



**AGENDA
FOR
185th OCC MEETING**

Date: 23.11.2021

Eastern Regional Power Committee

14, Golf Club Road, Tollygunge

Kolkata: 700033

EASTERN REGIONAL POWER COMMITTEE

AGENDA FOR 185TH OCC MEETING TO BE HELD ON 23.11.2021 (TUESDAY) AT 10:30 HRS

PART – A

ITEM NO. A.1: Confirmation of Minutes of 184th OCC Meeting held on 26th October 2021 through MS Teams online platform.

The minutes of 184th Operation Coordination sub-Committee meeting held on 26.10.2021 was circulated vide letter dated 15.11.2021.

Members may confirm the minutes of 184th OCC meeting.

PART B: ITEMS FOR DISCUSSION

ITEM NO. B.1: Removal of technical minimum schedule support from ISGS plants to facilitate full surrender of power by Constituents.

As per prevailing practice in Eastern Region, ISGS stations are provided with Technical Minimum schedule support. In the event where sum of requisition from all the beneficiaries falls below technical minimum, the beneficiary schedule is jacked up to provide technical minimum schedule to the generators.

However, in the light of recent CERC Order on Petition No: 60/MP/2019, the practice of jacking up surrendered schedule of beneficiaries shall be withdrawn, except in cases as mandated in Section 5.7 of detailed Reserve Shutdown Procedure (RSD) (CERC Order No. - L-1/219/2017-CERC), which states:

Quote

RLDC shall suo-moto revise the schedule of any generating station as per clauses 6.5.14 and 6.5.20 of the Grid Code to operate at or above technical minimum in the ratio of under-requisitioned quantum (with respect to technical minimum) in the interest of smooth system operation under the following conditions:

- ✓ Extreme variation in Weather Conditions*
- ✓ High Load Forecast*
- ✓ To maintain reserves on regional or all India basis*
- ✓ Network Congestion*
- ✓ Any other event which in the opinion of RLDC/NLDC shall affect the grid security.*

While doing so, it is possible that the requisition of some beneficiaries may go up to ensure technical minimum. In this case, SLDCs may surrender power from some other inter-State generating station(s) or intra-State generating station(s) based on merit order. The concerned RLDC shall issue R-1 schedule accordingly and this shall be intimated to the concerned generating station, through the scheduling process.”

Unquote.

In the 184th OCC meeting, ERLDC representative submitted that as per the existing practice if the sum of requisition from all the beneficiaries falls below the technical minimum then in order to ensure that the units continue to run on bar, RLDC jacks up the schedule of the beneficiaries thereby providing technical minimum to the generators. However, as per CERC Order on Petition No: 60/MP/2019, there should not be any jacking up by the RLDCs, except for some special conditions. If the requisition falls below the technical minimum then at that instance the concerned generators may run their unit at reduced generation or may go for RSD. He further added that the Generators may also approach the beneficiaries and request them to increase their requisition in case the sum of requisition from all the beneficiaries falls below the technical minimum.

NTPC representative submitted that if technical minimum is not allowed for only few blocks then either the concerned beneficiaries may increase their requisition to support the technical minimum of the generators or jacking up of the schedule for those time blocks may be done from RRAS.

SE(Comm), ERPC submitted that concerned generators may go for RSD if they don't get the technical minimum. He further added that in such scenarios the beneficiaries need to understand that if any unit goes under RSD then it will take a considerable amount of time to revive the unit and in that case if the beneficiaries need any power then they will have to depend on the market. Further he submitted that as per the prevailing regulation, RRAS can only be implemented where there is any increase/decrease in grid frequency or any major congestion in the transmission network happens.

Odisha representative opined that if any of the beneficiaries doesn't support the technical minimum and surrenders its power, then the other beneficiary (ies) may use that power thereby providing technical minimum to the generator(s). In that case only the variable cost/energy charge would be levied on the beneficiary (ies) who availed that power. The beneficiary (ies) surrendering the power would bear only the fixed charge. He further added that the same has also been discussed in WRPC forum.

After detailed deliberation, OCC opined that:

- The existing practice would be continued until a decision is taken.
- In the mean time Odisha would submit a detailed proposal along with the WRPC's decision before the next OCC for further deliberation on the matter.

Members may discuss.

ITEM NO. B.2: Islanding Schemes in Eastern Region

B2.1. Implementation of Islanding Schemes in Eastern Region

In the meeting held on 28th December 2020 and chaired by the Hon'ble Minister of State (IC) it was directed that islanding schemes should be implemented for all major cities of the country considering all the strategic and essential loads. Subsequently, in line with the direction given in the meeting, the subject matter was discussed in PCC meeting of ERPC and it was finalized that new islanding scheme would be implemented for capital city of Patna & Ranchi.

I. Patna Islanding Scheme:

In the special meeting held on 06.08.2021, it was decided that Patna islanding scheme would be designed considering two unit of Nabinagar STPP (2*660 MW) of NPGCL as participating generator and loads of in and around Patna city. The provision of island formation with one unit of NPGC with corresponding load is also to be included in the island logic.

The islanding frequency & logic will be finalized based on the result of dynamic study to be carried out by SLDC Bihar/ERLDC.

The following timelines were decided:

1. Submission of requisite information by SLDC, Bihar: 2nd week of Aug' 2021.
2. Completion of Islanding simulation study by ERLDC: 4th Week of Aug' 2021
3. Review of islanding study & designing of the logic: By September'2021
4. Implementation & Operationalization of the Islanding Schemes: By March'2022

In 106th PCC meeting held on 16.09.2021 it was informed that the requisite information had already been shared by SLDC Bihar and the study is under progress by ERLDC. Further SLDC Bihar was advised to prepare the DPR by September'2021 for PSDF funding, if required.

In the 44th TCC Meeting, BSPTCL updated that preparation of DPR for PSDF funding is under process and the same would be completed within 15 days.

TCC stressed on the fact that this issue is being regularly monitored by MoP and advised BSPTCL for timely implementation of the Islanding Scheme.

In the 184th OCC meeting, BSPTCL representative submitted that M/s Siemens would give a presentation on DPR by Oct'21 end and subsequently the DPR would be prepared by 1st week of November'2021.

OCC advised BSPTCL to expedite the matter with Siemens and prepare the DPR as per the said schedule without any further delay.

BSPTCL may update.

II. Ranchi Islanding Scheme:

In the special meeting held on 06.08.2021, it was decided that Ranchi islanding scheme would be formed with one unit of Tenughat TPS(150-160 MW average generation) & Inland IPP(50-55 MW average generation) as participating generator & essential/critical loads of Ranchi to the tune of 180 MW. The islanding frequency & logic will be finalized based on the result of dynamic study to be carried out by SLDC Jharkhand/ERLDC.

The following timelines were decided:

1. Submission of requisite information by SLDC, Jharkhand: 2nd week of Aug' 2021.
2. Completion of Islanding simulation study by ERLDC: 4th Week of Aug' 2021
3. Review of islanding study & designing of the logic: By September'2021
4. Implementation & Operationalization of the Islanding Schemes: By February'2022

In 106th PCC meeting held on 16.09.2021 it was informed that the requisite information had already been shared by SLDC Jharkhand and the study is under progress by ERLDC. Further SLDC Jharkhand was advised to prepare the DPR by September'2021 for PSDF funding, if

required.

In the 44th TCC Meeting, JUSNL updated that preparation of DPR for PSDF funding is under process and the same would be completed within 15 days.

TCC stressed on the fact that this issue is being regularly monitored by MoP and advised JUSNL for timely implementation of the Islanding Scheme.

In the 184th OCC meeting, JUSNL representative submitted that they had requested for budgetary offer from GE, Siemens and ABB and after getting the same they would prepare the DPR.

OCC advised JUSNL to expedite the work and prepare the DPR within the stipulated time frame.

JUSNL may update.

In addition to above new islanding schemes, the following schemes have already been finalized and under different stage of implementation:

III. Chandrapura Islanding Scheme:

The scheme detail in brief is as follows:

- The CTPS-B islanding scheme is to be designed with two units of CTPS-B (2x250 MW) generating station as participating generator and connected loads at CTPS, Putki, Biada, Nimiaghata & Patherdih. The estimated off-peak and peak load in the proposed islanding system is 280 MW & 420 MW respectively.
- The islanding frequency for CTPS-B islanding system was decided as 48.4 Hz.

In special meeting held on 06.08.2021, following deliberations took place:

Representative of SPE wing of DVC updated that necessary discussion for implementation of the scheme at CTPS-B is going on with M/s GE for finalization of the scope of work & other modalities. He submitted that the tender process for implementation of islanding scheme would be initiated within two weeks.

In the 44th TCC Meeting, DVC representative informed that the work order for implementation of Chandrapura Islanding Scheme would be placed by March-2022 and the same would be implemented within 6 months.

In the 184th OCC meeting, DVC representative submitted that the scope of work has already been finalized but the budgetary offer is yet to be received from GE & Siemens. He further intimated that after getting necessary details from GE and Siemens, approval from their appropriate authority would be taken.

On query, he submitted that they are following up the matter with Siemens and GE on daily basis and stated that they would resolve the issue within one week.

OCC advised DVC to update the status to ERPC and ERLDC.

DVC may update.

IV. KBUNL Islanding Scheme:

In special meeting held on 08.06.2021, following deliberations were made:

1. KBUNL Islanding scheme would be designed considering both units of KBUNL stage-II (2x195 MW) as participating generator and connected radial loads at Gopalganj along with in-house load of KBUNL.
2. The islanding frequency will be at 48.6 Hz and this is subject to revision based on the suggestion received from KBUNL/OEM on under frequency settings of the generator units.
3. KBUNL would expedite the construction work related to implementation of Islanding scheme in switchyard. They would also take up with concerned OEM for testing and commissioning of islanding relay panel at their end.

In 106th PCC Meeting following deliberations were took place -

Regarding bay construction work at KBUNL switchyard, NTPC informed that civil work would be completed by October-21 & further testing & commissioning would be completed by January-21.

ERPC secretariat informed that time line for implementation of KBUNL islanding scheme had been decided as December-21 and advised NTPC to complete the bay construction work as well as other pending works related to implementation of the islanding scheme at the earliest.

In the 44th TCC Meeting, NTPC representative informed that the Islanding Scheme would be implemented by February-2022.

TCC advised NTPC representative to share the detailed timelines for completion of the remaining work to ERPC.

TCC further advised NTPC to implement the KBUNL Islanding Scheme as per the timeline.

In the 184th OCC meeting, KBUNL representative submitted that 4 nos. of bays are under erection, however, the civil work for construction of Bus-sectionalizer is under progress and after completion of the same erection work would be started.

Further, KBUNL representative expressed that the islanding frequency i.e. 48.4Hz, as proposed by ERLDC, needs to be reviewed as they have their low frequency tripping command at 48.5Hz. ERLDC representative advised KBUNL to consult with their OEM and OS and thereafter getting the inputs from OEM and OS the matter may be further discussed for finalization of the frequency.

KBUNL may update.

V. IB-TPS Islanding Scheme:

The scheme was finalized in the special Meeting on Islanding Scheme of IB-TPS held at ERPC, Kolkata on 12th December 2018.

In special meeting held on 06.08.2021, OPGC representative informed that work order had been placed on OEM (M/s BHEL) for implementation of the Islanding scheme at IB TPS units.

OPGC was also advised to take up the issue with their highest authority as well as with the OEM for expediting the implementation of islanding scheme.

In the 44th TCC Meeting, OPGC representative informed that IB TPS Islanding Scheme would

be implemented as per the given timeline i.e. April-22.

In the 184th OCC meeting, OPGC representative informed that the erection and testing work has been completed. He further submitted that the islanding scheme would be implemented after consultation with OPTCL regarding the load details (144 MW).

OCC advised OPGC to update the status of their meeting with OPTCL regarding this to ERPC and ERLDC.

OPGC may update.

B2.2. Separate Display of Islanding Schemes (IS) on SCADA of respective states LDCs/Sub SLDs and RLDCs

Hon'ble Minister for Power and New & Renewable Energy had taken a meeting to review the Islanding Schemes in Indian Power system on 28th December 2020. Further, on 19th August 2021 Secretary, Ministry of Power had taken another meeting (MoM enclosed) in this regard wherein it was decided that for real time monitoring of participating generators & critical loads of Islanding schemes, a separate display of Islanding Schemes on SCADA of respective states LDCs/Sub SLDs and RLDCs may be prepared. Delhi SLDC and NAPS IS have already prepared the display page on their SCADA.

Separate displays of the Islanding Schemes on SCADA may be set up in the SLDCs/Sub SLDs and RLDCs.

In the 184th OCC meeting, OCC advised all the concerned state SLDCs to set up a separate SCADA display at their control room end so that the same can be extended to ERLDC. The display needs to be set up for both the existing and the proposed Islanding schemes.

OCC advised ERLDC SCADA representative to co-ordinate with the concerned utilities regarding the same.

Members may update.

ITEM NO. B.3: Reliable Power Supply to Lalmatia/Godda/Dumka areas of JUSNL

B3.1. 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 181st OCC Meeting, JUSNL representative submitted that they had got a letter from NTPC on 19th 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-Lamatia 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 10th 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.

In the 182nd OCC meeting, JUSNL representative submitted that the tripartite agreement for taking over of FLTS as well as O&M of FLTS is in process and the same would be done after getting the consent from the competent authority by 4th week of August'2021.

OCC advised JUSNL to expedite the work for anti-theft charging without any further delay. JUSNL representative ensured to do the same.

ERLDC representative advised JUSNL for putting 220kV Lamatia-Godda line into service. JUSNL representative informed that they had tried to charge the line once but due to voltage rise at Lalmatia end, they had to open the line.

OCC advised JUSNL to re-check the possibility of charging the 220kV Lamatia-Godda line for reliable power supply to Lalmatia.

In the 183rd OCC meeting, JUSNL representative informed that the proposal for taking over of FLTS has been placed before the BoD of JUSNL for approval.

In the 184th OCC meeting, JUSNL representative submitted that the agreement has been signed among NTPC, ECL and JUSNL. He further intimated that a joint patrolling of the line is yet to be done by them.

ERLDC representative opined that restoration of the 10 nos. of collapsed towers may be done first on priority basis.

JUSNL representative stated that the estimate for restoration of the lines has already been approved by their BoD and Govt. of Jharkhand has been approached for fund requisition. In the mean time the tendering process would be finalized and after getting the necessary fund approval the work order for the same would be placed.

On query, JUSNL representative ensured that the line would be restored by June'22.

JUSNL may update.

B3.2. Commissioning of 220kV Tenughat-Govindpur line

In 179th 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 181st 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 15th August 21.

In the 182nd OCC meeting, JUSNL representative submitted that they had already got all the Statutory Clearance. He further added that only one railway crossing is pending which is expected to be completed by 10th Sept'21.

In the 183rd OCC meeting, JUSNL representative submitted that all pending work has been completed and final checking of the line is under progress.

They intimated that the line would be charged by first week of Oct'21.

In the 184th OCC meeting, JUSNL representative submitted that the line would be charged by 26.10.2021.

OCC advised JUSNL to update the status to ERPC and ERLDC.

JUSNL may update.

B3.3. Status of O & M agreement with Powergrid for bay equipments at Maithon end and resolution of auto recloser issues in the 220 kV Maithon-Dumka Lines

In 103rd 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 181st 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 15th August 21.

In the 182nd OCC meeting, JUSNL representative submitted that Powergrid had submitted the revised estimate and the same is in the process for approval by competent authority. He further informed that it would be completed by 1st week of September'2021.

In the 183rd OCC meeting, JUSNL representative intimated that in-principle approval for the O &M agreement had already been accorded to Powergrid. Further, signing of the agreement would be completed by September'21.

In the 184th OCC meeting, JUSNL representative submitted that the agreement would be signed after getting necessary approval from their Finance wing.

JUSNL may update.

ITEM NO. B.4: Restoration of PLCC for 220 kV Chandil-STPS S/C line

In 101st PCC meeting held on 13.04.2021, it was come to notice that both the channels of PLCC of 220 kV Chandil-Santaldih S/C line is unhealthy at Chandil end since May-2020. PCC advised JUSNL to rectify the PLCC issue at Chandil end at the earliest.

In 108th PCC meeting held on 16.11.2021, JUSNL representative informed that the PLCC rectification work could not be carried out as they are yet to receive the financial approval for the said work from their higher authority.

220 kV Chandil-STPS being an inter-state line and connected to generating station, healthiness of PLCC/line shall be ensured for overall reliability & security of the grid.

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 181st 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.

In the 182nd OCC meeting, Sikkim informed that the matter is under persuasion.

In the 184th OCC meeting, the agenda could not be discussed as Sikkim representative was not available in the meeting.

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.

In the 182nd OCC meeting, OPTCL representative submitted that the restoration work for 220kV Pandiabili - Samangara D/C line has been assigned to Powergrid. He further added that redesigning of tower in view of change of wind zone from Zone 4 to Zone 6 has also been taken up by Powergrid.

On query, OPTCL representative informed that the line is expected to be restored by March'2022.

ERLDC representative expressed that as 220kV Pandiabili - Samangara D/C line is of utmost important, thus the restoration of the said line may be expedited.

OCC advised OPTCL to expedite the work and also advised OPTCL to submit the work schedule mentioning the timelines for completion of designing, procurement and erection activities to ERPC and ERLDC.

In the 183rd OCC meeting, OPTCL representative informed that design of all the tower foundations of subjected line has been changed from open cast to pile foundation based tower. Therefore, the restoration of the line would take considerable time. He submitted that restoration of the line is expected by June'23.

OCC advised OPTCL to submit the action plan along with the time line for restoration of the line.

In the 184th OCC meeting, OPTCL representative submitted that the restoration work has been undertaken by Powergrid.

He added that DA & DD type tower design has already been tested and passed by CPRI, however, the prototypes of DB & DC type tower are under testing. Once the testing of the same is successfully completed, the action plan of the restoration work would be submitted by Powergrid.

OCC advised OPTCL to share the action plan to ERPC & ERLDC.

OPTCL may update.

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

400KV/220KV 315 MVA ICT 2 at Meeramundali 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.

In the 182nd OCC meeting, OPTCL representative submitted that the old ICT, which was completely damaged, would be replaced by a new one. The new 315 MVA ICT of BHEL make has already arrived at site and the foundation modification work is going on. OPTCL representative stated that the replacement work is expected to be completed by 30th Nov'21.

OCC advised OPTCL to expedite the work and also to share the work schedule of the same to ERPC & ERLDC for effective monitoring of the same.

In the 183rd OCC meeting, OPTCL representative submitted that the foundation work has been completed and the remaining work is expected to be completed by Nov'21.

In the 184th OCC meeting, OPTCL representative submitted that the work would be completed by December'21. He further mentioned that representative of BHEL (OEM) is yet to visit the site, however, the civil construction work has been completed and the said transformer is on the plinth.

OCC advised OPTCL to expedite the work and complete it by 31st Dec'21.

OPTCL may update.

B5.4. Outage of 400kV Main Bus-2 at Dikchu HEP

400kV Main Bus-2 at Dikchu HEP has been out since 05.05.2021.

Dikchu main update the expected restoration date & work progress regarding restoration.

ITEM NO. B.6: Inadequate reactive power performance of generating units during the high voltage condition.

Since 180th 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. As per ERLDC SCADA data, following regional generating units' (ISGS & IPP) reactive power absorption was inadequate during October 2021.

Name of generating units	Maximum MVAR absorption limit (as per capability curve)	MVAR absorption during maximum voltage (as per ERLDC SCADA data)	Maximum voltage during October 2021
Talcher STPS Stage I – 500 MW unit 1 & 2	> 150 MVAR	0 -10 MVAR	410 kV
Nabinagar TPP Stage I - 250 MW Unit -1 (BRBCL)	> 120 MVAR	0 MVAR	412 kV
Nabinagar TPP Stage I - 250 MW Unit - 2 & 3 (BRBCL)	> 120 MVAR	<30 MVAR	412 kV
Nabinagar STPP Stage I - 660 MW Unit -1	> 250 MVAR	<62 MVAR	418 kV
MPL - 525 MW Unit -1 & 2	> 150 MVAR	< 80 – 100 MVAR	410 kV
JITPL - 600 MW Unit 2	> 200 MVAR	0 MVAR (Unit was generating 200 MVAR)	410 kV

The details of the same are also attached at **Annexure-B6**

- Significant improvement in reactive power absorption has been observed for Nabinagar TPP (BRBCL) unit 2 & 3, Nabinagar STPP (NPGC) unit 1, MPL unit 1 & 2 during October 2021. Further improvement may be explored by BRBCL, NPGC and MPL.
- Significant MVAR absorption has been observed for Talcher Stage II units. However MVAR absorption by Talcher Stage I units was not satisfactory.
- No improvement in reactive power absorption has been observed in case of JITPL and BRBCL unit 1.

NTPC Talcher, NPGC, BRBCL, MPL & JITPL may update.

ITEM NO. B.7: Agenda by OPTCL

B7.1. Splitting of Budhipadar 220kV Bus due to high fault level.

OPTCL vide mail dated 30.08.2021 submitted that the fault level at Budhipadar 220 kV bus during steady state is 42.79 kA which is beyond the breaker rating of 40 kA. OPTCL has conducted the system study and the study reveals that in the base case the fault level is 42.79 kA while during splitting the fault level at the two buses are 30.40kA and 12.72kA. ERPC may advise suitable scenario to mitigate the fault level at Budhipadar.

In the 183rd OCC meeting, OPTCL informed that the fault level at 220 kV Budhipadar S/s is found to be crossed more than 42 kA and there is multiple generating units connected to 220 kV buses. In order to reduce the fault level, they proposed to segregate the 220 kV bus & connected feeders by opening the bus coupler breaker. In this regard they had carried out a study.

ERLDC pointed out that the proposal of segregating the bus by opening of bus coupler breaker reduces the overall reliability of the system.

OPGC informed that in the given study all four evacuating lines from IB TPS is connected to same bus at Budhipadar thereby affecting the reliability of the evacuation of IB TPS generation in case of any bus fault at Budhipadar.

ERPC secretariat informed that as per the decision taken in the special meeting on "implementation of SPS at Budhipadar S/s" the 220 kV Vedanta-Budhipadar D/C is to be made off after commissioning of second 220/132 kV ATR at Budhipadar and as such Vedanta injection at Budhipadar shall not be considered in the study. Further on suggestion of proper bus split at Budhipadar by bus-sectionalizer, OPTCL submitted that it would take considerable time to implement the proper bus splitting scheme.

After detailed deliberation, OCC advised OPTCL to carry out revised study in consultation with OPGC & SLDC Odisha for different scenarios and submit the report to ERPC/ERLDC for further discussion in this regard.

B7.2. Splitting of Meramundali 220 kV Bus due to high fault level.

OPTCL vide mail dated 15.09.2021 submitted that the fault level at Meramundali 220 kV bus during steady state is 40.89 kA which is beyond the breaker rating of 40 kA. OPTCL has already conducted the system study. However, ERPC may advise suitable scenario to mitigate the fault level at Meramundali.

In the 183rd OCC meeting, after detailed deliberation, OCC advised OPTCL to carry out revised study in consultation with OPGC & SLDC Odisha for different scenarios and submit the report to ERPC/ERLDC for further discussion in this regard

In the 184th OCC meeting, OPTCL representative submitted that due to the ongoing festive month, meeting with OPGC and SLDC Odisha could not be convened. He further intimated that a meeting would be convened by 1st week of November'2021 and the outcome of the meeting would be shared with ERPC & ERLDC.

OPTCL may explain.

ITEM NO. B.8: Islanding incidents in CESC system

B8.1. Islanding Performance and Observations during recent Islanding incidents in CESC system

CESSC islanding performance and frequency variation for past few Islanding events were checked for Island stability. Based on the analysis by ERLDC, possible challenges for island survival are listed below.

- Oscillating Variation of frequency after island formation in Budge-budge frequency is observed up to (0.5-1 Hz) and was varying continuously till it got synchronized with grid at Howrah point.
- In event 3, Budge-Budge Unit generation was also oscillating and its root cause needs to be looked into which is ultimately driving the frequency of island.
- Any cyclic load changes or other behavior within the island need thorough analysis as these may also be the source of observed variation. Variation of traction and Metro load may also be studied within the island as it impacts on overall frequency stability within the islanded system.

- Under frequency load shedding setting as shared within the island starts from 49.4 Hz and may cause operation of UFR relay in some cases inside the island. This would be detrimental for island survival as observed for 2 events, Frequency dipped up to 49.5 & 49.6 Hz due to these variations.
- Above observation and frequency variation pattern was also observed during event of 28th April 2020.

Detailed report is attached at **Annexure B8.1**.

In the 184th OCC meeting, CESC representative submitted that their team would visit ERLDC on 27th Oct'21 for detailed discussion on the incidents.

CESC may explain.

B8.2. Low frequency oscillation observed on 20th September 2021 due to Budge-Budge Plant of CESC.

Low Frequency Oscillation of 0.875 Hz was observed between 03:53 Hrs to 03:57 Hrs on 20th Sept 2021 near Subhasgram area. The magnitude of oscillation was maximum near Subhasgram and started reducing on moving away from Subhasgram. Observed LFO was of Local mode which indicates that the oscillation initiated with hunting of any nearby unit.

It was observed that maximum variation in MW oscillation was observed for Budge-budge units, which appears to be the source of oscillation. It was also observed that as MW of units reduced at Budge Budge units, this oscillation also damped.

Detailed report from ERLDC is attached at **Annexure B8.2**.

In the 184th OCC meeting, CESC representative submitted that their team would visit ERLDC on 27th Oct'21 for detailed discussion on the incidents.

CESC may explain.

ITEM NO. B.9: Event of Smelter Load tripping at Sterlite CPP on 20th & 28th September 2021

Smelter load tripping of 400 kV Sterlite CPP was observed on two occasions i.e., on 20 & 28th September 2021 due to electrical disturbance in the downstream side which resulted into Smelter load reduction of more than 1000 MW.

- This has caused under drawl of Odisha by more than 1000 MW. Subsequently with SPS action at Sterlite, injection to grid was limited up to 800 MW.
- Intimation of such events is necessary in real time as grid flow pattern gets affected considerably and also this is important for frequency response assessment purpose.

Report by ERLDC is attached at **Annexure-B9**.

In the 184th OCC meeting, ERLDC representative submitted that due to the Smelter load tripping at Sterlite CPP, there was huge under drawl on that day. Odisha tried to mitigate the problem by reducing their hydro but the under drawl persisted for more than one hour.

Odisha representative mentioned that they had taken remedial actions like reducing the hydro generation but still the issue of under drawl persisted. He further added that the matter would be discussed with their higher authority and the details of the same would be shared with ERPC and ERLDC by 10th November'21.

OCC advised Odisha to send their action plan regarding mitigating the above mentioned issue so that it can be discussed further in next OCC.

SLDC Odisha may update.

ITEM NO. B.10: Proposal for provisioning of additional Bus Reactor (400 KV, 125 MVAR Capacity) at Alipurduar & Binaguri SS of POWERGRID for catering continuous high voltage during low hydel condition.

At present, for both Alipurduar HVDC SS and Binaguri SS, 02 No's 125 MVAR Bus Reactor are present. Considering hydel connectivity, both the stations are heavily influenced by available Hydel Generations of Bhutan/Sikkim area and further system demand also varies according to generation pattern.

In line with above, system voltage also varying in large scale when the generations are high or low. In recent past it is observed when the hydel generations (Mainly Bhutan) are in lower region from the month of November to March, sometimes system voltage of Alipurduar SS is touching around 430 KV and 424-425 KV in Binaguri SS.

This phenomena observed mainly due to low loading of long lines (Bhutan connecting for Alipurduar HVDC, ER-I lines for Binaguri). High system voltage is continuously generating stress in the connected equipment's and may cause failure of insulation in long run.

Recent trend of system Voltage in both stations are given below:-

ALIPURDUAR & BINAGURI VOLTAGE PROFILE										
DATE	Max	Time	Min	Time	Max	Time	Min	Time	09:00 hrs	19:00 hrs
	ALIPURDUAR(KV)				BINAGURI(KV)				WB Demand (MW)	
24.10.2021	424	04:00	416	18:00	412	15:50	408	22:00	5112	6909
25.10.2021	424	04:00	418	18:00	412	03:00	408	01:00	5308	7132
26.10.2021	426	03:00	414	18:00	412	02:00	407	18:00	5373	7183
27.10.2021	425	03:00	416	18:00	416	03:00	405	18:00	5372	7173
28.10.2021	424	01:00	416	17:00	416	04:00	408	17:00	5357	7130
29.10.2021	427	04:00	416	18:00	418	03:00	409	19:00	5476	7210
30.10.2021	424	03:00	415	18:00	417	06:00	409	15:00	5235	6833
31.10.2021	426	03:00	414	13:00	418	03:00	409	16:00	4722	6225
01.11.2021	424	23:00	416	08:00	417	14:00	410	00:00	5203	6560
02.11.2021	425	23:00	416	08:00	416	21:00	409	18:00	5011	6692
03.11.2021	424	01:00	414	17:00	419	05:00	409	09:00	5051	6802
04.11.2021	427	03:00	420	07:00	420	02:00	415	00:00	4867	6275
05.11.2021	428	15:00	420	19:00	422	14:00	413	19:00	5012	6187
06.11.2021	427	04:00	415	18:00	420	03:40	407	18:00	4304	5810
07.11.2021	427	02:00	417	17:00	420	03:00	408	19:00	4444	5589
08.11.2021	427	03:00	415	18:00	422	01:00	404	18:00	4452	5913
09.11.2021	427	02:00	418	17:00	422	03:00	405	18:00	4703	6150

From above it is very much clear that during low hydel system voltage is beyond the permissible

limits of IEGC band (> 420 KV) and in certain cases most of the time in a day is above defined limit causing violation. WB demand is shown as reference only however total regional demand is in down trend only.

To cater the situation and considering typical loading behaviour of Hydel generators, it is proposed for considering additional 01 No Bus Reactor of capacity 125 MVAR at each Alipurduar & Binaguri SS. Required place for commissioning of subject Reactors and spare bays are already available in both Alipurduar HVDC and Binaguri SS. Accordingly a consolidated project considering all activities like supply, erection and subsequent commissioning of 125 MVAR Bus Reactors at both stations may be reviewed.

Members may discuss.

ITEM NO. B.11: Technical overview of AMR Data Center hardware and application refreshment program for Eastern Region

AMR Hardware and Software/ Application installed and running since 2013 at ERLDC for all the constituents of ER. All the Hardware equipments installed in the system has already elapsed almost 08 Years and being IT equipment, as per present CERC regulation already usable life is consumed.

Accordingly for running the system smoothly, with latest Cyber security aspects/compliances, both, Hardware and Software refreshment is required. New Hardware will be installed as per the CEA/CERC guideline for IT Network equipment along with New AMR application will be developed, with latest JAVA version and new features.

In view of above, M/S. TCS shall deliver a presentation on above for better understanding. Further, after finalization of technical aspects/features, necessary commercial offer shall be submitted.

In the 184th OCC meeting, Powergrid representative submitted that AMR Hardware and Software/ Application which have been running since 2013 at ERLDC for all the constituents of ER became old and have already consumed its usable life. He also added that as per CERC guidelines regarding Cyber security aspects/compliances both the Hardware & Software need to be updated.

M/s TCS representative gave a brief presentation on the same.

OCC agreed to give go ahead to Powergrid for finalizing the technical aspects so that financial cost assessment can be done. Powergrid representative informed that they would provide the cost estimate for the upgradation project within 10 days.

Further, OCC advised Powergrid to co-ordinate with ERLDC for finalization of the technical aspects.

Powergrid may update.

ITEM NO. B.12: Progress of LAN integration work of existing AMR in all constituents of ER

As per latest amendment total 69 Locations are supposed to be integrated in LAN for AMR system. Almost all the POWERGIRD locations are already integrated and now only constituents SS are taken up for integration through LAN.

As on date, out of 69 locations, only 25 new locations are as on date integrated over LAN as follows:

AMR LAN integration done in between Jul-21 to Sep-21				
SL No	Utility	Sub Station	LAN Inegration	Completion Date
1	DVC	DSTPP (AND)	Completed	28.07.2021
2	DVC	JAMSHEDPUR (JAM)	Completed	31.08.2021
3	DVC	KALNESHWARI (KAR)	Completed	03.08.2021
4	DVC	KODERMA (KOD)	Completed	05.08.2021
5	DVC	KOLAGHAT (KGT) DVC	Completed	27.07.2021
6	DVC	MAITHON (MAI)	Completed	03.08.2021
7	DVC	MANIQUE (MNQ)	Completed	01.09.2021
8	DVC	WARIA (WAR)	Completed	28.07.2021
9	DVC	DHANBAD	Completed	04.08.2021
10	DVC	PARULIA	Completed	29.07.2021
11	DVC	PATRATU	Completed	07.08.2021
12	DVC	BARHI	Completed	06.08.2021
13	PGCIL	Medinipur	Completed	06.09.2021
14	PGCIL	Alipurduar	Completed	23.09.2021
15	WBSEB	Jeerat	Completed	12.07.2021

AMR LAN integration done in Oct-21				
SL No	Utility	Sub Station	LAN Inegration	Completion Date
1	BSEB	Bodhgaya	Completed	26.10.2021
2	BSEB	Hajipur	Completed	26.10.2021
3	BSEB	Lakhisarai	Completed	25.10.2021
4	BSEB	Sipara	Completed	26.10.2021
5	PGCIL	Sitamari PG	Completed	09.10.2021

AMR LAN integration done in Nov-21 (till date)				
SL No	Utility	Sub Station	LAN Integration	Completion Date
1	WBSEB	Malda	Completed	08.11.2021
2	WBSEB	Dalkhola	Completed	10.11.2021
3	WBSEB	Birpara	Completed	08.11.2021
4	WBSEB	Subhasgram	Completed	02.11.2021
5	WBSEB	New Town	Completed	01.11.2021

Already 05-06 locations are undertaken for present month where port details are already available and integration will be done soon. However, slot details for balance locations of BSEB, JSEB mainly yet to be received. Both constituents are requested to provide the same at the earliest as after completing of BSEB/JSEB & WB locations further TCS shall plan for Odisha.

Members may note and concerned constituents may provide further details for planning.

ITEM NO. B.13: Non-availability of A/R in non-auto mode in 220KV Alipurduar-Salakati TL

The A/R in non-auto mode has been approved in OCC for the entire month of October-2021. However, A/R in non-auto mode was disallowed by ERLDC from 11/10/2021 to 16/10/2021 on account of Durga Puja and from 25.10.2021 to 31.10.2021 due to non-availability of PTW. Due to this disallowance, the ropes remained stuck in the line which may burn and cause tripping of the line. Such disallowance of permission to work is also causing delay in completion of the work and idling of man-hours.

It is proposed that A/R in non-auto mode (not being a shutdown) shall be allowed OR allowing the A/R permission till the ongoing OPGW drum is completed (may take 2-3 days).

In the 10th TeST Committee meeting, the committee referred this issue to OCC Meeting.

Powergrid may explain.

ITEM NO. B.14: Keeping DIA complete after taking shutdown of any element.

Following provision in regards of keeping DIA complete after taking shutdown of any element are there in standard operating procedure of eastern regional grid:

“ In case any element, say a line or an ICT or a bus reactor, is expected to remain out for a period say beyond two hours at such substation, the main & tie breakers of such elements should be closed after opening the line side isolator. This should be done after taking all suitable precautions to avert inadvertent tripping. This of course assumes that no maintenance is planned on such breakers / isolators.”

However during the tripping of 400 kV Farakka Bus-I on 04-11-21, it was observed that Main (435) and tie (434) bay of Kahalgaon circuit-3 were in open condition. Therefore the 400 kV Baharampur -I feeder remained charged through Bus- I main bay only. Due to this 400 kV Farakka-Baharampur circuit 1 got tripped during the Farakka Bus tripping incident. Tripping of 400 KV Farakka-Baharampur-1 could have been avoided by following standard practice of completing the DIA after taking the shutdown of an element.

In view of the above mentioned incident, all utilities are once again requested to follow the standard procedure and in any circumstances if it is not possible to complete the DIA after taking the shutdown the same should be immediately informed to RLDC control room.

ERLDC may explain.

ITEM NO. B.15: Implementation of differential protection for shorter lines:

As per the CEA standard transmission line protection can have either have distance or differential protection scheme as main protection scheme. It has been observed that for short lines distance protection scheme tends to over reach and pose protection coordination issues with other elements from the substation. Further many a times due to this short line distance protection the longer lines from remote ends has to increase their zone-2 time delays to higher values(500-600 ms).

In view of this inherent issue the *Report of the Task Force on Power System Analysis under Contingencies* recommends the following:

Line differential protection:

Many transmission lines are now having OPGW or separate optic fiber laid for the communication. Where ever such facilities are available, it is recommended to have the line differential protection as Main-I protection with distance protection as backup (built-in Main relay or standalone). Main-II protection shall continue to be distance protection. For cables and composite lines, line differential protection with built in distance back up shall be applied as Main-I protection and distance relay as Main-II protection. Auto-recloser shall be blocked for faults in the cables.

Based on the above in the 68th PCC ER forum members agreed on:

PCC opined that differential protection should be implemented for all short lines (<20 kM) to overcome relay coordination issues with respect to distance and over current protection.

In view of the above, the status of implementation differential protection for shorter lines in the eastern region may be followed up at ER OCC/PCC forum level. As such implementation will require OPGW installation and the same may also be followed up in the ER TEST meeting.

A list of short lines (< 20 Km) at 220 kV and above voltage level is attached at **Annexure-B11** as reference.

ERLDC may explain.

ITEM NO. B.16: Measures for controlling high voltage:

With onset of winter season the demand of eastern region has reduced and during lean night hours many pockets of eastern region are facing high voltage issue. System is also facing low frequency due to high variability of RE in some span of time. Compounding of high voltage issue with low system frequency increases the chance over fluxing of ICTs, which may lead to some system disturbance. In view of the above following action may be taken as per system requirement:

1. Maximum VAR absorption by all generators and PPSP even in motor mode:-Generators
2. Optimizing of STATCOM setting for maximum VAR absorption:-System operators and transmission system owner
3. Timely switching of Bus reactors:-system operators and transmission system owner
4. Opening of lightly loaded long lines: Among lightly loaded lines the lines with lower OV setting should be opened first and where parallel lines available, there alternate lines should be open on alternate days.—System operators
5. SLDC should ensure the MVAR injection from state system to ISTS boundary is minimum during high voltage scenario.
6. SLDC should take up with DISCOM to ensure that capacitors banks are switched off whenever the support of Capacitor is not required or presence of capacitor is causing high voltage.

Members may discuss.

ITEM NO. B.17: Repeated trippings of generating units.

During October 2021, following generating stations tripped repeatedly due to the reasons mentioned hereunder:

Name of unit	No of tripping	Major reasons for repeated tripping
STPS – Unit 5	4	Low turbine vacuum, drum level low, Loss of fuel, boiler tube leakage
STERLITE- Unit 1	4	Ash handling problem and Air pre heater problem

Tripping statistics of generating units which tripped more than once during October 2021 are shown below:



Members may update.

ITEM NO. B.18: Draft Procedure for planning of Inter-State Transmission System

A Draft Procedure for planning of Inter-state Transmission System has been prepared by CTU of India Ltd in accordance with Electricity (Transmission System Planning, Development and Recovery of Inter-State Transmission Charges) Rules, 2021. The Draft Procedure is placed at **Annexure-B18**

Observations of stakeholders, if any, may be sent to ERPC Secretariat latest by 26.11.2021.

Members may discuss.

PART C: ITEMS FOR UPDATE

ITEM NO. C.1: ER Grid performance during October 2021

The average and maximum consumption of Eastern Region and Max/Min Demand (MW), Energy Export for the month October-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)
451.7	501.4 11-10-2021	23532 MW, 07-10-2021 21:16 Hrs.	15618MW, 01-10-2021 at 06:20 Hrs.	3815	3742

Members may note.

ITEM NO. C.2: Points discussed on the meeting for performance of generating units in ER on dated 28th October'2021

A meeting to discuss and deliberate on the performance of ISGS and IPPs generating power plants of the Eastern Region was organised by ERLDC on 28th October 2021. The meeting was for discussion on active and reactive power performance including primary frequency response (PFR) testing and forced outage for generating plants. Major issues were discussed during this meeting was as follows:

1. Performance of generating units during events occurred in June - September 2021 and action taken by generating stations based on the recommendation given in the meetings held on 31st May 2021.
2. Scheduling of primary frequency response testing at NTPC Talcher STPS Stage 1, NTPC Barh STPS, NTPC Darlipalli STPS, Jindal TPS (JITPL), Maithon RB TPS (MPL) and Dikchu HEP.
3. Running GMR unit #1 & #2 and Talcher unit #1 & #2 more than MCR and non-maintaining adequate margin for primary frequency response.
4. Inadequate reactive power absorption by Barh STPS, Nabinagar STPS, Nabinagar TPS and JITPL during high voltage. Summary of reactive power performance provided by above generating units along with action to be taken are provided in table 3.
5. NTPC informed remedial action has been taken regarding repeated tripping of Farakka unit 5 & 2 and Talcher unit 1.

Minutes of the meeting is attached at **Annexure-C2**

Members may update.

ITEM NO. C.3: Performance of Primary frequency response of ER generating units

Frequency response characteristics (FRC) have been analyzed pan India for one event of sudden frequency change that occurred in October 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
Event 1: On 28th October 2021 at 17:48:31:960 Hrs, 1500 MW smelter load loss at Sterlite in ER.	49.962 Hz to 50.090 Hz. Later stabilized at 50.031 Hz.	58.5 %

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

Generating Station/ SLDC	Event 1
NTPC Farakka	Non Satisfactory response
NTPC Kahalgaon	Response observed but non adequate
NTPC Talcher	Non Satisfactory response
NTPC Barh	Non Satisfactory response
NTPC Darlipalli	Non Satisfactory response
BRBCL	Satisfactory response
NPGC Nabinagar	Satisfactory response
GMR	Non Satisfactory response
JITPL	Non Satisfactory response
MPL	Response observed but non adequate
Adhunik	Response observed but non adequate
Dikchu HEP	Non Satisfactory response
Bihar SLDC	Satisfactory response
Jharkhand SLDC	Non Satisfactory response
DVC SLDC	Satisfactory response
GRIDCO SLDC	Non Satisfactory response
WB SLDC	Satisfactory response

Non Satisfactory response
 Response observed but non adequate
 Satisfactory response

Reason for non-satisfactory response may be explained.

Generator end data/FRC are yet to be received from following generating stations/SLDCs

- NTPC Farakka
- NTPC Kahalgaon
- NTPC Talcher
- NTPC Darlipalli
- NPGC Nabinagar
- JITPL
- Bihar SLDC
- Jharkhand SLDC
- GRIDCO SLDC
- WB SLDC

Reason for non-sharing of generator end data/FRC may be shared.

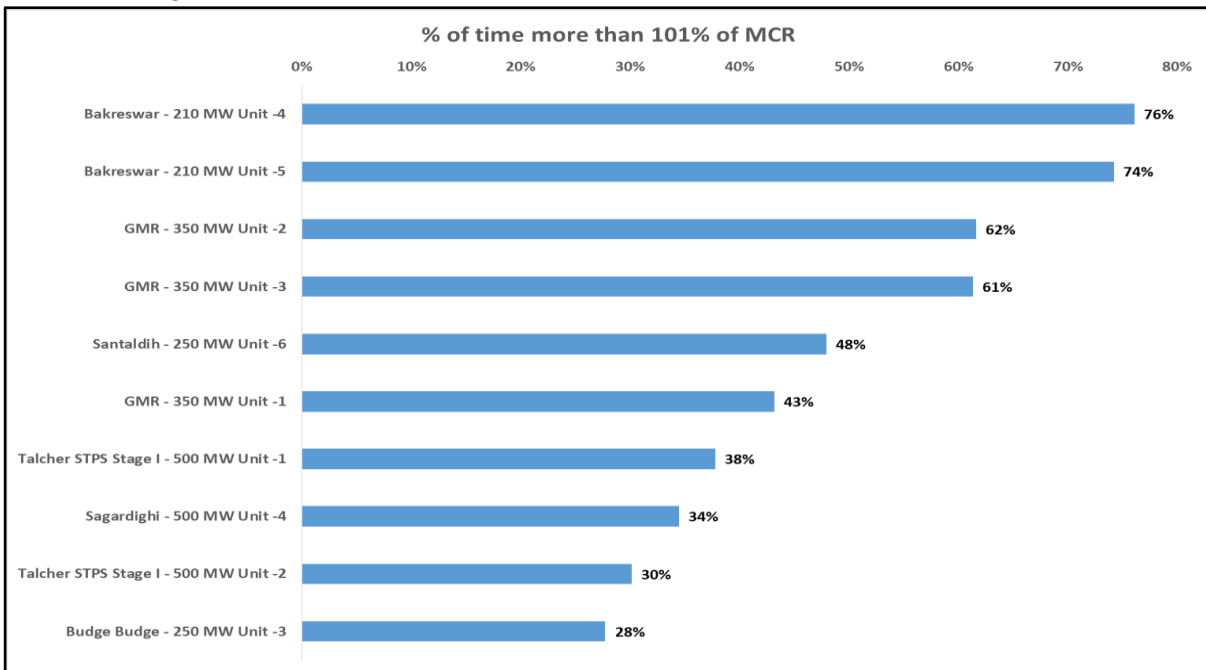
Members may update.

ITEM NO. C.4: Running Generating units at more than MCR

As per IEGC 5.2 (h), the coal fired thermal generating station shall not resort to Valve Wide Open (VWO) operation of units whether running on full load or part load, and shall ensure that there is margin available for providing Governor action as primary response.

Generating stations failed to provide adequate primary frequency response because of running units at more than MCR and running machines with insufficient PFR margin. Same issue was highlighted and discussed during meeting held on 31st May 2021, 31st August 2021 and 28th October 2021 to evaluate the performance of primary frequency response provided by ER generating units.

As per SCADA data stored at ERLDC, injection more than 101% of MCR limit (1% margin is considered to offset SCADA measurement error) has been captured for following generating units during October 2021:



Same issue is being highlighted by ERLDC since 180th ER OCC meeting and over injection has been observed for above generating units in spite of repeated intimation.

WBSLDC/WBPDCL/CESC, GMR/Odisha SLDC, Talcher STPS & GMR are requested to avoid over injection more than MCR limit.

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

In 10th 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 42nd TCC, DVC intimated that AGC shall be implemented in unit 7 and 8 of Mejia as per the given schedule by 31st July 2020.

WBPDCL 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.

OCC advised SLDC Odisha and OPGC to interact with Barh NTPC & ERLDC to get the technical specifications & the procedure for implementation of AGC.

In the 183rd OCC meeting, OPGC representative informed that work order has been issued to M/s Siemens for implementation of AGC. The work would be carried out during the unit shutdown which is scheduled from 18.10.2021.

State	Station/Unit	Deliberation in 184 th OCC Meeting
DVC	Mejia unit#7 &8	DVC representative informed that NIT is to be floated.
Odisha	Unit#3 of OPGC	OPGC vide email dated 25 th Oct'21 informed that some additional data is needed from SLDC Odisha and after getting the same AGC would be implemented.

Members may update.

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

In the 180th 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 181st 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 1st week of August'21 respectively.

In the 182nd OCC meeting, ERLDC representative submitted that During July – August 2021,

PFR testing has been conducted at the following generating units:

1. Adhunik TPS Unit 1 & 2
2. BRBCL TPS Unit 2 & 3
3. Nabinagar STPS Unit 1
4. Kahalgaon STPS Unit 1

In the 183rd OCC meeting, ERLDC representative updated that PFR testing for Unit# 1 & 2 of GMR had been completed.

The updated status 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 171st 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 6th 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

In the 182nd OCC meeting, WBPDC representative submitted that they had taken the budgetary offer from Siemens and Solvina and the same is in process for administrative approval. PO would be issued to the selected party after getting the necessary approval.

Jharkhand representative submitted that no update has been obtained from Tenughat in this regard.

DVC representative submitted that the Indent for this work had been placed in April'21 and they are in the process for floating the NIT.

OHPC representative submitted that the order would be issued to M/s Solvina by 1st week of September'2021.

In the 183rd OCC meeting, OHPC representative submitted that work order has been placed on M/s Slovenia and they are planning to conduct the test in the month of Nov'21 for unit#5 of Rengali & Unit #4 of Indravati HEP.

TVNL representative submitted that due to coal shortage issue, the PFR testing of Unit #1 could not be planned. The same would be taken up once the coal supply gets improved.

WBPDC representative submitted that they are yet to receive the administrative approval. The work order would be placed after getting the approval.

In the 184th OCC meeting, OHPC representative submitted that the order has been placed to M/s Solvina on 3rd Sept'21 and the testing of unit#5 of Rengali & Unit #4 of Indravati HEP are scheduled to be conducted in the month of Nov'21.

TVNL representative was not available in the meeting.

WBPDC representative submitted that the tender has been floated and the bid opening is scheduled in the 1st week of Nov'21. He further informed that the order would be placed by 3rd week of November'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 171st OCC Meeting and shared with all concerned utilities.

CESC representative submitted that PSS tuning for Budge Budge unit#1 & 2 was done on 16th & 17th Aug'21 respectively.

ERLDC representative informed that PSS tuning for Mejia unit#4, Mangdechu unit#3 & 4, DPL unit#7 and Kahalgaon unit#2 was done satisfactorily. However PSS tuning for APNRL was not successful.

DGPC Bhutan representative submitted that for Chuka, Tala and Mangdechu they had shared their report to ERPC.

In the 183rd OCC meeting, DVC representative informed that for PSS tuning for Unit#1 of Koderma TPS was carried out on 07/09/2021.

OCC advised DVC to submit the test report to ERLDC/ERPC.

In the 184th OCC meeting, ERLDC representative submitted that PSS tuning for Teesta-III is scheduled on 17th Nov'21. However, update from Bhutan is still pending.

OHPC representative mentioned that PSS tuning for all the units of Rengali was carried out from 10th to 13th Oct'21 and was tuned properly. He further added that the report would be shared to ERPC and ERLDC.

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.

Members may update the status of UFR healthiness installed in Eastern Region.

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

As per the decision taken in the meeting held on 8th 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 functions 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 perstate'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 Feb-2021

SI No	State/Utility	TTC (MW)		RM(MW)		ATC Import (MW)		Remark
		Import	Export	Import	Export	Import	Export	
1	BSPTCL	5000	--	100	--	4900	--	Nov-21
2	JUSNL	1702	--	49	--	1653	--	Feb-22
3	DVC	1577	2878	63	50	1514	2828	Feb-21
4	OPTCL	2360	1090	104	58	2256	1032	Jan-21
5	WBSETCL	5256	--	450	--	4806	--	Dec-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	http://www.bsptcl.in/ViewATCTTCWeb.aspx?GL=12&PL=10	Yes	Static Link-Table

2	JUSNL	Yes	http://www.jusnl.in/pdf/download/ttc_atc_nov_2020.pdf	Yes	Static link –pdf file
3	DVC	Yes	https://application.dvc.gov.in/CLD/atcttcmenu.jsp#	Yes	Static Link-Word file
4	OPTCL	Yes	https://www.sldcorissa.org.in/TTC_ATC.aspx	Yes	Static Link-pdf file
5	WBSETCL	Yes	http://www.wbsldc.in/atc-ttc	No (Not updating)	Static Link-Table
6	Sikkim	No	https://power.sikkim.gov.in/atc-and-ttc	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 2week 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 th 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		First Week of March	

		Nov 2021		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	

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

In the 182nd OCC meeting, OHPC representative submitted that Mock Black Start had been done for Rangali on 18th August'21 and they would go for Mock Black Start of Balimela in Sept'21.

OCC advised the concerned utilities to give prior intimation to ERLDC and ERPC regarding Mock Black Start.

In the 183rd OCC meeting, SLDC Odisha representative informed that mock black start for Balimela has been scheduled in Nov-21.

Teesta III HEP representative submitted that mock black would be carried out for their plant in Nov'21 as per the schedule.

Members may update.

PART D: OPERATIONAL PLANNING

ITEM NO. D.1: Anticipated power supply position during December 2021

The abstract of peak demand (MW) vis-à-vis availability and energy requirement vis-à-vis availability (MU) for the month of December 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 December 2021

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

Proposed Maintenance Schedule of Thermal Generating Units of ER during 2021-22 in the month of December'2021								
System	Station	Unit No.	Capacity (MW)	Period (as per LGBR 2021-22)		No. of Days	Reason	Remarks
				From	To			
WBPDC	Bandel TPS	5	215	10.12.2021	19.12.2021	10	PG Test	
	Santalidih TPS	5	250	20.12.2021	13.01.2022	25	AOH/BOH	
CESEC	Budge-Budge	3	250	14.12.2021	20.12.2021	7	PG Test	
DVC	Mejia TPS	2	210	26.12.2021	30.01.2022	36	COH-Boiler, Turbine-RLA, Gen., FGD	
	Chandrapura TPS	7	250	28.12.2021	01.02.2022	36	BOH, FGD, De-NOx Burner	
DPL	DPPS	8	250	01.12.2021	15.01.2022	31	AOH	
NTPC	Talcher STPS	1	500	10.12.2021	13.01.2022	35	Overhauling	Proposed to prepone from 01.12.2021 to 09.01.2022.
IPP	MPL	2	525	02.12.2021	15.01.2022	45	COH	Shifted to 22.01.2022 to 28.02.2022.
	JITPL	2	600	01.12.2021	10.12.2021	10	Short Maintenance	

Members may discuss.

ITEM NO. D.3: Shutdown proposal of Transmission lines/equipment

D3.1. Shutdown proposal for erection & Commissioning of 500 MVA ICT-5 at Malda S/s under ERSS-XVII-B

The shutdown for 315 MVA ICT-5 at Malda was proposed for 62 days for replacement of the same ICT with 500 MVA ICT. In 184th OCC Outage Coordination meeting held on 18/10/2021, Powergrid was advised to submit the detailed action plan along with the timeline for carrying out the replacement work and further it was decided to discuss this shutdown in 184th OCC meeting.

Element Name	Element Type	Daily/Continuous	Reason	From Date	From Time	To Date	To Time	No. of days
400KV/ 220KV 315 MVA ICT 5 AT MALDA	Transformer	D	500MVA ICT-V erection & commissioning under ERSS-XVII- B	15-11-2021	07:00	15-01- 2022	17:00	62

In the 184th OCC meeting, Powergrid representative submitted that the time schedule would be optimized and a revised schedule would be shared with ERLDC and ERPC.

Powergrid may update.

D3.2. Shutdown proposals related to re-conductoring work of 400 kV Maithon-MPL D/C line.

The following shutdowns are proposed in the month of Nov-21 for carrying out the re-conductoring work in 400 kV Maithon-MPL D/C line. The shutdown was discussed in 184th OCC Outage Coordination meeting wherein it was decided to refer the issue to 184th OCC Meeting for fruitful discussion.

Element Name	Element Type	Daily/Continuous	Reason	From Date	From Time	To Date	To Time	No. of days
400KV- MAITHON- MAITHON RB-1	Ac transmission line	D	To be kept in Non- Auto Mode during Re-conductoring work in Ckt-II	01-11- 2021	08:00	30-11- 2021	17:00	30
400KV- MAITHON- MAITHON RB-2	Ac transmission line	C	Re-conductoring work of 400KV Maithon - Right Bank Line	01-11- 2021	08:00	30-11- 2021	17:00	30
400KV TIE BAY OF MAITHON- 2 AND ST#1 AT MAITHON RB	Bay	C	Upgradation of Bay equipmenets under ERSS-XVII Project work.	25-11- 2021	08:00	20-12- 2021	17:00	26
400KV MAIN BAY OF MAITHON -2 AT MAITHON RB	Bay	C	Upgradation of Bay equipmenets under ERSS-XVII Project work.	01-11- 2021	07:00	20-11- 2021	17:00	20
400KV	Bay	C	Bay upgradation	15-11-	08:00	30-11-	18:00	16

MAIN BAY OF MAITHON RB-II AT MAITHON			work under ERSS-XVII	2021		2021		
400KV-MAITHON-MAITHON RB-2	Ac transmission line	D	Isolation of Jumpers of 400kV MPL Maithon-2 Main Bay(406) for upgradation of equipment under ERSS-XVII project work at MPL end.	01-11-2021	08:00	01-11-2021	17:00	1

In the 184th OCC meeting, after detailed deliberation it was decided that the shutdown may be allowed initially for a period of 15 days. Powergrid was advised to take all possible measures for optimizing the time schedule and complete the reconductoring work. The subsequent shutdown requirement may be decided based on status of the work completed during the initial shutdown.

Powergrid may update.

ITEM NO. D.4: Major Generating Units/Transmission Element outages/shutdown in ER Grid (as on 14.11.2021)

a) Thermal Generating Stations outage report:

Sl. No	Station	State	Agency	Unit No.	Capacity in Mw	Reason(s)	Outage Date
1	BARH	BIHAR	NTPC	5	660	FOR OVERHAULING AND BOILER MODIFICATION.	19-Sep-2021
2	BALIMELA HPS	ODISHA	OHPC	1	60	R & M WORK	05-Aug-2016
3	BALIMELA HPS	ODISHA	OHPC	2	60	R & M WORK	20-Nov-2017
4	BURLA HPS/HIRAKUD I	ODISHA	OHPC	5	37.5	R & M WORK	25-Oct-2016
5	BURLA HPS/HIRAKUD I	ODISHA	OHPC	6	37.5	R & M WORK	16-Oct-2015
6	KOLAGHAT	WEST BENGAL	WBPDC	1	210	INITIALLY TAKEN UNDER ESP R & M. PRESENTLY UNDER CONSIDERATION FOR DE-COMMISSIONING.	07-Jun-2018
7	MUZAFFARPUR TPS	BIHAR	BSPHCL	1	110	COMPLETION OF TENURE OF PPA	08-Sep-2021
8	MUZAFFARPUR TPS	BIHAR	BSPHCL	2	110	COMPLETION OF TENURE OF PPA	08-Sep-2021
9	TENUGHAT	JHARKHAND	TVNL	1	210	COAL SHORTAGE	17-Sep-2021
10	NABINAGAR(NPGC)	BIHAR	NPGC	1	660	TO RESOLVE THE SAPH 1B PROBLEM	08-Nov-2021
11	BAKRESHWAR	WEST BENGAL	WBPDC	2	210	PLANNED MAINTENANCE	09-Nov-2021
12	BARAUNI TPS	BIHAR	BSPHCL	6	110	ABNORMAL TSI PARAMETER	17-Mar-2021
13	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

14	BOKARO-A'	DVC	DVC	1	500	BOILER TUBE LEAKAGE	10-Nov-2021
15	DPL	WEST BENGAL	WBPDC	7	300	BOILER TUBE LEAKAGE	13-Nov-2021
16	KOLAGHAT	WEST BENGAL	WBPDC	2	210	INITIALLY TAKEN UNDER ESP & ASH HANDLING R & M. PRESENTLY UNDER CONSIDERATION FOR DE-COMMISSIONING.	26-Jun-2021
17	RENGALI HPS	ODISHA	OHPC	3	50	DUE TO HEAVY OIL LEAKAGE FROM SUMP TAK	19-Jul-2021
18	VEDANTA	ODISHA	SEL	4	135	AHP PROBLEM	06-Nov-2021
19	WARIA TPS	DVC	DVC	4	210	CONDENSER TUBE LEAKAGE	15-Oct-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.

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	BARH	BIHAR	NTPC	4	660	RSD/ LOW SYSTEM DEMAND	11-Nov-2021
2	BARAUNI TPS	BIHAR	BSPHCL	7	110	RSD/ LOW SYSTEM DEMAND	29-Oct-2021
3	KOLAGHAT	WEST BENGAL	WBPDC	4	210	RSD/ LOW SYSTEM DEMAND	04-Nov-2021
4	KOLAGHAT	WEST BENGAL	WBPDC	6	210	RSD/ LOW SYSTEM DEMAND	03-Nov-2021
5	RTPS	DVC	DVC	2	600	RSD/ LOW SYSTEM DEMAND	02-Nov-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 D I	ODISHA	OHPC	5	37.5	R & M WORK	25-Oct-2016
4	BURLA HPS/HIRAKU D I	ODISHA	OHPC	6	37.5	R & M WORK	16-Oct-2015
5	RENGALI HPS	ODISHA	OHPC	3	50	DUE TO HEAVY OIL LEAKAGE FROM SUMP TAK	19-Jul-2021

It is seen that about 245 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	Reasons for Outage
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			DATE	
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/J USNL	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 thereafter developed relay reset problem. Not commissioned.
7	400KV/220KV 315 MVA ICT 2 AT MEERAMUNDALI	OPTCL	21.02.2021	FIRE HAZARD
8	400KV/220KV 315 MVA ICT 4 AT JEERAT	WBSETC L	09.04.2021	Verbally confirmed by WB that new Transformer procurement under pipeline and shall be replaced in the near future.
9	220KV-FSTPP-LALMATIA	JUSNL	21.04.2021	THREE TOWER COLLAPSED NEAR LALMATIA

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).

Members may update.

ITEM NO. D.5: Commissioning of new units and transmission elements in Eastern Grid in the month of October-2021

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

Monthly commissioning List of Transmission element and generators: October 2021					
SL. No	Location	Owner/Unit Name	Date	Time	Remarks
1	PMTL	400/220KV 500MVA ICT-1 AT SAHARSA	6-Oct-21	17:31	1

2	PGCIL	400/220KV 315MVA ICT-4 AT JEYPORE	30-Oct-21	20:27	2
3	BSPTCL	220KV-BEGUSARAI- KHAGARIA-1	8-Oct-21	18:57	3
4	BSPTCL	220KV-KHAGARIA- NEW PURNEA-1	8-Oct-21	18:27	4
5	BSPTCL	132KV- MADHEPURA (BH)- SAHARSA(PMTL)-1	13-Oct-21	14:07	5
6	BSPTCL	132KV- SONEBARSA (BH)- SAHARSA(PMTL)-1	8-Oct-21	14:21	6
7	PGCIL	400KV- BAHRAMPUR(PG)- BEHERAMARA-4	26-Oct-21	15:43	7
8	PMTL	400KV-SAHARSA- KISHANGANJ-1 (LILO OF 400 kV Patna-Kishanganj-1 at Saharsa)	2-Oct-21	13:03	8
9	PMTL	400KV-PATNA- SAHARSA-1 (LILO OF 400 kV Patna- Kishanganj-1 at Saharsa)	2-Oct-21	16:06	9
10	PMTL	220KV MAIN BAY OF 400KV/220KV 500 MVA ICT 1 AT SAHARSA	8-Oct-21	11:10	10
11	PMTL	220KV MAIN BAY OF KHAGARIA-1 AT SAHARSA	15-Oct-21	11:53	11
12	PMTL	220KV MAIN BAY OF KHAGARIA-2 AT SAHARSA	15-Oct-21	11:38	12
13	PMTL	220KV MAIN BAY OF BEGUSARAI-1 AT SAHARSA	15-Oct-21	11:55	13
14	PMTL	220KV MAIN BAY OF BEGUSARAI-2 AT SAHARSA	15-Oct-21	11:54	14
15	PMTL	132KV MAIN BAY OF SONEBARSA (BH) -1 AT SAHARSA	4-Oct-21	16:12	15
16	PMTL	132KV MAIN BAY OF MADHEPURA (BH) -1 AT SAHARSA	4-Oct-21	16:31	16

Members may update.

ITEM NO. D.6: UFR operation during the month of October 2021

Frequency profile for the month as follows:

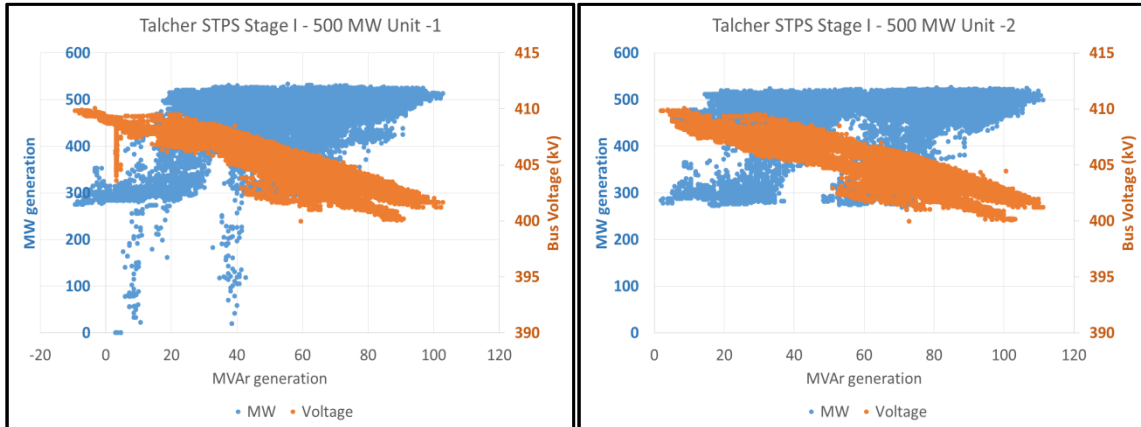
Month	Max	Min	Less IEGC Band (%)	Within IEGC Band (%)	More IEGC Band (%)
	(Date/Time)	(Date/Time)			
Oct, 2021	50.29 Hz on 26.10.2021 at 13:02 Hrs	49.50 Hz on 07.10.2021 at 18:14 Hrs	11.10	74.38	14.52

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

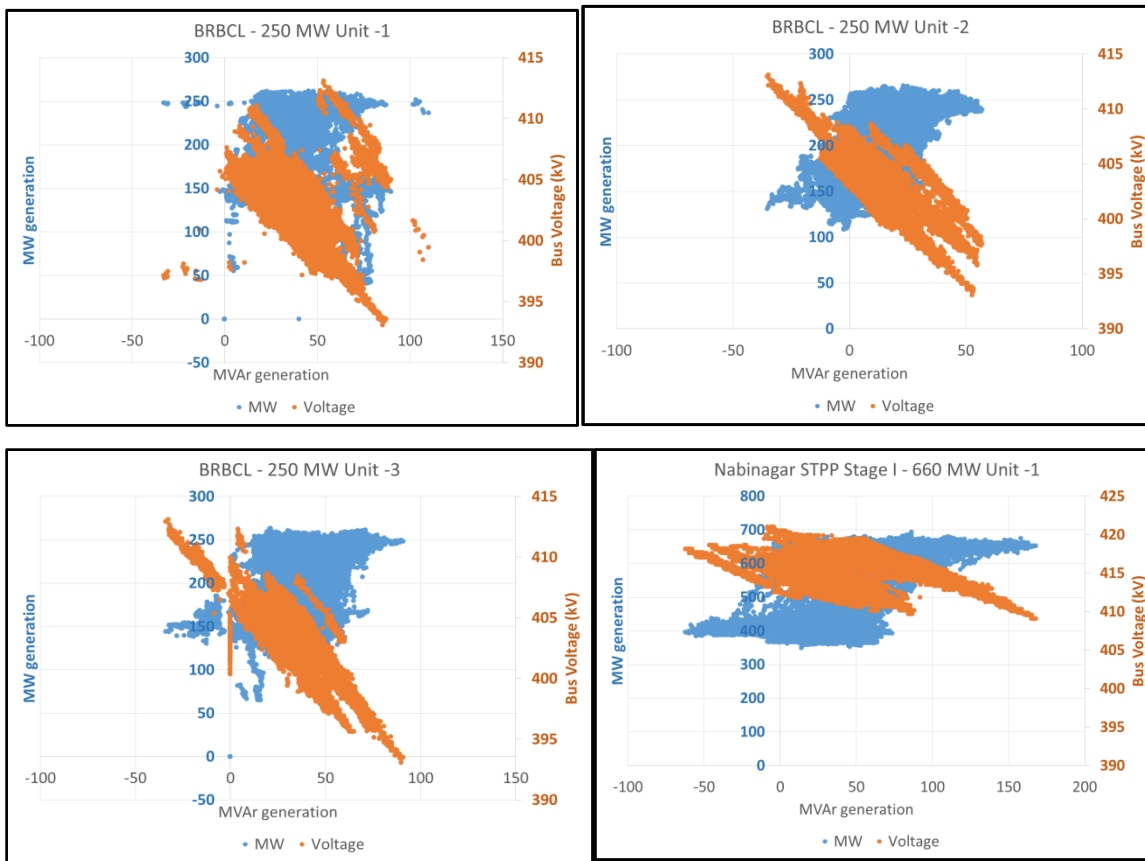
Members may note.

MVAr injection/absorption by generating units with inadequate reactive power support during October 2021

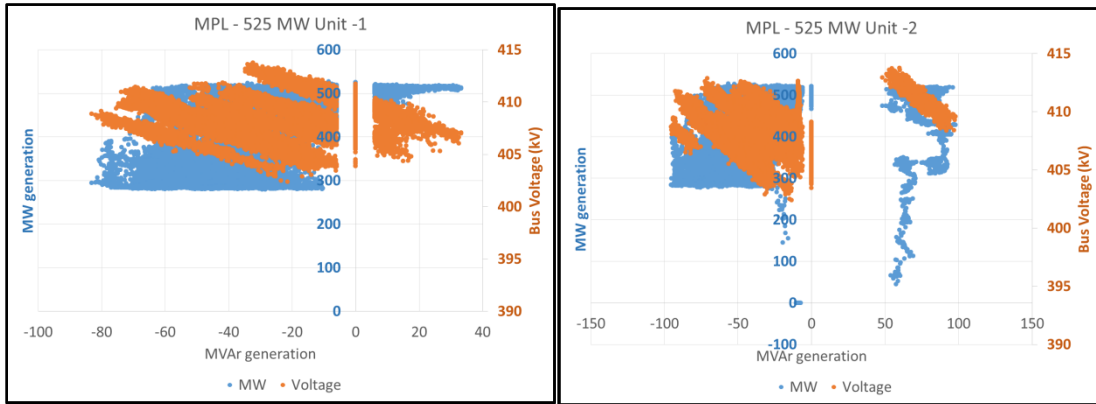
Talcher STPS



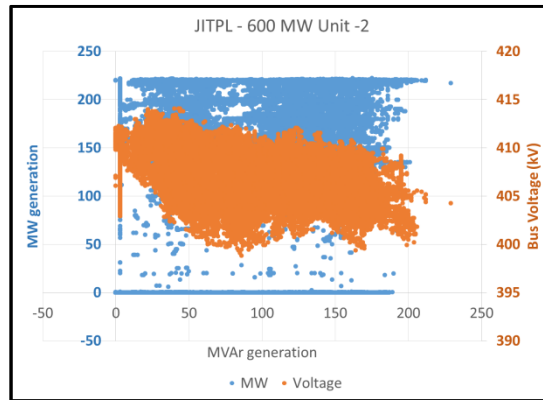
Nabinagar TPS (BRBCL) & Nabinagar STPS (NPGC)



MPL



JITPL

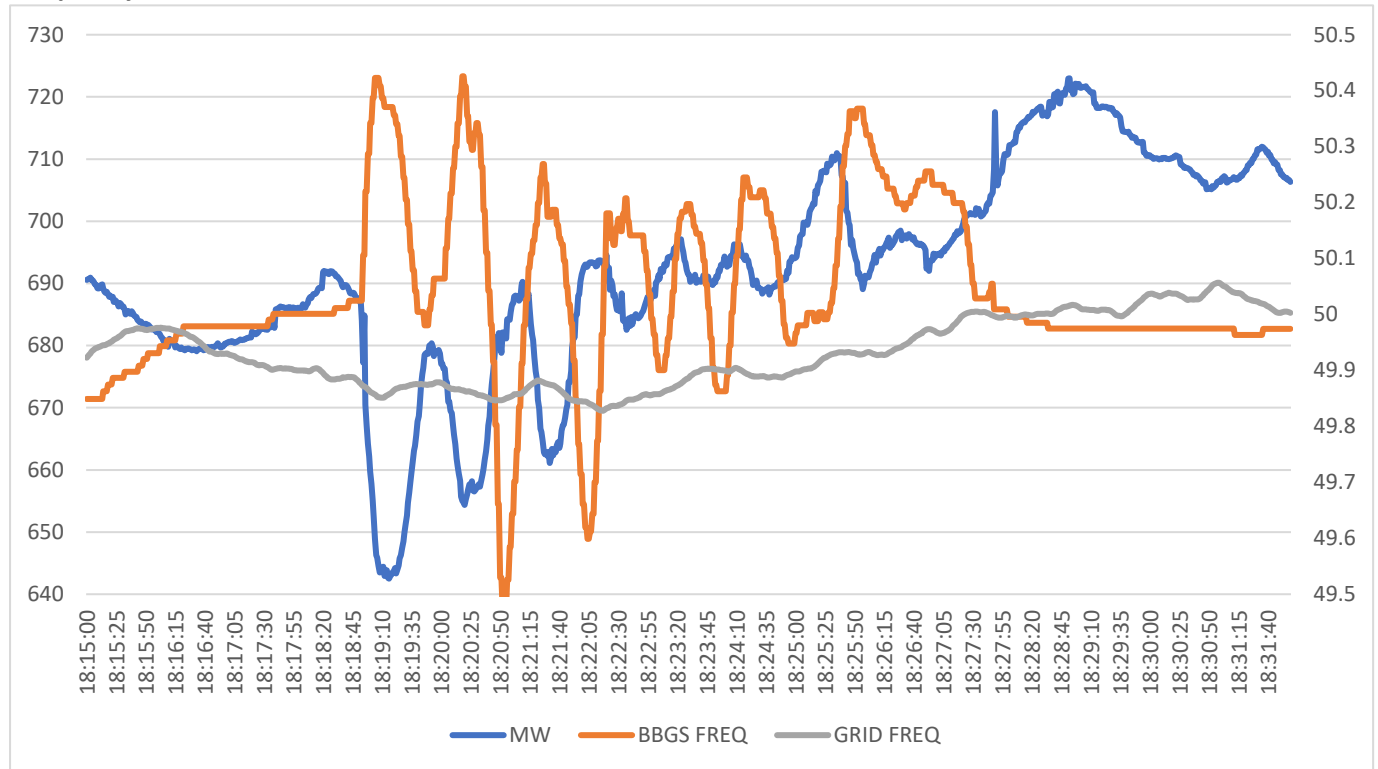


Islanding Performance and Observations During Past Islanding of CESC

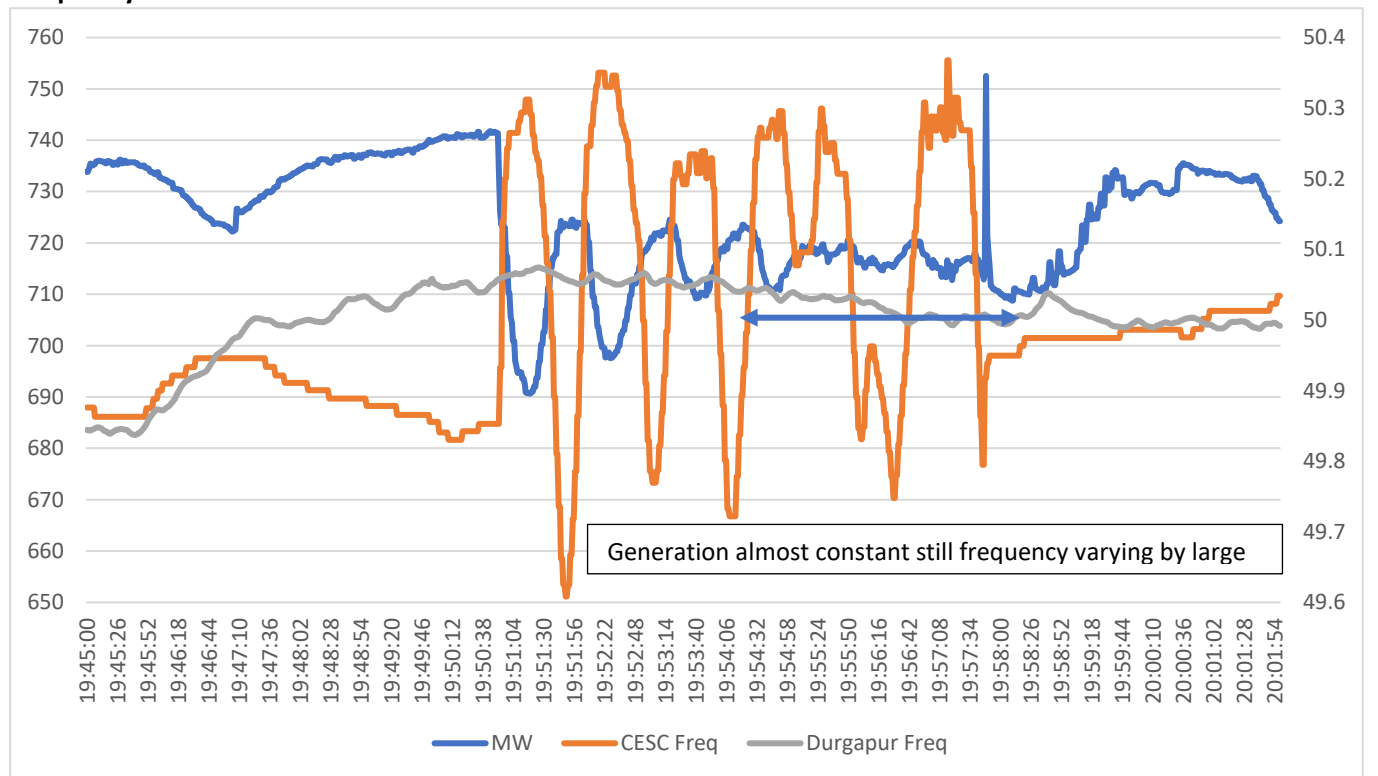
Islanding Performance and Frequency variation for past few Islanding events were checked for Island stability evaluation and following observations are listed in regard to this, (Plots for each event in attached)

- Oscillating Variation of frequency after island formation in Budge-budge frequency is observed upto (0.5-1Hz) and was varying continuously till it got synchronised with grid at Howrah point, this may also be checked.
- Such prolonged variation of frequency during whole islanded mode may be checked.
- In event 3 Budge-Budge Unit generation was also oscillating, root cause for which needs to be looked into which is ultimately driving the frequency of island.(Plot attached)
- Any cyclic load changes or other behaviour may also be analysed. Variation of traction and Metro load may also be studied.
- **Governor parameter tuning during islanded mode may also be checked along with PSS for stability during islanded mode.**
- **Reason for such continuous high oscillating variation in frequency may be analysed and possible consequences may also be looked.**
- **Frequency of oscillation was very slow 1 cycle in a minute so approx. 0.014Hz. So mechanical parameters associated with Machines may be checked for root cause analysis .**
- **Under frequency load shedding setting as shared within the island starts from 49.4Hz and may cause operation of UFR relay in some cases inside the island. Which is detrimental for island survival.**
- **As observed in below cases for 2 events, Frequency dipped upto 49.5 & 49.6Hz due to these variations. Chakmir -47Mw is under UFR shedding at 49.4Hz, tripping of which may further cause stability problem within island. (Setting attached)**
- **Same variation pattern was also observed during past events also one such event of 28April 2020 was checked and same observation found (Plot attached).**

SCADA plot for EVENT 1: 01st August 18:18Hrs, Budge-Budge generation Vs CESC frequency vs Grid Frequency

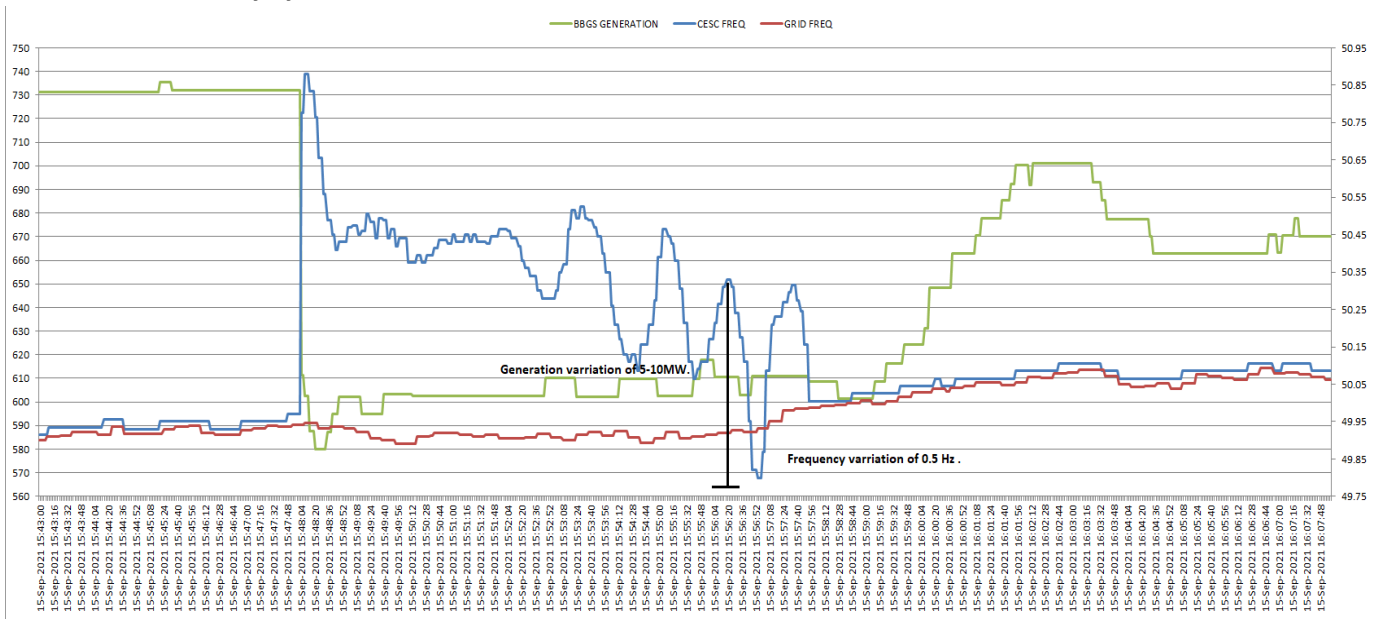


SCADA plot for EVENT 2: 01st August 19:50 Hrs ,BugBug generation Vs CESC frequency vs Grid Frequency



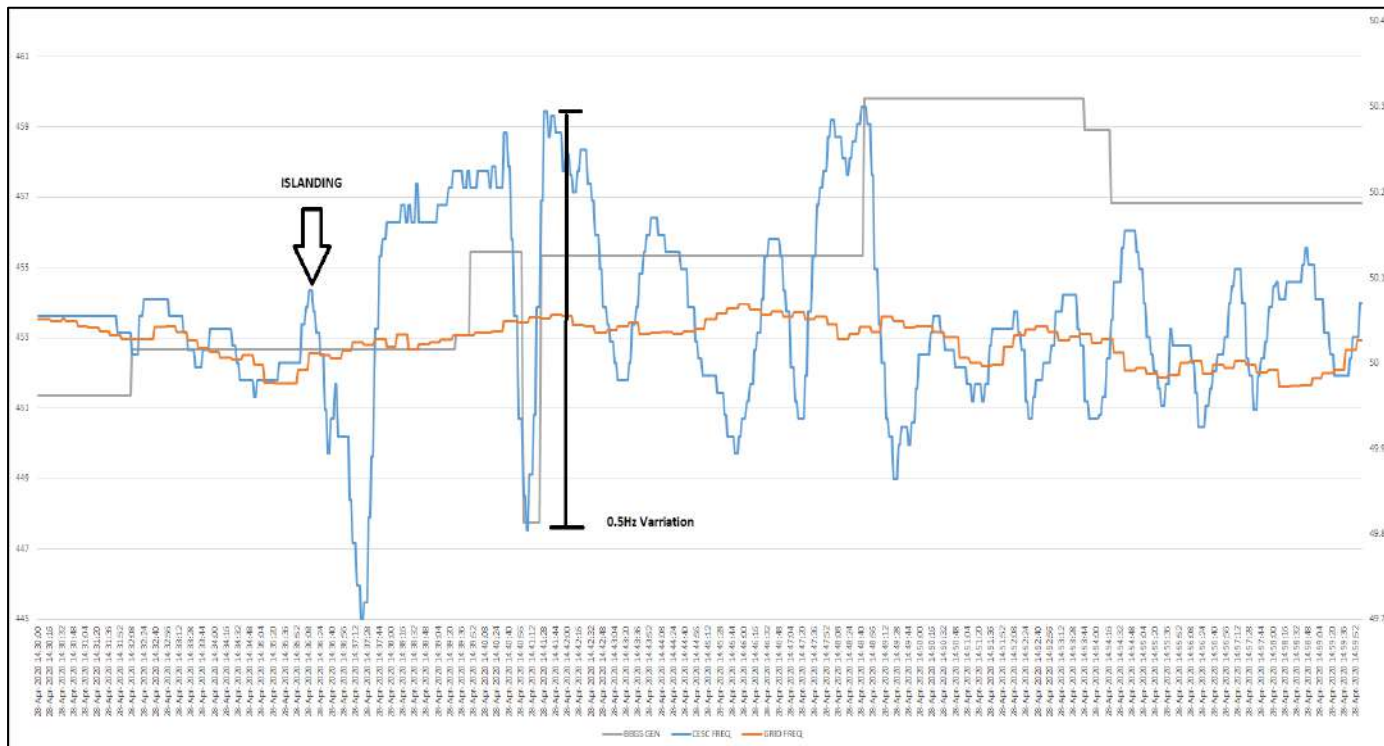
EVENT 3: Variation on 15th September Islanding: SCADA plot with 2 second resolution

Same pattern of Frequency variation observed. Governor performance during Islanding needs to be checked. In 15th September event also Budge-budge generation is oscillatory this needs to be checked and also any cyclic load variation for the same to be looked.

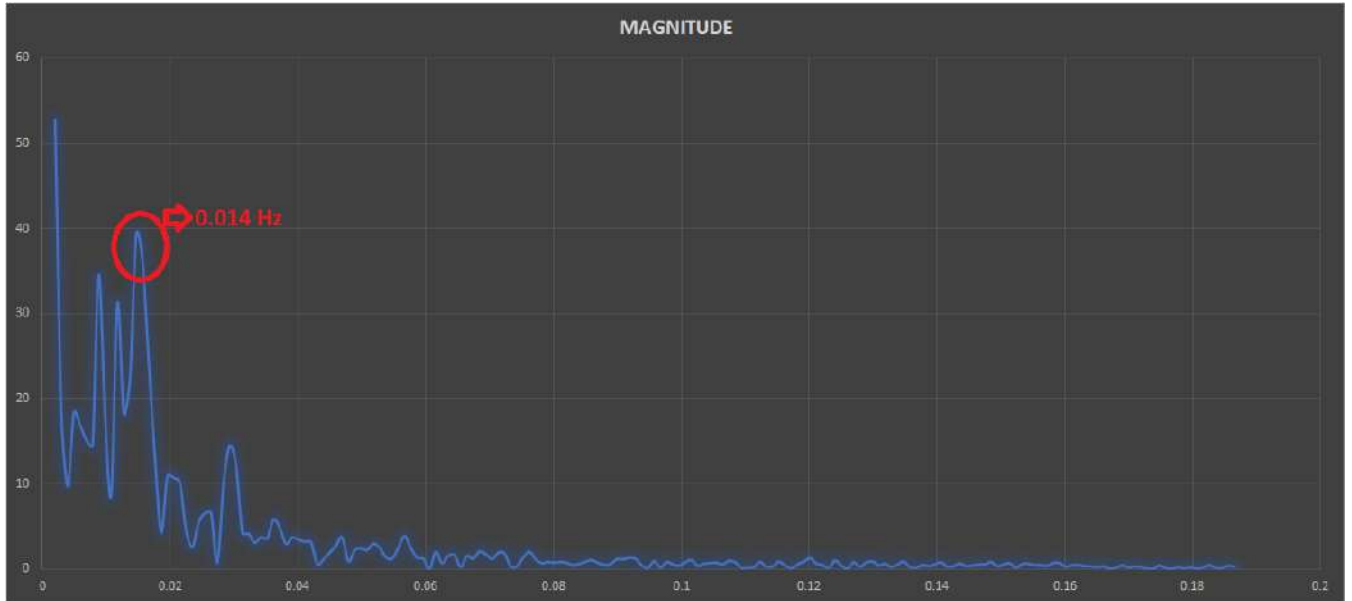


EVENT 4 :PAST ISLANDING ON 28 APRIL 2020:

In the 2020 Event also same very low frequency oscillatory variation observed



Oscillation Frequency as observed from FFT Spectrum: Very low frequency of 0.014 Hz observed

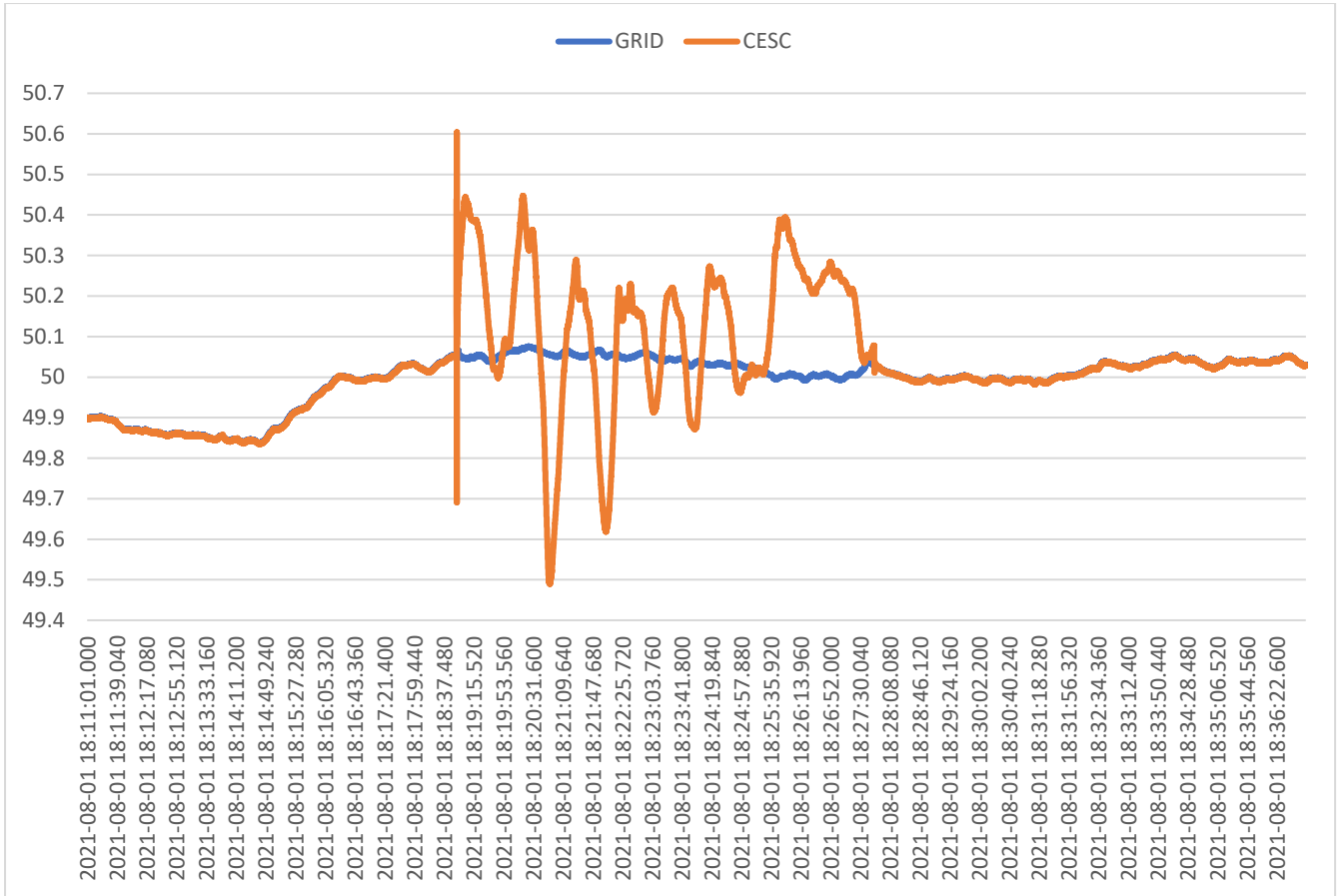


UFR setting for First Two stages:

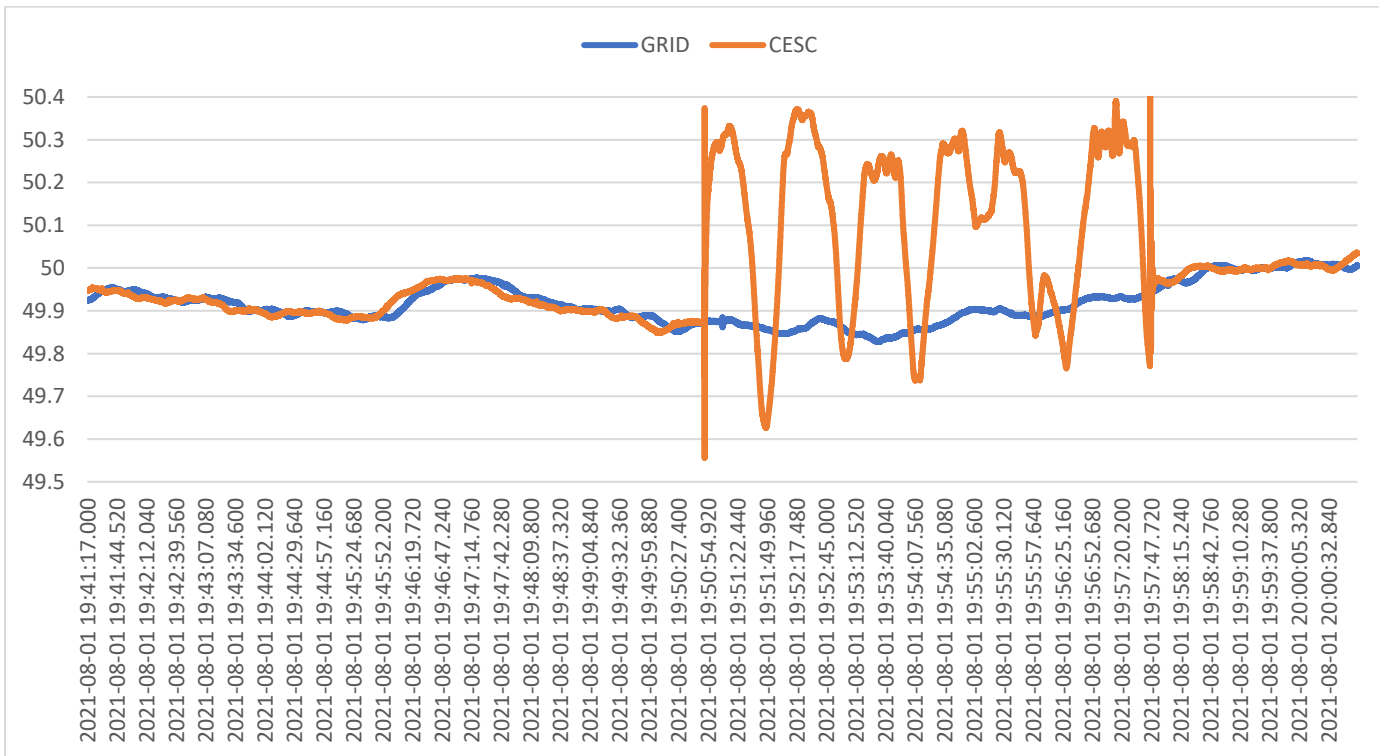
Settings of Under frequency relays				
CESC system				
Stage	132/33kV G/S/S	33kV Feeder	Max Load in MW	
Stage-I			SUMMER	WINTER
49.4Hz	CHAKMIR	55 MVA TRF - 1 & 2	47	29
	NCGS	KAMARHATI TRF - 1	8	6
		KUTIGHAT TRF - 3	10	8
TOTAL			65	43
Stage-II				
49.2Hz	DUMDUM	NEW DUMDUM TRF - 1	15	11
		NEW DUMDUM TRF - 2	14	9
		SOUTH DUMDUM TRF - 1	15	8
		DUMDUM TRF - 3	12	7
	BBGS	BAURIA 1 & 3	18	12
		FORESHORE RD D/S(6 KV FEEDER)	9	5
		SALIMAR D/S (6 KV FEEDER)	7	3
TOTAL			90	55

VERIFICATION BY PMU PLOTS FOR ALL EVENTS

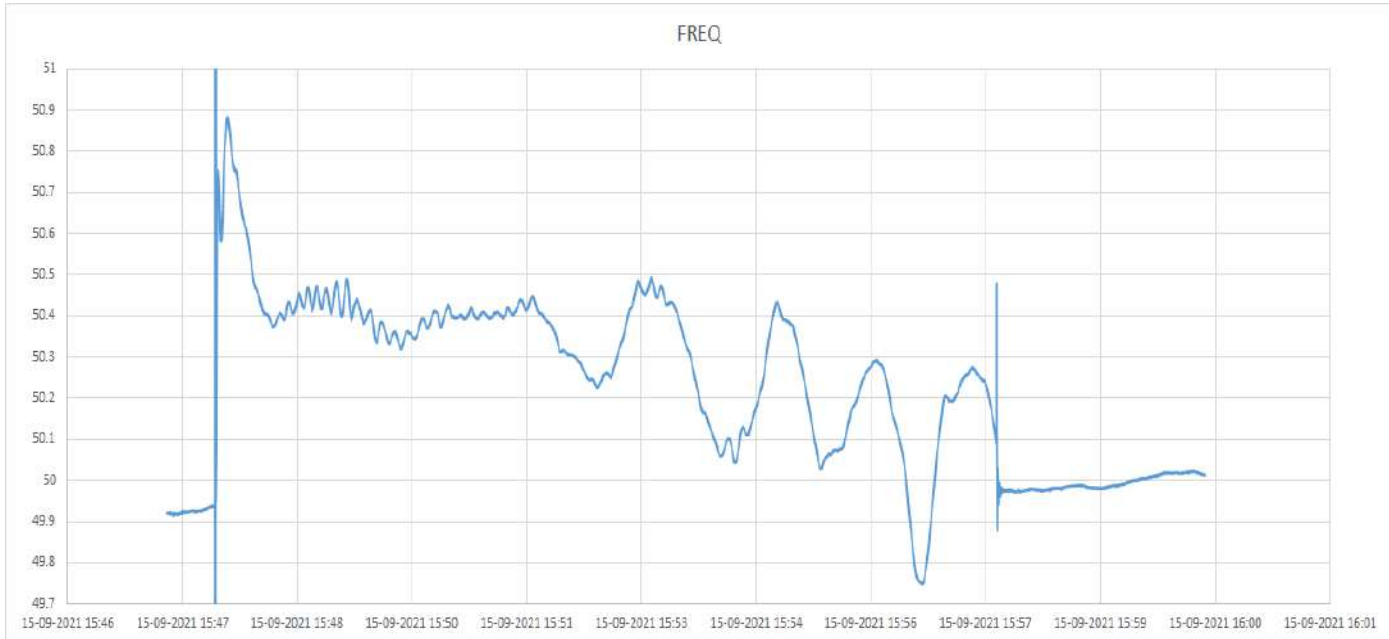
EVENT 1: Frequency comparison by PMU Plot:



EVENT 2 Frequency comparison by PMU Plot:



EVENT 3: PMU PLOT 15 September 2021



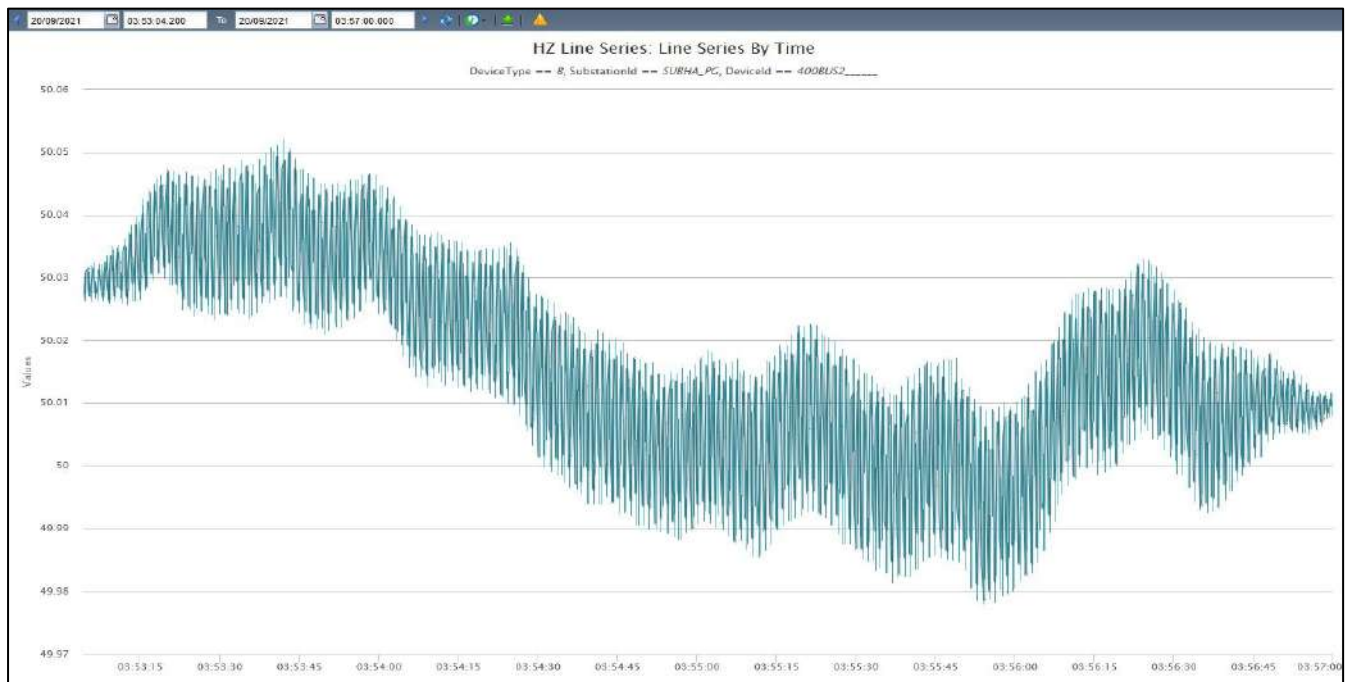
LOW FREQUENCY OSCILLATION BETWEEN 03:52 TO 03:58 Hrs ON 20/09/2021

LFO of **0.8-0.9 Hz** was observed between 03:53 Hrs to 03:57 Hrs near Subhasgram area, magnitude of which was observed most near Subhas gram and magnitude started reducing as moving away from Subhasgram.

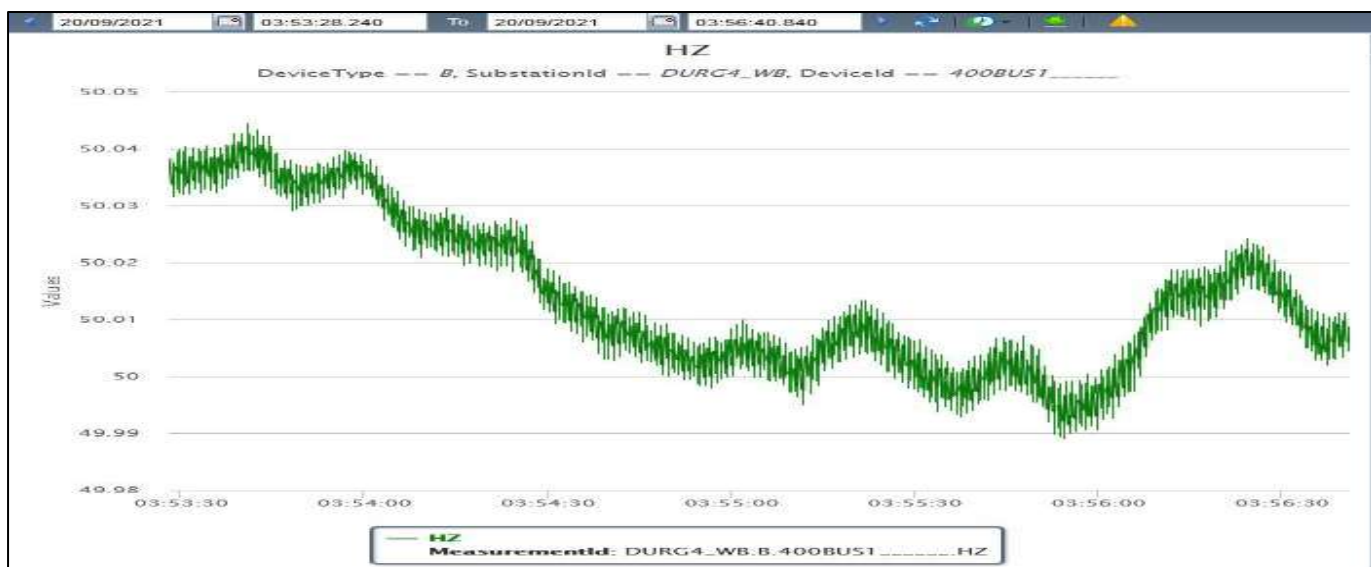
It was most prominent in Frequency only.

LFO was of Local mode which indicates that the oscillation initiated with hunting of any nearby unit.

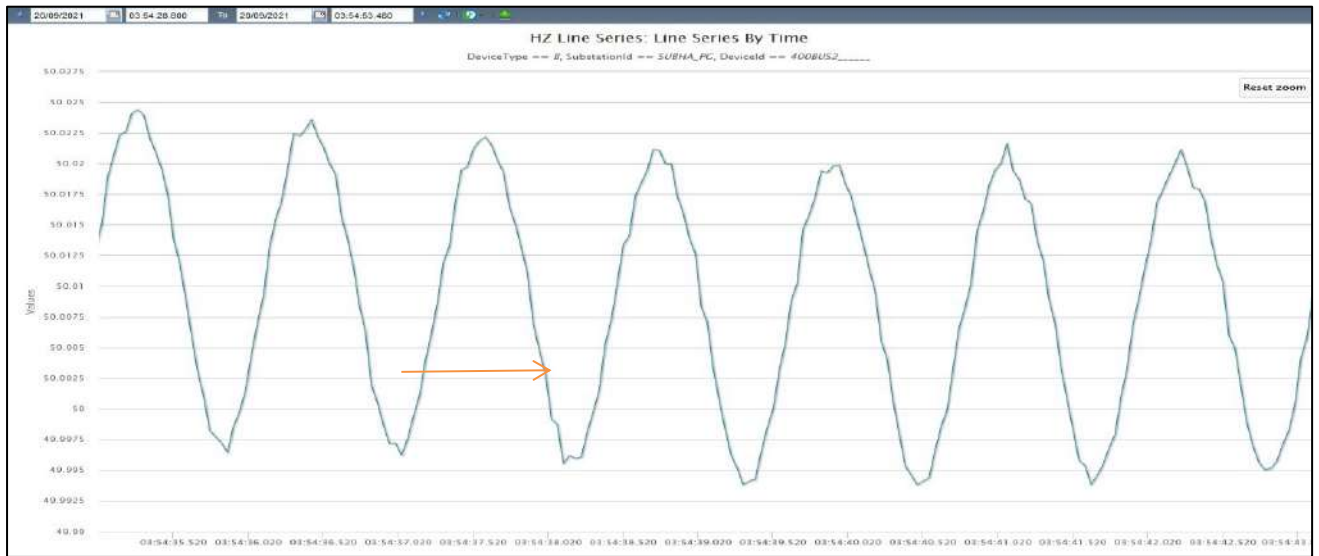
Subhas gram Frequency



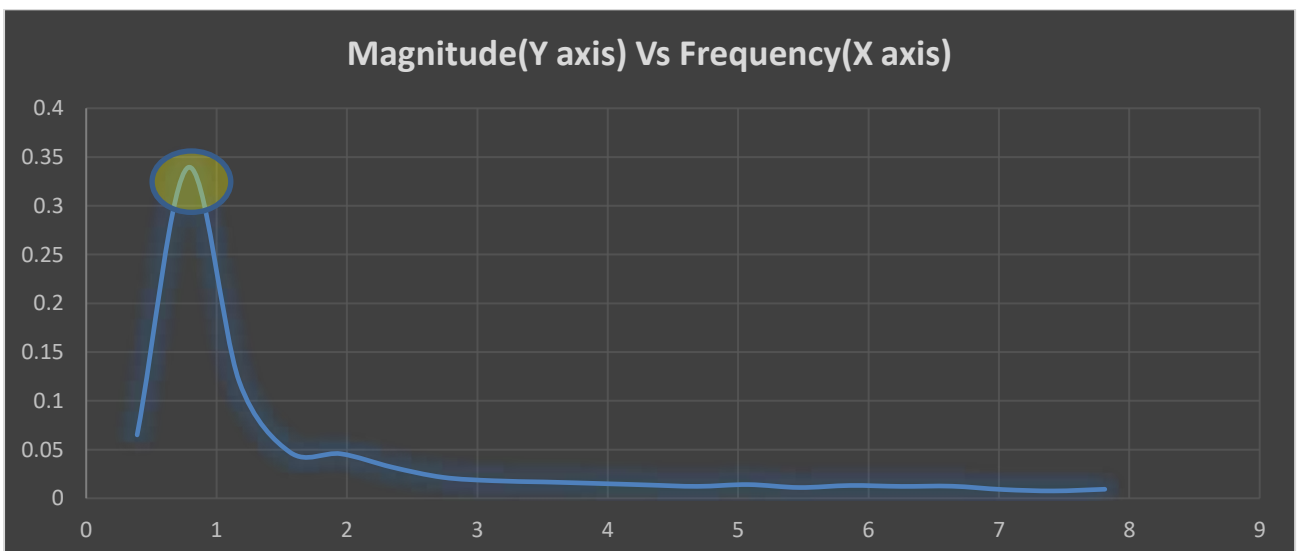
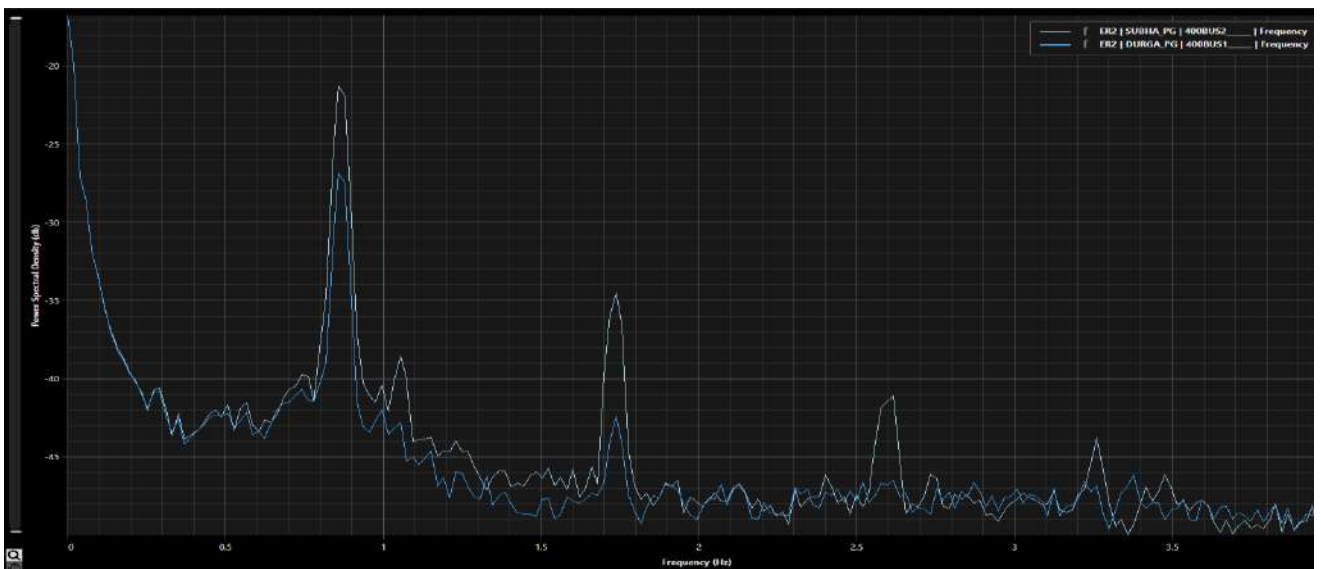
Durgapur Frequency: Frequency variation in Durgapur was comparatively less as moving away from Subhasgram



Mode : 0.8 to 0.9 hz (Local mode) ,This also indicates towards oscillation of any plant against the whole grid of Hunting of any unit due to any problem.

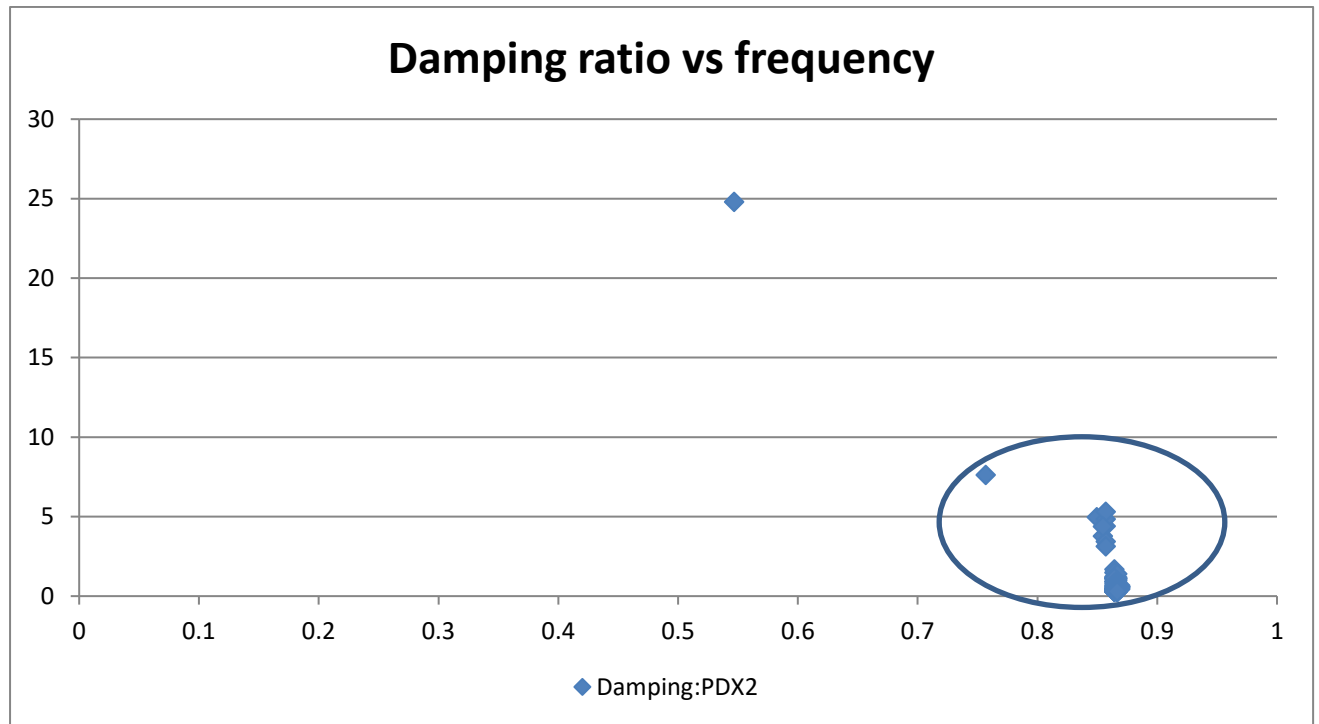


Power Spectral Density as shown below also shows that the highest energy is of 0.8-0.9Hz .

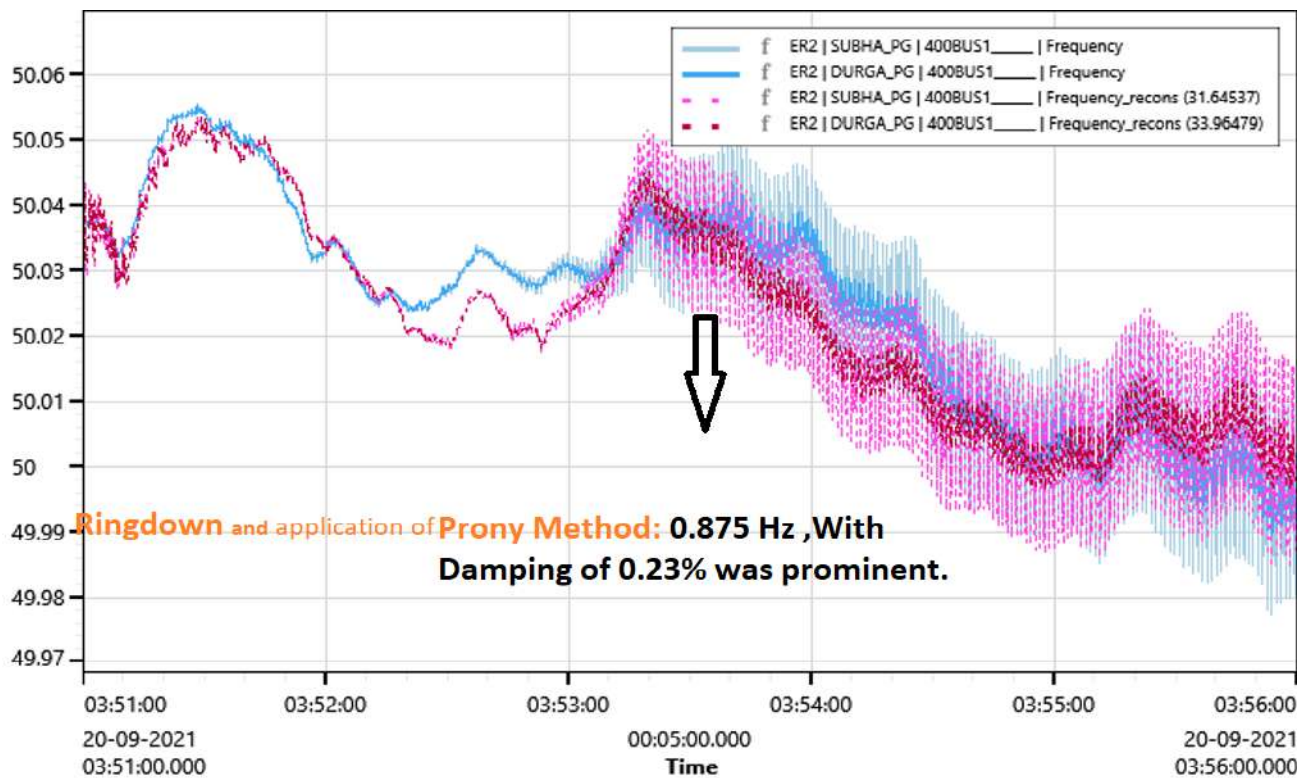


Above signal conditioning PSD and FFT of plot also shows Prominent mode of oscillating frequency 0.8-0.9 Hz (Local mode).

Critical modes as observed from below plot can be seen as between 0.8-0.9Hz with damping ratio less than 5%



Ringdown and application of Prony Method: 0.875Hz with Damping ratio of 0.23 Hz



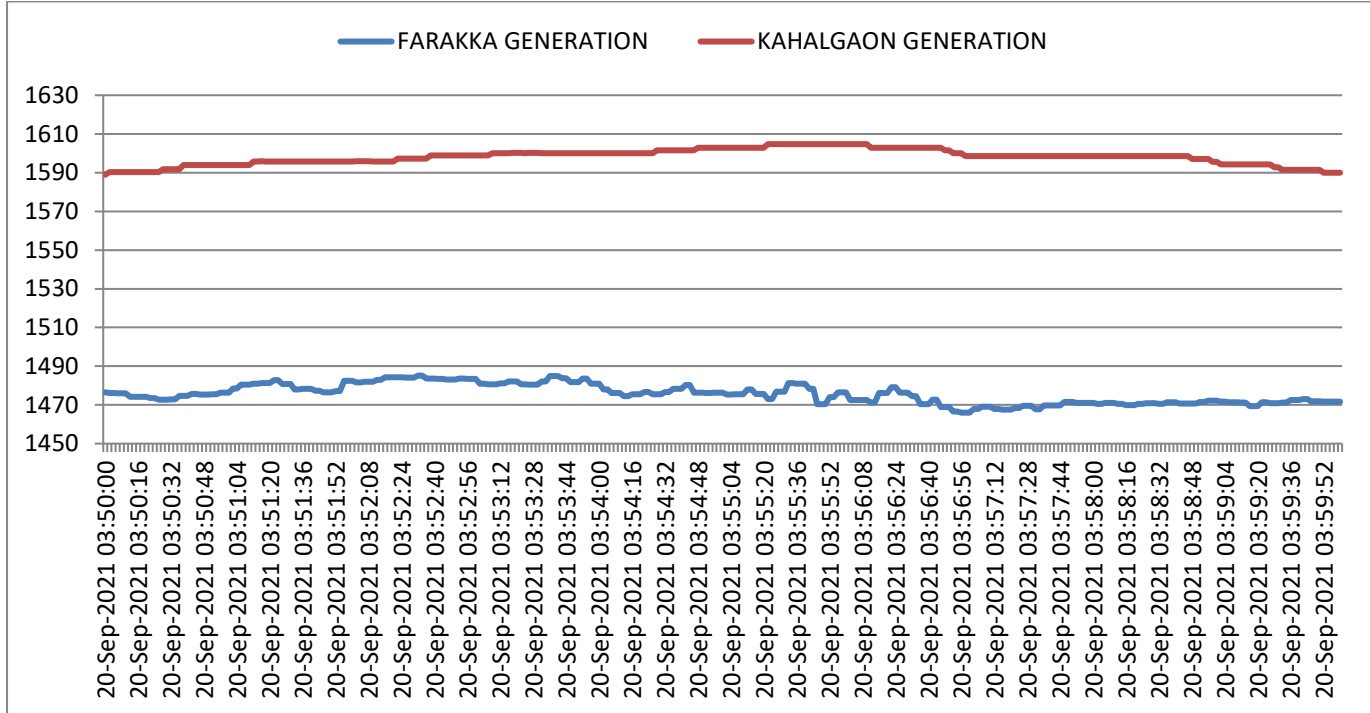
SOURCE OF OSCILLATION:

Scada plot of active power variation of Nearby units:

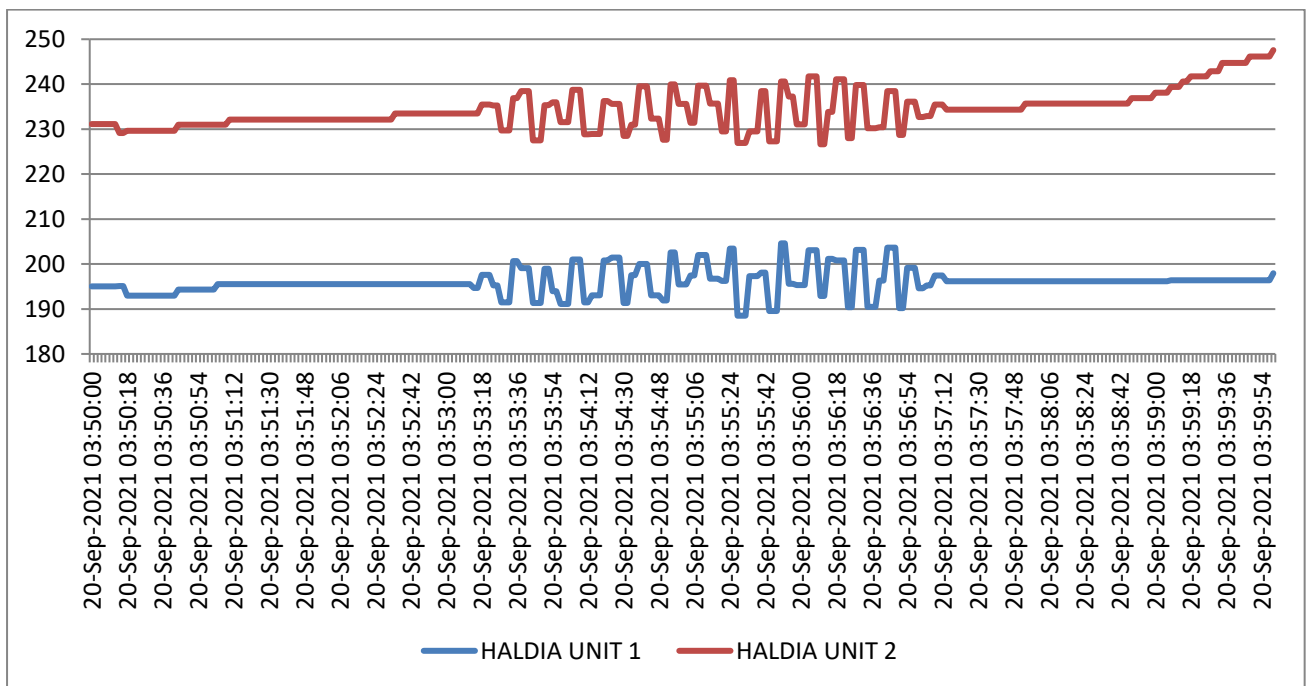
Farakka –Kahalgaon generation:

Farakka overall plant wise only 10 Mw variation unit wise it was only 2 to 3 Mw.

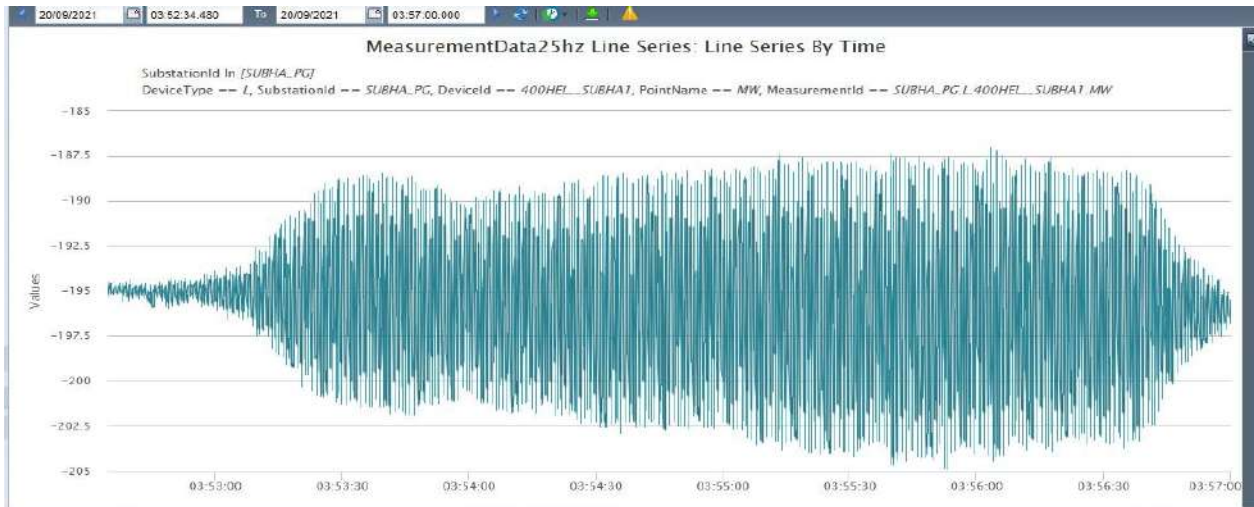
While Kahalgaon no variation observed. This also indicates as we are moving further away from Subhasgram ,units are having less impact .



HALDIA GENERATION VARRIATION: 10 TO 20 Mw in each unit of Haldia observed .

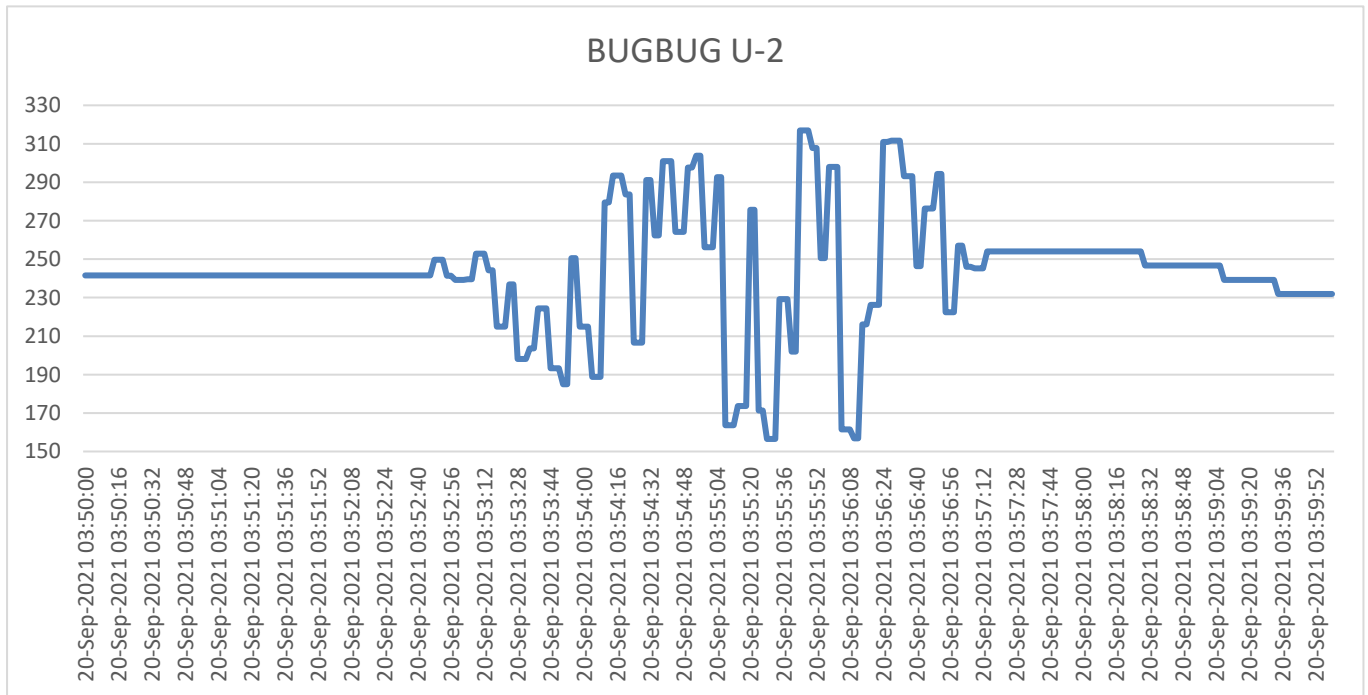


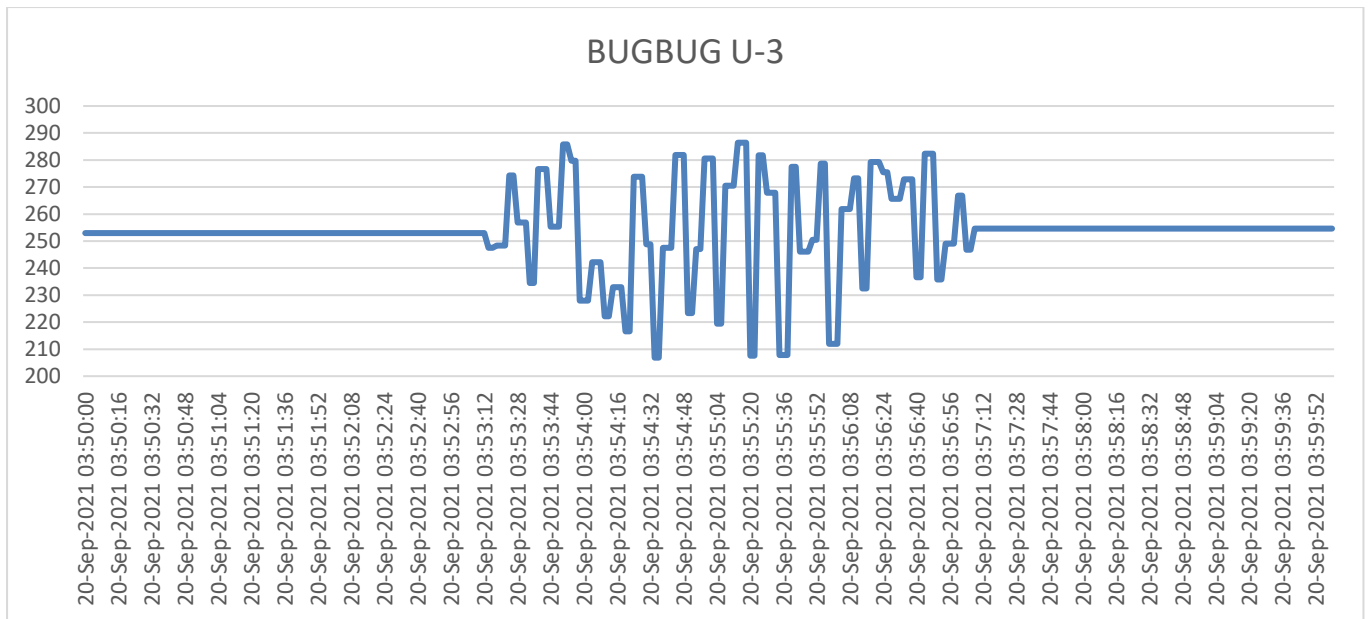
Same was also observed in Haldia Subhasgram power flow variation: 10 Mw variation in each circuit observed as Haldia generation varied.



It was most prominent in Budge-budge units: 140 to 160 Mw variation observed in each unit ,which is maximum and hunting of these units seems to be the source of oscillation .CESC also observed the hunting in these units.

Unit wise variation of Budge-budge Plant:





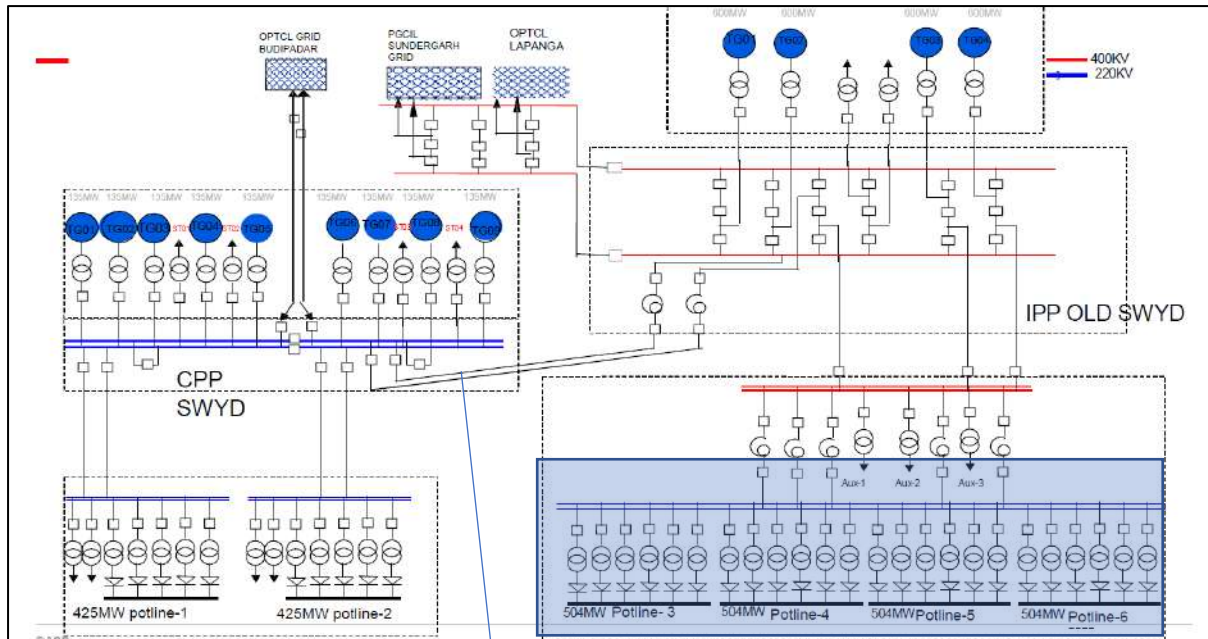
As observed from the above plots maximum variation in MW oscillation was observed for Budge-budge units ,which appears to be the source of oscillation as the Mw variation damped out ,oscillation was also damped .

At 03:46 Hrs BUDGE-BUDGE unit -1 was taken out due to suspected ash bridging over bottom ash hopper and after 8 minutes of taking unit 1 out hunting started .

Detailed root cause analysis from CESC and reasons are required for the hunting of BUDGE-BUDGE units .

EVENT OF SMELTER LOAD TRIPPING ON 28th September

Sterlite SLD:



400 & 220 kv are decoupled with each other.

Smelter load at 400 Kv.

Plant scenario prior to event:

- Unit 3 was out and Unit 1,2&4 was running with total generation of 1232 Mw.
- Sterlite was drawing 258 Mw from Grid ,so total load was 1490 MW.

At 17:48 Hrs due to fault in downstream within 400 kv Sterlite switchyard ,Smelter load reduced by 1450 Mw .

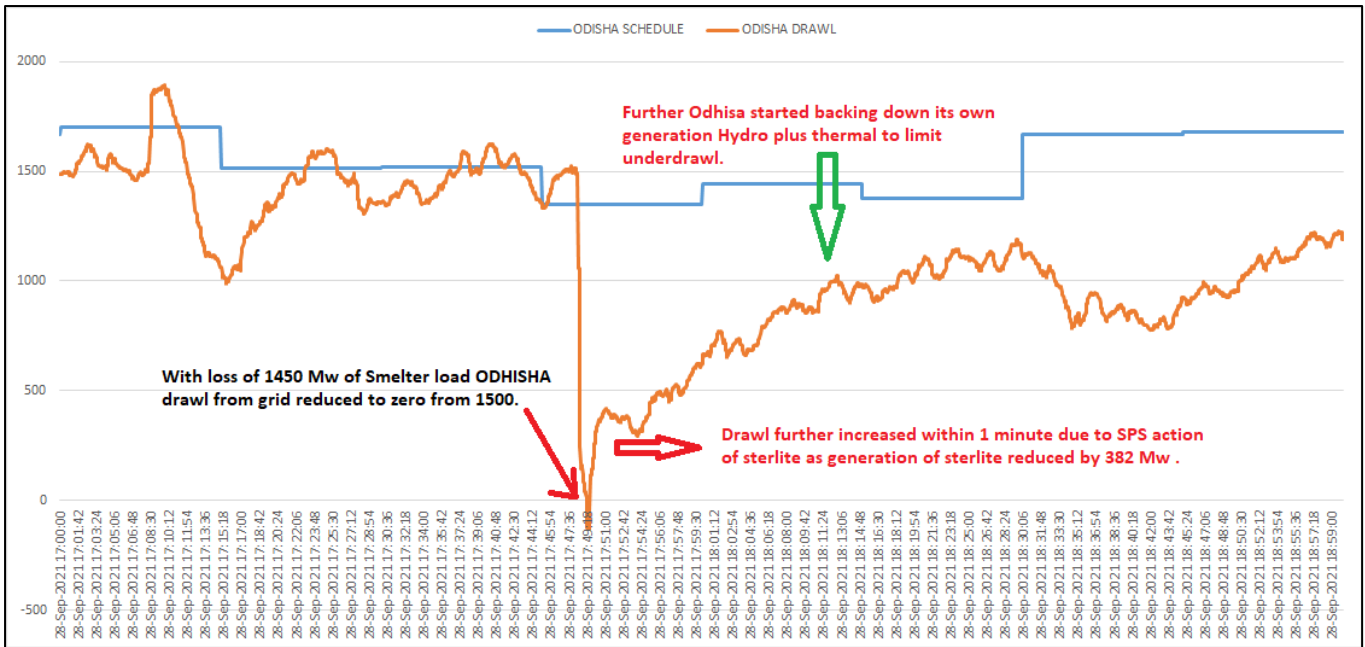
- As Sterlite load reduced ,Sterlite started exporting to the grid by 1182 Mw so total load reduced was 1450 Mw .
- At Sterlite SPS is there to take care of Huge injection in the grid which was set at 800Mw whenever injection is more than 800 MW it will limit it by generation reduction logic .
- Hence total generation to be reduced to limit till 800 Mw was ,1182-800= 382 Mw.

As per logic shown below priority 6 was satisfied

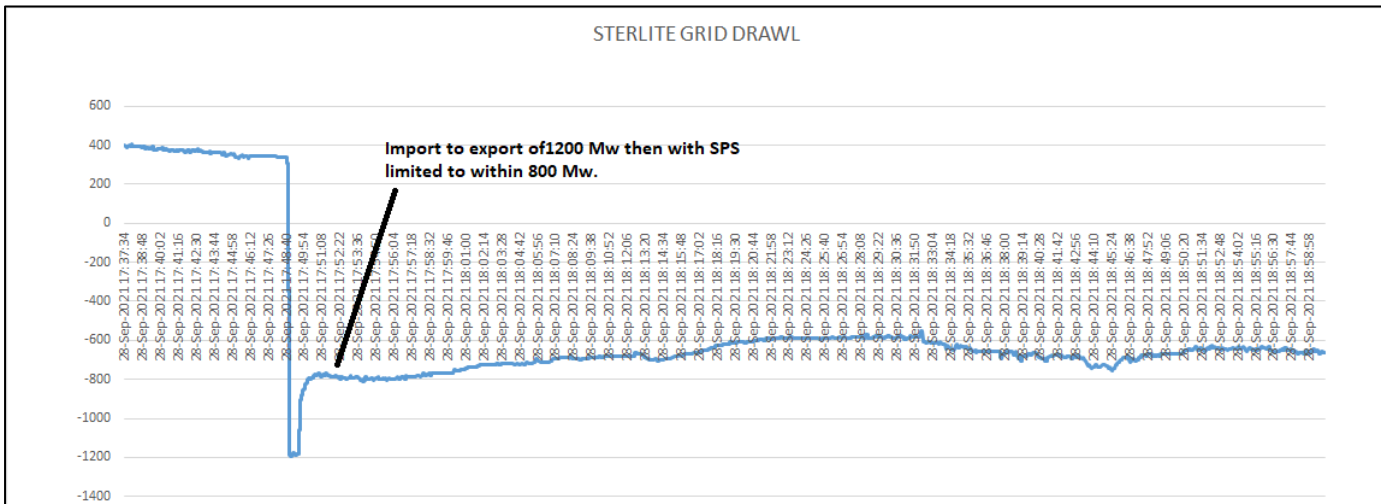
So generator 1 HP,LP Bypass occurred with generator 1 shedding which reduced the grid export within 800 Mw within 1 minutes .

Accumulated generation shed table	Priority	MW
GEN2 HPLP	1	81.417
GEN2 HPLP+GEN1 HPLP	2	225.621
GEN2HPLP+GEN1 HPLP+GEN 4 HPLP	3	369.45
GEN2HPLP+GEN1 HPLP+GEN 4 HPLP+GEN3 HPLP	4	369.45
GEN2	5	271.39
GEN2+ GEN1 HPLP	6	415.594
GEN2+ GEN1 HPLP+GEN4 HPLP	7	559.423
GEN2+ GEN1 HPLP+GEN4 HPLP+GEN 3 HPLP	8	559.423
GEN2+GEN1	9	752.07
GEN2+GEN1+GEN4 HPLP	10	895.899
GEN2+GEN1+GEN4 HPLP+GEN3 HPLP	11	895.899
GEN2+GEN1+GEN4	12	1231.5
GEN2+GEN1+GEN4+GEN3 HPLP	13	1231.5
GEN2+GEN1+GEN4+GEN3	14	1231.5

ODISHA schedule vs Draw



Sterlite Draw from Grid:



ISTS	
Name of the element	Length (km)
400 kV Durgapur-Bidhannagar D/c	11
400 kV Rangpo-Teesta V-D/c	11.6
400 kV Teesta-III- Dikchu	15.1
400 kV Gaya-Chandauti D/c	17.36
220 kV Subhashgram-Subhashgram (WB) D/c	1
220 kV Dalkhola-Dalkhola (WB)-D/c	1.1
220 kV Alipurduar-Alipurduar (WB) D/c	6.34
220 kV Rajarhat-NewTown D/c	7.5
220 kV Binaguri-NJP D/c	9
220 kV Rourkela-Tarkera D/c	15.3
Odisha	
Name of the element	Length (km)
400 kV Indravati-Indravati (Gridco)	3.7
400 kV Meramundali GMR T/c	8
400 kV New Duburi-TSL D/c	8.65
220 kV Chandka-Chandka B	1
220 kV Rengali-Rengali D/c	1
220 kV Balimela-Balimela T	1.38
220 kV Meramundali-BSL D/c	2.4
220 kV Bolangir-New Bolangir D/c	2.8
220 kV Tarkera-RSP D/c	4.07
220 kV Sterlite-Vedanta D/c	4.15
220 kV New Duburi-Jindal Steel D/c	4.8
220 kV Rengali-Rengali PH D/c	5
220 kV Mendhasal-Infocity	5.5
220 kV Katapalli-Hindalco D/c	5.5
220 kV Jaynagar-Upper Kolab D/c	6
220 kV Mendhasal-Chandaka D/c	7
220 kV Keonjhar-Keonjhar D/c	7.48
220 kV Jeypore-Jaynagar D/c	7.7
220 kV New Duburi-TSL D/c	8.65
220 kV Jeypore-Jaynagar D/c	8.8
220 kV Tarkera-RSP D/c	10.2
220 kV Bidansi-Cuttack D/c	10.42
220 kV Jaypatna-Indravati	11.13
220 kV Meramundali-TTPS D/c	11.2
220 kV Meramundali-NALCO D/c	11.5
220 kV Joda-Jindal	14.6
220 kV Mendhasal-Atri	15
220 kV TSTPP-Rengali PH	16.78
West Bengal	
Name of the element	Length (km)
400 kV PPSP-New PPSP D/c	2
220 kV Kasba-Eastern Metropolitan	1
220 kV New Haldia-IPCHL D/c	2.7
220 kV Bidhannagar-DPL D/c	8
220 kV Bakreswar-Sadaipur D/c	8
220 kV Eastern Metropolitan-Princep Street	8.2
220 kV Domjur-New Chanditala D/c	8.32
220 kV New Cossipore-Princep Street	8.8
220 kV NewTown-CLC Bantala	13
220 kV Sagardighi-New Sagardighi D/c	14.38
220 kV Subhashgram-CLC Bantala	15
220 kV Domjur-Foundry Park D/c	15
220 kV New Cossipore-Eastern Metropolitan	16.2
220 kV Jeerat-Dharampur D/c	17

Bihar	
Name of the element	Length (km)
220 kV Patna-Sipara-3	0.3
220 kV Patna-Sipara-D/c	0.45
220 kV Purnea-New Purnea D/c	2
220 kV Darbhanga-Darbhanga (DMTCL) D/c	2.9
220 kV Kishanganj-Kishanganj Q/c	4.4
220 kV Pusauli-New Sasaram (Nadokhar) D/c	6.98
220 kV Gaya-BodhGaya D/c	8.5
220 kV Barauni (BTPS)-Mokama D/c	11.65
220 kV Barauni (BTPS)-Begusarai D/c	15
220 kV Muzaffarpur-MTPS D/c	17
220 kV Gaya-Chandauti D/c	18
DVC	
Name of the element	Length (km)
220 kV Durgapur-Parulia (DVC) D/c	1
220 kV Burnpur-IISCO D/c	1.2
220 kV Chandrapura-Chandrapura-1	1.5
220 kV Chandrapura-Chandrapura-2	3.5
220 kV Parulia (DVC)-Tamlala DSP T/c	6
220 kV Maithon-Kalyaneshwari D/c	7.6
220 kV Chandrapura-BSL	9
220 kV Chandrapura-MSMDBSL D/c	10
220 kV Waria-DSTPS D/c	11.14
220 kV Parulia (DVC)-Muchipara D/c	14.75
220 kV Mejia-Barjora D/c	16.7
220 kV Waria-Bidhannagar D/c	17.2
220 kV Parulia (DVC)-DSTPS D/c	17.34
Jharkhand	
Name of the element	Length (km)
220 kV Chaibasa-Chaibasa (JUSNL) D/c	0.7
220 kV Ranchi-Hatia	6
IPP	
Name of the element	Length (km)
400 kV Adhunik (APNRL)-Jamshedpur D/c	0.3
400 kV Sterlite-Lapanga D/c	18.64
220 kV Rangpo-Rongnichu D/c	7.26

PROCEDURE FOR PLANNING OF INTER-STATE TRANSMISSION SYSTEM (ISTS)

Central Transmission Utility of India Ltd.

November, 2021

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DRAFT PROCEDURE FOR PLANNING OF INTER-STATE TRANSMISSION SYSTEM

1. Outline

- 1.1. This procedure has been prepared by Central Transmission Utility of India Ltd. (CTUIL), hereinafter referred to as CTU, in discharge of its functions under Section 38(2)(b) of the Act for the purpose of planning and co-ordination relating to Inter-State Transmission System in accordance with Electricity (Transmission System Planning, Development and Recovery of Inter-State Transmission Charges) Rules, 2021.

2. Applicability

- 2.1. This procedure shall be applicable to stakeholders such as Central Government, State Governments, Central Transmission Utility (CTU), Central Electricity Authority (CEA), Regional Power Committees (RPCs), State Transmission Utilities (STUs), Generation companies, System Operators (National, Regional, and State), Licensees, and any other person notified by the Central Government in this behalf.
- 2.2. This Procedure shall come into effect from the date it is published on CTU website.

3. Planning Philosophy and Cycle

- 3.1. A robust, strong and flexible ISTS network acts as an enabler for seamless transfer of power from any generator to demand centres anywhere in the country in an efficient, reliable and economic manner. Such a network shall facilitate the ease of interconnection of generators to the ISTS and also the end consumers to purchase power at competitive rates along with promoting the development of vibrant power market. An adequate ISTS network is essential for ensuring continuity of power supply to state utilities and distribution companies under various emergency situations including disaster management.
- 3.2. The CTU shall draw up plan for Inter-State Transmission System (ISTS) for upto next five years on rolling basis every year identifying specific transmission projects which are required to be taken up along with their implementation timelines, after considering the plans made by Central Electricity Authority (CEA) and studying the progress in generation capacity and demand in different parts of the country as well as taking note of General

Network Access (GNA) requests made by Designated Inter-state Customers (DICs), any signals of any congestion in any part of the ISTS and difficulties in obtaining right of way for development of transmission corridors.

3.3. Towards this, the entire process for transmission planning shall be undertaken on continuous basis, twice a year, as detailed below. Hereinafter, this shall be referred to as “**ISTS Planning Cycle**”:

Table 1: ISTS Planning Cycle

Sl. No.	Activities	Responsibility*	Timeline	
			(Apr- Sep)	(Oct-Mar)
1.	Data Collection: <ul style="list-style-type: none"> Inputs regarding plans made by CEA (short term & perspective plans for next ten years) Open Access / General Network Access / Cross border transaction requests made by Designated Inter-state Customers / other entities Data to be submitted by the STUs (to be co-ordinated by RPCs) Operational Issues to be submitted by NLDC/ RLDCs to CTU RE related inputs to be provided by MNRE 	MNRE, CTU, CEA, STUs, RPCs, and POSOCO	01 st to 30 th Apr	01 st to 31 st Oct
2.	Data validation and preparation of Load-Generation Balances (LGBs) for different scenarios through joint consultation in separate regional meetings	CTU, CEA, STUs, RPCs, and POSOCO	15 th Jun	15 th Dec
3.	Preparation of base case files for identified LGB(s)	CTU	30 th Jun	31 st Dec
4.	Single or Multi Regional Joint System studies for evolution of new ISTS schemes and / or augmentation of existing system	CTU, CEA, POSOCO, and concerned RPC(s) & STU(s)	31 st Jul	31 st Jan
5.	Preliminary proposal along with assumptions on CTU website for stakeholders' comments	CTU	15 th Aug	15 th Feb
6.	Stakeholders' comments on the preliminary proposal	Stakeholders	31 st Aug	28 th Feb
7.	Finalisation of transmission schemes considering comments / suggestions of	CTU	30 th Sep	31 st Mar

Sl. No.	Activities	Responsibility*	Timeline (Apr- Sep) (Oct-Mar)	
	stakeholders and uploading of the final proposal on CTU website			

**Inputs from transmission licensees may also be taken at various stages regarding RoW, new technologies, etc.*

- 3.4. The details of finalized schemes along with their implementation timelines and status of approval shall be made part of the ISTS Rolling Plan for upto next five years and the same shall be published and reviewed as per ISTS Planning Cycle mentioned above.

4. Data requirement from all stakeholders

- 4.1. CTU shall be the nodal agency for compilation of data required for formulation of basic network data file (base case files) for the purpose of ISTS planning.
- 4.2. Stakeholders shall provide requisite data in the form and manner specified under para 4.4 below, on bi-annual basis as per para 3.3.
- 4.3. Stakeholders shall also provide details related to expected timelines for commissioning of under construction and planned generation(s) / transmission elements.
- 4.4. Following type of data shall be required by CTU in PSSE as well as MS-Excel format (**Annexure-I**) from all stakeholders for preparing and updating planning files:
- **Substation (List-1):** Consists of buses represented in the file along with name and voltage level, availability of load and injection by generator
 - **Transmission lines (List-2):** Consists of lines along with names of the substations interconnected by them with line parameter (positive and zero sequence), line length, line reactors, conductor configuration, etc.
 - **Generator connected (List-3):** Various generating stations of the states modelled in the file along with parameters are given in the list with values like Pmax, Pmin, Qmax, Qmin, MVA base, Xs, Xd', Xd'', Xtran (% impedance of GT) etc.
 - **Loads (List-4):** Loads considered, both P and Q
 - **Shunt (List-5):** If fixed bus shunt includes shunt capacitor or bus reactors, reactors may be shown with negative sign

- **Transformer (List-6):** Substation name, From and To bus voltage, Tap Position, number of Transformers, Rated MVA, % Impedance, connection code, zero impedance etc.
- 4.5. CTU would circulate the last updated load flow file for planning horizon amongst all stakeholders as per requirement. RPCs shall coordinate with respective STUs to indicate changes in network topology, load, generation, etc. in PSSE format (python or idev files) supported by data indicating the above changes in formats given at **Annexure-I**.
- 4.6. Following common bus number nomenclature to be followed by all the stakeholders for creation of new bus numbers in PSSE after examining the next available unique bus nos. in the given series –

Zone / State		Voltage	Unique Bus Number		
D1	D2	D3	D4	D5	D6

Example: In bus number 542001, 54 represents Tamil Nadu zone, 2 represents 230 kV and 001 is the bus number.

Detailed nomenclature for bus numbering, zone and area allocation is attached as **Annexure-II**.

Regarding owner assignments for identification of type of generators based on source of fuel & sector nomenclature **Annexure-III** may be referred.

- 4.7. Stakeholders shall also be responsible for submission of electro-mechanical and electro-magnetic data models to CTU in desired simulation software such as PSSE, PSCAD, etc. of various network elements like Generators (all types), FACTS devices, HVDCs etc. The data shall preferably be provided using the standard models available in the simulation software.
- 4.8. In absence of receipt of data from Generator / Transmission utilities, data of similar size & type existing generator / transmission element shall be considered as per generic models with generic parameters available with CTU / POSOCO.
- 4.9. In case, stakeholders do not submit data within prescribed time-lines as specified in para 3.3, suitable assumptions would be made for the studies. However, data submitted after the time-lines shall be considered in the next cycle.

5. Data and information to be provided by STUs

- 5.1. STUs shall nominate two or more nodal officers for coordination with CTU & RPC in regard to planning studies including submission of requisite power system data within 15 days of publication of this procedure. Subsequent change in nomination, if any, may also be intimated to CTU & RPC well in advance.
- 5.2. STUs shall intimate modifications of following data in the last updated base case file circulated by CTU in PSSE format (idev or python) supported by data indicating the above changes in formats given at **Annexure-I** on bi-annual basis as per timeline specified in ISTS Planning Cycle:
 - Modifications of basic network data (as per Lists-1, 2, 5 & 6 of para 4.4) corresponding to Intra-State Transmission System (In-STS)
 - Intra-state generation addition/phasing out data (List-3)
 - Demand data changes (List-4). The overall demand data of states with proposed changes shall be submitted by respective STUs in due consideration of the EPS published by CEA. In case of any deviations same shall have to be appropriately justified. STUs shall consult their respective Distribution companies for submission of demand data, if required, for demand assessment.
- 5.3. STUs shall be responsible for submission of all the planning related data and models to CTU in desired formats in respect of In-STS generation and transmission elements.

6. Data and information to be provided by ISTS connected Generators

- 6.1. Generators connected or intending to connect to ISTS shall submit their technical data (electro-mechanical and electro-magnetic) to CTU in comprehensive manner in the form of equivalent PSSE, PSCAD and/or any other software standard models.
- 6.2. Generators are required to validate their data models with their respective machines before submission of the same to CTU.
- 6.3. Generators already connected to ISTS or to whom connectivity has been granted but are yet to be connected to grid shall be required to submit the data models within six months of publication of this Procedure. Further, till submission of requisite data, the data for planning studies of a similar sized machines as available in CEA manual on Transmission Planning Criteria shall be utilized.

6.4. Generators shall revise their data models or parameters of already supplied model, on regular intervals based on actual response.

6.5. Generators which are getting phased out in next five years shall be required to intimate to CTU in advance so that same is considered during planning stage.

7. Data and information to be provided by Transmission Licensees

7.1. Transmission licensees shall provide following inputs :

- Difficulties in obtaining Right of Way (Row) for development of transmission corridors
- New Technologies, Conductors, etc.
- Tentative cost of transmission equipment (on per unit basis), etc.

8. Data and information to be provided by ISTS Grid Operator (POSOCO)

8.1. POSOCO shall furnish information regarding signals of any congestion in any part of the ISTS in respect of ICT & Line loadings, over-voltages, short circuit issues, stability issues, etc. to CTU.

8.2. POSOCO shall facilitate CTU with real time and historical data of ICT & Lines loading, bus voltages etc. for the purpose of study and analysis.

8.3. POSOCO shall facilitate CTU in preparation of dynamic / transient stability study files by sharing data models of existing generating and transmission elements available with them.

8.4. After interconnection with ISTS Grid, POSOCO shall be responsible for model validation which refers to a process to improve the models used in simulations so as to make the simulation results as close to the actual responses of the power system as possible. Such validation effort mainly applies to data models, such as

- Generator including conventional, wind, and solar units
- Excitation system
- Governor
- PSS
- FACTS
- HVDC, etc.

Upon validation, the final models shall be submitted to CTU for use in the planning base cases.

9. Data and information to be provided by RPCs

- 9.1. RPCs shall facilitate CTU in respect of data collection from STUs; validation & preparation of study files; and joint studies for evolution of new ISTS schemes.
- 9.2. RPCs shall assist STUs in acquisition of details pertaining to In-STS including steady state and electro-mechanical & electro-magnetic data models of generating & transmission elements.

10. Data and information to be provided by CEA

- 10.1. CEA shall share relevant inputs for planning studies based on short term plan prepared every year on rolling basis for upto next five years and perspective plan every alternate year on rolling basis for next ten years for development of the ISTS.
- 10.2. CEA shall assist CTU in data collection, validation, joint studies, tentative costing as well as finalization of ISTS schemes before they are taken up for approval in relevant forums.

11. Data and information to be provided by MNRE

- 11.1. Following inputs shall be required from MNRE for evolving transmission system for potential RE zones (REZs):
 - Location of the RE potential (preferably district-wise) along-with quantum of the potential
 - Type of the above RE Potential (Wind/Solar/Hybrid)
 - Time-frame in which the above potential is expected to materialize so that the planned transmission system can be phased out to match with corresponding RE generation
 - Any other data as may be required for planning of ISTS system

12. Data Validation

- 12.1. Based on the inputs from various stakeholders as per various provisions above, CTU shall prepare the basic network base case file and same shall be validated through joint consultation amongst CTU, CEA, STUs, RPCs & POSOCO bi-annually as per time-line specified under para 3.3. Based on the inputs from the stakeholders, the committee shall carry out any necessary modifications and finalise the network data.
- 12.2. Based on the validated network data, details of generation (as provided by STUs/ISTS connected generators) and details of demand (as provided by

STUs in coordination with respective state distribution licensees), etc. CTU shall prepare the base case files bi-annually as per time-line specified under para 3.3.

13. Evolution of new transmission schemes (Preparation of ISTS Plan)

- 13.1. Load-generation scenarios shall be worked out as per the requirements so as to reflect the daily and seasonal variations in load demand and generation availability (such as cases for peak, off-peak and other than peak / off-peak hours for different seasons considering low, moderate and high renewable/other generation capacity).
- 13.2. In addition to this, varying import/export requirements of each state and scheduling of various generating stations under economic dispatch for which variable cost of existing and upcoming generating stations may also be considered.
- 13.3. While planning the transmission system, options of upgrading the existing ISTS in place of building new transmission lines (such as increasing line loading through use of compensation, reconductoring, etc.) shall be explored for optimally utilizing the existing assets.
- 13.4. To avoid bottling up of power, STUs shall also plan/strengthen their downstream networks based on the evolved inter-state transmission system in similar time-frame. Based on progress of implementation of generating stations and upstream/ downstream systems, mid-course correction for transmission system to the extent possible should be made in terms of (i) Re-configuration of planned transmission system, (ii) Phasing of transmission elements and (iii) Rescheduling of some of the transmission elements.
- 13.5. CTU shall carry out joint studies in consultation with CEA, POSOCO, RPCs, and STUs for evolution of new transmission system as per time-line specified under para 3.3.
- 13.6. Based on the outcome of joint studies, CTU shall prepare the preliminary proposal for proposed ISTS schemes with following details:
 - a) Assumptions made in system studies and inputs received from stakeholders
 - b) Results of system studies
 - c) Detailed justification for the scheme along with details of the complete scheme
 - d) Recommendations regarding matching In-STS network system strengthening (as required)

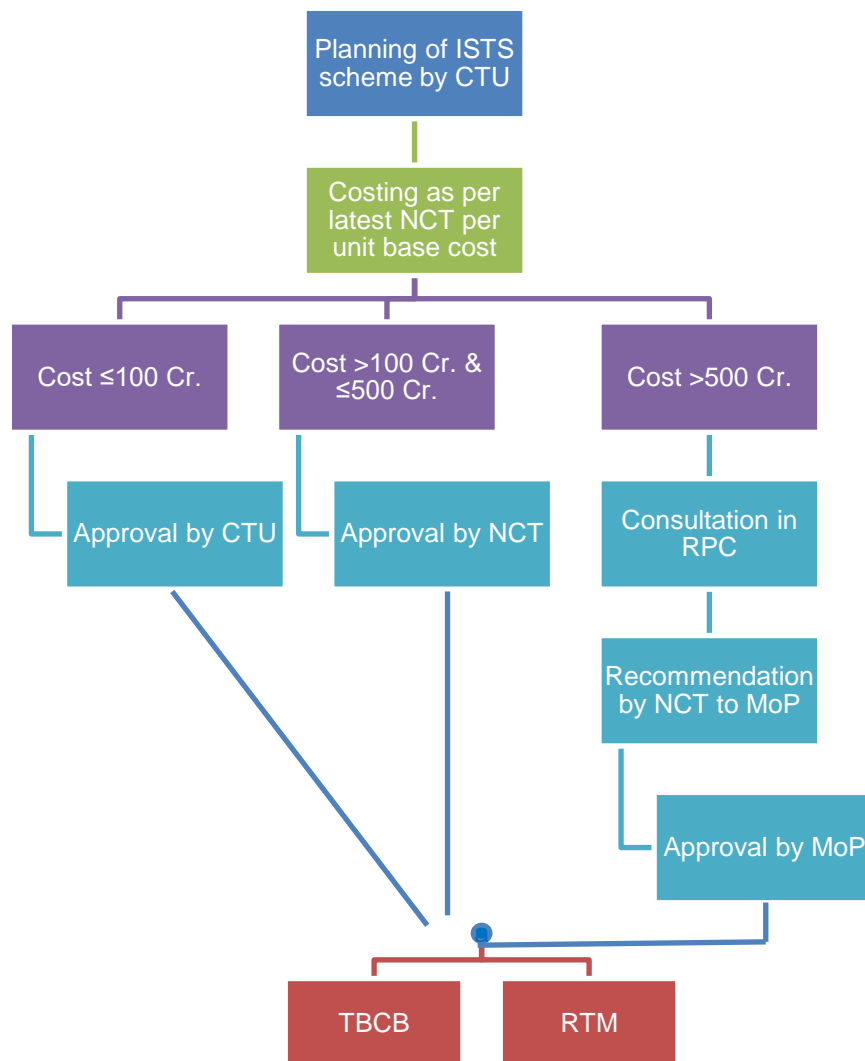
e) Estimated cost of schemes

- 13.7. The preliminary proposal shall be published on CTU website for inviting observations from stakeholders on the proposed transmission schemes bi-annually as per time-line specified under para 3.3. Thereafter, stakeholders shall be required to submit their comments on the evolved ISTS schemes, if any, bi-annually as per time-line specified under para 3.3 (viz. within 15 days of uploading). In case of non-receipt of comments by any stakeholder by the stipulated date, it shall be construed that stakeholders are in agreement with the proposal(s) and have no observations on the same.
- 13.8. The transmission schemes shall be finalized considering observations from stakeholders and CTU shall publish the final proposal on its website bi-annually as per time-line specified under para 3.3.
- 13.9. The approval of planned schemes shall be as per relevant notification(s) of the Ministry of Power. The details of finalized schemes along with their implementation time lines and status of approval shall be made part of the annual rolling plan for ISTS for upto next five years and the same shall be reviewed bi-annually as per details at para 3.3.

14. Consultation and Approval of planned ISTS scheme

14.1. The meeting for consultation on transmission planning with participation from CEA, CTU, POSOCO, RPCs and STUs for respective region would be held on monthly basis or earlier as the case may be. During the meeting, deliberations would be held for processing of Open Access / General Network Access applications, assessment of transmission system augmentation requirements in ISTS, any other matter pertaining to planning of ISTS, etc.

14.2. The approval of planned ISTS schemes shall be as per relevant notification(s) of the Ministry of Power (MoP). MoP vide its office order no. 15/3/2018-Trans-Pt(5) dated 28-10-2021 regarding reconstitution of National Committee on Transmission (NCT), has made following process for approval of ISTS schemes. As per said office order, approval shall include identification of mode of implementation viz. TBCB or RTM and also commissioning schedule. Further, cost estimation of the project is to be done by NCT.



14.3. The above process may undergo changes as per directions of MoP from time to time.

Minutes of the Meeting to discuss the performance of ISGS and IPP Generating plants in Eastern Region held on 28th October 2021

A meeting to discuss and deliberate on the performance of ISGS and IPPs generating power plants of the Eastern Region was organised by ERLDC on 28th October 2021. The meeting was for discussion on active and reactive power performance including primary frequency response (PFR) testing and forced outage for generating plants.

The meeting started with a welcome address by the Chief General Manager (I/C), ERLDC and he advised participants that with collective effort grid frequency and voltage can be operated within IEGC prescribed limits along with ensuring better generation adequacy in the eastern region. He highlighted the importance of frequency and voltage support by the generators. He further put thrust on increasing interaction between generating stations and grid operators so that issues can be discussed bilaterally and solved. He also cautioned participants about over injection more than MCR and non-satisfactory reactive power performance by generating units.

After this, generating station wise agenda items were taken by Manager, ERLDC. Major issues were discussed during this meeting was as follows:

1. Performance of generating units during following events:

Event No	Date and Time	Change in Frequency
1	11-06-2021 at 16:02:42 Hrs	50.09 Hz to 49.92 Hz. Later stabilized at 50.00 Hz.
2	20-07-2021 at 10:25:02 Hrs	50.07 Hz to 49.93 Hz. Later stabilized at 50.03 Hz.
3	22-07-2021 at 15:08:16 Hrs	49.99 Hz to 49.86 Hz. Later stabilized at 49.94 Hz.
4	06-08-2021 at 10:42:10 Hrs	50.02 Hz to 49.92 Hz. Later stabilized at 49.99 Hz.
5	15-08-2021 at 10:05:49 Hrs	49.97 Hz to 49.87 Hz. Later stabilized at 49.92 Hz.
6	22-08-2021 at 19:44:20 Hrs	50.03 Hz to 49.90 Hz. Later stabilized at 49.99 Hz.
7	26-08-2021 at 11:13:18 Hrs	49.891 Hz to 49.736 Hz. Later stabilized at 49.751 Hz.
8	28-09-2021 at 17:48:31 Hrs	49.962 Hz to 50.090 Hz. Later stabilized at 50.031 Hz.

Summary of primary frequency response provided by ER generating units is provided table 2

2. Action taken by generating stations based on the recommendation given in the meetings held on 31st May 2021
3. Scheduling of primary frequency response testing at NTPC Talcher STPS Stage 1, NTPC Barh STPS, NTPC Darlipalli STPS, Jindal TPS (JITPL), Maithon RB TPS (MPL) and Dikchu HEP
4. Running GMR unit #1 & #2 and Talcher unit #1 & #2 more than MCR and non-maintaining adequate margin for primary frequency response.

5. Inadequate reactive power absorption by Barh STPS, Nabinagar STPS, Nabinagar TPS and JITPL during high voltage. Summary of reactive power performance provided by above generating units along with action to be taken are provided in table 3.
6. NTPC informed remedial action has been taken regarding repeated tripping of Farakka unit 5 & 2 and Talcher unit 1.

The summary of the discussions held with generators is provided in attached table 1.

Some of the major issues and important points deliberated during the meeting are as follows:

1. Some generating stations informed that response was inadequate due to coal quality and wet coal. This aspect will be solved in upcoming months. ERLDC informed grid frequency touched as low as 49.7 Hz during few instances during October 2021. **During low frequency period, frequency may decrease further if adequate frequency response could not be ascertained at the time of requirement. ERLDC suggested to ensure adequate margin for Primary frequency response and throttle mode operation (not in VWO) while declaring capacity during poor coal quality or wet coal problem or other technical limitations.**
2. It is observed that some generating units were being run at more than maximum continuous rating (MCR) for considerable amount of time. Generating stations are advised to avoid running units at more than MCR and not utilising the primary frequency response margin.
3. Responses of generating units which have undergone primary frequency response test were found satisfactory during testing. However, sufficient response had not been observed for several generating units during the events that occurred after the PFR testing. ERLDC advised all these plants for implementing the necessary changes and fine-tuning in the governor setting as suggested by the testing agency.
4. It was informed that the tuning of the governor in generating plant is a continuous process and response to be checked for each event. Grid is changing from time to time with an increase in generation, load, and RE penetration. Therefore sudden frequency change detection has to be done at regular intervals.
5. It was intimated by ERLDC during previous meetings that as per **CERC TCT 2019-2024 Clause 30.2.i & ii.**
 - i. “In case of a new project, the rate of return on equity shall be reduced by 1.00% for such period as may be decided by the Commission, if the generating station or transmission system is found to be declared under commercial operation without

commissioning of any of the Restricted Governor Mode Operation (RGMO) or Free Governor Mode Operation (FGMO), data telemetry, communication system up to load dispatch centre or protection system based on the report submitted by the respective RLDC;”

- ii. in case of existing generating station, as and when any of the requirements under (i) above of this Regulation are found lacking based on the report submitted by the concerned RLDC, rate of return on equity shall be reduced by 1.00% for the period for which the deficiency continues;

It has further been elaborated that in case of insignificant improvement and persistent violation for governor response in line with IEGC regulations, **ERLDC will send their report to CERC for taking suitable action in view of maintaining Indian power system reliability and security.**

- 6. All power plants where reactive power performance issues have been observed will take actions in time to provide adequate reactive support to the grid in line with IEGC regulation and relevant CEA standards.
- 7. Generating plants where multiple forced outages of units were observed have been advised to take proper action to ensure better generation adequacy for system reliability and security.

The meeting ended with a vote of thanks from the Deputy General Manager, ERLDC and all generators assured to take corrective action as discussed during this meeting.

Table 1: Generator Primary Frequency Response and Meeting Discussion

Generating Power Plants	Course of action decided during last meeting on 31 st May 2021	Discussion during meeting on 28 th October 2021	Action to be taken on frequency control	Action to be taken to improve reactive power support
<p>Farakka NTPC (3 x 200 MW, 3 x 500 MW) (PFR Testing has been completed for unit #2, #3, #4, #5, #6 and response was satisfactory during testing)</p>	<ul style="list-style-type: none"> • NTPC Farakka assured generating units would not be run at more than MCR and system parameters will be kept to have adequate primary response margin as per IEGC. • They informed that plant output started to reduce due to activation of pressure correction loop. To solve this issue limit would be increased to 3.5 kg/cm². Support from OEM is not required for the necessary tuning of generating units. Corrected setting would be implemented at all units by July, 2021. This should resolve the issues being observed at present. • For unit 1, R&M activities will be completed by July 2021 after which EHG governor system will be installed in the plant. 	<ul style="list-style-type: none"> • ERLDC informed satisfactory primary frequency response has been observed for few units during some events. But during most of the events, most of the units did not provide adequate response. • ERLDC further informed that over injection issue has not been observed in the previous quarter. • NTPC informed Installation of EHG governor system of Unit 1 would be completed November 2021. After this, RGMO would be in service for unit 1 and satisfactory PFR will be provided by the unit. • Adequate response could not be obtained because of wet coal and coal quality issues. This issue will get solved in upcoming months. • Pressure feedback setting (as per recommendation in the previous meeting) has been corrected. 	<ul style="list-style-type: none"> • Capacity may be declared in such way so that margin for primary frequency response is ensured always even during wet/poor coal condition or with other technical limitation. Running units in VWO is to be avoided always. • NTPC Farakka to take all action to comply with IEGC now; Significant deviation from test results is not desirable. 	

Generating Power Plants	Course of action decided during last meeting on 31 st May 2021	Discussion during meeting on 28 th October 2021	Action to be taken on frequency control	Action to be taken to improve reactive power support
Kahalgaon NTPC (4 x 210 MW, 3 x 500 MW) (PFR Testing has been completed for unit #1, #5, #6, #7 and response was satisfactory during testing)	<ul style="list-style-type: none"> • Stage 1 units are Russian make old units having mechanical governor. PFR testing of unit 1 would be performed. Based on performance during testing, tuning would be done. • NTPC Kahalgaon assured generating units would not be run at more than MCR. • Modified Sliding pressure throttle set point would be implemented Unit #5, #6 and U#7. • Reference speed of all units used for RGMO Logic with reference to grid frequency would be adjusted by June 2021. • Adjustment of speed integration time used for RGMO logic in progress and would be completed by June 2021. • New speed pickup would be set up for Unit #7 during unit next Overhauling / opportunity. Next overhauling date is November 2021. 	<ul style="list-style-type: none"> • ERLDC informed that satisfactory primary frequency response has been observed for few units during some of the events. However, during most of the events, many units did not provide adequate response. • ERLDC further informed that over injection issue has not been observed in the previous quarter. • ERLDC requested timely sharing of generator end data so that the same can be analysed and incorporated in the report. • NTPC informed that adequate response could not be obtained because of wet coal and coal quality issues. This issue will get solved in upcoming months. • Change in setting regarding modified sliding pressure throttle set point, reference speed and adjustment of speed integration time has been implemented. • Testing of unit 1 has been completed. 	<ul style="list-style-type: none"> • Capacity may be declared in such way so that margin for primary frequency response is ensured always even during wet/poor coal condition or with other technical limitation. Running units in VWO is to be avoided always. • NTPC Kahalgaon to take all action to comply with IEGC now; Significant deviation from test results is not desirable. 	

Generating Power Plants	Course of action decided during last meeting on 31 st May 2021	Discussion during meeting on 28 th October 2021	Action to be taken on frequency control	Action to be taken to improve reactive power support
<p>Talcher NTPC (6 x 500 MW) (PFR Testing has been completed for unit #3, #4, #5 and response was satisfactory during testing)</p>	<ul style="list-style-type: none"> R& M was completed for unit 1 in Feb, 2020 and old GE governor was replaced by Emerson Governor. EHC of units# 1 & 2 were replaced (Unit-2 in Apr-21) by GE make. One set of tuning has been done in Unit-1. Further tuning of both Unit-1&2 will be done by GE, getting delayed due to prevailing Covid-19 situations. NTPC to conduct PFR testing at their units at Stage 1 at the earliest. Reason for poor response to be analysed by NTPC 	<ul style="list-style-type: none"> ERLDC informed that satisfactory primary frequency response has been observed for few units in stage 2 during some events. However, during most of the events, many units did not provide adequate response. Stage 1 units did not provide adequate response during any event. ERLDC further informed over injection by Talcher stage 1 has been observed for significant amounts of time in July – September 2021. Same has been observed in meter data also. NTPC Talcher informed adequate primary frequency response could not be provided by stage 1 units due to high turbine vibration. As a solution, EHC converter has been replaced. OEM has been consulted for short and long term solutions. 	<ul style="list-style-type: none"> NTPC Talcher informed during the Overhauling of Unit-1 scheduled in Dec-21, station would take corrective action for improvement of RGMO response They further informed testing of unit 1 & 2 would be done within January 2022. ERLDC informed response of stage 1 units to be improved before conducting testing. NTPC Talcher to take all action to comply with IEGC now; Significant deviation from test results is not desirable. NTPC Talcher to ensure primary frequency response. Unit generation more than MCR or 	

Generating Power Plants	Course of action decided during last meeting on 31 st May 2021	Discussion during meeting on 28 th October 2021	Action to be taken on frequency control	Action to be taken to improve reactive power support
			running units in VWO are to be avoided.	
Barh NTPC (2 x 660 MW)	<ul style="list-style-type: none"> • NTPC Barh units have Siemens make governor. • NTPC informed that implementation of new logic and necessary tuning has been done. Response of units would be checked during next event and further tuning would be done. • ERLDC advised NTPC to maintain a sufficient pressure margin to avoid problems due to the interaction of the pressure correction loop. • NTPC to conduct PFR testing at their units at the earliest and further tune their generating units during upcoming PFR testing of their units. 	<ul style="list-style-type: none"> • ERLDC informed satisfactory primary frequency response has been observed during some events. However, during most of the events, both/one unit(s) did not provide adequate response. • Reactive power absorption during high voltage condition during September 2021 was less compared to previous months. ERLDC suggested reviewing Auto mode operation setting of AVR. • NTPC informed that new RGMO logic has been implemented at Unit 5 which is under AOH now. Same would be tested after revival. If found ok same would be implemented at unit 4 also during overhauling. 	<ul style="list-style-type: none"> • Performance of unit 5 to be checked for upcoming events. Revised logic to be implemented at unit 4 also if logic's performance found satisfactory. • NTPC to conduct PFR testing at their units at the earliest. 	<ul style="list-style-type: none"> • NTPC Barh to review Auto mode operation setting of AVR

Generating Power Plants	Course of action decided during last meeting on 31 st May 2021	Discussion during meeting on 28 th October 2021	Action to be taken on frequency control	Action to be taken to improve reactive power support
BRBCL (3 x 250 MW) (PFR Testing has been completed for unit #2, #3 and response was satisfactory during testing)	<ul style="list-style-type: none"> • Tuning of HPCV and EHTC Governor Characteristics, to be done in the next scheduled Overhauling which was scheduled in August 2021. After this new logic would be implemented. • New logic to be implemented in units 2 and 3 during the next opportunity shutdown. • BRBCL to conduct PFR testing at their units at the earliest. 	<ul style="list-style-type: none"> • ERLDC informed satisfactory primary frequency response has been observed for most of the events for unit 2 & 3. Performance of unit 1 is to be improved. • Reactive power absorption during high voltage condition was poor by BRBCL generating units. • PFR testing has been conducted for BRBCL units during July – August 2021 • Tuning of HPCV and EHTC Governor Characteristics in Unit#1 completed in Sept'21 during AOH, RGMO logic in line with Unit#2 and 3 implemented. • Auto mode operation setting of AVR tuned, sensitization of CCR personnel regd. VAR absorption as per capability curve being done. • Reactive power performance of unit 2 & 3 improved during October 2021. No improvement has been observed for unit 1. 	<ul style="list-style-type: none"> • BRBCL to tune the primary frequency response performance of unit 1. 	<ul style="list-style-type: none"> • Reactive power absorption during high voltage condition by BRBCL generating units to be improved (particularly for unit 1) by taking appropriate action.

Generating Power Plants	Course of action decided during last meeting on 31 st May 2021	Discussion during meeting on 28 th October 2021	Action to be taken on frequency control	Action to be taken to improve reactive power support
<p>NPGC Nabinagar (2 x 660 MW) (PFR Testing has been completed for unit #1 and response was satisfactory during testing)</p>	<ul style="list-style-type: none"> • NPGC to further tune their generating units to respond. It is a newly commissioned plant and should comply with IEGC in full spirit. • NPGC informed ID fan problem would be solved by June 2021. • ERLDC informed during the meeting that NPGC to take all action to comply with IEGC Primary frequency response requirements. • NPGC to conduct PFR testing at their unit at the earliest. 	<ul style="list-style-type: none"> • ERLDC informed during most of the events, response was found to be non-satisfactory. • NPGC informed tuning of generating units and ID fan problem has been solved. Due to coal problem, sufficient response has not been observed. • NPGC further informed maximum MVAR absorption recorded was 60-70 MVAR while unit can absorb up to 200 MVAR as per reactive power capability curve. ERLDC suggested for reactive power capability testing. • PFR testing has been conducted for BRBCL units during August 2021 	<ul style="list-style-type: none"> • NPGC to ensure adequate primary frequency response during all the events. 	<ul style="list-style-type: none"> • NPGC to conduct reactive power capability testing at the earliest to ensure that adequate reactive power support is provided to the grid in line with IEGC and as per ERLDC instructions as per capability curve limit.
<p>Darlipalli (2 x 800 MW)</p>	<ul style="list-style-type: none"> • NTPC Daripalli to ensure adequate primary frequency response during all the events. • NTPC to conduct PFR testing at their unit at the earliest. 	<ul style="list-style-type: none"> • ERLDC informed during all events, response was non-satisfactory. • NTPC informed internal tuning and testing of RGMO logic was going on. By January 2022, primary frequency response of both units would be satisfactory. After this PFR testing would be conducted. 	<ul style="list-style-type: none"> • NTPC to ensure adequate primary frequency response during all the events. • NTPC to conduct PFR testing at their unit at the earliest. 	

Generating Power Plants	Course of action decided during last meeting on 31 st May 2021	Discussion during meeting on 28 th October 2021	Action to be taken on frequency control	Action to be taken to improve reactive power support
<p>GMR (2 x 350 MW) (PFR Testing has been completed for unit #1 & 2)</p>	<ul style="list-style-type: none"> • The units are Chinese make. • HPCV at units 2 and 3 would be made available in any shutdown opportunity of 5-6 days. • GMR to conduct PFR testing at their units at the earliest. 	<ul style="list-style-type: none"> • ERLDC informed satisfactory primary frequency response has been observed for most of the events. • ERLDC further informed over injection by GMR has been observed for significant amounts of time in July – September 2021. • Testing of GMR units has been conducted during September 2021. During testing it has been observed response was not withdrawn when frequency reduced from higher value to 50 Hz with step change (No generation increase with sudden drop in frequency; non-compliance of IEGC section 5.2 (h)) 	<ul style="list-style-type: none"> • GMR to modify FGMO logic for frequency increase > 50 Hz in line with IEGC. • GMR to ensure primary frequency response. Unit generation more than MCR or running units in VWO are to be avoided as per CEA and CERC regulations . 	

Generating Power Plants	Course of action decided during last meeting on 31 st May 2021	Discussion during meeting on 28 th October 2021	Action to be taken on frequency control	Action to be taken to improve reactive power support
JITPL (2 x 600 MW)	<ul style="list-style-type: none"> JITPL informed that the technical problem at unit 2 would be solved by October 2021 and the machine can respond in governor response after that. During CMC mode operations, delta pressure is influencing final load control output to maintain CMC reference. Action to be taken to implement RGMO through CMC also. JITPL to conduct PFR testing at their units at the earliest. 	<ul style="list-style-type: none"> ERLDC informed PFR performance of JITPL units was non satisfactory. MVAR absorption by JITPL units were also non satisfactory. JITPL informed Technical problem of unit 1 & 2 would be solved by November 2021 Reactive power absorption by JITPL was low due to vibration problem at JITPL units. Same issue would be solved by November end. To absorb reactive power, 2 x 50 MVAR reactor were installed at JITPL. 	<ul style="list-style-type: none"> JITPL to ensure adequate primary frequency response during all the events. JITPL to conduct PFR testing at their unit at the earliest. 	<ul style="list-style-type: none"> JITPL to provide required reactive power support.

Generating Power Plants	Course of action decided during last meeting on 31 st May 2021	Discussion during meeting on 28 th October 2021	Action to be taken on frequency control	Action to be taken to improve reactive power support
APNRL (2 x 270 MW) (PFR Testing has been completed for unit #1 & 2)	<ul style="list-style-type: none"> • APNRL to take all action to comply with IEGC Primary frequency response requirements. 	<ul style="list-style-type: none"> • ERLDC informed performance of APNRL units were not at all satisfactory even after successful testing of both units. • ERLDC further informed to replace CVTs also which were erroneous for long period. • APNRL informed that they are analysing the details of non-response and will be taking requisite action. • ERLDC suggested that they should get support from industry expert in resolving the delayed response in primary frequency as observed during test. 	<ul style="list-style-type: none"> • APNRL to take all action to comply with IEGC now; Significant deviation from test results is not desirable • APNRL to ensure sufficient margin for PFR and not to run their units in VWO mode. • APNRL to take PSS tuning activities which is pending. 	<ul style="list-style-type: none"> • APNRL to replace faulty CVTs at the earliest.

Generating Power Plants	Course of action decided during last meeting on 31 st May 2021	Discussion during meeting on 28 th October 2021	Action to be taken on frequency control	Action to be taken to improve reactive power support
MPL (2 x 525 MW)	<ul style="list-style-type: none"> • ERLDC informed MPL that it should not to operate units in VWO as this is not in compliance with IEGC and relevant CEA standards • MPL informed problem at unit 1 would be solved within 4 months (i.e., Sept 2021). • MPL to conduct PFR testing at their units at the earliest with Siemens. 	<ul style="list-style-type: none"> • ERLDC informed during few events PFR performance of MPL units was non satisfactory. • MPL informed during those events due to AGC command, generation was being ramped up or down and same interacted with RGMO influence. • ERLDC suggested to share AGC set point and AGC output along with unit output data for analysing of PFR performance • MPL informed they are planning testing of unit 2 and 1 in Jan-2022 and Feb-2022 respectively. • ERLDC further informed reactive power performance was non satisfactory. MPL shared they have taken required action and performance during October 2021 improved. 	<ul style="list-style-type: none"> • MPL to conduct PFR testing at their unit at the earliest. • MPL to share AGC set point, AGC output, RGMO influence along with speed and unit output data for PFR performance analysis. 	
Teesta V (3 x 170 MW) PFR Testing has been completed for unit #1)	Teesta V to check the performance of its units during frequency events.	<ul style="list-style-type: none"> • Teesta V informed that they disabled primary frequency control when they were in AGC. ERLDC raised concern and insisted to put both primary and secondary frequency control in service. 	<ul style="list-style-type: none"> • Teesta V to explore possibilities of keeping both primary and secondary frequency control in service. 	

Generating Power Plants	Course of action decided during last meeting on 31 st May 2021	Discussion during meeting on 28 th October 2021	Action to be taken on frequency control	Action to be taken to improve reactive power support
Teesta III (6 x 200 MW) (PFR Testing has been completed for all units and response was satisfactory during testing)	<ul style="list-style-type: none"> Adequate and Satisfactory primary frequency Response during all events. However, there is scope for improving the response of Unit 6 which needs to be investigated by TUL. 	<ul style="list-style-type: none"> Except the eighth event, primary frequency response was satisfactory for all events. During eighth event, frequency increased suddenly due to sudden disconnection of large load. ERLDC advised to check RGMO logic for sudden frequency rise. 	<ul style="list-style-type: none"> TUL to check logic for sudden frequency rise. 	
Dikchu (2 x 48 MW)	Dikchu HEP to conduct PFR testing at their units at the earliest.	<ul style="list-style-type: none"> Dikchu HEP informed they were facing some technical problems related to governor control switch. ERLDC asked to expedite and conduct testing at the earliest. 	<ul style="list-style-type: none"> Dikchu HEP to conduct PFR testing at their units at the earliest. 	

Table 2: Summary of primary frequency response provided by ER generating units

Generating Station/ SLDC	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8
NTPC Farakka	Satisfactory for Unit 6; Non satisfactory for other units (Response observed Unit 2: 0, Unit 3: 2MW, Unit 4,5: 6 MW)	Satisfactory for unit 3, 5 & 6. Non satisfactory for unit 2 & 4. Unit 1 was not in service. Response from unit 2 & 3 started to decrease after initial response.	Satisfactory for unit 3, 4 & 6. Non satisfactory for unit 5. No response has been observed for unit 2. Unit 1 was not in service. Response from all units did not sustain for longer period.	Satisfactory for unit 2, 5 & 6; Non satisfactory for unit 3 & 4	Satisfactory for unit 5; Non satisfactory for unit2, 3, 4 & 6	Non-Satisfactory	Non-Satisfactory (As per FRC calculated based on ERLDC SCADA data)	Non-Satisfactory except for unit 3
NTPC Kahalgaon	Satisfactory	Non satisfactory for stage 1; Satisfactory for stage 2 (As per FRC calculated based on ERLDC SCADA data)	Satisfactory (As per FRC calculated based on ERLDC SCADA data)	Non-Satisfactory (As per FRC calculated based on ERLDC SCADA data)	Non-Satisfactory (As per FRC calculated based on ERLDC SCADA data)	Non-Satisfactory (As per FRC calculated based on ERLDC SCADA data)	Non-Satisfactory (As per FRC calculated based on ERLDC SCADA data)	Non-Satisfactory (as per FRC calculated based on ERLDC SCADA data)
NTPC Talcher	Non-Satisfactory (As per FRC calculated based on ERLDC SCADA data)	Non satisfactory for unit 1, 2 & 4. Satisfactory for unit 5 & 6. But response was sluggish and time taken to provide full response was very high. Unit 3 was not in service.	Non satisfactory for unit 1. Satisfactory for unit 4, 5 & 6. Unit 2 & 3 was not in service.	Non-Satisfactory Unit 3 & 5 were not in service.	Satisfactory for Unit 4 & 6; Non satisfactory for Unit 1, 2 & 5. Unit 3 was not in service.	Non-Satisfactory Unit 3 was not in service.	Non-Satisfactory Unit 1, 3 & 5 were not in service.	Non-Satisfactory (as per ERLDC SCADA data)

Generating Station/ SLDC	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8
NTPC Barh	Satisfactory (Around 70% of ideal response)	Non satisfactory. For unit 5, response started to decrease after initial response.	Non satisfactory. Response did not sustain for longer time.	Satisfactory	Non-Satisfactory (9 MW response observed; ideal response 18 MW)	Non-Satisfactory	Satisfactory for unit 4. Non satisfactory for unit 5.	Non-Satisfactory
NTPC Darlipalli	Non-Satisfactory (As per FRC calculated based on ERLDC SCADA data)	Non satisfactory response observed. Response did not sustain for more than 10 seconds.	Non satisfactory response observed. Response did not sustain for more than 10 seconds.	No response has been observed	Non-Satisfactory	Non-Satisfactory (As per FRC calculated based on ERLDC SCADA data)	Non-Satisfactory (As per FRC calculated based on ERLDC SCADA data)	Non-Satisfactory
BRBCL	Satisfactory for unit 2 & 3. Non-Satisfactory for unit 1.	Satisfactory; Unit 1 & 3 were not in service.	Non Satisfactory for unit 2. Satisfactory for unit 1. Unit 3 was not in service	No response has been observed	Satisfactory for unit 2. Non satisfactory for unit 1 & 3.	Satisfactory for unit 2 & 3. Non satisfactory for unit 1.	Not satisfactory. Unit generation was more than MCR.	Satisfactory for unit 2; non satisfactory for unit 3
NPGC Nabinagar	Satisfactory, But response withdrawn within 3 min at rate faster than 1% per min.	Non-Satisfactory, response did not sustain for more than 2 min. Another response observed after 4 min	Non-Satisfactory, response did not sustain for more than 2 min.	Non-Satisfactory	Non-Satisfactory (As per FRC calculated based on ERLDC SCADA data)	Non-Satisfactory (As per FRC calculated based on ERLDC SCADA data)	Non-Satisfactory (As per FRC calculated based on ERLDC SCADA data)	Satisfactory
GMR	Non-Satisfactory (As per FRC calculated based on ERLDC SCADA data)	Non-Satisfactory (As per FRC calculated based on ERLDC SCADA data)	Satisfactory for unit 1, Non satisfactory for unit 2	Satisfactory for unit 2. Unit 1 was under shutdown	Non-Satisfactory for unit 1. Unit 2 was under shutdown	Satisfactory	Satisfactory	Satisfactory

Generating Station/ SLDC	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8
JITPL	Non-Satisfactory	Non-Satisfactory	Non-Satisfactory	Non-Satisfactory	Non-Satisfactory	Non-Satisfactory (As per FRC calculated based on ERLDC SCADA data)	Non-Satisfactory (As per FRC calculated based on ERLDC SCADA data)	Non-Satisfactory
MPL	Satisfactory	Satisfactory; But time taken to provide full response may be reduced.	Non satisfactory for unit 1. RGMO for unit 2 was not in service due to minimum load trial.	No response has been observed due to poor vacuum	Unit was being ramped down due to AGC. No response was observed in case of unit 2. Less but non adequate response has been observed for unit 1.	Satisfactory for unit 1. Non satisfactory for unit 2.	Satisfactory for unit 2. Non satisfactory for unit 1.	Satisfactory
Adhunik	Non-Satisfactory	Non satisfactory for unit 2; Unit 1 was being revived.	Satisfactory for unit 2; Unit 1 was under PFR testing.	No response has been observed	Response is not satisfactory	Response is not satisfactory	Response is not satisfactory	Non-Satisfactory
Teesta V HEP	Unit was not in service	No response for unit 3. Satisfactory response for unit 1 & 2. Time taken to provide response may be reduced.	Non satisfactory	No margin was available due to water spillage condition	Unit was being run at or more than MCR due to water spillage condition	Unit was being run at or more than MCR due to water spillage condition	Unit was being run at or more than MCR due to water spillage condition	Non-Satisfactory

Generating Station/ SLDC	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8
Teesta III HEP	Satisfactory	Satisfactory for Unit 3. 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.	Satisfactory for Unit 3. Other units did not have any margin for PFR response.	Unit was being run at or more than MCR due to water spillage condition	Unit was being run at or more than MCR due to water spillage condition	Unit was being run at or more than MCR due to water spillage condition	Unit was being run at or more than MCR due to water spillage condition	Response observed. But non adequate.
Dikchu HEP	Unit under spillage condition. No margin was available.	No margin was available for PFR due to water spillage condition	No margin was available for PFR due to water spillage condition	No margin was available due to water spillage condition	Unit was being run at or more than MCR due to water spillage condition	Unit was being run at or more than MCR due to water spillage condition	Unit was being run at or more than MCR due to water spillage condition	Satisfactory

Table 3: Action to be taken by generating stations to improve their reactive power performance

Name of generating units	Maximum MVAR absorption limit (as per capability curve)	MVAR absorption during maximum voltage (as per ERLDC SCADA data)	Maximum voltage during September 2021	Action to be taken to improve reactive power performance
Barh STPS Stage II - 660 MW Unit - 5	> 200 MVAR	<70 MVAR	419 kV	NTPC Barh to review Auto mode operation setting of AVR
Nabinagar STPP Stage I - 660 MW Unit -1	> 250 MVAR	<45 MVAR	420 kV	NPGC to conduct reactive power capability testing at the earliest to ensure that adequate reactive power support is provided to the grid in line with IEGC and as per ERLDC instructions as per capability curve limit.
JITPL - 600 MW Unit -1 & 2	> 200 MVAR	0 MVAR (Unit was generating 100-130 MVAR)	415 kV	JITPL to provide required reactive power support.

Annexure-C5

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		
			Total	83.10					73.03		90.745		
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						Price bid has been opened. Tender on awarding stage.
			Total	160.49					114.68		145.674		
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. Work In Progress
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			24.5	90% grant availed . Rest work in progress
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 (Balasore, Bidanasi, Budhipadar, Katapali, Narendrapur, New-Bolangir & Paradeep). (209)	29.56	24-May-19	13-Feb-20	18	13-Aug-21	8.87			32.85	30% grant availed. Work in Progress.
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.
			Total	270.18					101.35		193.42		
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 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		WBPDCL	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	WBPDCL	Renovation and Modernization of switchyard and related protection system of different power stations (BTPS, BKTPS and KTPS) of WBPDCL (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.	
			Total	295.15					194.26		256.661		

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	DVC	DVC	Renovation and Upgradatn 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			Renovation and Modernization of control and protection system and replACEMENT of equipment at Parulia, Durgapur, Kalyanewari, Giridhi Jamsedpur, Barjora, Burnpur, Dhanbad and Bundwan substation. (106)	140.50	16-May-17	14-Dec-17	24	14-Dec-19	102.43	0.98	127.684	
Total				166.46					125.38		156.287	
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
Total				10.00					3.00		20.00	
26	ERPC	ERPC	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.
Total				26.07					19.98		22.45888	
GrandTotal				1,011.46					631.68		885.25	

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	Testing Completed
28		2		
29		3		
30	JITPL	1	August'21	Scheduled
31		2		
32		3		
33	NPGCL	1	August'21	Testing Completed
34	BRBCL		1 st Week of August'21	Testing Completed
35	APNRL	1&2	July'21-August-21	Testing Completed

Annexure-C9

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
West Bengal							
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	Dec-21
PPSP	2	No	Yes	2009	No	Yes	Dec-21
PPSP	3	No	Yes	2009	No	Yes	Dec-21
PPSP	4	No	Yes	2009	No	Yes	Dec-21
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
CESC							
Budge Budge-CESC	1	Yes	Yes	2015	No	Yes	2021-22
Budge Budge-CESC	2	Yes	Yes	2015	No	Yes	2021-22
DVC							
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	Done on 7th Sept'21
Waria	4	Yes	Yes	2008	No	Yes	Unit Is out of Service
ISGS							
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	Nov 2021 (As per SRPC decision)
Talcher Stage 2	4	Yes	Yes	No Details	No Details	Yes	Nov 2021 (As per SRPC decision)
Talcher Stage 2	5	Yes	Yes	No Details	No Details	Yes	Nov 2021 (As per SRPC decision)
Talcher Stage 2	6	Yes	Yes	2016	Yes	Yes	Nov 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	Oct-21
Teesta V	2	Yes	Yes	2008	No	Yes	Oct-21
Teesta V	3	Yes	Yes	2008	No	Yes	Oct-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
IPP							
Jorethang	1	Yes	Yes	2015	No	Yes	Done on 14.10.2021
Jorethang	2	Yes	Yes	2015	No	Yes	Done on 13.10.2021
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	Dec-21
GMR	2	Yes	Yes	2013	No	Yes	Dec-21
GMR	3	Yes	Yes	2013	No	Yes	Dec-21
Orissa							
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	Done between 10th -13th OCT'21
Rengali	2	Yes	Yes	Not tuned	No	Yes	Done between 10th -13th OCT'21
Rengali	3	Yes	Yes	Not tuned	No	Yes	Done between 10th -13th OCT'21
Rengali	4	Yes	Yes	Not tuned	No	Yes	Done between 10th -13th OCT'21
Rengali	5	No	Yes	Not tuned	No	Yes	Done between 10th -13th OCT'21
Sterlite	4 X 600			No detail		Yes	To be updated by SLDC Orissa
Jharkhand							
Tenughat	1	Yes	Yes	2017	Yes	Yes	Dec-21
Tenughat	2	Yes	Yes	2017	Yes	Yes	Dec-21
Subarnrekha	2 X 65					Yes	To be updated
Bihar							
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
Bhutan							
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	Sep-21
Mangdechu	2	No	Yes			Yes	Sep-21
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 for the Month of Dec'21			
1	BIHAR	Demand (MW)	Energy Requirement (MU)
	NET MAX DEMAND	5220	2725
	NET POWER AVAILABILITY- Own Sources	680	224
	Central Sector+Bi-Lateral	5450	3080
	SURPLUS(+)/DEFICIT(-)	910	579
2	JHARKHAND		
	NET MAXIMUM DEMAND	1810	1028
	NET POWER AVAILABILITY- Own Source	359	195
	Central Sector+Bi-Lateral+IPP	1039	536
	SURPLUS(+)/DEFICIT(-)	-412	-297
3	DVC		
	NET MAXIMUM DEMAND	3060	2020
	NET POWER AVAILABILITY- Own Source	5115	2840
	Central Sector+MPL	273	152
	Bi- lateral export by DVC	2152	1601
	SURPLUS(+)/DEFICIT(-) AFTER EXPORT	176	-629
4	ODISHA		
	NET MAXIMUM DEMAND (OWN)	3850	2344
	NET MAXIMUM DEMAND (In Case,600 MW CPP Drawal)	5100	2990
	NET POWER AVAILABILITY- Own Source	3409	2177
	Central Sector	1847	888
	SURPLUS(+)/DEFICIT(-) (OWN)	1406	721
	SURPLUS(+)/DEFICIT(-) (In Case, 600 MW CPP Drawal)	156	75
5	WEST BENGAL		
5.1	WBSEDCL		
	NET MAXIMUM DEMAND	4970	2854
	NET MAXIMUM DEMAND (Incl. B'Desh+Sikkim)	5110	2945
	NET POWER AVAILABILITY- Own Source (Incl. DPL)	4688	2195
	Central Sector+Bi-lateral+IPP&CPP+TLDP	2313	1050
	EXPORT (TO B'DESH & SIKKIM)	10	7
	SURPLUS(+)/DEFICIT(-) AFTER EXPORT	1891	300
5.2	IPCL		
	IPCL Demand	130	84
	IPCL Import	130	84
	SURPLUS(+)/DEFICIT(-)	0	0
5.3	CESC		
	NET MAXIMUM DEMAND	1400	685
	NET POWER AVAILABILITY- Own Source	450	332
	FROM OTHER SOURCE (INCL. IPP/CPP-29-30 MU/M)	410	57
	IMPORT FROM HEL	540	296
	TOTAL AVAILABILITY OF CESC	1400	685
	SURPLUS(+)/DEFICIT(-)	0	0
5.4	WEST BENGAL (WBSEDCL+CESC+IPCL)		
	(excluding DVC's supply to WBSEDCL's command area)		
	NET MAXIMUM DEMAND	6500	3623
	NET POWER AVAILABILITY- Own Source	5138	2527
	CS SHARE+BILATERAL+IPP/CPP+TLDP+HEL	3263	1403

	SURPLUS(+)/DEFICIT(-) BEFORE WBSEDCL'S EXPORT	1901	307
	SURPLUS(+)/DEFICIT(-) AFTER WBSEDCL'S EXPORT	1891	300
6	SIKKIM		
	NET MAXIMUM DEMAND	130	63
	NET POWER AVAILABILITY- Own Source	2	1
	Central Sector	186	76
	SURPLUS(+)/DEFICIT(-)	58	14
7	EASTERN REGION		
	NET MAXIMUM DEMAND	20167	11803
	NET MAXIMUM DEMAND (In Case, 600 MW CPP Drawal of Odisha)	21265	12449
	BILATERAL EXPORT BY DVC	2152	1601
	EXPORT BY WBSEDCL TO SIKKIM & B'desh	10	7
	EXPORT TO B'DESH & NEPAL OTHER THAN DVC	642	142
	NET TOTAL POWER AVAILABILITY OF ER (INCLUDING CS ALLOCATION +BILATERAL+IPP/CPP+HEL)	26761	14099
	SURPLUS(+)/DEFICIT(-)	3790	546
	SURPLUS(+)/DEFICIT(-) (In Case, 600 MW CPP Drawal of Odisha)	2692	-100