524416.08	-18524416.08
	DIKCHU	10192	10317.90897	125.908968	356890.9	335270.69
	DVC	1234191.434	1229249.657	-4941.777468	-27379758.68	-53152823.57
	NR	-2232724.869	-2190867.499	41857.36938	32691365.39	32691365.39
	NER	-40820.95795	257831.9865	298652.9445	801081443.6	801081443.6
	SR	-2210321.593	-1948782.978	261538.6154	765102400.8	765102400.8
	WR	670993.6881	158115.0422	-512878.6459	-1402258801	-1402258801
	FSTPP - I & II	614120.1997	612677.064	-1443.135688	397786.75	-3176578.4
	FSTPP-III	274086.5282	273563.0568	-523.471397	1338102.2	571977.81
	GMRKEL	472811.365	475776.9377	2965.572688	9486639.74	9453460.78
	HVDC ALIPURDUAR	-487.120972	-363.0564	124.064572	334839.19	327544.16
	HVDC SASARAM	-395.301904	-530.65966	-135.357756	-359679.36	-367218.4
	JUVNL	-663139.6801	-672177.2203	-9037.540238	-30832494.65	-40186419.02
	JITPL	413734.9825	412964.7931	-770.189365	-1438550.15	-1465489.31
	JORETHANG HEP	17567.315	15235.072	-2332.243	-4340962.43	-4349147.91
	KHSTPP-I	241635.7911	234111.3709	-7524.420218	-15969263.23	-17566661.02
	KHSTPP-II	610233.9715	606433.1115	-3800.860004	-6172671.59	-7826443.53
	KURICHU	18571	-4708.35	-23279.35	-49352222.08	-49352222.08
	MANGDECHU	102220.74	102158.3976	-62.342423	-158972.55	-158972.55
	MPL	594785.64	595852.3155	1066.675485	6660681.21	6616733.72
	MTPS-II	203871.4238	201275.552	-2595.871786	-5561169.77	-5772730.37
	NVVN-NEPAL	-143047.7585	-155858.1046	-12810.34606	-33348461.73	-37459738.67
	NPGC	402446.4303	399705.8923	-2740.538022	211132.55	185526.44
	NPGC-INFIRM	0	-1973.32	-1973.32	-5601738.7	-5601738.7
	GRIDCO	-153138.8095	-126156.3509	26982.4587	13814521.8	-8006098.39
	RANGIT	12550.75	12659.8092	109.0592	521134.11	476994.19
	SIKKIM	-56537.10061	-55312.49182	1224.608791	2373928.31	2069728.36
	TALCHER SOLAR	1266.89	1208.99805	-57.89195	-575341.74	-575341.74
	TALA	133668.75	37062.16487	-96606.58513	-204805960.7	-204805960.7
	TUL	213683.58	208617.9603	-5065.61972	-2852743.22	-2913357.8
	TEESTA	101652.5	106437.5972	4785.097217	11136738.35	10949339.85
	THEP	13562.66	12450.048	-1112.612	-2182111.48	-2219400.94
	TPTCL	27840	21606.26345	-6233.736552	-13803275.76	-13963185.89
	TSTPP	621488.6231	620104.4318	-1384.191251	-274394.07	-505013.76
	VAE_ER	-13967.215	0	13967.215	-26621105.8	-53731539.87
	WBSETCL	-290541.5499	-303761.9194	-13220.36949	-36707203.04	-74253960.76
	Constituents	Total Scheduled (MWH)	Total Actual (MWH)	Deviation(MWH)	Deviation Charge in Rs.	Total DSM Charges in Rs.
Jan-21	APNRL	197398.325	197343.5589	-54.766111	1952732.12	601469.79
	NVVN-BD	-472627.8937	-474525.0822	-1897.188567	-8546589.05	-11630437.87
	BARH	741145.2645	733503.7244	-7641.540158	-15962375.85	-17994390.19
	BARH SG1_INFIRM	0	-6301.246628	-6301.246628	-17717212.59	-17717212.59
	BSPHCL	-2517938.83	-2522531.71	-4592.879474	-38388334.57	-88313356.06
	BRBCL	408003.9268	407086.102	-917.824875	-564063.84	-1458899
	CHUKHA	202.75	33054.52601	32851.77601	83772029.01	83772029.01
	CHUZACHEN	8123.83	8461.7088	337.8788	693412.26	673948.3
	DARLIPALI	394743.7825	392750.9039	-1992.878564	-5093021.22	-8468846.24
	DARLIPALI_U2_INFIRM	0	-6904.5192	-6904.5192	-20753322.52	-20753322.52
	DIKCHU	7276.385	7405.454502	129.069502	251798.88	231954.68
	DVC	1271407.18	1232994.21	-38412.96932	-117517886.8	-161857764.2
	NR	-2099927.711	-2148999.818	-49072.10622	-234041085.1	-234041085.1
	NER	-5995.715835	283134.5051	289130.2209	863609429.2	863609429.2
	SR	-1944997.995	-1910229.52	34768.47475	217681138.4	217681138.4
	WR	503343.0162	423258.9124	-80084.10377	-339639992.7	-339639992.7
	FSTPP - I & II	856562.1926	857185.2201	623.027488	7308549.38	7020980.13
	FSTPP-III	268340.6111	267689.7492	-650.861907	982571.99	931685.41
	GMRKEL	324938.0175	325978.9029	1040.88543	6237170.42	5188263.29
	HVDC ALIPURDUAR	-436.302729	-397.128	39.174729	148654.51	144197.13
	HVDC SASARAM	-597.294965	-514.566512	82.728453	244456.69	242905.02
	JUVNL	-630358.5367	-624044.0846	6314.452075	12197059.65	-433467.36
	JITPL	432273.215	430662.3928	-1610.822175	-2834342.45	-6810344.03
	JORETHANG HEP	13893.425	11376.992	-2516.433	-5123608.39	-5130326.24
	KHSTPP-I	373868.8257	363165.5658	-10703.25989	-23219271.29	-24573713.93
	KHSTPP-II	647563.0887	642493.2475	-5069.84116	-9251036.75	-9438260.18
	KURICHU	18708.5	-15856.3368	-34564.8368	-73277454.03	-73277454.03
	MANGDECHU	82316.17	83331.34318	1015.173175	2588691.56	2588691.56
	MPL	349280.7425	348554.282	-726.460486	785565.82	-398367.87
	MTPS-II	194080.5041	191682.684	-2397.820097	-5059671.22	-5380001.25
	NVVN-NEPAL	-173333.375	-196405.5951	-23072.22012	-67170213.6	-95786674.36
	NPGC	420402.5083	423194.0019	2791.493623	11922995.36	10465152.75
	NPGC-INFIRM	0	-10717.9574	-10717.9574	-30316181.36	-30316181.36
	GRIDCO	-88611.27752	-78971.1998	9640.077724	-14042518.12	-43424799.32
	RANGIT	12498.25	12776.532	278.282	567675.55	542587.59
	SIKKIM	-58214.98564	-56800.95152	1414.034121	3996420.04	3870290.56
	TALCHER SOLAR	1156.9375	1114.4466	-42.4909	-442786.37	-442786.37
	TALA	75545.5	18456.2626	-57089.2374	-121029183.6	-121029183.6
	TUL	170201.2775	166241.3061	-3959.971403	-2088036.3	-2152632.39
	TEESTA	79235	83295.63459	4060.634591	10129127.98	10048836.02
	THEP	13341.85	11683.296	-1658.554	-3520442.01	-3546954.97
	TPTCL	20400	16465.85926	-3934.140744	-9190698.46	-9240947.03
	TSTPP	580142.5471	578933.4657	-1209.081404	-1279796.45	-2030853.39
	VAE_ER	-49599.5125	0	49599.5125	-2521387.4	-11334488.16
	WBSETCL	-289920.9289	-298099.7149	-8178.78603	-31648092.65	-61259578.48

	Constituents	Total Scheduled (MWH)	Total Actual (MWH)	Deviation(MWH)	Deviation Charge in Rs.	Total DSM Charges in Rs.
Feb-21	APNRL	283462.3875	289131.2671	5668.879647	17496947.5	17404923.56
	NVVN-BD	-456290.8284	-456329.1559	-38.327468	-1514909.21	-2023066.15
	BARH	697315.2946	686033.772	-11281.52263	-25605101.8	-31843768.5
	BARH SG1_INFIRM	0	-389.075114	-389.075114	-16082165.34	-16082165.34
	BSPHCL	-2156669.157	-2177136.891	-20467.73341	-95814136.28	-161612445
	BRBCL	425367.4979	425916.6475	549.1496	2470938.1	1891479.72
	CHUKHA	1665.75	16994.26638	15328.51638	39087716.76	39087716.76
	CHUZACHEN	808.69	748.5312	-60.1588	-148061.7	-151221.84
	DARLIPALI	429749.9175	434759.7241	5009.806646	11780743.1	9447467.92
	DARLIPALI_U2_INFIRM	0	-2462.1444	-2462.1444	-8555921.29	-8555921.29
	DIKCHU	4741.1	4667.18176	-73.91824	-89694.55	-120366.17
	DVC	1406168.661	1410033.621	3864.959834	11365487	5980899.65
	NR	-1935247.128	-2012153.187	-76906.05901	-404041047.8	-404041047.8
	NER	-27661.1193	245297.033	272958.1523	931785731.4	931785731.4
	SR	-1955707.432	-1930094.65	25612.78282	277567658.5	277567658.5
	WR	26628.99229	-80490.5998	-107119.5921	-475602434.2	-475602434.2
	FSTPP - I & II	821426.7975	820661.2623	-765.535158	2658408.99	950679.75
	FSTPP-III	181614.6195	181174.6417	-439.977756	-341942.38	-1044903.27
	GMRKEL	285559.2625	288555.2671	2996.004625	9269136.03	7202817.16
	HVDC ALIPURDUAR	-353.354241	-321.1098	32.244441	107335.63	105615.02
	HVDC SASARAM	-557.327157	-499.025923	58.301234	180653.58	179385.2
	JUVNL	-538233.8587	-540918.3512	-2684.492535	-12241399.1	-21293608.43
	JITPL	695141.17	695723.1176	581.947625	1566432.08	1361422.11
	JORETHANG HEP	9926.975	8240.128	-1686.847	-3625077.01	-3666050.12
	KHSTPP-I	370634.2258	357945.3718	-12688.85403	-30776807.25	-34370903.63
	KHSTPP-II	854540.6882	848044.2423	-6496.445963	-15549352.18	-17953034.17
	KURICHU	16898	-17546.2092	-34444.2092	-73021723.59	-73021723.59
	MANGDECHU	64987.475	64550.17976	-437.295242	-1115103.06	-1115103.06
	MPL	371746.12	370711.3373	-1034.782685	-1671104.17	-1761230.95
	MTPS-II	185913.9868	188052.916	2138.929181	5540543.14	5247692.33
	NVVN-NEPAL	-164779.4735	-190025.5955	-25246.12195	-84055902.57	-126261669.4
	NPGC	270802.5208	271211.8574	409.33657	2980475.83	2080941.13
	NPGC-INFIRM	0	-11079.4636	-11079.4636	-35808330.02	-35808330.02
	GRIDCO	-309262.6932	-293445.6905	15817.00274	17333832.33	-2914968.21
	RANGIT	10527.25	10413.3072	-113.9428	-170412.81	-183119.46
	SIKKIM	-50966.64785	-50171.33994	795.307908	3057474.75	2890546.87
	TALCHER SOLAR	1266.8225	1261.72815	-5.09435	-52800.77	-52800.77
	TALA	51392.5	11897.71831	-39494.78169	-83728937.21	-83728937.21
	TUL	129855.74	126344.6523	-3511.087668	-2487600.35	-2512733.12
	TEESTA	65325.75	68388.79825	3063.048248	7926274.18	7243537.82
	THEP	9231.375	7967.2	-1264.175	-3096255.13	-3121933.91
	TPTCL	14784	12138.57322	-2645.426784	-6616442.89	-6694620.09
	TSTPP	532069.9986	531147.0043	-922.994326	-2100522.93	-4216641.83
	VAE_ER	-24666.3775	0	24666.3775	1405063.7	-2032502.17
	WBSETCL	-444419.7124	-444083.9328	335.779618	6950381.45	-16192829.32
	Constituents	Total Scheduled (MWH)	Total Actual (MWH)	Deviation(MWH)	Deviation Charge in Rs.	Total DSM Charges in Rs.
Mar-21	APNRL	341747.95	343381.8119	1633.861855	9671333.87	8322177.61
	NVVN-BD	-564012.3995	-567094.0994	-3081.699906	-11486051.6	-12152532.44
	BARH	872592.7345	868087.1846	-4505.549933	-8887375.16	-11747453.73
	BARH SG1_INFIRM	0	8434.274017	8434.274017	-4864735.38	-4864735.38
	BSPHCL	-2516263.756	-2581813.879	-65550.12262	-276392387.5	-458248902.3
	BRBCL	477634.8806	477592.6467	-42.23389	1896851.48	1121247.37
	CHUKHA	2969.75	19369.46681	16399.71681	41819277.86	41819277.86
	CHUZACHEN	12220.855	12429.3024	208.4474	426322.48	378994.55
	DARLIPALI	478584.0088	481370.9401	2786.931344	6402476.38	3854503.03
	DARLIPALI_U2_INFIRM	0	-4209.978425	-4209.978425	-27586567.79	-27586567.79
	DIKCHU	13829.05	13770.7269	-58.323104	36596.51	-23695.5
	DVC	1681841.617	1681894.704	53.086577	-7150993.17	-20029710.83
	NR	-1926172.209	-1968631.761	-42459.55167	-231953984.8	-231953984.8
	NER	-64055.47886	277574.6917	341630.1705	1204098147	1204098147
	SR	-2285519.45	-2262068.815	23450.63493	41826004.47	41826004.47
	WR	479451.2105	314649.4174	-164801.7932	-502033373.7	-502033373.7
	FSTPP - I & II	918997.5239	913971.5891	-5025.934816	-7238481.73	-7873345.82
	FSTPP-III	324997.6764	322532.0916	-2465.584801	-4652413.6	-5100036.34
	GMRKEL	468602.645	474546.9559	5944.310924	17844650.04	17376568.89
	HVDC ALIPURDUAR	-395.060272	-377.9352	17.125072	51328.42	44353.84
	HVDC SASARAM	-603.519413	-583.532323	19.98709	75346.47	72949.98
	JUVNL	-620732.1368	-632952.1444	-12220.00764	-63856391.31	-87232505.81
	JITPL	654599.5775	652535.1179	-2064.459554	-3997893.2	-7599313.02
	JORETHANG HEP	15178.195	12208.416	-2969.779	-6703449.45	-6813733.8
	KHSTPP-I	409843.3037	392557.5812	-17285.72246	-41627749.01	-50867329.16
	KHSTPP-II	988133.8161	982321.7802	-5812.03592	-10404646.47	-13085818.49
	KURICHU	18708.5	-13979.142	-32687.642	-69297800.73	-69297800.73
	MANGDECHU	87993.775	88593.01576	599.240755	1528064.21	1528064.21
	MPL	685222.8225	685164.7885	-58.033972	990218.32	34455.83
	MTPS-II	247168.1785	249588.352	2420.17354	5678006.14	5313592.05
	NVVN-NEPAL	-213897.1971	-235181.522	-21284.32492	-76556611.15	-135826010.4
	NPGC	328772.7097	323100.3893	-5672.320434	-11053680.17	-15806391.53
	NPGC-INFIRM	0	76203.31159	76203.31159	83912055.58	83912055.58
	GRIDCO	-874856.5302	-889164.8582	-14308.32802	-33229482.38	-53290245.19
	RANGIT	15440.5	15438.3	-2.2	174956.37	123373.55
	SIKKIM	-44994.68002	-51448.07829	-6453.39827	-21473786.24	-25314527.93
	TALCHER SOLAR	1209.48	1174.2885	-35.1915	-347183.34	-347183.34
	TALA	64910.15	12519.67731	-52390.47269	-111067802.3	-111067802.3
	TUL	169380.585	162044.797	-7335.788045	-8889306.75	-9963547.79
	TEESTA	100696	105477.2339	4781.233891	11991989.93	11831350.94
	THEP	11864.405	10357.216	-1507.189	-3514974.21	-3584743.11
	TPTCL	16519.7	12577.23298	-3942.467024	-9388506.23	-9551379.66
	TSTPP	319862.6238	319388.5813	-474.042552	-43368.05	-263282.14
	VAE_ER	-53559.055	0	53559.055	-805971.1	-2557650.32
	WBSETCL	-927232.1322	-919113.4141	8118.71808	27890726.32	9859926.71

Annexure-XVII-B

Details of Schedule and Actual Generation during the Year 2020-21

System	Schedule Gen. (MU)	Act. Gen./Drawal (MU)
RANGIT HPS	281.12	283.20
TEESTA HPS	2,742.04	2,807.81
BSPHCL	-32,225.04	-32,268.53
DVC	14,685.56	14,580.48
HVDC ALIPURDUAR	-7.36	-6.59
HVDC SASARAM	-7.35	-6.94
JUVNL	-7,155.17	-7,119.51
GRIDCO	-3,440.13	-3,236.12
SIKKIM	-536.97	-529.94
WBSETCL	-12,729.75	-13,126.00
NR	-25,626.32	-26,687.00
NVVN-BD	-6,534.76	-6,558.43
NVVN-NEPAL	-900.76	-1,007.02
WR	4,765.64	9,665.83
SR	-20,196.41	-21,669.02
NER	63.72	-850.08
BARH STPS	7,445.59	7,336.46
BRBCL TPS	3,934.34	3,912.09
DARLIPALI STPS	4,491.21	4,457.78
FSTPP I&II STPS	8,133.56	8,053.21
FSTPP-III STPS	2,952.02	2,930.19
KHSTPP-I STPS	4,612.80	4,480.53
KHSTPP-II STPS	7,796.69	7,727.20
MAITHON R/B TPS	5,979.30	5,991.27
MTPS-II TPS	2,023.92	2,009.22
NSTPS	4,445.59	4,398.06
Talcher STPs	6,824.48	6,800.29
CHUZACHEN HPS	479.78	482.67
DIKCHU HPS	452.94	464.84
JORETHANG LOOP HPS	438.87	397.61
Tashiding HPS	382.02	368.50
Teesta-III(TUL) HPS	6,062.66	5,997.87
APNRL	2,821.43	2,806.25
GMRKEL	4,494.51	4,507.02
JITPL	5,590.56	5,570.11
TPTCL	582.53	502.10
TALCHER SOLAR	13.96	13.44
CHUKHA	1,236.63	1,979.25
KIRICHU	179.27	350.79
MANGDECHHU	3,192.70	3,184.79
TALA	4,493.28	3,182.69
VAE	-161.35	0.00
DSTPS_U#2_INFIRM	0.00	-45.11
BARH SG1_INFIRM	0.00	-49.55
NPGC_INFIRM	0.00	35.63

Annexure -XVIII

STATUS OF REACTIVE ENERGY CHARGES ACCOUNT

RECEIVABLE IN ER POOL AS PER PUBLISHED A/C FROM 30.04.2020 TO 28.03.2021 (2020 -21)

Constituents	Previous Outstanding (Rs.)	Amount Recievable in the Pool (Rs.)	Amount Received in the Pool (Rs.)	Total Outstanding (Rs.)
WBSETCL	0	139929147	139929147	0
DVC	0	11883693	11883693	0
BSPHCL	17140671	21722550	0	38863221
SIKKIM	0	392539	31147	361392
JUVNL	0	44829090	18589022	26240068
GRIDCO	0	46923880	46923880	0
TOTAL	17140671	265680899	217356889	65464681

Annexure-XIX

Compensation received by various generating stations of ER during the year 2020-21		
SL NO.	**Station**	**Compensation (Rs. Cr.)**
1	BARH-II	32.31
2	FSTPS-I&II	64.52
3	FSTPS-III	9.81
4	KhSTPS-I	2.28
5	KhSTPS-II	3.09
6	TSPTS	0.00
7	MTPS-II	13.86
8	MPL	1.18
9	NABINAGAR STPP	0.00
10	DSTPP	0.00
11	BRBCL	0.00

Annexure-XX

AGC Settlement Account by ERPC
Revised AGC Account for the Period: 01-Apr-2020 to 30-Aug-2020

Payments to the AGC Provider(s) from the DSM pool

SI. No.	Weeks	AGC Provider Name	UP Regulation due to AGC(MWh)	Down Regulation due to AGC(MWh)	Net Energy(MWh)	Variable Charges (Rs)	Markup Charges as per CERC order (Rs)	Total Charges (Rs)
1	01.04.2020-05.04.2020	BARH	0.000000	0.000000	0.000000	0	0	0
2	06.04.2020-12.04.2020	BARH	0.000000	0.000000	0.000000	0	0	0
3	13.04.2020-19.04.2020	BARH	0.000000	0.000000	0.000000	0	0	0
4	20.04.2020-26.04.2020	BARH	0.000000	0.000000	0.000000	0	0	0
5	27.04.2020-03.05.2020	BARH	0.000000	0.000000	0.000000	0	0	0
6	04.05.2020-10.05.2020	BARH	142.565625	7.171875	135.393750	434614	74869	509483
7	11.05.2020-17.05.2020	BARH	181.425000	98.821875	82.603125	250288	140123	390411
8	18.05.2020-24.05.2020	BARH	598.856250	132.103125	466.753125	1414262	365480	1779742
9	25.05.2020-31.05.2020	BARH	0.000000	0.000000	0.000000	0	0	0
10	01.06.2020-07.06.2020	BARH	0.000000	0.000000	0.000000	0	0	0
11	08.06.2020-14.06.2020	BARH	1421.521875	549.018750	872.503125	2643684	985272	3628956
12	15.06.2020-21.06.2020	BARH	0.000000	0.000000	0.000000	0	0	0
13	22.06.2020-28.06.2020	BARH	0.000000	0.000000	0.000000	0	0	0
14	29.06.2020-05.07.2020	BARH	0.000000	0.000000	0.000000	0	0	0
15	06.07.2020-12.07.2020	BARH	0.000000	0.000000	0.000000	0	0	0
16	13.07.2020-19.07.2020	BARH	0.000000	0.000000	0.000000	0	0	0
17	20.07.2020-26.07.2020	BARH	0.000000	0.000000	0.000000	0	0	0
18	27.07.2020-02.08.2020	BARH	0.000000	0.000000	0.000000	0	0	0
19	03.08.2020-09.08.2020	BARH	0.000000	0.000000	0.000000	0	0	0
20	10.08.2020-16.08.2020	BARH	986.859375	308.540625	678.318750	1764307	647699	2412006
21	17.08.2020-23.08.2020	BARH	2880.834375	852.637500	2028.196875	5390947	1866736	7257683
22	24.08.2020-30.08.2020	BARH	2493.637500	922.200000	1571.437500	4176881	1707919	5884800
	Total	BARH	8705.700000	2870.493750	5835.206250	16074983	5788098	21863081

(+) means payable from DSM Pool to AGC provider

(-) means payable to DSM Pool by AGC provider

A) Revised AGC settlement account for the period 19-Aug-2019 to 30-Aug-2020 has been prepared based on the CERC order in petition No.79/RC/2017, dated 06.12.2017.

B) The markup rate has been calculated at the rate of 50 Paise/Kwh for Up & Down regulation.

C) Variable Charges for AGC provider has been calculated as per the rate furnished by the respective RRAS providers in Format AS-I and the same published in ERPC website as format AS-3.

ANNEXURE - XXI

THERMAL POWER PROJECT UNDER CONSTRUCTION IN THE ER (As on 31.03.2021)

State	Project Name	Impl. Agency	Unit No.	Capacity (MW)	Expected date of Synchronisation	Date of Test Synchronisation	Remarks
Bihar	Nabi Nagar TPP (BRBCL)	Joint Venture of NTPC and Railways	U-4	250	2021-22		
	New Nabi Nagar STPP (NPGC)	Joint Venture of NTPC and Bihar	U-2	660	2021-22	March, 2021	COD is yet to be declared
			U-3	660	2021-22		
	Barh-St-I	NTPC	U-1	660	2021-22	27.09.2020	COD is yet to be declared
			U-2	660	2021-22		
			U-3	660	2021-22		
	Barauni TPP	NTPC	U-9	250	2021-22	12.01.2021	COD is yet to be declared
Odisha	Darlipali STPP	NTPC	U-2	800	2021-22	March, 2021	COD is yet to be declared

HYDRO POWER PROJECT UNDER CONSTRUCTION IN THE ER (As on 31.03.2021)

State	Project Name	Impl. Agency	Unit No.	Unit Size & Capacity (MW)	Likely Commissioning Year	Date of Test Synchronisation	Remarks
Sikkim	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	2021-22		
	Rongnichu	Madhya Bharat Power Corp. Ltd.	U-1 to U-2	2x48	2021-22		
	Panan	Himgiri Hydro Energy Pvt. Ltd.	U-1 to U-4	4x75	2021-22		

Annexure-XXII

List of Assets to be Commissioned in ER-I during 2021-22

Sl. No.	Name of the Project	Name of the Trans line/ Substation/ Extn.	MVA addition	Length (CKM)	IA/ RCE Sch.	Tgt. Compln	Antt. Completion	Indic. Cap. Cost (Rs. Cr.)	Balance work/ Gang			Remarks/ Critical Issues
									Fdn (Nos)	TE (Nos)	Stgg (Km)	
(A) RTM												
1	ERSS XXIII	400 KV Bays extension at Saharsa Agency: M/s Vikran Sch Compln: May'21			May'21	May'21	June'21	40				The progress is very slow on account of Soil filling
2	ERSS XXIII	400 KV Bays extension at Muzaffarpur with 1 no. 500 MVA ICT Agency: M/s Vikran Sch Compln: May'21	500		May'21	May'21	May'21	18				Work in progress. ICT reached at site. Supply of GIS from Hyosung CRITICAL.
3	ERSS XXIII	Extension at Kahalgaon Agency: M/s Vikran Sch Compln: Dec'20			May'21	Dec'20	Apr'21	3				Supply of CB is critical from Siemens.Shutdown to be applied after completion of supply of all items at site.
4	ERSS XXIII	LILO of both circuits of 400 KV D/C Kishanganj-Darbhanga(Q Moose) at Saharsa(New) Agency:M/s L&T Sch Compl:May'21		77	May'21	May'21	June'21	125	46/10	90/3	39/0	Work in progress. Low lying area.
5	North Karanpura	400 KV GIS Bays extension at Chandwa Agency: Hyosung			Sep'17	Dec'20		15				GIS bays ready. CEA Clearance received. Decision on DOCO pending completion of TBCB line. (uncertain).
6	North Karanpura	400 KV Bays extension at Gaya Agency: GE Sch Compln: Jan'19			Sep'19	Dec'20		10				GIS bays ready. CEA Clearance received. Decision on DOCO pending completion of TBCB line. (uncertain).
	Sub-total (RTM)		**500**	**77**				**186**				
(B) TBCB												
1	ERSS-XXI	LILO of both circuits of 400 KV D/C Kishanganj-Patna(Q Moose) at Saharsa(New) Agency:M/s TPL Sch Compl:Apr'20		150	Mar'21	Mar'21	Jun'21	151	01/02	9/03	13/04	Progress was severly affected due to waterlogging till Dec'20 due to high Water table. Expected completion in June'21.
2	ERSS-XXI	400/220/132kV Saharsa (New) Agency: M/s ABB Sch Coml: Mar'20	1400		Mar'21	Mar'21	Jun'21	131				Progress was severly affected due to Sever rainfall from Apr'20 till Sep'20 and Waterlogging till Dec'20 due to high Water table. Work is in progress. Expected completion in June'21.
	Sub total (TBCB)		**1400**	**150**				**282**				

ANNEXURE-XXIII

IMPORTANT MEETING HELD DURING 2020-21

A. ERPC MEETING

SI.	Description	Date	Venue
1	43rd ERPC Meeting	26.03.2021	Hotel Vivanta, Kolkata

B. TCC MEETING

SI.	Description	Date	Venue
1	43rd TCC Meeting	23.03.2021	ERPC, Kolkata through Video Conferencing (VC)

C. OPERATION COORDINATION SUB-COMMITTEE (OCC) MEETINGS

SI.	Description	Date	Venue
1.	168th OCC Meeting	17.06.2020	Through VC
2.	169th OCC Meeting	27.07.2020	Through VC
3.	170th OCC Meeting	24.08.2020	Through VC
4.	171St OCC Meeting	25.09.2020	Through VC
5.	172nd OCC Meeting	19.10.2020	Through VC
6.	173rd OCC Meeting	24.11.2020	Through VC
7.	174th OCC Meeting	21.12.2020	Through VC
8.	175th OCC Meeting	20. 01.2021	Through VC
9.	176th OCC Meeting	19. 02.2021	Through VC
10.	177th OCC Meeting	17. 03.2021	Through VC

D. COMMERCIAL SUB-COMMITTEE (CC) MEETINGS

SI.	Description	Date	Venue
1	43rd CC Meeting	21.09.2020	Through VC

E. PROTECTION COORDINATION SUB-COMMITTEE (PCC) MEETINGS

SI.	Description	Date	Venue
1.	90th PCC Meeting	13.05.2020	Through VC
2.	91st PCC Meeting	24.06.2020	Through VC
3.	92nd PCC Meeting	22.07.2020	Through VC
4.	93rd PCC Meeting	17.08.2020	Through VC
5.	94th PCC Meeting	28.09.2020	Through VC
6.	95th PCC Meeting	15.10.2020	Through VC
7.	96th PCC Meeting	12.11.2020	Through VC
8.	97th PCC Meeting	14.12.2020	Through VC
9.	98th PCC Meeting	13.01.2021	Through VC
10.	99th PCC Meeting	12. 02.2021	Through VC
11.	100th PCC Meeting	12. 03.2021	Through VC

F. LOAD GENERATION BALANCE REPORT (LGBR) MEETING

SI.	Description	Date	Venue
1	LGBR (2021-22) Meeting	18.12.2020	Through VC

G. TELECOMMUNICATION, SCADA & TELEMETRY (TeST) MEETING

SI.	Description	Date	Venue
1.	6th TeST Meeting	08.07.2020	Through VC
2.	7th TeST Meeting	23.12.2020	Through VC
3.	8th TeST Meeting	11.03.2021	Through VC

H. OCC SHUTDOWN MEETINGS

SI.	Description	Date	Venue
1.	171st OCC Shutdown Meeting	22.09.2020	Through VC
2.	172nd OCC Shutdown Meeting	16.10.2020	Through VC
3.	173rd OCC Shutdown Meeting	18.11.2020	Through VC
4.	174th OCC Shutdown Meeting	16.12.2020	Through VC
5.	175th OCC Shutdown Meeting	15.01.2021	Through VC
6.	176th OCC Shutdown Meeting	15.02.2021	Through VC
7.	177th OCC Shutdown Meeting	15.03.2021	Through VC

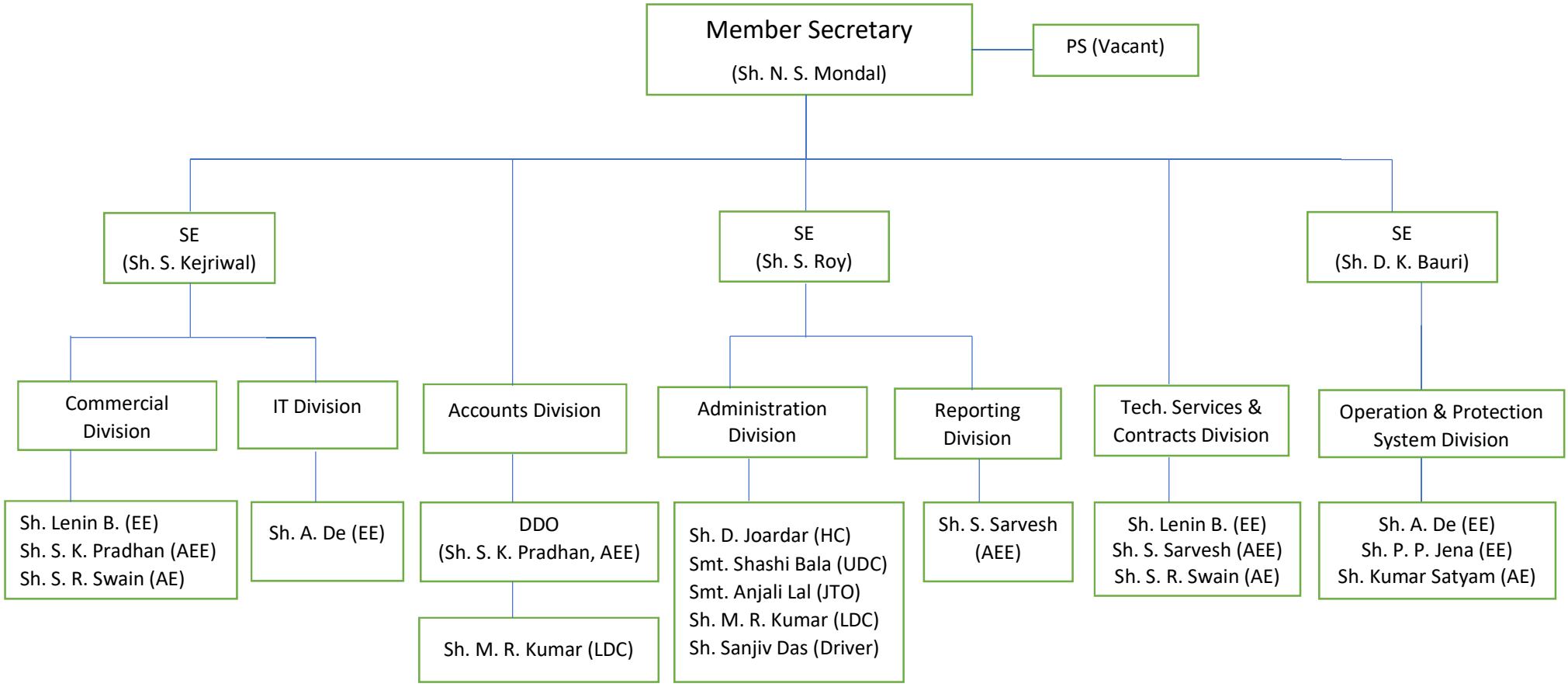
I. SPECIAL MEETINGS

SI.	Description	Date	Venue
1.	Meeting on Maintenance Programme of Transmission lines/ Equipment	27.04.2020	Through VC
2.	Meeting on Maintenance Programme of Transmission lines/ Equipment	26.05.2020	Through VC
3.	Meeting on repeated disturbances at 220/132/33 kV Lalmatia S/s	16.07.2020	Through VC
4.	Special Meeting to discuss Outstanding dues of Mangdechhu HEP	14.08.2020	Through VC
5.	Meeting of Validation Committee for the Application Period from 01.10.2020 to 31.12.2020 for implementation of CERC (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2010	21.08.2020	Through VC
6.	Special Meeting on Performance of primary frequency response	31.08.2020	Through VC
7.	RGMO Vendor Meeting	10.09.2020	Through VC
8.	9th Meeting of Standing Committee on Transmission Planning for State Sectors	24.09.2020	Through VC
9.	2nd meeting of Eastern Region Power Committee on Transmission Planning (ERPCTP)	30.09.2020	Through VC
10.	Meeting with PRDC	07.10.2020	ERPC, Kolkata
11.	Meeting. on Issues related to Sikkim & WB	09.11.2020	Through VC
12.	Meeting on Issues related to DVC & Jharkhand	10.11.2020	Through VC
13.	Review Meeting on PSDF Projects	11.11.2020	Through VC
14.	Meeting on Telemetry of real time active power (MW) data	19.11.2020	Through VC
15.	9th India-Bangladesh Operational Coordination Meeting	23.11.2020	Through VC
16.	Meeting on Revised Operating Procedure of ER	27.11.2020	Through VC
17.	Presentation of Siemens on RGMO Testing	11.12.2020	Through VC
18.	Meeting of Sub-Committee on "Transmission Planning"	15.12.2020	Through VC
19.	Joint Study Committee Mtg. by CEA	22.12.2020	Through VC
20.	Review Meeting	01.01.2021	ERPC, Kolkata
21.	Meeting with CESC for southern generation criticality	07.01.2021	Through VC
22.	Hindi Kavi Sammelan	05.02.2021	ERPC, Kolkata
23.	3rd Meeting of ERPCTP	09.02.2021	Through VC
24.	PSDF Project Review Meeting	10.02.2021	Through VC
25.	1st Standing Committee Meeting on Communication	09.03.2021	Through VC
26.	Meeting on planning alternative Transmission access to Metro Cities	31.03.2021	Through VC

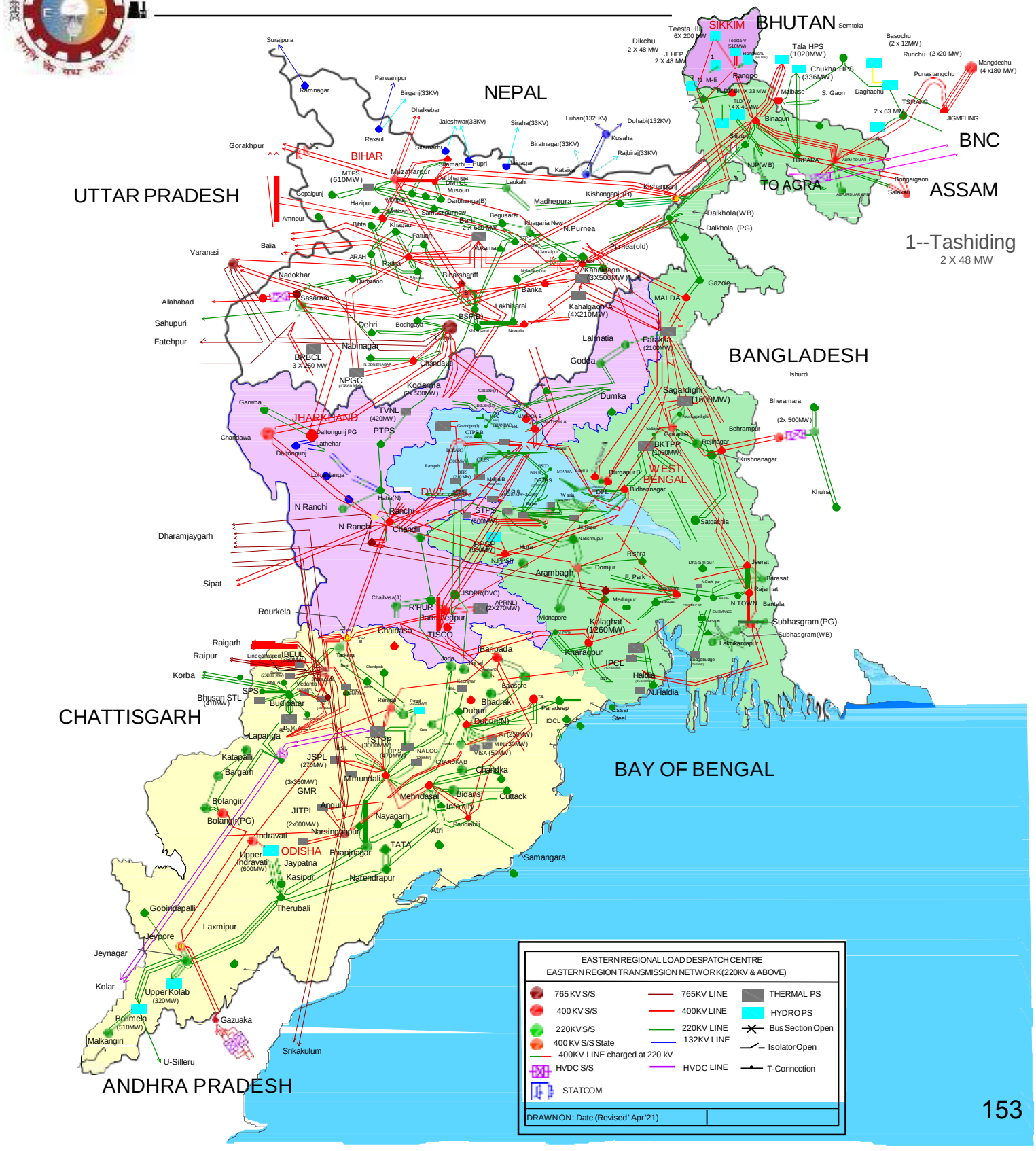
EXHIBIT - I

Organisation Chart of ERPC Secretariat, Kolkata

(As on 31.03.2021)



EASTERN REGIONAL POWER COMMITTEE



SINGLE LINE DIAGRAM: ER TRANSMISSION SYSTEM(220KV & ABOVE)