Agenda

for

165th OCC Meeting

Date: 22.01.2020
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

Eastern Regional Power Committee

Agenda of 165th OCC Meeting to be held on 22nd January 2020 at ERPC, Kolkata

Item no. 1: Confirmation of minutes of 164th OCC meeting of ERPC held on 23.12.2019

The minutes of 164th OCC meeting were uploaded in ERPC website and circulated vide letter dated 31.12.2019 to all the constituents.

ERPC Secretariat has received a request for amendment against the item no. B9 of OCC minutes. The original minutes as well as amendment sought are as follows:

Original Recording

OCC advised Teesta Urja Limited to coordinate with NHPC for necessary action at their end to maintain reservoir level for the construction work.

Amendment Requested

Regarding the request of NHPC to Teesta III, it was informed by TUL that the same would be discussed mutually between NHPC and TUL.

Members may deliberate and confirm the minutes of 164th OCC meeting.

PART A: ER GRID PERFORMANCE

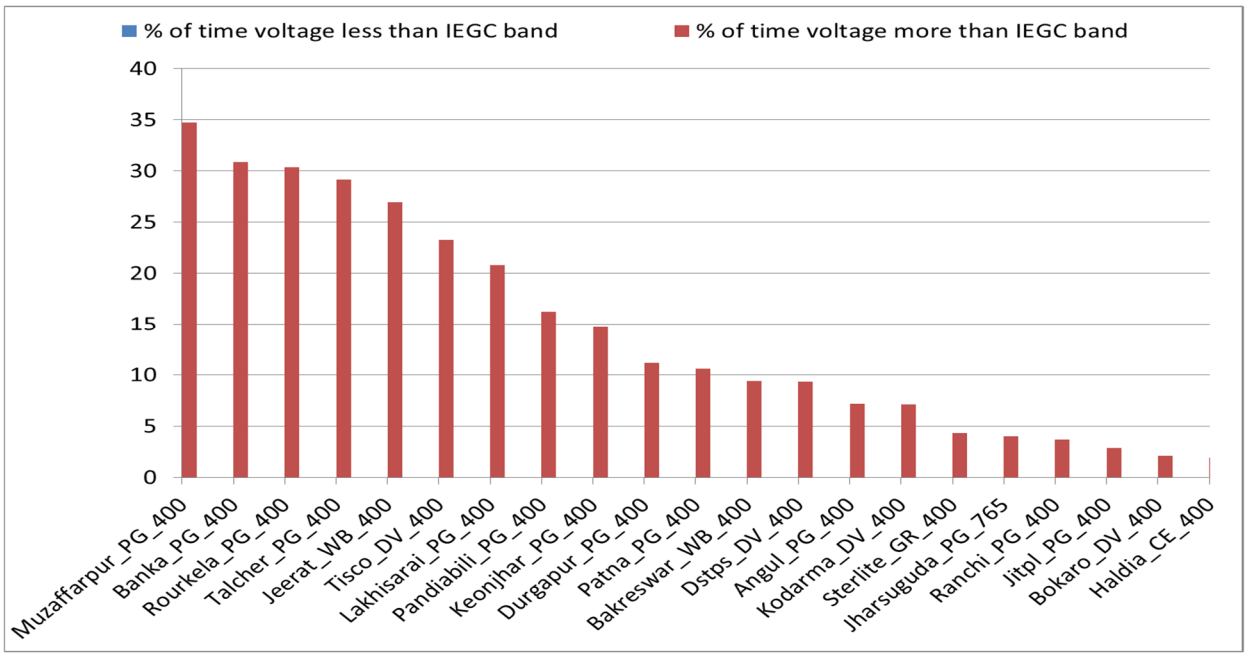
Item no. A1: ER Grid performance during December, 2019

The average consumption of Eastern Region for December - 2019 was 349 Mu. Eastern Region energy consumption reached a monthly maximum of 363 Mu on 30th December - 2019. Total Export schedule of Eastern region for December - 2019 was 3272 Mu, whereas actual export was 3222 Mu.

ERLDC may present the performance of Eastern Regional Grid covering the followings:

1. **Frequency profile**
2. **Over drawal/under injection by ER Entities**
3. **Performance of Hydro Power Stations during peak hours**
4. **Performance of ISGS during RRAS**
5. **Reactive Power performance of Generators**
6. **Over Voltage issue in ER substations**

High voltage is observed at different nodes in Eastern Region during the month of November and first week of December. Some of the nodes where voltage is beyond IEGC upper limit for significant amount of time during the month of December are shown below.



It can be seen that many of the high voltage nodes are generator nodes or close to generator node. As generators are not absorbing sufficient MVAr as per their capability curve is one of the reason for this sustained high voltage.

7. Restricted Governor /Free Governor Mode Operation of generators in ER

In 164th OCC, ERLDC presented the performance of the generators for a case of 1644 MW load loss on 1st November 2019.

OCC observed that the governor performance of the ER generators is not satisfactory and some constituents had not submitted the relevant details to ERLDC for detail analysis. During deliberation it was also emerged that there was a confusion in understanding the CERC regulation by the Generators.

DVC informed that they had already taken corrective action for Andal unit 1 and Mejia unit 7 & 8 in consultation with BHEL and ERLDC.

DVC added that the performance of the units would be reviewed and further action would be taken to improve the performance of other units of DVC.

After detailed deliberation, OCC decided the following:

- All the Generators and SLDCs shall formulate a systematic procedure to submit the relevant details to ERLDC for necessary analysis.
- The performance of the Generators shall be submitted to CERC for further necessary action
- ERLDC shall convene a separate meeting with IPPs, ISGS and state wise generators for better understanding of CERC regulations on RGMO/FGMO.

ERLDC informed that a workshop on “Calculation of FRC” would be held at ERLDC, Kolkata on 16th & 17th January 2020.

OCC advised all the SLDCs and Generating utilities to attend the workshop.

PART B: ITEMS FOR DISCUSSION

Item No. B.1: Automatic Under Frequency Load Shedding (AUFLS) Scheme

In the 2nd meeting of NPC held on 16th July 2013, the following AUFLS scheme with 4 stages of frequency viz. 49.2 Hz, 49.0 Hz, 48.8 Hz & 48.6 Hz had been decided to implement in all the regions:

AUFLS	Frequency (Hz)	Load relief in MW					
		NR	WR	SR *	ER	NER	Total
Stage-I	**49.2**	2160	2060	2350	820	100	7490
Stage-II	**49.0**	2170	2070	2360	830	100	7530
Stage-III	**48.8**	2190	2080	2390	830	100	7590
Stage-IV	**48.6**	2200	2100	2400	840	100	7640
	Total (MW)	**8720**	**8310**	**9500**	**3320**	**400**	**30250**

*SR grid not integrated with NEW grid at that point of time.

The scheme had been implemented throughout the country.

In 7th NPC meeting held on 08thSeptember 2017, it was agreed that there is need for review of the quantum of load shedding. The RPCs were to deliberate on additional slabs of frequency as well as raising the set frequency for UFR operation and inform the outcome to NPC.

In 8thNPC meeting, held on 30.11.2018, members agreed for the AUFLS scheme with 4 stages and raising the frequency by 0.2 Hz viz. 49.4, 49.2, 49.0 & 48.8 Hz. It was further decided that the quantum for AUFLS would be reworked by NPC Secretariat considering the requirement of load shedding to increase the frequency to 50 Hz in each stage of AUFLS operation.

In 9th NPC meeting held on 22.11.2019, it was decided to implement the AUFLS scheme with 4 stages and raising the frequency by 0.2 Hz viz. 49.4, 49.2, 49.0 & 48.8 Hz by keeping the quantum for AUFLS same as decided in 2nd NPC Meeting. It was also decided that a committee with all RPCs and NLDC would study and review the required quantum for each slab of AUFLS and submit a report to NPC. Minutes of the meeting are awaited.

The total load quantum for ER constituents is given below:

Control Area	Stage –I (49.4 Hz) (MW)	Stage –II (49.2 Hz) (MW)	Stage–III (49.0Hz) (MW)	Stage–IV (48.8Hz) (MW)	Total Relief by Control Area
Bihar	98	99	99	101	397
Jharkhand	61	62	61	62	246
DVC	134	135.5	136	137	542.5
Odisha	181.5	183.5	184	186	735
WB & CESC	345.5	350	350	354	1399.5
Total	**820**	**830**	**830**	**840**	**3320**

In 42nd TCC, all the constituents were advised to implement the revised AUFLS scheme as per the NPC decision within a month and submit a report to ERPC Secretariat and ERLDC.

TCC decided to review the implementation status in the next OCC Meeting.

In 164th OCC, all the SLDCs and STUs were advised to implement the revised AUFLS scheme by 1st week of January 2020 and submit a report to ERPC Secretariat and ERLDC.

Members may update.

Item No. B.2: Installation of SPS at 400kV Durgapur (PG) S/S--DVC

With the Installation of the 3rd ICT 400/220KV and 400KV Bus Splitting at PGCIL Parulia S/Stn different loading imbalances have been observed in the Interconnected network of DVC.

(i) Drawl through 220KV Parulia PGCIL – Parulia DVC Tie Line has increased and on occasions load reaches to the tune of 220 -230MW per line.
(ii) Sometimes 25% of this power is again transferred to WBSETCL Bidhannagar through the 220KV D/C DTPS (DVC) – WBSETCL Bidhannagar Tie Line although a 400KV D/C Connectivity exists between PGCIL Durgapur and WBSETCL Durgapur. For this ERLDC occasionally has to open the 220KV DTPS – WBSETCL Durgapur Tie Line for system stability.
(iii) Unit Generation at MTPS and DTPS have to be maintained at a certain level to avoid overloading of 220KV D/C Parulia PG – Parulia DVC Tie Line.
(iv) Power in 2 No's ICT in PGCIL Durgapur would flow from 400KV to 220KV and in One in the reverse direction.

This problem has been discussed at different Forums and finally at the CEA and CTU level the following was submitted and has already been placed in the AGENDA for 1st ERPC-TP which was supposed to be held on January 2019. Inference was as follows:

(i) Second 220KV D/C Line between Durgapur PG and Parulia DVC (approx 1 KM) along with associated bays at both ends. However DVC may also opt for bunching of conductors to save for additional bays, provided the capacity of bay equipment support the higher current on account of bunching.
(ii) Shifting of 400/220KV, 315MVA ICT – 1 from Durgapur – A section to Durgapur – B Section in the space vacated by shifting of bus reactor (Shifting of 420KV 125MVar bus reactor – 4 in Durgapur – B section is required to create space for shifting and installation of 400/220KV, 315MVA ICT-I.

Incidentally 220KV D/C Parulia PGCIL – DVC Parulia lines are very important tie lines and complete disconnection of both the lines may have an adverse effect on the DVC system. In the present scenario, tripping of one of the 220KV Lines would create overloading of the other line causing the same to trip, thereby causing a complete 220KV TIE disconnection from CTU. The above 2 inference would completely mitigate the problem.

Till the implementation of the above, implementation of SPS at PGCIL end may be looked into wherein with the tripping of one number 220KV PGCIL – DVC Tie line, 2 numbers of ICT may be tripped so that one ICT along with one 220KV Tie Line would be sufficient to meet the loads of DVC with 220KV D/C DTPS(DVC) – WBSETCL Bidhanngar tie supporting for the rest.

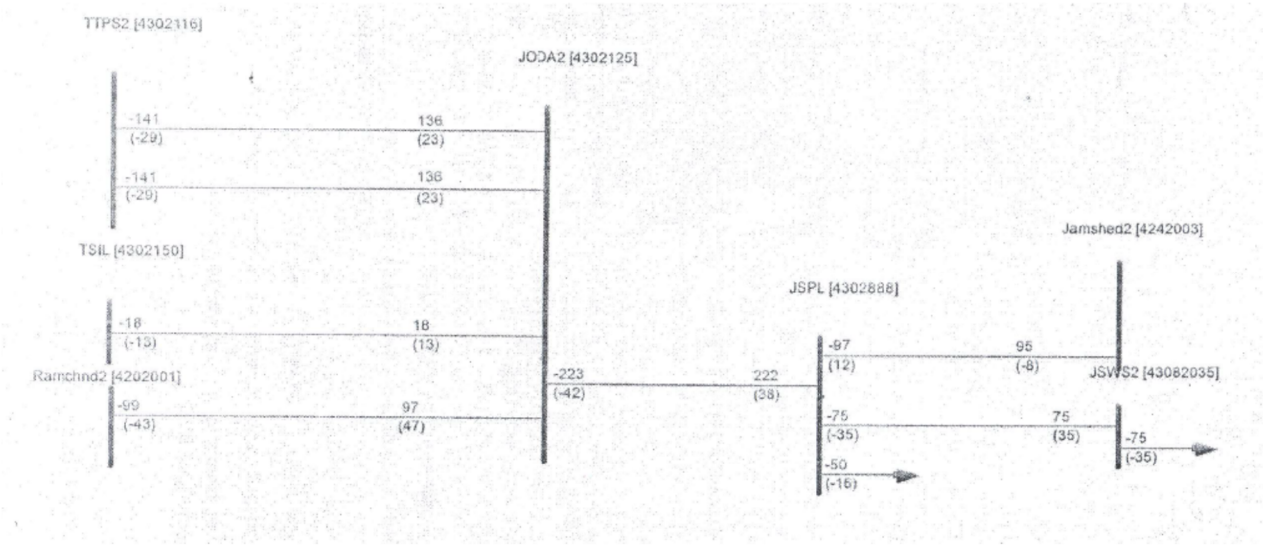
Since DVC is the sole beneficiary in 220KV system from PGCIL Durgapur, hence tripping of ICT would not hamper any other interconnecting system.

Members to discuss.

Item No. B.3: Implementation of SPS to avoid overdrawal from Jamshedpur (DVC) S/s

In 8th SSCM, OPTCL informed that they need power assistance of maximum 55 MW from 220kV Jamshedpur S/s, DVC to meet the load of JSPL during replacement work of the conductor of 220kV Joda-JSPL line.

DVC agreed to provide maximum 55 MW from 220kV Jamshedpur S/s during the conductor replacement work, however DVC requested to implement SPS to avoid over drawl from 220kV Jamshedpur S/s during any contingency in the system.



Members may discuss.

Item No. B.4: Implementation of Automatic Demand Management Scheme (ADMS)- ERLDC

The latest status along with proposed logic as follows:

Sl No	State/Utility	Logic for ADMS operation	Implementation status/target	Proposed logic (if different from under implementation logic)
1	West Bengal	F <49.7 AND deviation > 12 % or 150 MW	Implemented on 25.11.16	F <49.9 AND deviation > 12 % or 150 MW
2	DVC	F <49.7 AND deviation > 12 % or 150 MW	Implemented on 17.06.2016	
3	Bihar	F <49.7 AND deviation > 12 % or 150 MW	They would place the order to Chemtrol for implementation.	F <49.9 AND deviation > 12 % or 150 MW
4	Jharkhand	1. System Frequency < 49.9 Hz AND deviation > 12 % or 25 MW 2. System Frequency < 49.9 Hz AND deviation > 12 % or 50 MW 3. System Frequency < 49.9 Hz AND deviation > 12 % or 75 MW	In service from 21st August 2019.	Condition 1: Block I feeders will be selected for load shedding Condition 2: Block I & II feeders will be selected for load shedding Condition 3: Block I, II & III feeders will be selected for load shedding
5	Odisha	1. System Frequency < 49.9 Hz 2. Odisha over-drawl > 150 MW 3. DISCOM over-drawl > (40 MW)	10 Months Sent for PSDF approval. It was informed that tender for the work has been floated.	Logic 2 and 3 is AND or OR, in case it is AND then ADMS may not operated when discom are in schedule but GRIDCO is overdrawing due to less generation at state embedded generators
6.	Sikkim			Sikkim informed that they have submitted a proposal to PSDF Committee for installation of OPGW cables which is under approval stage. Sikkim added that ADMS scheme would be implemented after installation of OPGW.

In 42nd TCC, Bihar informed that the testing of ADMS would be done by end of December 2019.

Odisha informed that ADMS would be implemented by May 2020.

Sikkim informed that installation of OPGW is in progress, ADMS would be implemented after the installation of OPGW & renovation of sub-station tentatively by 2020.

TCC advised Odisha and Sikkim to implement ADMS at the earliest.

After detailed deliberation, TCC opined that uniform logic and settings are to be implemented for all the states. TCC advised to discuss the issue in next OCC Meeting to formulate uniform logic and setting of ADMS.

In 164th OCC, Bihar informed that the testing of ADMS would be done by end of December 2019.

ERLDC informed that they would prepare a draft regarding uniform logic and settings for ADMS and would give a presentation on this in next OCC Meeting.

ERLDC may give a presentation. Members may discuss.

Item No. B.5: Implementation of Automatic Generation Control in Eastern Region

In compliance to CERC's direction in order dated 06/12/2017 in petition no 79/RC/2017, AGC was commissioned in NTPC Barh on 01st August 2019 and operationalized since 23rd August, 2019.

Vide order dated 28th August 2019, CERC in Petition No.: 319/RC/2018 directed that all the ISGS stations whose tariff is determined or adopted by CERC shall be AGC-enabled and the ancillary services including secondary control through AGC be implemented as per the following direction:

I. All thermal ISGS stations with installed capacity of 200 MW and above and all hydro stations having capacity exceeding 25 MW excluding the Run-of-River Hydro Projects irrespective of size of the generating station and whose tariff is determined or adopted by CERC are directed to install equipment at the unit control rooms for transferring the required data for AGC as per the requirement to be notified by NLDC. NLDC shall notify the said requirements within one month of this order.
II. All such ISGS stations whose tariff is determined or adopted by CERC shall have communication from the nearest wide band node to the RTU in the unit control room.
III. The Central Transmission Utility (CTU) is directed to have communication availability from NLDC/ RLDCs to the nearest wide band node/ switchyard for the generating stations in a redundant and alternate path ensuring route diversity and dual communication.
IV. The NLDC is also directed to commission the required communication infrastructure.
V. The expenditure as a result of compliance of the above directions may be claimed as per relevant regulations or provisions of the PPA.
VI. The NLDC is directed to monitor implementation of the above directions so that all the ISGS stations whose tariff is determined or adopted by CERC are AGC-enabled within six months of this order.
VII. The framework regarding compensation for AGC support and deviation charges as stipulated in the Commission's Order in Petition no. 79/RC/2017 dated 06.12.2017 shall apply to the five pilot projects as also to other ISGS as and when they are AGC enabled. This arrangement shall remain in place till the relevant regulations inter alia on compensation for AGC services are framed by the Commission.
VIII. NLDC/RLDCs are allowed to operate the AGC system for enabling the signals to the power plants at the earliest.
IX. All new thermal ISGS stations with installed capacity of 200 MW and above and hydro stations having capacity exceeding 25 MW excluding the Run-of-River Hydro Projects irrespective of size of the generating station and whose tariff is determined or adopted by CERC shall mandatorily have the capability to provide AGC support.

All concerned plants may please ensure taking necessary action for arranging the communication (through redundant and alternate paths) from the existing nearest wideband communication node to their unit control rooms through two fiber optic cables, in coordination with CTU. It may please

be noted that all the ISGS stations whose tariff is determined by or adopted by CERC should be AGC-enabled before 28th February 2020, as per order of CERC.

A. Status of implementation of AGC for ISGS stations

The list of plants identified for AGC operation by NLDC in Eastern Region are as given below:

S. No.	Power Plant	Thermal/Hydro	Cap (MW)
1	Farakka STPS – I & II	Thermal	1600
2	Kahalgaon STPS – II	Thermal	1500
3	Barh STPS	Thermal	1320
4	Maithon Power Limited	Thermal	1050
5	Talcher STPS – I	Thermal	1000
6	Kahalgaon STPS – I	Thermal	840
7	Nabinagar Thermal Power Project	Thermal	750
8	NPGC	Thermal	
9	Darlipalli	Thermal	
10	Teesta – V	Hydro	510
11	Farakka STPS – III	Thermal	500
12	MTPS Stage - II	Thermal	390
13	Rangit	Hydro	60

In 161st OCC, all the ISGS stations were advised to implement the AGC within 6 months as per the above CERC order.

In 163rd OCC, NHPC and NTPC informed that they are in process of implementation of AGC at their stations in coordination with NLDC. The technical specifications have been prepared.

This issue was further deliberated in the 2nd TeST meeting held on 26.11.2019 at ERPC, Kolkata.

MS, ERPC raised concerns about the present reporting of AGC data signal from generating stations to NLDC and concerned RLDC is getting data through NLDC over ICCP protocol.

NLDC informed that, as a part of pilot project of AGC, all generating stations' AGC data would be directly reporting to NLDC for first 3 years and the same would be diverted to respective RLDCs after SCADA upgradation.

NTPC raised the concern about the bandwidth requirement, list of signals and cable requirement for implementation of AGC.

NLDC informed that all generating stations must make arrangement for extending the AGC data signals to the nearest POWERGRID node and POWERGRID shall make available two Ethernet ports (main & its redundant) so that AGC signal from generating stations should reach to NLDC.

*NLDC further informed that requirement for AGC implementation like list of signals, bandwidth requirement, hardware, software & cable requirement etc. are made available at POSOCO website (*https://posoco.in/spinning-reserves/*).*

ERLDC suggested that firewalls should be available at both end i.e. at Generator end as well as NLDC end. NLDC informed that they have a firewall at their end in their system.

All generating stations agreed to install adequate level of firewall at their end for extending the AGC signals.

ERLDC raised concern about AGC implementation of Nabinagar (BRBCL) as OPGW communication link from generating station to nearest POWERGRID S/S i.e. 400 kV Sasaram is not available.

ERPC advised NLDC to add NPGC, Nabinagar (2x660 MW) in AGC implementation list as this station is commissioned in November 2019. NLDC agreed for the same.

It was decided to take the above issue to the next TCC/ERPC meeting for further deliberation.

In 42nd TCC, NTPC and NHPC informed that they would place the order by March 2020 and implement the AGC by June 2020. MPL informed that AGC would be implemented by February 2020.

Powergrid informed that only single communication connectivity is available at MPL, Teesta V and Rangit. Other generating stations are having dual communication connectivity.

TCC advised all generating stations to make arrangement for extending the AGC data signals to the nearest POWERGRID node.

B. Status of implementation of AGC as a pilot project in states

In 162nd OCC, WBPDCL submitted that Bakreswar TPP is planning to implement AGC but there is no clarity on the source from where to receive the AGC control signal (from SLDC/ERLDC). This aspect needed to be clarified first.

In the meeting, it was clarified that AGC signal for intra-state generating stations would be generated by the concerned SLDC and the relevant communication path is to be established between SLDC to plant. For ISGS stations, the AGC signal would be sent from NLDC.

OCC advised SLDC, WB to establish the required hardware for generating AGC signal at SLDC.

In 163rd OCC, OPGC and SLDC, Odisha were advised to formulate the plan jointly for implementation of AGC. OCC advised them to submit the schedule of implementation of AGC to ERPC and ERLDC within a week.

All SLDCs and their respective state sector generators were advised to visit Barh STPS as well as to NLDC to have a first-hand knowledge on the implementation and functioning of AGC at control centre level as well as at generating station level.

Summary of status of implementation:

State	Station/Unit	Action plan
DVC	Mejia unit#8	• Finalization of technical specification, vendors and estimation: 30th November 2019 • NIT 31st January 2020 • Order placement 30th March 2020 • Commissioning of AGC 31st July 2020
West Bengal	Unit-5 of Bakreswar TPP	SLDC, WB to establish the required hardware for generating AGC signal at SLDC.
Odisha	Unit#3 of OPGC	SLDC, Odisha and OPGC agreed to submit their plan by 1st week of November 2019

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.

Odisha informed that SLDC and OPGC will sit together and finalise the scheme.

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 state.

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

C. Issues related to AGC at Barh Stage-II (both units)

NTPC informed that AGC at Barh Stage-II (both units) had been implemented on 23rd August 2019. But they are facing following issues related to AGC Implementation:

1. AGC Down schedule during Technical Minimum SG (Effective Ex Bus Schedule less than Technical Minimum- 680.63 MW)
2. AGC UP Schedule during full SG (Effective Ex Bus Schedule more than full capacity-1237.5 MW)
3. Ramp Rate more than declared Ramp Rate (90 MW in a 15 Min block) due to AGC Schedule.
4. Violation of sign change regulation due to AGC schedule

In 42nd TCC, NLDC confirmed that ramping issue has already been addressed.

NTPC and NLDC agreed to interact and settle the remaining issues.

Members may update.

Item No. B.6: Outage of important transmission lines

1. 400 kV Kishenganj-Patna D/C lines:

In 162nd OCC, Powergrid informed that one circuit of 400 kV Kishenganj-Patna D/C line would be restored through ERS by December 2019. Powergrid added that permanent restoration of both the circuits of 400 kV Kishenganj-Patna D/C lines would be completed by March 2020.

MS, ERPC submitted that Powergrid had repeatedly changed their schedule of restoration of the line. He advised Powergrid to give a report on restoration schedule committed till date in chronological order along with the reason for changing the scheduled dates.

He added that a Committee would visit the site once again in 2nd week of November 2019 to assess the situation.

In 163rd OCC, Powergrid informed that both circuits of 400 kV Kishenganj-Patna D/C line would be restored through ERS by December 2019. Powergrid added that permanent restoration of both the circuits of 400 kV Kishenganj-Patna D/C lines would be completed by March 2020.

Thereafter, Powergrid vide letter dated 3rd January 2020 informed that the temporary restoration of the line using ERS could not be completed due to pathetic condition of approach road, unprecedented cold weather condition and continued heavy water current in the Ganga river.

Powergrid added that restoration work is under progress in war footing basis and it is expected to be restorared temporarily by 3rd/4th week of January 2020 however permanent restoration is expected to be completed by end of March 2020.

Powergrid may update.

2. 400 kV Purnea-Biharshariff D/c lines:

In 161st OCC, ENCIL informed that they were planning for the permanent restoration of the line using special high-performance conductor (HPC with ACCC conductor) between tower AP46/9A and AP47/1. 400 kV Purnea-Biharshariff D/c would be restored by end of November 2019.

In 162nd OCC, ENICL informed that 400 kV Purnea-Biharshariff D/c would be restored by 30th November 2019.

MS, ERPC submitted that ENICL had repeatedly changed their schedule of restoration of the line. He advised ENICL to give a report on restoration schedule committed till date in chronological order along with the reason for changing the scheduled dates.

He added that a Committee would visit the site once again in 2nd week of November 2019 to assess the situation.

In 163rd OCC, ENICL informed that 400 kV Purnea-Biharshariff D/c would be restored by 30th November 2019.

In 164th OCC, ENICL informed that stringing of the conductor had been completed and stringing of OPGW is in progress.

ENICL added that they would charge 400 kV Purnea-Biharshariff D/c line by 27th December 2019.

ENCIL vide mail dated 29th December 2019 informed that 400 kV Purnea-Biharshariff D/c line was charged successfully on 29th December 2019.

3. 400 kV Barh-Motihari D/C and 400 kV Barh-Gorahkpur D/C lines

In 161st OCC, ERLDC informed that 400 KV Gorakhpur –Motihari(DMTCL) –D/C were out since 13/08/2019 on tower collapse at LOC 27/0 and 400 KV Barh–Motihari(DMTCL) –D/C were out since 04/09/2019 on tower collapse at LOC 26/0.

In 163rd OCC, OCC advised Powergrid to make direct connectivity i.e. 400 kV Barh- Gorahkpur D/C line, till restoration of the LILO portion of Motihari.

Powergrid agreed to make direct connectivity with Twin Moose conductor but DMTCL has to do the necessary destringing of the conductor of the LILO section with the original line to enable PGCIL to establish the direct connectivity.

OCC advised DMTCL to complete the destringing work at the earliest so that Powergrid could start the bypass arrangement.

In 164th OCC, Member Secretary, ERPC informed that a separate meeting with the concerned utilities would be conducted at Patna, Bihar in January 2020.

*DMTCL vide mail dated 11th January 2020 informed that de-stringing of 400kV Barh-Gorakhpur ckt-1&2 of LILO section work completed. Detail report is enclosed at **Annexure-B6**.*

Members may update.

Item No. B.7: Detailed guidelines for assessment of ramping capability of thermal ISGS- ERLDC

Proviso (iii) to regulation 30(2) of CERC (Terms and Conditions of Tariff) regulations, 2019 specify that
"In case of thermal generating stations with effect from 1.4.2020:
a) Rate of return on equity shall be reduced by 0.25% in case of failure to achieve the ramp rate of 1% per minute;
b) An additional rate of return in equity of 0.25% shall be allowed for every incremental ramp rate of 1% per minute achieved over and above the ramp rate of 1% per minute, subject to ceiling of additional rate of return on equity of 1.00%

Provided that the detailed guidelines in this regard shall be issued by National Load Dispatch Centre by 30.6.2019"

As per the direction detailed guidelines for operationalization of this provision have been prepared by NLDC and published on POSOCO website seeking feedback from stakeholders. The draft detailed guidelines are posted at the following link
"https://posoco.in/wp-content/uploads/2020/01/Ramp_Assessment_detailed-guidelines_6Jan2020.pdf"

Suggestions/feedback on these draft guidelines for assessment of ramping capability of thermal inter-state generating stations may kindly be forwarded to **feedback-ramp@posoco.in** by **21st January 2020**. Considering the suggestions and feedback received, the guidelines would be finalized and issued.

Members may note.

Item No. B.8: Testing and Calibration of Special type Energy Meter

Presently, POWERGRID have installed about 1310 nos. of Special Energy meters of 0.2 class accuracy in 765/400/220/132kV substations at about 189nos of locations in Eastern Region covering states of Orissa, West Bengal, Sikkim, Bihar and Jharkhand.

Out of 1310 no of meters installed in ER, around 768 meters (all L&T make) at 157 locations are more than five years old. Moreover, Testing and calibration of around 307 Interface meters in ER was last carried out in year 2013 i.e. more than 6 years ago. A list of 140 no of meters which are severely drifted in time is already communicated to POWERGRID for replacement and accordingly, replacement work has started. In view of the above, remaining 628 meters may be tested and calibrated as per the provision of aforesaid regulation. Further Time correction of meters of drifted meters may also be done (under testing and calibration).

In 162nd OCC, Powergrid submitted that out of 768 L&T meters, 140 would be removed from service by November 2019. Testing will be done for the remaining meters and the detailed plan for the same including cost of testing would be submitted in the upcoming OCC. Powergrid clarified that in case of any abnormal results found during the testing, those L&T meters would be replaced by Genus meters and the defective L&T meters would be sent for calibration.

In 163rd OCC Meeting held on 15.11.19, POWERGRID informed that they received the offer of 68 Lakhs (approx.) for testing and calibration of said 628 L&T meters.

OCC referred the issue to Commercial Sub-Committee for concurrence.

In 41st CCM, POWERGRID representative informed that the testing and calibration of 628 L&T meters is required as per the provisions of existing metering regulation since they were tested and calibrated a long back. Further, if any, time correction is necessary that would also be done.

However, ERPC and ERLDC opined that CEA is coming up with new metering regulation along with technical specifications (5 min & 15 min provision) of meters for future requirement of grid. Since the testing and calibration of the proposed meters has cost implication, it was agreed that the same may kept in abeyance till issuance of further guidelines or regulations by competent authority.

The Matter was referred to forthcoming TCC/ERPC meeting.

In 42nd TCC, TCC decided the followings:

- *50 % of total old L&T Meters shall be tested and calibrated.*
- *ERLDC shall prepare the priority list for SEMs to be tested which are old and highly time drifted.*
- *Powergrid shall carry out testing and calibration for the old L&T meters as per the list.*

In 164th OCC, ERLDC submitted the priority list of meters to be tested & calibrated. The list is enclosed at ***Annexure-B8.***

Powergrid should take necessary action expeditiously on receipt of requisite information from ERLDC and inform the progress made in the next OCC Meeting.

ERLDC and Powergrid may update.

Item No. B.9: Review of implementation of PSDF approved projects of Eastern Region.

NLDC (POSOCO) being the Nodal Agency for PSDF schemes, is carrying out PSDF Secretariat function under directions of MoP. Recently NLDC is directed by MoP to disburse the PSDF sanctioned funds as early as possible as its non-utilization is being viewed seriously by MoP on various fora.

In view of the above, status review of the projects being executed under PSDF funding in Eastern Region, is required to be carried out on regular basis for expediting the projects.

A Detailed statement of the Eastern Region project entities approved in PSDF is enclosed as **Annexure-B9**.

All the constituents are requested to furnish/update the status of their respective project in every OCC and also requested to submit requisition for disbursement to NLDC at the earliest by 1st February 2020, so that amount may be released by 31st March 2020.

Members may update.

Item No. B.10: FGD phasing plan for units commissioned after 31.03.2018--CEA

CEA requested to provide the phasing plan for the following units commissioned after 31.03.2018:

S.N	Developer	Project Name	Sector	State	Region	Unit No	Cap. (MW)	DT-of COMMISSIONING (DD/MM/YYYY)
1	NTPC	Nabi Nagar TPP	Central	Bihar	ER	U-3	250	26/02/2019
2	NTPC	Nabi Nagar STPP	Central	Bihar	ER	U-1	660	29/03/2019
3	OPGCL	Ib valley TPP	State Se	Odisha	ER	U-3	660	20/04/2019
4	OPGCL	Ib valley TPP	State Se	Odisha	ER	U-4	660	11/05/2019

NTPC and OPGC may update.

Item No. B.11: WIDE DEVIATION OF REAL TIME GENERATION/SCHEDULE GENARATION(SG) OF TALA WITH RESPECT TO DECLARED CAPACITY---WBSEDCL

Due to wide deviation between Declared capacity & real time generation of Tala HEP the day ahead & intraday planning of the beneficiaries are getting dislocated on regular basis specially during the evening peak period.

In practice distribution utilities like WBSEDCL tunes the day ahead LGBR by trading through Exchange platform, based on the day ahead availability received from different power stations under long/Medium term PPA within 12.00hrs of every day. But in real time it is observed that the Schedule Generation (SG) of Tala HEP differs widely w.r.t that of day ahead DC. So, for such unrealistic day ahead DC prediction from Bhutan side the beneficiaries are failing to plan their power purchase portfolio on economic principle & facing severe problem to take proper decision for load generation balancing under prevailing stringent DSM regime.

Members may discuss.

Item No. B.12: Segregation of Tala and Chukha Energy--ERLDC

Order related to Dagachu scheduling was issued by Honorable CERC on 11th Sept'14 vide order no 187/MP/2014. Para 15(ix) of this order is stated below:

Quote
(viii) From the total power injected at Binaguri (New Siliguri) and Birpara, the actual injection of Dagachhu power as furnished by NLDC Bhutan / the designated Nodal Agency shall be subtracted to arrive at the total power of Tala and Chukha injected at Indian periphery.
(ix) *The total power of Tala and Chukha so arrived above will be apportioned amongst Tala and Chukha in the ratio of the Tala and Chukha receipt at Indian periphery in the corresponding month of the previous year as per the published figure in the Regional Energy Accounts.*
Unquote

In view of the above, Tala and Chukha actual generation were calculated on the basis of REA of corresponding month of previous year. After deriving the components of injection of Tala and Chukha at Indian periphery, figure is forwarded to ERPC.

However, it was observed during the lean season that after adjusting Dagachu Power from the export of net power from Bhutan power at Indian Boundary, Bhutan has net import of India Power and accordingly, Bhutan REA during lean hydro season of previous year is as below:

Month	Chukha (Birpara Receipt) MWh	Tala (Binaguri Receipt) MWh	Ratio for Tala-Chukha Segregation	Ratio applied for Segregation
Jan'19	2614.622	-----	N/A	Ratio of Dec'18 wef 01.12.2019 and continued
Feb'19	6630.766	-----	N/A	Decision pending
Mar'19	30757.309	-----	N/A	Decision pending

In view of above, due to non-availability of Binaguri receipt data at Indian Periphery, segregation of Tala and Chukha energy at Indian Periphery for the month from Jan'19 to March'19 is not possible.

Members may discuss and finalize the method.

Item No. B.13: Replacement of energy meter of 400kV Tata-Binaguri-II at Binaguri--DGPC

DGPC informed that Power Grid has replaced the main energy meter of 400kV Tala-Binaguri feeder-II at Binaguri on December 24, 2019 without any intimation to Tala Power Plant (DGPC). It came to the knowledge of Tala HEP only during midnight while collecting the energy meter reading from Binaguri end for the day. This clearly shows the energy meter was replaced without taking shutdown of the line and energy for the time taken to replace the meter was therefore, not accounted.

DGPC and Powergrid may explain.

Item No. B.14: Report of expert group to review India Electricity Grid Code(IEGC)--ERLDC

The Commission vide office order dated 28.5.2019 constituted an Expert Group to review "Indian Electricity Grid Code and other related issues" under the Chairmanship of Shri Rakesh Nath, Ex-Chairperson, CEA & Ex-Member (Tech) of APTEL with Shri A.S.Bakshi, Ex-Chairperson, CEA & Ex-Member, CERC, Shri Ravinder, Ex-Chairperson, CEA & ExChief (Engg.), CERC as Members and Shri S.C.Shrivastava, Chief (Engg.), CERC as Member, Convenor. The group co-opted Shri S.R.Narasimhan, Director (S.O), POSOCO and Shri Hemant Jain, Chief Engineer (G.M), CEA as Members of the Expert Group.

The Terms of Reference (TOR) are as follows:

a) To review the provisions of Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010 based on past experience, recent developments in the power system of India, changes in market structure and the future challenges which includes high level of renewable penetration in the grid, introduction of new products in market.
b) Suggest appropriate regulatory intervention and prepare draft IEGC making recommendation for proposed amendment or changes in the existing Grid Code.

The Expert Group has finalized its recommendation as per comments received from various stake holder and several expert group meetings in the form of draft Indian Electricity Grid Code (IEGC), 2020, which is published in CERC website at the following link
http://cercind.gov.in/2020/reports/Final%20Report%20dated%2014.1.2020.pdf

Members may note.

Item No. B.15: Updated Black Start and Restoration Procedure of Eastern Region –ERLDC

In compliance with clause 5.8 (a) and (b) of the present IEGC, The Restoration Procedure has to be developed and updated annually by RLDC in consultation with NLDC, all users, STU,SLDC,CTU, RPC Secretariat of the region.

Draft copy of "Black Start and Restoration Procedure" was circulated on 16th Jan 2020 for review and feedback from stake holder. All stake holder are requested to give comments by 27th Jan 2020. So that the procedure can be finalized by 30th Jan 2020.

Members may note.

Item No. B.16: Additional agenda

PART C: ITEMS FOR UPDATE

Item no. C.1: Status of UFRs healthiness installed in Eastern Region

UFR Healthiness Certification for the month of December 2019 has been received from OPTCL, CESC, WBSETCL, DVC, BSPTCL and JUSNL.

Members may note.

In 161st OCC, Bihar was advised to review the UFR feeders as per the revised system configuration and suggested to shift the UFRs to unimportant radial loads.

In 42nd TCC, BSPTCL informed that they had already replaced the defective UFR. BSPTCL added that they are in process of reviewing the UFR list.

Bihar may update.

Item no. C.2: Status of Islanding Schemes healthiness installed in Eastern Region

At present, the following islanding schemes are in service:

1. CESC as a whole Islanding Scheme, CESC
2. BkTPS Islanding Scheme, WBPDCL
3. Tata Power Islanding Scheme, Haldia
4. Chandrapura TPS Islanding Scheme, DVC
5. Farakka Islanding Scheme, NTPC
6. Bandel Islanding Scheme, WBPDCL

In 108th OCC meeting, respective constituents agreed to certify that the islanding schemes under their control area are in service on monthly basis.

The healthiness certificate for Islanding Scheme for December, 2019 has been received from CTPS, DVC, NTPC, West Bengal, JUSNL, WBPDCL and CESC.

In 163rd OCC, DVC informed that since all units of CTPS-A would be retired shortly, instead of Chandrapura TPS islanding scheme, they are planning to implement an islanding scheme with units 5 & 6 of Mejia TPS (old).

OCC advised DVC to submit the detailed draft plan of the islanding scheme to ERPC and ERLDC.

DVC may update.

Item no. C.3: Healthiness of SPS existing in Eastern Region

The Status of healthiness certificate for December, 2019 is given below:

Sl. No.	Name of the SPS	Healthiness certificate received from	Healthiness certificate not received from
1.	*Talcher HVDC*	*NTPC,GMR,*	*JITPL, Powergrid,*
2.	SPS in CESC system	*CESC*	*Nil*

Members may update.

Item no. C.4: Review of the PSS Tuning of Generators in Eastern Region --ERLDC

On 31st January 2019, PSS Tuning Meeting was held at ERPC. All generating utilities were advised to complete the PSS tuning of their plant at earliest for improvement of damping in the grid during

transients. In addition, the tuning reports have also to be submitted to ERLDC/ERPC for their validation.

In line with this ERLDC has communicated to following utilities in view of the recent oscillation observed during various events.

In 42nd TCC, members updated the status as follows:

Generating Power Plant	**Observation**	**Status of Action Plan to be informed to OCC**
All Units of DVC Generating Plant	Oscillation Observed at DSTPS on 24th April 2019 and other Oscillation events in the past.	DVC gave consolidated plan for its units in 162nd OCC
All Units of OPGC and OHPC, Sterlite	PSS are tuned long back and in many units PSS have not been tuned but are in service.	OPGC units—Feb 2020 OHPC informed that they will submit the plan in January 2020.
Sikkim Hydro Complex (Teesta-III, Teesta-V, Chujachen, Dikchu, Tashiding, Jorethang)	In view of Oscillation during the 16th April 2019 events and changes in Network configuration in Sikkim hydro Complex with augmentation of lines	Teesta-III: PSS Tuned on 21 Oct. 2019. Dikchu: Done on 23rd Nov. 2019. Jorethang: Jan. 2020 Chujachen and Tashiding: Feb 2020 Teesta-V: March 2020
MPL Plant	Due to Change in Network configuration during to bus splitting at Maithon.	MPL Unit-2: 14th June-2019 during AOH. MPL Unit-1: Planned during AOH in Jan-2020.
APNRL Plant	Oscillation with Low Damping during transient and switching observed at the plant.	APNRL attempted in Nov 2019 but not successful.
Farakka NTPC Power Plant	With Augmentation of new lines and changes in network configuration with upcoming bus split at Kahalgaon.	PSS Tuning of Unit 4, 5 and 6 has been done. Unit 1&2 are planned in December 2019. Unit 3 after overhauling.
NPGC/BRBCL/KBUNL NTPC Power Plant	The new units have been commissioned however there are no details on the PSS tuning activity in line with Indian Electricity Grid Code and CEA Grid Connectivity Standards	NPGC: December 2019 BRBCL: Unit 2 completed.
GMR	Was done in 2013 and retuning is required with change in the network at Angul.	During overhauling in Dec 2020
Sterlite 4 X 600 MW	Due to network changes.	Plan not yet submitted (Orissa SLDC)

TCC advised all the concerned generating stations to take appropriate action to carry out PSS tuning of their units as per the schedule and submit the report to ERPC and ERLDC.

In 164th OCC, ERLDC placed the detail list of generators where the PSS tuning is yet to be done and PSS tuning details received from the generators. Details are enclosed at ***Annexure-C4****.*

OCC advised all the concerned generators to submit the plan to carry out the PSS tuning.

Members may update.

Item no. C.5: Transfer capability determination by the states

Latest status of State ATC/TTC declared by states for the month of April-2020

Sl No	State / Utility	TTC import(MW)		RM(MW)		ATC Import (MW)		Remark
		Import	Export	Import	Export	Import	Export	
1	BSPTCL	5300	--	100	--	5200	--	Jan-20
2	JUSNL	1172	--	31	--	1141	--	Apr-20
3	DVC	1465	2873	63	50	1402	2850	Apr-20
4	OPTCL	3293	1112	86	62	3207	1053	Apr-20
5	WBSETCL	3639	--	400	--	3238	--	Jan-20
6	Sikkim	295	--	2.5	--	292.5	--	Dec-19

Members may update.

Item no. C.6: Mock Black start exercises in Eastern Region – ERLDC

Mock black start date for financial year 2019-20 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 May, 2019	Done on 19th July 2019	Last Week of January 2020	
2	Maithon	1st week of June 2019	Taken up only after replacing the governing systems of the units	1st Week of February 2020	
3	Rengali	2nd week of June 2019	Done on 27th June 2019	Last week of November 2020	
4	U. Indarvati	3rd week ofJune 2019	Done on 7th November 2019	2nd week of February 2020	
5	Subarnarekha	1st week of October 2019	Done 20th August 2019	1st week of January 2020	
6	Balimela	3rd week of October 2019	Done on 17th July 2019	1st week of March 2020	*Dec 2019*
7	Teesta-V	2nd week of May 2019	Done on 28th Nov 2019	Last week of February 2020	
8	Chuzachen	Last Week of Dec 2019	Done on 5th December 2019	Last week of February 2020	
9	Burla	Last Week of June 2019	Done on 20th July 2019	Last week of February 2020	December 2019
10	TLDP-III	1st Week of June 2019	November-19	2nd Week of January 2020	
11	TLDP-IV	Last Week of June 2019	December-19	1st Week of February 2020	
12	Teesta-III	Last Week of Oct 2019		First Week of March 2020	
13	Jorthang	First Week of May 2019		First Week of Feb 2020	

14	Tasheding	2nd Week of May 2019		2nd Week of Feb 2020	
15	Dikchu	Sep 2019		3rd Week of Feb 2020	

Members may update.

Item no. C.7: Mock Blackstart and controlled separation exercise at Teesta III--ERLDC

As per IEGC each blackstart capable power plant needs to demonstrate its blackstart capability twice every year. Further as per the schedule the mock black start of Teesta-III is scheduled in the end of October 2019. Thus to carryout mock black start exercise with radial load of Bihar at Kishanganj and nearby substations a two steps procedure is proposed.

Step-1:- Controlled separation of one running unit at Teesta-III with loads at Kishanganj (Bihar) for formation of Island

A controlled island will be formed in first step by taking some local load at 220 kV Kishanganj (Bihar), this requires bus split arrangement at Teesta-III, 400 kV/220 kV Kishanganj (PG) and 220 kV Kishanganj(Bihar). Once island is formed, system is expected to run in islanded mode for 15-20 minutes. After Tessta-III unit will be switched off resulting in collapse of island.

Step-2:- Blackstart of one unit at Teesta-III and extension of power to Kishanganj
Then after tripping the machine blackstart needs to be initiated from DG set and after successful synchronisation of one of the unit power will be extended to the loads of already created island, the island may be operated with the loads for 15-20mins, before synchronising with grid at 400 kV Kishanganj(PG)

Teesta III is a pelton turbine so it may operate on any load. However, Minimum requirement of 20 MW has been known by telephonic conversation with station personnel.

In 162nd OCC, ERLDC informed that it is a preliminary scheme, the detailed scheme would be prepared and it will be circulated to concerned utilities. The scheme would be finalized after receiving the suggestions from concerned utilities.

In 164th OCC, ERLDC informed that they had received the relevant details. They would conduct a meeting with the concerned constituents through VC for finalization of scheme.

Members may discuss.

Item no. C.8: Summary of Status Update on Previous agenda items in OCC

OCC	Agenda	Decision	Status Update
152	**Item No. B3: Installation of PMUs for observation of the dynamic performance of STATCOMs**	Powergrid informed that M/s GE had agreed to supply and install of 4 no's PMUs for 4 STATCOMs in the Eastern Region within the quantity variation clause under the existing URTDSM Project.	In 159th OCC Meeting Powergrid informed that the work would be completed by 15th August 2019. Powergrid informed that material supplied at Ranchi and Kishanganj were damaged. New material would be supplied by November 2019. **Powergrid May update**

155	**C.22: Collection of modeling data from Renewable as well as conventional energy generators: ERLDC**	OCC advised all the constituents to submit the details of renewable power plants of 5 MW and above.	157th OCC advised all the SLDCs to submit the details to ERPC and ERLDC. Format along with an explanation for collection of Wind and Solar Data has been shared by ERLDC to all SLDC. **Bihar/ West Bengal and Orissa are having Solar Plant with more than 5 MW capacity. However, details were recived only from some of the plants in Odisha.**
156	**Low frequency Oscillation at MTDC BNC-ALP-Agra**	OCC Advised ERTS-2 to submit the analysis report to ERLDC/ERPC	159th OCC Powergrid informed that the issue was referred to ABB, Sweden. The report is yet to be received from ABB. **PGCIL may update on Report submission to OCC.**
156	**Item no. C.20: Updated Black Start and Restoration procedure of State--ERLDC**	Bihar, Jharkhand, DVC, West Bengal and Orissa have submitted the updated restoration procedure.	Restoration procedure form Sikkim is yet to be received. Mail has been given by ERLDC to SLDC for early submission.
156	**Item No. B.12: Status of Auto-Reclosure on Lines from Tala and Chukha Hydro Power Plant (Bhutan)**	DGPC informed that an Expert Committee was constituted to enable the autorecloser for transmission lines connected to Tala and Chuka hydro stations. The Committee had recommended for implementation of the autorecloser at Tala and Chuka. DGPC added that they are planning to implement the autorecloser scheme for the transmission lines connected at Chuka by May 2019. Based on the experience gained, they would implement the autorecloser scheme for the transmission lines connected at Tala.	In 159th OCC meeting DGPC informed that they are implementing autorecloser at Tala also. The A/R is implemented at Binaguri end and there have been various cases where successful A/R has occurred at Binaguri but due to no A/R attempt Tala has a blackout in June 2019. In addition, in month of Aug also many times 400 kV lines successfully reclosed from Binaguri end. The experience on 220 kV Chukha-Birpara in the form of successful A/R has been observed on 25th June 2019. DGPC has informed that after the deliberation in

			their group, they would be implementing the A/R at Tala by the end on August 2019. **DGPC may kindly appraise the status of A/R on lines from Tala and Malbase.**
160 OCC	**Bypassing arrangement of LILO of 400kV Lines at Angul**	Powergrid informed that bypass arrangement would be completed by end of August 2019. OPTCL informed that 2nd circuit of 400kV Meramundali-Mendhasal line would be commissioned by end of August 2019.	Powergrid informed that the bypassing arrangement would be completed by **November 2019.**

In 164th OCC, DGPC informed that they are still analyzing the performance of autorecloser at Chuka end.

OCC advised Bhutan representatives to submit the relevant details (DR and relay settings) of autorecloser at Chuka end to ERLDC. The issue would be placed in next PCC Meeting for fruitful discussion.

Powergrid placed the scheme of Bypassing arrangement of LILO of 400kV Lines at Angul and explained the scheme in detail.

Powergrid informed that two group settings have to be adopted at Bolagir, Talcher and Meramundali. Powergrid added that they received confirmation for the same from Bolangir and Talcher.

OCC advised OPTCL to implement the settings and send the confirmation to Powergrid, ERPC and ERLDC.

Members may update.

Item no. C.9: Transmission Constraint in the 220 kV System in Eastern Region—ERLDC

Constituents	**Constraint list**	**Issues based on ATC/TTC case submission by States**	**Action Plan by Utilities/ SLDC**
West Bengal, DVC	220 kV Waria-Bidhan Nagar D/C	N-1 Contingency	3rd ICT at Bidhan Nagar would be installed.
CESC, PGCIL	220 kV Shubhasgram-EMSS D/C	N-1 Contingency	
WBSETCL, PGCIL	220 kV Newtown-Rajarhat D/C	N-1 Contingency	
WBSETCL	220 kV Howrah-New-Chanditala D/C	N-1 Contingency	
DVC, PGCIL	220 kV Durgapur (PG)-Parulia D/C	N-1 Contingency	Discussed in State Standing Committee Meeting

Jharkhand, PGCIL	220 kV Hatia-Ranchi D/C	N-1 Contingency	3rd ckt of 220 kV Hatia-Ranchi has been commissioned.
Bihar	220 kV Mujaffarpur-Hazipur D/C	N-1 Contingency	A New 400/220/132 kV sub-station at Chhapra(2x500+2x200 MVA) has been proposed to meet the nearby growing power demand. The 220 kV connectivity of the proposed GSS as follow:- • Chapra(new)-Amnour DCDS • Chhapra(new)-Goplaganj DCDS
Bihar	220 kV Hazipur-Amnour D/C	N-1 Contingency	
Bihar, PGCIL	220 kV Patna-Sipara T/C	N-1 Contingency	Two nos. of 400/220/132 kv Jakkanpur GSS and Naubarpur GSS are proposed in nearby area which is already approved in 13th Plan
Bihar, PGCIL	220 kV Khagaul-Sipara S/C	Overlaod of 220 kV Khagaul-Sipara	Already resolved by addition of 02 mor lines i.e. 220 kV Khagaul-Patna(PG) D/C (Ckt 2 &3)
Bihar	220 kV Bodhgaya-Gaya D/C	N-1 Contingency	A new 400/220/132 kV sub-station at Chandauti has been proposed with connectivity at 220 kV by LILO of both circuits of Gaya(PG)-Sonenagar(new)

OCC advised all the utilities to share their short term and long term action plans to remove the constraint to ERLDC. However till date action plan from none of the constituent is received.

Input received from BSPTCL vide letter dated 06-November-2019 are as shown above. All proposed action plans are long term in nature. Further the time line for the implementation of action plan is missing.

In 163rd OCC, DVC and WBSETCL agreed to submit the action plan by next month.

OCC advised other constituents to submit the action plan at the earliest.

JUSNL, WBSETCL and CESC may update.

Item no. C.10: Monitoring of Next Six-Month New Element Integration in OCC and Its Update on Monthly Basis --ERLDC

It has been observed that many elements are getting interconnected into the system and beforehand details are not available with the system operator resulting in difficulty in carrying our operational planning activity. In view of this, as a regular agenda all ISTS and ISGS/IPP to update the OCC

regarding any new elements at 220 kV and above which will be integrated in next six month with the grid. For State Grid, SLDC will be submitting the details on behalf of its intrastate Generation and transmission system. The format is given below:

Transmission Elements	Agency/ Owner	Scheme (ERSS/ TBCB/ Standing Committee/State	Schedule Completion	Projected Month for Completion	Issue Being Faced

In previous several OCC, Transmission licensees and SLDCs are requested to submit RLDC/RPC following details on monthly basis

- List of transmission element /generators of State and ISTS licensees synchronised in the last month.
- List of transmission element /generators expected to be synchronised during next month or in near future

Some SLDCs are submitting the list of intrastate and interstate line on regular basis, however transmission element /generators expected to be synchronised during next month or in near future is not submitted by any SLSC/Transmission licensee to RLDC/RPC.

In 162nd OCC, OCC advised all the constituents, SLDCs and ISTS licensees to submit the details the list of transmission elements / generators already synchronized / charged in the previous month as well as those expected to be commissioned in the near future (as per the format specified) to ERLDC

In 163rd OCC, OCC advised all the constituents, SLDCs and ISTS licensees to submit the details to erldcprotection@posoco.co.in as per the format.

List of upcoming Transmission Element is received from Bihar and Jharkhand and same is attached in **Annexure-C10**.

DVC, OPTCL , WBSETCL and Sikkim may update.

Item no. C.11: Reconductoring work of 400 kV Rangpo-Binaguri D/C lines

In 162nd OCC, Powergrid informed that SPS at Rangpo is ready and it can be put in service as and when required.

Powergrid explained that reconductoring work of both 400 kV Rangpo-Binaguri D/C lines would take 1 year time approximately and they are ready to take shutdown of both the circuits from 01.11.2019.

ED, ERLDC advised Powergrid to complete the reconductoring work of one circuit by end of February 2019. He added that after February 2019, shutdown of both lines is not possible in view of the likelihood of rise in hydro generation in Sikkim.

MS, ERPC submitted that there is a need for reviewing the progress of the work by field visit. In this regard a Committee shall be formed comprising the members from ERPC Secretariat, ERLDC, WBSETCL, PGCIL, TVTPL etc. The Committee will visit the site and check the preparedness of the work. Also, periodic inspection will be done to assess the progress of the work.

In 42nd TCC, Powergrid updated that reconductoring of 11 km of both the circuits out of 110 km line had been completed (9.3 km in West Bengal and 1.7 km in Sikkim).

Powergrid further informed that they are facing severe ROW issues in Sikkim and requested Power and Energy Department, Govt. of Sikkim to support in resolving the ROW issues.

Powergrid added that they are putting all the efforts to complete the reconductoring work of both 400 kV Rangpo-Binaguri D/C lines by April 2020.

TCC advised Powergrid to complete the work as per the schedule so that evacuation of hydro power from Sikkim would not get affected in the coming monsoon season.

TCC requested Sikkim to help Powergrid in resolving the ROW issues for smooth completion of the reconductoring work.

ERPC Secretariat informed that a Committee with members from ERPC Secretariat, WBSETCL, PGCIL, TVPTL has been formed to monitor the progress of the work and the Committee would visit the site in every two months.

PGCIL was requested to furnish the status of progress to ERPC Secretariat every month for discussion in the OCC meeting.

Powergrid may update.

Item no. C.12: Submission of Thermal Loading of Transmission line and associated terminal equipment by ISTS licensee

Thermal Loading of Transmission line and associated terminal equipment is one of the most vital data which is utilized for Operation Purpose, calculation of ATC/TTC and various other studies. This information has to be submitted by the transmission utilities. However even after regular follow-up in past several OCC meetings, significant delay has been observed in submission. Status of submission of data upto first week of December 2019 is as follows:

Name of Utility	**Whether End Equipment Rating Submitted or Not?**
PGCIL ERTS-1 and ERTS-2	Partial Details (Final Complete details yet to be received)
DMTCL	NA
POWERLINKS	NA
Sterlite (ENICL, OGPTL, PKTCL)	NA
TVPTL	NA
Alipurduar Transmission Limited	NA
Powerlink	NA
CBPTCL	NA
OPTCL	Submitted (Revised list given to OPTCL for submission)
WBSETCL	Submitted
BSPTCL	Submitted
DVC	Submitted
JUSNL	NA

Members may update.

Item no. C.13: Conversion of Line Reactor as Bus reactor with NGR bypass Scheme -ERLDC

A mail was circulated by ERLDC for collecting the switchability information of the Line reactors and the availability of the required NGR bypass arrangement for converting the line reactor to Bus reactor. So far following response received from the corresponding owner:

1. 400 kV Kishanganj-Darbhanga D/C at Darbhanga end (owned by ATL) – Switchable but no NGR by pass arrangement.

2. 400 kV Barh-Motihari D/C at Barh end (Owned by Barh) – Switchable but no NGR by pass arrangement.

All the other utilities are requested to submit the details at the earliest so that RLDC can do operational planning for better reactive power management.

Also, Barh and ATL are request to do necessary by pass arrangement of NGR as early as possible so that during winter season these resources could be used for maintaining better voltage profile in the grid.

In 163rd OCC, OCC advised all the utilities to submit the details to ERLDC and ERPC at the earliest (not later than 30/11/2019) so that ERLDC can do operational planning for better reactive power management.

OCC advised Barh and ATL to do the necessary by pass arrangement of NGR at the earliest.

In 164th OCC, NTPC requested to provide the scheme for NGR bypass arrangement.

OCC advised NTPC to interact with Powergrid for the scheme and advised submit the plan for implementation of NGR bypass arrangement at Barh STPS, NTPC.

List of Line reactors which cannot be converted into Bus reactor is attached in **Annexure-C13**.

Members may discuss.

PART D:: OPERATIONAL PLANNING

Item no. D.1: Anticipated power supply position during February 20

The abstract of peak demand (MW) vis-à-vis availability and energy requirement vis-à-vis availability (MU) for the month of February 20 were prepared by ERPC Secretariat on the basis of LGBR for 2019-20 and feedback of constituents, keeping in view that the units are available for generation and expected load growth etc. is at **Annexure-D.1**.

Members may confirm.

Item no. D.2: Shutdown proposal of transmission lines and generating units for the month of February 20

Generator shutdown for February 20:

System	Station	Unit	Capacity (MW)	Period		No. of Days	Reason
				From	To		
DVC	CTPS	8	250	22.02.20	28.03.20	8	COH (Blr,Turb,Gen.)
ODISHA (NTPC)	Talcher TPS	1	60	01.02.20	15.02.20	15	AOH
WBPDCL	Kolaghat TPS	4	210	01.02.20	15.03.20	29	COH
CESC	Titagarh TPS	2	60	22.02.20	07.03.20	8	Not Specified
NTPC	FSTPS	1	200	17.02.20	22.03.20	13	Boiler acid cleaningDDCMIS R&M+HPT LPT

Chuzachen vide mail dated 18th December 2019 informed that 2X55 MW Chuzachen HEP will be under periodical maintenance of the Dam and turbine components& remain unavailable to the Grid with effect from 04/02/20 to 18/02/20.

Dikchu informed that they are taking total plant shutdown required from 21:00 hrs of 30th Jan' 2020 to 21:00 hrs of 2nd Feb' 2020 (72 Hours) for silt flushing & other maintenance works at DAM. Dikchu generation will be zero during this duration.

ERLDC may place the list transmission line shutdown discussed on 20th January 2020 through VC.

Members may confirm.

Item no. D.3: Prolonged outage of Power System elements in Eastern Region as on 10-01-2020

(i) Thermal Generating units:

S.No	Station	Location	Owner	Unit No	Capacity	Reason(s)	Outage Date
1	GMR	ODISHA	GMR	2	350	COAL SHORTAGE	*28-Dec-19*
2	FARAKKA	WEST BENGAL	NTPC	3	200	SUPER HEATER SPRAY LINE LEAKAGE	23-Dec-19

3	JITPL	ODISHA	JITPL	2	600	PA Fan Problem	25-Dec-19
4	KAHALGAON	BIHAR	NTPC	7	500	TURBINE BEARING VIBRATION	31-Dec-19
5	KOLAGHAT	WEST BENGAL	WBPDCL	3	210	*units are available but kept in out of service due to less demand*	24-Nov-19
6	KOLAGHAT	WEST BENGAL	WBPDCL	4	210		17-Nov-19
7	KOLAGHAT	WEST BENGAL	WBPDCL	5	210		1-Oct-19
8	KOLAGHAT	WEST BENGAL	WBPDCL	2	210	ESP MAINTENANCE	26-Dec-18
9	BANDEL	WEST BENGAL	WBPDCL	5	250	BOILER TUBE LEAKAGE	27-Nov-19
10	BOKARO B	JHARKHAND	DVC	3	210	PROBLEM IN ASH POND	12-Sep-19
11	*BOKARO A*	*JHARKHAND*	*DVC*	*1*	*500*	*BOILER TUBE LEAKAGE*	*29-Sep-19*
12	*RAGHUNATHPUR*	*WEST BENGAL*	*DVC*	*1*	*600*	*PROBLEM IN GOVERNOR SYSTEM*	*7-Jan-20*
13	*MEJIA*	*WEST BENGAL*	*DVC*	*2*	*210*	*LOW SYSTEM DEMAND*	*5-Jan-20*
14	*WARIA*	*WEST BENGAL*	*DVC*	*4*	*210*	*AUXILARY SUPPLY FAILURE*	*24-Dec-19*
15	*STERLITE*	*ODISHA*	*GRIDCO*	*2*	*600*	*DUE TO PROBLEM IN OLTC SYSTEM OF Unit Transformer*	*10-Apr-19*

Generators/ constituents are requested to update the expected date of revival of the units.

(ii) Hydro Generating units:

Sl. No.	Station	Unit No.	Capacity (MW)	Reason (s) of outage	Outage date
1	Balimela	Unit- 1	60	Renovation & Modernization work (Planned)	05-08-2016
		Unit- 2	60	Renovation & modernization work (Planned).	20-11-2017
2	Burla	Unit-1	49.5	Turbine & Generator coupling cover water leakage (Forced)	14-03-2018
		Unit-5	37.5	Renovation. Modernization & up rating work (Planned)	25-10-2016
		Unit-6	37.5	Renovation, Modernization & up rating work (Planned)	16-10-2016
		Unit-7	37.5	Annual Maintenance	
3	Chiplima	Unit-3	24	Renovation & Modernization work (Planned)	15-10-2015
4	Indravati	Unit-3	150	Annual Maintenance	17-11-2019
5	U.KOLAB	Unit-1	80	Annual Maintenance	06-12-2019

It is seen that about 536 MW hydro capacities in Odisha is under forced outage / planned outage in the period of peak monsoon and therefore not available for providing the much needed peaking support during evening peak. SLDC / OHPC may please indicate restoration plan of the units.

(iii) Transmission elements

SL NO	Transmission Element / ICT	Agency	Outage DATE	Reasons for Outage
1	220 KV BALIMELA - U' SILERU	OPTCL / APSEB	10-03-2018	LINE ANTITHEFT CHARGED FROM UPPER SILERU ON 17-04-18
2	400 KV IBEUL JHARSUGUDA D/C	IBEUL	29-04-2018	TOWER COLLAPSE AT LOC 44,45
3	400 KV PATNA KISHANGANJ- I	POWERGRID	01-09-2018	TOWER COLLAPSE AT LOC 129. PILING DAMAGED
4	400 KV PATNA KISHANGANJ- II	POWERGRID	06-07-2019	EMERGENCY HAND TRIPPED DUE TO FRUSTUM OF LOCATION NO: 129A/0 (A LEG) HAS BEEN EXPOSED ON SOIL EROSION.
5	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.
6	400/132 KV, ICT II (200 MVA) AT KAHALGAON	NTPC	02-08-2019	Y PHASE BUSHING BURSTED
7	132 KV KhSTPP-KAHALGAON(BSPTCL)	BSPHCL	23-09-2019	TO RESTRICT LOADING ON 400/132 KV KAHALGAON(NTPC) ICT 1 /LOAD OF KAHALGAON SHIFTED TO NEW SABOUR(GORADIH).
8	400 KV MOTIHARI(DMTCL)-GORAKHPUR-I	POWERGRID/DMTCL	13-08-2019	TOWER COLLAPSED REPORTED AT LOC 27/0(132) ON 15/08/19 AT 07:00 HRS.
9	400 KV MOTIHARI(DMTCL)-GORAKHPUR-II	POWERGRID/DMTCL	13-08-2019	TOWER COLLAPSED REPORTED AT LOC 27/0(132) ON 15/08/19 AT 07:00 HRS.
10	400 KV BARH-MOTIHARI(DMTCL) -I	POWERGRID/DMTCL	04-09-2019	*TOWER COLLAPSE AT LOCATION 26/0 AND 25/5*
11	400 KV BARH-MOTIHARI(DMTCL) -II	POWERGRID/DMTCL	04-09-2019	*TOWER COLLAPSE AT LOCATION 26/0 AND 25/5*
15	220KV BEGUSARAI-NEW PURNEA-I	BSPTCL	13-10-2019	B-N, 5.98kA, 12.6km at NEW PURNEA;Since line wsa tripping frequently in the past and hence will not to be charged till: 1)sag/clearance issue is resoved 2)Healthiness certificate from independent third party obtained 3)ensure auto reclosure healthiness.

16	220KV BEGUSARAI-NEW PURNEA-II	BSPTCL	14-10-2019	R-N, 1.93kA, 85.6km A/R successful at NEW PURNEA.Since line was tripping frequently in the past and hence will not be charged till: 1)sag/clearance issue is resoved 2)Healthiness certificate from independent third party obtained 3)ensure auto reclosure healthiness.
17	400 KV BINAGURI-RANGPO-1	POWERGRID	01-11-2019	*S/D AVAILED FOR RECONDUCTORING WORK TILL 31/01/2020*
18	400 KV BINAGURI-RANGPO-2	POWERGRID	01-11-2019	*S/D AVAILED FOR RECONDUCTORING WORK TILL 31/01/2020*
19	400 KV MPL-MAITHON II	POWERGRID	20-11-2019	RECONDUCTORING WORK
20	400 KV TALA - BINAGURI - IV	POWERGRID/BHUTAN	26-11-2019	Approved S/D till 05.01.2020
21	400 KV TALA - BINAGURI - II	POWERGRID/BHUTAN	07-01-2020	*OPENED ON OVER VOLTAGE AT BHUTAN END*
22	400 KV ALIPURDUAR-JIGMELLING I	POWERGRID/BHUTAN	05-12-2019	Initially Antitheft charged from Alipurduar end at 19:59 hrs on 05.12.19 and later on at 22:48 hrs kept open on H/V.
23	220 KV CHUKHA BIRPARA- 1	BHUTAN/PGCIL	07-01-2020	VOLTAGE REGULATION(AT CHUKHA END)

(Reported as per Clause 5.2(e) of IEGC)

** Transmission licensees whose line were out due to tower collapse/ bend, may please update the detail restoration plan and as on date work progress status in OCC.

Also Monthly progress report to be submitted to ERLDC/ERPC till restoration of the element.

Members may update.

PART E :: ITEMS FOR INFORMATION

The following agenda items are placed for information and necessary compliance:

Item No. E.1: Submission of data in MERIT Order portal--CEA

CEA vide mail dated 9th July 2019 informed that the MERIT Order portal had been launched on 23rd June, 2017 by Honourable Minister of Power. One of the most important advantages of "Merit" Portal is Transparent information dissemination pertaining to marginal variable cost and source wise purchase of electricity and indication of supply side reliability, adequacy, and cost of power procurement.

However, it has been observed that many of the states are not filling the data regularly and sometimes the data filled varies widely from the data available on the respective RLDCs daily reports.

It is requested that the states may be advised to fill the data regularly and check that correct data is filled on the MERIT Portal.

In 159th OCC, all the SLDCs were advised to fill the correct data in MERIT portal on regular basis.

Item No. E.2: Status of 1st Third Party Protection Audit:

The compliance status of 1st Third Party Protection Audit observations is as follows:

Name of Constituents	Total Observations	Complied	% of Compliance
Powergrid	54	46	85.19
NTPC	16	14	87.50
NHPC	1	1	100.00
DVC	40	26	65.00
WB	68	49	72.06
Odisha	59	42	71.19
JUSNL	34	25	73.53
BSPTCL	16	5	31.25
IPP (GMR, Sterlite and MPL)	5	5	100.00

** Pending observations of Powergridare related to PLCC problems at other end.*

The substation wise status of compliance are available at ERPC website (Observations include PLCC rectification/activation which needs a comprehensive plan).

In 118th OCC, all the constituents were advised to comply the pending observations at the earliest. All the STUs informed that most of the observations are related to funding from PSDF. DPRs have been submitted to PSDF committee.

Item No. E.3: Commissioning of new transmission elements in Eastern Region

The details of new units/transmission elements commissioned in the month of December-2019 based on the inputs received from beneficiaries

SL NO	Element Name	Owner	Charging Date	Charging Time
1	125 MVAR B/R at Arambagh	WBSETCL	12-12-2019	20:11
2	220 KV Ranchi-Hatia III	JUSNL	17-12-2019	13:07

3	765 kV main bay of Darllipali Jharsuguda- 2 at Darlipali	NTPC	20-12-2019	17:23
4	Main Bay of 400KV Muzaffarpur- Dhalkebar I at Muzaffarpur	PGCIL	28-12-2019	12:47
5	Main Bay of 400KV Muzaffarpur- Dhalkebar-II at Muzaffarpur	PGCIL	28-12-2019	13:03
6	400/132KV 315MVA ICT-III at Lakhisarai	PGCIL	29-12-2019	17:15
7	400/132KV 315MVA ICT-III at Banka	PGCIL	30-12-2019	19:43
8	Darlipali unit -1 (800MW)	NTPC	30-12-2019	00:00
9	132/33kv 50MVA Transformer 3 Sonarpur	WBSETCL	19-12-2019	12:44
10	132/33kv 50Mva Transformer 3 Jangipur	WBSETCL	19-12-2019	16:12
11	132/33KV 50MVA Tr#2 Khanyan	WBSETCL	18-12-2019	12:11
12	132kv Gajole-Balurghat #1	WBSETCL	27-12-2019	15:31
13	LILO OF 220kV EMSS-BBGS ckt. 2 at EM South S/S	WBSETCL	17-12-2019	

Item No. E.4: UFR operation during the month of December'19

System frequency touched a maximum of 50.34 Hz at 20:59hrs of 15/12/19 and a minimum of 49.65 Hz at 16:17hrs of 11/12/19. Hence, no report of operation of UFR has been received from any of the constituents.

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Restoration schedule of 400 kV Barh-Motihari D/C and 400 kV Motihari-Gorakhpur D/C lines

In 161st OCC, ERLDC informed that 400 KV Barh – Motihari (DMTCL) – D/C were out since **04/09/2019** on tower collapse at LOC 26/0 and 400 KV Motihari – Gorakhpur(DMTCL) –D/C were out since **13/08/2019** on tower collapse at LOC 27/0.

After detailed deliberation, it was emerged that one of the circuits of 400 KV Barh–Motihari(DMTCL) –D/C line could be restored as 400 KV Barh–Motihari(DMTCL) S/C line and other circuit could be directly connected to Gorakhpur to operate as 400 KV Barh-Gorakhpur S/C line keeping one circuit of 400 kV Motihari – Gorakhpur line under outage, till its tower restoration, so that Barh STPS generation could be evacuated safely.

Subsequently it was reported that on **7th Oct 2019** tower no 25/5 of Motihari-Barh got collapsed due to which temporary restoration of 400kV Barh-Motihari line as earlier planned, now seems to be in-feasible.

Under the circumstances POWERGRID is requested to furnish a detailed plan for restoration of 400kV Barh – Gorakhpur D/C (by passing the LILO point at Motihari) on urgent basis to maintain reliability of ER – NR inter regional corridor and safe evacuation of Barh STPS power.

The Committee constituted for analyzing the major outages of ISTS elements of ER had made extensive deliberation on this issue in its 3rd meeting held on 24.10.2019. The Committee also considered to visit the affected location of tower collapse in December, 2019 to assess the actual site condition and volume of work involved etc.

In 163rd OCC, DMTCL informed that the restoration work would start from 15th December 2019 after completion of approach road for carrying the construction material and mobilization of gangs.

DMTCL added that restoration of 400 kV Barh-Motihari D/C line would take five months and restoration of 400 kV Motihari -Gorahkpur D/C line would take six months.

a) Direct connectivity of 400 kV Barh- Gorahkpur D/C line

In 163rd OCC, Powergrid was advised to make direct connectivity i.e. 400 kV Barh- Gorahkpur D/C line, till restoration of the LILO portion of Motihari.

Powergrid agreed to make direct connectivity with Twin Moose conductor but DMTCL has to do the necessary destringing of the conductor of the LILO section with the original line to enable PGCIL to establish the direct connectivity.

OCC advised DMTCL to complete the destringing work at the earliest so that Powergrid could start the bypass arrangement.

Thereafter, DMTCL vide mail dated 11th January 2020 informed that de-stringing of 400kV Barh-Gorakhpur ckt-1&2 of LILO section work completed.

POWERGRID informed that they have mobilized the required man and material for stringing of conductor to provide direct connectivity from BARH STPS to Gorakhpur which is likely to be completed within 5 days.

b) Issues related to Bihar:

In 163rd OCC, Bihar informed that they are facing severe power shortage at Motihari due to outage of above lines and requested DMTCL to accelerate the restoration work. Bihar requested DMTCL to complete the restoration work before summer.

Thereafter, Bihar informed that, outage of the above 400 kV Transmission Lines has severally affected East Champaran (Motihari) & West Champaran (Bettiah) and the adjoining areas which caused acute power crisis since September '2019. The feeder wise load details at DMTCL (Motihari) is as follows:

	132kV Substation	**OFF peak load**	**Peak load**
Motihari (DMTCL) 400/132 KV, **Transformer Capacity** – 2*200 MVA	Motihari	50	60
	Bettiah	45	47
	Narkatiyaganj	12	18
	Ramnagar	55	65
	Valmikinagar	03	05
	Raxaul	30	45
	Parwanipur (Nepal)	65	80
	TOTAL	260	320

Therefore, 260-320 MW loss of load occurred due to outage of this transmission line. Nepal is also facing a deficit of 70-80 MW power supply through 132 kV Raxaul-Parwanipur (Nepal) line.

The vast areas which are adversely affected due to the outage of 400 KV Transmission Lines are being fed partially through GSS Gopalganj , Parwanipur (Nepal) T/L, Surajpura (Nepal) & GSS Sitamarhi . GSS Gopalganj is fed through single source i.e. 220 KV D/C MTPS-Gopalganj T/L. This Line gets overloaded during peak hours and in that condition BSPTCL is left with no other option except load shedding in almost five districts namely East Champaran(Motihari) & West Champaran (Bettiah) , Siwan , Gopalganj & Chhapra . The situation may further worsen in case of outage of 220 KV MTPS-Gopalganj T/L & it will lead to total blackout in the northern region of Bihar.

Due to outage of these 400 kV Transmission Lines since sep'2019, Bihar has to face a deficit of 320 MW, which was met through alternative sources with a load restriction of approximately 125-160 MW. In present scenario, due to lower demand BSPTCL is able to meet the demand

through available sources. But, the situation will worsen with increasing load demand in upcoming months.

Therefore, it is requested to kindly take necessary measures at your end to ensure the timely availability of 400 KV D/C Barh-Motihari-Gorakhpur T/L to avoid any load restriction.

c) Latest restoration schedule submitted by DMTCL:

400kV Motihari - Barh line with ERS single ckt	
Activity	**End Date**
Piles -	30th Jan 2020
Pile caps & chimney -	7th Feb 2020
Tower supply -	10-Feb-20
Condcuotor supply -	30th Jan 2020
Tower erection -	23-Feb-20
Stringing completion for towers 25/1, 25/2 &25/3 -	29-Feb-20
ERS - Mobilization -	7th Feb 2020
ERS - Installation & Stringing -	29th Feb 2020
400kV Motihari - Barh D/C line permanent restoration by 25-May-20	
400kV Motihari Gorakhpur D/C line	
Islanding-	19-Feb-20
Pile completion -	24-Mar-20
Pile caps & Chimney -	30-Mar-20
Tower supply-	20-Feb-20
Conductor supply -	20th Feb 2020
Tower erection -	22-Apr-20
Stringing	30-Apr-20
Commissioning -	30 Apr 2020

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Annexure-B8

List of Meter for Testing & calibration in Eastern Region

S. NO.	Make	ERLDC ID	STATION	BAY	Meter No.
1	L&T	BI-09	KAHALGAON(BSPHCL)	132 KV LALMATIA(JUVNL)	NP-6071-A
2	L&T	BI-10	KAHALGAON(BSPHCL)	132KV KAHALGAON (NTPC)	NP-6076-A
3	L&T	RG-08	RANGIT(NHPC)	66KV/11 KV TRANSFORMER	NP-5918-A
4	L&T	RG-01	RANGIT(NHPC)	RANGIT GT-1	NP-5919-A
5	L&T	RG-02	RANGIT(NHPC)	RANGIT GT-2	NP-5920-A
6	L&T	RG-03	RANGIT(NHPC)	RANGIT GT-3	NP-5921-A
7	L&T	RG-10	RANGIT(NHPC)	132KV SAGBARI (SIKKIM) (MAIN)	NP-5925-A
8	L&T	RG-07	RANGIT(NHPC)	66KV RAVANGLA (SIKKIM) (MAIN)	NP-5926-A
9	L&T	DV-06	DSTPS(DVC)	400 KV JAMSHEDPUR (PG)-II (MAIN)	NP-6522-A
10	L&T	DV-07	DSTPS(DVC)	400 KV JAMSHEDPUR (PG)-II (CHECK)	NP-6523-A
11	L&T	DV-10	DSTPS(DVC)	400 KV JAMSHEDPUR-I (MAIN)	NP-6524-A
12	L&T	DV-11	DSTPS(DVC)	400 KV JAMSHEDPUR-I (CHECK)	NP-6525-A
13	L&T	FK-31	FARAKKA(NTPC)	FARAKKA ST-5	NP-5215-A
14	L&T	FK-30	FARAKKA(NTPC)	FARAKKA GT-6	NP-5216-A
15	L&T	FK-09	FARAKKA(NTPC)	400KV KAHALGAON (NTPC) -2	NP-5200-A
16	L&T	FK-26	FARAKKA(NTPC)	400KV KAHALGAON (NTPC) -2	NP-5201-A
17	L&T	FK-08	FARAKKA(NTPC)	400KV KAHALGAON (NTPC) -1	NP-5202-A
18	L&T	FK-25	FARAKKA(NTPC)	400KV KAHALGAON (NTPC) -1	NP-5203-A
19	L&T	FK-12	FARAKKA(NTPC)	400KV MALDA (PG) -1	NP-5204-A
20	L&T	FK-11	FARAKKA(NTPC)	400KV DURGAPUR (PG) -2	NP-5208-A
21	L&T	FK-24	FARAKKA(NTPC)	400KV DURGAPUR (PG) -2	NP-5209-A
22	L&T	FK-14	FARAKKA(NTPC)	220KV LALMATIA (JUVNL)	NP-5211-A
23	L&T	FK-16	FARAKKA(NTPC)	400KV SAGARDIGHI(WB)-1 (MAIN)	NP-5213-A
24	L&T	FK-22	FARAKKA(NTPC)	400KV SAGARDIGHI (WB)-1 (CHECK)	NP-5214-A
25	L&T	FK-21	FARAKKA(NTPC)	400KV SAGARDIGHI (WB)-2 (CHECK)	NP-5220-A
26	L&T	FK-15	FARAKKA(NTPC)	400KV SAGARDIGHI (WB)-2 (MAIN)	NP-5221-A
27	L&T	FK-23	FARAKKA(NTPC)	400KV DURGAPUR (PG) -1	NP-5222-A
28	L&T	FK-13	FARAKKA(NTPC)	400KV MALDA (PG) -2	NP-5223-A
29	L&T	FK-29	FARAKKA(NTPC)	400KV MALDA (PG) -2	NP-5224-A
30	L&T	FK-10	FARAKKA(NTPC)	400KV DURGAPUR (PG) -1	NP-5228-A
31	L&T	FK-28	FARAKKA(NTPC)	400KV MALDA (PG) -1	NP-5229-A
32	L&T	DV-26	MEJIA (DVC)	400 KV MEJIA(DVC)-MAITHON(PG)-1(CHECK)	NP-7494-A
33	L&T	DV-27	MEJIA (DVC)	400 KV MEJIA(DVC)-MAITHON(PG)-2(CHECK)	NP-7495-A
34	L&T	WB-14	SAGARDIGHI(WBSETCL)	400 KV DURGAPUR (PG) -1 (MAIN)	NP-6546-A
35	L&T	WB-15	SAGARDIGHI(WBSETCL)	400 KV DURGAPUR (PG) -1 (CHECK)	NP-6547-A
36	L&T	DV-35	TISCO(DVC)	400 KV JAMSHEDPUR(PG)	NP-7406-A
37	L&T	DV-34	TISCO(DVC)	400 KV BARIPADA(PG)	NP-7408-A
38	L&T	DV-20	KODERMA (DVC)	400 KV - BIHARSHARIFF (PG)-1(MAIN)	NP-7831-A
39	L&T	GM-10	GMR (GRIDCO)	400 KV M'MUNDLI(GRIDCO)(MAIN)	NP-7483-A
40	L&T	EM-93	ROURKELA(PG)	400 KV SUNDERGARH(PG)-4	NP-6545-A
41	L&T	MR-03	MAITHON RB (MPL)	400 KV MAITHON (PG)-1 (CHECK)	NP-6549-A
42	L&T	MR-04	MAITHON RB (MPL)	400 KV MAITHON (PG)-2 (CHECK)	NP-6550-A
43	L&T	MR-07	MAITHON RB (MPL)	400 KV SIDE OF MAITHON RB STN TRF-1	NP-6552-A
44	L&T	BI-22	KHAGAUL(BSPHCL)	220 KV PATNA (PG)	NP-5833-A
45	L&T	BI-14	KHAGAUL(BSPHCL)	220KV ARAH (PG)-2	NP-6060-A
46	L&T	BH-06	BARH(NTPC)	400 KV PATNA-1(MAIN)	NP-6080-A
47	L&T	BH-04	BARH(NTPC)	400 KV KAHALGAON-1(MAIN)	NP-6111-A
48	L&T	BH-12	BARH(NTPC)	400 KV SIDE OF ICT -I	NP-6531-A
49	L&T	KH-39	KAHALGAON(NTPC)	400KV FARAKKA (NTPC) -3	NP-7826-A
50	L&T	ER-45	BINAGURI(PG)	220KV JALPAIGURI(WBSETCL)-2	NP-5881-A
51	L&T	TS-07	TEESTA(NHPC)	400KV RANGPO-1 (CHECK)	NP-5895-A
52	L&T	TS-08	TEESTA(NHPC)	400KV RANGPO-2 (CHECK)	NP-5897-A
53	L&T	TS-06	TEESTA(NHPC)	400KV RANGPO-2 (MAIN)	NP-5898-A
54	L&T	TS-01	TEESTA(NHPC)	TEESTA GT-1	NP-5899-A
55	L&T	TS-02	TEESTA(NHPC)	TEESTA GT-2	NP-5900-A
56	L&T	TS-03	TEESTA(NHPC)	TEESTA GT-3	NP-5901-A
57	L&T	EM-82	RANCHI(PG)	400KV ROURKELLA (PG)-1	NP-5876-A
58	L&T	EM-83	RANCHI(PG)	400KV ROURKELLA (PG)-2	NP-6530-A
59	L&T	FK-32	FARAKKA(NTPC)	400KV KAHALGAON (NTPC) -3 (MAIN)	NP-5207-A
60	L&T	FK-35	FARAKKA(NTPC)	400KV KAHALGAON (NTPC) -4 (CHECK)	NP-5217-A
61	L&T	FK-33	FARAKKA(NTPC)	400KV KAHALGAON (NTPC) -3 (CHECK)	NP-5218-A
62	L&T	FK-34	FARAKKA(NTPC)	400KV KAHALGAON (NTPC) -4 (MAIN)	NP-5219-A
63	L&T	MR-12	MAITHON RB (MPL)	400 KV RANCHI (PG)-2 (CHECK)	NP-5252-A
64	L&T	DV-17	MEJIA (DVC)	400KV JAMSHEDPUR (PG) (CHECK)	NP-7493-A
65	L&T	SM-01	RAVANGLA (SIKKIM)	66 KV RANGIT (NHPC)	NP-6481-A
66	L&T	ER-14	PUSAULI(PG)	220KV NADHOKHAR(BSPHCL) -2	NP-6511-A
67	L&T	ER-13	PUSAULI(PG)	220KV NADHOKHAR(BSPHCL) -1	NP-6512-A
68	L&T	ER-97	PUSAULI(PG)	400/220KV ICT-1	NP-6513-A
69	L&T	ER-94	PUSAULI(PG)	400/220KV ICT-2	NP-6516-A
70	L&T	ER-82	PUSAULI(PG)	400KV SASARAM (PG) EAST BUS-1	NP-6514-A
71	L&T	ER-83	PUSAULI(PG)	400KV SASARAM (PG) EAST BUS-2	NP-6515-A
72	L&T	BI-12	DUMRAON(BSPHCL)	132KV ARAH (PG)	NP-6067-A

73	L&T	BI-17	DEHRI (BSPHCL)	220 KV GAYA (PG) -1	NP-7449-A
74	L&T	TL-18	TALCHER(NTPC)	400KV MIRAMUNDALI(GRIDCO) (MAIN)	NP-5970-A
75	L&T	ER-79	PUSAULI(PG)	132KV MOHANIA(BSPHCL)	NP-6094-A
76	L&T	ER-78	PUSAULI(PG)	132KV KUDRA(BSPHCL)	NP-6095-A
77	L&T	WB-59	KALIMPONG (WBSETCL)	66 KV MELLI (SIKKIM)	NP-5994-A
78	L&T	SM-51	MELLI (SIKKIM)	66 KV KALIMPONG (WBSETCL)	NP-5849-A
79	L&T	EP-08	PUSAULI(PG)	400 KV ALLAHABAD (NR)	NP-6091-A
80	L&T	JS-06	HATIA(JUVNL)	220 KV RANCHI (PG)-2	NP-6121-A
81	L&T	JS-07	HATIA(JUVNL)	220 KV RANCHI (PG)-1	NP-6122-A
82	L&T	JS-51	RAMCHANDRAPUR(JUVNL)	220KV JODA (GRIDCO)	NP-6102-A
83	L&T	JS-01	RAMCHANDRAPUR(JUVNL)	220KV JAMSHEDPUR(PG)-1	NP-6103-A
84	L&T	WB-06	MALDA (WBSETCL)	132 KV MALDA (PG) -2	NP-6472-A
85	L&T	WB-05	MALDA (WBSETCL)	132KV MALDA (PG) -1	NP-6480-A
86	L&T	BI-62	DEHRI (BSPHCL)	220KV PUSAULII (PG)	NP-6097-A
87	L&T	BI-66	SONENAGAR (BSPHCL)	132KV NPGC(BSPHCL)	NP-6013-B
88	L&T	BI-60	SONNAGAR(BSPHCL)	132KV JAPLA (JUVNL)	NP-6015-B
89	L&T	JS-55	PATRATU (JUVNL)	132KV PATRATU (DVC) TRANSFER BUS	NP-6003-B
90	L&T	JS-54	PATRATU (JUVNL)	132KV PATRATU (DVC) -1	NP-6004-B
91	L&T	JS-40	PATRATU (JUVNL)	132KV PATRATU (DVC) -2	NP-6005-B
92	L&T	BI-63	KARAMNASA(BSPHCL)	132KV CHANDAULI (UPSEB)	NP-6017-B
93	L&T	BI-64	KARAMNASA(BSPHCL)	132KV SAHUPURI(UPSEB)	NP-6018-B
94	L&T	BI-49	MOHANIA (BSPHCL)	132KV PUSAULI (PG)	NP-6099-A
95	L&T	DV-53	PATRATU (DVC)	132KV PATRATU(JUVNL)-1&2(SUM)	NP-6006-B
96	L&T	DV-18	DHANBAD (DVC)	220 KV MAITHON (PG)-2	NP-6541-A
97	L&T	DV-19	DHANBAD (DVC)	220 KV MAITHON (PG)-1	NP-6542-A
98	L&T	OR-09	MIRAMUNDALI(GRIDCO)	220KV TSTPP (NTPC) -1	NP-5981-A
99	L&T	OR-10	MIRAMUNDALI(GRIDCO)	220KV TSTPP (NTPC) -2	NP-5982-A
100	L&T	ER-62	PURNEA(PG)	132KV PURNEA (BSPHCL) -1	NP-6081-A
101	L&T	ER-63	PURNEA(PG)	132KV PURNEA (BSPHCL) -2	NP-6082-A
102	L&T	ER-48	PURNEA(PG)	132KV PURNEA (BSPHCL) -3	NP-6083-A
103	L&T	ER-49	PURNEA(PG)	132KV KISHANGANJ (BSPHCL)	NP-6084-A
104	L&T	EM-50	PURNEA(PG)	400/220 KV ICT-2	NP-6086-A
105	L&T	ER-04	PURNEA(PG)	400 KV SIDE 500 MVA ICT-1	NP-6087-A
106	L&T	RG-04	RANGIT(NHPC)	132KV KURSEONG(WBSETCL) (MAIN)	NP-6503-A
107	L&T	RG-06	RANGIT(NHPC)	132KV RAMMAM (WBSETCL) (MAIN)	NP-6504-A
108	L&T	RG-11	RANGIT(NHPC)	132KV RANGPO (PG) (MAIN)	NP-6506-A
109	L&T	OR-04	RENGALI (GRIDCO)	220KV RENGALI (PG) -2	NP-5985-A
110	L&T	OR-11	RENGALI (GRIDCO)	220KV TSTPP (NTPC)	NP-5986-A
111	L&T	WB-51	BIDHANNAGAR (WBSETCL)	220 KV WARIA (DVC)-1	NP-6484-A
112	L&T	WB-07	BIDHANNAGAR (WBSETCL)	220 KV PARULIA (PG)	NP-6486-A
113	L&T	BI-03	PURNEA (BSPHCL)	132KV PURNEA (PG) -1	NP-6088-A
114	L&T	BI-04	PURNEA (BSPHCL)	132KV PURNEA (PG) -2	NP-6089-A
115	L&T	BI-51	PURNEA (BSPHCL)	132KV PURNEA (PG)-3	NP-6090-A
116	L&T	WB-57	KURSEONG(WBSETCL)	132 KV RANGIT(NHPC)	NP-7541-A
117	L&T	WB-58	KURSEONG(WBSETCL)	132 KV SILIGURI(PG)	NP-7542-A
118	L&T	DV-04	MEJIA(DVC)	400KV MAITHON (PG) (MAIN)	NP-6557-A
119	L&T	BI-21	BAISI (BSPHCL)	132 KV DALKHOLA (WBSETCL)	NP-6085-A
120	L&T	BI-20	KISHANGANJ (BSPHCL)	132 KV PURNEA (PG)	NP-5236-A
121	L&T	TL-24	TALCHER(NTPC)	400KV RENGALI (PG) -2	NP-5972-A
122	L&T	OR-61	BARIPADA(GRIDCO)	132KV BARIPADA(PG)	NP-5908-A
123	L&T	OR-62	BANGRIPOSI(GRIDCO)	132KV BARIPADA(PG)	NP-5907-A
124	L&T	EM-59	BARIPADA(PG)	220KV SIDE OF BARIPADA 220/132 KV ICT	NP-5911-A
125	L&T	DV-55	MANIQUE (DVC)	132KV CHANDIL (JUVNL)	NP-6011-B
126	L&T	OR-63	BALASORE(GRIDCO)	220KV BARIPADA(PG)-2	NP-5904-A
127	L&T	OR-60	BALASORE(GRIDCO)	220KV BARIPADA(PG)-1	NP-5906-A
128	L&T	BI-19	JAGDISHPUR(BSPHCL)	132 KV ARAH(PG)-2	NP-7689-A
129	L&T	ER-08	DURGAPUR(PG)	400KV BIDHANAGAR(WB)-2	NP-6459-A
130	L&T	ER-07	DURGAPUR(PG)	400 KV JAMSHEDPUR(PG)	NP-6461-A
131	L&T	OR-54	JINDAL (GRIDCO)	220KV JAMSHEDPUR (DVC)	NP-6502-A
132	L&T	DV-51	BARHI (DVC)	132KV RAJGIR/BSF (BSPHCL)	NP-6007-B
133	L&T	JS-62	TENUGHAT (JUVNL)	220KV BIHARSARIFF (BSPHCL)	NP-6115-A
134	L&T	JS-57	CHANDIL (JUVNL)	220KV SANTALDIH (WBSETCL)	NP-7436-A
135	L&T	JS-05	CHANDIL(JUVNL)	220 KV RANCHI (PG)-1	NP-7434-A
136	L&T	ER-05	DURGAPUR(PG)	220KV PARULIA (DVC) -1	NP-6456-A
137	L&T	EM-08	BINAGURI(PG)	400KV TALA (THP)-2	NP-5087-A
138	L&T	EM-14	BINAGURI(PG)	400KV KISHANGANJ(PG)-2	NP-5093-A
139	L&T	JS-52	KENDOPOSI (JUVNL)	132KV JODA (GRIDCO)	NP-6117-A
140	L&T	OR-53	JODA (GRIDCO)	220KV RAMCHANDRAPUR (JUVNL)	NP-5937-A
141	L&T	OR-52	JODA (GRIDCO)	132KV KENDPOSI (JUVNL)	NP-5939-A
142	L&T	EM-74	SUBHASGRAM(PG)	400KV SAGARDIGHI(WBSETCL)	NP-5846-A
143	L&T	WB-20	BIDHANNAGAR (WBSETCL)	400 KV DURGAPUR (PG) -2	NP-6499-A
144	L&T	JS-58	GARWA(JUVNL)	132KV RIHAND (UPSEB)	NP-6113-A
145	L&T	JS-53	GOELKERA (JUVNL)	132KV ROURKELA (GRIDCO)	NP-6009-B
146	L&T	JS-64	JAPLA (JUVNL)	132KV SONENAGAR (BSPHCL)	NP-6112-A
147	L&T	ER-06	DURGAPUR(PG)	220KV PARULIA (DVC) -2	NP-6458-A
148	L&T	EM-91	DURGAPUR(PG)	400 KV SAGARDIGHI (WBSETCL)-1	NP-6548-A

149	L&T	BH-13	BARH(NTPC)	400 KV SIDE OF ICT -II	NP-7481-A
150	L&T	OR-56	BUDHIPADAR (GRIDCO)	220KV RAIGARH (MPEB)	NP-5940-A
151	L&T	OR-57	BUDHIPADAR (GRIDCO)	220KK KORBA (MPEB) -2	NP-5941-A
152	L&T	OR-59	BUDHIPADAR (GRIDCO)	220KK KORBA (MPEB) -3	NP-5944-A
153	L&T	OR-01	TARKERA (GRIDCO)	220KV ROURKELA (PG) -1	NP-5934-A
154	L&T	OR-02	TARKERA (GRIDCO)	220KV ROURKELA (PG) -2	NP-5935-A
155	L&T	ER-54	SILIGURI(PG)	132KV KURSEONG(WBSETCL)	NP-5947-A
156	L&T	ER-50	SILIGURI(PG)	220KV KISHANGANJ (PG) -1	NP-5949-A
157	L&T	DV-60	WARIA (DVC)	220KV BIDHANNAGAR (WBSETCL)-1	NP-6564-B
158	L&T	JS-63	LALMATIA (JUVNL)	132KV KAHALGAON (BSPHCL)	NP-6107-A
159	L&T	JS-03	LALMATIA (JUVNL)	132KV KAHALGAON (NTPC)	NP-6108-A
160	L&T	JS-04	LALMATIA (JUVNL)	220KV FARAKKA (NTPC)	NP-6109-A
161	L&T	ER-30	RENGALI(PG)	220KV RENGALI (GRIDCO) -1	NP-5989-A
162	L&T	ER-31	RENGALI(PG)	220KV RENGALI (GRIDCO) -2	NP-5990-A
163	L&T	DV-01	PARULIA (DVC)	220KV PARULIA (PG) -1&2(SUM)	NP-6563-B
164	L&T	ER-53	SILIGURI(PG)	132KV NJP(WBSETCL)	NP-5946-A
165	L&T	ER-76	SILIGURI(PG)	220/132 KV ICT -1	NP-5951-A
166	L&T	WB-11	RAMMAM (WBSETCL)	132 KV RANGIT (NHPC)	NP-5917-A
167	L&T	JS-65	DEOGARH (JUVNL)	132KV SULTANGANJ (BSPHCL)	NP-6048-B
168	L&T	ER-29	RENGALI(PG)	400KV INDRAVATI (PG)	NP-5987-A
169	L&T	WB-04	NBU(WBSETCL)	132KV SILIGURI(PG)	NP-5953-A
170	L&T	WB-03	NJP(WBSETCL)	132KV SILIGURI(PG)	NP-5952-A
171	L&T	JS-66	JAMTARA (JUVNL)	132KV MAITHON (DVC	NP-6110-A
172	L&T	OR-05	JEYNAGAR (GRIDCO)	220KV JEYPORE (PG) -1	NP-5963-A
173	L&T	OR-06	JEYNAGAR (GRIDCO)	220KV JEYPORE (PG) -2	NP-5964-A
174	L&T	ER-39	BIRPARA(PG)	220KV CHUKHA (CHPC) -1	NP-6465-A
175	L&T	EM-94	RANCHI(PG)	400 KV MAITHON RB -I	NP-7839-A
176	L&T	ER-96	ARAH(PG)	220/132 KV ICT-2	NP-6059-A
177	L&T	OR-21	MENDHASAL (GRIDCO)	400 KV PANDIABILI (PG)-1	NP-5980-A
178	L&T	EM-21	BIHARSHARIFF(PG)	400KV BALIA (NR)-1	NP-6061-A
179	L&T	ER-90	BIHARSHARIFF(PG)	400KV SASARAM (NR) -2	NP-6062-A
180	L&T	ER-01	BIHARSHARIFF(PG)	400/220 KV ICT-1	NP-6063-A
181	L&T	EP-74	BIHARSHARIFF(PG)	400 KV KAHALGAON(NTPC) LINE-1	NP-6064-A
182	L&T	EM-22	BIHARSHARIFF(PG)	400KV BALIA (NR)-2	NP-6065-A
183	L&T	ER-03	BIHARSHARIFF(PG)	400/220 KV ICT-3	NP-6068-A
184	L&T	ER-02	BIHARSHARIFF(PG)	400/220 KV ICT-2	NP-6069-A
185	L&T	DV-05	MEJIA(DVC)	400KV JAMSHEDPUR (PG) (MAIN)	NP-6508-A
186	L&T	OR-13	INDRAVATI P/H (GRIDCO)	400KV INDRAVATI (PG)	NP-5967-A
187	L&T	WB-02	BIRPARA (WBSETCL)	132KV BIRPARA(PG)-2	NP-5893-A
188	L&T	ER-18	JAMSHEDPUR(PG)	400/220 KV ICT-2	NP-6105-A
189	L&T	ER-17	JAMSHEDPUR(PG)	400/220 KV ICT-1	NP-6106-A
190	L&T	BI-48	BIHARSHARIFF (BSPHCL)	132KV RAJGIR (BSPHCL)	NP-6070-A
191	L&T	BI-55	RAJGIR(BSPHCL)	132KV BARHI (DVC)	NP-6066-A
192	L&T	BI-11	ARAH(BSPHCL)	132KV ARAH (PG)	NP-6052-A
193	L&T	ER-09	ARAH(PG)	132KV ARAH (BSPHCL)	NP-6051-A
194	L&T	ER-10	ARAH(PG)	132KV DUMRAO (BSPHCL)	NP-6054-A
195	L&T	ER-65	PURNEA(PG)	220KV DALKHOLA (PG) -2	NP-7419-A
196	L&T	ER-64	PURNEA(PG)	220KV DALKHOLA (PG) -1	NP-7420-A
197	L&T	BI-02	BIHARSHARIFF(BSPHCL)	220KV BIHARSHARIF(PG)-2	NP-5840-A
198	L&T	BI-01	BIHARSHARIFF(BSPHCL)	220KV BIHARSHARIF(PG)-1	NP-5841-A
199	L&T	BI-67	BIHARSHARIFF(BSPHCL)	220KV BIHARSHARIF(PG)-3	NP-5843-A
200	L&T	BI-57	BIHARSHARIFF(BSPHCL)	220KV TENUGHAT (JUVNL)	NP-5844-A
201	L&T	EP-42	PATNA(PG)	400 KV BALIA (NR)-3	NP-7684-A
202	L&T	EP-40	PATNA(PG)	400 KV BARH(NTPC)-3	NP-7685-A
203	L&T	BI-18	DEHRI (BSPHCL)	220 KV GAYA (PG) -1	NP-7397-A
204	L&T	EP-17	GAYA(PG)	400 KV SIDE 1500 MVA GAYA ICT-2	NP-7469-A
205	L&T	EM-75	BIRPARA(PG)	132KV BIRPARA(WB)-2	NP-6470-A
206	L&T	EP-32	BOLANGIR(PG)	400 KV ANGUL(PG) LINE	NP-7538-A
207	L&T	ER-86	INDRAVATI(PG)	400KV INDRAVATI P/H)	NP-5966-A
208	L&T	ET-10	JEYPORE(PG)	430 V SIDE OF TERTIARY TRF(PG)	NP-5965-A
209	L&T	KG-01	KAHALGAON(NTPC)	KAHALGAON GT-5	NP-5116-A
210	L&T	KH-32	KAHALGAON(NTPC)	400KV BANKA-2(MAIN)	NP-5117-A
211	L&T	KH-33	KAHALGAON(NTPC)	400KV BANKA-1(CHECK)	NP-5235-A
212	L&T	KH-13	KAHALGAON(NTPC)	132KV SABOUR (BSPHCL)	NP-5239-A
213	L&T	KH-23	KAHALGAON(NTPC)	400KV MAITHON (PG) -1	NP-5242-A
214	L&T	KH-14	KAHALGAON(NTPC)	132KV LALMATIA (BSPHCL)	NP-5244-A
215	L&T	KH-31	KAHALGAON(NTPC)	400KV BANKA-1(MAIN)	NP-5245-A
216	L&T	KH-11	KAHALGAON(NTPC)	400KV LAKHISARAI(PG)-1	NP-5246-A
217	L&T	KH-09	KAHALGAON(NTPC)	400KV MAITHON (PG) -1	NP-5247-A
218	L&T	KH-25	KAHALGAON(NTPC)	400KV LAKHISARAI(PG)-1	NP-5248-A
219	L&T	KH-02	KAHALGAON(NTPC)	KAHALGAON GT-2	NP-5250-A
220	L&T	KH-16	KAHALGAON(NTPC)	K'GAON 400/132 ATR-II	NP-5251-A
221	L&T	KH-24	KAHALGAON(NTPC)	400KV MAITHON (PG) -2	NP-5253-A
222	L&T	KH-08	KAHALGAON(NTPC)	400KV FARAKKA (NTPC) -2	NP-5254-A
223	L&T	KH-17	KAHALGAON(NTPC)	COLONY TRANSFORMER-I	NP-5255-A
224	L&T	KH-06	KAHALGAON(NTPC)	KAHALGAON STN TRANS-2	NP-5256-A
225	L&T	KH-10	KAHALGAON(NTPC)	400KV MAITHON (PG) -2	NP-5257-A
226	L&T	KH-07	KAHALGAON(NTPC)	400KV FARAKKA (NTPC) -1	NP-5258-A

227	L&T	KH-21	KAHALGAON(NTPC)	400KV FARAKKA (NTPC) -1	NP-5259-A
228	L&T	KH-22	KAHALGAON(NTPC)	400KV FARAKKA (NTPC) -2	NP-5260-A
229	L&T	KH-19	KAHALGAON(NTPC)	132KV KAHALGAON (BSPHCL)	NP-5261-A
230	L&T	KH-05	KAHALGAON(NTPC)	KAHALGAON STN TRANS-1	NP-5262-A
231	L&T	KH-27	KAHALGAON(NTPC)	400/132 ATR-I	NP-5263-A
232	L&T	KH-37	KAHALGAON(NTPC)	400KV BARH-1 (CHECK)	NP-5264-A
233	L&T	KH-28	KAHALGAON(NTPC)	400/132 ATR-II	NP-5265-A
234	L&T	KH-36	KAHALGAON(NTPC)	400KV BARH-2 (MAIN)	NP-5266-A
235	L&T	KH-18	KAHALGAON(NTPC)	COLONY TRANSFORMER-II	NP-5267-A
236	L&T	KH-38	KAHALGAON(NTPC)	400KV BARH-2 (CHECK)	NP-5268-A
237	L&T	KH-35	KAHALGAON(NTPC)	400KV BARH-1 (MAIN)	NP-5269-A
238	L&T	KH-15	KAHALGAON(NTPC)	K'GAON 400/132 ATR-I	NP-5837-A
239	L&T	KH-03	KAHALGAON(NTPC)	KAHALGAON GT-3	NP-5850-A
240	L&T	KH-01	KAHALGAON(NTPC)	KAHALGAON GT-1	NP-5851-A
241	L&T	KG-02	KAHALGAON(NTPC)	KAHALGAON GT-6	NP-5852-A
242	L&T	KG-06	KAHALGAON(NTPC)	132KV STN TRANS-5	NP-5856-A
243	L&T	KG-03	KAHALGAON(NTPC)	KAHALGAON GT-7	NP-5857-A
244	L&T	KH-04	KAHALGAON(NTPC)	KAHALGAON GT-4	NP-5859-A
245	L&T	KH-34	KAHALGAON(NTPC)	400KV BANKA-2(CHECK)	NP-5861-A
246	L&T	KG-04	KAHALGAON(NTPC)	132KV STN TRANS-3	NP-5862-A
247	L&T	KG-05	KAHALGAON(NTPC)	132KV STN TRANS-4	NP-5863-A
248	L&T	ET-11	KEONJHAR(PG)	33 KV SIDE OF TERTIARY TRF(PG)	NP-7921-A
249	L&T	DV-65	KHARAGPUR (DVC)	132KV KHARAGPUR (WBSETCL)	NP-6559-B
250	L&T	ES-46	KISHANAGNJ(PG)	400 KV SIDE OF 500 MVA ICT-1	NP-7413-A
251	L&T	DV-09	K'NESWARI (DVC)	220KV MAITHON (PG) -4	NP-6493-A
252	L&T	WB-10	KOLAGHAT (WBSETCL)	400 KV KHARAGPUR (WBSETCL)	NP-6487-A
253	L&T	DV-61	KOLAGHAT(DVC)	132KV KOLAGHAT (WBSETCL)	NP-6558-B
254	L&T	ER-15	MAITHON(PG)	400KV DSTPS ANDAL (DVC)	NP-6521-A
255	L&T	DV-16	MEJIA (DVC)	400 KV MAITHON(DVC) (CHECK)	NP-6776-A
256	L&T	EM-23	MUZAFFARPUR(PG)	400KV BIHARSARIFF-1	NP-5071-A
257	L&T	EM-25	MUZAFFARPUR(PG)	400KV GORAKHPUR(NR)-1	NP-5074-A
258	L&T	EM-27	MUZAFFARPUR(PG)	400KV PURNEA-1	NP-5075-A
259	L&T	EM-26	MUZAFFARPUR(PG)	400KV GORAKHPUR(NR)-2	NP-9981-A
260	L&T	EM-30	MUZAFFARPUR(PG)	400/220KV ICT-1	NP-9983-A
261	L&T	BI-56	NALANDA(BSPHCL)	132KV BARHI (DVC)	NP-7690-A
262	L&T	EN-86	NEW MELLI(PG)	220 KV TASHIDING	NP-8740-A
263	L&T	EN-85	NEW MELLI(PG)	220 KV RANGPO(PG)-2	NP-8746-A
264	L&T	ES-39	PANDIABILI(PG)	415 V SIDE OF TERTIRAY AT PANDIABIL	NP-7462-A
265	L&T	EM-71	PATNA(PG)	400KV BARH-2	NP-5838-A
266	L&T	EP-41	PATNA(PG)	400 KV BARH(NTPC)-4	NP-8632-A
267	L&T	DV-62	PURULIA (DVC)	132KV PURULIA (WBSETCL)	NP-6560-B
268	L&T	EG-66	PUSAULI(PG)	415 V SIDE OF PUSAULI 11/0.415 ST LIGHT TF-1	NP-6016-B
269	L&T	JS-02	RAMCHANDRAPUR(JUVNL)	220KV JAMSHEDPUR(PG)-2	NP-5119-A
270	L&T	EG-89	RANCHI NEW(PG)	765 KV SIDE OF 765/400 KV ICT-1	NP-7848-A
271	L&T	EG-90	RANCHI NEW(PG)	400 KV SIDE OF 765/400 KV ICT-1	NP-8756-A
272	L&T	EM-47	RANCHI(PG)	400KV SIPAT(WR)-1	NP-5835-A
273	L&T	EM-48	RANCHI(PG)	400KV SIPAT(WR)-2	NP-5836-A
274	L&T	EM-61	RANCHI(PG)	220KV SIDE OF RANCHI ICT-1	NP-5870-A
275	L&T	EM-41	RANCHI(PG)	400KV RAGHUNATHPUR(DVC)-II	NP-5871-A
276	L&T	EM-43	RANCHI(PG)	220KV SIDE ICT-2	NP-5872-A
277	L&T	EM-42	RANCHI(PG)	400KV SIDE ICT-2	NP-5873-A
278	L&T	EM-45	RANCHI(PG)	220KV CHANDIL (JUVNL)-1	NP-5874-A
279	L&T	EM-46	RANCHI(PG)	400KV MAITHON-1	NP-5877-A
280	L&T	EM-60	RANCHI(PG)	400KV SIDE OF RANCHI ICT-1	NP-5878-A
281	L&T	EM-44	RANCHI(PG)	220KV PATRATU (JUVNL)	NP-5879-A
282	L&T	ER-28	RENGALI(PG)	400KV BARIPADA (PG)	NP-5991-A
283	L&T	WB-12	SAGARDIGHI(WBSETCL)	400 KV FARAKKA (NTPC)-1(MAIN)	NP-6482-A
284	L&T	WB-13	SAGARDIGHI(WBSETCL)	400 KV SUBHASGRAM(PG)	NP-6483-A
285	L&T	WB-21	SAGARDIGHI(WBSETCL)	400 KV DURGAPUR(PG)-1(MAIN)	NP-7964-A
286	L&T	WB-22	SAGARDIGHI(WBSETCL)	400 KV DURGAPUR(PG)-1(CHECK)	NP-7990-A
287	L&T	ST-12	STERLITE	400 KV SUNDERGARH (CHECK)-1	NP-6536-A
288	L&T	ST-11	STERLITE	400 KV SUNDERGARH (CHECK)-2	NP-6537-A
289	L&T	ST-10	STERLITE	400 KV SUNDERGARH (MAIN)-1	NP-6538-A
290	L&T	ST-09	STERLITE	400 KV SUNDERGARH (MAIN)-2	NP-6539-A
291	L&T	TL-14	TALCHER(NTPC)	400KV TSTPP STG-I - STG-II-1	NP-5066-A
292	L&T	TL-19	TALCHER(NTPC)	400KV ANGUL (PG) (MAIN)	NP-5067-A
293	L&T	TL-16	TALCHER(NTPC)	400KV TSTPP STG-II - STG-I -1	NP-5069-A
294	L&T	TL-17	TALCHER(NTPC)	400KV TSTPP STG-II - STG-I -2	NP-5070-A
295	L&T	TL-25	TALCHER(NTPC)	400/220KV ATR-1	NP-5077-A
296	L&T	TL-27	TALCHER(NTPC)	400KV MIRAMUNDALI (CHECK)	NP-5078-A
297	L&T	TL-13	TALCHER(NTPC)	220/11 KV STATION TRANS. -1	NP-5081-A
298	L&T	TL-21	TALCHER(NTPC)	400KV ROURKELA (PG) -1	NP-5082-A
299	L&T	TL-05	TALCHER(NTPC)	400KV ROURKELA (PG) -1	NP-5083-A
300	L&T	TL-06	TALCHER(NTPC)	400KV ROURKELA (PG) -2	NP-5084-A
301	L&T	TL-07	TALCHER(NTPC)	400KV RENGALI (PG) -1	NP-5085-A
302	L&T	TL-12	TALCHER(NTPC)	220KV M'MUNDALI (GRIDCO) -2	NP-5101-A
303	L&T	TL-10	TALCHER(NTPC)	220KV RENGALI HPS (GRIDCO)	NP-5102-A
304	L&T	TL-09	TALCHER(NTPC)	220KV TTPS (GRIDCO)	NP-5103-A

305	L&T	TL-28	TALCHER(NTPC)	400KV ANGUL (PG) (CHECK)	NP-5104-A
306	L&T	TL-02	TALCHER(NTPC)	TALCHER GT-2	NP-5105-A
307	L&T	TL-08	TALCHER(NTPC)	400KV RENGALI (PG) -2	NP-5106-A
308	L&T	TL-01	TALCHER(NTPC)	TALCHER GT-1	NP-5107-A
309	L&T	TL-03	TALCHER(NTPC)	400/220KV ATR-1	NP-5108-A
310	L&T	TL-04	TALCHER(NTPC)	400/220KV ATR-2	NP-5109-A
311	L&T	TL-23	TALCHER(NTPC)	400KV RENGALI (PG) -1	NP-5110-A
312	L&T	TL-11	TALCHER(NTPC)	220KV M'MUNDALI (GRIDCO) -1	NP-5112-A
313	L&T	TL-26	TALCHER(NTPC)	400/220KV ATR-2	NP-5113-A
314	L&T	TL-22	TALCHER(NTPC)	400KV ROURKELA (PG) -2	NP-5115-A

Precautions to be taken during accuracy check of Special Energy meters

Precautions applicable to all sub stations

1. Take One meter at a time for accuracy check for inservice meters
2. Take 220 kV of ICT SEMS one after one on first day (All meter on 220 kv can be taken for calibration in one day one after one)
3. Take 400 side of ICT SEMs one after one on Second day (All 400 kV side meters can be taken up for calibration in One day one after one)
   (One day gap should be allowed between 220 kV side and 400 kV side of ICT)
4. While taking out 400 kV feeder SEM, ensure standby meter(Other meter) is in service.
5. After Shorting CT circuits, and removing PT supply to SEM , Meter can be given for accuracy check.
6. SEM meter need not be removed from the location
7. Accuracy check of SEMs at SEB location is also to be carried out.
8. Genus SEM meters need not be calibrated as they are new
9. Calibration of Main/Check meters and standby meter of same feeder should be avoided.
10. Calibration plan may be shared with ERLDC.

Annexure-B9

POWER SYSTEM DEVELOPMENT FUND

Status of the Projects approved in Eastern Region

Sl No	State	Entity	Name of the Proposal & No	Date of Sanction	Approved DPR cost	Sanctioned Grant	Date of signing of Agreement	Date of First Disbursment	Completion Schedule (in months)	Grant Disbusred till date	% Grant disbursed	Under process of disbusrement	Total Awards amount placed till date	Remarks
1	Bihar	BSPTCL	Renovation and Upgradation of protection system of substations. (18)	11-May-15	71.35	64.22	3-Dec-15	16-May-16	24	56.04	87.26%		69.20	Final 10% not yet claimed
2			Installation of Capacitor bank in 20 Nos of Grid Sub Station. (74)	5-Sep-16	20.98	18.88	14-Mar-18	26-Mar-19	24	16.99	89.98%		20.98	Final 10% not yet claimed
3			Renovation and Upgradation of the protection and control system of 12nos 132/33 Grid Sub Station. (73)	2-Jan-17	54.69	49.22	Agreement not signed		24	0.00	0.00%			Agreement not signed
			Total		**147.02**	**132.32**				**73.03**	**55.19%**		**90.18**	
4	Jharkhand	JUSNL	Renovation & Upradation of protection system of Jharkhnad. (161)	15-Nov-17	153.48	138.13	3-Jul-18	28-Mar-19	16	39.03	28.26%	75.65	140.09	60% grant under process of disbusrement
5			Reliable Communication & data acquisition system upto 132kV Substations ER. (177)	24-May-19	46.82	22.36	Agreement not signed				0.00%			Agreement not signed
			Total		**200.3**	**160.49**				**39.03**	**24.32%**	75.65	**140.09**	
6	Odisha	OPTCL	Renovation and Upgradation of protection system of substaions. (08)	11-May-15	180.56	162.50	5-Aug-15	22-Mar-16	24	46.04	28.33%		60.26	Final 10% not yet claimed
7			Implementation of OPGW based reliable communication at 132 kv and above substations.	15-Nov-17	51.22	25.61	3-Jan-18	29-Mar-19	36	7.68	29.99%		51.22	60% grant not yet requested
8			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-Jul-18	30.26	27.23	21-Sep-18	1-Apr-19	18	2.72	9.99%			Awards not yet placed & 20% not yet requested
9			Implementation of Automatic Demand Management System (ADMS) in SLDC, Odisha. (196)	24-May-19	3.26	2.93	Agreement not signed		10		0.00%			Agreement not signed
10			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)	24-May-19	40.7	36.63			18		0.00%			Agreement is under execution
11		OHPCL	Renovation and Upgradation of protection and control system of OHPC. (109)	22-May-17	24.83	22.35	19-Sep-17	25-May-18	24	2.67	11.95%		10.17	60% grant not yet requested
			Total		**330.83**	**277.25**				**59.11**	**21.32%**		**121.66**	
12	West Bengal	WBSETCL	Renovation and Upgradation of protection system of substations. (07)	31-Dec-14	120.67	108.60	10-Feb-15	4-Feb-16	15	46.10	42.45%		51.23	Project Completed. Short closed
13			Installation of switchable reactor & shunt capacitor for voltage improvement. (88)	22-May-17	48.19	43.37	10-Aug-17	22-Jun-18	19	11.69	26.95%		28.30	60% not yet claimed
14			Renovation & Modernisation of Transmission System. (87)	22-May-17	93.51	70.13	10-Aug-17	25-Jun-18	25	63.12	90.00%		93.51	Final 10% not yet claimed
15			Installation of Bus Reactors at different 400kV Substation within the state of West Bengal for reactive power management of the Grid. (210)	24-May-19	79.71	71.74	24-Jun-19	23-Oct-19	19		0.00%	7.17		10% under process of disurement
16			Project for establishment of reliable communication and data acquisition at different substation at WBSWTCL. (222)	24-May-19	62.39	31.19	24-Jun-19	23-Oct-19	25	3.12	10.00%			Awards not yet placed & 20% not yet requested

POWER SYSTEM DEVELOPMENT FUND														
Status of the Projects approved in Eastern Region														
Sl No	**State**	**Entity**	**Name of the Proposal & No**	**Date of Sanction**	**Approved DPR cost**	**Sanctioned Grant**	**Date of signing of Agreement**	**Date of First Disbursment**	**Completion Schedule (in months)**	**Grant Disbusred till date**	**% Grant disbursed**	**Under process of disbusrement**	**Total Awards amount placed till date**	**Remarks**
17		WBPDCL	Renovation and Modernization of 220/ 132 kV STPS switch yard and implementation of Substaion Automation System. (72)	5-Sep-16	26.09	23.48	29-Dec-16	18-May-17	18	7.05	30.02%			60% not yet claimed
18			Implementation of Islanding scheme at Bandel Thermal Power Station. (97)	16-May-17	1.54	1.39	10-Aug-17	14-Dec-17	8	1.39	100.00%			Project Completed
19			Renovation and Modernization of switchyard and related protection system of different power stations (BTPS, BKTPS and KTPS) of WBPDCL (155)	27-Jul-18	50.18	45.16	20-Dec-18	27-Mar-19	12	4.52	10.01%			60% not yet claimed
			Total		**482.28**	**395.06**				**136.99**	**34.68%**		**173.04**	
20	DVC	DVC	Renovation and Upgradation of the protection and control system of Ramgarh Sub Station. (81)	2-Jan-17	28.85	25.96	11-Apr-17	31-May-17	24	22.95	88.41%		28.27	Final 10% not yet claimed
21			Renovation and Modernization of control and protection system and replecement of equipment at Parulia, Durgapur, Kalyanewari, Giridhi Jamsedpur, Barjora, Burnpur, Dhanbad and Bundwan substation. (106)	16-May-17	156.11	140.50	21-Jun-17	14-Dec-17	24	36.06	25.67%		122.75	60% not yet claimed
			Total		**184.96**	**166.46**				**59.01**	**35.45%**		**151.03**	
22	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)	24-May-19	20.00	10.00	4-Dec-19				0.00%			Initla 10% not yet claimed
					20.00	**10.00**				**0.00**	**0.00%**		**0.00**	
23	PGCIL	PGCIL	Installation of STATCOMs in ER at Ranchi-New, Rourkela, Kishanganj and Jeypore substations of POWERGRID. (56)	5-Jan-16	700.31	630.28	29-Sep-16	31-Mar-17	30	571.69	90.70%		651.52	Project Completed
24	ERPC	ERPC	Creation and Maintenance of web based protection database management. (67)	17-Mar-16	20	20.00	26-Apr-16	28-Jun-16	18	14.83	74.15%		16.48	Final 10% not yet claimed
25			Study Programme on power trading at NORD POOL Academy for Power System Engineers of Eastern Region. (122)	27-Jul-18	5.46	5.46	21-Sep-18	27-Mar-19	60	4.61	84.43%		5.37	Final 10% not yet claimed
26			Traning Program for Power system Engineers of various constituents of Eastern Region. (117)	27-Jul-18	0.61	0.61	21-Sep-18	11-Apr-19	60	0.18	29.51%		0.61	60% not yet claimed
			Total		**726.38**	**656.35**				**591.31**	**90.09%**		**673.98**	
			GrandTotal		**2,091.77**	**1,797.94**				**958.48**	**53.31%**	**75.65**	**1349.96**	

PSS Tuning Status in Eastern Region

Power System Stabilizer (PSS) tuning is an ongoing exercise in Eastern regional grid after observation of various low frequency oscillation from time to time in the grid. In line with this, OCC has decided that all generating plants in eastern region will submit their PSS tuning plan to ERLDC/ERPC and the test reports for validation. During last 3 years, 36 Units PSS have been tuned whose details are given below in table 1. While the units where PSS have not been tuned in last three are given in table 2. It has been observed that utility such as OPGC, OHPC, WBSEDCL, NTPC, GMR and few others have yet not submitted their plan for PSS tuning to ERLDC/ERPC.

In view of the above, all generating utilities who have not yet submitted their PSS tuning plan are advised to submit the same to ERLDC/ERPC in compliance to CERC and CEA regulation on Power System stabilizer and associated tuning for reliability and security of the Grid.

Table 1: Unit Where PSS tuning Completed during last Three years (2016-2019)

Power Plant	Unit No	PSS tuned (Yes/No)	PSS in Service (Yes/No)	Last PSS Tuning Date
Kolaghat-WBPDCL	4-5	Yes	Yes	2019
Sagardighi-WBPDCL	3-4	Yes	Yes	2019
Santhaldih-WBPDCL	5-6	Yes	Yes	2019
Bandel-WBPDCL	5	Yes	Yes	2019
Bakreshwar-WBPDCL	1-5	Yes	Yes	2019
Budge Budge-CESC	3	Yes	Yes	2019
Durgapur-DVC	1-2	Yes	Yes	2019
Koderma-DVC	2	Yes	Yes	2019
Kahalgaon NTPC	1	Yes	Yes	2017
Kahalgaon NTPC	2-3	Yes	Yes	2016
BRBCL	2	Yes	Yes	2019
Teesta-III	1-6	Yes	Yes	2019
Tashiding	1-2	Yes	Yes	2017
Dikchu	1-2	yes	yes	2017
Maithon Power Limited	1	Yes	Yes	2019
Maithon Power Limited	2	Yes	Yes	2017
JITPL	1-2	Yes	Yes	2016
Tenughat	1-2	Yes	Yes	2017
Adhunik	2	Attempted	Yes	2019

*(*Total 36 units PSS has been tuned, among these few Units may require re-tuning due to network changes and has been intimated)*

Table 2 : Units Where PSS tuning is carried out prior to 2016 or No Information on Tuning has been shared.

Power Plant	Unit No	Utility	Remarks from Utility on Tuning
DPL	**7-8**	**WBPDCL (After takeover)**	**No Details**
PPSP	**1-4**	**WBSEDCL**	**No Details**

TLDP III	**1-4**	**WBSEDCL**	**No Details**
TLDP IV	**1-4**	**WBSEDCL**	**No Details**
Budge Budge	**1-2**	**CESC**	**No Details**
Kahalgaon	**4-7**	**NTPC**	**No Details**
Farakka	**1-6**	**NTPC**	**No Details**
Talcher Stage 1	**1-2**	**NTPC**	**No Details**
Talcher Stage 2	**3-6**	**NTPC**	**No Details**
NPGC	**1-1**	**NTPC**	**No Details**
BRBCL	**1-3**	**NTPC**	**No Details**
KBUNL	**1-4**	**NTPC**	**No Details**
Rangit	**1-3**	**NHPC**	**No Details**
GMR	**1-3**	**GMR**	**No Details**
IB TPS	**1-4**	**OPGC**	**No Details**
Upper Indravati	**1-4**	**OHPC**	**No Details**
Balimela	**1-8**	**OHPC**	**No Details**
Upper Kolab	**1-4**	**OHPC**	**No Details**
Rengali	**1-5**	**OHPC**	**No Details**
Sterlite	**1-4**	**Sterlite**	**No Details**
Subarnrekha	**1-2**	**JUUNL**	**No Details**
Tala, Chukha Mangdechu	**All Units**	**BPC**	**No Details**
Chujachen	1-2	IPP	Planned In Feb 2020
Teesta 5	1-3	NHPC	Planned In March 2020
Waria	4-1	DVC	Planned in April 2020
Mejia	4-8	DVC	Planned in December 2019
Chandrapura B	1-2	DVC	Planned in December 2019
Raghunathpur	1-2	DVC	Planned in Feb 2021 for Unit 1 and June 2021 for Unit 2
Jorethang	1-2	IPP	Planned In Jan 2020
Bokaro	A1,B	DVC	Planned in Jun 2020
Koderma	1-1	DVC	Planned in May 2020
Barh	4-5	NTPC	Planned in Nov 2019
Sagardighi	1-2	WBPDCL	PSS tuning Order Placed for one Unit
Kolaghat	1-3	WBPDCL	PSS tuning planned with DAVR Upgrade (Order placed)
Adhunik	1-2	APNRL	Unit 1 in Next AOH , Unit 2 in Dec 2019

*(*Units need to submit their PSS tuning plan in line with IEGC and CEA standard Regulations to ERLDC/ERPC)*

Jharkhand Urja Sancharan Nigam Limited

UNDER CONSTRUCTION SUBSTATIONS TO BE COMMISSIONED UPTO MARCH 2020

Sl. No.	Transmission Elements	Agnecy/ Owner	Scheme (ERSS, TBCB/ Standing Committee/ State)	Schedule Completion	Expected Month for completion	Issue Being Faced
1	400/220/132 kV GSS, Latehar	JUSNL	JCP work	23.08.2013	23-Mar-20	Delay in land acquisition
2	400/220 kV GSS, Patratu	JUSNL	JCP work	23.08.2013	23-Mar-20	Delay in land acquisition
3	220/132 kV GSS, Lohardagga	JUSNL	JCP work	23.08.2013	23-Mar-20	Delay in land acquisition
4	220/132 kV GSS, Garhwa	JUSNL	State	02.09.2018	21-Feb-20	Delay in land acquisition
5	220/132/33 kV GSS, Godda	JUSNL	State	02.09.2018	16-Feb-20	Delay in land acquisition
6	220/132/33 kV GSS, Giridih	JUSNL	State	28.03.2018	14-Feb-20	Delay in land acquisition
7	220/132/33 kV GSS, Jasidih	JUSNL	State	13.12.2018	18-Feb-20	Delay in land acquisition
8	220/132/33 kV GSS, Chatra	JUSNL	State	07.12.2014	21-Feb-20	Delay in land acquisition
9	220/132/33 kV GSS, Ratu	JUSNL	State	29.03.2018	25-Mar-20	Delay in land acquisition
10	132/33 kV GSS, Bahragora	JUSNL	State	07.05.2018	26-Feb-20	Delay in land acquisition
11	132/33 kV GSS, Jamua	JUSNL	State	07.05.2018	22-Feb-20	Delay in land acquisition
12	132/33 kV GSS, Saria	JUSNL	State	29.03.2018	24-Feb-20	Delay in land acquisition
13	400 kV D/C Patratu - Latehar	JUSNL	JCP work	23.08.2013	15-Mar-20	Forest clearance & ROW issue
14	400 kV D/C Bero - Patratu	JUSNL	JCP work	23.08.2013	10-Mar-20	Forest clearance & ROW issue
15	220 kV D/C Chatra - Latehar	JUSNL	State	19.06.2014	16-Mar-20	Forest clearance & ROW issue
16	220 kV D/C Godda - Dumka	JUSNL	State	07.05.2018	21-Feb-20	Forest clearance & ROW issue
17	220 kV D/C Godda - Lalmatia	JUSNL	State	07.05.2018	19-Feb-20	Forest clearance & ROW issue
18	220 kV D/C Jasidih - Dumka	JUSNL	State	01.02.2018	26-Feb-20	Forest clearance & ROW issue
19	220 kV D/C Jasidih - Giridih	JUSNL	State	07.05.2018	21-Feb-20	Forest clearance & ROW issue
20	220 kV D/C Ratu - Patratu	JUSNL	State	08.05.2018	14-Mar-20	Forest clearance & ROW issue
21	220 kV D/C Garhwa - Daltonganj	JUSNL	State	14.08.2016	12-Feb-20	Forest clearance & ROW issue
22	132 kV D/C Giridih - Saria	JUSNL	State	07.05.2018	16-Feb-20	Forest clearance & ROW issue
23	132 kV D/C Giridih - Jamua	JUSNL	State	07.05.2018	19-Feb-20	Forest clearance & ROW issue
24	132 kV D/C Bahragora - Dalbhumgarh	JUSNL	State	07.05.2018	28-Feb-20	Forest clearance & ROW issue

General Manager, C&M (NWBP)

Sl. No.	Transmission Elements	Agency/Owner	Scheme(ERSS/TBCB /Standing Committee/State)	Schedule Completion	Projected Month for Completion	Issue being faced if any for delay in commissioning
1	Construction of Loop In Loop Out arrangement of 132 KV Tx. line Madhepura- Sonebarsa 132 KV S/C Tx.line on D/C Tower at Saharsa Existing against NIT No. 38/PR/BSPTCL/2014.	M/s VSPL	Special Plan of Phase-III BRGF	31.07.2018	Jan., 2020	ROW issues
2	Construction of 02 nos. 132KV Line bays at each 132/33KV Grid-Substation Mahnar & Shahpurpatori and Construction of 02nos. 220KV Line bays at 220/132/33KV GSS Samastipur(New) against NIT No. 85/PR/BSPTCL/2018.	M/s A.K. Das Associates Ltd. In JV with M/s REW Contracts Pvt. Ltd.	State Plan	13.10.2019	April, 2020	
3	Construction of 132 KV D/C transmission line from Laukahi – Phulparas with HTLS Conductor aginst NIT No. 111/PR/BSPTCL/2018	M/s M/s. Larsen & Toubro Limited	State Plan	06.02.2019	Dec., 2020	
4	Construction of 220 KV D/C Saharsa(New)- Begusarai Transmission line with ACSR Zebra Conductor against NIT No. 54/PR/BSPTCL/2018.	M/s Associated Power Structures Pvt. Ltd	State Plan	20.04.2020	April, 2020	
5	Construction of 02 Nos of 132KV bays each at GSS Muzaffarpur & Vaishali against NIT 65/PR/BSPTCL/2018	M/s Jagabandhu Enterprisers Pvt. Ltd. in JV with M/s MHD Power	State Plan	13.07.2019	April, 2020	
6	Construction of 02 Nos of 132KV bays at GSS Runnisaidpur & 02 Nos 220KV line bays at GSS Motipur against NIT 76/PR/BSPTCL/2018	M/s Powertech Engineers	State Plan	13.07.2019	June, 2020	
7	Construction of 220 KV D/c transmission line from 220/132/33 KV GSS Chapra(New), Amnour to 400/220 KV GSS Muzaffarpur (PG) with Zebra conductor and 132 KV D/c transmission line from 220/132/33 KV GSS Chapra(New), Amnour to 132/33 KV GSS Vaishali with Panther conductor against NIT No- 51/PR/BSPTCL/2018	M/s KRRTPPL	State Plan	20.04.2020	Dec., 2020	
8	Augmentation of existing 132/33KV GSS Ekma (1x20MVA + 1x50MVA) by 3x50 MVA capacity against NIT No-36/PR/BSPTCL/2018	M/s REW Contracts Pvt. Ltd.	State Plan	15.04.2020	Dec., 2020	
9	Capacity augmentation of GSS Hajipur, Gopalganj & Darbhanga by replacement of power transformer NIT No-46/PR/BSPTCL/2018	M/s A.K. Das Associates Ltd. In JV with M/s REW Contracts Pvt. Ltd.	State Plan	20.01.2020	Sept., 2020	

Sl. No.	Transmission Elements	Agency/Owner	Scheme(ERSS/TBCB /Standing Committee/State)	Schedule Completion	Projected Month for Completion	Issue being faced if any for delay in commissioning
10	Construction of (i)132 KV D/C by making LILO arrangement of 132 KV DCSS Saharsa(OLD)-Banmankhi Transmission Line at Saharsa (New) GSS (line length approx. 20 RKM) (ii) 132 KV D/C by making LILO arrangement of 132 KV DCSS Saharsa(OLD)-Udakishanganj Transmission Line at Saharsa (New) GSS (line length approx. 15 RKM) and (iii) 132KV D/C by making LILO arrangement of one circuit of Madhepura-Sonebarsa 132KV D/C transmission line at Saharsa (New) GSS (line length approx. 35 RKM) against NIT No. 53/PR/BSPTCL/2018	M/s KRRTPPL	State Plan	20.01.2020	May, 2020	
11	Construction of 02 Nos. of 220 KV Line bay at 220/132/33 KV GSS Kishanganj (New) with SAS and 02 Nos. of 132 KV Line bay at 132/33 KV GSS Araria against NIT No. 67/PR/BSPTCL/2018	M/s A.K. Das Associates Ltd. In JV with M/s REW Contracts Pvt. Ltd.	State Plan	13.10.2019	March, 2020	
12	Construction of 04 Nos of 132/33 KV Transformer Bays in Gaya Transmission Circle against NIT No. 120/PR/BSPTCL/2018	M/s KRRTPPL	State Plan	24.11.2019	May, 2020	
13	Construction of 03 Nos of 132/33 KV Transformer Bays in Saran, Kosi & Darbhanga Transmission Circle against NIT No. 121/PR/BSPTCL/2018	M/s KRRTPPL	State Plan	24.11.2019	May, 2020	
14	Construction of 03 Nos of 132/33 KV Transformer Bays in Biharsharif & Dehri-on-sone Transmission Circle against NIT No. 122/PR/BSPTCL/2018	M/s Jagabandhu Enterprisers Pvt. Ltd. in JV with M/s MHD Power	State Plan	24.11.2019	May, 2020	
15	Supply, erection, testing and commissioning of 06 Nos. of 50 MVA Power Transformer with construction/modification of foundation in Transmission Circle Muzaffarpur against NIT No. 125/PR/BSPTCL/2018	M/s REW Contracts Pvt. Ltd.	State Plan	24.02.2020	Sept., 2020	
16	Supply, erection, testing and commissioning of 06 Nos. of 50 MVA Power Transformer with construction/modification of foundation in Transmission Circle Saran, Kosi & Darbhanga against NIT No. 126/PR/BSPTCL/2018	M/s KRRTPPL	State Plan	24.02.2020	Sept., 2020	
17	Supply, erection, testing and commissioning of 06 Nos. of 50 MVA Power Transformer with construction/modification of foundation in Transmission Circle Gaya against NIT No. 127/PR/BSPTCL/2018	M/s KPM Infrastructure Pvt. Ltd.	State Plan	24.02.2020	Sept., 2020	
18	Supply, erection, testing and commissioning of 05 Nos. of 50 MVA Power Transformer with construction/modification of foundation in Transmission Circle Purnea & Bhagalpur against NIT No. 128/PR/BSPTCL/2018	M/s KRRTPPL	State Plan	24.02.2020	Sept., 2020	

Sl. No.	Transmission Elements	Agency/Owner	Scheme(ERSS/TBCB /Standing Committee/State)	Schedule Completion	Projected Month for Completion	Issue being faced if any for delay in commissioning
19	Supply, erection, testing and commissioning of 05 Nos. of 50 MVA Power Transformer with construction/modification of foundation in Transmission Circle Patna & Dehri-on-sone against NIT No. 129/PR/BSPTCL/2018	M/s KPM	State Plan	24.02.2020	Sept., 2020	
20	Construction of 132KV Laukahi-Supaul Transmission line against NIT No.-15/PR/BSPTCL/2014, Pkg-D	M/s. Larsen & Toubro Limited	Special Plan of Phase-III BRGF	28.02.2019	31.01.2020	ROW issues
21	Construction of 132/33KV GSS Benipur	M/s KPM	State Plan	16.05.2018	Jan., 2020	ROW issues
22	Restoration of different Transmission Lines (Total – 06 nos.) of BSPTCL by constructing Pile Foundation (Total – 14 nos.) /Height Raising (Total – 01 No.) on turnkey basis.	M/S New Modern Technomech Pvt. Ltd.	O & M head	21.11.2018	31.01.2020	Delay in getting S/D and during rainy season site could not be approached
23	Construction of 220 KV D/C Raxaul(New)-Sitamarhi (New) Transmission Line with Twin Moose Conductor (Line Length - 120 RKM) on turnkey basis under state plan against NIT no. 60/PR/BSPTCL/2018	M/s KEC	State Plan	20.04.2020	FY 2020-21	
24	Construction of 220 KV D/C Raxaul(New)-Gopalganj Transmission Line with Twin Moose Conductor (Line Length - 80 RKM) on turnkey basis under state plan against NIT no. 62/PR/BSPTCL/2018	M/s KEC	State Plan	20.04.2020	FY 2020-21	
25	Construction of (i) 220 KV D/C Transmission Line from GSS Sitamarhi (New) to 220/132/33 KV GSS Motipur with Twin ACSR Moose Conductor (Approx Line Length -54 RKM) (ii) 132 KV D/C Transmission line from GSS Sitamarhi (New) to 132/33 KV GSS Runnisaidpur with Single ACSR Moose Conductor Transmission Line (17 RKM) a under State Plan 61/PR/BSPTCL/2018	M/s KEC	State Plan	20.04.2020	FY 2020-21	
26	220 KV Line Bays at 220 KV GSS Darbhanga (02 nos.)	M/s ABN	Special Plan of Phase-III BRGF	24.05.2016	Dec., 2020	Non availability of Land, Work for civil portion awarded separately on 30.05.2019 with copletion period up to 29/09/2019.
27	Construction of 132 KV Line bays at 132/33KV GSS Darbhanga	M/s ABN	Special Plan of Phase-III BRGF	21.12.2015	Jan., 2020	Addition in scope of work .
28	Construction of 2 Nos. 132 KV Line bays at 132/33KV GSS Supaul (Existing)	M/s GE	Special Plan of Phase-III BRGF	20.05.2016	Jan., 2020	Due to bad condition of approach road particularly in rainy season. Unavailability of sand. Addition in scope of work at 132/33 KV GSS Supaul

Sl. No.	Transmission Elements	Agency/Owner	Scheme(ERSS/TBCB /Standing Committee/State)	Schedule Completion	Projected Month for Completion	Issue being faced if any for delay in commissioning
29	construction of 1) 220 KV D/C Muzaffarpur(PG)-Garaul Transmission Line with ACSR Zebra Conductor (Line Length-20 RKM) 2) 132 KV D/C Garaul-MahnarTransmission Line with ACSR Panther Conductor (Line Length- 45 RKM) 3) LILO of both circuit of 132 KV D/C Muzaffarpur-vaishali Transmission Line at Garaul GSS with ACSR Panther Conductor (Line Length- 2x15 RKM) 4) 132 KV D/C Transmission line from GSS Chhapra(New)-Ekma with ACSR Panther Conductor (Line Length - 45 RKM) on turnkey basis against NIT NO:-50/PR/BSPTCL/2018	M/s R S infra Projects Pvt. Ltd.	State Plan	20.04.2020	April, 2020	
30	Construction of Second circuit stringing of 220 KV DCSS Darbhanga (400/220 KV) – Samastipur (New) Transmission Line (Line Length- 47 KM) NIT No - 72/PR/BSPTCL/2018.	M/s New Modern Technomech Pvt. Ltd. JV With M/S MKB Power Construction Pvt. Ltd	State Plan	14.10.2019	Jan., 2020	

Annexure-C13

List of line Reactors

Sl No	Voltage	From Bus	To Bus	Line Owner	Ckt ID	Line Length	Reactor (MVAr)						Remarks
							From End	Switchable(with additional CB) : YES or NO?	Provision to use as Bus reactor	To End	Switchable(with additional CB) : YES or NO?	Provision to use as Bus reactor	
1	400	B'shariff	Sasaram	POWERGRID	1	195	1X50	YES	NO				
2	400	Farakka	Durgapur	POWERGRID	1	150	1X50	NO	NO	-			
3	400	Gorakhpur	Motihari	POWERGRID + DMTCL(LILO)	1	190	1X80			1X50	YES	NO	
4	400	Gorakhpur	Motihari	POWERGRID + DMTCL(LILO)	2	190	1X80			1X50	YES	NO	
5	400	K'gaon	Maithon	POWERGRID	1	172	-			1X50	NO	NO	
6	400	K'gaon	Maithon	POWERGRID	2	172	-			1X50	NO	NO	
7	400	Lakhisarai	B'shariff	POWERGRID	2	89	-			1X50	YES	NO	
8	400	Maithon	Gaya	POWERGRID	1	235	1X50	YES	NO	1X50	YES	YES	
9	400	Maithon	Gaya	POWERGRID	2	235	1X50	YES	NO	1X50	YES	YES	
10	400	Maithon	Mejia	POWERGRID	1	83	1X50	YES	NO	-			
11	400	Malda	New purnea	POWERGRID	1	167	1X63	NO	NO	-			
12	400	Malda	New purnea	POWERGRID	2	167	1X63	NO	NO	-			
13	400	Meramundali	Angul	POWERGRID	1	21	1X63	YES	NO	-			
14	400	Motihari	Barh	POWERGRID	1	237	1X80	YES	NO	1X63	YES	NO	
15	400	Motihari	Barh	POWERGRID	2	237	1X80	YES	NO	1X63	YES	NO	
16	400	Mpl	Ranchi	POWERGRID	1	188	1X50	YES	NO	1X50	YES	YES	
17	400	Mpl	Ranchi	POWERGRID	2	188	1X50	YES	NO	1X50	YES	YES	
18	400	Pandiabili	Mendasal	POWERGRID	1	273	1X63	NO	NO				LR at Medhasal end shifted to Pandiabili
19	400	Pandiabili	Mendasal	POWERGRID	2	273	1X63	NO	NO				
20	400	Rengali	Keonjhor	POWERGRID	1	100	1X63	NO	NO				
21	400	Rourkela	Talcher	POWERGRID	1	175	-			1X50	NO	NO	
22	400	Rourkela	Talcher	POWERGRID	2	175	-			1X50	NO	NO	
23	400	RTPS	Ranchi	POWERGRID	2	155.5	1X50	NO	NO	-			
24	400	RTPS	Ranchi	POWERGRID	3	155.5	1X50	NO	NO	-			
25	400	Sagardighi	Subashgram	POWERGRID	1	256.3				1X50	YES	NO	
26	400	Darbhanga	Kishanganj	ATL	1	209	1X80	YES	NO	1X80	YES	YES	
27	400	Darbhanga	Kishanganj	ATL	2	209	1X80	YES	NO	1X80	YES	YES	
28	400	Baripada	Keonjhar	POWERGRID	1	156.25	3X16.67	YES	NO	-			

Annexure-D.1

Anticipated Power Supply Position for the month of
Feb-20

SL.NO		PARTICULARS	PEAK DEMAND MW	ENERGY MU
1		**BIHAR**		
	i)	NET MAX DEMAND	5055	2380
	ii)	NET POWER AVAILABILITY- Own Source (including bilateral)	427	329
		- Central Sector	4539	2136
	iii)	SURPLUS(+)/DEFICIT(-)	-88	85
2		**JHARKHAND**		
	i)	NET MAX DEMAND	1370	770
	ii)	NET POWER AVAILABILITY- Own Source (including bilateral)	341	153
		- Central Sector	938	445
	iii)	SURPLUS(+)/DEFICIT(-)	-91	-172
3		**DVC**		
	i)	NET MAX DEMAND (OWN)	3045	1710
	ii)	NET POWER AVAILABILITY- Own Source	5165	2606
		- Central Sector	511	198
		Long term Bi-lateral (Export)	1825	1227
	iii)	SURPLUS(+)/DEFICIT(-)	806	-133
4		**ODISHA**		
	i)	NET MAX DEMAND	4930	2500
	ii)	NET POWER AVAILABILITY- Own Source	3690	1446
		- Central Sector	1665	776
	iii)	SURPLUS(+)/DEFICIT(-)	425	-278
5		**WEST BENGAL**		
5.1		**WBSEDCL**		
	i)	NET MAX DEMAND (OWN)	6370	2963
	ii)	CESC's DRAWAL	0	57
	iii)	TOTAL WBSEDCL's DEMAND	6370	3020
	iv)	NET POWER AVAILABILITY- Own Source	4598	1732
		- Import from DPL	465	0
		- Central Sector	2416	1090
	v)	SURPLUS(+)/DEFICIT(-)	1109	-198
	vi)	EXPORT (TO B'DESH & SIKKIM)	742	-186
5.2		**DPL**		
	i)	NET MAX DEMAND	0	190
	ii)	NET POWER AVAILABILITY	465	205
	iii)	SURPLUS(+)/DEFICIT(-)	465	15
5.3		**CESC**		
	i)	NET MAX DEMAND	1680	720
	ii)	NET POWER AVAILABILITY - OWN SOURCE	700	420
		FROM HEL	540	250
		Import Requirement	440	50
	iii)	TOTAL AVAILABILITY	1680	720
	iv)	SURPLUS(+)/DEFICIT(-)	0	0
6		**WEST BENGAL (WBSEDCL+DPL+CESC)** **(excluding DVC's supply to WBSEDCL's command area)**		
	i)	NET MAX DEMAND	8050	3873
	ii)	NET POWER AVAILABILITY- Own Source	5763	2357
		- Central Sector+Others	3396	1340
	iii)	SURPLUS(+)/DEFICIT(-)	1109	-176
7		**SIKKIM**		
	i)	NET MAX DEMAND	120	63
	ii)	NET POWER AVAILABILITY- Own Source	2	1
		- Central Sector+Others	175	63
	iii)	SURPLUS(+)/DEFICIT(-)	58	1
8		**EASTERN REGION** **At 1.03 AS DIVERSITY FACTOR**		
	i)	**NET MAX DEMAND**	21911	11296
		Long term Bi-lateral by DVC	1825	1227
		EXPORT BY WBSEDCL	742	-186
	ii)	**NET TOTAL POWER AVAILABILITY OF ER (INCLUDING C/S ALLOCATION)**	26612	11850
	iii)	**PEAK SURPLUS(+)/DEFICIT(-) OF ER (ii)-(i)**	2133	-487