



**AGENDA**  
**OF**  
**182<sup>nd</sup> OCC MEETING**

**Date: 24.08.2021**

**Eastern Regional Power Committee**

**14, Golf Club Road, Tollygunge**

**Kolkata: 700033**

## **EASTERN REGIONAL POWER COMMITTEE**

**AGENDA FOR 182<sup>nd</sup> OCC MEETING TO BE HELD ON 24.08.2021 (TUESDAY) AT 10:30 HRS**

### **PART – A**

**ITEM NO. A.1: Confirmation of Minutes of 181<sup>st</sup> OCC Meeting held on 22<sup>nd</sup> July 2021 through MS Teams online platform.**

The minutes of 181<sup>st</sup> Operation Coordination sub-Committee meeting held on 22.07.2021 was circulated vide letter dated 05.08.2021.

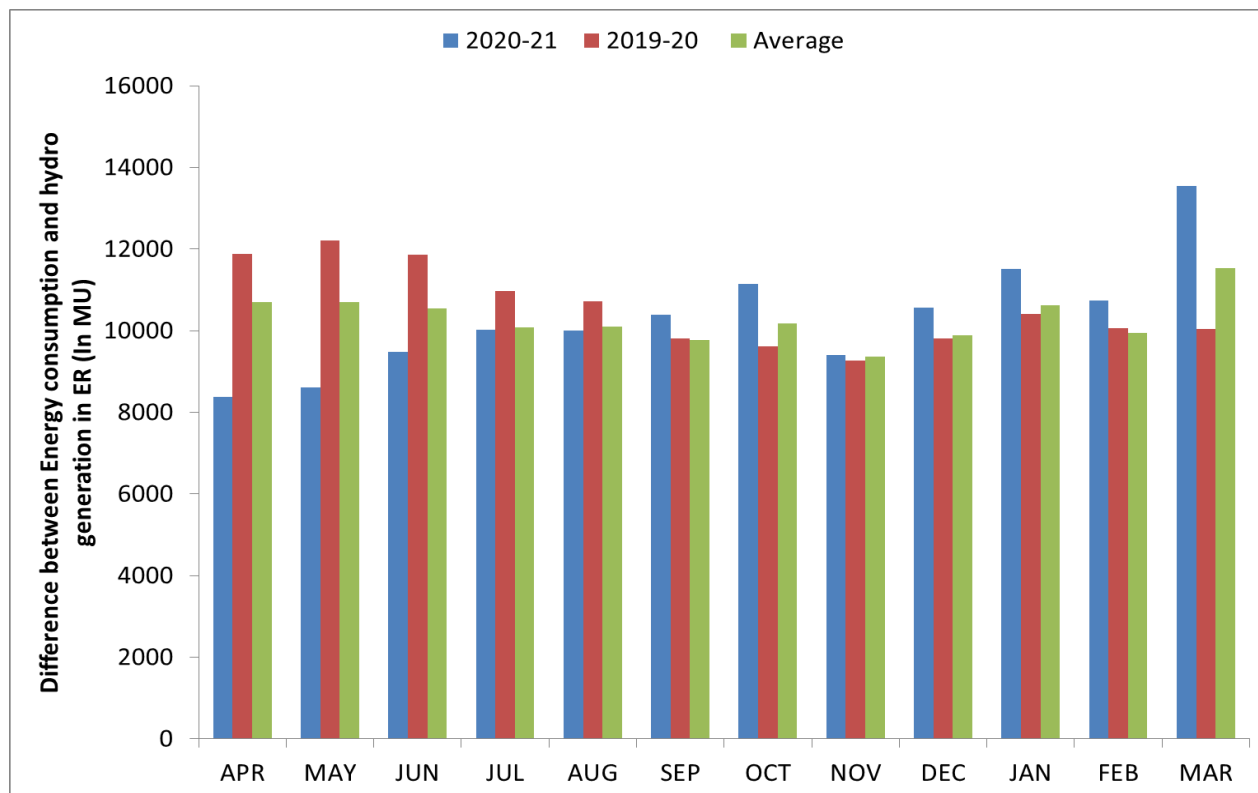
**Members may confirm the minutes of 181<sup>st</sup> OCC meeting.**

### **PART B: ITEMS FOR DISCUSSION**

**ITEM NO. B.1: Declaration of high demand / low demand season for 2022**

Regulation 42 of CERC (Terms and Conditions of Tariff) Regulations, 2019, pertaining to computation and payment of capacity charge for thermal generating stations, contains the following provisions: “The capacity charge shall be recovered under two segments of the year, i.e. High Demand Season (period of three months) and Low Demand Season (period of remaining nine months), and within each season in two parts viz., Capacity Charge for Peak Hours of the month and Capacity Charge for Off Peak Hours of the month” “The number of hours of “Peak” and “Off-Peak” periods during a day shall be four and twenty, respectively. The hours of Peak and Off-Peak periods during a day shall be declared by the concerned RLDC at least a week in advance. The High Demand Season (period of three months, consecutive or otherwise) and Low Demand Season (period of remaining nine months, consecutive or otherwise) in a region shall be declared by the concerned RLDC, at least six months in advance: Provided that RLDC, after duly considering the comments of the concerned stakeholders, shall declare Peak Hours and High Demand Season in such a way as to coincide with the majority of the Peak Hours and High Demand Season of the region to the maximum extent possible”

As per IEGC, hydro generating station is must run during high hydro season in order to reduce water spillage condition. Hence need for availability of thermal generating stations will be more when demand is high and support from hydro generation is low. In order to find out high and low demand season for 2022-23, difference between energy consumption and hydro generation in Eastern Region for 2019-20, 2021-22 and average of previous five years (i.e. 2016-17, 2017-18, 2018-19, 2019-20 and 2020-21) are shown below.



As per above chart, difference between energy consumption and hydro generation in Eastern Region was high during following months:

- **2019-20:** April-19, May-19 and June-19
- **2020-21\*:** Oct-20, Jan-21, Mar-21
- **Average of last five years:** March, April and May

\*Due to COVID related lockdown, energy consumption was low during March – June 2020

As per trend in previous five years (**Annexure-B1**), difference between energy consumption and hydro generation in Eastern Region was high during March, April and May as demand was in higher side with less support from hydro generation.

Hence April-2022, May-2022 and March -2023 may be considered high demand seasons for 2022-23.

**Members may note.**

**ITEM NO. B.2: Cyber Security Guidelines for Power Sector issued by MoP**

Ministry of Power vide order No.25-I I/6/2018-PG dated 02.07.2020 issued guidelines regarding cyber security aspects in Power Sector. The same is attached at **Annexure-B2**.

Power Supply System is a sensitive and critical infrastructure that supports not only our national defense, vital emergency services including health, disaster response, critical national infrastructure including classified data & communication services, defense installations and manufacturing establishments, logistics services but also the entire economy and the day-to-day life of the citizens of the country. Any danger or threat to Power Supply system can have catastrophic effects and has the potential to cripple the entire country. Therefore, the Power Sector is a strategic and critical sector.

The vulnerabilities in the Power Supply System & Network mainly arise out of the possibilities of cyber attacks through malware / Trojans etc. embedded in imported equipment.

Hence, to protect the security, integrity and reliability of the strategically important and critical Power Supply System & Network in the country, the following directions are hereby issued:

- 1) All equipment, components, and parts imported for use in the power Supply System and Network shall be tested in the country to check for any kind of embedded malware/trojans/cyber threat and for adherence to Indian Standards.
- 2) All such testings shall be done in certified laboratories that will be designated by the Ministry of Power (MoP).
- 3) Any import of equipment/components/parts from "prior reference" countries as specified or by persons owned by, controlled by, or subject to the jurisdiction or the directions of these "prior reference" countries will require prior permission of the Government of India.
- 4) Where the equipment/components/parts are imported from "prior reference" countries with special permission, the protocol for testing in certified and designated laboratories shall be approved by the Ministry of Power (MoP).

This order shall apply to any item imported for end use or to be used as a component, or as a part in manufacturing, assembling of any equipment or to be used in power supply system or any activity directly or indirectly related to power supply system.

**Members may note for compliance.**

**ITEM NO. B.3: Adopting Guidelines for Rationalized use of High Performance Conductors**

1. Representation from Merchant's Chamber of Commerce & Industry (MCCI) has been received by Ministry of Power, Govt. of India, wherein, it has been alleged that State utilities are procuring one particular type of High Performance Conductors, thereby restricting competition. Due to specific qualification requirements mentioned by various utilities in their bidding documents, specific type of HPC conductors are being selected for various projects relating to High performance conductors. There exists a monopoly for supply of types of HPC conductors in the market and hence competitive pricing are not achieved. They have requested MoP's support to ensure that the necessary changes are made in the present bidding scenario with all State Utilities to ensure that there is openness and competitive pricing for all conductor manufacturers to compete and develop.

2. In this regard, it is informed that Central Electricity Authority had formulated a guideline titled "Guidelines for Rationalized Use of High Performance Conductors" which comprehensively covers the various aspects of High Performance Conductors and attempts to provide technical insight to the utilities and to promote judicious use of these conductors. These guidelines are available on CEA website.

[https://cea.nic.in/wp-content/uploads/2020/04/guidelines\\_conductors.pdf](https://cea.nic.in/wp-content/uploads/2020/04/guidelines_conductors.pdf)

3. In these guidelines, an attempt has been made to create a level playing field of various conductor manufacturers, where the utilities can quote the required current carrying capacity, required sag, maximum operating temperature, loss per km, estimated cost etc. and the conductor manufacturers can quote their products satisfying the required parameters with their offered prices. Some of the clauses of the subject guidelines pertaining to selection of type of HPC conductor are produced below:

- a. **Clause 13.3:** The power utilities should invite bids without specifying type of High Performance Conductor as several types of such conductors are available and could

bring techno-economic benefits. Also, generic name of conductor like CCC, GAP conductor etc. should only be specified by the power utilities instead of patented names of manufacturer or conductor.

- b. **Clause no. 13.9:** The state utilities should go for vendor development program for manufacturers who want to develop manufacturing facility for high performance conductors for promoting complete indigenization of the product and its hardware.
- c. **Clause no. 13.11:** It is observed that even though some manufacturers have proper manufacturing & testing facility for making HPC and also got their product type tested from accredited labs are not able to participate in the bidding process due to lack of supply or relevant experience of in-service operation of High Performance Conductors thereby do not meet qualifying requirement specified by the utilities. In such a scenario only few manufacturers compete and utilities do not get the competitive price. The utilities should devise a mechanism to allow such experienced manufacturers to participate, without compromising their interest and quality of the product.

It is requested that all the utilities may follow the aforementioned guidelines in letter and spirit.

**Members may note for compliance.**

**ITEM NO. B.4: Reliable Power Supply to Lalmatia/Godda/Dumka areas of JUSNL**

**B4.1: Restoration of 220kV Farraka-Lalmatia S/C line**

The 220 kV Farakka-Lalmatia S/C was out of service since April 2021 due to tower collapse. The 220/132/33 kV Lalmatia substation is relying on only 132 kV lines. At present the local load at 220 kV Dumka and Godda S/S were being radially fed from 400/220 kV Maithon S/S through 220 kV Maithon-Dumka D/C and 220 kV Dumka-Godda D/C.

In 181<sup>st</sup> OCC Meeting, JUSNL representative submitted that they had got a letter from NTPC on 19<sup>th</sup> July '21 regarding anti-theft charging of the 220kV Farraka-Lalmatia S/C line at 33kV level. Earlier the antitheft charging of the line was done at 11kV level but incidents of thefts have been reported in some portion of the conductor.

Further, Jharkhand representative requested NTPC to submit the details of the 33kV lines passing below 220kV Farakka-Lalmatia T/L. He added that as per information obtained from their JUSNL Discom part, the 33kV lines are mostly connected with 11kV feeders and due to this it would be difficult to charge the Farakka-Lalmatia line at 33kV level in Pakur area.

NTPC representative informed that they had charged the line up to loc no.241 but in between loc no.76-82 only the top conductor was in charged condition and the bottom rest were not; because of this theft might have happened in that portion. He further added that they had already isolated the section from loc no.76-82, whereas up to loc no.76 the line is in charged condition and from loc no.82-241 the line needs to be charged.

ERPC advised NTPC and Jharkhand to explore the possibility of antitheft charging at 33kV level first and if that is not feasible then charging at 11kV can be assessed.

In the meeting held on 10<sup>th</sup> August 2021 by the Hon'ble Secretary, Ministry of Power, Government of India, ECL was directed to handover the FLTS assets on "as is where is basis" to

JUSNL, the Operation and Maintenance whereof as was with the NTPC is also to be transferred to the JUSNL without any further delay and latest by 20th August 2021. Further JUSNL was directed to comply with all other directions of the CERC's order dated 21.07.2020, after the transfer of the FLTS from ECL.

**JUSNL, ECL may update.**

#### **B4.2: Commissioning of 220kV Tenughat-Govindpur line**

In 179<sup>th</sup> OCC meeting, ERLDC representative stressed over the fact that commissioning of 220kV Tenughat-Govindpur line would increase the system reliability and the said line may be commissioned at the earliest.

In 181<sup>st</sup> OCC Meeting, Jharkhand representative submitted that as per the information received from Powergrid the line would be ready by July'21 end and it would take another 15 days for getting the necessary Statutory Clearance.

OCC advised Jharkhand to apply for the necessary Statutory Clearance in the meanwhile so that further delay can be avoided when the line gets ready. OCC advised Jharkhand to co-ordinate with Powergrid and get the said line ready by 15<sup>th</sup> August 21.

**JUSNL may update.**

#### **B4.3: Status of O & M agreement with Powergrid for bay equipments at Maithon end and resolution of autorecloser issues in the 220 kV Maithon-Dumka Lines**

In 103<sup>rd</sup> PCC meeting, during discussion of tripping of 220 kV Maithon-Dumka line-2 on 15/05/21, it was informed that the auto-recloser in the said line is not in operation due to some issues in PLCC. It was also come to notice that there was no formal agreement between JUSNL & Powergrid for O & M of the bay equipment at Maithon end. As a result, bay equipment at Maithon end for 220 kV Maithon-Dumka D/C lines are not being maintained properly.

In 181<sup>st</sup> OCC Meeting, Jharkhand representative submitted that some queries along with few finance observations had been raised to Powergrid in this regard. However, complete reply from Powergrid side is yet to be received and as soon as they receive the response from Powergrid, they would proceed for the agreement. However, in principle they are ready for the agreement.

ERPC opined that as Farakka-Lalmatia line is not in service at present, Maithon-Dumka line is of vital importance and healthiness of PLCC at both ends is to be ensured.

OCC advised Jharkhand to take up the necessary rectification work for ensuring the healthiness of the PLCC. In this regard, Powergrid has also given consent to Jharkhand for the necessary PLCC work at Maithon end.

Jharkhand representative assured that the PLCC would be restored by 15<sup>th</sup> August 21.

**JUSNL may update.**

## **ITEM NO. B.5: Outage of Important Transmission System.**

### **B5.1. 132kV Sagbari–Melli.**

Sikkim vide mail dated 09.06.2021 updated the following status:

- 1) In loc 82,83 & 84 we have low ground clearance which need hill cutting but if needed TL can be charged after putting temporarily barbed wire fencing .
- 2) In loc 98-99 a house had been constructed just below the line and warning had been issued to the owner for not to do vertical extension of the house till any such arrangement is made.
- 3) In loc 116 &117 land owner demanding for intermediate tower and not allowing for us to clear the jungles.
- 4) Loc 128 is in dilapidated condition due to sinking effect posing threat to lives and properties. Local public are asking to shift the tower in safe place before restoration of supply in the TL.
- 5) 80% of jungle clearance has been completed and remaining 20% is in Forest area most of it is under west district and waiting for permission from Forest department.
- 6) The delay in obtaining permission for following trees in forest land is that it cannot be ascertained whether FCA clearance during construction of TL was obtained as the record is not available either in power department or in DFO Office. Regarding this in the it had been told by ERPC that once obtaining environment clearance at the time of construction there need not to take permission for further clearance of ROW from Forest dept and this matter is been conveyed to the Forest department but they informed us as per Forest Act of Sikkim state permission has to be obtained for fresh felling with payment of compensation. File for approval is being send to conservator of Forest from DFO on 10/6/2021.

In the 181<sup>st</sup> OCC meeting, Sikkim representative submitted that for the rest 20% work, they are yet to get clearance from the Forest Department. He further informed that there are also some RoW issues in that portion of the line. Further, ERLDC representative stressed over the fact that being a very important line, the restoration of the 132kV Sagbari–Melli linemay be done at the earliest.

OCC advised Sikkim to take up the matter with Forest Department for obtaining necessary clearance and also to resolve the ROW issues without any further delay.

**Sikkim may update.**

### **B5.2. 220kV Pandiabili - Samangara D/C.**

220kV Pandiabili-Samangara D/C line tripped on 03-02-2019 during the event of Fani due to Tower collapse. 48 no towers got fully damaged and 12 no towers got partially damaged. Presently the line is charged from Pandiabili end up to location no 58. It is a very important line for supplying power to Puri area. The line is under outage more than 2 years.

**OPTCL may update the status.**

### **B5.3. 440/220kV 315 MVA ICT 2 at Meeramundali:**

400KV/220KV 315 MVA ICT 2 at Meeramandali tripped on 21-02-2021 due to fire hazard at Meeramundali SS. The ICT is under outage since then. Meeramundali S/S is serving the important load of the Odisha. Long outage of an ICT at such crucial S/S may hamper the reliability of the Grid.

**OPTCL may explain.**



**ITEM NO. B.6: Reliability of Power Supply to 132 kV Gangtok S/s.**

132 kV Gangtok has a Single Main transfer bus scheme. However this single bus scheme at such an important substation which is feeding state capital is resulting in various Operation, Maintenance and Reliability issues Like:-

- An outage of Single bus results in a complete outage of the Gangtok substation.
- The shutdown of the Main bus of Gangtok for maintenance purposes is denied by Sikkim on many occasions as it results in interruption of power supply to the capital, as a fact shutdown of Gangtok bus was not taken in last 4 years.

Thus for increasing reliability and operational flexibility following needs to be explored:

- Creation of one more bus at 132 kV Gangtok.
- Creation of Bus-sectionalizer at 132 kV level, in case the second bus is not possible.
- Creation of any new substation nearby where some load of Gangtok can be shifted.
- Maintaining healthiness of 66 kV Melli-URHP D/C line so that power to critical load can be supplied from Melli source in case of outage of Gangtok.

**Sikkim may explain.**

**ITEM NO. B.7: Reliability Issue at 220/132 kV Budhipadar S/s**

The reliability issue at Budhipadar was discussed during analysis of the grid disturbance at Budhipadar S/s on 08/04/2021 in 101st PCC meeting. The issue was also discussed in 178<sup>th</sup> OCC meeting held on 20/04/2021.

Subsequently in the special meeting held on 10/05/2021, the followings were decided:

- a. The opening of 220 kV Vedanta-Budhipadar lines from Vedanta would be decided based on the system study to be carried out by OPTCL.
- b. Further, SLDC Odisha will plan and submit a SPS for further contingency at Budhipadar and subsequent generation reduction at IB TPS units.
- c. OPTCL to take utmost measure in ensuring the healthiness of substation equipments at Budhipadar till the time the short term measures are being implemented.

Further, OPTCL vide letter dated 29/06/2021 have submitted the study report for intrastate constraints in Odisha system in Budhipadar command area.

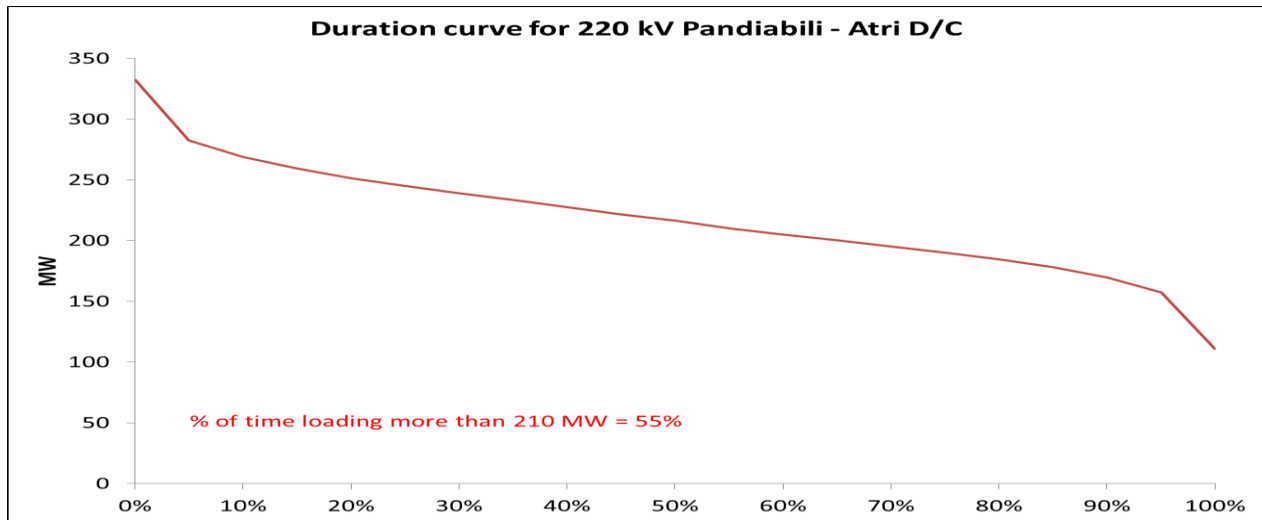
In line with the decision of 181<sup>st</sup> OCC Meeting, a special meeting was held on 04.08.2021 to discuss "Implementation of SPS at 220/132 kV Budhipadar S/s". The minutes of the meeting is attached at **Annexure-B7**.

**Member may discuss.**

**ITEM NO. B.8: High loading of 220 kV Pandiabili-Atri D/C line.**

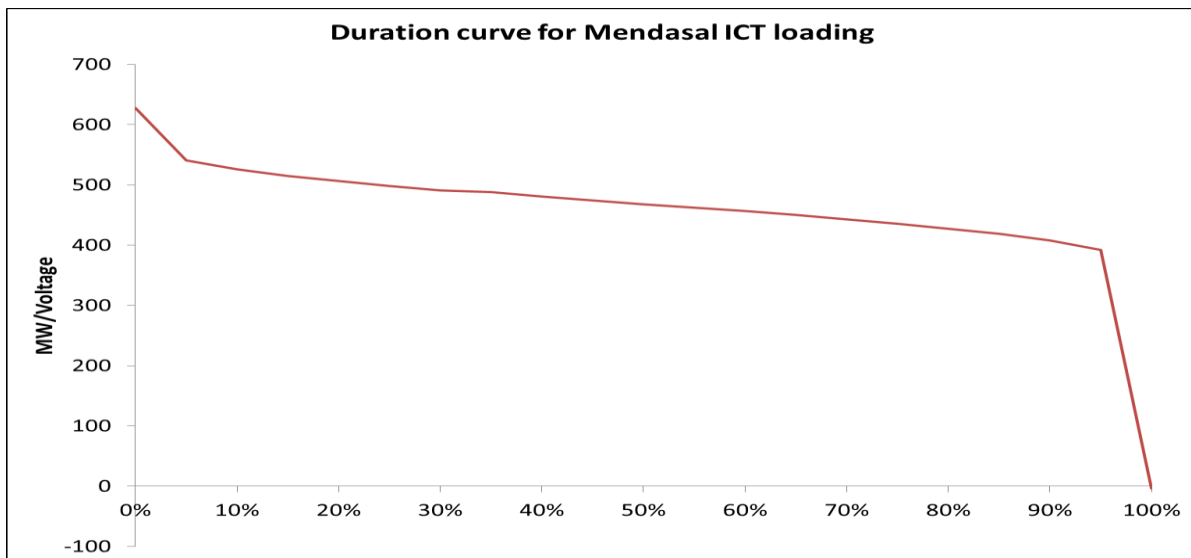
It has been observed that line loading limit of 220 kV Pandiabili-Atri D/C line remained high for considerable amount of time during July 2021. Line flow duration curve as captured in ERLDC SCADA data are shared below. Around 55% of time, power flow through both circuits is more than 210 MW. Same power flow pattern has been observed in previous months also.





As per study done at ERLDC, it has been found that tripping of one circuit will increase the loading of remaining circuit by 50%. Hence tripping or planned outage of one line may over load remaining circuit without any load restriction or load shifting to other source.

Loading of 400/220 kV ICT at Mendasal also increases after outage of one or both circuits of 220 kV Pandibili-Atri D/C and criteria for N-1 contingency may get violate for these ICTs as they were highly loaded most of the time. MW power flow through 400/220 kV ICTs at Mendasal during July 2021 as per ERLDC SCADA data is shown below.



In view of that, OPTCL/Odisha SLDC may share the following details:

- Plan of action to reduce the loading of 220 kV Pandibili-Atri D/C.
- Reason for delay in restoration of 220 kV Pandibili Samangara D/C which is under breakdown since May 2019. Restoration of 220 kV Pandibili Samangara D/C may reduce the loading of 220 kV Pandibili-Atri D/C.

**OPTCL may explain.**

**ITEM NO. B.9: Inadequate reactive power performance of generating units during the high voltage condition.**

**A. Performance of Regional Generators:**

During 180<sup>th</sup> ER OCC meeting, ERLDC highlighted the issue of inadequate reactive power absorption by generating units during the high voltage condition. Due to inadequate reactive power absorption by generating units, voltage at various 400 kV and 765 kV remained high. Same issue was highlighted during 181<sup>st</sup> OCC meeting also. As per ERLDC SCADA data, following regional generating units' (ISGS & IPP) reactive power absorption was inadequate during July 2021.

<b>Name of generating units</b>	<b>Maximum MVAR absorption limit (as per capability curve)</b>	<b>MVAR absorption during maximum voltage (as per ERLDC SCADA data)</b>	<b>Maximum voltage during July 2021</b>
Kahalgaon STPS Stage I - 210 MW Unit -1, 2, 3 & 4	> 60 MVAR	< 25-30 MVAR	424 kV
Kahalgaon STPS Stage II - 500 MW Unit – 6 & 7	> 150 MVAR	< 25 MVAR	424 kV
Barh STPS Stage II - 660 MW Unit -4& 5	> 200 MVAR	<160 MVAR (For significant amount of time MVAR absorption < 50 MVAR)	422 kV
BRBCL - 250 MW Unit -1, 2 & 3	> 100 MVAR	0 MVAR (Unit was generating 20-30 MVAR)	418 kV
Nabinagar STPP Stage I - 660 MW Unit -1	> 250 MVAR	<50 MVAR	425 kV
MPL - 525 MW Unit -1 & 2	> 150 MVAR	< 20 – 40 MVAR	413 kV
JITPL - 600 MW Unit -1 & 2	> 200 MVAR	0 MVAR (Unit was generating 100-130 MVAR)	411 kV

The details of the same is also attached at **Annexure-B9**

**In view of the above generating plant to share the following details:**

- Reason for not providing VAr absorption in line with capability curve.
- Action taken based on deliberation of 181<sup>st</sup> ER OCC meeting and ERLDC letter dated 05th July 2021. Except Barh stage II units, improvement has not been observed at any units. MVAR absorption by Barh units is very less (<50 MVAR) when MW generation is more than 600 MW.

**Generators may update.**

**ITEM NO. B.10: Healthiness of 89T isolator of ICT-V at Malda**

On 13.03.21 400/220kV 315MVA ICT#5 at Malda required emergency outage (hand tripped), as 400kV side CB lockout occurred. POWERGRID informed via mail that 315 MVA ICT - V cannot be charged through 400 kV TBC because, it was observed that B-ph 89 T PG Isolator spring has broken and is not operational, which compelled for forced manual tripping of ICT-5. On 14.03.2021 early morning, during emergency restoration of ICT-5 through 400kV TBC bay, some shorting arrangement at 89T isolator of ICT-5 was made to restore ICT-5 through TBC.

On 19.04.2021 at 13:15 hrs, 315MVA, 400/220kV ICT- V at Malda has been Emergency hand tripped due to sudden flash over at 89T isolator. ICT -V was restored through Main Bay.

In the 179<sup>th</sup> OCC meeting, Powergrid representative informed that problem in 89T isolator still persists, and for that they have already applied shutdown for normalization from TBC bay to Main Bay after isolating the faulty isolator.

Powergrid representative further added that as 89T is a line side Isolator, any maintenance of it would require shutdown of ICT 5. Upon query he mentioned that all the other isolators and breakers of the TBC have been replaced and there is no issue related to the operation. But the said bay isolator has problem due to ageing problem and it was planned to be replaced during the ICT augmentation work. However, Powergrid has planned for phase wise replacement of 89T and 89 M2 under O&M activity which will be done on daily basis shutdown and it would require 7-8 days in order to get the work done.

OCC advised Powergrid to submit the detailed replacement plan to ERPC/ERLDC for further action.

In the 180<sup>th</sup> OCC meeting, Powergrid representative informed that they had already given the schedule for shutdown details and the same has already been approved. He further added that the work is expected to be completed by July 2021 subject to weather conditions.

In the 181<sup>st</sup> OCC meeting, Powergrid representative submitted that they need shutdown from 24<sup>th</sup> July to 25<sup>th</sup> July'21 on continuous basis, as it involves complete equipment replacement.

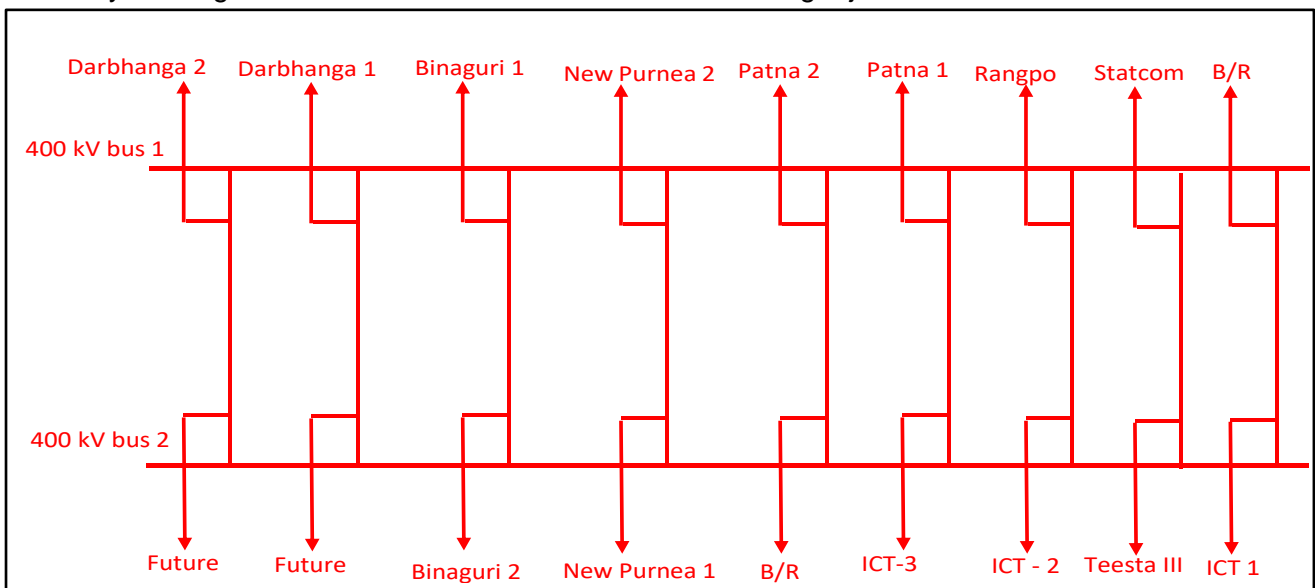
West Bengal representative informed that they had already given their consent for the shutdown.

Powergrid representative further assured that the work would be completed by 25<sup>th</sup> July'21 (Evening).

**Powergrid may update.**

**ITEM NO. B.11: Problem faced during bus shutdown at 400 kV section of 400/220 kV Kishanganj S/s.**

Switchyard diagram of 400 kV section of 400/220 kV Kishanganj Substation is shown below:



In the diagram, it can be seen that, although the 400 kV system of 400/220kV Kishanganj S/S has a one & half breaker scheme. However, 400kV Binaguri1 & 2 are in same dia. Similarly New Purnea 1 & 2 feeders are in same dia. As a result, forced and planned outage of both bus 1 & 2 will result outage of 400 kV New Purnea – Kishanganj D/C and 400kV Kishanganj – Binaguri D/C which plays important role to evacuate hydro power. If say one circuit of Binaguri & New\_Purnea would have been in same dia, the link of 400kV-Binaguri-Kishanganj-New\_Purnea link could have been survived through tie even in case of outage of double bus.

Possibility of swapping of Binaguri 1 and adjacent New Purnea 2 feeders may be explored. Under the double bus outage at Kishanganj, New Purnea – Kishanganj – Binaguri D/C will be available through tie breaker.

**Powergrid may explain.**

#### **ITEM NO. B.12: Ensuring adequacy of reserves in Indian Electricity Grid**

During first week of August 2021, all India demand and energy met increased from 172 GW (2<sup>nd</sup> Aug) to 187 GW (7<sup>th</sup> Aug), Energy met during that period also increased from 3850 MU to 4239 MU. During that period significant reduction in was also there.

However it was observed that frequency remained much below IEGC band especially during the evening hours (18:00 to 24:00 Hrs) due to inadequate commitment of units at ISGS and Intra State level and persistent overdraw from grid by some utilities. A copy of letter in this regard from NLDC is attached as **Annexure-B12**.

In view of above all SLDCs are requested to ensure good forecast of their state control area demand and ensure availability of resources to meet their requirements in all time periods. The requisite reserves to meet uncertainties be also kept while committing the resources. Thus unit commitment should take care of spinning reserve requirement also.

**Members may discuss.**

#### **ITEM NO. B.13: Inadequate ADMS Response during Low Frequency Event on 16<sup>th</sup> August 2021**

Frequency of All India grid touched below 49.7 Hz on 16th August 2021 twice in the evening peak. ADMS (Automatic Demand Management System) is installed in various states to shed the load during the low frequency & over drawal condition as a temporary relief mechanism to improve the frequency. ERLDC proposed the ADMS logic for different states of Eastern region is as follows:

*If frequency is less than 49.9 Hz for 3 minutes and Overdrawal/Under injection > 150 MW or 12 %*

ADMS of DVC & Jharkhand is under operational as per revised ERLDC logic and Bihar, Sikkim & Odisha have yet not implemented any ADMS. West Bengal implemented as per previous logic and the revised logic is yet to be implemented.

As per last healthiness status of ADMS, the demand relief logic is as mentioned below:

- WB is having total 225 Mw of load relief via ADMS if frequency below 49.7Hz and UI>150 MW.

- DVC is having total 281 Mw of load relief via ADMS if frequency is less than 49.9 Hz for 3 minutes and UI > 150 MW or 12 %.
- Jharkhand is having total 90 Mw of load relief via ADMS if frequency below 49.9Hz for 3 minutes and UI more than 75MW.

As per SCADA data of WB, condition for triggering ADMS was satisfied in both the low frequency event. However, no significant reduction observed via ADMS in demand. In case of DVC, the triggering condition was satisfied only for the second event. However, the response is not significant. Jharkhand satisfied the ADMS condition in the 1<sup>st</sup> event (between 18:24 to 18:30hrs.) but no significant relief observed via ADMS. The Demand curve of Jharkhand, DVC & West Bengal and UI vs Frequency plot is attached at **Annexure-B13**.

West Bengal, DVC and Jharkhand are requested to update ADMS triggered on the day and quantum of load reduction obtained in the following format:

Sl No	Date & Time	Constituent O/D	Frequency(Hz)	ADMS Optd (Y/N)	Total Relief (MW)	Total Qtm. Already Under Shedding prior to the event (in MW)

Bihar, Odisha & Sikkim are requested to update the ADMS implementation status. West Bengal is requested to update the logic change status, healthiness of the same. DVC & Jharkhand is requested to update the healthiness of the ADMS.

**Members may update.**

**ITEM NO. B.14: Review of Identified feeders for disconnecting load of States during extreme events**

In accordance with IEGC sections 5.4.2- (c), (d) and (f), feeders for disconnecting demand of every state in the order of their priority for switching off, were identified in the past vide 144<sup>th</sup> OCC meeting. However, with growth of network interconnection and load as well as change of load distribution (if any) during the intervening period, it is felt that the list needs reviewing. Also the existing list has ear marked only one of double ckt to be opened thereby allowing no scope for physical demand disconnection.

Post relaxations in COVID related lockdown restrictions & gradual opening of socio-economic sectors across India the growth the energy demand has escalated to record levels. This in consonance with heat waves in Northern India, intermittent monsoonal spell, subsequent rise in humidity & agricultural cycle which has pushed pan India demand beyond 200 GW in the month of July. Max demand in terms of MW has reached highest levels for Odisha, Bihar. At this juncture it has been observed that excursions in all India frequency have remained on lower side for considerable amount of time. Overdrawal by the utilities during such low frequency operation makes the system extremely vulnerable.

Such critical condition witnessed at 18.58 hrs of 16/08/2021 when frequency touched 49.60 Hz with major overdraw /under injection from some ER constituents. Erring states were unable to minimize deviation in spite of repeated reminder and messages from ERLDC control room. Consequently, ERLDC was compelled to take physical regulatory measure by opening tie-line.

But existing list of pre identified feeders does not give any load relief and there is no reduction in deviation of erring constituents. It is the need of the hour to revisit the 2014 Hon'ble CERC order on Grid Disturbance which clearly states that –

*“Each entity is obligated to follow instructions of RLDC in real-time immediately even if it results in possible commercial loss.....Protracted discussion during real- time operation is dangerous for security of the grid.”(Para 64).*

Considering the gravity of situation and to restrict major deviation it is suggested for reviewing the feeder disconnection list. All constituents are requested to furnish views regarding their respective identified feeders and indicate the expected load (average and peak) that would be disconnected by switching off the feeders, so that the list can be finalized at the earliest.

List of existing identified transmission elements (**Annexure-B14.1**). A list of identified transmission elements have been identified for physical disconnections to ensure sufficient load relief (**Annexure-14.2**).

**Members may discuss/review.**

**PART C: ITEMS FOR UPDATE**

**ITEM NO. C.1: ER Grid performance during July 2021**

The average and maximum consumption of Eastern Region and Max/Min Demand (MW), Energy Export for the month July-2021 were as follows:

Average Consumption (MU)	Maximum Consumption (MU)/ Date	Maximum Demand (MW) Date/Time	Minimum Demand(MW) Date/Time	Schedule Export (MU)	Actual Export (MU)
494	542 16-07-2021	24733 MW, 16-07-2021 23:31 Hrs.	15079MW, 31-07-2021 06:47 Hrs.	3219	3323

**ERLDC may present performance of Eastern Regional Grid.**

**ITEM NO. C.2: Performance of Primary frequency response of ER generating units**

**C2.1.** Frequency response characteristics (FRC) have been analyzed pan India for one event of sudden frequency change that occurred in July 2021. The details of this event and the overall response of the Eastern region have been summarized in following table.

Event	Frequency Change	ER FRC
<b>Event 1: On 20<sup>th</sup> July 2021 at 10:25:02 Hrs, 1550 MW generation loss at Akal in NR.</b>	<b>50.07 Hz to 49.93 Hz.</b> Later stabilized at 50.03 Hz.	<b>45 %</b>
<b>Event 2: On 22<sup>nd</sup> July 2021 at 15:08:16 Hrs, 1400 MW generation loss at UPCL in SR</b>	<b>49.99 Hz to 49.86 Hz.</b> Later stabilized at 49.94Hz.	<b>39 %</b>

Summary of the response of regional generating stations/SLDCs are given in following table.

Generating Station/ SLDC	Event 1	Event 2
NTPC Farakka	<b>Satisfactory for unit 3, 5 &amp; 6. Non satisfactory for unit 2 &amp; 4.</b> Unit 1 was not in service. Response from unit 2 & 3 started to decrease after initial response.	<b>Satisfactory for unit 3, 4 &amp; 6. Non satisfactory for unit 5. No response has been observed for unit 2.</b> Unit 1 was not in service. Response from all units did not sustain for longer period.
NTPC Kahalgaon	<b>Non satisfactory for stage 1; Satisfactory for stage 2</b> (As per FRC calculated based on ERLDC SCADA data)	<b>Satisfactory</b> (As per FRC calculated based on ERLDC SCADA data)
NTPC Talcher	<b>Non satisfactory for unit 1, 2 &amp; 4. Satisfactory for unit 5 &amp; 6.</b> But response was sluggish and time taken to provide full response was very high. Unit 3 was not in service.	<b>Non satisfactory for unit 1. Satisfactory for unit 4, 5 &amp; 6.</b> Unit 2 & 3 was not in service.
NTPC Barh	<b>Non satisfactory.</b> For unit 5, response started to decrease after initial response.	<b>Non satisfactory.</b> Response did not sustain for longer time.
NTPC Darlipalli	<b>Non satisfactory</b> response observed. Response did not sustain for more than 10 seconds.	<b>Non satisfactory</b> response observed. Response did not sustain for more than 10 seconds.
BRBCL	<b>Satisfactory;</b> Unit 1 & 3 were not in service.	<b>Non Satisfactory</b> for unit 2. Satisfactory for unit 1. Unit 3 was not in service



Generating Station/ SLDC	Event 1	Event 2
NPGC Nabinagar	<b>Non-Satisfactory</b> , response did not sustain for more than 2 min. Another response observed after 4 min	<b>Non-Satisfactory</b> , response did not sustain for more than 2 min.
GMR	<b>Non-Satisfactory</b> (As per FRC calculated based on ERLDC SCADA data)	<b>Satisfactory for unit 1, Non satisfactory for unit 2</b>
JITPL	<b>Non-Satisfactory</b>	<b>Non-Satisfactory</b>
MPL	<b>Satisfactory</b> ; But time taken to provide full response may be reduced.	<b>Non satisfactory for unit 1.</b> RGMO for unit 2 was not in service due to minimum load trial.
Adhunik	<b>Non satisfactory for unit 2</b> ; Unit 1 was being revived.	<b>Satisfactory for unit 2</b> ; Unit 1 was under PFR testing.
Teesta V HEP	<b>No response for unit 3. Satisfactory response for unit 1 &amp; 2.</b> Time taken to provide response may be reduced.	<b>Non satisfactory</b>
Teesta III HEP	<b>Satisfactory for Unit 3.</b> Unit 2, 5 and 6 did not have margin for primary frequency response. Unit 1 was not in service and unit 4 was being ramped up.	<b>Satisfactory for Unit 3.</b> Other units did not have any margin for PFR response.
Dikchu HEP	No margin was available for PFR due to water spillage condition	No margin was available for PFR due to water spillage condition
Bihar SLDC	<b>Non-Satisfactory</b> (As per FRC calculated based on ERLDC SCADA data)	<b>Non-Satisfactory</b> (As per FRC calculated based on ERLDC SCADA data)
Jharkhand SLDC	<b>Non-Satisfactory</b> (As per FRC calculated based on ERLDC SCADA data)	<b>Non-Satisfactory</b> (As per FRC calculated based on ERLDC SCADA data)
DVC SLDC	<b>Satisfactory</b>	<b>Satisfactory</b>
GRIDCO SLDC	<b>Non-Satisfactory</b>	<b>Non-Satisfactory</b>
WB SLDC	<b>Non-Satisfactory</b> (As per FRC calculated based on ERLDC SCADA data)	<b>Non-Satisfactory</b> (As per FRC calculated based on ERLDC SCADA data)

Reason for non-satisfactory response may be explained. Detailed analysis is attached at **Annexure-C2**.

**Generator end data/FRC is yet to be received from following generating stations/SLDCs:**

Generating Station/ SLDC	Event 1	Event 2
NTPC Kahalgaon	<b>Yet to be received</b>	<b>Yet to be received</b>
GMR	<b>Yet to be received</b>	Data received
Bihar SLDC	<b>Yet to be received</b>	<b>Yet to be received</b>
Jharkhand SLDC	<b>Yet to be received</b>	<b>Yet to be received</b>
WB SLDC	<b>Yet to be received</b>	<b>Yet to be received</b>

**Generators may respond.**

**C2.2.** To review the performance of primary frequency response of state generating units and frequency response characteristics of state control area for various frequency events, a meeting is being called by ERLDC on 31-08-2021 at 10:30 hrs. During this meeting, the following agenda points will be discussed:

- Status of action taken by SLDC/state generating stations for conducting primary frequency response (PFR) testing at state generating station in line with IEGC section 5.2(h).
- Action taken by state generating stations based on the recommendation given in the meetings held on 31-08-2020
- Performance of generating units during the events shown in following table:

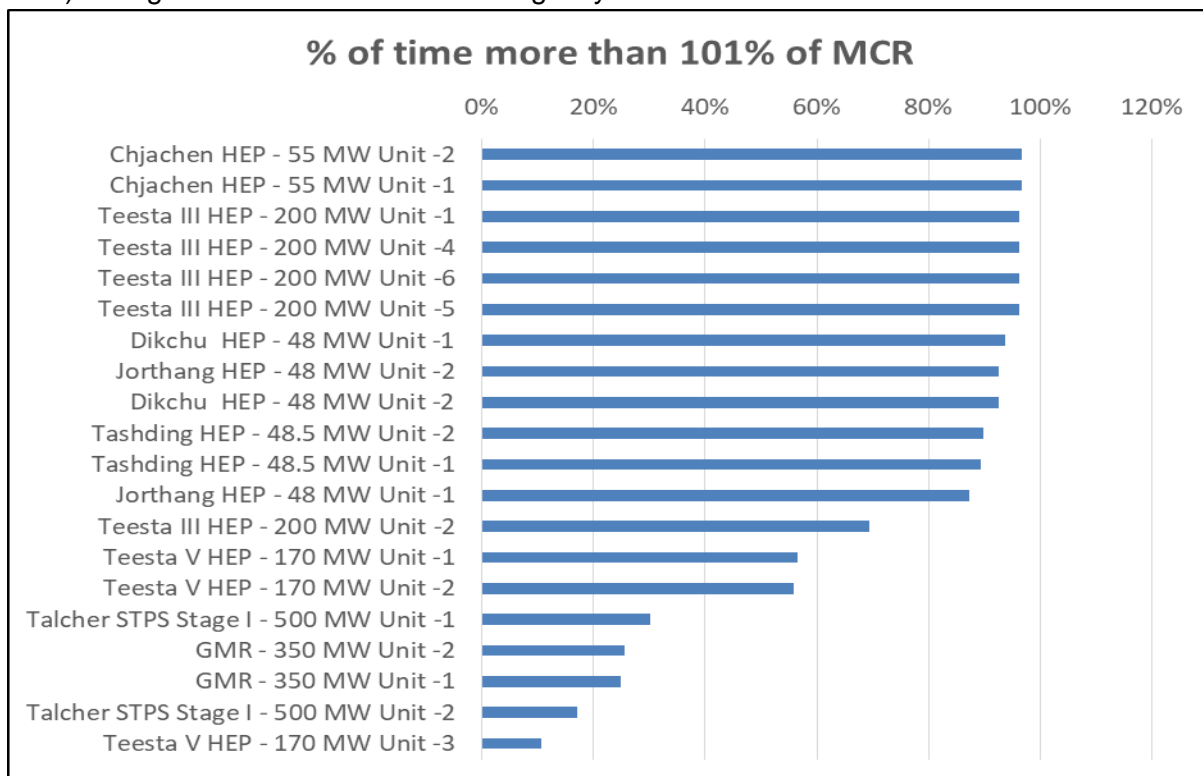
Event No	Date and Time	Change in Frequency
1	19-02-2021 at 15:26:52 Hrs	<b>49.985 Hz to 49.854 Hz.</b> Later stabilized at 49.938 Hz
2	10-03-2021 at 19:35:34 Hrs	<b>50.01 Hz to 49.87 Hz.</b> Later stabilized at 49.94 Hz
3	24-03-2021 at 12:16:19 Hrs	<b>50.022 Hz to 49.856 Hz.</b> Later stabilized at 49.907 Hz
4	11-06-2021 at 16:02:42 Hrs	<b>50.09 Hz to 49.92 Hz.</b> Later stabilized at 50.00 Hz.
5	20-07-2021 at 10:25:02 Hrs	<b>50.07 Hz to 49.93 Hz.</b> Later stabilized at 50.03 Hz.
6	22-07-2021 at 15:08:16 Hrs	<b>49.99 Hz to 49.86 Hz.</b> Later stabilized at 49.94Hz.

- All the SLDCs are requested to prepare a presentation along with responses provided by generating units under their control area during the events mentioned in the above table. Unit-wise response for all units and comparison with the ideal response of each generating stations should be shown in presentation. In case of non-performance, generating units should provide adequate reasons for not achieving the required response in line with regulatory provision.

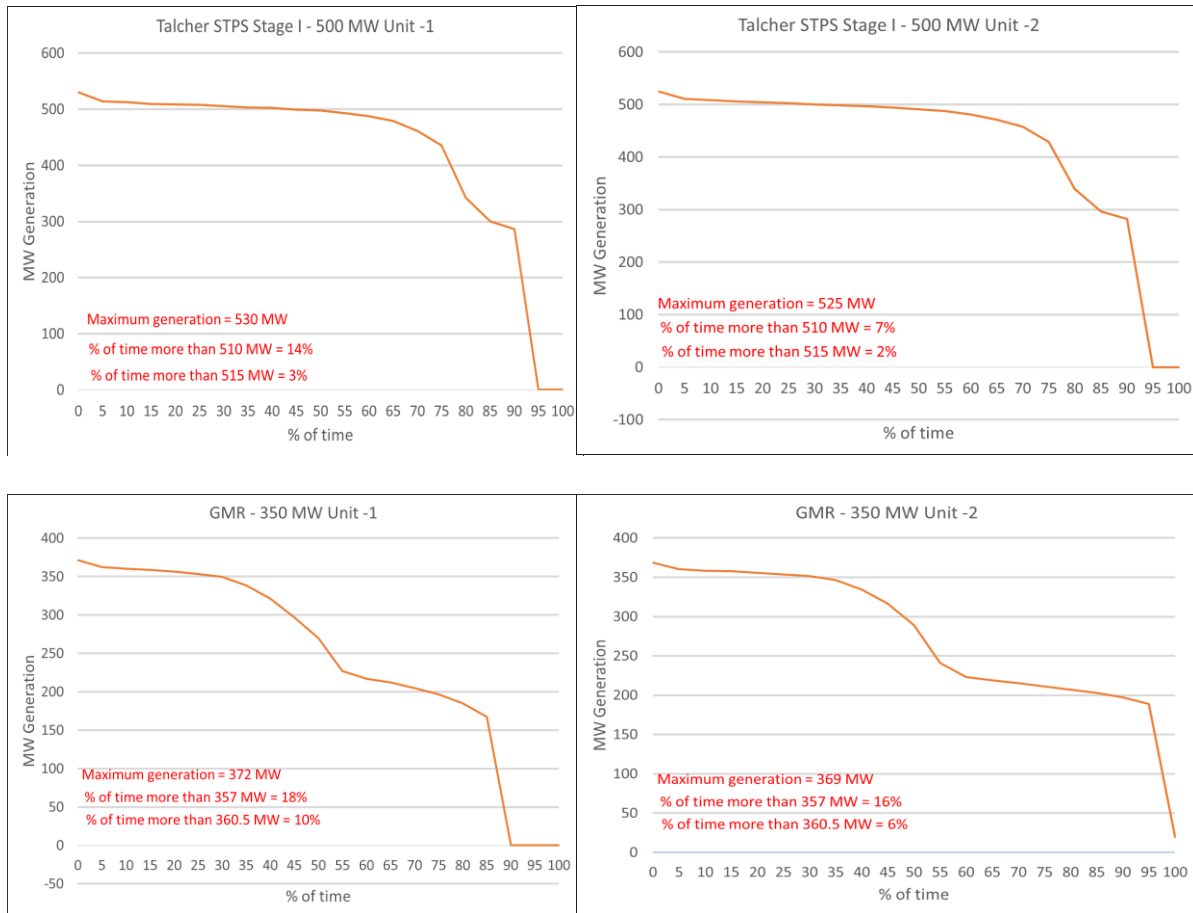
**Members may note.**

**ITEM NO. C.3: Running Generating units at more than MCR**

During 180<sup>th</sup> OCC meeting of ERPC, ERLDC highlighted the issue of over injection by generating units at more than MCR. Due to running unit at more than MCR, margin for primary frequency response gets exhausted and machine cannot provide sufficient primary frequency response during the event of sudden frequency change. Same issue was highlighted during 181<sup>st</sup> OCC meeting also. As per ERLDC SCADA data, following regional generating units (ISGS & IPP) generated at more than 101% of MCR (1% margin is considered to offset SCADA measurement error) for significant amount of time during July 2021.



It has been observed that GMR TPS Unit 1 & 2 and Talcher STPS Unit 1 & 2 generated more than 101% for more than 15% of time. Generation duration curve for above mentioned generating stations as per ERLDC SCADA data are shown below:

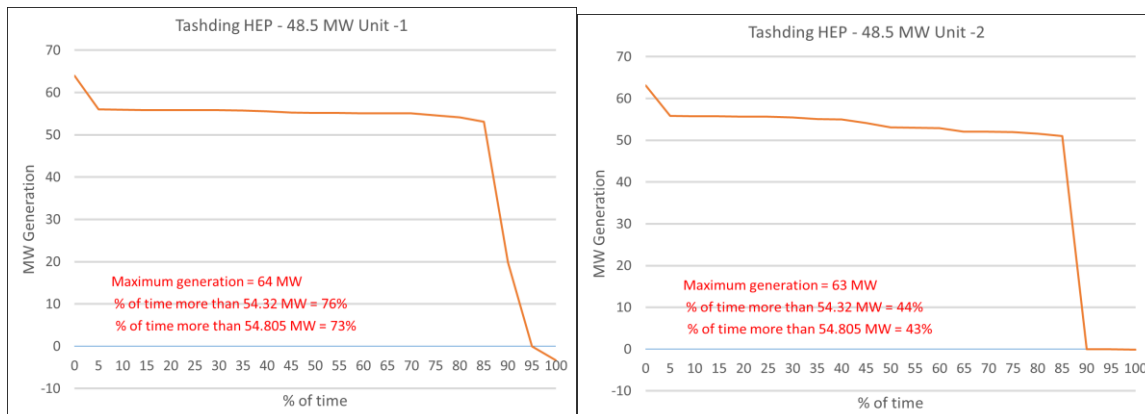


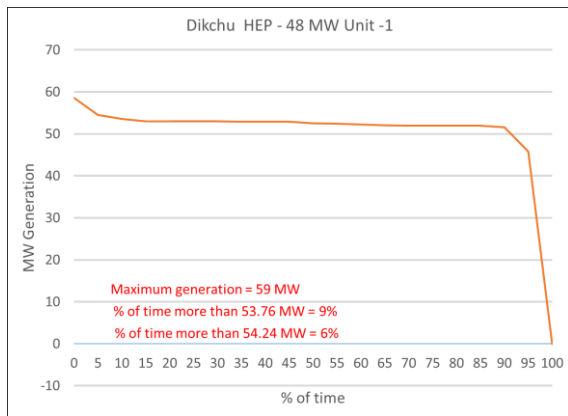
**Talcher STPS and GMR TPS may share the reason for over injection.**

**ITEM NO. C.4: Running of Hydro Generating units at more than 110% of MCR**

During July 2021, Tashding Hydro generating unit 1 & 2, Dikchu Hydro generating unit 1 generated more than 110% of MCR for more than 10% of time. In view of the safety of the machine, generation may be restricted to 110% of MCR.

Generation duration curve of above mentioned generating units are shown below:





**Tashinging HEP and Dikchu HEP may explain.**

**ITEM NO. C.5: Review of implementation of PSDF approved projects of ER.**

In 10<sup>th</sup> NPC meeting held on 09.04.2021, RPCs were advised take up the matter for improvement of the fund disbursement and expeditious implementation of the sanctioned projects under PSDF.

In view of the above, status review of the projects being executed under PSDF funding in Eastern Region would be carried out on regular basis for expediting the projects. All the constituents are requested to furnish/update the status of their respective project in every month.

Concerned utilities may update the present status of the project as given in the **Annexure-C5**.

**Members may update.**

**ITEM NO. C.6: Status of implementation of AGC as a pilot project in States.**

In 42<sup>nd</sup> TCC, DVC intimated that AGC shall be implemented in unit 7 and 8 of Mejia as per the given schedule by 31st July 2020.

WBPDCCL informed that they have already collected offer from Siemens for implementation of AGC and they are awaiting the concurrence from SLDC.

SLDC, WB informed that they are not in a position to implement AGC unless a clear direction is given by WBERC. Further, implementation of intra state DSM is a prerequisite for implementation of AGC in the states.

It was decided to request CERC to include this as an issue in the Agenda for discussion in the meeting of Forum of Regulators.

In 169<sup>th</sup> OCC Meeting, SLDC DVC informed that due to COVID-19 pandemic, participation in the tender was very less therefore they are floating a new tender for implementation of AGC. AGC would be implemented by Feb 2021.

Odisha informed that they could not visit Barh NTPC and NLDC due to ongoing COVID 19 pandemic situation.

OCC advised SLDC Odisha and OPGC to interact with Barh NTPC & ERLDC to get the technical

specifications & the procedure for implementation of AGC.

**Latest Status:**

State	Station/Unit	Deliberation in 181 <sup>st</sup> OCC Meeting
DVC	Mejia unit#7 &8	DVC representative informed that the technical offers from vendors have been received. Expected date of placing Indent is 28th July 21 and that of PO is by 30 <sup>th</sup> Sept '21.
West Bengal	Unit-5 of Bakreswar TPP	OCC referred it to next TCC meeting.
Odisha	Unit#3 of OPGC	OPGC representative submitted that they had communicated with M/s Siemens and the budgetary offer has already been received but discussion with SLDC is yet to be done. OCC advised OPGC to coordinate for a meeting with Siemens and SLDC Odisha to discuss the matter and also advised them to share the outcome of the meeting to ERPC & ERLDC by 31 <sup>st</sup> July 21.

**Members may update.**

**ITEM NO. C.7: Primary Frequency Response Testing of ISGS Generating Units**

In the 180<sup>th</sup> OCC meeting, ERLDC representative informed that as per communication received from GMR and JITPL PFR testing has been scheduled by Siemens in August'21.

MPL representative submitted that they would carry out the PFR testing in the month of July'21.

In the 181<sup>st</sup> OCC meeting, ERLDC representative informed that PFR testing of MPL got postponed due to some technical issue. He further informed that PFR testing is going on in APNRL and that of NPGC and BRBCL is scheduled in the last week of July'21 and 1<sup>st</sup> week of August'21 respectively.

The status of the testing schedule for the generators is enclosed at **Annexure-C7**.

**Members may update.**

**ITEM NO. C.8: Testing of Primary Frequency Response of State Generating units by third party agency.**

In the 171<sup>st</sup> OCC Meeting, OCC advised all the SLDC's to prepare the action plan for their state generators and submit the details to ERPC and ERLDC at the earliest.

DVC vide-mail dated 6<sup>th</sup> Oct 2020 informed that the Primary Frequency Response Testing may be carried out for the following generating units:

Sl. No.	Name of the Units	Capacity (MW)
1	BTPS-A	500
2	CTPS Unit #7&8	2X250
3	DSTPS Unit#1&2	2X500

4	KTPS Unit # 1&2	2X500
5	MTPS Unit # 3 to 8	2 X 210 +2 X 250 + 2X 500
6	RTPS Unit # 1 & 2	2 X 600

DVC informed that both the agencies M/s Siemens & M/s Solvina have agreed to carry out the testing at pre-agreed rates, terms & conditions.

In the 176<sup>th</sup> OCC meeting, OPGC informed that they would finalize the order with Siemens by end of Feb'2021. SLDC, DVC informed that indent has been placed for PFR testing of their generating units. On request from WBPDC, OCC advised ERLDC to share all relevant documents related to selection of the vendor for PFR Testing along with contact details of the vendors to West Bengal SLDC for further sharing by them with their state generators.

In 177<sup>th</sup> OCC Meeting, SLDC, Bihar informed that PFR testing for Barauni TPS would be completed by April '2021. OHPC informed that PFR testing is being planned to be carried out for units of Indravati & Rengali. OCC advised OHPC to submit a schedule for testing to ERLDC/ERPC secretariat.

OCC advised SLDC DVC, SLDC West Bengal & SLDC Jharkhand to coordinate with their generators and submit the schedule of PFR testing.

In the 178<sup>th</sup> OCC meeting, WBPDC informed that they have received some of the relevant documents from SLDC West Bengal. Further they informed that they are collecting some other information to finalize the scope and purchase order for PFR testing.

DVC informed that the indent has been placed for PFR testing of generating units and the order would be placed tentatively in October'21.

In the 179<sup>th</sup> OCC meeting, WBPDC submitted that they are in contact with Siemens in this regard and once they get any update, they would intimate the same in the next OCC meeting.

In the 180<sup>th</sup> OCC meeting, WBPDC representative submitted that they are consulting with DVC Mejia and NTPC Farakka regarding this and informed that they would share the further update to ERPC and ERLDC.

SLDC Jharkhand representative informed that they had communicated with Tenughat, but yet to get any update from them.

DVC representative informed that they had already placed the indent in the month of April'21. OCC advised DVC to give the update to ERPC and ERLDC.

OHPC representative submitted that PFR testing has been proposed for Rengali and Upper Indravati Stage-I. Accordingly, they have contacted M/s Solvina and are in process of placing order to them. He further informed that the work is expected to be completed by July'21.

In the 181<sup>st</sup> OCC meeting, WBPDC representative submitted that they had received budgetary offer from M/s Siemens and M/s Solvina. Subsequently they had raised some queries to M/s Solvina in this regard. After getting the response they would be in a position to place the order.

SLDC, Jharkhand representative submitted that no update has been received from Tenughat. OCC advised SLDC, Jharkhand to collect the necessary details and intimate ERPC and ERLDC

at the earliest.

DVC representative submitted they would update the details by 22<sup>nd</sup> July'21.

OHPC representative informed that response of some financial queries is yet to be received from Solvina and after getting the response they would place the order by August'21.

**Members may update.**

**ITEM NO. C.9: PSS tuning of Generators in Eastern Region.**

The PSS tuning activity is mandatory in line with IEGC and CEA regulations. The Procedure of PSS tuning for helping utilities in getting this activity carried out has been approved in 171<sup>st</sup> OCC Meeting and shared with all concerned utilities.

In 177<sup>th</sup> OCC Meeting, DVC informed that PSS tuning of Unit#1 of Bokaro-A TPS had been completed.

WBSEDCL stated that the status of PSS tuning in PPSP units would be submitted shortly.

In the 178<sup>th</sup> OCC meeting, ERLDC informed that PSS tuning for APNRL units were carried out however it was not successful due to some technical issue at APNRL end. It was informed that PSS tuning of Unit#4 of Mejia TPS of DVC had been completed on 07.04.2021.

In the 179<sup>th</sup> OCC meeting, on query ERLDC submitted that they are yet to receive update from APNRL and JITPL.

In the 180<sup>th</sup> OCC meeting, ERLDC submitted that they are yet to receive any update from APNRL and JITPL.

In the 181<sup>st</sup> OCC meeting, APNRL representative submitted that they had gone for PSS tuning but it was not successful. He further informed that they are again planning to go for PSS tuning in August'21.

ERLDC representative submitted that they are yet to receive any update from JITPL.

The updated schedule for PSS tuning of the units is attached at **Annexure-C9**.

**Members may update.**

**ITEM NO. C.10: Status of UFRs healthiness installed in Eastern Region.**

UFRs healthiness status has been received from West Bengal, Jharkhand.

**Members may update.**



**ITEM NO. C.11: Status of Islanding Schemes healthiness installed in Eastern Region.**

As per the decision taken in the meeting held on 8<sup>th</sup> July 2021 and chaired by member (GO&D), CEA, data in prescribed formats may be submitted by concerned utilities to RPCs on monthly basis to certify the healthiness of the Islanding Schemes.

**a. Format - I for RLDC/SLDCs**

S.NO	Name of Islanding Scheme	Healthiness of Communication channel

**b. Format - II for Generating Station**

S.NO	Name of Islanding Scheme	Healthiness of Islanding Relay	Healthiness of Communication channel

**c. Format - III for Transmission Utility/ DISCOMs**

S.NO	Name of Islanding Scheme	Elements considered for tripping to from Island	For communication based tripping logic of feeders	For UFR based tripping logic of feeders	
			Healthiness of Communication channel	Healthiness of PT Fuse and status of DC supply to UFR relay*	Healthiness of Relay#

\* Where dedicated UFR relay have been installed for tripping of the feeders under islanding scheme.

# Where UFR function have been enabled within backup protection relay of the line.

**d. Format - IV for collecting Relay details of the Islanding scheme.**

The following format may be used to get Relay details of the Islanding scheme:

S.NO	Description	UFRs-for load relief (A)	df/dt -for load relief (B)	Relay for Island creation(C)
1	Relay location (S/s name)			
2	Relay make & model			
3	Frequency setting of the relay (at which load shedding is			

	envisaged)			
4	Feeder name (voltage level and source-destination name) signaled by the Islanding Relay for separation /load shedding/separation from outside grid			
5	Quantum of load relief due to tripping of feeder (as per state's peak of previous year)			
6	Quantum of load (Min, Avg, Max in MW) on the feeder (as per state's peak of previous year)			

**e. Format - V for Contact details of all Nodal Officers**

Utility Name & Location	Name	Designation	Organization	Email ID	Mobile No.

Members may update.

**ITEM NO. C.12: Transfer capability determination by the states.**

**Latest status of State ATC/TTC declared by states during the month of Nov-2021**

Sl No	State/Utility	TTC (MW)		RM(MW)		ATC Import (MW)		Remark
		Import	Export	Import	Export	Import	Export	
1	BSPTCL	6400	--	128	--	6278	--	Aug-21
2	JUSNL	1525	--	38	--	1487	--	Nov-21
3	DVC	1458	2838	61	48	1397	2790	Oct-21
4	OPTCL	2372	1059	88	62	2284	997	Sep-21
5	WBSETCL	5490	--	400	--	5090	--	Aug-21
6	Sikkim	189	--	2.6	--	186.4	--	Nov-21

**Declaration of TTC/ATC on SLDC Website:**

Sl. No	SLDC	Declared on Website	Website Link	Constraint Available on Website	Type of Website Link
1	BSPTCL	Yes	<a href="http://www.bsptcl.in/ViewATCTTCWeb.aspx?GL=12&amp;PL=10">http://www.bsptcl.in/ViewATCTTCWeb.aspx?GL=12&amp;PL=10</a>	Yes	Static Link-Table
2	JUSNL	Yes	<a href="http://www.jusnl.in/pdf/download/ttc_atc_nov_20_20.pdf">http://www.jusnl.in/pdf/download/ttc_atc_nov_20_20.pdf</a>	Yes	Static link –pdf file
3	DVC	Yes	<a href="https://application.dvc.gov.in/CLD/atcttmenu.jsp#">https://application.dvc.gov.in/CLD/atcttmenu.jsp#</a>	Yes	Static Link-Word file
4	OPTCL	Yes	<a href="https://www.sldcorissa.org.in/TTC_ATC.aspx">https://www.sldcorissa.org.in/TTC_ATC.aspx</a>	Yes	Static Link-pdf file
5	WBSETCL	Yes	<a href="http://www.wbsldc.in/atc-ttc">http://www.wbsldc.in/atc-ttc</a>	No (Not updating)	Static Link-Table
6	Sikkim	No	<a href="https://power.sikkim.gov.in/atc-and-ttc">https://power.sikkim.gov.in/atc-and-ttc</a>	No (Not updating)	Static Link-Excel file

It is necessary to highlight that the ATC/TTC declaration on website need to be updated in timely manner. It is suggested that along with PDF copies, a tabular format may also kindly be provided so that it can be utilized for preparing ERLDC portal on State ATC/TTC.

In addition, ATC/TTC may be declared three months in advance and periodically reviewed based on any shutdown causing leading to any constraint.

**Members may update.**

**ITEM NO. C.13: Mock Black start exercises in Eastern Region**

Mock black start date for financial year 2021-22 is as follows:

Sl. No	Name of Hydro Station	Schedule	Tentative Date	Schedule	Tentative Date
		Test-I		Test-II	
1	U. Kolab	Last week of Oct 2021		Second Week of Feb 2022	
2	Balimela	Second week of Nov 2021		First Week of March 2022	
3	Rengali	Second week of Nov 2021		First 2eek of March 2022	
4	Burla	Second week of Nov 2021		First Week of March 2022	
5	U. Indravati	Last week of Oct 2021		Second Week of Feb 2022	
6	Maithon	Third Week of Nov 2021		First Week of March 2022	
7	TLDP-III	Second week of Nov 2021		Second Week of Feb 2022	
8	TLDP-IV	Third Week of Nov 2021		First Week of March 2022	
9	Subarnarekha	Second week of Nov 2021		Second Week of Feb 2022	

10	Teesta-V	Third Week of Nov 2020		Third Week of March 2022	
11	Chuzachen	Done on 9 <sup>th</sup> April'21		First Week of March 2022	
12	Teesta-III	Third Week of Nov 2021		First Week of March 2022	
13	Jorethang	Third Week of Nov 2021		First Week of March 2022	
14	Tasheding	Second week of Nov 2021		First Week of March 2022	
15	Dikchu	Second week of Nov 2021		Second Week of Feb 2022	

In the 179<sup>th</sup> OCC meeting, ERLDC submitted that Chuzachen had done the Mock Black Start on 9<sup>th</sup> April 2021.

In the 180<sup>th</sup> OCC meeting, ERLDC representative informed that they have not received any further update on Mock Black Start.

Odisha representative submitted that they have not started the Mock Black Start due to ongoing Covid-19 Vaccination drive.

In the 181<sup>st</sup> OCC meeting, SLDC, Jharkhand representative submitted that they would go for Mock Black Start in the 2<sup>nd</sup> week of August '21. ERLDC representative advised Jharkhand to give prior intimation regarding the Mock Black Start.

SLDC, Odisha representative informed that they would go for Mock Black Start of Balimela in the 2<sup>nd</sup> week of August '21.

**Members may update.-**

**ITEM NO. C.14: Monthly Data on Category-wise consumption of electricity in states.**

The data of category-wise consumption of electricity in the states/UTs are being frequently referred to by CEA and Ministry of Power. In this regard, as advised by Member (GO &D), GM division of CEA has advised the following:

- The monthly data of category-wise consumption of electricity in the states/UTs may be discussed in the OCC meeting on regular basis with comparative analysis of the same for corresponding monthly data of previous years.
- In case the utilities have reservations on submitting unaudited data then the same may be mentioned in the data itself that these data are unaudited. In that case the data so received would be used only for the purpose of trend analysis and would not be used in any report of CEA.

In 177<sup>th</sup> OCC Meeting, OCC advised all SLDCs to take up the issue with their DISCOM(s) and submit the required data on monthly basis to ERPC secretariat.

In the 181<sup>st</sup> OCC meeting,

**Bihar:** Submitted the data for the month of May 21 and June 21.

**Odisha:** Submitted that the data for June'21 will be send after getting the same from the Discoms.

**Jharkhand:** Informed that data is yet to be received from Discom.

**DVC:** Informed that details are yet to be received from their commercial department.

**Members may update.**

**ITEM NO. C.15: Activation of Transient data record facility in the AVR, if available and sharing the information with RLDC whenever required.**

Monitoring of response of all dynamic elements of the grid is extremely important for analyzing various events in the grid and validating dynamic models of the elements.

Modern AVR are having transient data recording facility and can record very high-resolution data. Therefore all generating station must activate the facility for understanding the dynamics of the grid in a much better way. Therefore all generators are requested to submit the following details:

Generator Name	AVR manufacturer	Transient Data recording facility available (Yes/No)	IS the data recording facility activated (Yes/No)

In the 179<sup>th</sup> OCC meeting, ERLDC submitted that they had received the data from some of the constituents.

ERLDC further suggested that all the generators having the transient data record facility in the AVR should activate the same facility at their end. Also in the upcoming new generators or in the generators where R& M work is going on, possibility of incorporating this feature should be explored.

OCC advised all the concerned utilities to submit the data at the earliest.

Information is yet to be received from following plants

- **Central Sector**
  - Rangit
  - Barh
  - Darlipalli
  - NPGC
  - BRBCL
  - MPTS St- II
- **West Bengal**
  - Kolaghat
  - Sagardighi
  - TLDP-4
  - PPSP
- **Odisha**
  - Hirakud
  - Chiplima
  - Balimela
  - Upper Kolab
  - Indravati
  - Rengali
- **Jharkhand**
  - Tenughat
  - Subarnarekah
- **DVC**

- Bokaro-B
- DSTPS
- Mejia-A
- Waria
- Raghunathpur
- Mejia-B
- Chandrapura
  - Sterlite
- Bokaro-A
- Koderma
- **Bihar**
  - MTPS St- I
  - Barauni TPS

It is further suggested that all generating station must activate the facility where ever available for understanding the dynamics of the grid in a much better way. Data for the same may be shared with ERLDC when need for analysis arises.

In the 180<sup>th</sup> OCC meeting, ERLDC representative informed that till date no further status in this regard has been received. He further added that they had already informed the concerned generators to activate the transient data recording facility in AVR at their end, if available, and inform to ERLDC.

NTPC Kahalgaon representative informed that the transient data facility in AVR is available at their end but due to shortage of memory they are not in a position to activate the same. He further informed that they would share their views after consulting the concerned department.

OCC advised all the concerned generators to activate the facility at their end, if available, and share the latest status to ERPC and ERLDC at the earliest.

In the 181<sup>st</sup> OCC meeting, Bihar representative submitted that MTPS St-I doesn't have any AVR recording facility and the details regarding Barauni TPS details would be shared to ERPC & ERLDC with two days.

OCC advised the all the concerned generators to check for the availability of the said facility and share the details to ERLDC.

Information is yet to be received from following plants:

- |   |   |  |
|---|---|--|
| <ul style="list-style-type: none"> <li>➤ <b>Central Sector</b></li> <li>● Rangit</li> <li>● MPL</li> <li>● Barh</li> <li>● BRBC</li> <li>➤ <b>Bihar</b></li> <li>● Barauni</li> </ul> | <ul style="list-style-type: none"> <li>➤ <b>Odisha</b></li> <li>● Sterlite</li> <li>● Hirakud</li> <li>● Chiplima</li> <li>● Balimela</li> <li>● Upper Kolab</li> <li>● Indravati</li> <li>● Rengali</li> </ul> | <ul style="list-style-type: none"> <li>➤ <b>Jharkhand</b></li> <li>● Tenughat</li> <li>● Subarnarekha</li> <li>➤ <b>DVC</b></li> <li>● Bokaro B</li> <li>● Andal</li> <li>● Mejia A</li> <li>● Waria</li> <li>● Raghunathpur</li> <li>● Mejia B</li> <li>● Chandrapura</li> <li>● Bokaro A</li> <li>● Koderma</li> </ul> |
|---|---|--|

**Members may update.**

**ITEM NO. C.16: Status of CEA regulation compliance of grid-connected RE (33kV & Above)**

With the steady growth of RE integration, it has become extremely important to closely monitor the compliance of various connectivity standards by the RE plants and Distributed Generation Resources.

As per CEA connectivity regulation: "Compliance of regulations"

1. It shall be the responsibility of the concerned licensee to ensure that before connectivity to the grid, all the provisions with regard to the connectivity stipulated in these regulations are complied with by the applicant.
2. The user may be disconnected from the grid by the licensee for non-compliance of any provision of these regulations, under-report by the licensee to the appropriate Electricity Regulatory Commission."

Therefore SLDC's are requested to submit the following compliance status for each RE plant separately:

- a. Communication status with SLDC
- b. Metering status
- c. LVRT status
- d. Active power control in case of frequency event
- e. Cyber security compliance status
- f. Harmonics measurement sharing status
- g. Modelling details submission status

\*\*The above points are not inclusive of all the technical compliance, SLDC should ensure all other technical compliance as well

In the 180<sup>th</sup> OCC meeting, ERLDC representative informed that as per the CEA connectivity Regulations, compliance of regulations is needed to be confirmed by all the solar generators. He submitted that in Eastern Region considerable amount of solar generation is there and for that communication between SLDC and solar plants is of utmost importance. ERLDC representative further stated that solar power plants connected to the ISTS as well as state networks need to follow the LVRT so that in case of any tripping the grid connectivity can be maintained.

It was also informed that all the above data need to be monitored by SLDCs.

**Bihar:** On query, SLDC Bihar informed that they have some solar power plants which have connectivity at 33kV and above level, out of which some of them are communicating with the SLDC and for the rest SLDC is coordinating with them to get it complied. It is expected that within 15 days the status of communication between SLDC and solar power plants for the rest would be collected by SLDC.OCC advised Bihar to submit the necessary details regarding the same to ERPC and ERLDC.

**Jharkhand:** SLDC Jharkhand submitted that they have no solar power plant connected at 33kV level and above.

**DVC:** DVC submitted that they have no solar power plant connected at 33kV level and above.



**Odisha:** GRIDCO representative submitted that regarding the solar power plants which are connected at 132kV network, there is already a provision in SCADA system. Last year GRIDCO had implemented the data communication to SLDC for the RE projects that are connected at 11kV & 33kV level. She further informed that till date they have covered 16 nos. of locations and the work is going on and after successful completion of the pilot project they awarded the work to M/s Chemtrols Ltd.

She further submitted that work for the implementation of the above points from (a) to (g) is currently under progress and the work is expected to be completed within 2 months for all 16 nos. of locations (11kV & 33kV level) and for 132kV level the same is already available

OCC advised GRIDCO to submit the aforesaid data in tabular format to ERPC & ERLDC.

**West Bengal:** SLDC West Bengal representative informed that presently they do not have any solar power plant connected at 132kV system. However, only 1 no. of 10MW solar power plant is there under WBSEDCL which is connected at 33kV level. He further submitted that neither SCADA data nor any status as mentioned in the above points (a) to (g) is available with them. He told that an official proposal would be put before the competent authority so that the same can be forwarded to the solar power plant for getting the necessary data and status. He further assured that as soon as any decision is taken, the same would be intimated to the forum.

ERLDC representative mentioned that as per regulation, for renewable generations connected at 33kV and above these said features are mandatory requirements.

SE (O), ERPC opined that as SLDC is an apex body of the State and they are already empowered to collect the requisite data, as per regulatory requirements.

SLDC WB representative ensured that they would write to WBSEDCL about this regulatory information and would share the details to ERPC and ERLDC.

**Members may update.**

**ITEM NO. C.17: Submission of Status of installation of Harmonics meter at the connection point of bulk consumers**

- i. The limits of voltage harmonics by the distribution licensee in its electricity system, the limits of injection of current harmonics by bulk consumers, point of harmonic measurement, i.e., point of common coupling, method of harmonic measurement and other related matters, shall be in accordance with the IEEE 519-2014 standards, as amended from time to time.
- ii. Measuring and metering of harmonics shall be a continuous process with meters complying with provisions of IEC 61000-4-30 Class A.
- iii. The data measured and metered as mentioned in sub-paragraph (ii) with regard to the harmonics, shall be available with distribution licensee and it shall also be shared with the consumer periodically.
- iv. The bulk consumer shall install power quality meter and share the recorded data thereof with the distribution licensee with such periodicity as may be specified by the appropriate Electricity Regulatory Commission: Provided that the existing bulk consumer

shall comply with this provision within twelve months from the date of commencement of the Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2018.

- v. In addition to harmonics, periodic measurement of other power quality parameters such as voltage sag, swell, flicker, disruptions shall be done as per relevant International Electro-technical Commission Standards by the distribution licensee and the reports thereof shall be shared with the consumer.
- vi. The distribution licensee shall install power quality meters in a phased manner within three years from the date of commencement of the Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2019 covering at least 33% of the 33 kV substations each year.”

Therefore SLDCs are requested to coordinate with all the distribution licensees and get the latest status.

In 180<sup>th</sup> OCC Meeting, SE (O), ERPC submitted that as per Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2019 all Discoms shall install Harmonics Meter at their end in a phased manner.

ERLDC representative added that monitoring shall be done from SLDCs regarding the installation of the same. He further submitted that installation of harmonic meters would help to ensure quality power to the consumer.

OCC advised the concerned utilities to coordinate with their distribution licensees for compliance of the above regulatory requirements.

**Members may update.**

## **PART D: OPERATIONAL PLANNING**

### **ITEM NO. D.1: Anticipated power supply position during September 2021**

The abstract of peak demand (MW) vis-à-vis availability and energy requirement vis-à-vis availability (MU) for the month of September 2021 were prepared by ERPC Secretariat on the basis of LGBR for 2021-22 and feedback of constituents, keeping in view that the units are available for generation and expected load growth etc. is enclosed at **Annexure-D1**.

**Members may update.**

### **ITEM NO. D.2: Shutdown proposal of generating units for the month of September September 2021**

Generator unit shutdown schedule for September' 2021 is given in the table:

<b>Proposed Maintenance Schedule of Thermal Generating Units of ER during 2020-21 in the month of September'2021 (as finalised in LGBR meeting for 2020-21)</b>							
System	Station	Unit	Capacity (MW)	Period (as per LGBR 2020-21)		No. of Days	Reason
				From	To		
WBPDC	Santhaldih TPS	U-6	250	11.09.2021	20.09.2021	10	PG Test
	Sagardighi TPS	U-1	300	01.09.2021	05.10.2021	35	COH
DVC	Mejia TPS	U-6	250	01.09.2021	06.10.2021	36	AOH, Turb., Boiler-RLA, FGD, De-NOx, Gen.
	DSTPS	U-1	500	30.09.2021	04.11.2021	36	bOH, FGD, De-NOx Burner
NTPC	KhSTPS	U-4	210	15.09.2021	04.10.2021	20	BOH
	TSTPS	U-3	500	08.09.2021	07.10.2021	30	OH

**Note:**

1. Nabinagar TPS (BRBCL) U-1 (250 MW) was scheduled for annual overhauling from 25.07.2021 to 08.09.2021. However, BRBCL has rescheduled its AOH and now it is scheduled from 22.08.2021 to 20.09.2021.

2. Barh STPS U-5 (660 MW) is under S/D from 15.09.2021 onwards for Boiler Modification.

**Members may update.**

**ITEM NO. D.3: Major Generating Units/Transmission Element outages/shutdown in ER Grid (as on 11.08.2021)**

**a) Thermal Generating Stations outage report:**

Sl. No	Station	State	Agency	Unit No.	Capacity in Mw	Reason(s)	Outage Date
1	FSTPP	WEST BENGAL	NTPC	1	200	ANNUAL OVERHAULING.	11-Jul-2021
2	BARAUNI TPS	BIHAR	BSPHCL	7	110	RESERVE SHUT DOWN	20-Jul-2021
3	DPL	WEST BENGAL	WBPDC	7	300	POOR COAL STOCK	17-Jul-2021
4	KODERMA	DVC	DVC	1	500	ANNUAL OVERHAULING	15-Jul-2021
5	KOLAGHAT	WEST BENGAL	WBPDC	1	210	ESP R & M	07-Jun-2018
6	MUZAFFARPUR TPS	BIHAR	BSPHCL	1	110	RESERVE SHUT DOWN	20-Jul-2021
7	SAGARDIGHI	WEST BENGAL	WBPDC	4	500	ANNUAL OVERHAULING	29-Jun-2021
8	KHSTPP	BIHAR	NTPC	7	500	ABNORMAL SOUND OF TURBINE VIBRATION	08-Aug-2021
9	BARAUNI TPS	BIHAR	BSPHCL	6	110	ABNORMAL TSI PARAMETER	17-Mar-2021
10	BARAUNI TPS	BIHAR	BSPHCL	9	250	PROBLEM IN GT	17-Jun-2021
11	BOKARO'B'	DVC	DVC	3	210	INITIALLY OUT DUE TO ASH PONDAGE PROBLEM UPTO 31/12/21. LATER OUT DUE TO POLLUTION CLERANCE ISSUE	21-Oct-2020
12	HEL HIRANMAYEE	WEST BENGAL	WBPDC	2	150	HEAVY STEAM LEAKAGE FROM IP-LP TURBINE PARTING PLATE.	06-Jul-2021
13	KOLAGHAT	WEST BENGAL	WBPDC	2	210	ESP & ASH HANDLING R & M	26-Jun-2021
14	MEJIA TPS	DVC	DVC	2	210	STATOR EARTH FAULT	13-Jul-2021
15	RENGALI HPS	ODISHA	OHPC	3	50	DUE TO HEAVY OIL LEAKAGE FROM SUMP TAK	19-Jul-2021
16	WARIA TPS	DVC	DVC	4	210	FLAME FAILURE	06-Jul-2021

All Generating stations are requested to update expected restoration time and reason outage to ERLDC/ERPC on weekly basis in case of any change at their end.

**Generators/ constituents may to update the expected date of revival of the units.**

**b) Major Generating stations Out on Reserve Shutdown due to low system demand:**

S.No	Station	State	Agency	Unit No.	Capacity in Mw	Reason(s)	Outage Date
1	BARAUNI TPS	BIHAR	BSPHCL	7	110	RESERVE SHUT DOWN	20-Jul-2021
2	HEL HIRANMAYEE	WEST BENGAL	WBPDC	1	150	LOW SYSTEM DEMAND	30-Jul-2021
3	MUZAFFARPUR TPS	BIHAR	BSPHCL	1	110	RESERVE SHUT DOWN	20-Jul-2021

**c) Hydro Unit Outage Report:**

Sl. No.	Station	State	Agency	Unit No	Capacity	Reason(s)	Outage
1	BALIMELA HPS	ODISHA	OHPC	1	60	R & M WORK	05-Aug-2016
2	BALIMELA HPS	ODISHA	OHPC	2	60	R & M WORK	20-Nov-2017
3	BURLA HPS/HIRAKU DI	ODISHA	OHPC	5	37.5	R & M WORK	25-Oct-2016
4	BURLA HPS/HIRAKU DI	ODISHA	OHPC	6	37.5	R & M WORK	16-Oct-2015
5	BURLA HPS/HIRAKU DI	ODISHA	OHPC	7	37.5	ANNUAL MAINTENANCE	20-Jan-2020
6	RENGALI HPS	ODISHA	OHPC	3	50	DUE TO HEAVY OIL LEAKAGE FROM SUMP TAK	19-Jul-2021

It is seen that about 282.5 MW hydro capacities in Odisha is under forced outage / planned outage and therefore not available for providing the much-needed peaking support during evening peak.

**SLDC / OHPC may please indicate restoration plan of the units.**

**d) Long outage report of transmission lines:**

SL NO	Transmission Element / ICT	Agency	Outage DATE	Reasons for Outage
1	400 KV IBEUL JHARSUGUDA D/C	IBEUL	29.04.2018	TOWER COLLAPSE AT LOC 44,45
2	220/132 KV 100 MVA ICT II AT LALMATIA	FSTPP/JU SNL	22.01.2019	FAILURE OF HV SIDE BREAKER
3	220 KV PANDIABILI - SAMANGARA D/C	OPTCL	03.05.2019	49 NOS OF TOWER COLLAPSED.AS REPORTED BY SLDC OPTCL, TOTAL 60 NOS OF TOWER IN BETWEEN 220KV PANDIABILI – SAMANGARA LINE IN WHICH 48 NOS TOWERS FULLY DAMAGED AND 12 NOS TOWERS PARTIALLY DAMAGED. WORK UNDER PROGRESS.PRESENTLY CHARGED FROM PANDIABILLI END (LOC 156) TO LOC 58
4	220KV BARAUNI-HAJIPUR CKT-1	BSPTCL	28.09.2019	TOWER COLLAPSE AT LOCATION 38 & 39. CKT-2 IS ON ERS SINCE 13.01.2020.
5	220/132 KV 100 MVA ICT 3 AT CHANDIL	JUSNL	30.04.2020	ICT BURST AND DAMAGED AFTER FIRE REPORTED
6	220KV/132 KV 100 MVA ICT 4 AT RANGPO	PGCIL	08.04.2021	HAND TRIPPED AFTER TRIPPING OF ALL 400/220 ICTS AT RANGPO ON 8.4.21 AFTER DISTURBANCE AND THERAFTER DEVELOPED RELAY RESET PROBLEM
7	400KV/220KV 315 MVA ICT 2 AT MEERAMANDALI	OPTCL	21.02.2021	FIRE HAZARD
8	400KV/220KV 315 MVA ICT 4 AT JEERAT	WBSETCL	09.04.2021	TRIPPED ON DIFFERENTIAL AND PRD PROTECTION PROTECTION OPTD
9	220 KV GODDA-LALMATIA D/C	JUSNL	21.04.2021	TOWER COLLAPSED AT LOC. NO. 4
10	220KV-FSTPP-LALMATIA-1	JUSNL	21.04.2021	THREE TOWER COLLAPSED NEAR LALMATIA
11	400KV-BINAGURI-TALA-1	PGCIL	04.06.2021	BINAGURI: B-N, FC- 2.035 KA, FD- 174.7 KM; TALA: B-N, FC- 1.12 KA, FD- 85.4 KM; LATER TAKEN EMERGENCY S/D ON 07-06-21 10:07HRS TO ATTEND BURNT MARKS

				OBSERVED IN THE XLPE CABLE TERMINATION.
12	400KV-PPSP-BIDHANNAGAR-2	WBSETCL	05.08.2021	RECTIFICATION WORK OF DEFORMED TOWER NO. 17 NEAR ANDAL AIRPORT
13	400KV/220KV 500 MVA ICT 1 AT DHANBAD	NKTL	06.08.2021	TO ATTEND HUNTING ISSUE IN 412 BAY,409 BAY 202 BAY & 201 BAY CB
14	400KV/220KV 500 MVA ICT 2 AT DHANBAD	NKTL	06.08.2021	TO ATTEND HUNTING ISSUE IN 412 BAY,409 BAY 202 BAY & 201 BAY CB
15	400KV/220KV 315 MVA ICT 1 AT KOLAGHAT TPS	WBSETCL	07.08.2021	MAINTENANCE OF 29C, 29D,LA,33KV SIDE ISOLATORS & CB OF ICT#1 BAY AT KOLAGHAT

Transmission licensees/ Utilities are requested to update expected restoration date & work progress regarding restoration regularly to ERLDC/ERPC on monthly basis by 5th of each month so that status of restoration can be reviewed in OCC. Utilities are also requested to update outage of any elements within their substation premises like isolator/breaker to ERLDC/ERPC regularly. (Reported as per Clause 5.2(e) of IEGC)

**ITEM NO. D.4: Commissioning of new units and transmission elements in Eastern Grid in the month of July-2021**

The details of new units/transmission elements commissioned in the month of July -2021 based on the inputs received from beneficiaries:

Monthly commissioning List of Transmission element and generators: July 2021					
SL. No	Location	Owner/Unit Name	Date	Time	Remarks
1	NKTL	400/220KV ICT -1 500MVA AT DHANBAD	31.07.2021	20:56	ICTS ARE CHARGED ON NO-LOAD AS NO DOWNSTREAM LINE COMMISSIONED YET.
2	NKTL	400/220KV ICT -2 500 MVA AT DHANBAD	31.07.2021	18:25	ICTS ARE CHARGED ON NO-LOAD AS NO DOWNSTREAM LINE COMMISSIONED YET.
3	OPTCL	220KV-JAYNAGAR-JEYPORE-3	01.07.2021	21:39	
4	OPTCL	220KV-JAYNAGAR-JEYPORE-4	08.07.2021	20:36	
5	PMJTL	400KV-JEERAT-NEW JEERAT-1	08.07.2021	16:05	LINE WAS IDLE CHARGED FROM JEERAT(WB) END UP TO 25 KM.
6	PMJTL	400KV-JEERAT-NEW JEERAT-2	08.07.2021	16:24	LINE WAS IDLE CHARGED FROM JEERAT(WB) END UP TO 25 KM.
7	PMJTL	400KV-JEERAT-NEW JEERAT-1	31.07.2021	12:30	LINE WAS CHARGED ALONG WITH 400 KV BUS 2 AT NEW JEERAT
8	PMJTL	400KV-JEERAT-NEW JEERAT-2	31.07.2021	14:12	LINE WAS CHARGED ALONG WITH 400 KV BUS 2 AT NEW JEERAT
9	PGCIL	400KV-BAHARAMPUR-BHERAMARA-4	25.07.2021	11:32	LINE WAS CHARGED FROM BAHARAMPUR UP TO TERMINATION TOWER OF BHERAMARA
10	JUSNL	132KV-NAGARUNTARI-SONENAGAR-1	14.07.2021	18:12	LILO OF 132 KV RIHAND-SONENAGAR CKT-1 AT NAGARUNTARI
11	JUSNL	132KV-NAGARUNTARI-RIHAND-1	14.07.2021	20:02	LILO OF 132 KV RIHAND-SONENAGAR CKT-1 AT NAGARUNTARI TSS. FIRST TIME LOADED 17:12 HRS ON 28-07-2021

12	NKTL	400KV-DHANBAD-RANCHI-1	21.07.2021	13:42	LILO OF 400 KV RANCHI-MAITHON RB D/C
13	NKTL	400KV-DHANBAD-MAITHON RB-1	23.07.2021	18:48	LILO OF 400 KV RANCHI-MAITHON RB D/C
14	NKTL	400KV-DHANBAD-RANCHI-2	27.07.2021	13:37	LILO OF 400 KV RANCHI-MAITHON RB D/C
15	NKTL	400KV-DHANBAD-MAITHON RB-2	27.07.2021	19:46	LILO OF 400 KV RANCHI-MAITHON RB D/C
16	NKTL	125 MVAR Bus Reactor-1	21-07-2021	14:47	
17	NKTL	125 MVAR Bus Reactor-2	25-07-2021	15:12	
18	NKTL	400KV MAIN BAY OF RANCHI-1 AT DHANBAD	21-07-2021	13:42	
19	NKTL	400KV MAIN BAY OF MAITHON RB-1 AT DHANBAD	23.07.2021	18:48	
20	NKTL	400KV MAIN BAY OF RANCHI-2 AT DHANBAD	21-07-2021	16:28	
21	NKTL	400KV MAIN BAY OF MAITHON RB-2 AT DHANBAD	21-07-2021	16:38	
22	NKTL	400KV TIE BAY OF ( 125MVAR B/R-2 AND MAITHON-2) AT DHANBAD	21-07-2021	16:39	
23	NKTL	400KV TIE BAY OF ( 500 MVA ICT 2 AND RANCHI 2) AT DHANBAD (NKTL)	21-07-2021	16:29	
24	NKTL	400 KV MAIN BAY OF 500 MVA ICT 1 AT DHANBAD	21-07-2021	14:34	
25	NKTL	400 KV MAIN BAY OF 500 MVA ICT 2 AT DHANBAD	21-07-2021	16:27	
26	NKTL	400KV MAIN BAY OF B/R 2 AT DHANBAD	21-07-2021	16:39	
27	NKTL	400KV MAIN BAY OF B/R 1 AT DHANBAD	21-07-2021	14:47	
28	OPTCL	220KV MAIN BAY OF JAYNAGAR -4 AT JEYPORE	08-07-2021	20:36	
29	PMJTL	400KV MAIN BAY OF JEERAT -1 AT NEW JEERAT	31-07-2021	14:12	
30	PMJTL	400KV MAIN BAY OF JEERAT -2 AT NEW JEERAT	31-07-2021	14:12	
31	PMJTL	400 KV MAIN BUS II AT NEW JEERAT	31-07-2021	14:12	
32	NKTL	400 KV MAIN BUS I AT DHANBAD	21.07.2021	13:42	
33	NKTL	400 KV MAIN BUS II AT DHANBAD	21.07.2021	14:34	
34	NKTL	220 KV MAIN BUS I AT DHANBAD	31-07-2021	18:27	
35	NKTL	220 KV MAIN BUS II AT DHANBAD	31-07-2021	12:30	

**Members may update.**



**ITEM NO. D.5: UFR operation during the month of July 2021**

Frequency profile for the month as follows:

Month	Max	Min	Less IEGC Band (%)	Within IEGC Band (%)	More IEGC Band (%)
	(Date/Time)	(Date/Time)			
<b>July, 2021</b>	50.26 Hz, 20-07-2021 13:07 Hrs.	49.51 Hz, 06-07-2021 22:12 Hrs	5.35	75.05	19.60

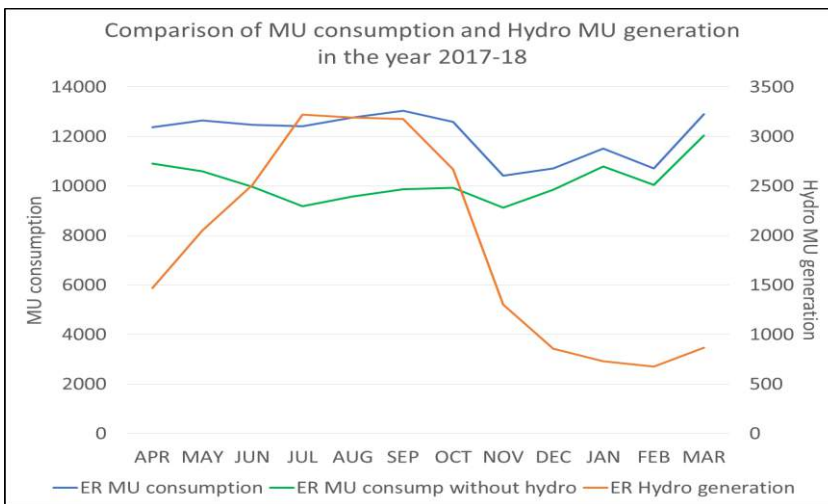
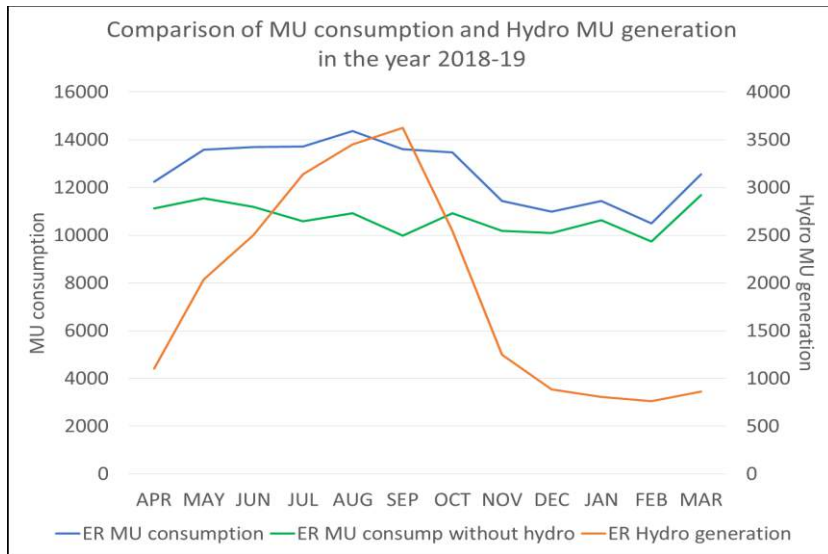
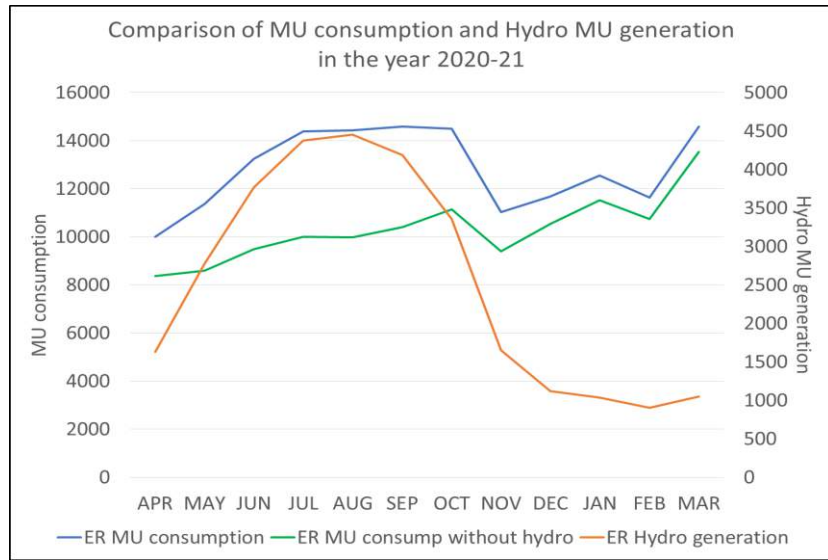
Hence, no report of operation of UFR has been received from any of the constituents.

**Members may note.**

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# Annexure: Trend of energy consumption and hydro generation in Eastern Region during last five years

Annexure-B1



No.25-11/6/2018-PG  
Government of India  
Ministry of Power  
Shram Shakti Bhawan, Rafi Marg, New Delhi – 110001  
Tele Fax: 011-23730264  
\*\*\*\*\*

Dated 02/07/2020

**ORDER**

Power Supply System is a sensitive and critical infrastructure that supports not only our **national defence, vital emergency services** including health, disaster response, **critical national infrastructure** including classified data & communication services, defence installations and manufacturing establishments, logistics services but also the **entire economy** and the **day-to-day life** of the citizens of the country. Any danger or threat to Power Supply System can have catastrophic effects and has the potential to cripple the entire country. Therefore, the Power Sector is a **strategic and critical sector**.

The vulnerabilities in the Power Supply System & Network mainly arise out of the possibilities of cyber attacks through malware / Trojans etc. embedded in imported equipment. Hence, **to protect the security, integrity and reliability of the strategically important and critical Power Supply System & Network** in the country, the following directions are hereby issued :-

(1) All equipment, components, and parts imported for use in the Power Supply System and Network shall be tested in the country to check for any kind of embedded malware/trojans/cyber threat and for adherence to Indian Standards.

(2) All such testings shall be done in certified laboratories that will be designated by the Ministry of Power (MoP).

(3) Any import of equipment/components/parts from "prior reference" countries as specified or by persons owned by, controlled by, or subject to the jurisdiction or the directions of these "prior reference" countries will require prior permission of the Government of India

(4) Where the equipment/components/parts are imported from "prior reference" countries, with special permission, the protocol for testing in certified and designated laboratories shall be approved by the Ministry of Power (MoP).

This order shall apply to any item imported for end use or to be used as a component, or as a part in manufacturing, assembling of any equipment or to be used in power supply system or any activity directly or indirectly related to power supply system.

This issues with the approval of Hon'ble Minister of State for Power and New & Renewable Energy (Independent Charge).

  
(Goutam Ghosh)  
Director  
Tel: 011-23716674

To:

1. All Ministries/Departments of Government of India (As per list)
2. Secretary (Coordination), Cabinet Secretariat
3. Vice Chairman, NITI Aayog
4. Comptroller and Auditor General of India
5. Chairperson, CEA
6. CMDs of CPSEs/Chairman of DVC & BBMB/MD, EESL/DG, NPTI/DG, CPRI/DG, BEE/
7. All ASs/JSs/EA, MoP

Copy:

1. PS to Hon'ble PM, Prime Minister's Office
2. PS to Hon'ble MOS(IC) for Power and NRE
3. Sr. PPS to Secretary(Power)

## ERPC:: KOLKATA

### Minutes of the Special meeting on “Implementation of SPS at 220/132 kV Budhipadar S/s” held on 04.08.2021 through MS Teams platform

SE(O), ERPC chaired the meeting. List of participants is enclosed at **Annexure-A**.

SE(O), ERPC welcomed all participants to the meeting and briefed the background of the issue & requirement of SPS at Budhipadar S/s. He stated that the meeting had been convened as per the decision of 181st OCC meeting held on 22.07.2021 wherein it was decided to convene a special meeting with representative of SLDC Odisha, OPTCL, GRIDCO, OPGC, ERLDC & ERPC to discuss the implementation of SPS at Budhipadar S/s.

#### **The followings were discussed in the meeting.**

**SLDC Odisha** initiated the discussion & informed that they had carried out study considering different contingency scenarios at Budhipadar S/s. They explained their study with a presentation.

Based on the study results, following observations were placed by them:

1. For the scenario of peak load & maximum generation injection at 220 kV Budhipadar S/s with 160 MVA, 220/132 kV second ATR in service, no transmission constraints is being observed at Budhipadar system & n-1 reliability criteria is being satisfied.
2. When 220 kV Vedanta-Budhipadar D/C line is switched off at Budhipadar end & Vedanta generation was evacuated through 400/220 kV ICTs at Vedanta S/s, the loading of the evacuating lines at Budhipadar is relieved to great extent however the loading of 220 kV Rourkela-Tarkera touches 160 MW for each circuit which violates n-1 reliability criteria.

Based on above study, they suggested the followings:

- 220 kV Vedanta-Budhipadar D/C line may be switched off at Budhipadar end as short term measure to limit high loading of evacuating lines from Budhipadar S/s during contingencies.
- Further, as a remedial measure to reduce the loading of 220 kV Tarkera-Rourkela D/c lines so as to satisfy n-1 reliability criteria, 220 kV Tarkera-Rengali & 220 kV Tarkera-Barkote line may be hand tripped at Tarkera end whenever the loading in 220 kV Tarkera-Rourkela D/c lines exceeds the permissible value.

They added that after the grid disturbance at Budhipadar S/s on 08.04.2021, they are closely monitoring the Budhipadar system in real time in order to avoid any overloading of the lines connected to it. The generation injection by CPPs at Budhipadar is also being monitored.

GRIDCO representative submitted that the opening of lines at Tarkera end shall be implemented through a provision of SPS rather than manual operation.

On query, OPTCL representative informed that second 220/132 kV ATR at Budhipada S/s would be restored by October-2021.

ERLDC informed that the SPS may be implemented through relay based logic in which overcurrent functionality may be used to measure the line loading of 220 kV Rourkela-Tarkera D/C line & as per the set logic, trip command may be extended to the breakers of 220 kV Tarkera-Barkote & Tarkera-Rengali lines at Tarkera end to trip the lines.

On a separate query regarding restoration of busbar protection at Budhipadar S/s, OPTCL submitted that the same has got delayed due to poor response from OEM(M/s Siemens).

On a query from ERLDC regarding PLCC & A/R status healthiness for all the lines at Budhipadar S/s, OPTCL informed that A/R is not working for some of the lines like 220 kV Budhipadar-Lapanga lines at Budhipadar end & all circuits of 220 kV Budhipadar-Korba lines.

After detailed deliberation the followings were decided:

- I. An SPS would be implemented at 220 kV Tarkera S/s immediately as a short term measure by OPTCL with the following logic:
  - Whenever the flow of either circuit of 220 kV Rourkela-Tarkera D/C Line is greater than 160 MW, a trip command would be sent to trip the following lines
    - 220 kV Tarkera-Rengali
    - 220 kV Tarkera-Barkote.

The time delay for tripping the above lines may be appropriately set by OPTCL.

- II. As a short term measure to address the reliability concern at 220 kV Budhipadar S/s, 220 kV Budhipadar-Vedanta D/C lines would be kept in switched off condition at Budhipadar end. The power share of Odisha from Vedanta would be evacuated through the two 400/220 kV ICTs at Vedanta at 400 kV level. However, this would be implemented after restoration of the second ATR at Budhipadar S/s & necessary clearance from GRIDCO. Vedanta was advised to check healthiness of all equipments before charging the ICTs at their end.
- III. The SPS at sl no. I would continue even after the opening of the 220 kV Budhipadar-Vedanta D/C lines and may be reviewed for any modification/addition considering the system condition.
- IV. Further OPTCL was advised to expedite the restoration of busbar protection at Budhipadar S/s with highest priority.
- V. Regarding A/R & PLCC healthiness of lines at Budhipadar end, they were advised to take immediate action to rectify the issue for the concerned lines.

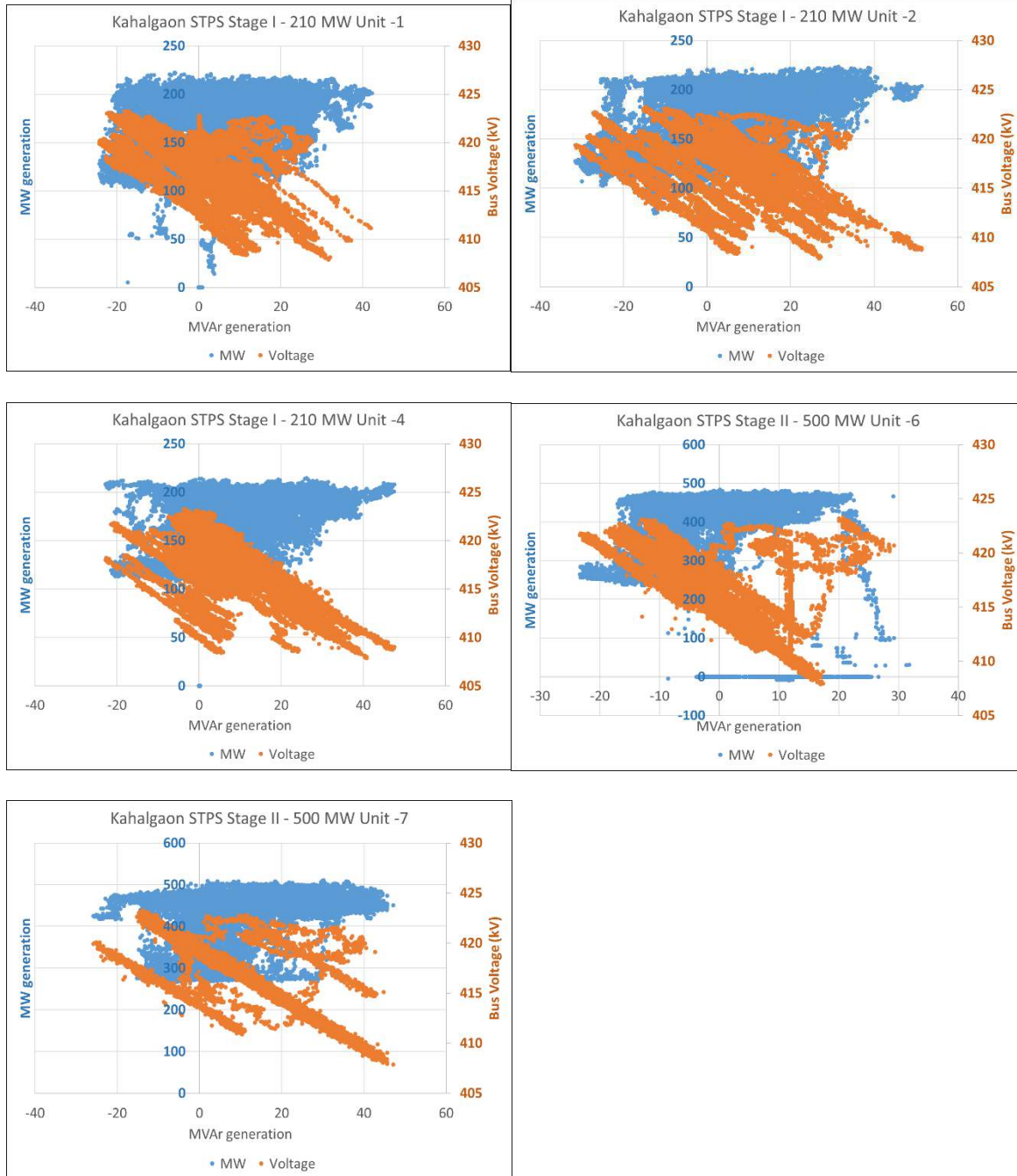
Meeting ended with vote of thanks to the chair.

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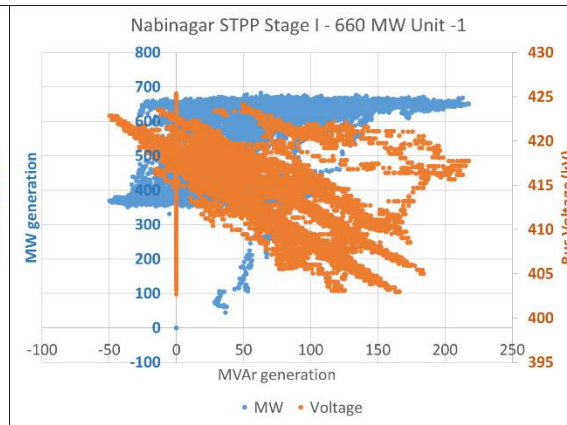
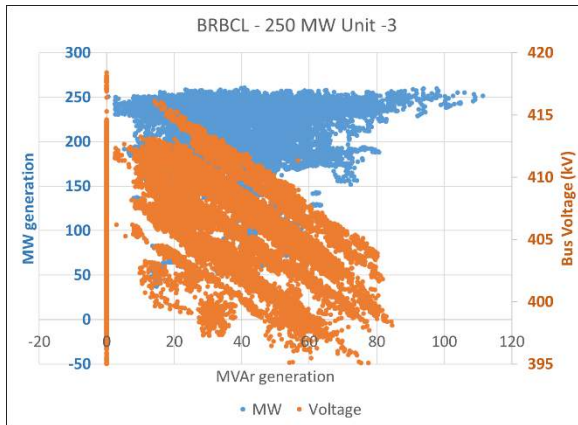
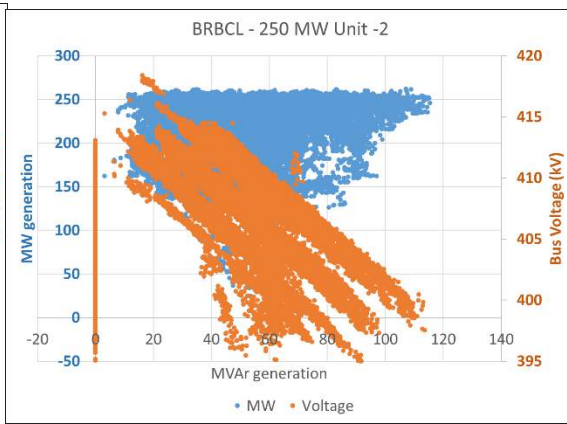
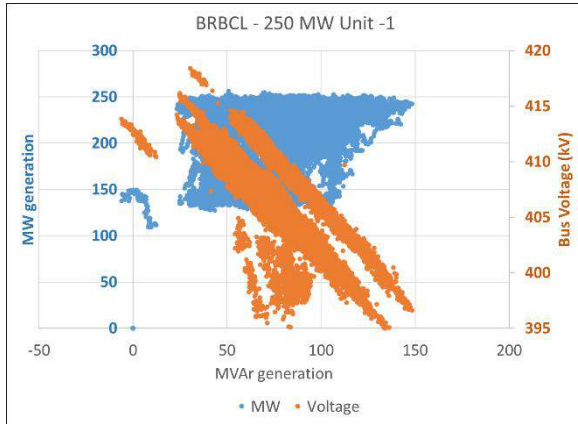
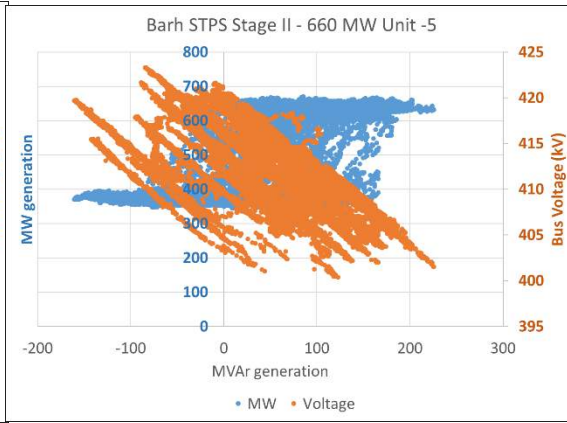
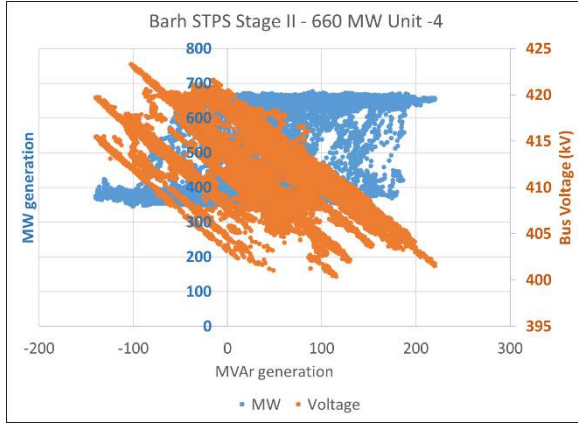
**Annexure-A**

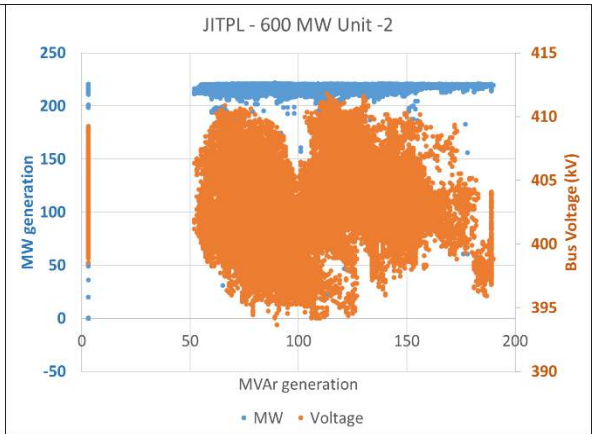
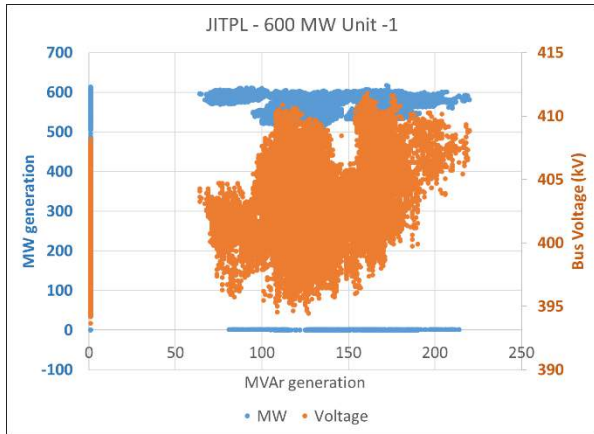
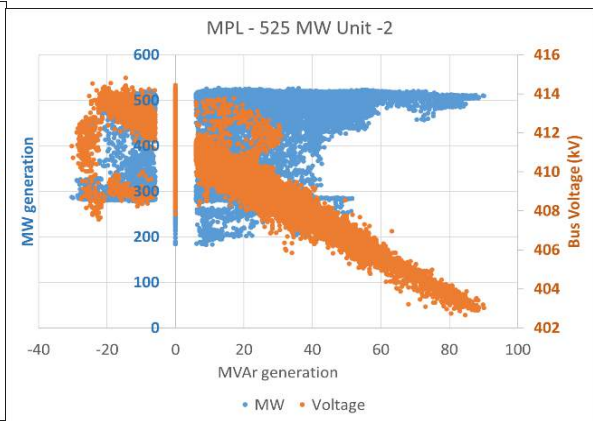
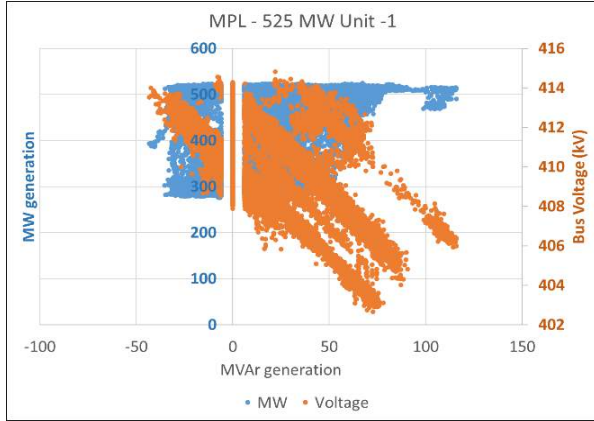
<b>SI NO.</b>	<b>Full Name</b>	<b>User Action</b>	<b>Timestamp</b>
1	ERPC Kolkata	Joined	8/4/2021, 10:46:42 AM
2	SLDC , Odisha (Guest)	Joined	8/4/2021, 10:52:34 AM
3	D K Bauri, SE, ERPC (Guest)	Joined	8/4/2021, 10:57:03 AM
4	Uma Kanta Mishra (Guest)	Joined	8/4/2021, 10:57:30 AM
5	Saurav Sahay Ch. Mgr ERLDC (Guest)	Joined	8/4/2021, 10:58:05 AM
6	Mangu Srinivas	Joined	8/4/2021, 10:58:13 AM
7	Ajay Majhi	Joined	8/4/2021, 10:59:23 AM
8	Manoj Panda, Vedanta Ltd	Joined	8/4/2021, 10:59:53 AM
9	Satyapriya Behera	Joined	8/4/2021, 11:00:21 AM
10	Ganesh Korada	Joined	8/4/2021, 11:00:56 AM
11	Gridco Ltd. (Guest)	Joined	8/4/2021, 11:01:59 AM
12	Amresh Prusti	Joined	8/4/2021, 11:02:01 AM
13	Saugato Mondal , ERLDc" (Guest)	Joined	8/4/2021, 11:02:05 AM
14	PP CHAND ERLDC (Guest)	Joined	8/4/2021, 11:02:33 AM
15	Binod Sahoo, OPGC	Joined	8/4/2021, 11:02:54 AM
16	Rajib Sutradhar, ERLDC	Joined	8/4/2021, 11:03:06 AM
17	Shyamal Konar (Guest)	Joined	8/4/2021, 11:03:42 AM
18	SMS SAHOO,DGM,OPTCL,BHUBANESWAR (Guest)	Joined	8/4/2021, 11:04:18 AM
19	Alok ERLDc (Guest)	Joined	8/4/2021, 11:05:21 AM
20	D.K.JAIN ED ERLDC (Guest)	Joined	8/4/2021, 11:06:11 AM
21	Amaresh Mallick ERLDC (Guest)	Joined	8/4/2021, 11:09:40 AM
22	pritam mukherjee ERLDC (Guest)	Joined	8/4/2021, 11:14:52 AM
23	Saibal Ghosh,ERLDC (Guest)	Joined	8/4/2021, 11:15:42 AM
24	Raj Protim ERLDC (Guest)	Joined	8/4/2021, 11:15:52 AM
25	Bauribandhu Behera	Joined	8/4/2021, 11:24:04 AM
26	U K MISHRA (Guest)	Joined	8/4/2021, 11:31:25 AM

### MVAR injection/absorption by generating units with inadequate reactive power support during July 2021











पावर सिस्टम ऑपरेशन कॉर्पोरेशन लिमिटेड  
(भारत सरकार उद्यम)  
**POWER SYSTEM OPERATION CORPORATION LIMITED**  
(A Government of India Enterprise)



केन्द्रीय कार्यालय : 61, आई एफ सी आई टावर, 8 एवं 9वीं मंजिल, नेहरु प्लेस, नई दिल्ली - 110019  
Corporate Office : 61, IFCI Tower, 8 & 9th Floor, Nehru Place, New Delhi - 110019  
CIN : U40105DL2009GOI188682, Website : www.posoco.in, E-mail : posocccc@posoco.in, Tel.: 011- 40234672

Ref. No. POSOCO/NLDC/SO/2020-21/

Date: 09.08.2021

From: CGM (SO), NLDC

To: MS, ERPC /NRPC/ NERPC/SRPC/WRPC  
Copy: ED, ERLDC/ NLDC/SRLDC  
CGM (I/C), NRLDC/NERLDC/WRLDC

**Subject: Ensuring adequacy of reserves in the Indian electricity grid.**

Sir/Madam,

During last week, all India maximum demand and energy met increased from 172 GW to 187 GW & 3850MU to 4239MU respectively. This 15 GW increase in demand along with reduction in wind generation within few days, necessitated commitment of number of units from reserve shutdown at ISGS & Intra state level also. All India demand & wind generation trend attached as **Annexure-I**.

However, it was observed that the frequency remained much below IEGC band especially during evening hours (18:00 to 24:00 hrs) due to inadequate commitment of units at ISGS & Intra state level and persistent over drawal from grid. Frequency plots for the above-mentioned dates are attached as **Annexure-II**.

Maximum deviation in drawl (during 18:00-24:00hrs) from grid by different states are tabulated below

Dates	Rajasthan	UP	Bihar	Maharashtra	Gujarat	MP	AP	Telangana
02-08-21	431	1396	646	137	722	162	666	385
03-08-21	318	652	481	1165	895	211	410	337
04-08-21	475	464	378	261	888	469	239	511
05-08-21	780	807	273	561	544	524	760	308
06-08-21	807	395	247	473	692	282	715	538
07-08-21	1027	661	437	508	322	1329	349	666

Reserves in ISGS Thermal & Gas stations were also exhausted during most of the time. Plot of reserves from 02<sup>nd</sup> to 07<sup>th</sup> August 21 was attached as **Annexure-III**. The situation was despite bringing gas units under open cycle for these specific hours.



Forced outage of thermal units as per the table given below (details in Annexure-IV) have aggravated the situation. This forced outage capacity corresponds to 2-2.5% of on bar thermal capacity.

Date	Forced Outage Capacity between 1800-2400hrs (MW)	Date	Forced Outage Capacity between 1800-2400hrs (MW)
03 <sup>rd</sup> Aug-21	500	06 <sup>th</sup> Aug-21	1964
04 <sup>th</sup> Aug-21	4940	07 <sup>th</sup> Aug-21	2505
05 <sup>th</sup> Aug-21	2728	08 <sup>th</sup> Aug-21	1590

During these periods, there were cold reserve of the order of 20GW in the country. The above circumstances emphasize the requirement of keeping sufficient spinning reserves to tackle any unit tripping(s), variability of wind generation and demand forecast errors. These measures would help load serving entities tide over such issues during such uncertainties.

In view of above, it is requested that kindly impress upon the state utilities to ensure the good forecast of their state control area demand and ensure availability of resources to meet their requirements in all time periods. The requisite reserves to meet uncertainties be also kept while committing the resources. Thus, unit commitment should take care of spinning reserve requirement also.

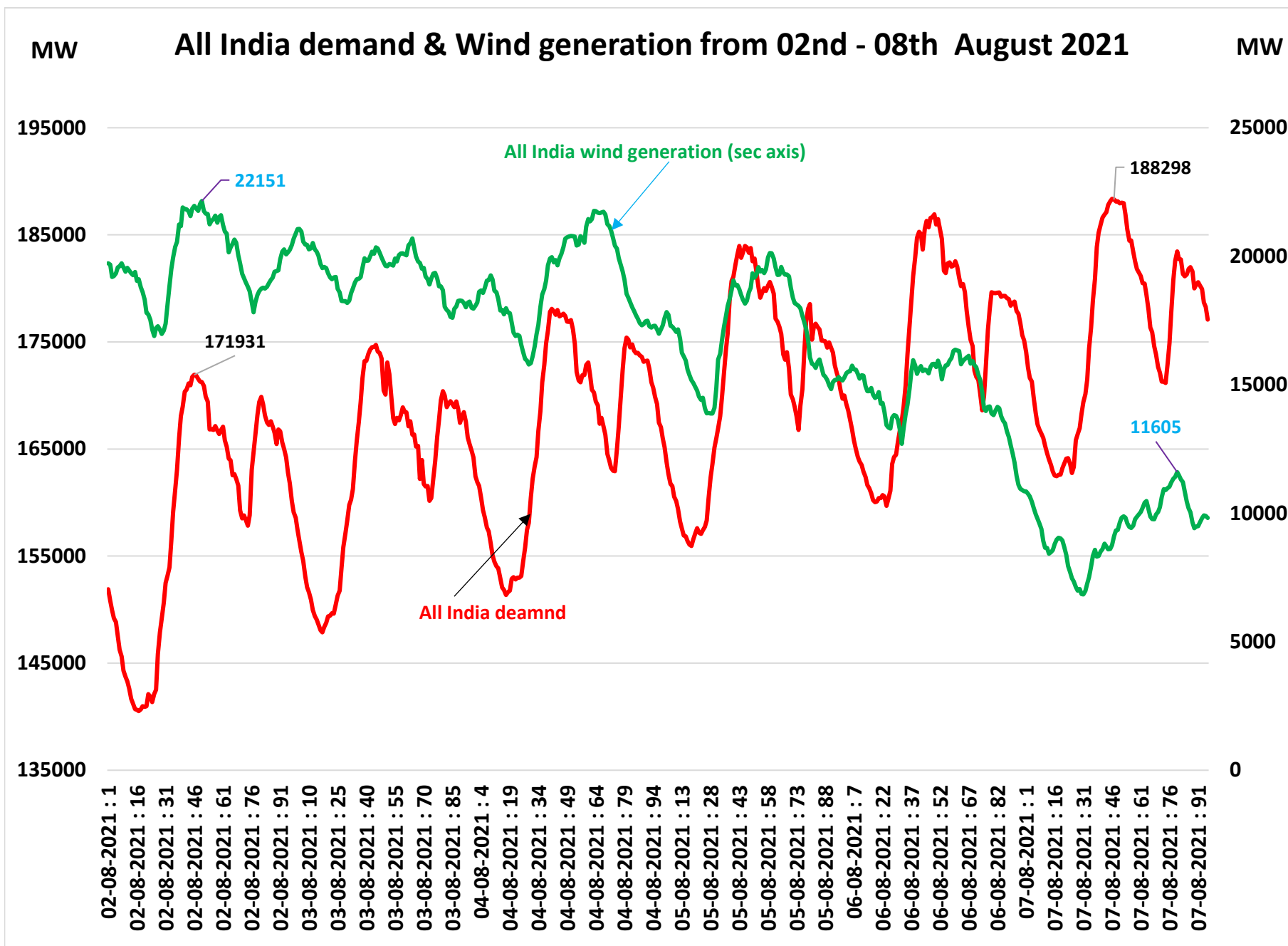
Thanking You

Yours sincerely,

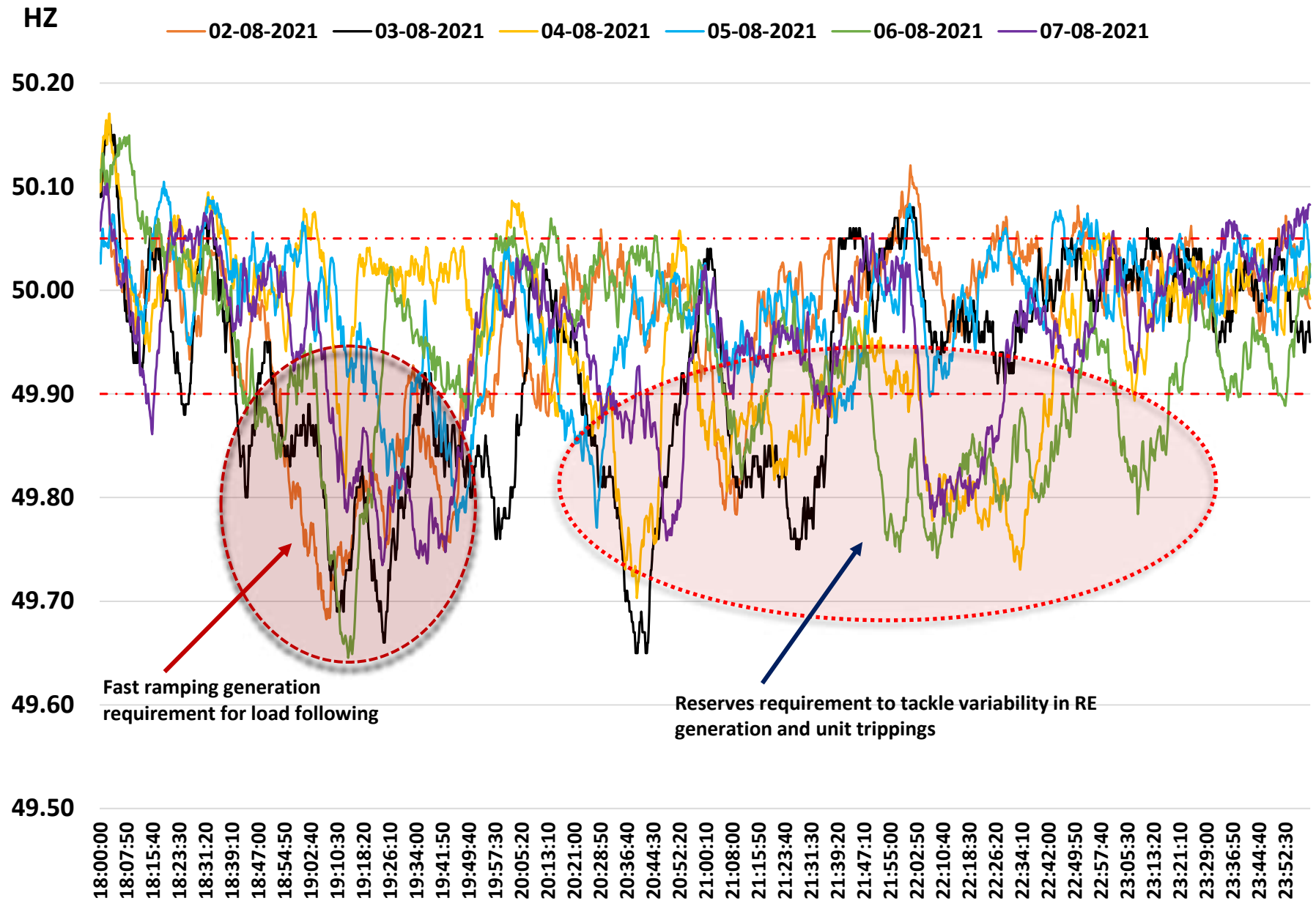


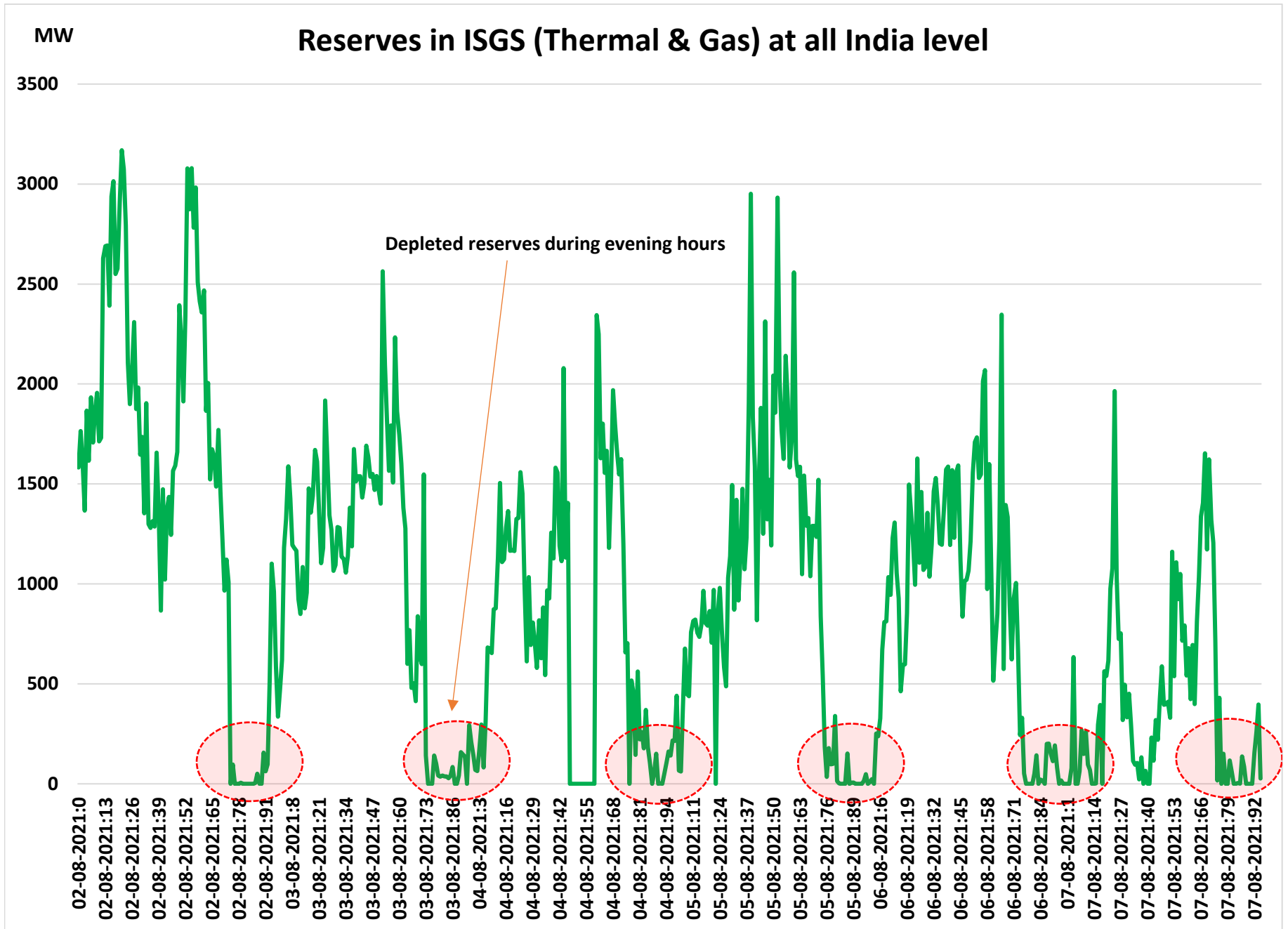
(R K Porwal) 08/08/21

Enclosures: Annexure-I to IV.



### Frequency profile during night hours for dt. 02/08/21 to 07/08/21

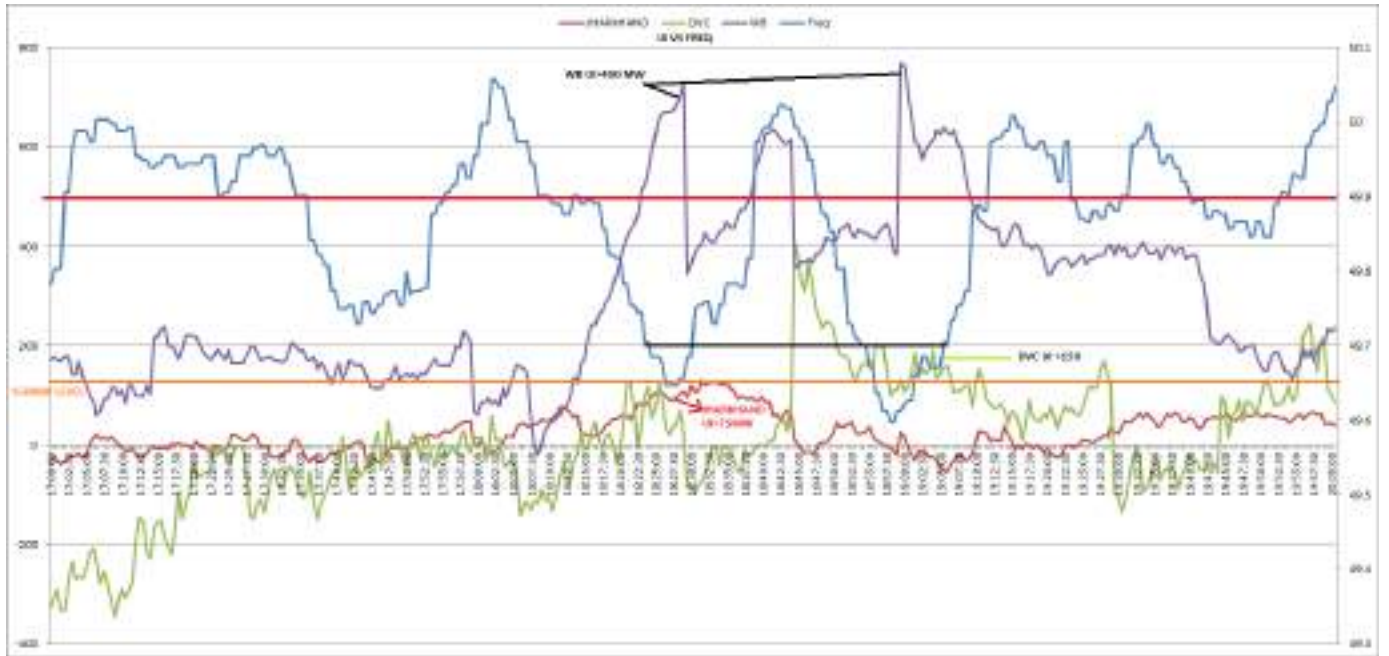




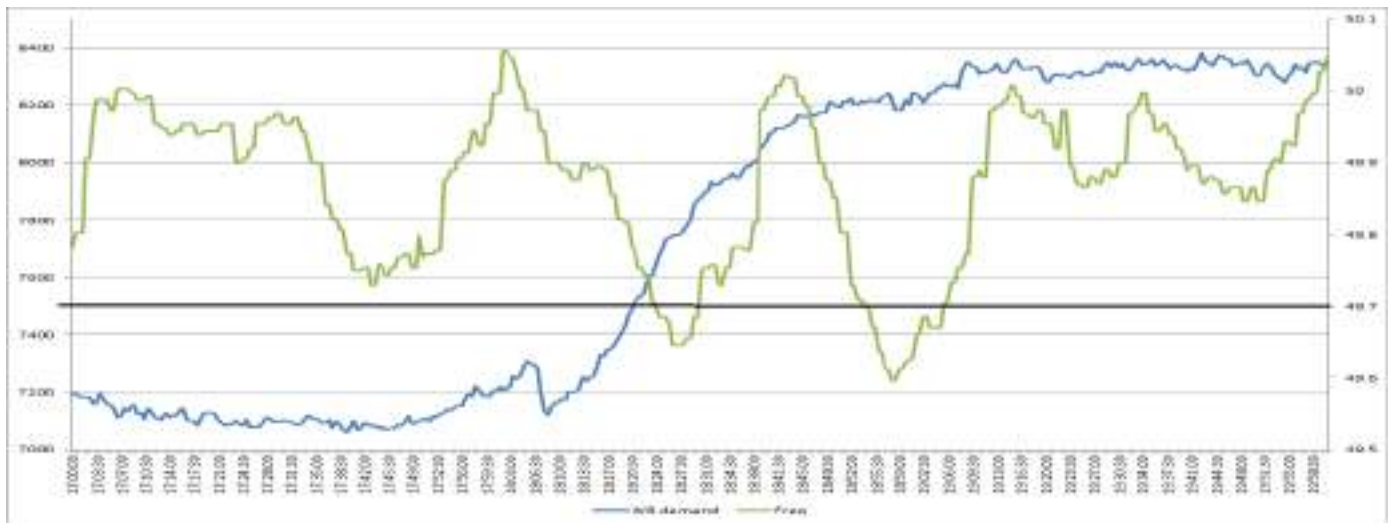


## Annexure-IV

Forced outage unit details at all India level from 1800 to 2400 hrs of 03/08/21 to 08/08/21										
S.No	Station	State	Agency	Unit No	Capacity	Reason(s)	Outage		Revival	
					MW		Date	Time	Date	Time
<b>03rd August 2021</b>										
1	KOTHAGUDEM TPS	TELANGANA	TELANGANA	10	250	TURBINE BEARING VIBRATION HIGH	03-08-2021	17:44	04-08-2021	23:12
2	NABINAGAR(BRBCL)	BIHAR	NTPC	1	250	Due to tripping of ID Fan.	03-08-2021	23:50	06-08-2021	06:05
<b>Total</b>					<b>500</b>					
<b>4th August 2021</b>										
1	Suratgarh SCTPS	RAJASTHAN	RRVPL	7	660	EVAPORATOR METAL TUBE TEMP. HIGH	04-08-2021	17:01	05-08-2021	01:53
2	NNTPS	TAMILNADU	NEYVELI	2	500	REHEATER PROBLEM	04-08-2021	17:04		
3	SASAN	MADHYA PRADESH	SASAN_UMPP (SPL)	4	660	BTL	04-08-2021	21:04	06-08-2021	03:35
4	LARA	CHHATTISGARH	NTPC	1	800	trippng of boiler on ECO flow low	04-08-2021	21:05	05-08-2021	01:33
5	Bara PPGCL TPS	UP	UPPTCLJPVL	3	660	furnace draft fluctuation	04-08-2021	21:19	-	
6	VSTPS III	MADHYA PRADESH	NTPC	1	500	Withdrawn on BTL	04-08-2021	22:00	-	
7	RAMAGUNDAM	TELANGANA	NTPC_RSTPS	4	500	BOILER TUBE LEAKAGE	04-08-2021	22:08	06-08-2021	02:34
8	APML TIRODA	MAHARASHTRA	ATIL-Adani	5	660	APH-B gearbox abnormal sound	04-08-2021	23:52	07-08-2021	10:20
<b>Total</b>					<b>4940</b>					
<b>5th August 2021</b>										
3	Lalitpur TPS	UP	UPPTCL,LPGL	2	660	Boiler tube leakage	05-08-2021	18:50	07-08-2021	17:00
4	OPGC3	ODISHA	OPGC	3	660	Lube Oil pressure low	05-08-2021	19:18	07-08-2021	21:08
5	URAN A0	MAHARASHTRA	Maharashtra	1	120	APM Gas shortage	05-08-2021	20:02		
6	URAN	MAHARASHTRA	Maharashtra	5	108	gas shortage	05-08-2021	20:02		
7	TROMBAY	MAHARASHTRA	Maharashtra	7	180	APM Gas shortage	05-08-2021	22:39		
8	Rihand-II STPS	UP	NTPC	1	500	Turbine Problem turbine governing problem	05-08-2021	23:04	06-08-2021	15:15
9	ISTPP (Jhajjar)	HARYANA	APCPL	3	500	Electrical Fault.	05-08-2021	23:16	06-08-2021	04:12
<b>Total</b>					<b>2728</b>					
<b>6th August 2021</b>										
7	TALCHER ST2	ODISHA	NTPC	5	500	BTL	06-08-2021	21:40		
8	SASAN	MADHYA PRADESH	SASAN_UMPP (SPL)	2	660	BTL	06-08-2021	22:32	08-08-2021	06:00
9	Gandhar - UNIT GT1	GUJARAT	NTPC	1	144.3	Tripped due to PRD operation	06-08-2021	22:35	-	
10	KHARGONE	MADHYA PRADESH	NTPC	2	660	Withdrawn due to leakage developed in raw water makeup line #2.	06-08-2021	23:00	-	
<b>Total</b>					<b>1964.3</b>					
<b>7th August 2021</b>										
12	UKAI	GUJARAT	Gujarat	3	200	BTL	07-08-2021	18:00	-	
13	KLTPS	GUJARAT	Gujarat	3	75	Super heater problem	07-08-2021	18:30	-	
14	DGBP 3	GUJARAT	Gujarat	1	375	HRSG Valve problem	07-08-2021	19:30	-	
15	NASIK	MAHARASHTRA	Maharashtra	5	210	Withdrawn on BTL	07-08-2021	20:45	-	
16	KOTHAGUDEM TPS	TELANGANA	TELANGANA	12	800	ELECTRICAL PROTECTION	07-08-2021	21:59	08-08-2021	12:38
17	Dadri-I TPS	DELHI	NTPC	4	210	Turbine Problem	07-08-2021	22:30	08-08-2021	03:55
18	MPL	JHARKHAND	MPL	1	525	Exciter rotor balancing problem	07-08-2021	23:03		
19	Kota TPS	RAJASTHAN	RRVPL	1	110	DUE TO DRUM LEVEL LOW	07-08-2021	23:21	08-08-2021	09:57
<b>Total</b>					<b>2505</b>					
<b>8th August 2021</b>										
4	JP BINA	MADHYA PRADESH	Madhya Pradesh	2	250	Tripped on electrical fault	08-08-2021	18:48	-	
5	Singrauli STPS	UP	NTPC	2	200	Boiler tube leakage Boiler Tube leakage in Water Wall area	08-08-2021	20:53	-	
6	Kishenganga	J&K	NHPC	1	110	Due to Nozzle problem	08-08-2021	21:00	-	
7	RAICHUR TPS	KARNATAKA	KPCL	8	250	LOSS OF OIL	08-08-2021	22:02		
8	Bairasiul HPS	HP	NHPC	1	60	Due to high silt content .	08-08-2021	22:23	-	
9	Bairasiul HPS	HP	NHPC	2	60	Due to high silt content .	08-08-2021	22:40	-	
10	KORADI	MAHARASHTRA	Maharashtra	8	660	Generator protefction operated..	08-08-2021	22:58	-	
<b>Total</b>					<b>1590</b>					



**WB DEMAND**



## DVC DEMAND



## JHARKHAND DEMAND



## List of Existing Feeders identified

**LIST OF FEEDERS IDENTIFIED TO BE DISCONNECTED UNDER RLDC INSTRUCTION, TO CONTROL OVERDRAWAL OF THE CONCERNED STATE****WB System**

Priority	Feeders/ICTs	Point of Disconnection
1	220 kV Dalkohla (PG)-Dalkohla(WB)	220 kV Dalkohla-PG
2	132 kV Malda (PG)-Malda(WB)	132 kV Malda-PG
3	132 kV Birpara(PG)-Birpara (WB)	132 kV Birpara(PG)

**Odisha System**

Priority	Feeders/ICTs	Point of Disconnection
1	220 kV Rengali(PG)-Rengali(OPTCL)	220 kV Rengali-PG
2	220/132 kV Baripada 160 MVA ICT	220 kV Baripada-PG
3	220 kV Baripada (PG)-Balsore (Odisha)	220 kV Baripada-PG

Intra-state Feeders	Remarks
132kV Bolangir(New)-Patnagarh S/C	
132kV Bhanjanagar-Phulbeni S/C	
132kV Chandaka-Nimapara / Ranasighpur	
132kV Baripada(PG)-Jaleswar/Bhograi	
132kV Jajpur Rd. – Kendrapara D/C	

DVC System (feeders identified are at 33kV)

List of Sheddable Feeders of DVC

SUBSTN	NAME OF THE CONSUMER	Category	Rev. CD in MVA
Barhi	JSEB Barhi	JSEB	30.0
BTPS-A	JSEB Bokaro	JSEB	24.0
CTPS	JSEB Chas	JSEB	20.0
Konar	JSEB Konar Banaso	JSEB	10.0
Kumardubi	JSEB Mugma	JSEB	22.0
Girdih	JSEB Girdih	JSEB	55.0
Patherdih	JSEB Digwadih	JSEB	17.0
Patherdih	JSEB Gobindpur	JSEB	40.0
Putki	JSEB Ganeshpur	JSEB	35.0
Putki	JSEB Jamadoba	JSEB	13.0
Barhi	JSEB Padma PSS RGGVY	JSEB	18.0
CTPS	JSEB Dugdha	JSEB	25.0
Ramgarh	JSEB Ramgarh	JSEB	80.0
Konar	JSEB Kama PSS RGGVY	JSEB	3.0
Kumardubi	JSEB Kumardubi	JSEB	9.0
Nimiaghat	JSEB Dumri Banaso	JSEB	40.0
Patherdih	JSEB Mukunda	JSEB	13.0
Putki	JSEB Katras (Tilatand)	JSEB	17.0
Patherdih	PMCH Medical College	JSEB	9.0
Ramgarh	JSEB West Bokaro ( Ghato)	JSEB	1.5
Sindri	JSEB Sindri	JSEB	9.0
Biada	JSEB Biada-Chas	JSEB	15.0
Putki	JSEB Katras(Sijua)	JSEB	2.5
Putki	JSEB Sendra Bansjora	JSEB	4.0
CTPS	JSEB Jainamore	JSEB	22.0
Maithon R/B	JSEB Badjna	JSEB	18.0
Belmuri	WBSEB Belmuri	WBSEB	25.00
Burdwan	WBSEB Burdwan	WBSEB	48.00
Kalpahari	WBSEB Kanyapur	WBSEB	29.00
Kalpahari	WBSEB Luchipur	WBSEB	25.00
Maithon L/B	WBSEB Dendua	WBSEB	10.00
Maithon L/B	WBSEB Kalyaneswary	WBSEB	1.00
MTPS	WBSEB Borjora	WBSEB	10.00
Patherdih	WBSEB Santhaldih	WBSEB	0.80
Jamuria	WBSEDCL Jamuria	WBSEB	20.0

## JUSNL System

Priority Feeders/ICTs		Point of Disconnection
1	One 400/220 kV 315 MVA ICT Jamsedpur	400 kV Jamsedpur
2	220 kV Ranchi(PG)-Chandil(JUVNL)	220 kV Ranchi-PG
Intra-state Feeders		Remarks
132kV Chandil – Golmuri D/C		
132kV Dumka-Pakur S/C		

## BSPTCL System

Priority Feeders/ICTs		Point of Disconnection
1	132kV Banka(PG)-Banka D/C line	132kV Banka PG
2	132kV Banka(PG)-Sultanganj D/C	132kV Banka PG
3	132kV Ara(PG)-Jagdishpur S/C line	132 kV Ara PG



## List of Tie lines

<b>West Bengal</b>				
	<b>Tie-Line</b>	<b>Area Supplied</b>	<b>Quantum (MW)</b>	<b>Alternate Source</b>
1	220 KV Dalkhola-Dalkhola D/c	Islampur, Raiganj	190	Gazole, TCF, Baisi
2	132 KV Birpara-Birpara D/c	Birpara, Nagrakata, Banarhat, Hamiltanganj	155	NJP, Alipurduar
3	132 KV Malda-Malda D/c	Malda, Khejuria	150	Gazole
4	220 KV DalkholaGazole D/c	Samsi, Balurghat, Harischandrapur	200	Malda
5	220 KV Malda-Gazole D/c			Dalkhola
6	220 KV Alipurduar-Alipurduar D/c	Coochbehar, Dinhata, Mathabhanga	120	Birpara, NJP
7	220 KV Siliguri-NJP D/c	Moinaguri, Ujanoo	115	TLDP
8	220 KV Rajarhat-NewTown D/c	NewTown, Basirhat, AshokNagar	400	KLC, Subhashgram
9	220 KV Subhashgram-KLC Bantala S/c	SaltLake	115	NewTown
10	220 KV Subhashgram-Subhashgram D/c	Lakhikantpur, joka, Kakdeep	460	Kasba
11	132 KV Siliguri-Kurseong	Kurseong	12	Rangit
12	132 KV Siliguri-NBU	NBU, Lebong	35	Rammam, NJP
13	66 KV Kalimpong-Melli	Kalimpong	10	Chalsa (NJP)
<b>DVC</b>				
1	220 KV Durgapur-Parulia D/c	Tamla, Muchipara, DSP	240	DSTPS
3	220 KV Maithon-Dhanbad D/c	Dhanbad, Putki, Patherdih	120	CTPS, Koderma
4	220 KV Joda-Jindal-Jamshedpur	Mosabani, Kharagpur	150	Bokaro
<b>Odisha</b>				
1	220 KV Baripada-Balasore	Balasore, Basta, Soro, Udala, Industrial load of Birla Tyres, Ispat Alloys	90	Duburi, Bhadrak
2	132 KV Baripada-Baripada	Baripada, Betanati	55	Balasore
3	132 KV Baripada-Jaleshwar	Jaleshwar	25	Balasore
4	132 KV Baripada-Bhograi	Bhograi	15	Jaleshwar
5	220 KV Joda-Jindal-Jamshedpur	Industrial loads, JSPL	145	TTPS
6	220 KV Joda-Ramchandrapur			TTPS
<b>Bihar</b>				



1	220 KV Darbhanga DMTCL-Darbhanga	Darbhanga, Samastipura, Gangaura, Shiso	220	Musari
2	132 KV Motihari DMTCL-Motihari D/c	Motihari-Dhaka, Jivdhara	80	Motipur, Bettiah
3	132 KV Motihari DMTCL Raxaul D/c	Raxaul, Parwanipur	45	Bettiah
4	132 KV Motihari-Bettiah D/c	Bettiah, Ramnagar, Majhulia	120	
5	220 KV Chandauti-Sonenagar	Sonenagar, Rafiganj, Aurangabad	130	Gaya, Dehri (132 KV)
6	132 KV Banka-Banka D/c	Banka	60	Jamui
7	132 KV Banka-Sabour D/c	Sabour, Jagdishpur	30	New Sabour
8	132 KV Banka-Sultanganj D/c	Sultanganj, Tarapur, Deoghar	75	Lakhisarai
9	132 KV Kahalgaon NTPC-Sabour	Sabour	35	New Sabour
10	132 KV Kahalgaon NTPC-Kahalgaon	Kahalgaon	30	New Sabour
11	132 KV Lakhisarai-Lakhisarai D/c	Lakhisarai	50	New Sabour, Jamalpur
12	132 KV Lakhisarai-Jamui D/c	Jamui, Jhajha	60	Seikhpura, Banka
13	132 KV Purnea-Purnea T/c	Forbisganj, Damdaha, Banmankhi	110	Khagaria
14	132 KV Purnea-Barsoi	Barsoi	25	Kishanganj
15	220 KV New Purnea-Madhepura D/c	Madhepura, Supaul, Kataiya, Phulparas	110	Laukahi
16	220 KV Kishanganj-Kishanganj Q/c	Kishanganj, Araria	280	Madhepura
17	132 KV Arrah-Arrah	Arrah	80	Jagdishpur
18	132 KV Arrah-Dumraon	Dumraon, Buxar	45	Dumraon New
19	132 KV Arrah-Jagdishpur	Jagdishpur	30	Arrah
20	132 KV Sitamarhi-Runnisaipur D/c	Runnisaipur	40	Mushari
<b>Jharkhand</b>				
1	220 KV Maithon-Dumka	Dumka, Govindpur, Jasidih, Giridih	340	Lalmatia-Godda
2	220 KV Jamshedpur-Ramchandrapur T/c	Jamshedpur, Adityapur, Golmuri	130	Chandil, Joda, Chaibasa
3	220 KV Joda-Ramchandrapur			Jamshedpur
4	220 KV Chaibasa-Chaibasa D/c	Chaibasa, Manoharpur	100	Ramchandrapur
5	220 KV Ranchi-Chandil	Chandil, Tamar, Khunti	60	Santaldih, Ramchandrapur
6	220 KV Ranchi-Hatia T/c	Ranchi, Namkum, Gumla, Lohardaga	250	Patratu
7	220 KV Daltongunj-Daltongunj D/c	Daltongunj, Latehar	70	Hatia
8	220 KV Daltongunj-New Garhwa	Garhwa	40	Rihand-Nagaruntari
9	132 KV Kahalgaon NTPC-Lalmatia	Lalmatia	30	Godda, Dumka

10	132 KV Kahalgaon BSEB-Lalmatia	Sahebganj	35	Godda, Dumka
11	220 KV FSTPP-Lalmatia	Rajmahal, pakur	30	Godda, Dumka
12	132 KV Deoghar-Sultanganj	Deoghar, Chitra	40	Jaisidih
13	132 KV Joda-Kendposhi	Noamundi	15	Chandil
<b>Sikkim</b>				
1	66 KV Gangtok-Sherathang		15	All radial
2	66 KV Gangtok-Bulbuley		12	
3	66 KV Gangtok-Tadong		15	
4	66 KV Gangtok-LLHP		10	
5	66 KV Rangit-Rabangla		4	

पावर सिस्टम ऑपरेशन कारपोरेशन लिमिटेड

(भारत सरकार का उद्यम)

**POWER SYSTEM OPERATION CORPORATION LIMITED**

(A Government of India Enterprise)



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Date: 05-08-2021

## Report on primary frequency response observed in the generating units of Eastern Region for July 2021 (July 2021 के लिए पूर्वी क्षेत्र के विधुत इकाइयों पर प्राथमिक आवृत्ति प्रतिक्रिया पर रिपोर्ट)

Frequency response characteristics (FRC) have been analyzed pan India for two events of sudden frequency change that occurred in the month of July 2021. The details of these events and the overall response of the Eastern region have been summarized in Table 1.

**Table 1: Summary of the events and Frequency Response Characteristic (FRC) of the Eastern Region for the events**

Event	Frequency Change	ER FRC
Event 1: On 20 <sup>th</sup> July 2021 at 10:25:02 Hrs, 1550 MW generation loss at Akal in NR.	50.07 Hz to 49.93 Hz. Later stabilized at 50.03 Hz.	45 %
Event 2: On 22 <sup>nd</sup> July 2021 at 15:08:16 Hrs, 1400 MW generation loss at UPCL in SR	49.99 Hz to 49.86 Hz. Later stabilized at 49.94 Hz.	39 %

Analysis of Frequency Events is provided below and covers the following aspects :

1. Non Sharing of **generation end data (generation output in MW and frequency/speed measured at generator end) and FRCs** despite of repeated reminders to generating stations and **SLDCs**. List of regional generating stations/SLDCs from which generation end data/FRC yet to be received is shown in table 2.
2. Based on data received from generating stations & SLDCs and SCADA data archived at ERLDC, regional generating stations and state control areas performance have been analyzed and summarized in table 3.
3. Based on data received from generating stations & SLDCs, the performance of state generating stations has been analyzed and summarized in table 4.

**Table 2: List of regional generating stations/SLDCs from which generation end data/FRC yet to be received (as per status on 04<sup>th</sup> August 2021)**

Generating Station/ SLDC	Event 1	Event 2
NTPC Kahalgaon	Yet to be received	Yet to be received
GMR	Yet to be received	Data received
Bihar SLDC	Yet to be received	Yet to be received

Jharkhand SLDC	Yet to be received	Yet to be received
WB SLDC	Yet to be received	Yet to be received

**Table 3: performance of regional generating stations and state control areas for the events in July 2021\***

Generating Station/ SLDC	Event 1	Event 2
NTPC Farakka	<b>Satisfactory for unit 3, 5 &amp; 6. Non satisfactory for unit 2 &amp; 4.</b> Unit 1 was not in service. Response from unit 2 & 3 started to decrease after initial response.	<b>Satisfactory for unit 3, 4 &amp; 6. Non satisfactory for unit 5. No response has been observed for unit 2.</b> Unit 1 was not in service. Response from all units did not sustain for longer period.
NTPC Kahalgaon	<b>Non satisfactory for stage 1; Satisfactory for stage 2</b> (As per FRC calculated based on ERLDC SCADA data)	<b>Satisfactory</b> (As per FRC calculated based on ERLDC SCADA data)
NTPC Talcher	<b>Non satisfactory for unit 1, 2 &amp; 4. Satisfactory for unit 5 &amp; 6.</b> But response was sluggish and time taken to provide full response was very high. Unit 3 was not in service.	<b>Non satisfactory for unit 1. Satisfactory for unit 4, 5 &amp; 6.</b> Unit 2 & 3 was not in service.
NTPC Barh	<b>Non satisfactory.</b> For unit 5, response started to decrease after initial response.	<b>Non satisfactory.</b> Response did not sustain for longer time.
NTPC Darlipalli	<b>Non satisfactory</b> response observed. Response did not sustain for more than 10 seconds.	<b>Non satisfactory</b> response observed. Response did not sustain for more than 10 seconds.
BRBCL	<b>Satisfactory;</b> Unit 1 & 3 were not in service.	<b>Non Satisfactory</b> for unit 2. Satisfactory for unit 1. Unit 3 was not in service
NPGC Nabinagar	<b>Non-Satisfactory,</b> response did not sustain for more than 2 min. Another response observed after 4 min	<b>Non-Satisfactory,</b> response did not sustain for more than 2 min.
GMR	<b>Non-Satisfactory</b> (As per FRC calculated based on ERLDC SCADA data)	<b>Satisfactory for unit 1, Non satisfactory for unit 2</b>
JITPL	<b>Non-Satisfactory</b>	<b>Non-Satisfactory</b>
MPL	<b>Satisfactory;</b> But time taken to provide full response may be reduced.	<b>Non satisfactory for unit 1.</b> RGMO for unit 2 was not in service due to minimum load trial.
Adhunik	<b>Non satisfactory for unit 2;</b> Unit 1 was being revived.	<b>Satisfactory for unit 2;</b> Unit 1 was under PFR testing.
Teesta V HEP	<b>No response for unit 3. Satisfactory response for unit 1 &amp; 2.</b> Time taken to provide response may be reduced.	<b>Non satisfactory</b>
Teesta III HEP	<b>Satisfactory for Unit 3.</b> Unit 2, 5 and 6 did not have margin for primary frequency response. Unit 1 was not in service and unit 4 was being ramped up.	<b>Satisfactory for Unit 3.</b> Other units did not have any margin for PFR response.
Dikchu HEP	No margin was available for PFR due to water spillage condition	No margin was available for PFR due to water spillage condition
Bihar SLDC	<b>Non-Satisfactory</b> (As per FRC calculated based on ERLDC SCADA data)	<b>Non-Satisfactory</b> (As per FRC calculated based on ERLDC SCADA data)

<b>Generating Station/ SLDC</b>	<b>Event 1</b>	<b>Event 2</b>
Jharkhand SLDC	<b>Non-Satisfactory</b> (As per FRC calculated based on ERLDC SCADA data)	<b>Non-Satisfactory</b> (As per FRC calculated based on ERLDC SCADA data)
DVC SLDC	<b>Satisfactory</b>	<b>Satisfactory</b>
GRIDCO SLDC	<b>Non-Satisfactory</b>	<b>Non-Satisfactory</b>
WB SLDC	<b>Non-Satisfactory</b> (As per FRC calculated based on ERLDC SCADA data)	<b>Non-Satisfactory</b> (As per FRC calculated based on ERLDC SCADA data)

\*Response of the generating stations are shown in Annexure 1

**Table 4: performance of state generating stations for the events in July 2021 (Based on data received from SLDC/generating stations) \*\***

<b>Generating Station</b>	<b>Event 1</b>	<b>Event 2</b>
Koderma	<b>Non Satisfactory</b>	<b>No response has been observed</b>
RTPS	<b>Non Satisfactory</b>	<b>No response has been observed</b>
DSTPS (Andal)	<b>Satisfactory</b>	<b>Non Satisfactory</b>
Mejia B	<b>Satisfactory</b>	<b>Satisfactory</b>
Mejia	<b>Satisfactory</b>	<b>Satisfactory; But response is oscillatory</b>
HEL	<b>Satisfactory</b> but response did not sustain for longer duration	<b>Satisfactory</b> but response did not sustain for longer duration
BBGS	<b>Non Satisfactory</b>	<b>Non Satisfactory</b>
GMR TPS (unit 3)	Yet to be received	<b>Satisfactory</b>
Kolaghat	Yet to be received	<b>No response has been observed</b>
Bakreswar	Yet to be received	<b>No response has been observed</b>
Sagardighi	Yet to be received	<b>No response has been observed</b>

\*\*Response of these generating stations are shown in Annexure 2

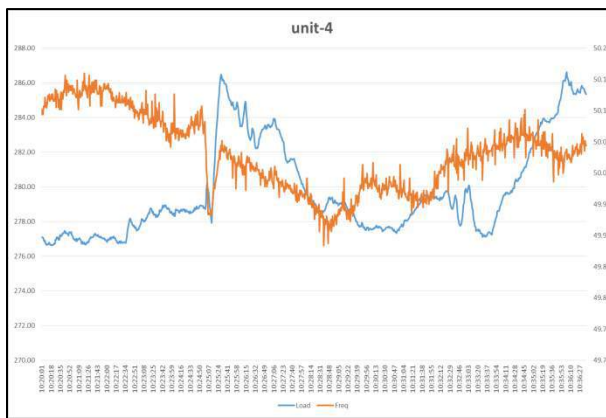
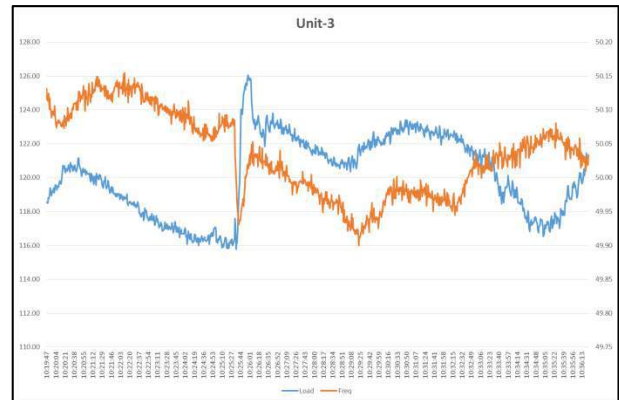
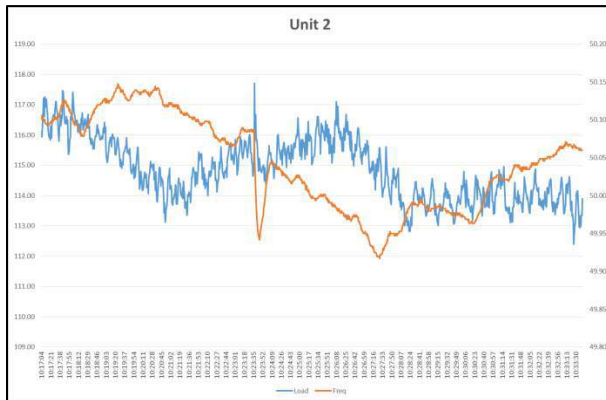
# Annexure 1: Variation of generation of regional generating units during frequency change

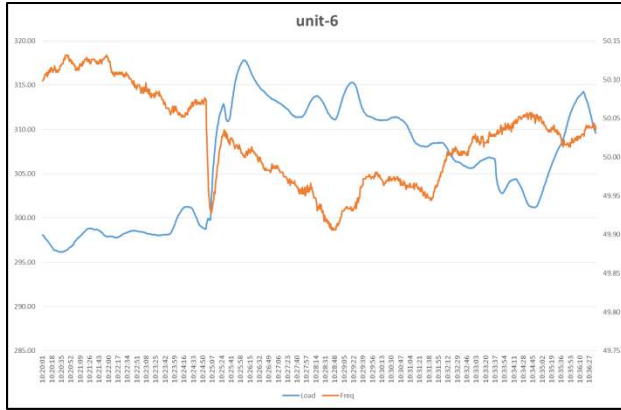
## Farakka STPS

### Event 1

Summary of the response as shared by generating station along with ERLDC's remarks

Unit	Frequency change	Load before Incident	Load after incident	% response	ERLDC's remarks based on response shared
Unit-1	0.14	Unit was not in service			
Unit-2		114	118	70.2	Response was spike in nature. It did not last for more than 10 seconds.
Unit-3		116	126	172.4	Response started to decrease after initial response.
Unit-4		278	286	57.6	Response started to decrease after initial response. Response not satisfactory
Unit-5		281	291	71.2	Response satisfactory
Unit-6		299	318	127.1	Response satisfactory

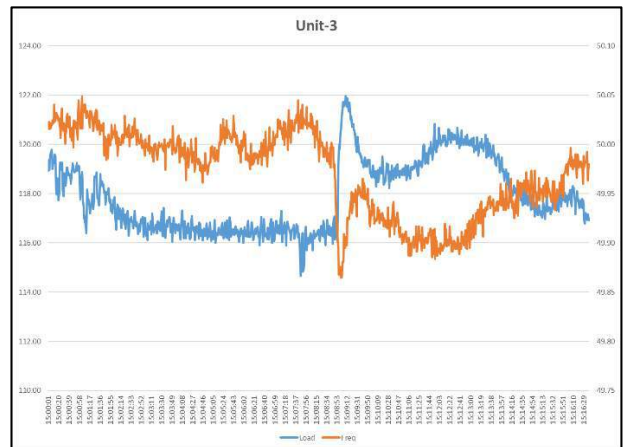
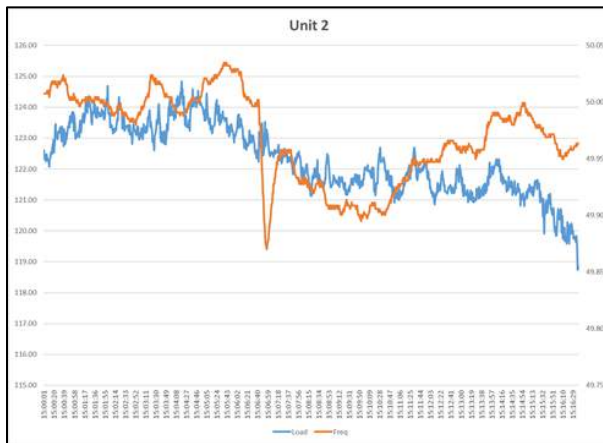




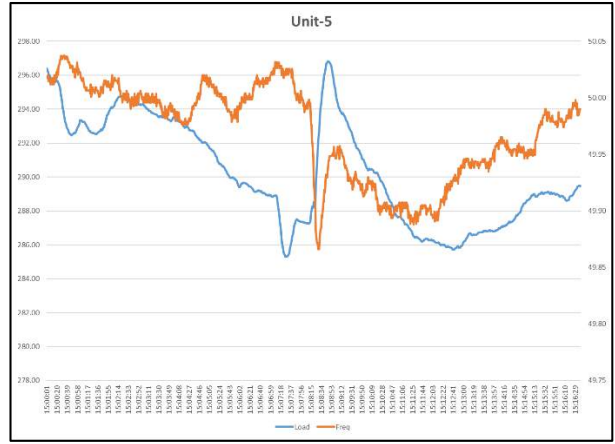
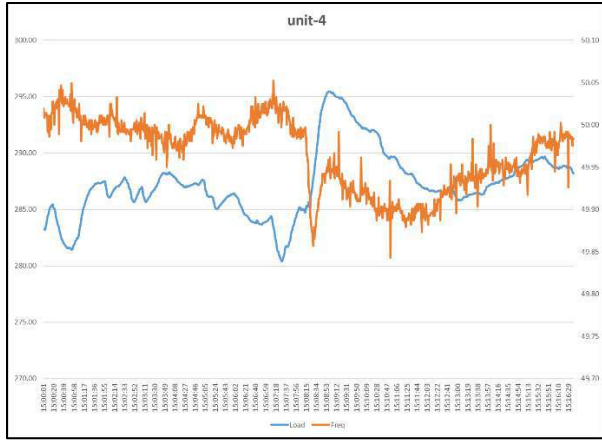
## Event 2

### Summary of the response as shared by generating station along with ERLDC's remarks

Unit	Frequency change	Load before Incident	Load after incident	% response	ERLDC's remarks based on response shared
Unit-1	0.15	Unit was not in service			
Unit-2		122	124	32.8	No response has been observed
Unit-3		116	122	103.4	Response satisfactory; but response withdrawn with improvement of frequency
Unit-4		285	296	77.2	Response satisfactory but did not sustain
Unit-5		287	297	69.7	Response was observed but did not sustain for longer time.
Unit-6		296	309	87.8	Response satisfactory but did not sustain

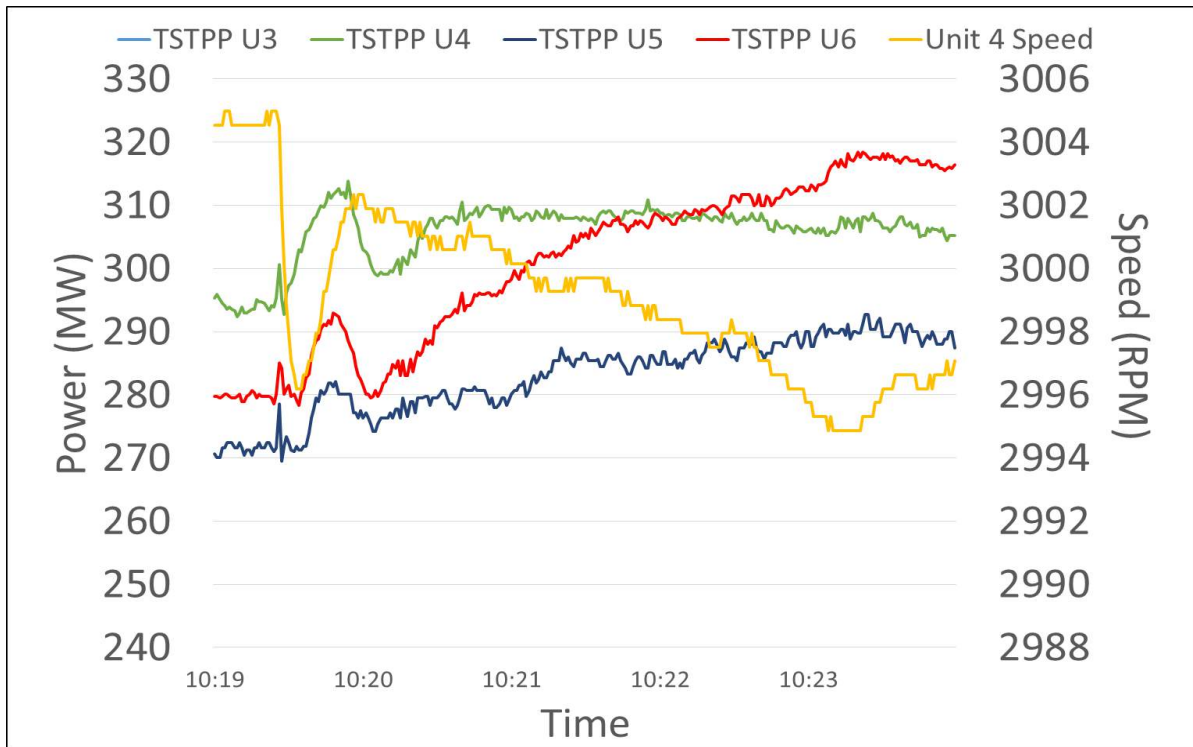
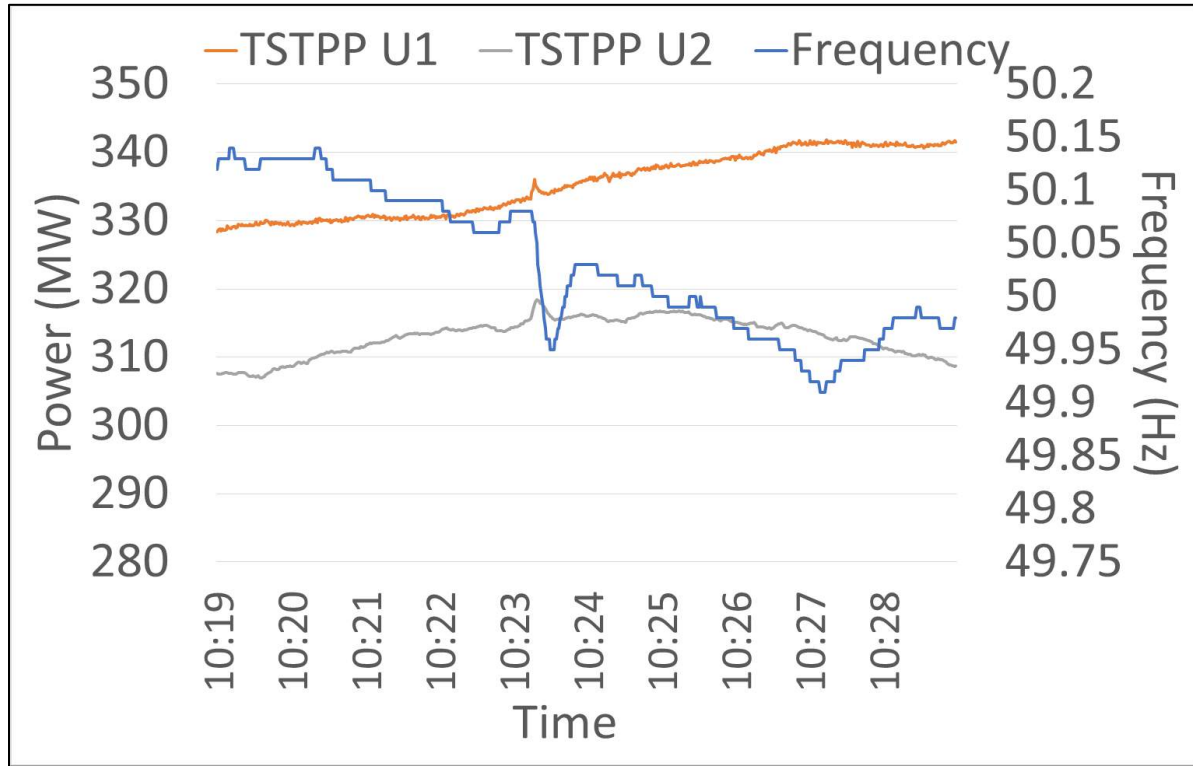




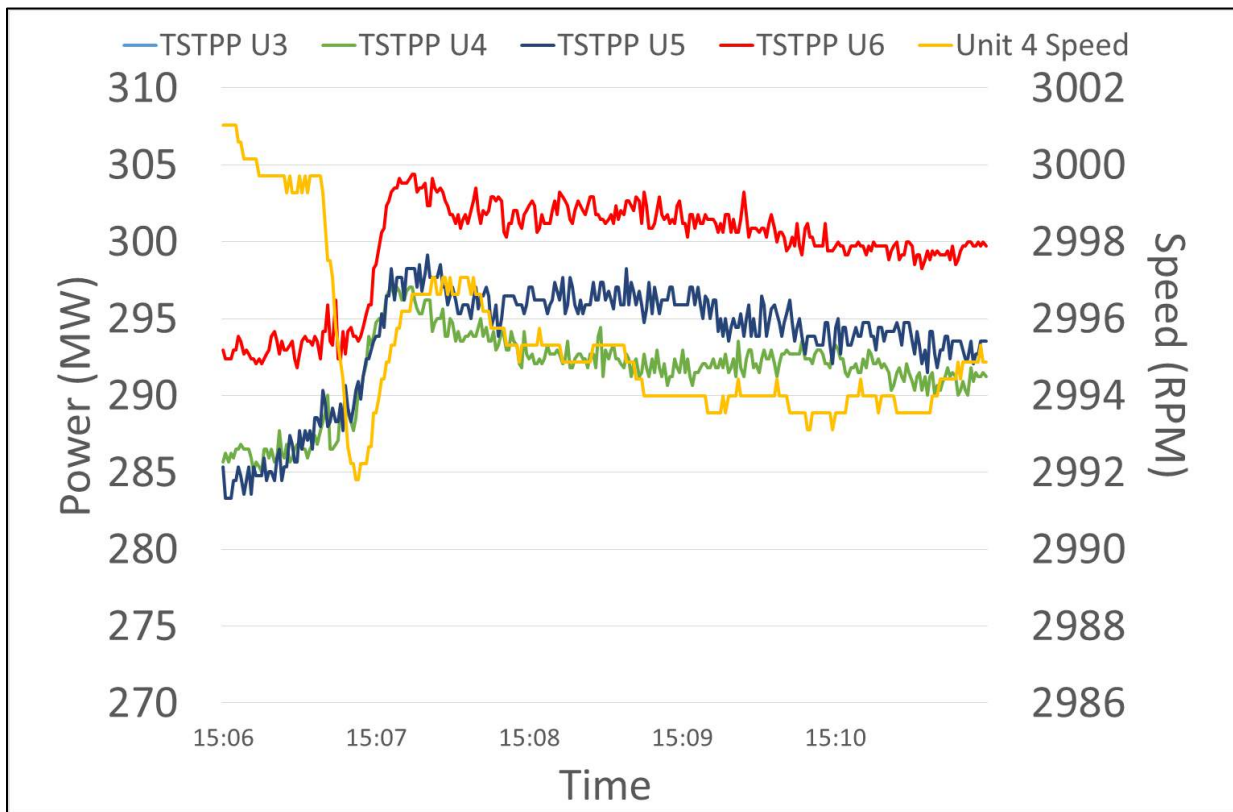
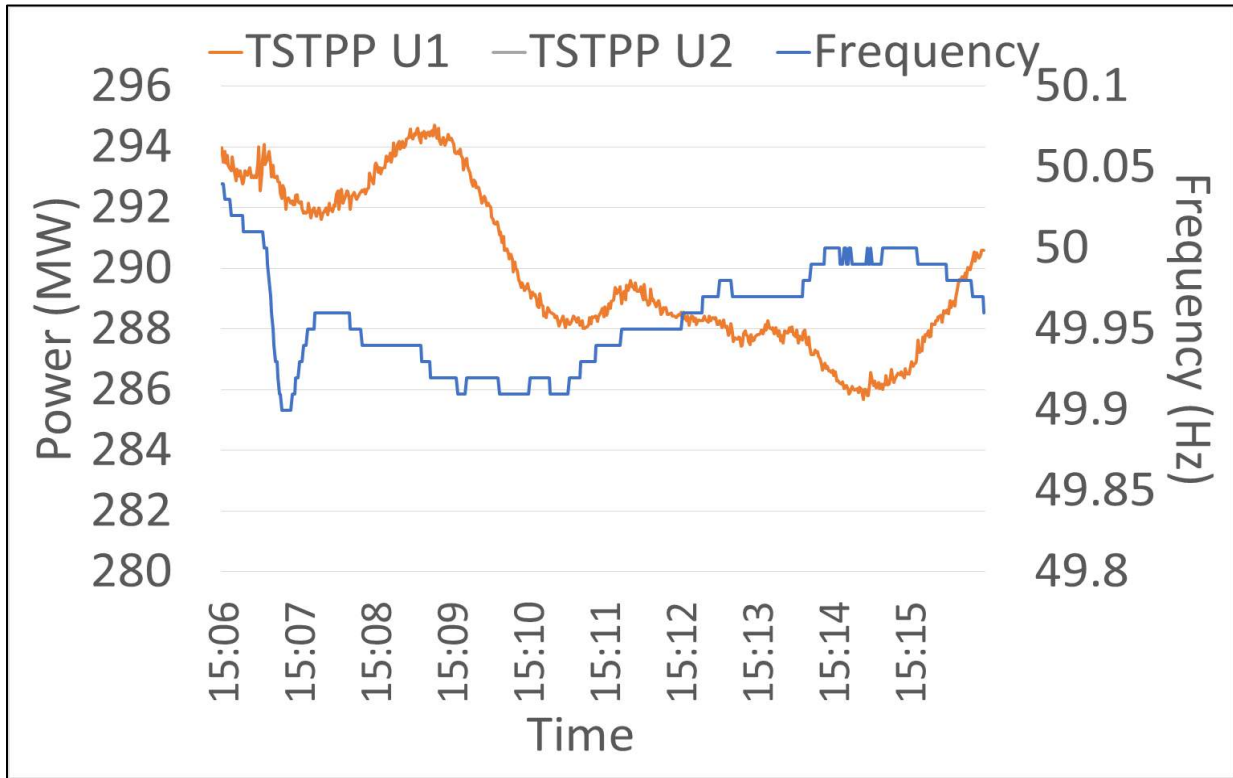


# Talcher STPS

## Event 1

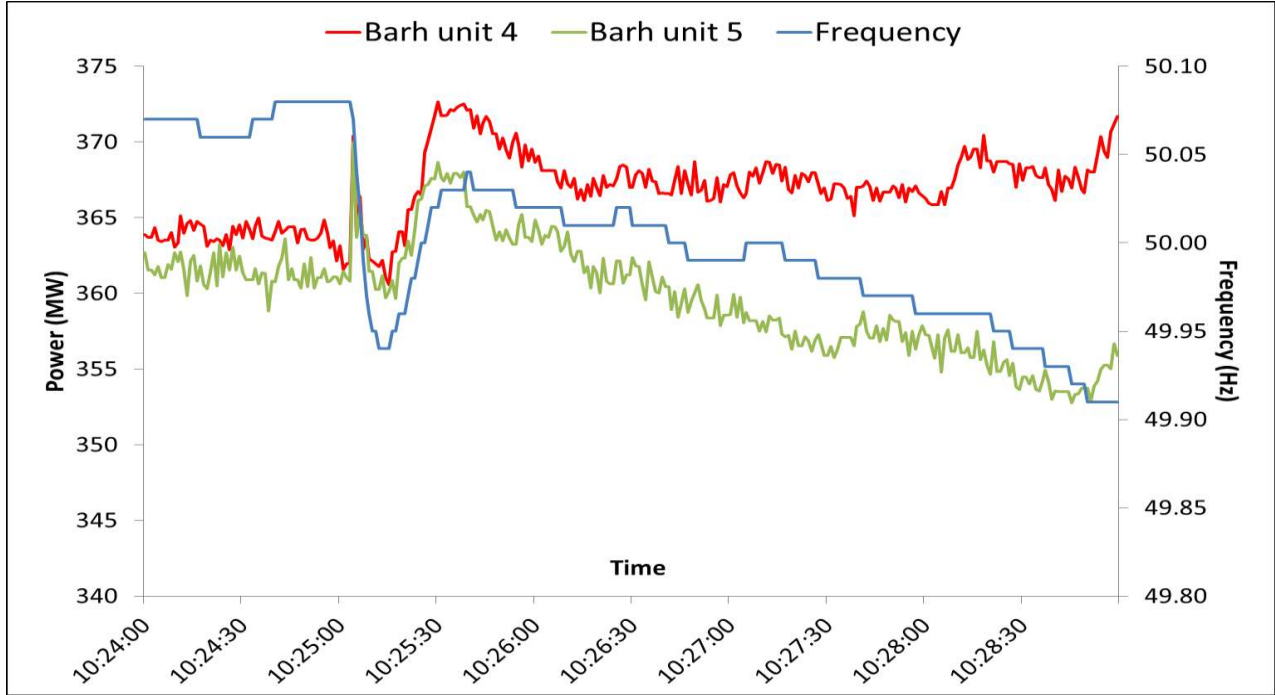


### Event 2

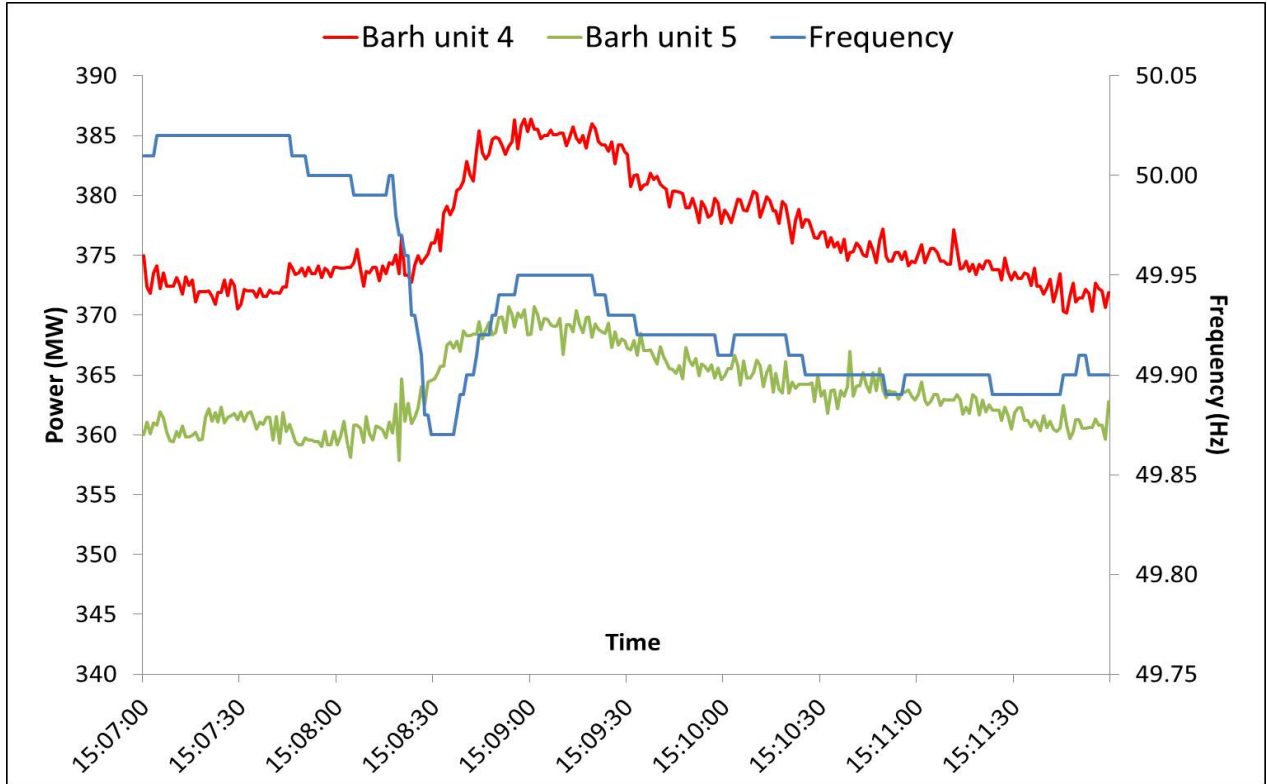


# Barh STPS

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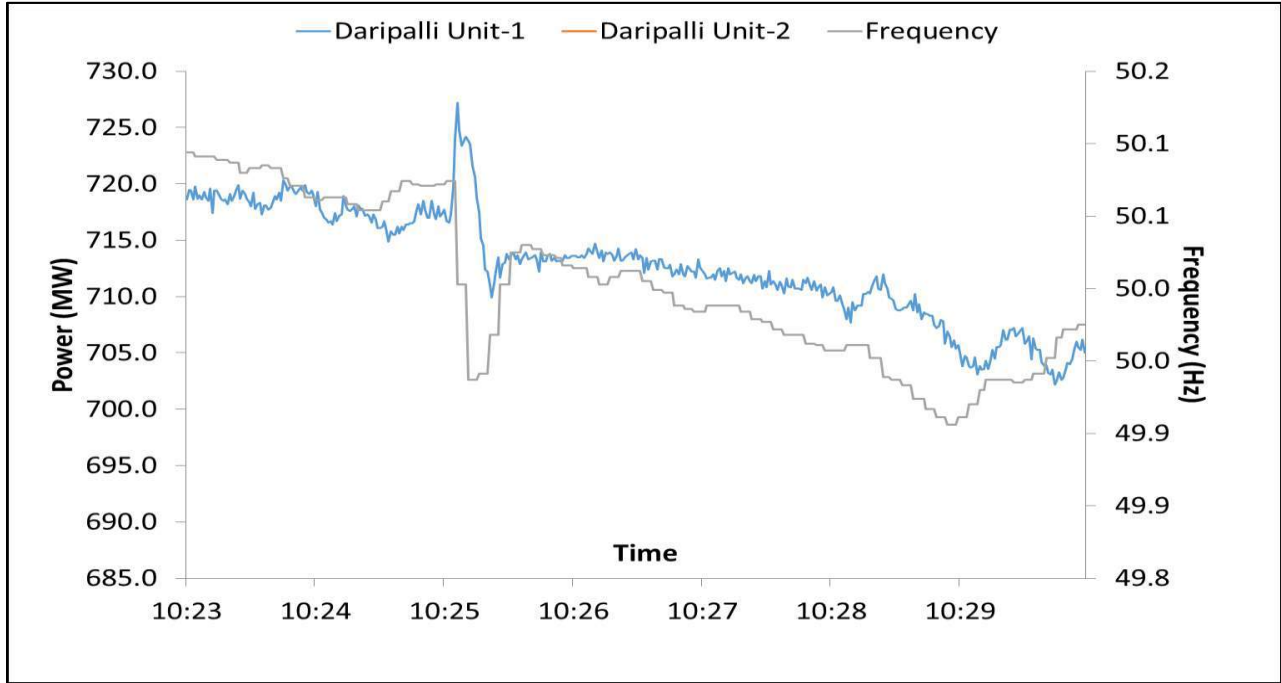


## Event 2

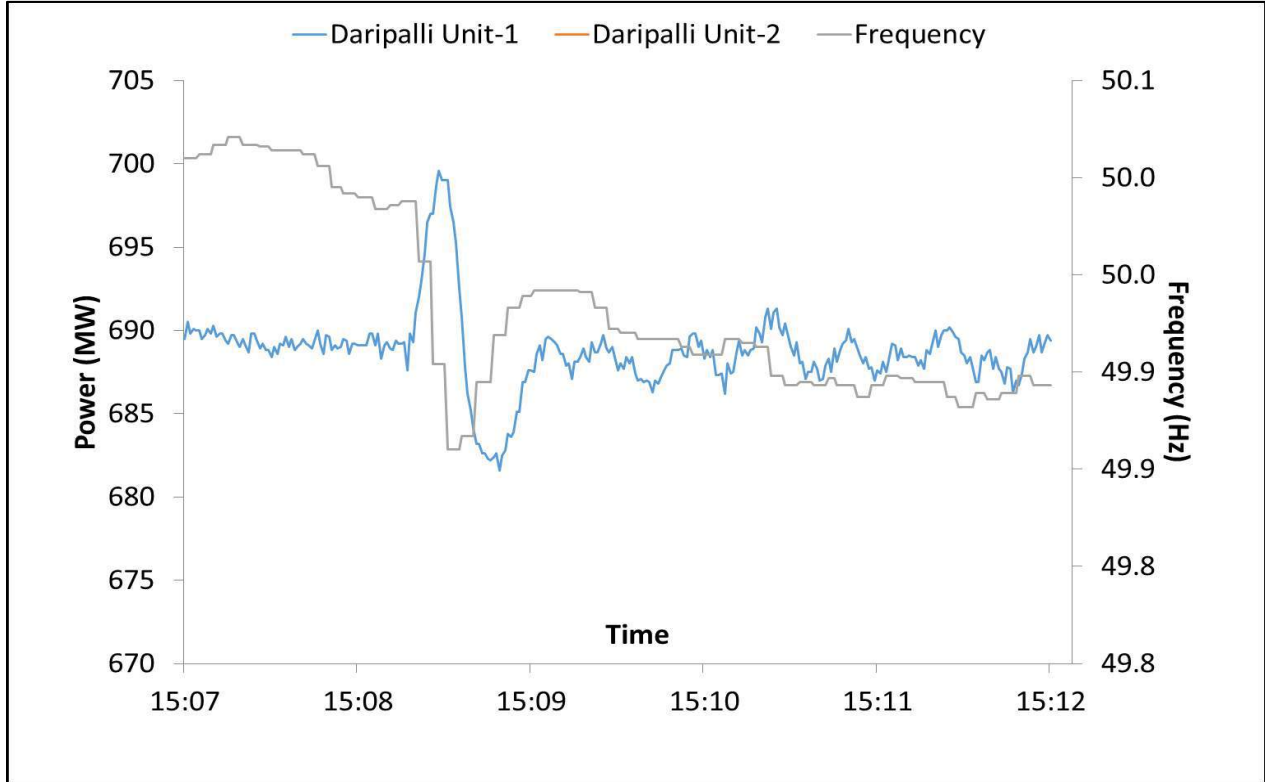


# Daripalli STPS

## Event 1

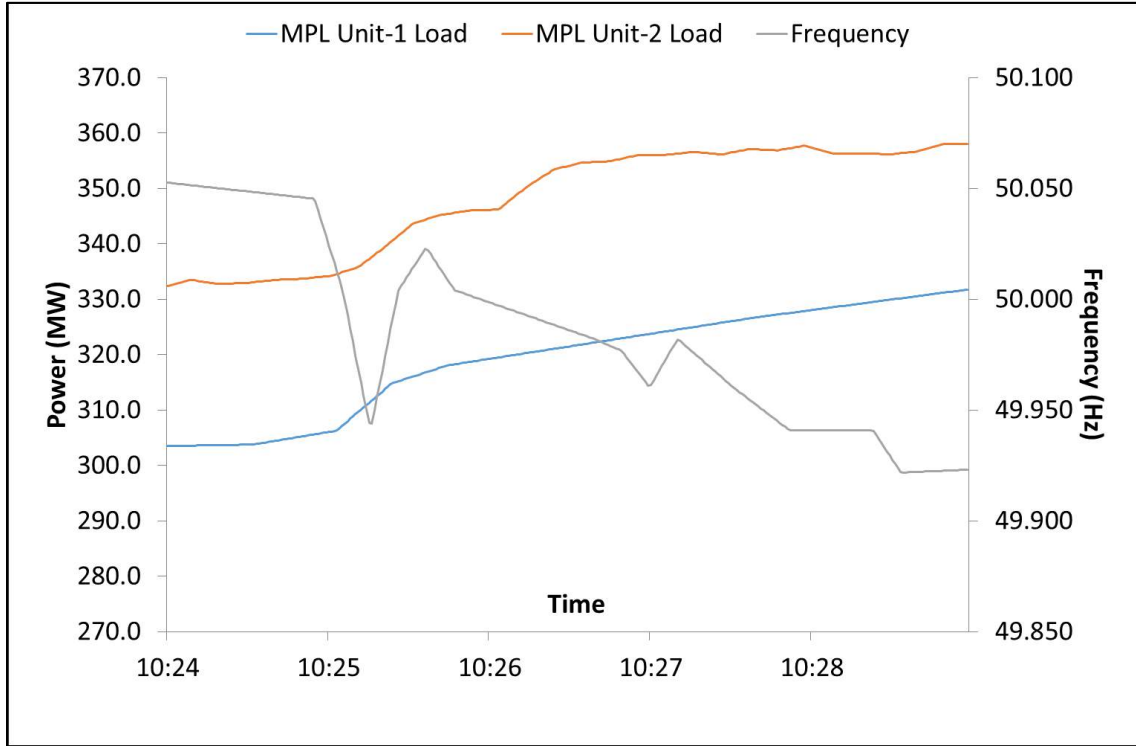


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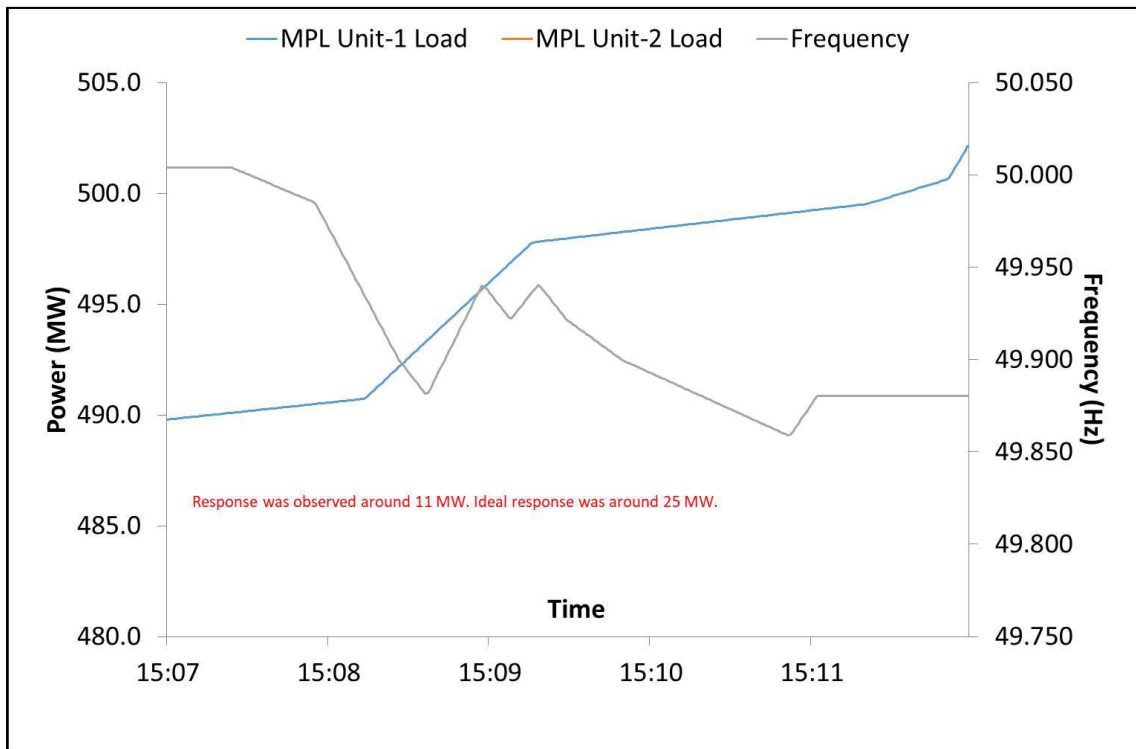


# MPL

## Event 1

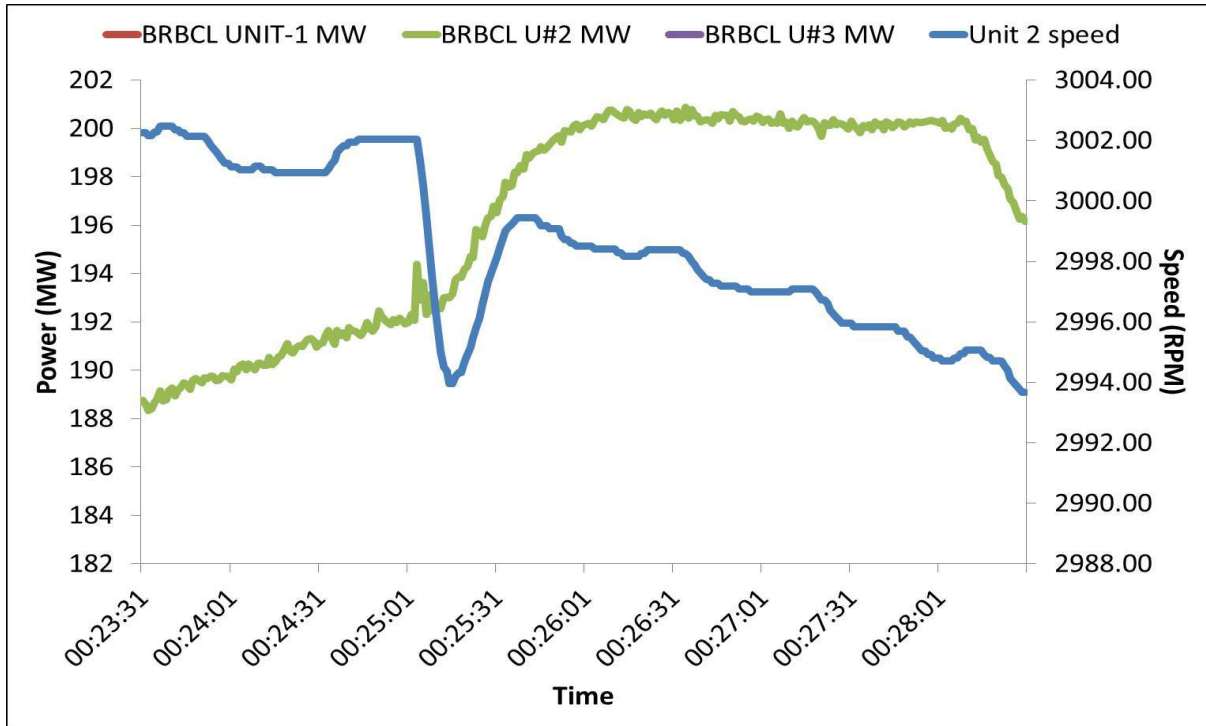


## Event 2

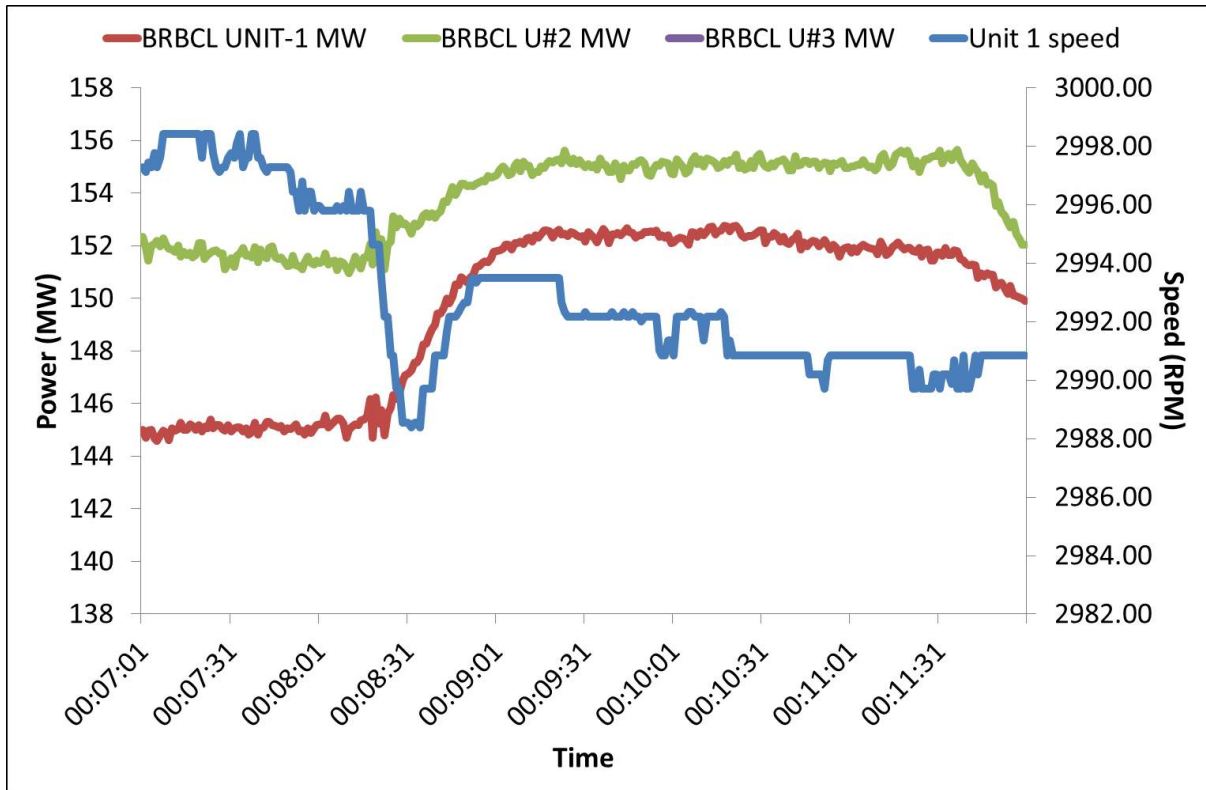


# Nabinagar TPS (BRBCL)

## Event 1



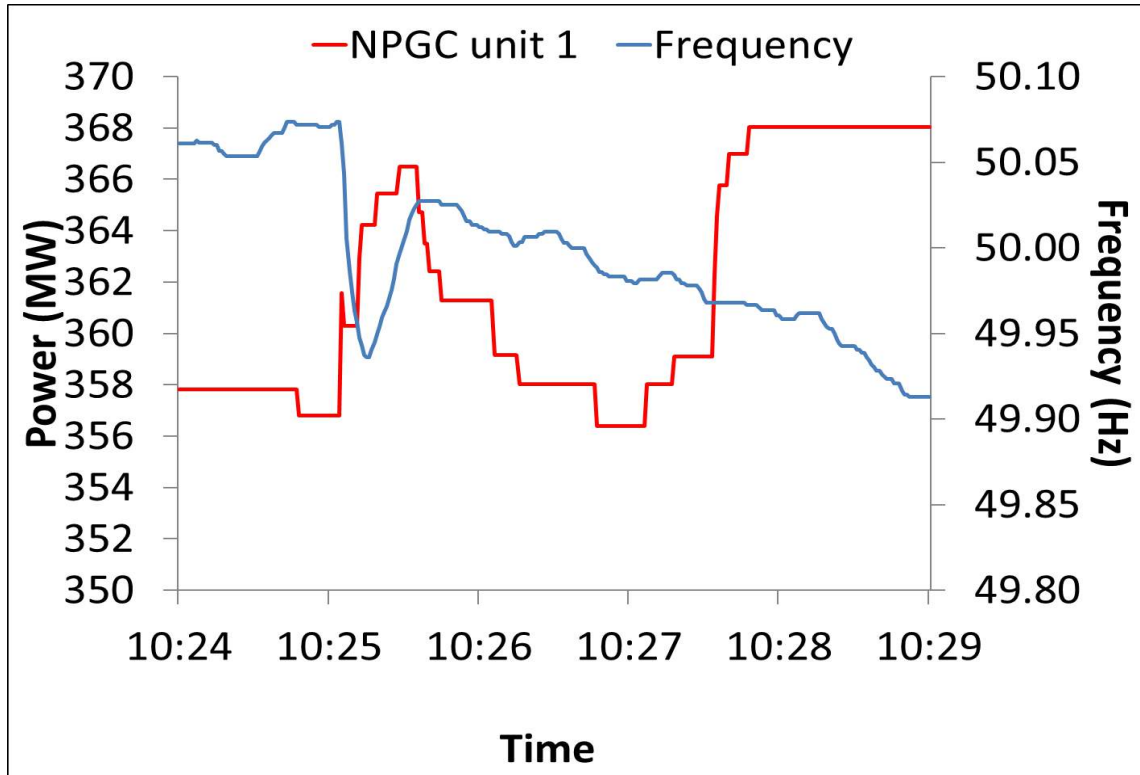
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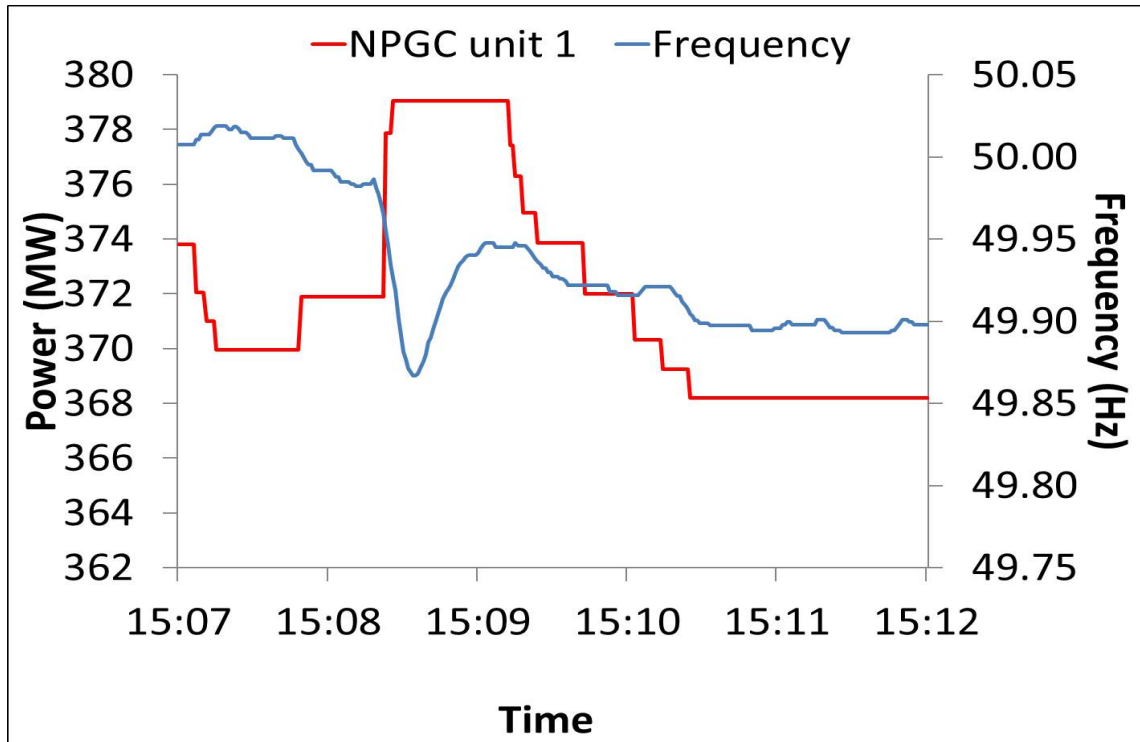


# Nabinagar STPS (NPGC)

## Event 1

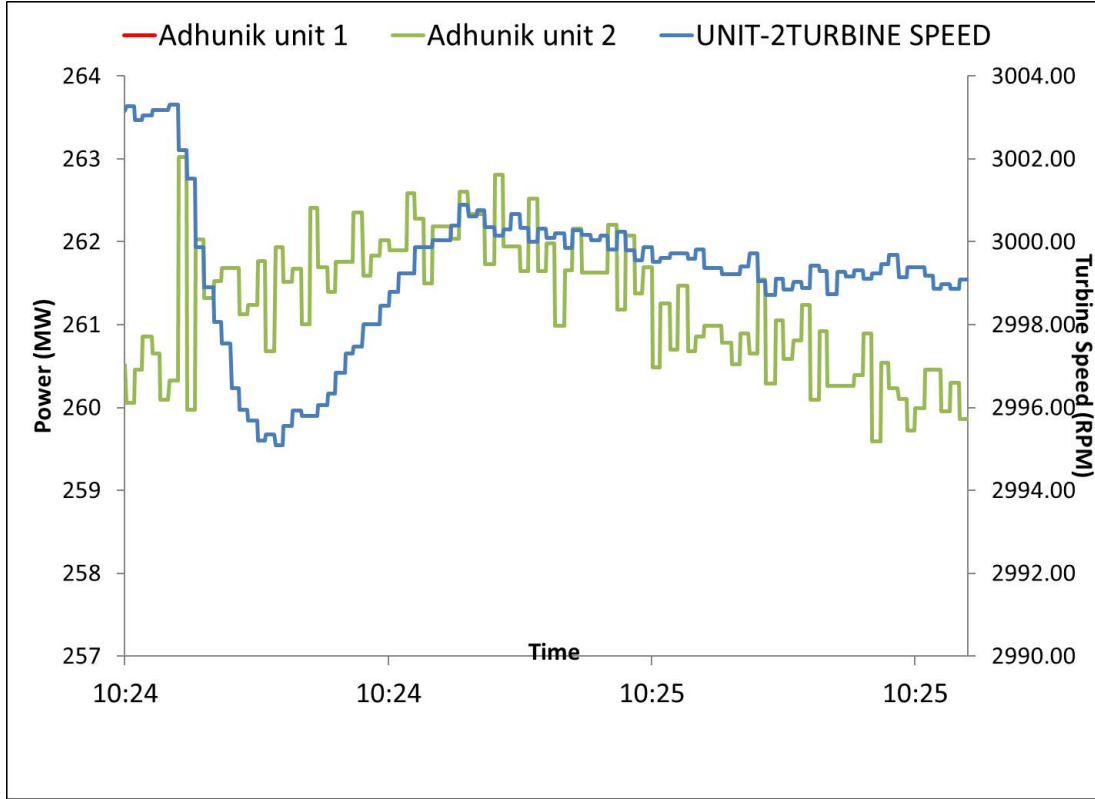


## Event 2

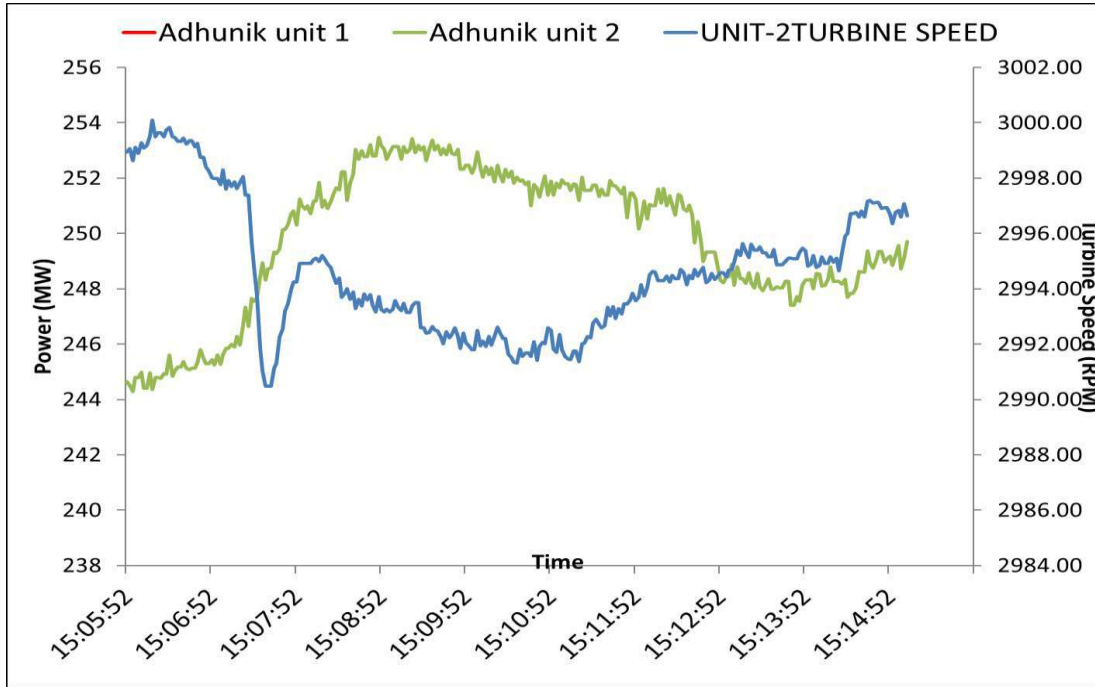


# Adhunik TPS

## Event 1

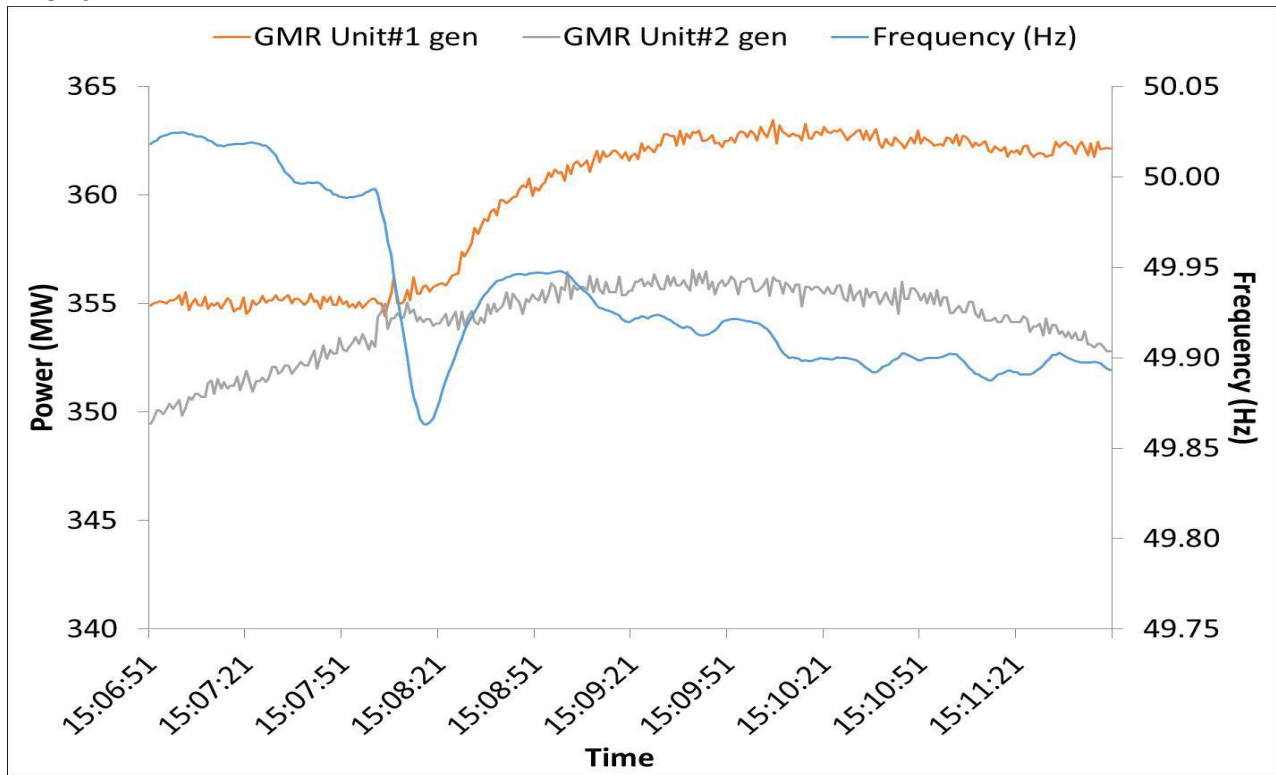


## Event 2



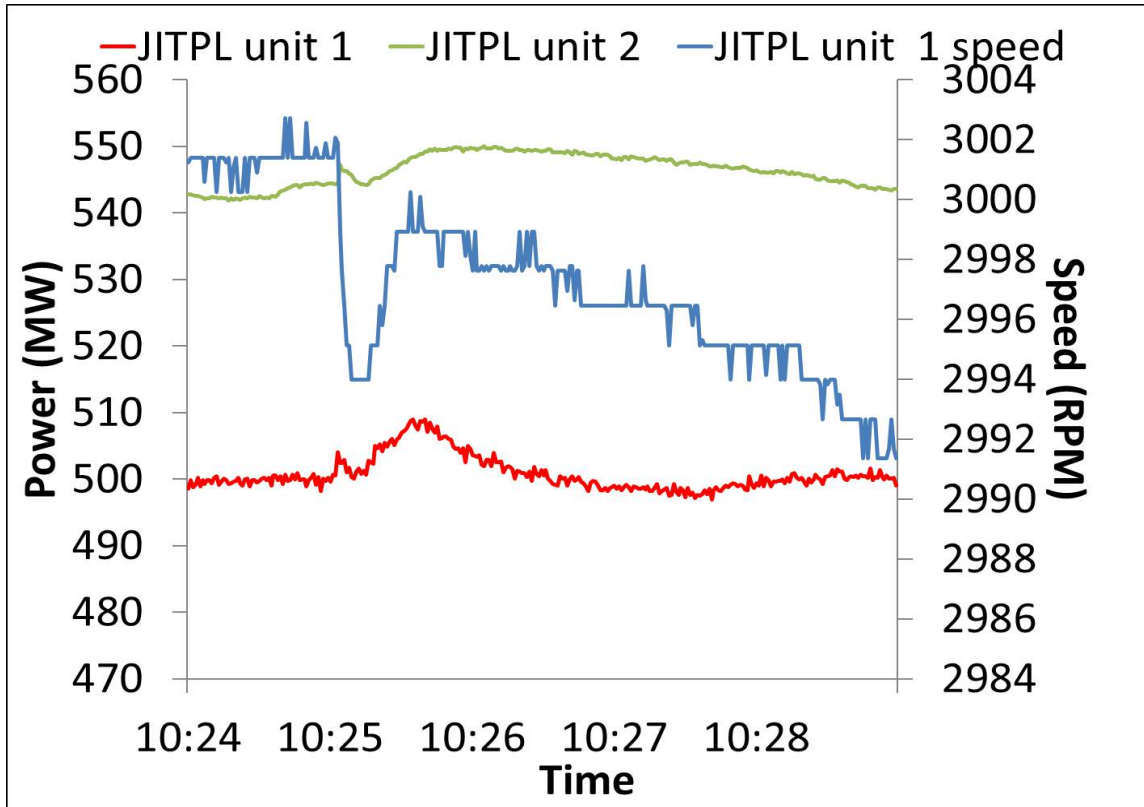
# GMR

## Event 2

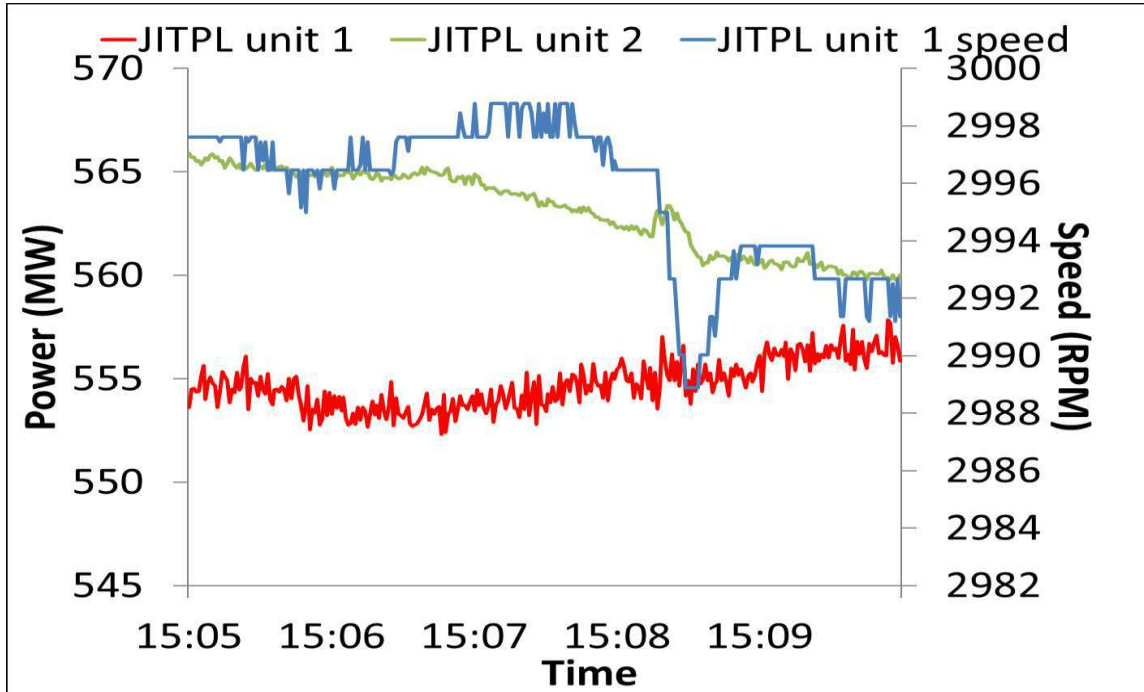


# JITPL

## Event 1

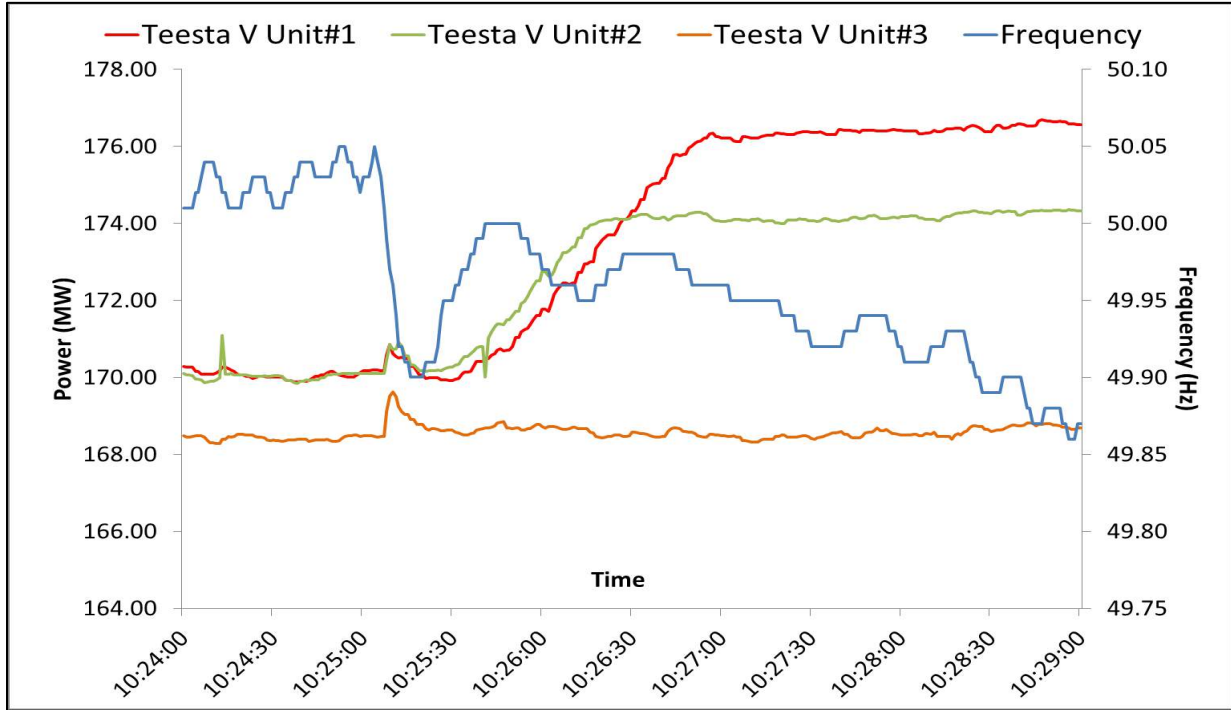


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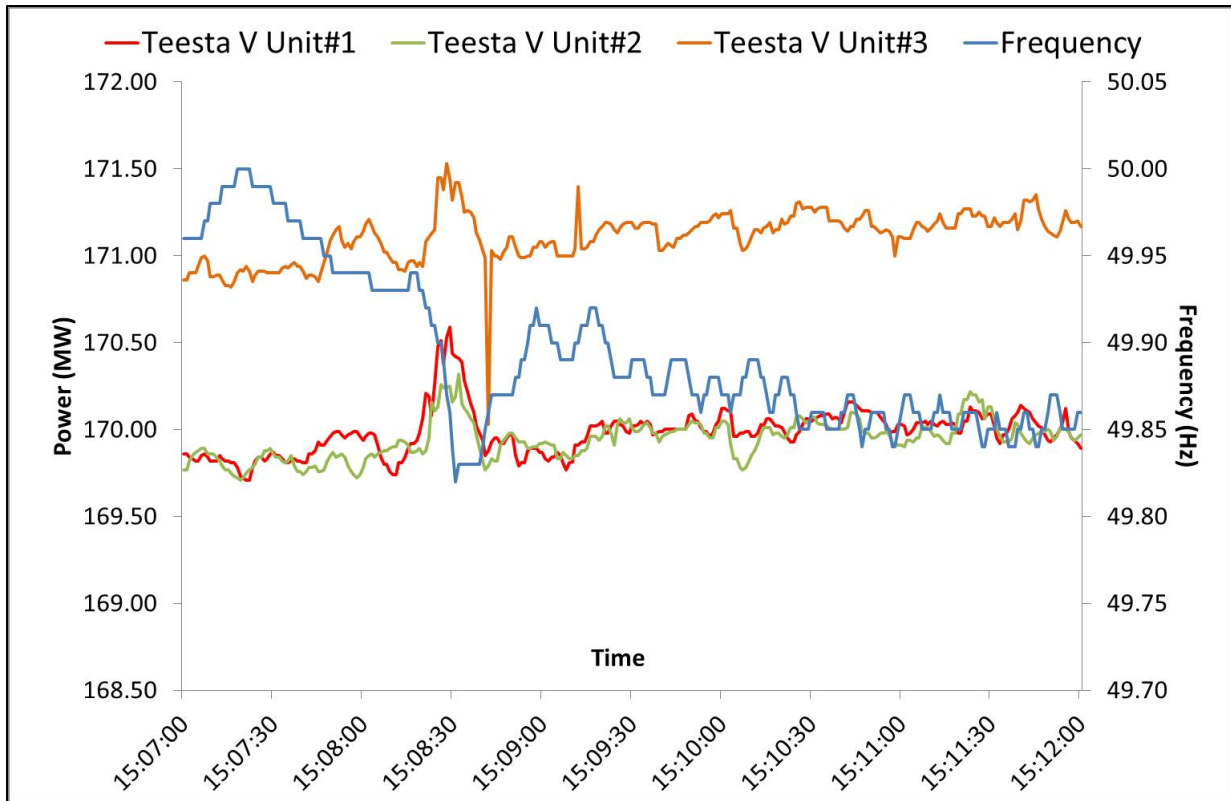


# Teesta V HPS

## Event 1:

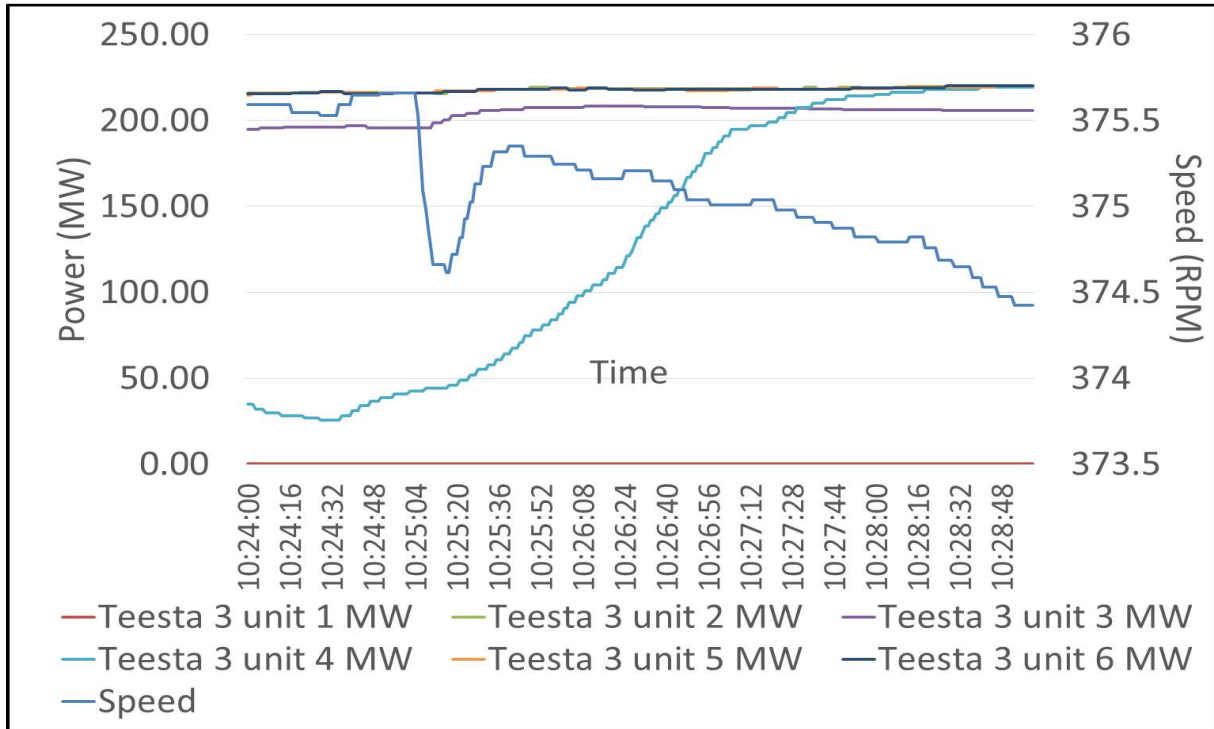


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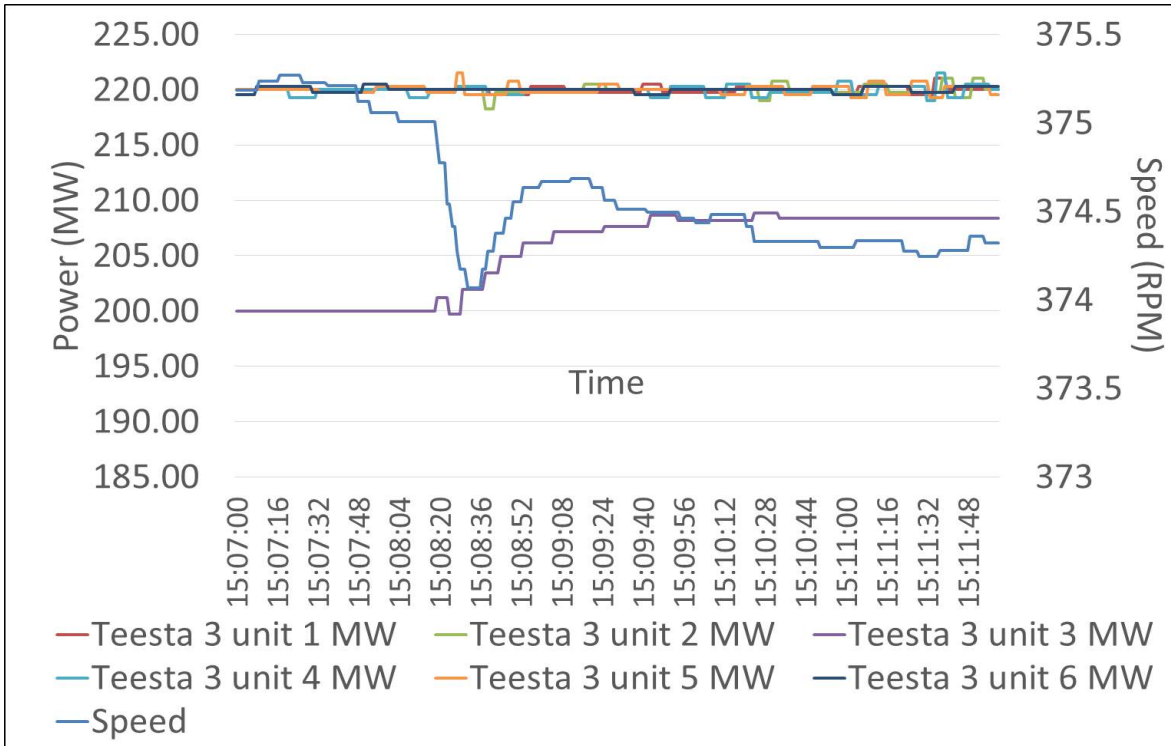


# Teesta III HPS

## Event 1:



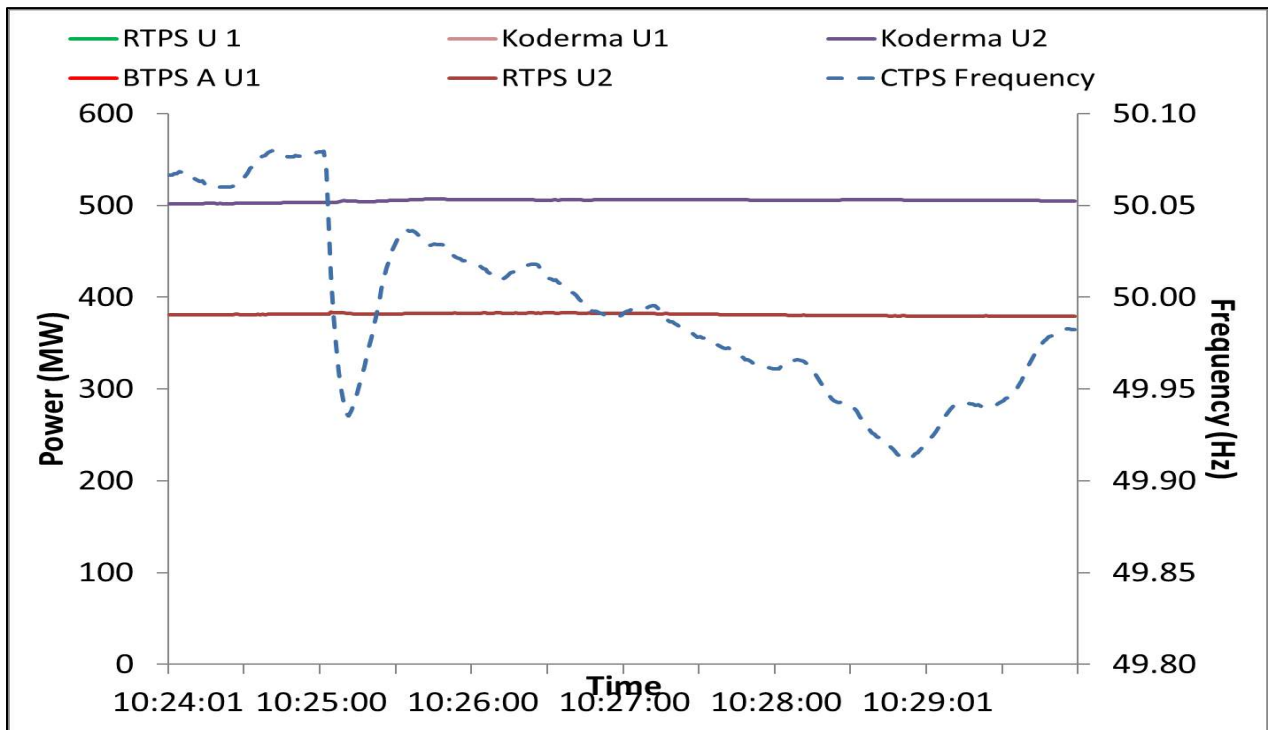
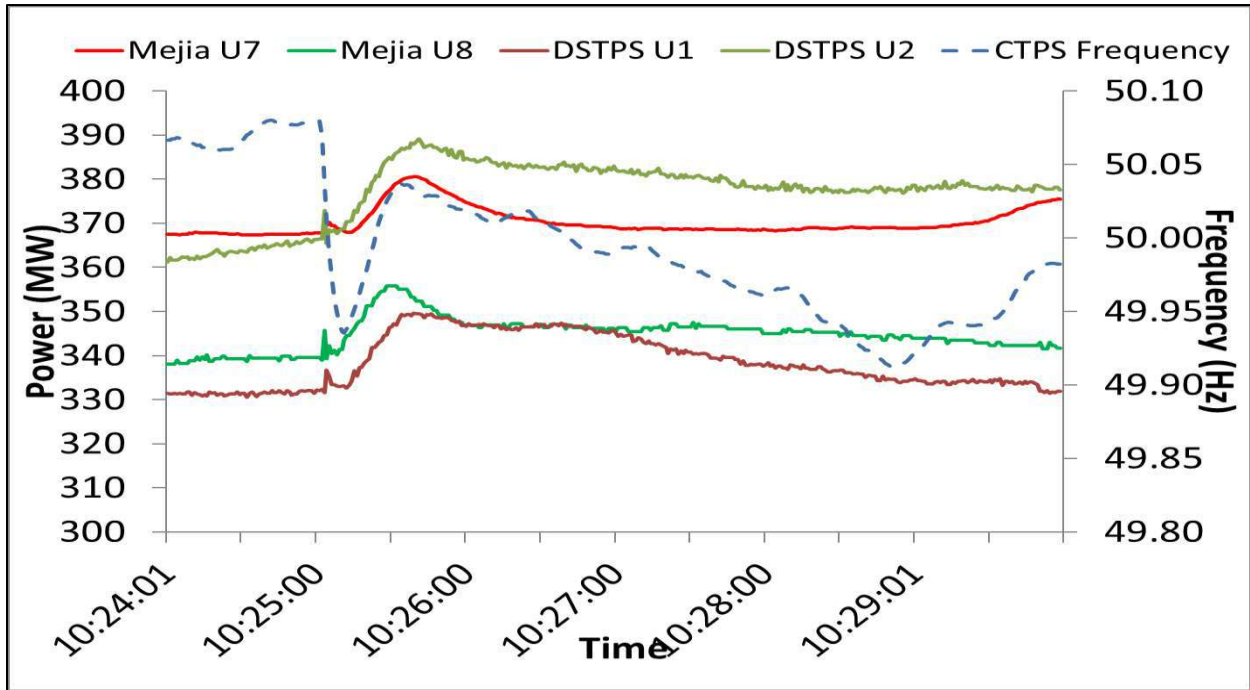
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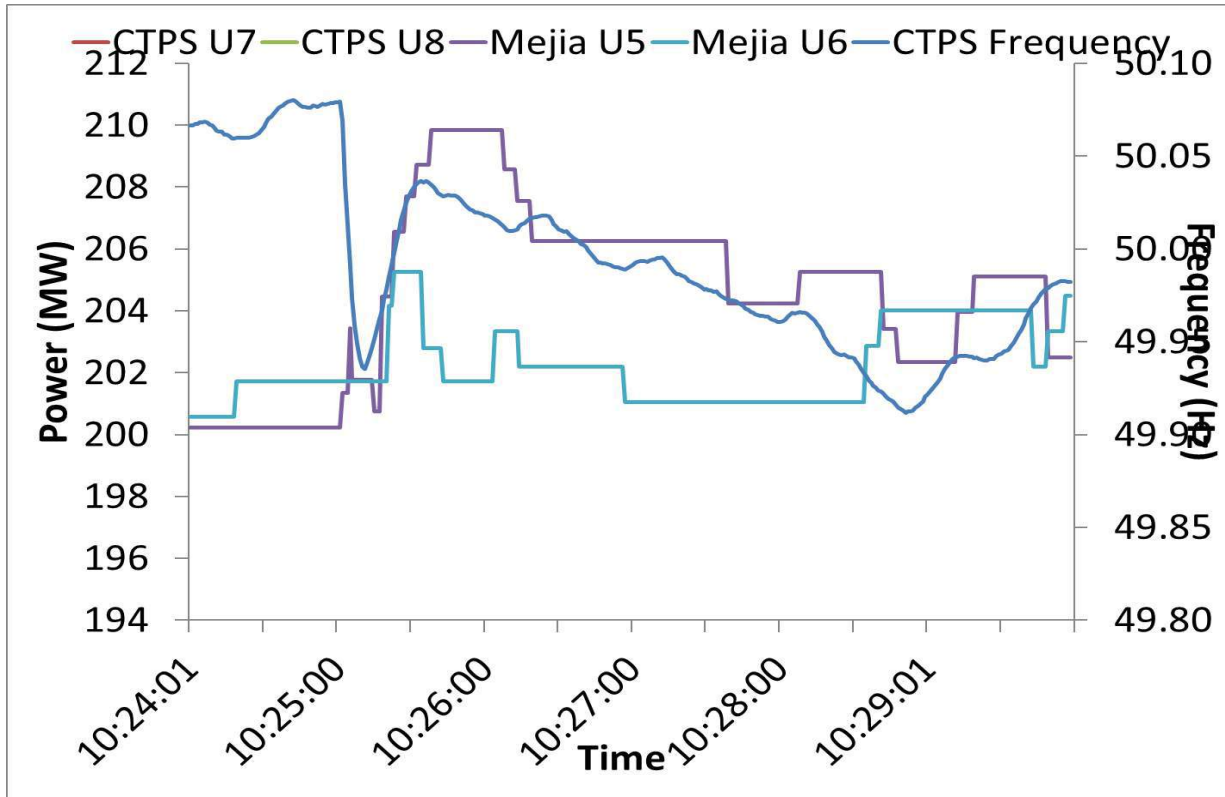
## Annexure 2: Variation of generation of state generating units during frequency change

### Generating units in DVC control area

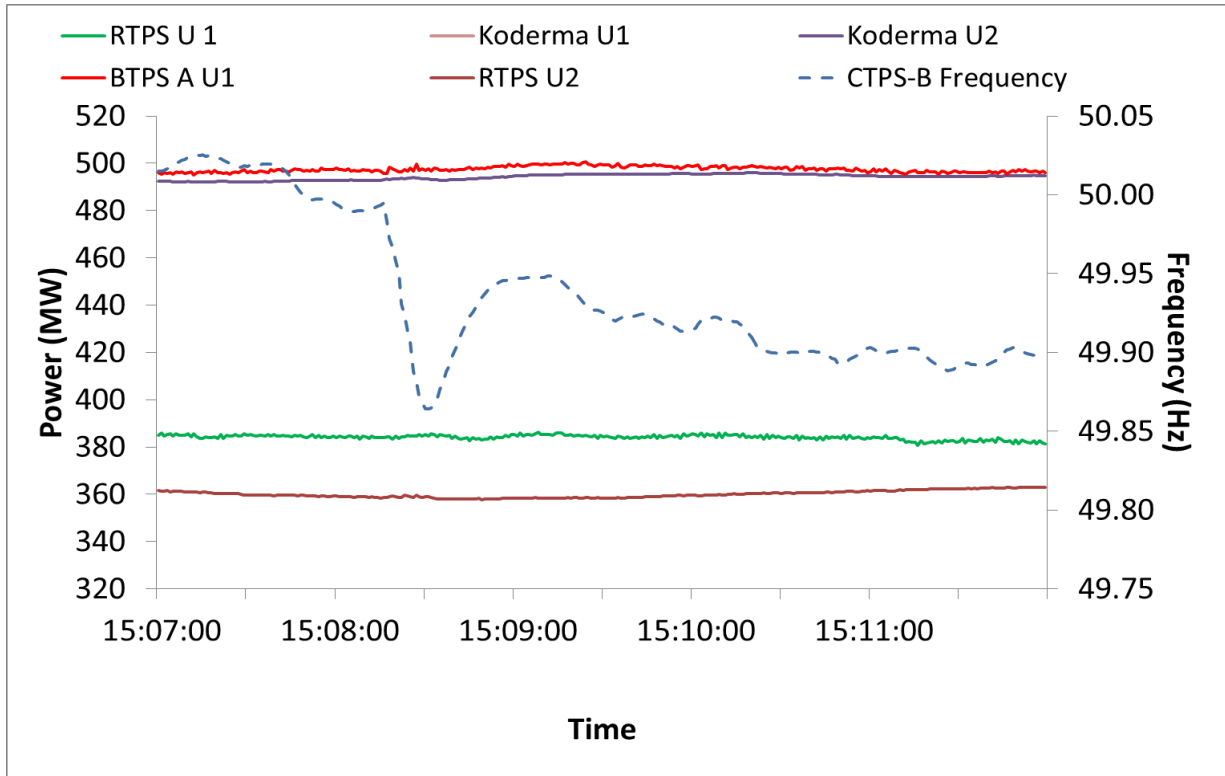
#### Event 1

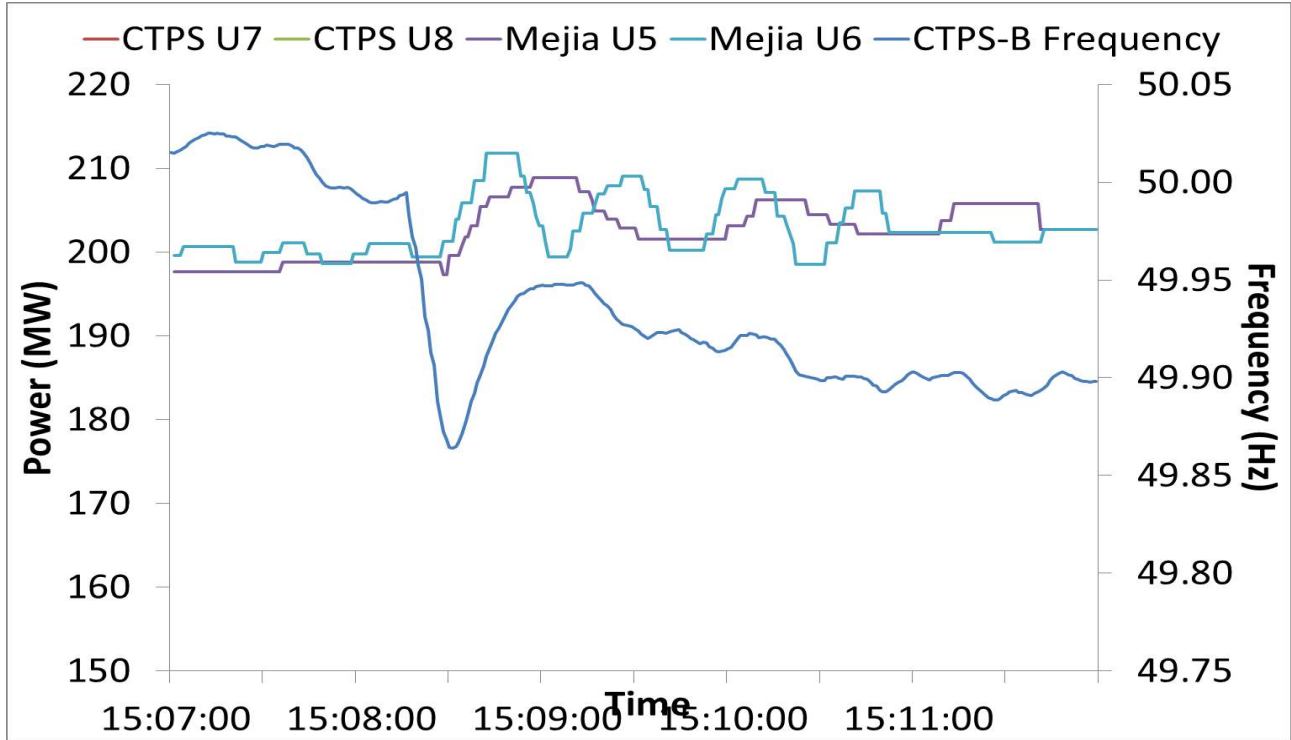
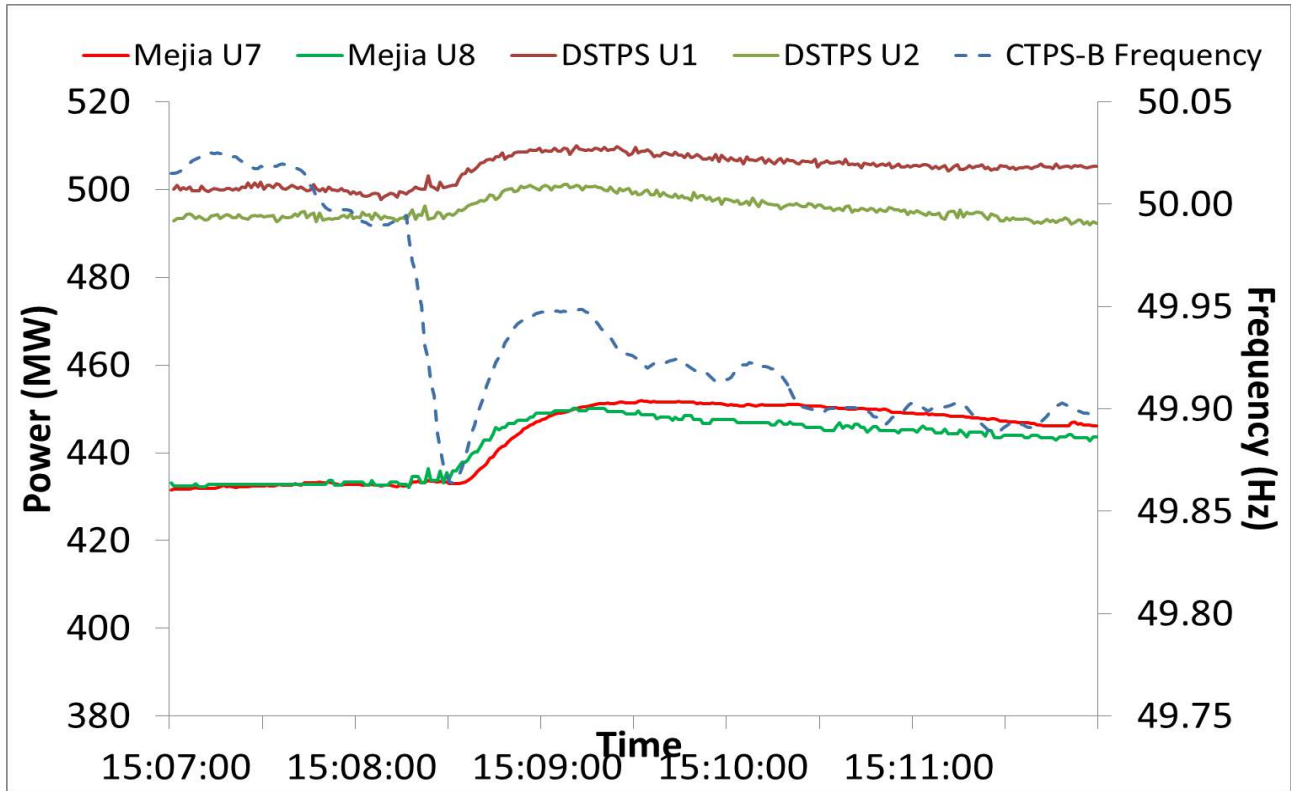






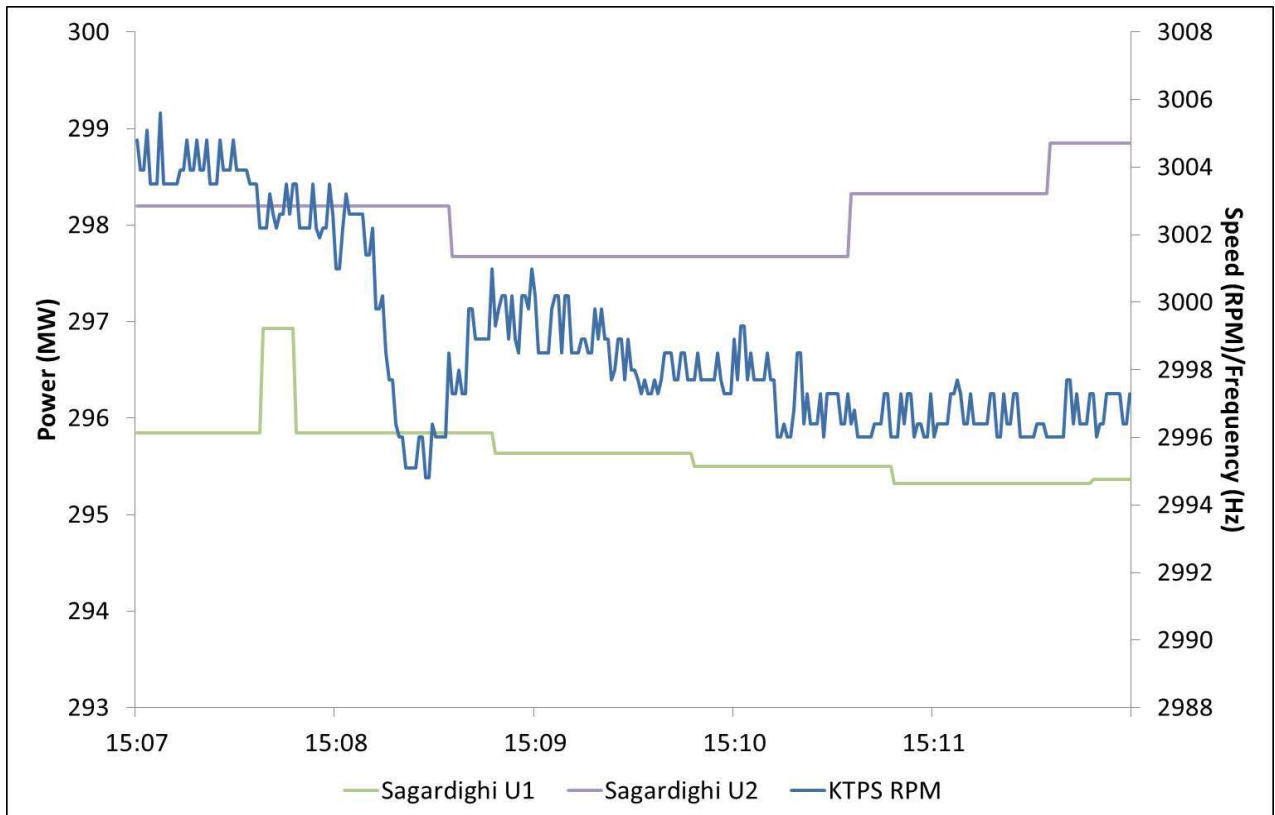
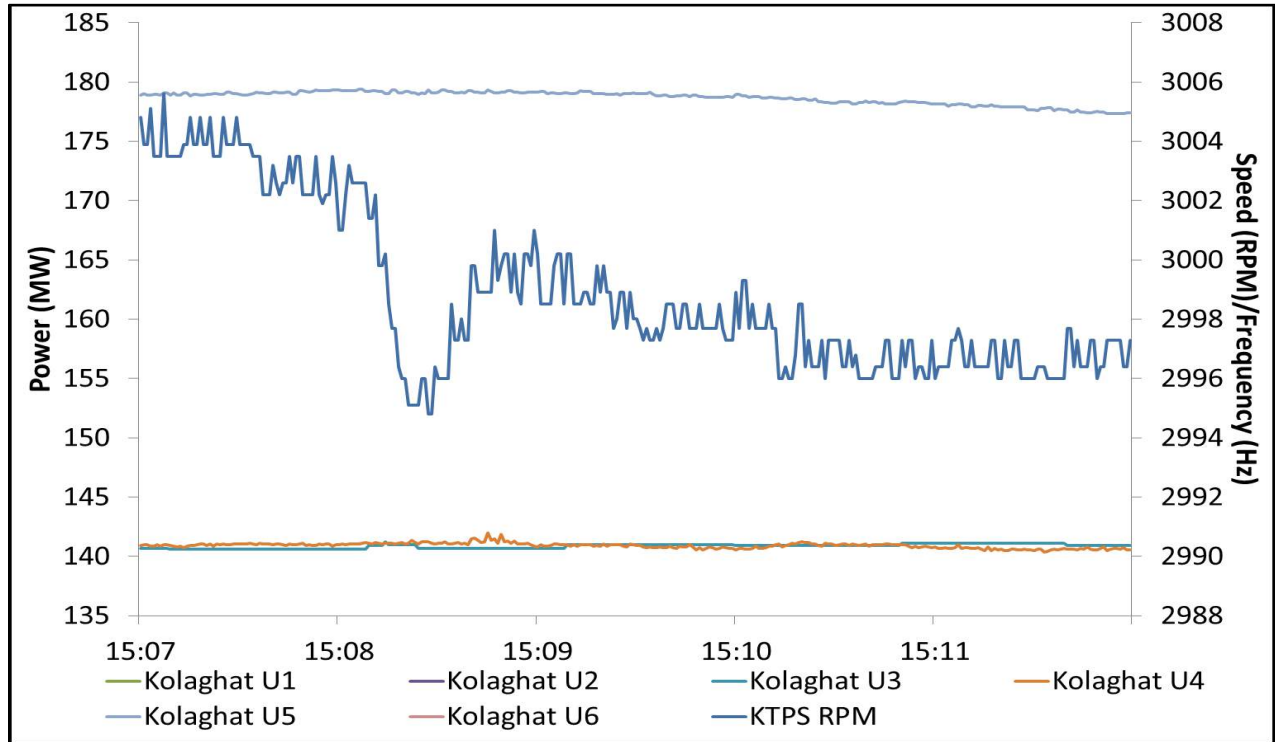
**Event 2**

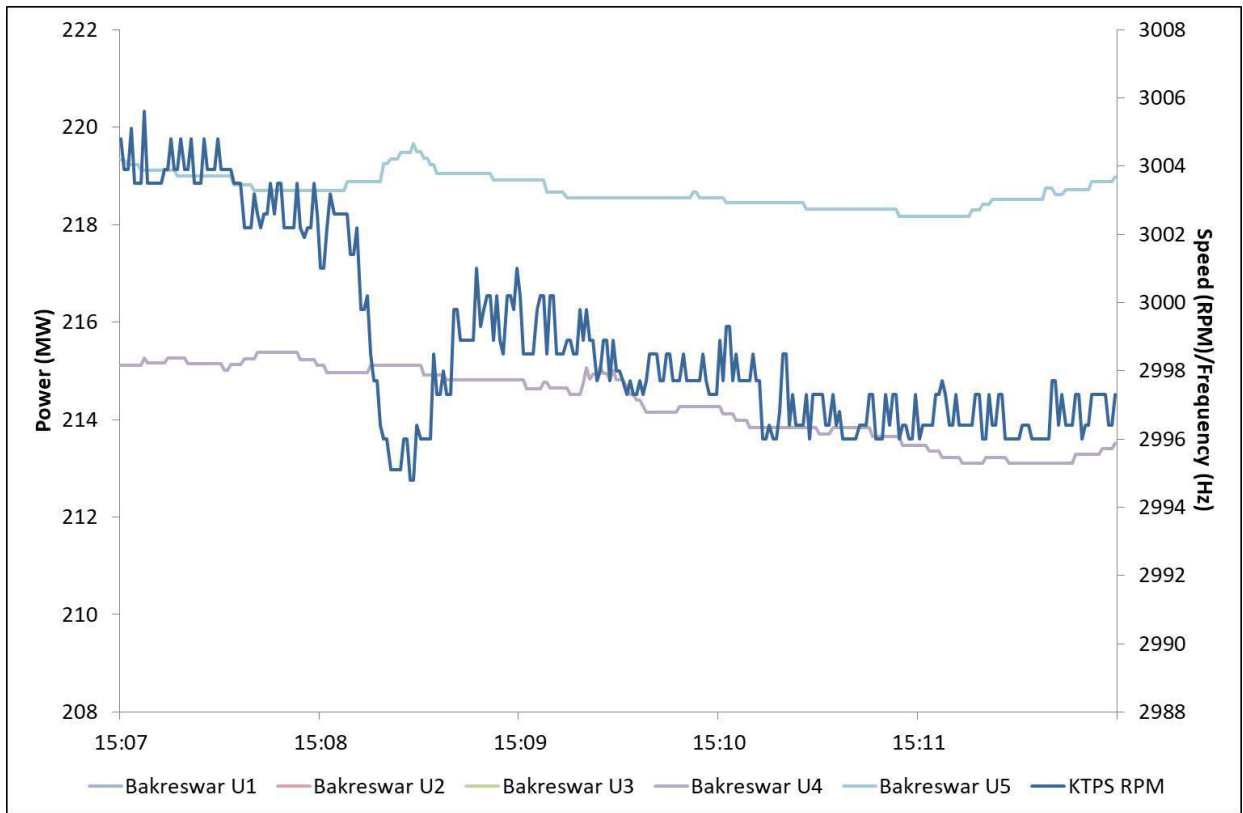
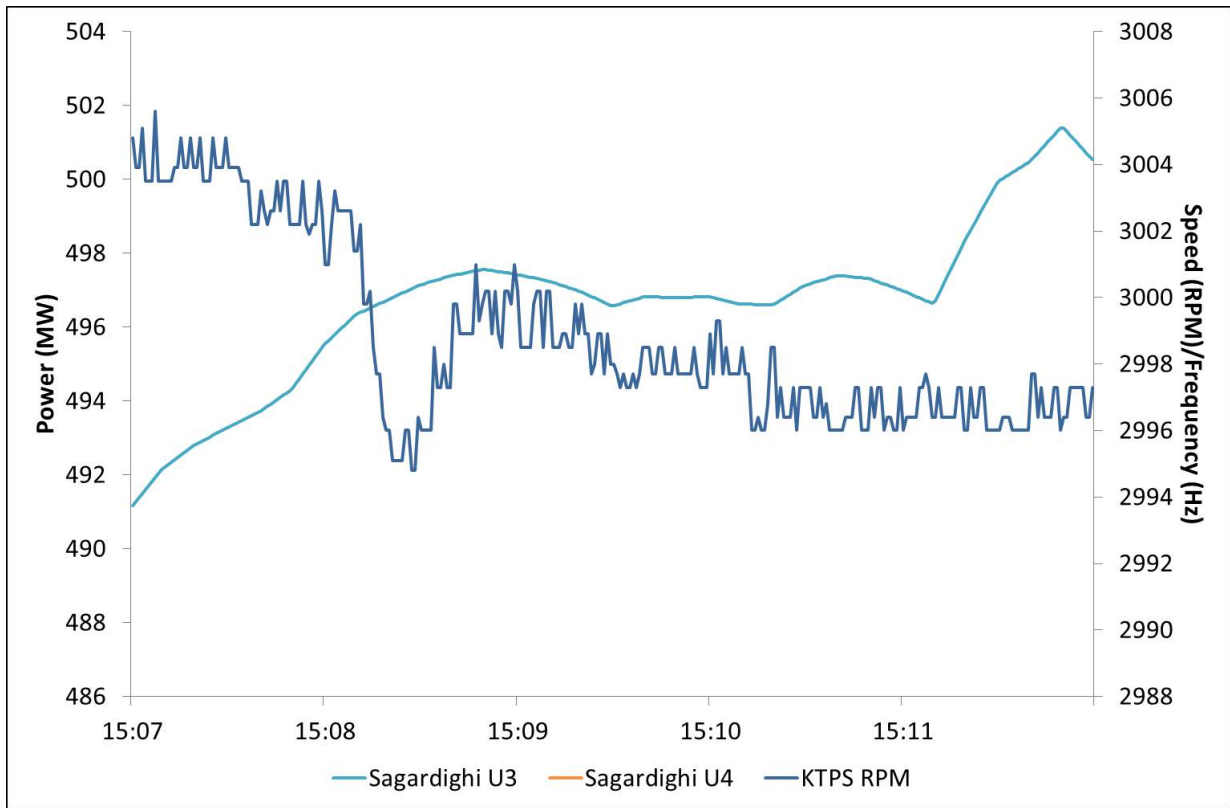




# Generating units in WBDCL control area

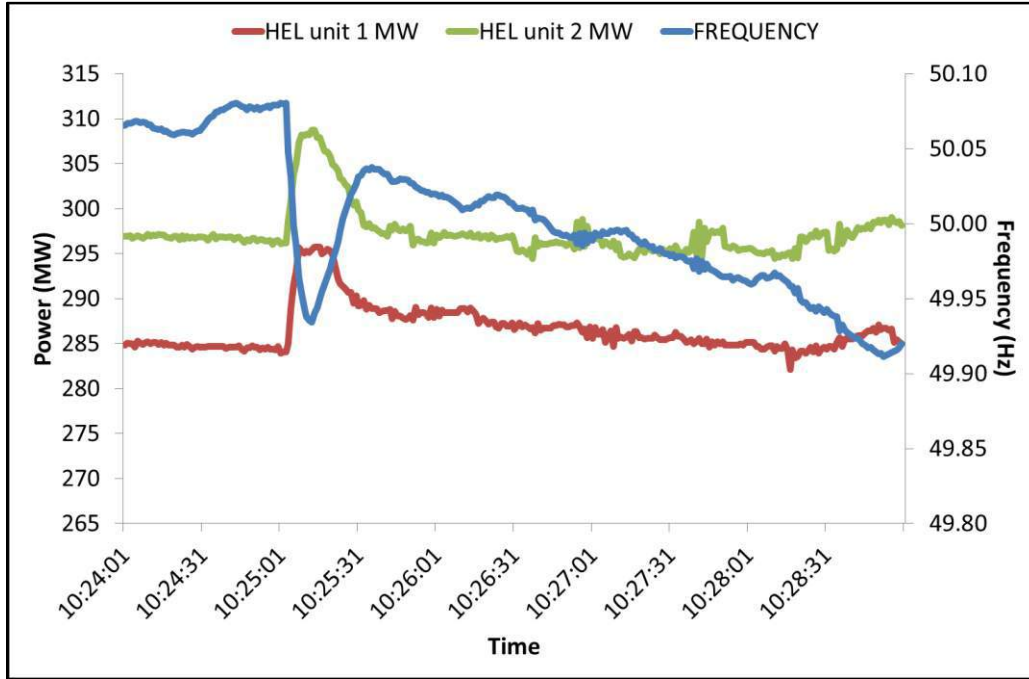
## Event 2



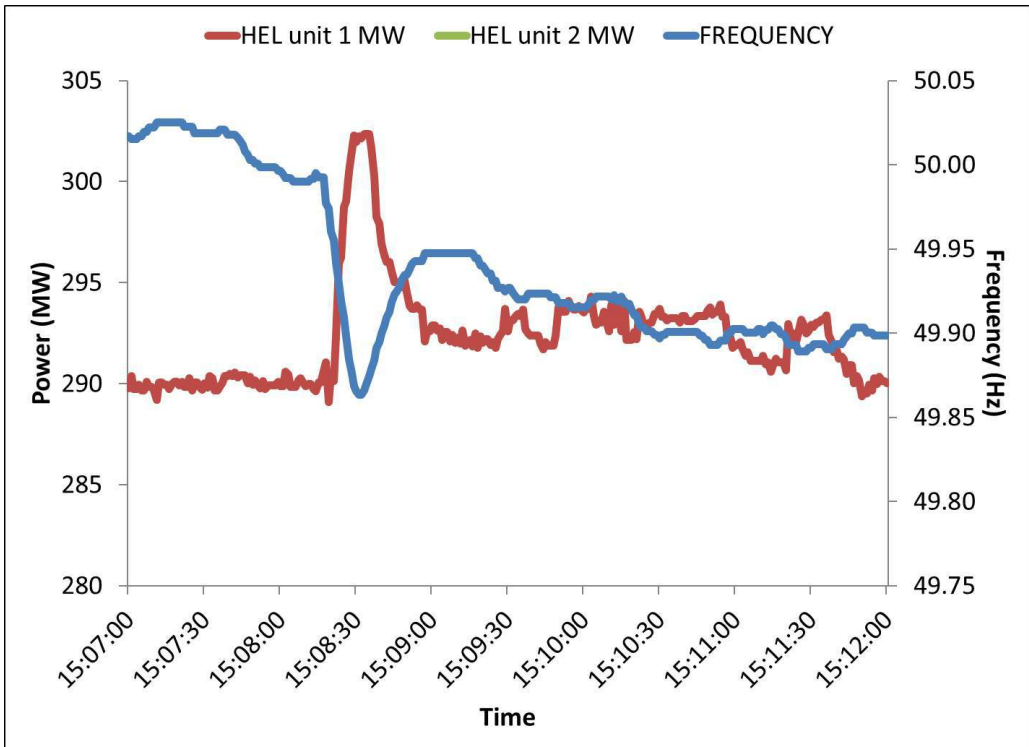


# HEL TPS

## Event 1



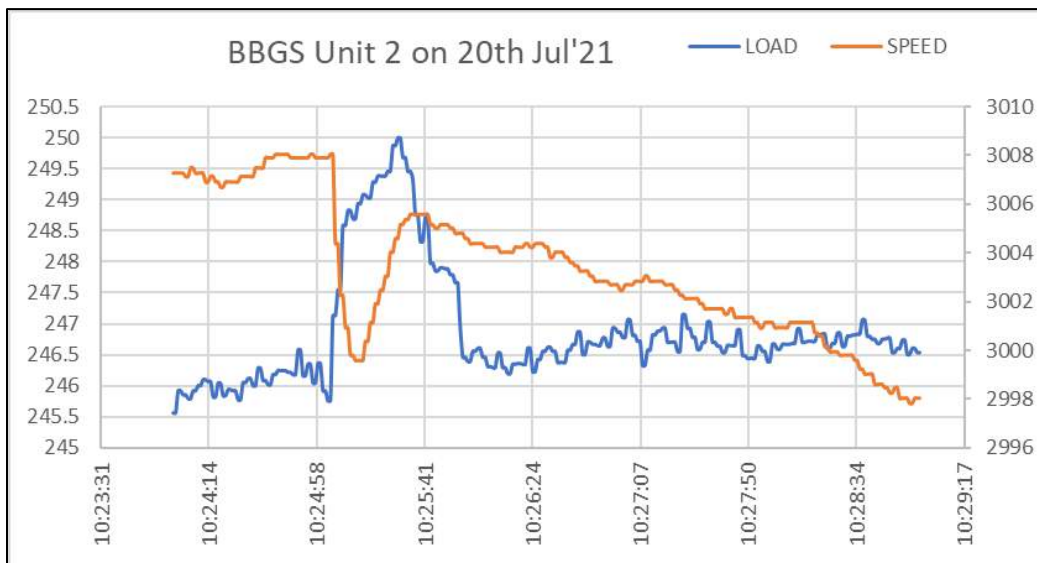
## Event 2

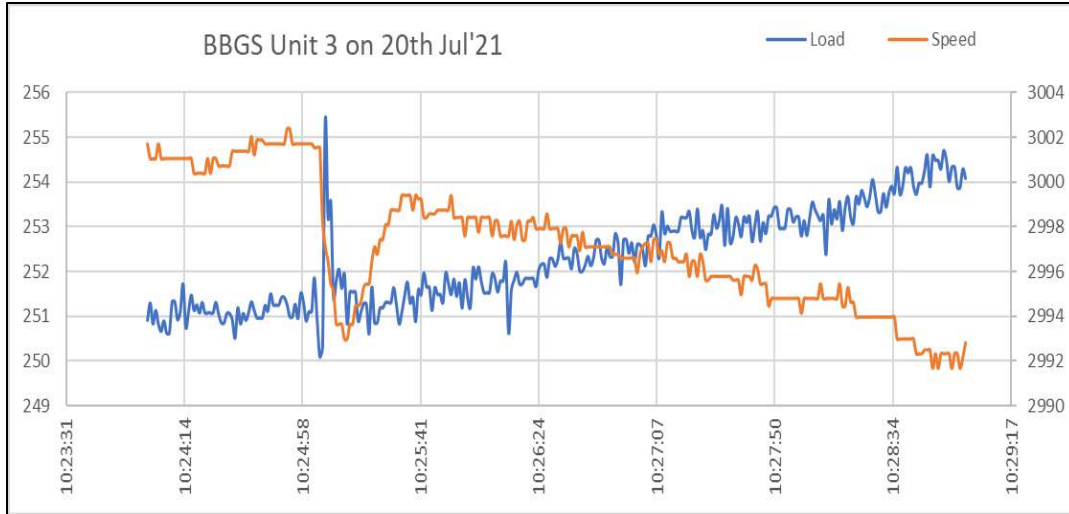


# Budge Budge TPS

## Event 1

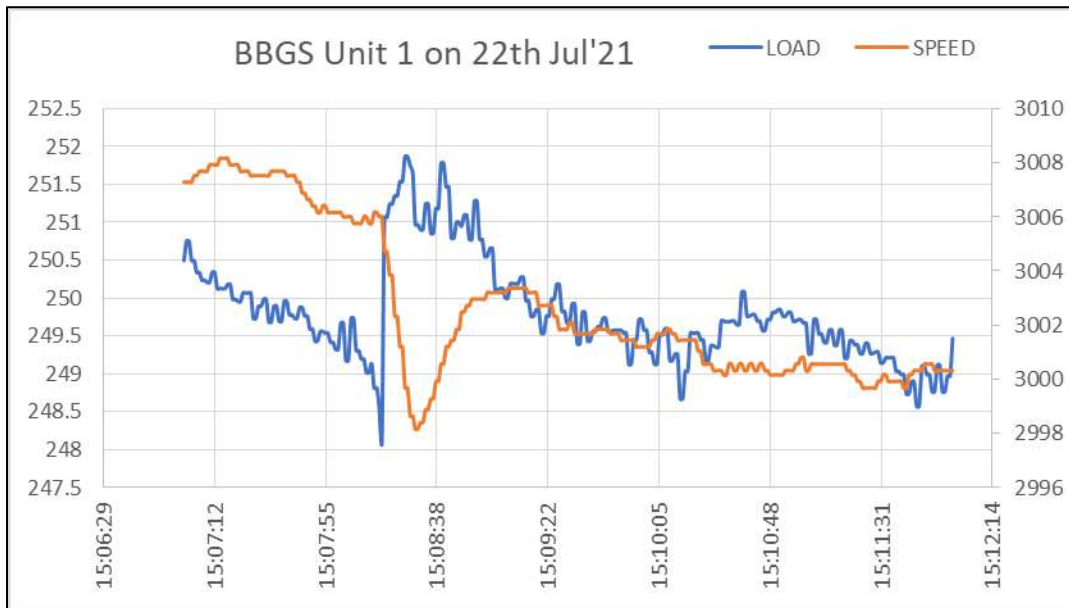
	Capacity	Gov	F <sub>drop</sub>	P-ideal rise	P-actual rise	T	Remarks from generating stations
Unit 1	250	FGMO	0.14	12.3	4	30	Response observed
Unit 2	250	FGMO	0.14	12.3	4.2	26	Response observed for a short period. Lower MS pressure operation as HPLP Bypass system fault repair was in progress.
Unit 3	250	RGMO	0.145	12.5	5	5	Response observed but did not sustain as MS pressure margin was less during the period , although adequate RGMO response was evident



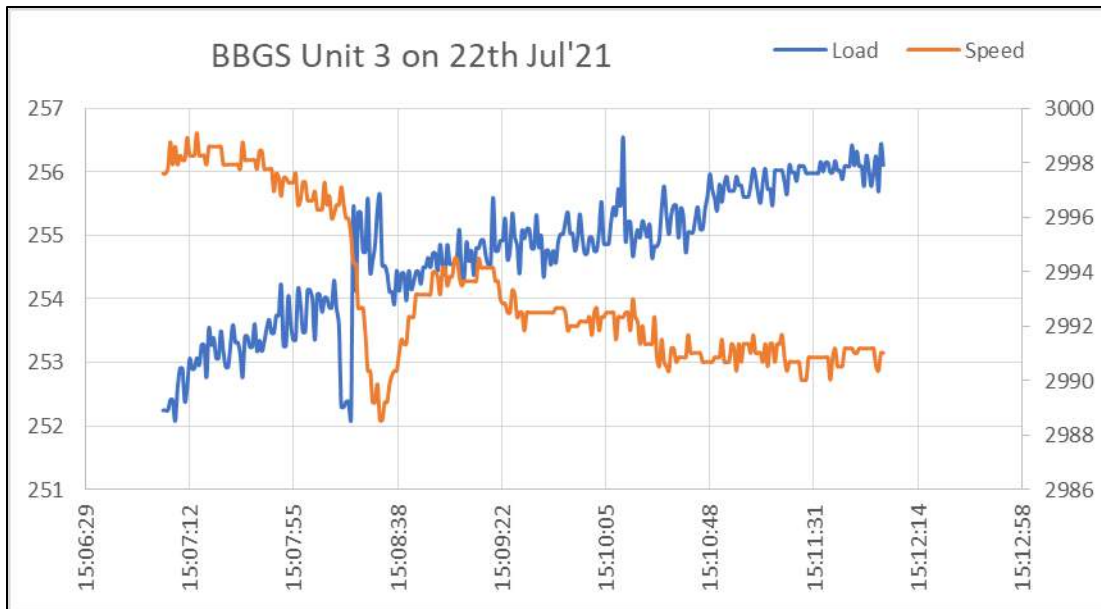
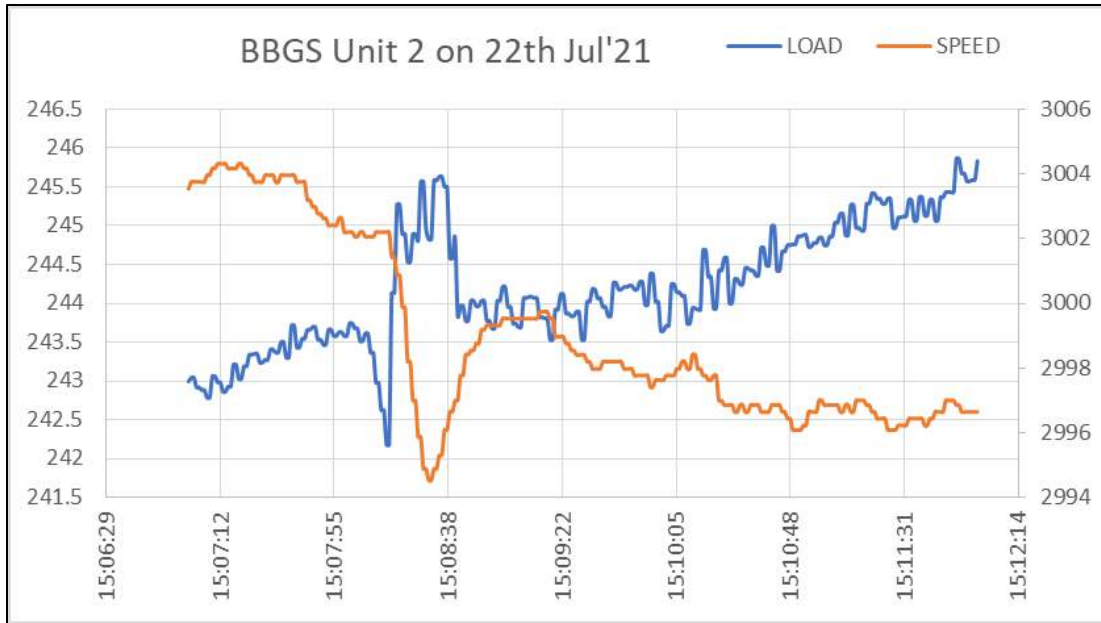


### Event 2

	Capacity	Gov	F <sub>drop</sub>	P-ideal rise	P-actual rise	T	Remarks from generating stations
Unit 1	250	FGMO	0.13	12.45	3.75	12	Response observed;
Unit 2	250	FGMO	0.13	12.15	3.38	11	Response observed.
Unit 3	250	RGMO	0.13	12.5	3.52	12	Response observed

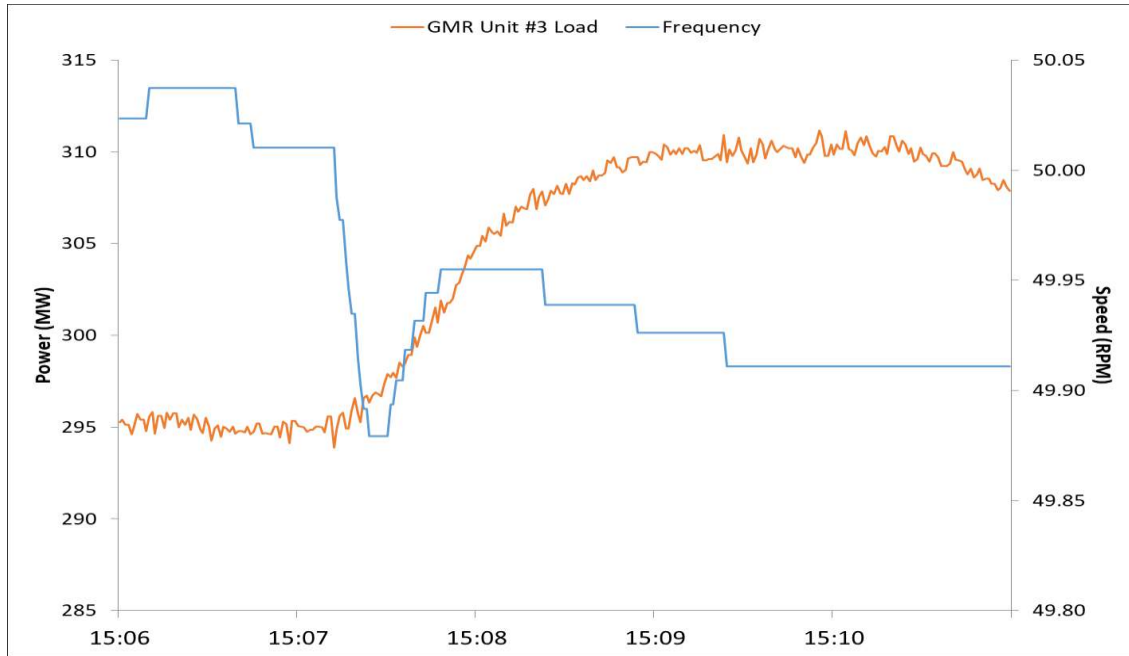






# GMR TPS (Unit 3)

## Event 2



### Annexure 3: FRC shared by DVC SLDC

#### Event 1

Frequency Response Characteristic Calculation in Eastern Region			
<p>On 22nd July 2021 at 15:08:16:240 Hrs, generation loss of around 1400 MW occurred at UPCL in SR. It led to the frequency drop from 49.99 Hz to 49.86 Hz at nadir point</p>			
S No	Particulars	Dimension	DVC Interchange
1	Actual Net Interchange before the Event (15:08:20)	MW	-1976
2	Actual Net Interchange before the Event (15:09:50)	MW	-2055
3	Change in Net Interchange (2 - 1)	MW	-79.7
4	Generation Loss (+) / Load Throw off (-) during the Event	MW	0.0
5	Control Area Response (3 - 4)	MW	-79.7
6	Frequency before the Event	HZ	49.99
7	Frequency after the Event	HZ	49.94
8a	Change in Frequency (7 - 6)	HZ	-0.049
8	Effective change in Frequency considering RGMO *	HZ	-0.049
9	Frequency Response Characteristic (5 / 8)	MW/HZ	1640
10	Net System Demand met before the Event	MW	2670
11	Internal Generation before the Event (10 - 1)	MW	4646
12	Ideal load response assuming 4% per Hz (0.04*Row 10)	MW/Hz	106.8
13	Ideal generator response assuming 5% droop.....40% per Hz (40% of Row 11)	MW/Hz	1858.3
14	Composite ideal response (12 + 13)	MW/Hz	1965.1
15	Percentage of ideal response $\{(9/14) \times 100\}$	%	83.5%

## Event 2

Frequency Response Characteristic Calculation in Eastern Region			
On 20th July 2021 at 10:25:02 hrs, RE generation loss of around 1550 MW occurred at AKAL S/S. It led to the frequency drop from 50.07 Hz to 49.93 Hz at nadir point			
S No	Particulars	Dimension	DVC Interchange
1	Actual Net Interchange before the Event (10:25:00)	MW	-1106
2	Actual Net Interchange before the Event (10:27:30)	MW	-1229
3	Change in Net Interchange (2 - 1)	MW	-123.4
4	Generation Loss (+) / Load Throw off (-) during the Event	MW	0.0
5	Control Area Response (3 - 4)	MW	-123.4
6	Frequency before the Event	HZ	50.08
7	Frequency after the Event	HZ	50.02
8a	Change in Frequency (7 - 6)	HZ	-0.060
8	Effective change in Frequency considering RGMO *	HZ	-0.060
9	Frequency Response Characteristic (5 / 8)	MW/HZ	2061
10	Net System Demand met before the Event	MW	2658
11	Internal Generation before the Event (10 - 1)	MW	3764
12	Ideal load response assuming 4% per Hz (0.04*Row 10)	MW/Hz	106.3
13	Ideal generator response assuming 5% droop.....40% per Hz (40% of Row 11)	MW/Hz	1505.6
14	Composite ideal response (12 + 13)	MW/Hz	1611.9
15	Percentage of ideal response $\{(9/14) \times 100\}$	%	127.9%

# Annexure 4: FRC shared by GRIDCO SLDC

## Event 1

Frequency Response Characteristic Calculation in GRIDCO control area												
On 20th July 2021 at 10:25:02 hrs, RE generation loss of around 1550 MW occurred at AKAL S/S. It led to the frequency drop from 50.07 Hz to 49.93 Hz at nadir point. Later it stabilized at 50.03 Hz.												
S No	Particulars	Dimension	Balimela	Burla	Rengali	Indravati	Upper Kolab	IBTPS	GKEL #3	VAL IPP #2	BTPS Stage 2	GRIDCO Interchange
1	Actual Net Interchange before the Event (10:25:02)	MW	-52	-59	-124	-294	0	-330	-240	-423	-642	2009
2	Actual Net Interchange after the Event (10:25:36)	MW	-53	-59	-123	-295	0	-330	-240	-423	-643	1999
3	Change in Net Interchange (2 - 1)	MW	-1.1	-0.6	0.6	-0.9	0.0	-0.4	0.6	0.0	-1.2	-10.4
4	Generation Loss (+) / Load Throw off (-) during the Event	MW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Control Area Response (3 - 4)	MW	-1.1	-0.6	0.6	-0.9	0.0	-0.4	0.6	0.0	-1.2	-10.4
6	Frequency before the Event	HZ	50.08	50.08	50.08	50.08	50.08	50.08	50.08	50.08	50.08	50.08
7	Frequency after the Event	HZ	50.04	50.04	50.04	50.04	50.04	50.04	50.04	50.04	50.04	50.04
8a	Change in Frequency (7 - 6)	HZ	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.043
8	Effective change in Frequency considering RGMO *	HZ	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.043
9	Frequency Response Characteristic (5 / 8)	MW/Hz	25	15	-15	21	0	8	-14	0	28	242
10	Net System Demand met before the Event	MW	0	0	0	0	0	0	0	0	0	4944
11	Internal Generation before the Event (10 - 1)	MW	52	59	124	294	0	330	240	423	642	2935
12	Ideal load response assuming 4% per Hz (0.04*Row 10)	MW/Hz	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	197.8
13	Ideal generator response assuming 5% droop.....40% per Hz (40% of Row 11)	MW/Hz	20.9	23.5	49.5	117.5	0.0	132.0	96.1	169.3	256.6	1173.9
14	Composite ideal response (12 + 13)	MW/Hz	20.9	23.5	49.5	117.5	0.0	132.0	96.1	169.3	256.6	1371.7
15	Percentage of ideal response ((9/14)x100)	%	120.4%	64.4%	-29.6%	18.2%	0.0%	6.2%	-15.0%	0.0%	11.1%	17.7%

## Event 2

S No	Particulars	Dimension	Balimela	Burla	Rengali	Indravati	Upper Kolab	IBTPS	GKEL #3	VAL IPP #2	BTPS Stage 2	GRIDCO Interchange
1	Actual Net Interchange before the Event (15:08:16)	MW	-52	-83	-120	-294	0	-314	-275	-424	-788	1558
2	Actual Net Interchange after the Event (15:08:54)	MW	-53	-83	-121	-296	0	-314	-277	-424	-795	1533
3	Change in Net Interchange (2 - 1)	MW	-1.6	-0.1	-0.5	-2.2	0.0	0.0	-2.4	0.0	-6.5	-25.6
4	Generation Loss (+) / Load Throw off (-) during the Event	MW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Control Area Response (3 - 4)	MW	-1.6	-0.1	-0.5	-2.2	0.0	0.0	-2.4	0.0	-6.5	-25.6
6	Frequency before the Event	HZ	49.99	49.99	49.99	49.99	49.99	49.99	49.99	49.99	49.99	49.99
7	Frequency after the Event	HZ	49.94	49.94	49.94	49.94	49.94	49.94	49.94	49.94	49.94	49.94
8a	Change in Frequency (7 - 6)	HZ	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.049
8	Effective change in Frequency considering RGMO *	HZ	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.049
9	Frequency Response Characteristic (5 / 8)	MW/Hz	33	2	11	45	0	0	49	0	131	518
10	Net System Demand met before the Event	MW	0	0	0	0	0	0	0	0	0	4573
11	Internal Generation before the Event (10 - 1)	MW	52	83	120	294	0	314	275	424	788	3014
12	Ideal load response assuming 4% per Hz (0.04*Row 10)	MW/Hz	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	182.9
13	Ideal generator response assuming 5% droop.....40% per Hz (40% of Row 11)	MW/Hz	20.7	33.1	48.1	117.4	0.0	125.5	110.0	169.7	315.4	1205.7
14	Composite ideal response (12 + 13)	MW/Hz	20.7	33.1	48.1	117.4	0.0	125.5	110.0	169.7	315.4	1388.6
15	Percentage of ideal response ((9/14)x100)	%	159.3%	6.1%	22.7%	38.6%	0.0%	0.0%	44.9%	0.0%	41.7%	37.3%

POWER SYSTEM DEVELOPMENT FUND												
Status of the Projects in Eastern Region												
Sl No	State	Entity	Name of the scheme	Grant Approved	Grant sanctioned on	1st Installment grant released on	Completion Schedule	Completion schedule w.r.t date of 1st instalment	Grant aviled so far	Under process of release	Total awards amount of placed of till date	Latest status
1	Bihar	BSPTCL	Renovation and Upgradation of protection system of substations. (18)	64.22	42135	42506	24	43236	56.04		69.195	90% grant availed on award cost.
2			Installation of Capacitor bank in 20 Nos of Grid Sub Station. (74)	18.882	42618	43550	24	44281	16.99		21.55	
			<b>Total</b>	<b>83.10</b>					<b>73.03</b>		<b>90.745</b>	
5	Jharkhand	JUSNL	Renovation & Upgradation of protection system of Jharkhnad. (161)	138.13	15-Nov-17	28-Mar-19	16	28-Jul-20	114.68	1.01	145.674	90% grant availed on award cost. Project closure is expected by Q-2 of 2021-22.
6			Reliable Communication & data acquisition system upto 132kV Substations ER. (177)	22.36	24-May-19		24					
			<b>Total</b>	<b>160.49</b>					<b>114.68</b>		<b>145.674</b>	
7	Odisha	OPTCL	Renovation and Upgradation of protection system of substations. (08)	162.50	11-May-15	22-Mar-16	24	22-Mar-18	46.04		63.31	Project Completed on Dec-20. Request for release of final 10 % fund has been placed.
8			Implementation of OPGW based reliable communication at 132 kv and above substations. (128)	25.61	15-Nov-17	29-Mar-19	36	29-Mar-22	23.04		51.22	90% grant availed on award cost.
9			Installation of 125 MVAR Bus Reactor along with construction of associated by each at 400kV Grid S/S of Mendhasal, Meramundali & New Duburi for VAR control & stabilisation of system voltage. (179)	27.23	27-Jul-18	1-Apr-19	18	1-Oct-20	8.17		8.166	30% grant availed
10			Implementation of Automatic Demand Management System (ADMS) in SLDC, Odisha. (196)	2.93	24-May-19	19-Feb-20	10	19-Dec-20	0.29		0.29	10% grant availed
11			Protection Upgradation and installation os Substation Automatic System (SAS) for seven nos of 220/132/33kV Substations (Balasure, Bidanasi, Budhipadar, Katapali, Narendrapur, New-Bolangir & Paradeep). (209)	36.63	24-May-19	13-Feb-20	18	13-Aug-21	8.87		8.87	30% grant availed
12		OHPCL	Renovation and Upgradation of protection and control system of OHPC. (109)	22.35	22-May-17	25-May-18	24	25-May-20	14.94		21.25	90% grant availed on award cost.
			<b>Total</b>	<b>277.25</b>					<b>101.35</b>		<b>153.106</b>	
14	West Bengal	WBSETCL	Installation of switchable reactor & shunt capacitor for voltage improvement. (88)	43.37	22-May-17	22-Jun-18	19	22-Jan-20	33.07		40.83	90% grant availed on award cost. Will get completed by Oct'21
15			Renovation & Modernisation of Transmission System. (87)	70.13	22-May-17	25-Jun-18	25	25-Jul-20	63.12		96.44	90% grant availed on award cost. Will get completed by Mar'22
16			Installation of Bus Reactors at different 400kV Substation within the state of West Bengal for reactive power management of the Grid. (210)	71.74	24-May-19	23-Oct-19	19	23-May-21	39.3		45.62	30% grant availed on award cost. 04 Nos. of Reactors will be commissioned by December 2021. LoA of the 5th Reactor is yet to be placed.
17			Project for establishment of reliable communication and data acquisition at different substation at WBSWTCL. (222)	31.19	24-May-19	23-Oct-19	25	23-Nov-21	3.12			The tender has been cancelled for OPGW. Re-tendering has to be done.
18			Implementation of Integated system for Scheduling, Accounting, Metering and Settlement of Transactions (SAMAST) system in West Bengal. (197)	10.08	43910		12					10% grant not yet requested
19		WBPDCCL	Renovation and Modernization of 220/ 132 kV STPS switch yard and implementation of Substaion Automation System. (72)	23.48	5-Sep-16	18-May-17	18	18-Nov-18	21.13		32.09	Target date for completion of project is Sept,'21 subject to availability of S/D & Covid scenario. Request for release for final 10% grant has been placed.
21			Renovation and Modernization of switchyard and related protection system of different power stations (BTPS, BKTPS and KTPS) of WBPDCCL (155)	45.16	27-Jul-18	27-Mar-19	12	27-Mar-20	34.52		41.68	Target date for completion of project is Oct'21, subject to availability of S/D & Covid scenario. 90% grant availed on award cost.
			<b>Total</b>	<b>295.15</b>					<b>194.26</b>		<b>256.661</b>	

POWER SYSTEM DEVELOPMENT FUND												
Status of the Projects in Eastern Region												
Sl No	State	Entity	Name of the scheme	Grant Approved	Grant sanctioned on	1st Installment grant released on	Completion Schedule	Completion schedule w.r.t date of 1st instalment	Grant aviled so far	Under process of release	Total awards amount of placed of till date	Latest status
22			Renovation and Upgradation of the protection and control system of Ramgarh Sub Station. (81)	25.96	2-Jan-17	31-May-17	24	31-May-19	22.95	2.57	28.603	90% grant availed on award cost.
23	DVC	DVC	Renovation and Modernization of control and protection system and replcement of equipment at Parulia, Durgapur, Kalyanewari, Giridhi Jamsedpur, Barjora, Burmpur, Dhanbad and Bundwan substation. (106)	140.50	16-May-17	14-Dec-17	24	14-Dec-19	102.43	0.98	127.684	
			<b>Total</b>	<b>166.46</b>					<b>125.38</b>		<b>156.287</b>	
24	Sikkim	ENPD, Sikkim	Drawing of optical ground wire (OPGW) cables on existing 132kV & 66kV transmission lines and integration of leftover substations with State Load Despatch Centre, Sikkim. (173)	10.00	24-May-19		18		3.00		20	30% grant availed on award cost
			<b>Total</b>	<b>10.00</b>					<b>3.00</b>		<b>20.00</b>	
26			Creation and Maintenance of web based protection database management. (67)	20.00	17-Mar-16	28-Jun-16	18	28-Dec-17	14.83		16.48	Project Completed
27			Study Programme on power trading at NORD POOL Academy for Power System Engineers of Eastern Region. (122)	5.46	27-Jul-18	27-Mar-19	13	27-Apr-20	4.61		5.37	
28			Traning Program for Power system Engineers of various constituents of Eastern Region. (117)	0.61	27-Jul-18	11-Apr-19	24	11-Apr-21	0.54		0.60888	90% grant availed on award cost.
			<b>Total</b>	<b>26.07</b>					<b>19.98</b>		<b>22.45888</b>	
			<b>Grand Total</b>	<b>1,018.53</b>					<b>631.68</b>		<b>844.93</b>	



## Date of PFR testing scheduled /completed for generating stations in ER

Sr. No	Station	Generating Unit	Test schedule	Remarks
1	TALCHER STAGE 2	3	Unit 3 - 5: 23-11-2020 to 28-11-2020	Testing for unit 6 yet to be conducted
2		4		
3		5		
4		6		
5	Farakka	2	01-02-2021 to 10-01- 2021	Testing completed
6		3		
7		4		
8		5		
9		6		
10	Kahalgaon	1	August'21	Testing completed for Unit 1
11		5		
12		6		
13		7		
14	Barh	4	18-02-2021 to 21-02- 2021	Scheduled
15		5		
16	Teesta V	1	07-01-2021 - 08-01-2021	Testing completed
17	Teesta III	1	30-01-2021 - 10-02-2021	Testing completed
18		2		
19		3		
20		4		
21		5		
22		6		
23	Dikchu	1	Unit#1: 6th & 7th April' 21 Unit#2: 8th & 9th April' 21	Scheduled
24		2		
25	MPL	1	-	Postponed due to some technical issue
26		2		
27	GMR	1	August 21	Scheduled
28		2		
29		3		
30	JITPL	1	August 21	Scheduled
31		2		
32		3		
33	NPGCL	1	August'21	Testing completed
34	BRBCL	2 & 3	1 <sup>st</sup> Week of August'21	Testing completed
35	APNRL	1 & 2	July-August'21	Testing completed

Power Plant	Unit No	PSS tuned (Yes/No)	PSS in Service (Yes/No)	Last PSS Tuning Date	Whether Done in Last 3 Years	Whether Next to be planned	Planned Next PSS Tuning
<b>West Bengal</b>							
Kolaghat-WBPDCL	1	No	Yes	Long Back	No	Yes	Under retirement
Kolaghat-WBPDCL	2	No	Yes	Long Back	No	Yes	Under retirement
Kolaghat-WBPDCL	3	No	Yes	Long Back	No	Yes	When Unit will be on Bar
Sagardighi-WBPDCL	2	No	No	Long Back	No	Yes	When Unit will be on Bar
Bakreshwar-WBPDCL	2	Yes	Yes	2019	Yes	Yes	Retuning to be done as from plot response is not good
Bakreshwar-WBPDCL	3	Yes	Yes	2019	Yes	Yes	Retuning to be done as from plot response is not good
Bakreshwar-WBPDCL	4	Yes	Yes	2019	Yes	Yes	Retuning to be done as from plot response is not good
Bakreshwar-WBPDCL	5	Yes	Yes	2019	Yes	Yes	Retuning to be done as from plot response is not good
DPL	7	No	No	N.A	No	Yes	Planned in March 2021
DPL	8	No	Yes	No	No Detail	Yes	To be updated by WBPDCL/DPL
PPSP	1	No	Yes	2009	No	Yes	To be updated by WBSEDCL
PPSP	2	No	Yes	2009	No	Yes	To be updated by WBSEDCL
PPSP	3	No	Yes	2009	No	Yes	To be updated by WBSEDCL
PPSP	4	No	Yes	2009	No	Yes	To be updated by WBSEDCL
TLDP III	4 x 33			No Detail	No Detail	Yes	To be updated by WBSEDCL
TLDP IV	4 X 44			No Detail	No Detail	Yes	To be updated by WBSEDCL
<b>CESC</b>							
Budge Budge-CESC	1	Yes	Yes	2015	No	Yes	2021-22
Budge Budge-CESC	2	Yes	Yes	2015	No	Yes	2021-22
<b>DVC</b>							
Bokaro B 210 MW	3				No Detail	Yes	Unit Is out of Service
Mejia-DVC	4	Yes	Yes	2009	No	Yes	Jun-21
Raghunathpur-DVC	1	No	No		No Detail	Yes	Will be done after AOH
Raghunathpur-DVC	2	No	No		No Detail	Yes	Jun-21
Koderma-DVC	1	Yes	Yes	2013	No	Yes	Sep-21
Waria	4	Yes	Yes	2008	No	Yes	Unit Is out of Service
<b>ISGS</b>							
Kahalgaon NTPC	1	Yes	Yes	2017	Yes	Yes	Apr-21
Kahalgaon NTPC	2	Yes	Yes	2018	Yes	Yes	April 2021 (During AOH)
Kahalgaon NTPC	3	Yes	Yes	2016	Yes	Yes	Jul-21
Kahalgaon NTPC	4	Yes	Yes	2015	No	Yes	Mar-21

Kahalgaon NTPC	6	Yes	Yes	2009	No	Yes	Mar-21
Talcher Stage 2	3	Yes	Yes	2016	Yes	Yes	July 2021 (As per SRPC decision)
Talcher Stage 2	4	Yes	Yes	No Details	No Details	Yes	July 2021 (As per SRPC decision)
Talcher Stage 2	5	Yes	Yes	No Details	No Details	Yes	July 2021 (As per SRPC decision)
Talcher Stage 2	6	Yes	Yes	2016	Yes	Yes	July 2021 (As per SRPC decision)
Barh NTPC	4			2015		Yes	In Next AOH
Barh NTPC	5			During Unit commissioning		Yes	June 2021 (AOH)
Teesta V	1	Yes	Yes	2008	No	Yes	Jun-21
Teesta V	2	Yes	Yes	2008	No	Yes	Jun-21
Teesta V	3	Yes	Yes	2008	No	Yes	Jun-21
BRBCL	1	No	Yes	Vendor to Do	No	Yes	Jun-21
BRBCL	2	Yes	Yes	2019	Yes	Yes	Jun-21
BRBCL	3	No	Yes	Vendor to Do	No	Yes	Jun-21
KBUNL	1	Yes	Yes	2014	No	Yes	2021-22
KBUNL	2	Yes	Yes	2014	No	Yes	2021-22
KBUNL	3	Yes	Yes	Not Available	No	Yes	2021-22
KBUNL	4	Yes	Yes	Not Available	No	Yes	2021-22
Rangit	3 x 20			Not Available	No	Yes	To be updated by NHPC
<b>IPP</b>							
Jorethang	1	Yes	Yes	2015	No	Yes	Apr-21
Jorethang	2	Yes	Yes	2015	No	Yes	Apr-21
ADHUNIK	1	Yes	YES	2013	No	Yes	Aug-21
ADHUNIK	2	Yes	YES	2013	No	Yes	Aug-21
JITPL	1	Yes	Yes	2016	Yes	Yes	Jul-21
JITPL	2	Yes	Yes	2016	Yes	Yes	Jul-21
GMR	1	Yes	Yes	2013	No	Yes	May-21
GMR	2	Yes	Yes	2013	No	Yes	May-21
GMR	3	Yes	Yes	2013	No	Yes	May-21
<b>Orissa</b>							
IB TPS	1	Yes	Yes	2011	No	Yes	Mar'2021
IB TPS	2	Yes	Yes	2012	No	Yes	Mar'2021
Upper Indravati	1	Yes	No	2015	No	Yes	To be updated by OHPC
Upper Indravati	2	Yes	No	2015	No	Yes	To be updated by OHPC
Upper Indravati	3	Yes	No	2000	No	Yes	To be updated by OHPC
Upper Indravati	4	Yes	No	2001	No	Yes	To be updated by OHPC
Balimela	1 (60 MW)			No detail		Yes	To be updated by OHPC
Balimela	2 (60 MW)			No detail		Yes	To be updated by OHPC
Balimela	3 (60 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Balimela	4 (60 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Balimela	5 (60 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC

Balimela	6 (60 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Balimela	7 (75 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Balimela	8 (75 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Upper Kolab	1	Yes	Yes	2007	No	Yes	To be updated by OHPC
Upper Kolab	2	Yes	Yes	2007	No	Yes	To be updated by OHPC
Upper Kolab	3	Yes	Yes	2007	No	Yes	To be updated by OHPC
Upper Kolab	4	Yes	Yes	2007	No	Yes	To be updated by OHPC
Rengali	1	Yes	Yes	Not tuned	No	Yes	To be updated by OHPC
Rengali	2	Yes	Yes	Not tuned	No	Yes	To be updated by OHPC
Rengali	3	Yes	Yes	Not tuned	No	Yes	To be updated by OHPC
Rengali	4	Yes	Yes	Not tuned	No	Yes	To be updated by OHPC
Rengali	5	No	Yes	Not tuned	No	Yes	To be updated by OHPC
Sterlite	4 X 600			No detail		Yes	To be updated by SLDC Orissa
<b>Jharkhand</b>							
Tenughat	1	Yes	Yes	2017	Yes	Yes	No report has been submitted. So tuning to be planned
Tenughat	2	Yes	Yes	2017	Yes	Yes	No report has been submitted. So tuning to be planned
Subarnrekha	2 X 65					Yes	To be updated
<b>Bihar</b>							
BTPS	6 (110)					Yes	To be updated by BSPGCL
BTPS	7 (110)					Yes	To be updated by BSPGCL
BTPS	8					Yes	To be updated by BSPGCL
BTPS	9					Yes	To be updated by BSPGCL
<b>Bhutan</b>							
Tala	1	No	Yes			Yes	To be updated by BPC
Tala	2	No	Yes			Yes	To be updated by BPC
Tala	3	No	Yes			Yes	To be updated by BPC
Tala	4	No	Yes			Yes	To be updated by BPC
Tala	5	No	Yes			Yes	To be updated by BPC
Tala	6	No	Yes			Yes	To be updated by BPC
Chukha	1	No	Yes	2005	No	Yes	To be updated by BPC
Chukha	2	No	Yes	2005	No	Yes	To be updated by BPC
Chukha	3	No	Yes	2005	No	Yes	To be updated by BPC
Chukha	4	No	Yes	2005	No	Yes	To be updated by BPC
Mangdechu	1	No	Yes			Yes	To be updated by BPC
Mangdechu	2	No	Yes			Yes	To be updated by BPC
Mangdechu	3	No	Yes			Yes	To be updated by BPC
Mangdechu	4	No	Yes			Yes	To be updated by BPC

**Anticipated Peak Demand (in MW) of ER & its constituents**  
Sep-21

**Annexure-D1**

		Demand (MW)	Energy Requirement (MU)
<b>1</b>	<b>BIHAR</b>		
	NET MAX DEMAND	6475	3850
	NET POWER AVAILABILITY- Own Sources	678	185
	Central Sector+Bi-Lateral	5782	3158
	SURPLUS(+)/DEFICIT(-)	-15	-507
<b>2</b>	<b>JHARKHAND</b>		
	NET MAXIMUM DEMAND	1760	986
	NET POWER AVAILABILITY- Own Source	404	206
	Central Sector+Bi-Lateral+IPP	1182	704
	SURPLUS(+)/DEFICIT(-)	-174	-76
<b>3</b>	<b>DVC</b>		
	NET MAXIMUM DEMAND	3125	1879
	NET POWER AVAILABILITY- Own Source	5351	2988
	Central Sector+MPL	493	359
	Bi- lateral export by DVC	1998	1261
	SURPLUS(+)/DEFICIT(-) AFTER EXPORT	968	207
<b>4</b>	<b>ODISHA</b>		
	NET MAXIMUM DEMAND (OWN)	4400	2635
	NET MAXIMUM DEMAND (In Case,600 MW CPP Drawal)	5000	2707
	NET POWER AVAILABILITY- Own Source	4406	2558
	Central Sector	1944	942
	SURPLUS(+)/DEFICIT(-) (OWN)	1950	865
	SURPLUS(+)/DEFICIT(-) (In Case, 600 MW CPP Drawal)	1350	793
<b>5</b>	<b>WEST BENGAL</b>		
<b>5.1</b>	<b>WBSEDCL</b>		
	NET MAXIMUM DEMAND	7440	4155
	NET MAXIMUM DEMAND (Incl. B'Desh+Sikkim)	7580	4246
	NET POWER AVAILABILITY- Own Source (Incl. DPL)	5111	2255
	Central Sector+Bi-lateral+IPP&CPP+TLDP	2688	1646
	EXPORT (TO B'DESH & SIKKIM)	10	7
	SURPLUS(+)/DEFICIT(-) AFTER EXPORT	219	-345
<b>5.2</b>	<b>IPCL</b>		
	IPCL Demand	130	84
	IPCL Import	130	84
	SURPLUS(+)/DEFICIT(-)	0	0
<b>5.3</b>	<b>CESC</b>		
	NET MAXIMUM DEMAND	1920	1020
	NET POWER AVAILABILITY- Own Source	770	503
	FROM OTHER SOURCE (INCL. IPP/CPP-29-30 MU/M)	610	140
	IMPORT FROM HEL	540	377
	TOTAL AVAILABILITY OF CESC	1920	1020
	SURPLUS(+)/DEFICIT(-)	0	0
	<b>WEST BENGAL (WBSEDCL+CESC+IPCL)</b>		
	(excluding DVC's supply to WBSEDCL's command area)		
	NET MAXIMUM DEMAND	9490	5259
	NET POWER AVAILABILITY- Own Source	5881	2758
	CS SHARE+BILATERAL+IPP/CPP+TLDP+HEL	3838	2163
	SURPLUS(+)/DEFICIT(-) BEFORE WBSEDCL'S EXPORT	229	-338
	SURPLUS(+)/DEFICIT(-) AFTER WBSEDCL'S EXPORT	219	-345
<b>6</b>	<b>SIKKIM</b>		
	NET MAXIMUM DEMAND	102	46
	NET POWER AVAILABILITY- Own Source	8	3
	Central Sector	200	119
	SURPLUS(+)/DEFICIT(-)	106	76
	<b>EASTERN REGION</b>		
	NET MAXIMUM DEMAND	24855	14654
	NET MAXIMUM DEMAND (In Case, 600 MW CPP Drawal of Odisha)	25443	14726
	BILATERAL EXPORT BY DVC	1998	1261
	EXPORT BY WBSEDCL TO SIKKIM & B'desh	10	7
	EXPORT TO B'DESH & NEPAL OTHER THAN DVC	642	548
	NET TOTAL POWER AVAILABILITY OF ER	30167	16143
	(INCLUDING CS ALLOCATION +BILATERAL+IPP/CPP+HEL)		
	SURPLUS(+)/DEFICIT(-)	2662	-327
	SURPLUS(+)/DEFICIT(-) (In Case, 600 MW CPP Drawal of Odisha)	2074	-399