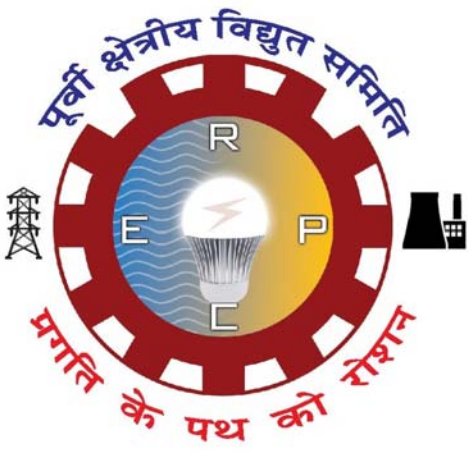

AGENDA FOR 38th TCC MEETING OF EASTERN REGIONAL POWER COMMITTEE

Date: 29th June, 2018

Venue: Kolkata

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EASTERN REGIONAL POWER COMMITTEE, KOLKATA

AGENDA FOR 38TH TCC MEETING

Date: 29th June, 2018 **Place: Kolkata**

ITEM NO.A1:	CONFIRMATION OF THE MINUTES OF 37TH TCC MEETING

The minutes of the 37th TCC meeting held on 16th March, 2018 at Goa were circulated vide letter no. ERPC/TCC&Committee/14/2018/4885 dated 28th March, 2018.

No comments have been received from constituent members on the minutes of the meeting.

Members may confirm the minutes of 37th TCC meeting.

PART B: ITEMS FOR DISCUSSION

ITEM NO. B1:	STATUS OF PROJECTS FUNDED UNDER PSDF SCHEMES

The 9th meeting of the PSDF Project Monitoring Group for review of the projects approved under PSDF in Eastern Region was held at Binaguri on 8th June, 2018. The meeting was chaired by Chairperson, CEA. All the states/utilities of the Eastern Region participated in the meeting. The status/progress of all projects of Eastern Region was reviewed in the meeting. Chairperson, CEA appreciated the progress of projects in Eastern Region.

The minutes of the said meeting are awaited.

In the meeting, it was informed that there have been considerable delays on the part of the utilities for utilisation of the fund granted from PSDF for the approved projects. It was also pointed out that most of the fund under PSDF had already been allocated for system improvement. Still, proposals for a good number of projects are being received by NLDC for funding through PSDF. In such cases, a situation might also likely to arise where the unutilised fund of the approved projects, which were getting delayed might be diverted to new projects. Therefore, the onus is on the utilities for ensuring timely completion of the projects.

The status of the projects (as given in the 145th OCC Meeting) of the Eastern Region which were approved for implementation utilising PSDF are given in **Annexure-B1**.

TCC may note.

ITEM NO. B2:	FLEXIBILITY IN GENERATION & SCHEDULING OF THERMAL POWER STATIONS TO REDUCE EMISSIONS-MOP, GOI ORDER

MoP vide letter No. 23/70/2017-R&R dated 05.04.2018 published a detailed mechanism of allowing Flexibility in Generation and Scheduling of Thermal Power Stations to reduce emissions. Subsequently, CEA vide its letter No. 7/X/VIP/GM/2018/923-27 dated 12.06.2018 requested all RPCs to make necessary changes in Energy Accounting to implement the above mentioned mechanism.

The concept of flexible utilization of coal as introduced by the Central Govt in year 2016, allows the use of coal within its basket in optimal manner. This avoids unnecessary coal transportation and reduces the power generation cost. In a similar manner, it has been decided by MoP that there should be some flexibility in Generation and Scheduling of Thermal Power Stations so that Discoms are able to meet their RPO without facing any additional financial burden.

Further, due to large scale integration of Grid connected renewable, which is generally infirm in nature, there is a need for balancing power to maintain security & stability of the Grid. Such balancing has to be done by Discoms and Generators both. This flexibility will provide optimum use of RE by Power Generators and help reduce emissions.

The detailed mechanism of allowing "Flexibility in Generation & Scheduling of Thermal Power Stations to reduce emissions" is enclosed in **Annexure-B2**.

TCC may discuss.

ITEM NO. B3:	PERFORMANCE OF HYDRO POWER STATIONS IN ER INCLUDING HYDRO POWER STATIONS IN BHUTAN

CEA vide letter dated 18.07.17 informed that POSOCO had carried out operational analysis of various hydro stations in the country and observed that despite 40.6 GW of peaking hydro capacity, only about 33 GW peak generation is available on all India basis. According to POSOCO, this is on account of a number of hydro stations, particularly in state sector, not being operated in peaking mode.

In 37th TCC Meeting, ERLDC gave a detailed presentation highlighting the availability of peaking power from Hydro Stations of Eastern Region and it was concluded that there are scope for further improvement. It was also pointed out in the meeting that improvement of injection of power at Indian periphery by Bhutan HPS during peak hours was also possible.

Thereafter, a separate meeting with Bhutan was held on 27.03.2018 to discuss the issue related to maximization of the hydro generation during peak hours from Bhutan. In the meeting, a detailed process of scheduling involving NLDC-Bhutan, NLDC-India, ERLDC, Generators of Bhutan etc. was discussed and formulated.

ERLDC may give a presentation highlighting the performance of hydro stations of India and Bhutan for providing improvement in peaking support.

Members may please discuss.

ITEM NO. B4:	IMPLEMENTATION OF DIFFERENTIAL PROTECTION FOR SHORT DISTANCE LINES

Powergrid informed that for short distance line (<20KM) they are planning to replace existing Distance protection relay with fibre base differential protection relay. Feeder details are as follows:

1. 220KV Subhasgram (POWERGRID)-Subhasgram (WBSETCL) D/C: Line length = 0.8 KM
2. 132KV Malda (POWERGRID)-Malda (WBSETCL) D/C: Line length = 5.94 KM,
3. 220KV Alipurduar (POWERGRID)-Alipurduar (WBSETCL) D/C: Line length = 6.377 KM,
4. 220KV Durgapur (POWERGRID)-Durgapur (DVC) D/C: Line length = 1 KM,
5. 400KV Durgapur (POWERGRID)-Bidhan Nagar (WBSETCL) D/C: Line length = 11 KM,
6. 132KV Birpara (POWERGRID)-Birpara (WBSETCL) D/C: Line length = 0.3 KM,
7. 132KV Siliguri (POWERGRID)-NJP (WBSETCL) S/C: Line length = 10 KM,
8. 132KV Siliguri (POWERGRID)-NBU (WBSETCL) S/C: Line length = 10 KM

In 68th PCC Meeting, it was opined that differential protection should be implemented for all short lines (<20KM) to overcome relay coordination issues with respect to distance and over current protection.

PCC in principle agreed to the proposal.

PCC opined that differential protection at both the ends could be implemented by one entity to maintain the relay and communication compatibility.

WBSETCL informed that they are implementing differential protection in 220KV Subhasgram (POWERGRID)-Subhasgram (WBSETCL) D/C for both the ends using fibre optic cables.

PCC advised Powergrid to implement differential protection at both ends for rest of the above lines.

Powergrid requested DVC and WBSETCL to share the availability of fibre optic terminal equipment details and protection scheme installed at their end.

TCC may please concur.

ITEM NO. B5:	INSTALLATION OF PMUs FOR OBSERVATION OF THE DYNAMIC PERFORMANCE OF STATCOMS

Four STATCOMs (Rourkela, Jeypore, Kishenganj, New Ranchi) are being commissioned in the Eastern Region to improve the dynamic VAR compensation in the grid and for the improvement of the transient stability. STATCOM is a dynamic VAR compensation device and provides the fast reactive support to the grid during transient as well steady state operation. The steady-state response of STATCOM can be monitored through conventional SCADA data, however; the dynamic response, which comes within milliseconds, cannot be well captured through conventional SCADA system. In order to analyze the dynamic performance of STATCOM (STATCOM+ MSR /MSC) during day-to-day operation, it is desired to install PMU on the Coupling Transformer of the STATCOM as a part of the URTDSM project. This will help the operator in monitoring and analyze the STATCOM dynamic response in real time as well as offline mode.

Based on the above for better monitoring of the STATCOM devices, Powergrid may be advised for installation of PMU at all the four STATCOMs of Eastern region.

In 146th OCC, ERLDC informed that as the STATCOMs are dynamic compensation devices, PMUs are required to be installed for availing synchronized data. The data will help in analyzing the dynamic response of the STATCOMs during day-to-day operation.

OCC recommended to install PMUs on the Coupling Transformer of the four STATCOMs as a part of the URTDSM project.

Powergrid informed that the proposal for installation of PMUs in above substations were not covered in original URTDSM project. They had taken up the matter with their Engineering Wing.

OCC referred to TCC for approval for installation of PMUs on the Coupling Transformer of the four STATCOMs are being in commissioning stage, as a part of the URTDSM project .

TCC may approve.

ITEM NO. B6:	**REPLACEMENT OF OLD RTUS IN EASTERN REGION FOR REPORTING OF RTU/SAS TO BACKUP CONTROL CENTRES**

In 36th TCC/ERPC meeting, proposal of replacement of RTU (as per Committee constituted in 35th ERPC meeting), was approved. It was also advised that replacement of OPGW on older ULDC lines may be deliberated in lower forum before submitting for TCC/ERPC approval.

Accordingly, in 37th ERPC meeting implementation of 'Upgradation of SCADA/RTUs/SAS in Central Sector stations and strengthening of OPGW network in Eastern Region' project on tariff route basis was approved.

In 37th TCC/ERPC Meeting, ERPC authorized POWERGRID to undertake the works related to replacement of the old RTUs of the Eastern Region. It was also decided by the ERPC that the investment made in this regard shall be recovered by POWERGRID through tariff. However, subsequent O&M shall be the responsibility of the concerned constituents.

In the said approval, the replacement/up-gradation of SAS, BCU based automation work, Replacement of old DCPS/UPS and Laying of OPGW as mentioned in detail scope of work are not included.

Therefore, implementation of 'Upgradation of SCADA/RTUs/SAS in Central Sector stations and strengthening of OPGW network in Eastern Region' Project by POWERGRID is proposed to be implemented with following scope:

A) Replacement of Old RTUs/SAS and Upgradation of SAS in Eastern Region.
B) Implementation of BCU based Substation Automation System at 05 nos. substations in Eastern Region.
C) Replacement of Old DCPS & UPS in Eastern Region.
D) Laying of OPGW (903 Km) in Eastern Region.

The detail scope of the project is enclosed in **Annexure-B6.**

Investment made by POWERGRID on this project shall be recovered through tariff.

ITEM NO. B7:	RELIABLE COMMUNICATION SCHEME UNDER CENTRAL SECTOR FOR EASTERN REGION

In line with the status of Implementation of Enquiry Committee Recommendations under **clause no: 9.15.2under Network visualization**, the last mile fibre availability to all central sector stations were discussed in 20th SCADA O & M meeting held on 15th December 2017 at ERLDC, Kolkata. In the meeting it was pointed out that POWERGRID has already taken approval for last mile fibre connectivity for some stations mainly GMR, JITPL & Ind Bharat etc in 36th TCC/ERPC meeting held on 13th/14th September 2017 at Bhubaneshwar. Status of last mile fibre connectivity for central sector stations which are still not having fibre connectivity, required for real time SCADA system & AGC, as mentioned below may also be planned.

ISGS	SL NO	NAME OF THE STATION	DISTANCE BETWEEN THE NEAREST COMMUNICATION NODE TO THE UNIT CONTROL ROOM	NEAREST COMMUNCATION NODE	Fiber layed (Y/N)	End Equipment (Y/N)	Availabilty Upto SAS/RTU	Distance Between Gen. and SAS for AGC	Distance Between SAS & Communication Equip.
NTPC	1	FARAKKA STPS	2500M	.....NA.....	Y	Y	N	100M	2400M
	2	BARH STPS	2000M		Y	Y	N	1500M	500M
	3	KAHALGAON STPS	1500M		Y	Y	N	1450M	60M
	4	BRBCL NABINAGAR	81.65KM+1000M	SASARAM (PGCIL)	N	N	N	1000M	
	5	TALCHER STPS	660M	.....NA.....	Y	Y	N	650M	10M
	6	DARLIPALLY STPS	810M	JHARSGUDA (SUNDERGARH)	Y	Y	Y	800M	10M
NHPC	7	RANGIT HPS	600M	.....NA.....	Y	Y	N	580M	20M
	8	TEESTA -V HPS	520M		Y	Y	N	500M	20M
IPP HYDRO	9	DIKCHU HPS	32.67KM+550M	RANGPO (PGCIL)	N	N	N	550M	
	10	TEESTA-III HPS	46.28KM+1800M	RANGPO (PGCIL)	N	N	N	1800M	
	11	JORETHANG HPS	27KM+300M	RANGPO (PGCIL)	N	N	N	300M	
	12	CHUZACHEN HPS	21KM+350M	RANGPO (PGCIL)	N	N	N	350M	
	13	TASHIDING HEP	8KM	New Melli	N	N	N	10M	
IPP THERMAL	14	JINDAL ITPL	85KM+1000M	ANGUL (PGCIL)	N	N	N	1000M	
	15	GMR TPS	30KM+800M	ANGUL (PGCIL)	N	N	N	800M	
	16	IND BHARAT EUL	65KM+700M	JHARSGUDA (SUNDERGARH)	N	N	N	700M	
	17	ADHUNIK PNRL	300M	.....NA.....	Y	Y	N	290M	10M
	18	MPL	31.5KM+1500M	MAITHON (PGCIL)	Y	Y	N	1500M	
	19	OPGCL	220M	.....NA.....	Y	Y	Y	200M	20M
NTPC/ JUSNL	20	Lalmatia	79KM+	Farakka	N	N	N		

In 37th TCC/ERPC meeting, POWERGRID informed that the work would be awarded by June, 2018 and would be completed by December, 2019 in phased manner.

In 21st SCADA O & M meeting held on 19th June 2018, POWERGRID intimated that the work is not covered under the scope of POWERGRID and the same is also mentioned in Committee report for 'Replacement of RTUs in Eastern Region'.

Accordingly, POWERGRID stated that concerned utilities shall take up the work.

ERLDC requested POWERGRID to take up the OPGW portion of the above work on behalf of the utilities.

POWERGRID intimated that only the OPGW portion along with terminal equipments (excluding the fiber connectivity within stations from Control room to the generators) can be considered upon approach from concerned utilities with a commitment of providing workfront and Right Of Way (including compensation) during execution. Further the O&M of these links will be in the scope of the concerned utilities. The OPGW links may be included under the Project ''Up-gradation of SCADA/RTUs/SAS in Central Sector stations and strengthening of OPGW network in Eastern Region' through tariff route and the investment made by POWERGRID shall be recovered through tariff.

POWERGRID/ERLDC may explain.

TCC may concur.

ITEM NO. B8:	STUDY OF REACTIVE ENERGY CHARGES PAYABLE BY WBSETCL SYSTEM

It has been observed that during 2017-18, the statement of weekly reactive energy charges payable by WBSETCL System to the Pool A/c is in the range of Rs. 40 – 50 Lakh and total payment to Reactive Pool A/c amounts to 3 crore. The Reactive Energy charges are payable only for either higher voltage (>103% of nominal voltage) high reactive (MVARh) injection or lower voltage (<97% of the nominal voltage) high reactive (MVARh) drawl. In order to investigate the reasons of such huge amount of reactive charges payable on continuous basis, ERPC and ERLDC have carried out a joint study on this score. It has been found that among the various tie points of WBSETCL with ISTS / neighbouring utilities, the following interconnecting points / ties are cause of concern to WBSETCL System which requires special attention:

Case : 1	Case : 2
Higher Voltage high MVAR injection	**Lower Voltage high MVAR drawal**
i) 220 kV Binaguri (PG) – NJP # 1 & 2	i) 220 kV Subhasgram (PG) – Subhasgram (WB) #1 & 2
ii) 400 kV Subhasgram (PG) – HEL(CESC)#1 & 2	ii)220 kV Subhasgram (PG) – EM Bypass (CESC) #1& 2
iii) 400 kV Sagardighi - Durgapur (PG) # 1 & 2	iii)220 kV Subhasgram (PG) – KLC Bantala / New Town
iv) 400 kV PPSP (New) – Ranchi (New) (PG) # 1 & 2	iv)132 kV Malda (PG) – Malda (WB) # 1 & 2
v) 400 kV Bidhannagar – Durgapur D/C of WBSETCL	

The details of the study results and the actions to be taken for reduction of Reactive Energy charges by WBSETCL is enclosed at **Annexure- B8.**

WBSETCL may please opine.

ITEM NO. B9:	STATUS OF IMPLEMENTATION OF NEW ISLANDING SCHEMES IN ER

1. ISLANDING SCHEME AT BANDEL TPS-WBPDCL

In 145th OCC, WBPDCL informed that the implementation at Power station would be completed by May 2018. Implementation part at Substation end for load segregation would be done by WBSETCL.

In 146th OCC, *WBPDCL and WBSETCL informed that the work would be completed by end of July, 2018.*

WBPDCL and WBSETCL may update.

2. ISLANDING SCHEME AT KANTI TPS - KBUNL

The islanding scheme was discussed in 68th PCC Meeting held on 18-06-2018.

After detailed deliberation, PCC in principle agreed with the following islanding scheme at Kanti TPS:

- Stage II units (2x195 MW) of Kanti TPS will be islanded with station load of 40 MW and radial load of 150 MW (approx.) of 220kV Kanti TPS-Gopalganj D/C line.
- Once the grid frequency falls to 48.2 Hz, the PLC at Kanti TPS would initiate the islanding process after 500 ms time delay.

TCC may note.

3. ISLANDING SCHEME AT IBTPS- OPGC

The islanding scheme was discussed in 68th PCC Meeting held on 18-06-2018. PCC opined that the draft scheme submitted by Odisha was three years old and the draft scheme is needed to be reviewed with existing network configuration.

PCC decided to discuss the islanding scheme in next PCC Meeting and advised OPTCL to submit all the relevant details to ERPC and ERLDC.

TCC may note.

ITEM NO. B10:	**IMPLEMENTATION OF AUTOMATIC DEMAND MANAGEMENT SCHEME (ADMS)**

As per IEGC 5.4.2.d –

"The SLDC through respective state Electricity Boards/Distribution Licensees shall also formulate and implement state-of-the-art demand management schemes for automatic demand management like rotational load shedding, demand response (which may include lower tariff for interruptible loads) etc. before 01.01.2011, to reduce overdrawl in order to comply para 5.4.2. (a) and (b). A report detailing the scheme and periodic reports on progress of implementation of the scheme shall be sent to the Central Commission by the concerned SLDC."

ADMS has so far been implemented by DVC and West Bengal. Therefore, Bihar, JUSNL and Odisha needs to expedite their respective implementation.

Maximum over drawl (MW and MU) observed for various constituents during March to May'18 are as follows:

Maximum over drawl (in MW)

	BSPTCL		JUSNL		DVC		OPTCL		WBSETCL		Sikkim	
	MW	Date	MW	Date	MW	Date	MW	Date	MW	Date	MW	Date
Max daily O/D in Mar - May-18	643	28-05-18 20:30	299	26-04-18 00:00	525	18-05-18 17:15	800	18-03-18 18:00	806	13-05-18 00:00	66	15-05-18 07:30
Max daily O/D in Mar-18	509	24-03-18 04:30	265	30-03-18 14:45	460	17-03-18 06:30	800	18-03-18 18:15	568	29-03-18 11:00	52	31-03-18 09:15
Max daily O/D in Apr-18	418	09-04-18 13:15	299	26-04-18 06:00	471	21-04-18 12:30	419	20-04-18 15:15	564	20-04-18 15:15	60	02-04-18 23:45
Max daily O/D in May-18	643	28-05-18 20:30	275	29-05-18 16:30	525	18-05-18 15:15	587	13-05-18 07:15	806	13-05-18 07:15	66	15-05-18 04:15

Maximum over drawl (in MU)

	BSPTCL		JUSNL		DVC		OPTCL		WBSETCL		Sikkim	
	MU	Date	MU	Date	MU	Date	MU	Date	MU	Date	MU	Date
Max daily O/D in Mar - May-18	4.07	16-04-18	3.23	11-03-18	4.99	21-04-18	6.34	30-03-18	6.52	15-03-18	0.55	12-05-18
Max daily O/D in Mar-18	1.49	22-03-18	3.23	11-03-18	2.83	20-03-18	6.34	30-03-18	6.52	15-03-18	0.42	31-03-18
Max daily O/D in Apr-18	4.07	16-04-18	2.87	20-04-18	4.99	21-04-18	3.91	22-04-18	3.82	19-04-18	0.42	02-04-18
Max daily O/D in May-18	2.97	18-05-18	2.68	12-05-18	4.54	15-05-18	5.09	25-05-18	5.23	05-05-18	0.55	12-05-18

It is important to note that during the month of May 2018,there were several instances when logic for ADMS operation was satisfied, but no relief observed in West Bengal system and only 200 MW relief was observed in DVC system. So, West Bengal and DVC may review their ADMS logic.

Instances,when the frequency was below 49.7 Hz during the month of March – June 2018 is shown in **Annexure – B10.**

Inadequate ADMS action, delay in implementation of 'ADMS' by Bihar and Odisha coupled with inadequate governor response by the majority of generators is increasing the vulnerability of the grid to disturbance. All constituents may accord top most priority to grid security by complying with the stipulation of IEGC.

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	3 months Feeders identified. Implemented by June 2018	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	9 Months Tendering for RTU installation is in progress. Implemented by May 2018	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.	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 142nd OCC, members opined that uniform logic should be implemented for all the states. OCC decided to review the logic of ADMS after implementation of the scheme by all the states.

ERLDC may explain.

TCC may discuss.

ITEM NO. B11:	AUTOMATIC UNDER FREQUENCY LOAD SHEDDING (AUFLS)

In 2nd NPC meeting held on 16th July 2013 it was decided to implement the following load shedding scheme:

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**

In 7th NPC held on 7th September 2017, it was agreed that there is need for review of the quantum of load shedding and introduction of additional slabs/stages of frequency.

NPC vide letter dated 30th May 2018 informed that considering the grid size and assuming Power Number of 7000, the following two options are proposed (computation procedure is enclosed at **Annexure-B11**):

Option 1:

AUFLS scheme with 4 stages of frequency viz. 49.2, 49.0, 48.8 & 48.6 Hz

AUFLS	Frequency (Hz)	Load relief in MW					
		NR	WR	SR	ER	NER	Total
Stage-I	**49.2**	3920	3360	3170	1380	170	12000
Stage-II	**49.0**	3950	3380	3190	1380	170	12070
Stage-III	**48.8**	3970	3400	3210	1390	170	12140
Stage-IV	**48.6**	4000	3430	3230	1400	170	12230
	Total (MW)	**15840**	**13570**	**12800**	**5550**	**680**	**48440**

Option 2:

AUFLS scheme with 4 stages of frequency viz. 49.4, 49.2, 49.0 & 48.8 Hz

AUFLS	Frequency (Hz)	Load relief in MW					
		NR	WR	SR	ER	NER	Total
Stage-I	**49.4**	3900	3340	3150	1370	170	11930
Stage-II	**49.2**	3920	3360	3170	1380	170	12000
Stage-III	**49.0**	3950	3380	3190	1380	170	12070
Stage-IV	**48.8**	3970	3400	3210	1390	170	12140
	Total (MW)	**15740**	**13480**	**12720**	**5520**	**680**	**48140**

NPC sought the views of RPCs on the review of quantum of load shedding and stages of frequency.

In 146th OCC, all the utilities were requested to send their comments to ERPC Secretariat within a week.

Members may discuss.

ITEM NO. B12:	THIRD PARTY PROTECTION AUDIT OBSERVATION OF DVC SUB-STATIONS

In view of repeated un-coordinated tripping in DVC generating sub-stations, a team of ERPC consisting members from ERPC, ERLDC and Powergrid visited 400kV Bokaro TPS, 220kV MTPS, DTPS, CTPS and BTPS S/s during 29th May 2018 to 1st June 2018. The observations are enclosed at **Annexure-B12.**

DVC may note and respond.

ITEM NO. B13:	UNRELIABLE OPERATION AT 400 kV MOTIHARI (DMTCL) S/S

400/132kV Motihari S/Stn. in Bihar is of critical importance as the two high capacity inter-regional lines (400kV Barh-Gorakhpur Qd. Moose D/C) link Eastern Region with Northern Region at this S/Stn. The 400 kV Barh-Motihari D/C Qd. Moose line is essential for reliable power evacuation from Barh STPS of 2X660MW capacity. Motihari S/Stn has itself provided for meeting about 200MW load, considering Bihar and Nepal loads together.

As on date, main CB of 125MVAR, 400 kV bus reactor-1, line isolator of 400kV Gorakhpur-2 line along with main and tie CBs of this line are out of service due to problem in gas duct. 400 kV Motihari – Gorakhpur – II was out of service due to unavailability of both bays at Motihari S/S.

In 145th OCC, DMTCL informed that 400kV Motihar-Gorakhpur D/C line is under outage due to non-availability of GIS spares.

In 145th OCC, DMTCL representative informed that the line will be restored by 20th July, 2018.

Total power failed at 400/132 kV Motihari substation on 07-04-2018 at 09:56 hrs and 18:25 hrs. respectively. These disturbances had led to blackout of 132 kV Radial loads of Bihar (Betiya, Motihari, Raxaul, Ramnagar, Dhaka, Sibhar, Narkatiyaganj) including 90 MW load loss at Nepal.

DMTCL was not in a position to explain the queries, which were mentioned in the PCC agenda.

In 67th PCC, it was decided to form a Committee with members from NTPC, Powergrid, ERLDC and ERPC. The Committee would visit 400kV Motihari S/s during 11th June 2018 to 13th June 2018 and will do on-site inspection along with Third Party Protection Audit and place the report in next PCC Meeting.

Accordingly, Third Party Protection Audit was done on 11th June 2018. Report is enclosed at **Annexure-B13**.

DMTCL may respond.

ITEM NO. B14:	FLEXIBLE OPERATION OF THERMAL POWER STATIONS-IDENTIFICATION OF PILOT PROJECTS

Central Electricity Authority vide letter dated 16th February 2018 informed that a special Task Force was constituted under IGEF Sub-Group-I for enhancing the flexible operation of existing coal-fired power plants. The Committee has recommended for implementation of measures for 50%, 40% and 25% minimum load in thermal power stations. The measures for 50% minimum load operation requires no investment or minimal investment. (Report is available on CEA website under TRM division)

Subsequently, a meeting was held under the Chairmanship of Member (Thermal) on 8th February 2018 wherein it was decided that 55% minimum load operation would be implemented nationwide in first phase. Further, six units, comprising of two units of NTPC and one unit each from DVC, GSECL, APGENCO, MSPGCL, would be taken up for 55% minimum load operation on pilot basis as 55% minimum load operation in line with the CERC notification dated 6th April 2016 and 5th May 2017 (IEGC 4th Amendment).

In 142nd OCC Meeting, NTPC informed all the units of NTPC were capable of 55% minimum load operation.

In 37th TCC meeting, *DVC informed that they would demonstrate the capability of 55% minimum load operation for one unit of DSTPS.*

Subsequently in the 145th OCC meeting DVC informed that they had carried out the test on 12.04.2018 and the details were awaited.

In 146th OCC meeting, DVC informed that they could bring down their machine up to 60 % without oil support and with the available quality of coal.

DVC may explain.

TCC may note.

ITEM NO. B15:	PROCUREMENT OF WEB-NET-USE SOFTWARE FOR ER CONSTITUENTS

The PoC Inter-State Transmission Charges and losses are published by CERC on Quarterly basis. A better understanding of the PoC Charges can be developed using "WEB-NET-USE" software which is developed by IIT Mumbai. GRIDCO, Odisha has contacted IIT Mumbai for procurement of the software. It was learnt that this software could be procured from I.I.T. Mumbai at the rate of **Rs 32.2Lakhs plus applicable Taxes, per year, up to 10 logins**. Thus 10 DICs can use the software simultaneously.

CTU is presently raising PoC Bills to all beneficiaries every month. Since the said software is highly essential for developing the understanding of the PoC regime, GRIDCO has suggested that the same should be procured by CTU from IIT Mumbai and hand over the same to ERPC for distribution among the beneficiaries of Eastern Region.

OCC agreed and referred to 37th TCC.

37th TCC advised Member Secretary, ERPC to study the methodology of procurement of WEB-NET-USE Software by NRPC and SRPC. Thereafter, a detailed proposal, if required, might be placed by ERPC Secretariat in next TCC meeting.

After consultation with other RPCs, it was found that, at present, none of them had procured the WEB-NET-USE software for their constituents. Some of the constituents of WRPC had procured the software themselves for their use.

Further, it is to mention that the CERC is likely to bring new regulations on Tariff, GNA/ Sharing of transmission charges, Transmission planning etc. Therefore, it is proposed that the software may be procured after the notification of GNA/Sharing of transmission Charges regulations.

TCC may decide.

ITEM NO. B16:	TRANSFER CAPABILITY DETERMINATION BY THE STATES

In order to ensure safe and secure operation of the grid, the states should carry out the power system study for operational planning and power transfer capability through their respective transmission links with the rest of the grid.

It was decided in the NPC meeting that to begin with, power system study for assessment of operational limits/power transfer capability for each state will be done by the concerned RLDC in association with concerned SLDC. Monthly TTC /ATC will be uploaded by the SLDCs at their respective websites and also communicated to concerned RLDC & NLDC subsequently.

At present all SLDCs except Bihar and Sikkim, are calculating TTC for their respective states on 3 months ahead basis.

BSPTCL has neither declared TTC nor has provided an updated base case in last six months. Representative of Sikkim has just been familiarized with the process to start TCC calculation.

In 146th OCC, BSPTCL and Sikkim informed that the persons dealing with TTC/ATC calculation got transferred which resulted in the discontinuation of ATC/TTC assessment work.

ED, ERLDC advised BSPTCL & Sikkim to send their new personnel to ERLDC for necessary training for enabling them to undertake TTC/ATC calculation and thereby, regularize the process of TTC/ATC calculation at the earliest.

BSPTCL informed they would calculate & update from next month onwards.

OCC underlined the need for continuity of the calculation for the benefits of the states and referred to TCC for guidance.

BSPTCL and Sikkim may update the status.

TCC may advise.

ITEM NO. B17:	INSULATOR REPLACEMENT OF 220KV CHUKHA-BIRPARA D/C LINE

In 60th PCC meeting, POWERGRID explained that the 220kV Chukha-Birpara D/c line is in lightning prone area. The line was repeatedly getting tripped due to insulator failures. POWERGRID has informed that line insulators of part of the line, which belong to POWERGRID had already been replaced with polymer insulators. As a result, failure of insulators of this portion during lightning had been reduced considerably. However, the line is getting tripped due to failure of porcelain insulators in 39.8 km stretch which belong to Bhutan.

The issue was discussed in 37th TCC Meeting and a special meeting was held on 27.03.2018.

Thereafter, BPC vide mail submitted the details of replacement of porcelain insulators with glass insulators in the 220kV Chukha-Birpara D/C line (Bhutan section). Out of 97 towers, porcelain insulators had been completely replaced with glass insulators in 31 locations, while, at 20 locations, only some insulator strings had been replaced. The remaining insulators would be replaced in a phase wise manner during preventive and break down maintenance.

Following is the list of tripping of 220 KV Chukha-Birpara D/C during the last 4 months:

Sl No	LINE NAME	TRIP DATE	Reason	Remarks (Length of line: Indian portion- 36 Km, Bhutan portion-36 Km, Total length- 72 Km)
1	220KV CHUKHA-BIRPARA-I	26-02-18	Y-N FAULT	Fault In Bhutan portion
2	220KV CHUKHA-BIRPARA-II	26-02-18	Y-B-N FAULT	Fault In Bhutan portion
3	220KV CHUKHA-BIRPARA-II	17-04-18	B-N Fault	Fault In Indian portion, near the boundary
4	220KV CHUKHA-BIRPARA-I	29-04-18	B-N Fault	Fault In Bhutan portion
5	220KV CHUKHA-BIRPARA-II	01-05-18	R-N Fault	Fault In Indian portion, near the boundary
6	220KV CHUKHA-BIRPARA-I	22-05-18	R-Y-N Fault	Fault In Bhutan portion
7	220KV CHUKHA-BIRPARA-II	22-05-18	R-B-N Fault	Fault In Bhutan portion
8	220KV CHUKHA-BIRPARA-I	24-05-18	R-B-N Fault	Fault In Bhutan portion
9	220KV CHUKHA-BIRPARA-II	24-05-18	B-N Fault	Fault In Bhutan portion, near the boundary
10	220KV CHUKHA-BIRPARA-II	02-06-18	Y-N FAULT	Fault In Bhutan portion
11	220KV CHUKHA-BIRPARA-I	04-06-18	B-N FAULT	Fault In Bhutan portion
12	220KV CHUKHA-BIRPARA-II	04-06-18	Y-B FAULT	Fault In Bhutan portion, near the boundary
13	220KV CHUKHA-BIRPARA-I	07-06-18		Fault In Bhutan portion

Most of the fault location is within Bhutan or close to India-Bhutan boundary, as in Indian portion, POWERGRID has already replaced the porcelain insulators by polymer type. Although in 147th OCC meeting Bhutan informed that all trippings are not related to insulator failure and they are replacing selected insulator stings with polymer insulators.
ERLDC requested Bhutan to share DR EL in the event of tripping

In 146th OCC, it was informed that recently three incidences were reported where the tripping was due to faults in the line, which is under the jurisdiction of Bhutan.

OCC advised Bhutan to submit a comprehensive plan to minimise the tripping in the line.

ERLDC/POWERGRID may explain.

BPC may update.

ITEM NO. B18:	OUTSTANDING ISSUES TOWARDS CHARGING OF 220KV TENUGHAT- BIHARSHARIF S/C LINE AT 400 KV LEVEL

The issue was discussed in several TCC Meetings.

In the special meeting of 14th December, 2017 the followings were emerged:

- 220 kV Tenughat- Biharsharif line is in very bad shape and need strengthening before charging at 400 kV level. The ground clearance might not meet the safety clearance requirement for 400kV level between some spans. It was further informed that line spans were very long and there might be a requirement of installation of new towers.
- It was emerged that the line was jointly maintained by JUSNL and BSPTCL as per their respective geographical area. The line has total 506 towers out of which JUSNL is looking after 290 towers and rest 216 towers are being maintained by BSPTCL.

- JUSNL and BSPTCL were advised to do survey of their respective portion of the line and assess the requirements like ground clearance, sag etc for charging the line at 400kV level. A report on the assessment may be submitted by March, 2018.
- JUSNL/TVNL informed that they will face problem in power evacuation during strengthening of 220 kV Tenughat- Biharsharif line due to outage.
- POWERGRID was advised to expedite 220kV TVNL-Govindpur line so that TVNL power can be evacuated during outage of 220 kV Tenughat- Biharsharif line.

As per the decision of 37th TCC, a Special Meeting was convened on 21st May, 2018 at ERPC, Kolkata to finalize the course of action for charging of 220kV Tenughat- Biharsharif line at 400 kV level.

In the meeting, it was informed that JUSNL has completed the survey and submitted the report for strengthening of line. However, BSPTCL furnished a report based on walkover survey. The followings were emerged from the reports:

a) Conductor of the line needs to be rectified or replaced due to ageing, bulging and rusting of the conductors.

b) The hardware fittings and jumpering were need to be replaced completely.

c) The complete Earth wire needs to be replaced with OPGW as the existing earth wire is missing at many locations.

d) There will be requirement of forest clearance and ROW clearances before charging the line at 400 kV level due to enhancement of corridor width from 35m to 53m (for 400 kV level).

e) The cost estimates for strengthening of line for JUSNL and BSPTCL portions would be approximately ₹ 65.12 Cr. and ₹ 55 Cr. respectively.

After detailed deliberations, it was concluded that the 220 kV Tenughat- Biharshariff line should be charged at 400 kV level only after strengthening of the line.

TCC may discuss and advise.

ITEM NO. B19:	EXPEDITIOUS COMMISSIONING OF 400KV FSTPS – BAHARAMPUR (TWIN HTLS) D/C LINE

The above line is part of ERSS-XV project and linked with transfer of 1000MW power from India to Bangladesh. In the 7th OCC meeting with Bangladesh held on 04-06-18, it was learnt that commissioning of the 2nd 500MW B-t-B HVDC converter station at Bheramara is in an advanced stage and by July 2018 Bangladesh would be ready to import 1000MW from India through the existing 400kV Baharampur-Bheramara 400kV D/C line, with suitable modification of their own defence mechanism.

Under the circumstances, to meet the enhance export of power to Bangladesh, it is absolutely essential to commission the 400kV FSTPS-Baharampur (Twin HTLS) D/C line at the earliest .. As this activity involves shutdown of the existing 400kV FSTPS-Baharampur (Twin Moose) S/C line, WBSETCL was requested to extend necessary cooperation for facilitating timely completion of the Twin HTLS line which is under construction. Enhanced export of power to Bangladesh would benefit both the countries.

In 146th OCC, Powergrid elaborated their detailed plan of interim arrangement during the commissioning work of above lines. They informed that, keeping in view of the grid security and West Bengal demand, they had fine-tuned their plan so as to minimize the period of interim arrangement with reduced grid security to 10 days.

WBSETCL informed that, based on the study undertaken by them, any outage of the lines in the interim arrangement during shutdown would likely to overload their ICTs which, in turn, would necessitate huge load curtailment.

OCC advised WBSETCL that, as the proposed line has significant importance in view of enhancing the power transfer capability to Bangladesh, it should facilitate the shutdown so as to complete the work in timely manner.

WBSETCL informed that they would discuss the issue with their management and revert back within a week.

ERLDC/POWERGRID may explain.

WBSETCL may update.

ITEM NO. B20:	**STATUS OF 400KV TEESTA III-RANGPO-KISHANGANJ D/C LINE AND 400KV DIKCHU- RANGPO S/C LINE IN SIKKIM**

A. STATUS OF 400KV TEESTA III-RANGPO-KISHANGANJ LINE

In special meeting held at ERPC, Kolkata on 25th April 2018, TPTL informed that 400kV Rangpo-Kishanganj D/C line would be commissioned by 31st July 2018.

CTU has granted LTA of 174 MW for transferring power from Teesta-III HEP to UPPCL w.e.f 12th May, 2018.

TPTL may update. TCC may discuss.

B. STATUS OF 400KV DIKCHU- RANGPO S/C LINE

In 146th OCC, TPTL informed the construction of the line has been completed and the line is ready for charging.

OCC advised TPTL to submit the first time charging documents for their line segment to ERLDC. OCC advised concern bay owners (Dikchu and Powergrid) to submit the first time charging documents to ERLDC.

Members may update.

ITEM NO. B21:	**REPAIR/RECTIFICATION OF TOWER AT LOCATION 79 OF 132KV RANGPO-MELLI D/C LINE AND CHUZACHEN (RANGPO) -GANGTOK TRANSMISSION LINES**

POWERGRID had informed that their patrolling team had observed bent in part of tower no. 79 of 132kV Rangpo-Melli D/c line and Chuzachen(Rangpo)-Gangtok transmission lines which might further degrade the condition of tower.

In 137th OCC, POWERGRID informed that tower no. 79 of 132kV Rangpo-Melli D/c line and Chuzachen(Rangpo)-Gangtok transmission lines falls under the jurisdiction of Energy & Power Department, Govt. of Sikkim.

In 37th TCC, it was decided that Sikkim would give a comprehensive proposal to PGCIL within one week regarding handing over of the relevant segments of the line to PGCIL. Thereafter, PGCIL and Sikkim would sit together and resolve the issues involved therein.

In 145th OCC, Sikkim informed that the proposal had been sent to State Govt. for approval.

In 146th OCC, Sikkim informed that State Govt. for approval is pending.

OCC took serious note of delay in tower rectification and referred to TCC for further guidance.

Sikkim may update.

TCC may Guide.

ITEM NO. B22:	**STATUS OF CONSTRUCTION OF CHUZACHEN BAYS AT RANGPO S/S.**

Construction of bays at Rangpo S/s meant for evacuation of power from Chuzachen has been undertaken by Department of Power, Govt of Sikkim, under consultancy with POWERGRID.

In 35th TCC, Sikkim informed that retendering work was in progress.

Sikkim assured that they would commission the bay within the target date i.e. December, 2017.

In 36th TCC, Sikkim informed that the work has been awarded and commissioning is expected by March, 2018.

In 37th TCC, Sikkim assured that they would resolve the issue in coordination with PGCIL ER-II.

Sikkim may update.

ITEM NO. B23:	**RESTORATION OF MPL-MAITHON D/C LINES**

At around 5:21 hrs on 10th May 2018, both 400kV MPL-Maithon (PG) line-1 and 2 tripped on Line to Earth and Phase to Phase fault. Later upon physical inspection from MPL end, it was found that 3 nos. towers namely 63, 64 and 65 have collapsed at 2 kms from MPL periphery. Being a double circuit tower both Maithon-1 and 2 are not available for evacuation of power.

In 145th OCC, Powergrid informed that restoration of 400kV MPL-Maithon line-1 and 2 using ERS towers is not possible as the damaged tower was at river crossing. However, Powergrid assured that the line would be restored by 15th July 2018.

MPL and Powergrid may update.

ITEM NO. B24:	ERECTION AND COMMISSIONING OF 2 NOS. 220 KV LINE BAYS AT MTPS, KBUNL, BIHAR

At present, 220 kV KBUNL – Samastipur (D/C) and KBUNL – Motipur (D/C) lines have only one 220 kV bays each at KBUNL end and 2nd bay of the each of the above lines had not been commissioned since long. In absence of these bays at KBUNL end, the 2nd circuit of the above lines is remained unutilised and evacuation of total power from KBUNL is being restricted. The execution of construction works of 2nd bay could not be taken up mainly for the want of awarding the contract to suitable agency.

In the previous (37th) TCC meeting, it was decided that ERPC would convene a separate meeting with KBUNL and BSPTCL to expedite the works.

Accordingly, a special meeting has been convened at ERPC with BSPTCL, NTPC and ERLDC to assess the progress of the construction works of 2 nos. 220 kV 2nd bay at KBUNL end. It transpired that NTPC has taken up best efforts to complete the work as detailed below:

i) NIT has already floated and bid will open by 10.07.2018. BSPTCL and Powergrid will also help to identify suitable local / relevant bidders for the bidding process to undertake the construction works.
ii) Once the award of the contract is finalised, the work is expected to be started by August, 2018 and target of completion schedule of 2 nos. bays by September, 2018. The balance works i.e. 3 nos. additional bays out of 5 nos. bays under the scope of the work will be completed by 31.01.2019.

Members may please note.

ITEM NO. B25:	ISSUANCE OF TAKING OVER CERTIFICATE (TOC) FOR DSTPS-RTPS OPGW LINK BY DVC

In 19th SCADA O & M meeting held on 7th April 2017 at ERLDC, Kolkata, POWERGRID had informed that they were not able to complete the OPGW work in 400 kV DSTPS – RTPS in DVC Sector under Microwave Replacement Package due to severe ROW issue. POWERGRID further informed that they had mobilized the team several times, but work could not be completed due to heavy ROW / compensation issues related to TL construction resulting non-completion of 2 nos. OPGW drum (approx. 9 Km) out of total 69.182 Km. POWERGRID again informed that this issue was discussed in various fora, but the solution could not be provided by DVC. DVC informed that they are not able to resolve the issue as this was an old ROW / compensation issue related to TL construction. OPGW work in this link could not be completed due to ROW/Compensation issues since September-2013.
In 36th ERPC meeting, matter was deliberated and DVC informed that they would try to resolve ROW issues by 31st October-2017. Otherwise, they would provide the necessary certificate.

In 20th SCADA O&M meeting held on 15th December-2017, POWERGRID informed that DVC had not yet issued Taking over Certificate for this link. DVC confirmed that they would issue TOC and request for a letter from POWERGRID. POWERGRID issued the request letter on 20.12.2017. However, Taking over Certificate is yet to be issued by DVC.

In 37th TCC, DVC informed that the ROW issue would likely to be resolved after the Panchayat Election of West Bengal.

In 21st SCADA O & M meeting held on 19th June 2018, POWERGRID proposed the following:

(A) DVC shall issue of trial operation certificate for completed portion (69.182 Km completed out of total 70 Km).

OR

(B) Deletion of the link from MW replacement Package and DVC shall reimburse the cost incurred for DSTPS-RTPS link along with requisite overhead charges (15%) to POWERGRID.

DVC informed that their higher management is taking up the matter and decision for appointing separate agency for laying of the said OPGW is under process. POWERGRID requested DVC to provide space in their premises for keeping the OPGW materials. DVC agreed and informed that they will revert back by 28th June 2018.

DVC may update.

ITEM NO. B26:	OPERATIONALIZING BLACK START FACILITY AT PURULIA PUMP STORAGE PROJECT (PPSP) OF WBSEDCL

The issue was discussed in last several OCC meetings. However, till date, no fruitful conclusion has arrived. As orders for operationalization of black start facility at PPSP is already passed by honorable CERC and APTEL. Thus, under this condition, only two choices remain, that is either to perform mock black start test or to obtain an exemption from CERC/APTEL, a state in between these two, (unfortunately which is the present scenario) is not acceptable.

In 146th OCC meeting WBSEDCL informed that they would seek exemption from CERC / APTEL in this regard.

As the ER grid is already deprived of the reliability benefits that could have been made available by PPSP.

ERLDC may explain.

WBSEDCL may update.

ITEM NO. B27:	RESTRICTED GOVERNOR /FREE GOVERNOR MODE OPERATION OF GENERATORS IN ER

The issue was discussed in *37th TCC Meeting and monthly* OCC meetings and *all the generators were advised to ensure proper RGMO/FGMO response of their units.*

The 145th OCC advised all the generators to ensure proper RGMO response of their units and submit data relevant for monitoring unit performance to ERLDC within seven days before the OCC. However, none of the generating stations/utilities has submitted high resolution (1sec) data till last OCC, for the following events:

1. Event 1:- On 23.04.2018 at 10:42 Hrs, Multiple tripping of lines from Kotra (PG) due to DC earth fault reported in 765kV Kotra S/S consequently Generation loss of 3090MW occurred. Leading to 0.3 Hz dip in frequency.
2. Event 2:- On 06.05.2018 at 16:51 Hrs, there was generation loss of 1100 MW on account of tripping of Lalitpur Unit-I, II& III due to loss of evacuation path. Resulting in 0.055 Hz dip in frequency
3. Event 3:- On 10.05.2018 at 06:12 Hrs, there was generation loss of 900 MW on account of tripping of DSTPS unit I & II of DVC due to loss of evacuation path. Resulting in 0.054 Hz dip in frequency

Further, in 146th OCC meeting, it was once again requested to submit one-second high-resolution data from generating units for the above-mentioned event within 7 days. However, till date, high-resolution data is received only from following utilities:

Sl No	Event	High resolution (1Sec) data received from WBPDCL
1	Event -1	Bandel unit 5, STPS #5, 6
2	Event -2	STPS #5, 6
3	Event -3	Bandel unit 5, STPS #5, 6

In 146th OCC, all the Generators agreed to send the relevant data to ERLDC within a week.

OCC advised ERLDC to analyse the RGMO/FGMO response and place a report in ensuing TCC meeting scheduled to be held on 29th June,2018.

ERLDC may elaborate.

TCC may discuss.

ITEM NO. B28:	PAYMENT/RECEIPT STATUS FROM VARIOUS POOL ACCOUNTS IN ER

1) PAYMENT OF DEVIATION CHARGE – PRESENT STATUS

Deviation Pool Account Fund of ER is being maintained & operated by ERLDC, in accordance with the CERC Regulations. As per Regulations 10 (1) of "Deviation Settlement Mechanism and related matters" the payment of charges for Deviation shall have a high priority and the concerned constituents shall pay the indicated amounts within 10 days of issue of statement of Charges for Deviation including Additional Charges for Deviation by the Secretariat of the respective Regional Power Committee in to the "Regional Deviation Pool Account Fund" of the concern region.

The status of Deviation Charge payment as on 01.06.2018 is enclosed at **Annexure –B28.1**. The current principal outstanding Deviation Charge of JUVNL & BSPHCL is **₹16.58 Cr & ₹ 5.44 Cr** respectively considering bill up to 13.05.2018. ERLDC has given reminders to BSPHCL & JUVNL to liquidate the outstanding Deviation charges.

Further SIKKIM is not paying DSM charges and waiting for adjustment with the receivable amount.

In 37th CCM, ERLDC informed that BSPHCL had partially liquidated their dues and the present outstanding stood around ₹ 5.36 Cr. The outstanding against JUVNL is also around ₹ 15.69 Cr.

BSPHCL, JUVNL & SIKKIM representatives were not present.

As per the decision taken in 37th CCM, ERPC Secretariat has already written letters to the concerned constituents for liquidation of their dues by 25th June, 2018.

Subsequently, BSPHCL informed that they have cleared the payment of ₹ 1.55 Cr & ₹ 3.89 Cr on 08.06.18 &13.06.18 respectively.

ERLDC may update the latest status.

2) DISBURSEMENT OF INTEREST DUE TO DELAYED PAYMENT OF DEVIATION CHARGES.

Outstanding deviation charges including interest for all the ER constituents (except Vedanta of ₹ 3, 51,637 towards interest) along with Inter-regional Pool during FY 2016-17 are fully settled.

Due to delayed payment of deviation charges in DSM Pool in FY 2017-18, Interest amount is computed (till 31.05.18) for all the DSM Pool Members. The statement of interest amount is enclosed in **Annexure –B28.2**. Settlement of delayed payment Interest for 2017-18 for the recipient constituents has been done on 01.06.18.

In 37th CCM, GRIDCO assured that the issue related to outstanding of Vedanta would be resolved positively by 25th June 2018 and they would confirm it in forthcoming TCC Meeting.

As per the decision taken in 37th CCM, ERPC Secretariat has already written letters to the concerned constituents for liquidation of their dues by 25th June 2018.

Subsequently, BSPHCL informed that they have cleared the payment of ₹ 27.49 Lakh on 13.06.18.

ERLDC/ GRIDCO may update.

3) REACTIVE ENERGY CHARGES – PRESENT STATUS.

The updated position of Receipt/Payment of Reactive Energy Charges in the pool as on 01.06.2018 (considering bill up to 13.05.2018) is indicated in **Annexure –B28.3**. The total outstanding receivable on account of Reactive charges from West Bengal is **₹ 3.34 Cr** & from SIKKIM is **₹ 2.97 Lac**. SIKKIM has not paid the Reactive energy Charges since last one year.

Out of the above amount of **₹ 3.34 Cr** i.r.o WBSETCL/WBSEDCL, reactive amount receivable from WBSEDCL prior to 04.01.2016 is **₹ 1.82 Cr** (prior to Suo-moto order dated 21.07.2016 of the Hon'ble WBERC in the matter of case no: SM-14/16-17) which is long pending and not cleared yet.

In this regard it is to inform that WBERC vide letter no. WBERC/B-7/1/0470 dated 16.06.2017 has clarified that the Reactive Energy bills prior to 04.01.2016 is to be settled as per the previous practice followed to settle the bills.

In 37th CCM, WBSEDCL assured that the payment issue would be resolved by next TCC meeting.

As per the decision taken in 37th CCM, ERPC secretariat has already written letters to Sikkim for liquidation of their dues by 25th June, 2018.

ERLDC/ WBSEDCL/Sikkim may update.

ITEM NO. B29:	OPENING OF LC BY ER CONSTITUENTS FOR DEVIATION CHARGES PAYMENTS

Clause 10 (4) of CERC Deviation Settlement Mechanism and related matters Regulations, 2014 vide notification No. L-1/132/2013/CERC dated 6th January, 2014 to be implemented from 17.02.2014.

As intimated by ERLDC, the details of LC amount required to be opened in 2018-19 by ER constituents is given in **Annexure – B29.** Letters to this effect has been issued by ERLDC to the defaulting entities.

In 37th CCM, it was informed that DIKCHU and BRBCL had opened their LC and for TEESTA-III, it was in process.

JUVNL, GMR and IBEUL, CHUZACHEN, SIKKIM, THEP representatives were not present in the meeting.

As per the decision taken in 37th CCM, ERPC secretariat has already written letters to the concerned utilities to open their LC at the earliest.

Constituents may please intimate the latest status LC.

ITEM NO. B30:	METER RELATED ISSUES

1) NON RECEIPT OF SEM DATA FROM VARIOUS LOCATIONS

I. MOTIHARI, BETIAH AND RAXAUL (BSPTCL)

BSPTCL end meter data from Motihari, Betiah and Raxaul end of DMTCL Motihari Line is not being sent by BSPTCL on regular basis. Due to non-availability of data from BSPTCL end on regular basis, validation of power through the line is being affected. The matter was informed to BSPTCL for sending the data. However there is no improvement in the status.

BSPTCL may please respond.

II. BIDHANNAGAR(WBSETCL)

Defective meter NP-6485-A at Bidhannagr (WB) end of 220 KV Waria(DVC) Line-2 is replaced with Genus meter on 23.05.18. However Meter data of newly installed Genus meter is not being sent by WBSETCL.

In 37th CCM, WBSETCL representative informed that they have no laptop for downloading the newly installed Genus meter data. ERLDC suggested that the latest version of the software, which is available on ERLDC website, might be installed in the existing laptop in order to successfully send the meter data.

WBSETCL may update.

2) REVERSE POLARITY OF METER

Following meters installed at different Locations are connected in Wrong/Reverse Polarity since installation of meters which needs to be corrected. The matter has already been informed to respective Sub stations through e mail and telephonically.

Location	SEM S. No	Line	Responsibility	Present Status
Darbhanga (DMTCL)	ER-1272-A ER-1273-A	400 KV Darbhanga DMTCL-Muzafarpur D/C Line	DMTCL/PGCIL	Same

The matter was last discussed in 37th Commercial sub Committee Meeting. However the polarity is still reversed.

DMTCL may correct the Polarity of the meters at their end.

ITEM NO. B31:	OUTSTANDING ISSUES RELATED TO IBEUL

1) NON-PAYMENT OF DEVIATION CHARGES BY IBEUL

IBEUL is not paying Deviation charges in ER DSM Pool since 12.04.2017 (more than one year) and present outstanding amount payable by M/s IBEUL towards principal deviation charges is ₹ **112.50429 Lac** considering bill up to 13.05.2018 and **₹ 10.33012 Lac** against the delayed payment interest of deviation charges till 31.05.18.

2) NON RECEIPT OF SEM DATA FROM IND-BARATH (IBEUL)

Six (6) nos of SEM are installed at Ind-Bharath end for energy accounting of IBEUL. As per IEGC, every Utility has to send SEM data to respective RLDC by Tuesday noon in every week. IBEUL is not sending the SEM data since April'17. Due to non-receipt of data, validation of data of other end i.e Sundergarh is being affected. Several reminders through mail and phone were sent to the representatives of IBEUL but till date no data is received.

In 145th OCC, it was decided to convene a separate meeting with IBEUL to resolve the issues.

Accordingly, a special meeting was convened at ERPC, Kolkata on 01.06.2018 wherein IBEUL representative did not attend the meeting.

As per the decision taken in 37th CCM, ERPC secretariat has already written letters to IBEUL for clearing their outstanding dues at the earliest.

Further, in 146th OCC meeting, it was noted that IBEUL is not adhering to the decisions of any forum of ERPC and not clearing the outstanding dues of various pool accounts of Eastern Region. Further, OCC recommends that suitable actions including de-registering IBEUL as Regional Entity might be explored.

Subsequently, Powergrid vide letter dated 18.06.2018 had issued a Termination Notice of 30 days to IBEUL in line with their TSA. Further, after the expiry of 30 days of issuance of theTermination Notice IBEUL shall cease to be party to the TSA and therefore shall cease to be a DIC and therefore shall be ineligible to inject power into ISTS.

TCC may discuss.

ITEM NO. B32:	OUTSTANDING PAYMENT ISSUE BETWEEN M/S JITPL AND POWERGRID

There was an agreement between M/s JITPL and Powergrid on 07.02.2011 regarding Consultancy fee @ 15% of final project cost for execution of 4 nos. 400 kV bays (2 No. main + 2 no. Tie) inside Angul pooling station of Powergrid. The project was awarded to M/s SIEMENS for supply of equipment and its erection & commissioning amounting to Rs. 18.81 crore, thereby consultation fee (15%) of Powergrid works out to Rs. 2,82,15,000/-. The net amount payable was 2,88,71,932/- (consultancy fee + taxes), of which M/s JITPL paid Rs. 2, 88,98,297/- thereby leaving excess amount Rs. 26365/-. Further, the earmarked bays were commissioned on 02.06.2014 and thereafter, bay maintenance by Powergrid is continued as per the agreement i.e. Powergrid will raise the bill on quarterly basis and M/s JITPL shall pay within 15 days' time, failing which the delayed payment will accrue interest. The project cost of M/s SIEMENS was subsequently amended 2 times 17.74crore and Rs. 16.56 crore respectively by M/s JITPL. Powergrid indicated outstanding payment against O&M charges – Rs. 53.56 Lakh and Interest charges – Rs. 57.24 Lakh, thereby total outstanding amounts to Rs. 1.11 Crore (approximately).

As advised by 37th TCC, a special meeting was convened on 18.05.2018 at ERPC, it was informed that a Court case on the issue of LD payment between Powergrid and M/s SIEMENS is under process, as such M/s JITPL was not in a position to issue a final amended project cost. It was decided that consultancy contract between M/s JITPL and Powergrid may be closed at Rs. 17.74 crore as an interim measure (till Court verdict), the excess payment of M/s JITPL on this account will be adjusted with subsequent bay maintenance charges by Powergrid.

Regarding bay maintenance charges since commissioning of bays, vis-à-vis interest accrued, if any, due to delayed payment by M/s JITPL, it was decided that Powergrid will raise the bill on quarterly basis henceforth and payment shall be made by M/s JITPL within 15 days' time. On this issue, the interest accrued due to past delayed payment, which was not fully attributed to M/s JITPL,it was decided that M/s JITPL could approach to higher authority of Powergrid for such waivers. Powergrid also suggested to explore possibilities of opening LC with bank to avoid interest accrual due to delayed payments in future.

TCC may note.

ITEM NO. B33:	SCHEDULING OF CHUZACHEN HEP AND TASHIDING HEP

Scheduling of Chuzachen HEP and Tashiding HEP is carried out by ERLDC, as per Indian Electricity Grid Code Clause 6.4.3. The clause 6.4.3 states

Quote:

"There may be exceptions with respect to above provisions, for reasons of operational expediency, subject to approval of CERC. Irrespective of the control area the jurisdiction, if a generating station is connected both to the ISTS and the STU, the load dispatch centre of the control area under whose jurisdiction the generating station falls, shall take into account grid security implication in the control area of the other load dispatch centre. "

Unquote:

Presently for net injection of Chuzachen, Gangtok(PG) and Rangpo(PG) end meter is used and for Tashiding net injection , New Melli(PG) and Rangpo(PG) end meter is being used.

It was decided in the 36th ERPC meeting that Tashiding would approach CERC and obtain approval from Hon'ble commission regarding scheduling of Tashiding HEP by ERLDC. Tashiding HEP and Chuzachen HEP are yet to approach CERC for the said approval.

In 37th CCM, the followings were decided:

i) The metering points for Chuzachen and Tashiding HEPs, would be at CTU end.

ii) As Chuzachen and Tashiding HEPs are embedded generators of Sikkim, both need to seek approval from CERC regarding scheduling by ERLDC.

ERLDC may explain.

ITEM NO. B34:	DEPUTATION OF NODAL OFFICERS BY REGIONAL ENTITIES

All Regional entities are requested to intimate the contact details of the Nodal Officer who could coordinate with their sites and ERLDC to ensure the following:

- Under - recording of SEM data due to reasons such as CT/PT input problems
- Polarity reversal
- Change in CT/PT ratio
- Meter replacements
- Completeness w.r.t no of meters and no of days
- Checking of time drift in meters: correction and reporting to RLDC
- Data non-availability due to reasons such as outage of Feeder etc.

It was requested to furnish the details like Name, designation, Mailing address, Landline No, Fax No, Email Id, Mobile No etc. to ERLDC for smooth transaction of SEM data.

So far details of Nodal person only from JUVNL, BSPHCL, GATI, DVC, Rangit, Teesta-V, NTPC ER-I(HQ), Talcher NTPC, GMR, BRBCL and GRIDCO have been received by ERLDC.

In 35th CCM, it was agreed by members that SLDC Chief in case of states and Station Head in case of generating station may be taken to be nodal officers for coordinating meter related issues.

Other constituents/beneficiaries are requested to furnish the details like Name, designation, Mailing address, Landline No, Fax No, Email Id, Mobile No etc to ERLDC for smooth transaction of SEM data.

Members may please update.

ITEM NO. B35:	ISSUES RELATED TO ASSOCIATED / DOWNSTREAM SYSTEMS

WEST BENGAL

1. **2 nos. 220 KV line bays at Subhashgram (PG) s/s**: Bays are ready and idle charged under ERSS-VIII due to non readiness of 220 KV D/C Subhashgram – Baruipur Tr. line and associated bays at Baruipur. Order recently placed by WBSETCL and expected completion by December 2018. Program for readiness of lines for utilisation of above bays to be confirmed by WBSETCL.

2. **6 nos. 220 KV bays at Rajarhat GIS substation under ERSS-V -** 02 no. bays of 220 KV will be utilized through LILO of 01 ckt of 220 KV Jeerat New Town Tr. line (WBSETCL) at Rajarhat. (Scope -02 nos. tower, 700 mtr stringing); Program for readiness of lines for utilisation of above bays to be confirmed by WBSETCL. Construction activity of 220 kV line bays was completed. Due to public agitation, work is stopped from January' 2017 to till date. Even the security guard of POWERGRID was advised to vacate the premise on 17.01.17 by local police for safety of lives. Severe damage of Panels, cables etc have been done by the miscreants during unmanned period. It may take 3-4 months for completion of 220 kV line bays (damaged by miscreants) after clearance for re-commencement of the work at Rajarhat S/S by State Govt. administration.

In 146th OCC, WBSETCL updated the completion schedule of inter-connecting system as follows:

Sl. No.	Name of the transmission line	Completion schedule
1.	**2x315MVA, 400/220kV Alipurduar sub-station**	
a.	Alipurduar (POWERGRID) – Alipurduar (WBSETCL) 220kV D/c (***Twin moose***)	*The line was commissioned on 6th June 2018*
2.	**2x500MVA, 400/220kV Rajarhat---**	
a.	Rajarhat-N. Town-3 (WBSETCL) 220 kV D/C line	Matching, ROW problem
b.	Rajarhat-N. Town-2 (WBSETCL) 220 kV D/C line	June, 2018,ROW problem
c.	Rajarhat- Barasat (WBSETCL) 220 kV D/C line	June, 2018,ROW problem
3	**Subashgram400/220kVS/s**	
a	Subashgram–Baraipur220kVD/cline	Feb 2019, 50% of work has been completed.

ODISHA

1. **4 nos. 220 KV bays at Bolangir S/S :**Out of total 4 nos. 220 KV line bays, 2 nos. are commissioned during Feb'16 and 2 nos. are pending due to unavailability of 220 KV lines of OPTCL. Program for utilisation of balance 2 bays to be confirmed by OPTCL.

2. **6 nos. 220 KV bays at Pandiabil GIS:** Pandiabil (PG) substation is ready for commissioning since July '16. DOCO held up due to non-readiness of 220 KV lines of OPTCL. OPTCL to confirm plan for readiness of the lines for utilization of 6 nos. 220 KV line bays. Readiness of 220 KV Feeders by OPTCL critical for downstream power flow from Pandiabil (PG) S/S.

3. **4 nos. 220 KV bays at Keonjhar S/S:** Utilisation of total 4 nos. 220 KV line bays is pending due to unavailability of 220 KV lines of OPTCL. Program for readiness of lines for utilisation of above bays to be confirmed by OPTCL.

In 36th TCC OPTCL informed that at Pandiabil, 2 no. bays already utilized and 2 no. bays awaiting for approval of ERLDC. In 146th OCC, OPTCL updated the completion schedule of inter-connecting system as follows:

Sl. No.	Name of the transmission line	Completion schedule
1.	**2x315MVA 400/220kV Bolangir S/s**	
a.	LILO of one circuit of Sadeipalli-Kesinga220 kV D/C line at Bolangir S/S	*Only 7 towers left (Severe ROW problem).**By June, 2018.***
2.	**400/220kV Pandiabil Grid S/s:**	
a.	Pratapsasan(OPTCL)-Pandiabil(PG) 220 kV D/C line	By Dec, 2018.
3.	**400/220 kV Keonjhar S/S**	
a.	Keonjhar (PG)-Keonjhar (OPTCL) 220 kV D/C line	By June, 2018.
b.	Keonjhar (PG)-Turumunga(OPTCL) 220kV D/C line	By 2019. The work is yet to be started.

JHARKHAND

JUSNL has finalised their downstream of 220 KV & 132 KV TL to evacuate the power from Daltonganj (PG) S/S. 400/220Kv Daltonganj (PG) S/S under ERSS III & 220/132 KV Daltonganj (PG) S/S under ERSS XVII are ready. The following downstream work would be constructed by JUSNL to match for drawl of power from 220 KV & 132 KV level from Daltonganj (PG) :

Eastern Region System Strengthening Scheme III :

- Daltonganj (POWERGRID) – Latehar 220Kv D/C
- Daltonganj (POWERGRID) – Garhwa 220kV D/c

Eastern Region System Strengthening Scheme XVII:

- Daltonganj (POWERGRID) – Daltonganj (JUSNL) 132kV D/C
- Daltonganj (POWERGRID) – Chatarpur/Lesliganj132kV D/c

Contingent plan:

The contingent arrangement for the evacuation of power from Daltonganj Substation shall be connecting through existing 220kV D/C Daltaonganj-Latehar (presently charged at 132 kV) line passes through Daltonganj SS (PG), which require the diversion, at a distance of about 1km from Daltonganj(PG) only & It is to be disconnected when the original 132kV line from Daltonganj(PG) to Daltonganj(JUSNL) become ready by M/s R S Infra Private Limited.

JUSNL requested to expedite the transmission line of 220 kV & 132 kV for normalization of the system as required.

In 146th OCC, JUSNL updated the latest status as follows:

Sl. No.	Name of the transmission line	Completion schedule
1.	**Daltonganj 400/220/132kV S/s:**	
a.	Daltonganj(POWERGRID)–Latehar220kVD/c	By April, 2019.
b.	Daltonganj (POWERGRID) – Garhwa 220kV D/c	The line expected to be completed by May, 2018 but – Garhwa 220kV is expected to be completed by Dec 2018.
c	Daltonganj (POWERGRID) – Daltonganj (JUSNL) 132kV D/c	The line would be charged as per original configuration by July 2018. At present, Daltonganj (PG) has been connected to Daltonganj (JUSNL) at 132kV through existing 220 kV Latehar-Daltonganj line as stop gap arrangement till completion of the line.
d	Daltonganj (POWERGRID) – Chatarpur/Lesliganj 132kV D/c	Tendering is in progress. Expected to be completed by October 2019
2	**Chaibasa400/220kVS/s**	
a	Chaibasa(POWERGRID)–Noamundi220kVD/c	Not yet started
3	**Dhanbad400/220kVS/s**	
a	LILO of Govindpur–Jainamore/TTPS 220kVD/c at Dhanbad	ROW issues.Target date November 2018.

Members may please update.

ITEM NO. B36:	AUGMENTATION OF 400/220KV ICT CAPACITY AT MAITHON, PATNA, SASARAM, BIHARSHARIFF

ICTs of (1X315+1X500) MVA capacity exists at Maithon, Patna and Sasaram. In the peak period, the total power catered by each of the sub-stations is high enough to cause tripping of the parallel 315MVA ICT, if the 500MVA ICT trips. Similarly, if one out of the 3X315 MVA ICTs at Biharshariff trips, the other two ICTs are also likely to trip on overload.

The 315 MVA ICTs at Patna and Sasaram are already planned to be replaced by 500MVA ICTs while a 500MVA ICT is scheduled to be added each at Maithon and at Biharshariff.

19th SCM approved the 3rd 500 MVA ICT at Patna for fulfilling the (n-1) criterion and in view of load growth at Patna area.

CTU informed that in view of changed scenario at first the 3rd 500 MVA ICT will be commissioned at Patna and after that the 2nd 315 MVA ICT will be replaced with 500 MVA ICT.

In 37th TCC, POWERGRID updated the latest status as follows:

S. No.	*Name of the Substation*		*Status*
1	*Patna*	*Argumentation of 315 MVA ICT with 500 MVA ICT*	*The 2nd 500 MVA ICT was installed in place of 3rd ICT.*
		New 500 MVA 3rd ICT	
2	*Maithon*	*Installation of new 500 MVA 2nd ICT*	*Installed in October 2017*
3	*Biharshariff*	*Installation of new 500MVA 4th ICT*	*Installed by January 2019*
4	*Sasaram*	*Argumentation of 315 MVA ICT with 500 MVA ICT*	*will be done in 1st quarter of 2018-19.*

POWERGRID may update.

ITEM NO. B37:	PRIORITY-BASED COMMISSIONING OF BUS REACTOR FOR CONTROL OF HIGH VOLTAGE DURING LEAN PERIODS

POWERGRID updated the latest status in 146th OCC Meeting as follows:

S.N.	Reactor	Status
1	125 MVAR Bus reactor of Jamshedpur	Charged on 1st December 2017
2	125 MVAR Bus reactor of Biharshariff	Commissioned
3	Additional bus-reactor of 125 MVAR capacity at Beharampur.	Commissioned in March'18.
4.	125 MVAR Bus reactor of Subashgram	***LOA placed.***

POWERGRID may update.

*Powergrid added that considering the low voltage issues in Eastern Region, the following reactors would be commissioned in advance as per the following schedule against investment approval schedule of **November 2018**:*

Sl No	Substation	Name of element	Expected Date of commissioning
1	Baripada	125MVAR Bus Reactor	30.07.2018
2	Bolangir	125MVAR Bus Reactor	30.08.2018
3	Keonjhar	125MVAR Bus Reactor	30.09.2018
Early commissioning of Bus reactor under ERSS XIV Scheme			
1	Durgapur	125MVAR Bus Reactor	30.06.2018
2	Chaibasa	125MVAR Bus Reactor	30.06.2018
3	Banka	125MVAR Bus Reactor	30.07.2018
4	Lakhisarai	125MVAR Bus Reactor	30.09.2018

After commissioning of these Bus Reactors, voltage profile of Eastern Region may be improved. Accordingly, it is proposed that commissioning of the said Reactor may please be preponed to the dates mentioned in above table.

TCC may approve.

ITEM NO. B38:	COMPLETION OF 400 KV ALIPURDUAR-PHUNATSANHGCHU-D/C QUAD LINE

As per approved project scheme 400 KV Alipurduar-Phunatsanchu-D/C Line (Quad) along with 400 KV Line Bays at Alipurduar S/S has been commissioned and successfully charged on 27th March 18. However due to non availability of Bhutan generation and balance construction activity at Bhutan end, Power flow is yet to initiate through the lines. POWERGRID has completed all the relevant work pertaining to the line, and as on date both the lines are charged from Alipurduar end up to Indian border as anti theft measure. POWERGRID should be allowed to declare DOCO of the said line from 27.03.2018 and claim tariff accordingly.

In 146th OCC, Powergrid informed that the line up to Indian boarder is ready and it is in anti theft charge from Alipurduar end.

TCC may approve.

ITEM NO. B39:	O&M AGREEMENT BETWEEN BSPTCL AND POWERGRID

The following 132 kV and 220 kV bays of M/s BSPTCL has been constructed by POWERGRID under BSPTCL consultancy project.

i) 02 nos. 132 kV bays at Banka for Sultanganjline : Commissioned on 15.07.2015.
ii) 02 nos. 220 kV bays at Gaya for Sonenagar line: Commissioned on 03.09.2016.
iii) 01 no. 220 kV bay at Patna for Sipara line: Commissioned on 08.03.2018
iv) 02nos 220KV bays at Muzaffarpur S/S : Ready for Commissioning.

POWERGRID is maintaining the above bays since commissioning and therefore agreement for maintenance of above 132 kV and 220 kV bays at Banka, Gaya, Patna and Muzaffarpur S/S needs to be enforced between POWERGRID and M/s BSPTCL.

The draft copy of O&M agreement has already been submitted to the Chief Engineer (Proj./BSPTCL vide our letter dated 03.01.2017 but the signing of agreement could not be materialised.

The issue was discussed in 37th TCC Meeting wherein it was decided that POWERGRID and BSPTCL should bilaterally settle the issue.

POWERGRID may explain. BSPTCL may update.

ITEM NO. B40:	AGENDA BY POWERGRID

1) NON OPENING OF LC REQUISITE AMOUNT OF LC :

Following constituents are required to enhance/ extend LC towards Payment Security Mechanism, as per CERC Regulations:

Amount (in Cr.)

Sl No	Name of DIC's	Present Value of LC	Value of LC Required
(i)	North Bihar Power Distribution Company Limited(NBPDCL)	**9.73**	**29.00**
(ii)	South Bihar Power Distribution Company Limited(SBPDCL)	**8.89**	**40.00**
(iii)	Ind-Barath Energy (Utkal) Limited	**--**	**17.50**
(iv)	South Eastern Railway	**--**	**3.15**

In 37th CCM, NBPDCL, SBPDCL, IBEUL and SER representatives were not present.

As per the decision taken in 37th CCM, ERPC Secretariat has already written letters to the concerned utilities to open their LC at the earliest.

Subsequently, BSPHCL informed that the opening of LC is under process; however, NBPDCL & SBPDCL are making payment consistently..

BSPHCL/SBPDCL may update.

2) PAYMENT OF OUTSTANDING DUES MORE THAN 60 DAYS :

Amount(in Cr.)

Sl No	Total Outstanding dues	Outstanding due more than 60 days
Vedanta Ltd.	**11.59**	**11.59**
GMR Kamalanga Energy Ltd.	**40.64**	**9.52**
Jindal India Thermal Power Limited	**2.55**	**2.55**
Ind-Bharat Energy (Utkal) Limited	**214.29**	**193.84**
Damodar Valley Corporation(DVC)	**143.08**	**138.16**
West Bengal State Electricity Distribution Company Ltd.(WBSEDCL)	**105.78**	**8.73**
Total	**541.89**	**387.65**

(vi) The outstanding pertaining to WBSEDCL (Surcharge @ 7.30 Cr & Bill # 4 @ 1.43 Cr)

In 37th CCM, WBSEDCL informed that their payment is under process.

VEDANTA, GMR, JITPL, IBEUL & DVC representatives were not present.

Concerned members may update the latest status.

3) PROJECT CONSULTANCY AND BAY O&M CHARGES PERTAINING TO IPPS ARE LONG PENDING FOR PAYMENT TO POWERGRID AS FOLLOWS:

Sl	Name of IPP	Location	Project consultancy or Bay O&M	Total Payment pending(Rs)	Remarks
1	MONNET POWER CORPORATION LIMITED	Angul	Project consultancy	92.30 Lakh	Work stopped since 26th July 2014
2	JINDAL INDIA THERMAL POWER LIMITED	Angul	Bay O&M Charges	110.80 Lakh	Irregular payment
3	GMR KAMALANGA ENERGY INDIA LIMITED	Angul	Bay O&M Charges	23.96 Lakh	Interest payment
4	INDOBARATH	Sundragarh	Bay O&M Charges	119.79 Lakh	No response
5	STERLITE	Sundragarh	Bay O&M Charges	15.40 Lakh	Payment of 1st Qtr of 18-19 is pending

Inspite of regular correspondences and follow up from POWERGRID with the IPPs, the above pending payments are not getting settled.

Powergrid may explain.

4) LIST OF ASSETS COMMISSIONED BY POWERGRID.

List of Assets commissioned by POWERGRID is enclosed in **Annexure-B40.4.**

Members may note.

ITEM NO. B41:	AGENDA BY NHPC

1) SIGNING OF RECONCILIATION STATEMENT.

The reconciliation statements for Quarter-IV (2017-18) are yet to be reconciled by all the beneficiaries except for WBSEDCL,JUVNL ,SIKKIM &GRIDCO which have been already sent to beneficiaries on dated 18.04.2018

In 37th CCM, WBSEDCL, GRIDCO assured that the signed reconciliation statements would be sent shortly. JUVNL, SIKKIM representatives were absent.

2) PAYMENT OF LATE PAYMENT SURCHARGE BY DVC.

The total amount of LPS **₹ 2,40,971** is still pending against energy supplied from Rangit & Teesta Power Stations despite directions of MoP and persistent requests by NHPC

In 37th CCM, DVC representative was absent.

3) NON-OPENING OF LC OF REQUISITE VALUE

All the beneficiaries are intimated that the calculation sheet of LC for F.Y 2017-18 have been sent which is based upon 105% of average billing w.e.f Jan'2016 to Dec'2016. All the concerned beneficiaries are requested to enhance the existing LC or open the new LC of requisite value before 31st March'2017 and same should be valid up to 31st March '2018.
NBPDCL, SBPDCL and JBVNL have not yet provided the LC of requisite amount despite repeated request by NHPC. The beneficiaries NBPDCL,SBPDCL & JUVNL are requested to open L.C amounting to Rs.6.85 Crs, Rs 9.07 Crs and Rs.8.47 Crs respectively at the earliest being a statutory requirements as per PPA.

S. No	Beneficiaries	Existing L.C Amount	Expiry date	Required L.C Amount	Diffrence
(i)	NBPDCL	**2.74 Crs**	**26.12.2018**	**6.85 Crs (Validity Up to 31.03.2019)**	**2.01 Cr**
		2.10 Crs	**17.12.2018**		
Total		**4.84Crs**			
(ii)	SBPDCL	**5.1025 Crs**	**26.12.2018**	**09.07 Crs (Validity Up to 31.03.2019)**	**1.0672 Crs**
		2.90 Crs	**18.12.2018**		
Total		**8.0025 Crs**			
(iii)	JUVNL	**8.24 Crs**	**16.10.2018**	**8.47 Crs (Validity Up to 31.03.2019)**	**23 Lcs**

In 37th CCM, SBPDCL, NBPDCL & JUVNL representatives were absent.

As per the decision taken in 37th CCM, ERPC Secretariat has already written letters to the concerned utilities to open their LC at the earliest.

Subsequently, BSPHCL informed that as per their calculations the required LC is ₹ 7.06 Cr &₹ 8.86 Cr for NBPDCL &SBPDCL respectively. So there is no requirement of enhancement of LCs.

4) SIGNING OF PPA IN RESPECT OF TAWANG H.E.PROJECT, STAGE - II.

Signing of Power Purchase Agreement is pending with GRIDCO, JBVNL & WBSEDCL. All the three beneficiaries may be again requested to sign the long pending Power purchase agreement at the earliest**.**

In 37th CCM, NHPC was advised to take up the signing of PPA individually with the concerned utilities.

5) PAYMENT OF LATE PAYMENT SURCHARGE BY WBSEDCL

The total amount of LPS Rs. 29.92 Crs. out of which Rs.1,13,68,351/- is against energy supplied from Rangit & Teesta-V Power Stations & Rs. 28.78 Crs. against energy of TLDP-III Power Station is outstanding. WBSEDCL has agreed to pay Rs.1,13,68,351/- out of above total outstanding dues against energy supplied from Rangit & Teesta-V Power Stations in 4 equal instalment and thus 1st instalment of Rs. 28.42 lakh have been received on 11.05.2018. Moreover, as per MoM held on dated 09.11.2017 under chairpersonship of Deputy Secretary(H-II), MoP, Govt of India, WBSEDCL was directed to pay the entire amount of Rs.29.92 Crs. and not in instalments to NHPC.

6) EXTENSION OF PPA IN R/O TLDPP-III & IV POWER STATIONS

The validity of PPA in respect of TLDP-III Power Station stands expired which was valid for 5 years from the date of commercial operation and PPA in respect of TLDP-IV Power Station is valid upto 10.03.2021 which need to be extended for their entire useful life of Power Stations i.e. 35 years. Only the formal supplementary agreement is required to be signed to regularize extension of these PPA's which has been already confirmed by WBSEDCL vide letter dated 26.07.2012(Copy enclosed). It is reiterated that as per minutes of meeting of 103rd EREB held on 27.04.2002 at Chalsa and circulated by EREB vide their letter no. EREB/PSD/BOARD/2002/2970-3033 dated 24.05.2002, Principal Secretary (Power), Govt. of West Bengal had confirmed that the entire power from TLDP-III & TLDP-IV H.E Projects would be absorbed by WBSEB.

NHPC may elaborate. Concerned utilities may update.

ITEM NO. B42:	**ADDITIONAL AGENDA**

With the permission of Chair.

PART C: ITEMS FOR INFORMATION

The following items are placed before TCC for noting and compliance:

ITEM NO. C1 :	STATUS OF INSTALLATION OF STATCOM IN EASTERN REGION

In the 15th meeting of SCM it was agreed to install STATCOM in combination with mechanically switched Reactors (MSR) and Capacitors (MSC) and co-ordinated control mechanism of MSCs and MSRs at Ranchi, Rourkela, Jeypore and Kishanganj substations in Eastern Region.

The matter was again discussed in the 28th ERPC/TCC meeting held on 12th -13th September, 2014 at Goa, wherein, it was decided that POWERGRID may go ahead with implementation of the STATCOM project in Eastern Region with debt – equity ratio of 70:30 funding. The debt part should be refunded through PSDF and Equity Component (30%) to be funded by POWERGRID to be recovered through regulated tariff mechanism. CTU should initiate the process of availing fund from PSDF.

POWERGRID updated the latest status as follows:

Sl No	Location /Sub-Station of POWERGRID in ER	STATCOM - Dynamic Shunt Controller (MVAr)	Mechanically Switched Compensation Sl. (MVAr)		Latest status
			Reactor (MSR)	Capacitor (MSC)	
1	Rourkela	±300	2x125		*In service from March 2018.*
2	Kishanganj	±200	2x125		*70% civil work completed. 30% switchyard equipment supplied. Expected to complete by December 2018*
3	Ranchi(New)	±300	2x125		*80% civil work completed. All switchyard equipment, reactors and 3 transformers supplied. Expected to complete by June 2018*
4	Jeypore	±200	2x125	2x125	*Expected to complete by June 2018*

ITEM NO. C2 :	BUS SPLITTING OF KAHALGAON STPS STAGE I&II, NTPC

In 24th ERPC meeting held on 27.04.2013, ERPC advised NTPC to go ahead with the bus-splitting scheme as it is a technical requirement for safe, secure operation of the grid.

In 32nd TCC, NTPC informed that they are going ahead with the implementation of Bus Splitting of Kahalgaon STPS Stage I&II and the implementation is expected to be completed by December, 2018.

In 126th OCC, NTPC has given the present status as follows:

- 400/132kV Switchyard package - bid opened on 14.03.16. Awarded on 04.05.2016.
- Site levelling – Site levelling work has been completed.
- Transformer package and Shunt reactor– have been awarded.

In 35th TCC, NTPC informed that the work is in progress as per the schedule and the bus splitting will be completed by December, 2018.

In 146th OCC, NTPC informed that bus splitting would be implemented by December, 2018.

ITEM NO. C3 :	PAYMENT/RECEIPT STATUS FROM VARIOUS POOL ACCOUNTS IN ER

1) RRAS ACCOUNT ----PRESENT STATUS.

The updated position of Payments to the RRAS Provider(s) from the DSM pool and Payments by the RRAS Provider(s) to the DSM pool as on 01.06.2018 (considering bill up to 13.05.2018) is indicated in **Annexure – C3.1**. So far **₹ 42.4** Cr have been settled under RRAS in ER during FY 2018-19.

2) CONGESTION ACCOUNT - PRESENT STATUS

The status of congestion charge payment after full settlement is enclosed at **Annexure –C3.2.**

3) STATUS OF PSDF

An amount of **₹ 4.28Cr** from Reactive account have been transferred to PSDF after 36th Commercial sub-committee meeting held on 13.02.18. With this the total amount of **₹ 943.6 Cr** has been transferred to PSDF so far. No amount from Deviation pool has been transferred to PSDF A/c since 29.06.16 and surplus amount in deviation pool is being utilized for settlement of RRAS Bill. The break up details of fund transferred to PSDF (till 31.05.18) is enclosed in **Annexure-C3.3.**

ITEM NO. C4 :	RECONCILIATION OF COMMERCIAL ACCOUNTS

1) RECONCILIATION OF DEVIATION ACCOUNTS.

At the end of 4th quarter of 2017-18, the reconciliation statement (Period: 01.01.18 to 31.03.18) has been issued by ERLDC on 09.04.18 and statements had been sent to the respective constituents and also uploaded the same at ERLDC website at https://erldc.in/market-operation/dsmreconcilation/ The constituents were requested to verify /check the same & comments if any on the same were to be reported to ERLDC by 30.04.2018. The status of reconciliation is enclosed in **Annexure-C4.1.**

SIKKIM and IBEUL have not reconciled the statement for more than one year.

TEESTA-III, THEP (Shiga) & JLHEP have not yet signed reconciliation statement for more than 2 quarters.

BSPHCL, JUVNL, DVC, GMR, JITPL, TPTCL (DAGACHU), BRBCL, Powergrid(ER-I) & Dickchu have not signed reconciliation statement for last quarter of 2017-18.

Above constituents are once again requested to submit the signed reconciliation statement at the earliest. If the confirmation is not received within 2 weeks from the date of issuance of the letters the statements issued by ERLDC will be deemed to have been reconciled.

In 37th CCM, ERLDC informed that TEESTA-III, BRBCL & POWERGRID (ER-I) have reconciled the statement for their respective pending quarters.

BSPHCL, JUVNL, DVC, SIKKIM, GMR, JITPL, TPTCL, IBEUL, DIKCHU, THEP & JLHEP representatives were not present in the meeting.

As per the decision taken in 37th CCM, ERPC secretariat has already written letters to Sikkim for liquidation of their dues by 25th June, 2018.

2) RECONCILIATION OF REACTIVE ACCOUNT

At the end of 4th quarter of 2017-18, the reconciliation statement (Period: 01.01.18 to 31.03.18) has been issued by ERLDC on 09.04.18 and statements had been sent to the respective constituents and also uploaded the same at ERLDC website at link https://erldc.in/market-operation/reactivereconcilation/ Constituents were requested to verify /check the same & comments if any on the same were to be reported to ERLDC. WBSETCL have reconciled the Account and sent the signed statement.

In 37th CCM, GRIDCO informed that the reconciled Reactive Account statements had already been forwarded to ERLDC.

As per the decision taken in 37th CCM, ERPC secretariat has already written letters to Sikkim for liquidation of their dues by 25th June, 2018.

3) RECONCILIATION OF RRAS ACCOUNT

At the end of 4th quarter of 2017-18, the reconciliation statement (Period: 01.03.18 to 31.03.18) has been issued by ERLDC on 09.04.18 and statements had been sent to the respective constituents (NTPC and BRBCL) and also uploaded the same at ERLDC website at link https://erldc.in/market-operation/rrasreconcilation/ NTPC & BRBCL has not reconciled the RRAS Account.

In 37th CCM, it was informed that NTPC & BRBCL had reconciled the RRAS Account statements.

4) RECONCILIATION FOR STOA PAYMENTS MADE TO SLDC / STU:

The reconciliation statements of STOA payments for the entire period of 2017-18 have been sent to the DVC, OPTCL and WBSETCL for checking at their end and confirmation from their side.

WBSETCL is yet to confirm for Quarter-II, Quarter-III and Quarter-IV of 2017-18. DVC and OPTCL is yet to confirm for Quarter-IV of 2017-18. DVC and OPTCL are yet to confirm for Quarter-IV of 2017-18.

As per clause 15.1 of CERC approved STOA bilateral procedure since the confirmations have not been received within 2 weeks from the date of issuance of the letters the statement issued by ERLDC have been deemed to be reconciled.

In 37th CCM, it was informed that WBSETCL and OPTCL had done the reconciliation for the respective quarters.

DVC representative was absent.

5) RECONCILIATION FOR PAYMENTS RECEIVED FROM STOA APPLICANTS:

The reconciliation statements of STOA payments for the entire period of 2017-18 have been sent to the CESC, GMR Kamalanga, JITPL, JUVNL, MPL and WBSEDCL for checking at their end and confirmation.

CESC, GMR Kamalanga, JITPL and MPL have confirmed for the entire period. JUVNL and WBSEDCL are yet to confirm for Quarter-IV of 2017-18.

As per clause 15.1 of CERC approved STOA bilateral procedure since the confirmations have not been received within 2 weeks from the date of issuance of the letters the statement issued by ERLDC have been deemed to be reconciled.

The details is attached in the **Annexure-C4.5.**

Since there is a serious audit objection on non-signing of DSM, Congestion and STOA reconciliation statement it is once again requested that all regional pool members may check and sign the statement sent by ERLDC.

In 37th CCM, WBSEDCL confirmed that they would reconcile within 2 days.

JUVNL, GMR, JITPL & MPL representatives were not present.

As per the decision taken in 37th CCM, ERPC secretariat has already written letters to Sikkim for liquidation of their dues by 25th June, 2018.

ITEM NO. C5 :	**INSTALLATION OF NEW PWC MADE STOA SOFTWARE AT ERLDC.**

ERLDC has successfully migrated to new Short Term Open Access (STOA) w.e.f. 1st June'18 by PWC. A training programme was arranged on the functioning of new STOA software on 24th May, 2018 at ERPC conference hall, Kolkata. For any query related to functioning, log in detail etc. please contact Shri Subhendu Mukherjee, Mob: 9433041874, E-mail: subhendu@posoco.in.

ITEM NO. C6 :	STU AND SLDC TRANSMISSION &OPERATING CHARGES

1) State Transmission Utility Charges and Losses applicable for STOA for FY 2018-19

As available with ERLDC the STU charges and losses to be considered for STOA for FY 2018-19 are as follows:

Name of STU	Intra-State Transmission Charges	TRANSMISSION LOSS (For Embedded entities)
WBSETCL	*	3.10%
DVC	Rs. 80 / MWh	2.68%
OPTCL	Rs. 62.5 / MWh	3.0%
JUSNL	*	#
BSPTCL	*	#
SIKKIM	*	#

***** Indicates rates yet to be furnished by concerned State Utilities. Transmission Charges for use of state network shall be Payable @ Rs.80 per MWh as per subsequent Amendment regulation 2009-dated 20.05.2009.
# Not yet intimated by the State Utility.

2) State Load Despatch Centre Operating Charges for STOA for FY 2018-19

Name of SLDC	SLDC Operating Charge
West Bengal	**
DVC	**
Odisha	Rs. 2000
Jharkhand	**
Bihar	**
SIKKIM	**

** Indicates rates yet to be furnished by concerned State Utilities.
Operating charges at the rate of Rs 1000/-, per day or part of the day for each bilateral transaction for each
of the Regional Load Despatch Centre involved and at the rate of Rs 1000/- per day or part of the day for each State Load Despatch Centre involved shall be payable by the applicant as per subsequent Amendment regulation 2009-dated 20.05.2009.

ITEM NO. C7 :	IMPLEMENTATION OF AUTOMATIC METER READING IN EASTERN REGION

The list of 16 new locations with 68 Meters & 25 existing locations with 68 meters to be implemented in AMR was given in 36th CCM as enclosed in **Annexure-C7.**

Presently 145 Locations with 924 meters are connected through AMR system in ER. ERLDC is receiving data from 125 locations out of total 145 locations through AMR. The latest status of data receipt from the locations as below:

- Number of meters for which data is received: 705
- Number of locations for which data is received: 125 locations

After the phase-wise completion of AMR for the locations commissioned, some of the utilities have been asked to discontinue the sending of the weekly SEM data through mail. However, in case of an emergency or communication failure, as the case may be, the utilities may download the data through DCD/Laptop and send it by mail. As such DCD is required to be kept in charged condition. Of late, there have been issues with the GPRS communication/DCU for around 20 locations having 220 meters.

In 37th CCM, POWERGRID informed that the implementation of the remaining locations/meters would be done by August 2018.

ITEM NO. C8 :	**REPLACEMENT OF GPRS COMMUNICATION WITH OPTICAL FIBER FOR AMR**

In ER, 80% meters are connected through Automated Meter Reading (AMR). At present the communication system used for data transfer from each location is GPRS. It has been observed that many locations are not communicating with AMR system due to poor/no GPRS signal. Many substations have their own optical fiber which is also used for the LAN network of respective stations. TCS has successfully connected 03 locations (Malda-PG, Subhasgram-PG and Binaguri-PG) in ER-II with PGCIL intranet and these two locations are smoothly reporting to AMR system after connecting with PGCIL LAN. The proposed network will not only provide better communication but also reduce the cost of GSM. The above matter was last discussed in 145th OCC meeting also.

In 37th CCM, POWERGRID informed that the replacement of GPRS communication of the remaining 34 locations would be completed by August 2018.

ITEM NO. C9 :	**PROCUREMENT OF NEW SEMS**

In 30th ERPC meeting procurement of 965 no of SEM's and 110 nos of Laptop/DCD (in 111th OCC meeting) was approved. Further 31st TCC/ERPC approved the cost sharing mechanism of expenditure on SEM's and DCD/Laptops along with POWERGRID overhead charges @ 15% to be shared by the beneficiaries constituents of Eastern Region in proportional to the share allocation for the month in which the proposal was approved in the ERPC meeting.

In 35th CCM held at ERPC on 02.08.17, PGCIL informed that in 1st phase, 300 meters and 40 laptops with software had been supplied by M/s Genus so far.

In 145th OCC, PGCIL informed that meter of 2nd lot has been supplied. Time drifted meters/Elster meters are being replaced by Genus meters phase wise.

In 37th CCM, POWERGRID informed that in 3rd phase 300 nos. (approx.) of SEMs would be delivered and the inspection of the same is scheduled to be done by August 2018.

ITEM NO. C10 :	REPLACEMENT OF ELSTER METERS

In Eastern Region, 28 nos of Elster make meters had been installed at 5 locations (Teesta-III, New Melli, Alipurduar, New Ranchi & Kishanganj) initially due to scarcity of meters. As informed by M/s TCS (also Confirmed by PGCIL) Elster make meters can't be integrated in AMR system with existing DCU. To enable all such locations to report data in AMR, a List of Elster meters to be replaced was placed in 36th CCM as per **Annexure-C10.** As per ERLDC record, 04 meters at Alipurduar and 02 meters at New melli is replaced so far.

In 37th CCM, POWERGRID ERTS-II informed that 6 nos. of meters had already been replaced, 10 Nos. of meters of TEESTA-III would be replaced by next week and the remaining 8 nos. of meters would be replaced by 15th July 2018.

ERTS-I informed that 4 SEMs had been replaced.

ITEM NO. C11 :	TIME CORRECTION OF SEMS IN EASTERN REGION – REPLACEMENT OF HEAVILY DRIFTED SEMS

The issue was discussed in 35th TCC/ERPC meetings and it was felt that the meters with severe drift greater than 10 min need to be replaced first and if replacement is done with Genus then readings are to be collected manually using Laptop till interfacing with AMR is completed. Subsequently drifted meter replacement work of Phase –I for 24 meters and Phase-II for 23 Meters have been completed. In 141st OCC, List of 22 drifted meters to be replaced in Phase-III was placed as per **Annexure-C11.**

In 145th OCC, Powergrid updated that new SEMs have been received and Meters at Rangpo, Gangtok and New Melli is replaced.

In 37th CCM, POWERGRID informed the status as follows:

a) ERTS-I: 3 nos. of meters replaced
b) ERTS-II: 8 nos. of meters replaced. 10 Nos. of meters of TEESTA-III would be replaced by next week.
c) ODISHA: 1 no. of meter replaced.

In 146th OCC Meeting, Teesta-III informed that time correction has been done by them for all the SEMs installed at their end and the time drift is within permissible limits.

OCC opined that although time drift have been corrected, SEM connected to Teesta-III being Elster make are to be replaced by newly procured Genus make meter for AMR connectivity.

ITEM NO. C12 :	ACCOUNTING OF STATE DRAWL FROM SUBSTATION OF PGCIL/ISTS LICENSEE IN ER

State net drawl from Substation of PGCIL/ISTS Licensee in ER is being computed considering meter installed at feeders on LV side of Transformer due to the fact that for a few ICTs, multiple states used to draw through same ICT. Further, Sub stations where auxiliary requirement is met through tertiary of the IST ICT, States net drawl is computed by adding drawl through feeders after LV side of Transformer and auxiliary consumption through tertiary.

Presently with network strengthening and re-configuration in ER, such case of multiple State/entity drawing power from same ICT of PGCIL/ISTS Licensee does not exist anymore.

As per Clause 7(1) (C) of CEA (Installation and Operation of Meters) Regulations, 2006 & its subsequent amendments, Main Meters for drawl computation through ICT should be installed on HV side of ICT and meters installed on LV side of ICT should be considered as Standby meters. In view of the above it is proposed that Sate drawl from PGCIL/ISTS Licensee S/S may be computed by using the meter installed on HV side of ICTs in line with CEA regulation. In order to enable ERLDC compute the state drawl through ICTs of PGCIL & other ISTS Licensees in ER as per CEA Regulations, PGCIL is requested to install meters at HV and LV side of ICTs at the stations.

In 144th OCC, Powergrid informed that SEMs are already available at some stations. OCC advised Powergrid to check the healthiness & time synchronization of the installed SEMs and install new SEMs wherever it is required.

In 37th CCM, POWERGRID informed the status of installation of SEMs at HV sides of ICTs as follows:

a) ERTS-I: Completed
b) ERTS-II: 5 completed; rest 18 would be completed by July 2018.
c) ODISHA: Would be completed by July 2018.

Further, POWERGRID was advised to check and correct the time drifting of old SEMs available at HV side of ICTs.

ITEM NO. C13 :	**NON-SUBMISSION OF WEEKLY SEM READINGS BY TUESDAY NOON FROM NON-AMR LOCATIONS/ FAULTY AMR LOCATIONS / GENUS METER LOCATIONS**

As per IEGC (effective from 3.5.2010) Sub-clause-22 of Clause-6.4 (demarcation of responsibilities), all concerned utilities in whose premises SEMs are installed shall take weekly meter readings and transmit the same to RLDC by Tuesday noon for timely issuance of Deviation account Bill. Significant improvement in timely receipt of SEM data has been seen after AMR implementation at various locations and most of the meter data is being received by Tuesday. Genus meters are installed at many locations in Eastern Region and data of Genus meters from those locations which are yet to be integrated in AMR are being sent manually. It was also gathered that if concerned person responsible for data downloading is on Leave or not available, meter data is not being sent from those substations.

However general trend of receipt of meter data in last one month is as below:

By Wednesday or later: Pandiabili, WBSETCL (North Bengal, Kharagpur) & SIKKIM

POWERGRID, WBSETCL & SIKKIM are requested to please adhere to the schedule.

ITEM NO. C14 :	**SUBMISSION OF SEM DATA TO ERLDC PRIOR & AFTER 6 HR OF FIRST TIME CHARGING OF NEW ELEMENT**

Before first time charging of any new element in the Grid, SEM details along with meter dummy data is being submitted by respective utility to ERLDC. The purpose of meter reading without power flow was to ensure its compatibility with RLDCs software and purpose of meter reading with power flow was to ensure its healthiness, correct connections of CT/PT and correct CT ratio.

Correctness of SEM readings is important for computing of drawl/Injection of a control area and inter-regional/trans-national energy flows as various accounts/billings are based on it. In view of the above, meter readings after six(6) hrs of power flow must be sent by the utilities to ERLDC before start of trial operation. Further the 24 hour trial operation would be assumed complete only when the both end meter readings for this period are correct.

ITEM NO. C15 :	SOFTWARE RELATED ISSUE WITH GENUS METER

It has been observed that in case of shutdown of any line/element throughout the day, the meter output NPC report (Text file) generated with help of BCS urja software doesn't show the data of that day and it goes missing from the output file. This results different start date & caused difficulties in processing of the same, as processing requires manual intervention & handling of such huge data manually always invites error. The issue was raised with PGCIL to take the matter with M/s Genus and get changes in the software and latest patch of the software should be made available. Till now the issue is not resolved and problem still persists.

In 37th CCM, POWERGRID informed that the software related issue would be resolve by July 2018.

ERLDC informed that the latest version of the software is available on ERLDC website. The same may be installed and used to download the SEM data.

Further it was decided that a workshop on software related issue with Genus meter would be conducted at ERPC in July 2018.

ITEM NO. C16 :	LILO arrangement at 132/33 KV GSS Baisi in 132 KV Kishanganj(old)- Dalkola(WBESTCL)

BSPTCL vide mail dated 13th April 2018 informed that 132/33 KV GSS Baisi is being constructed by M/S GE T&D India Ltd. under state plan which is ready for charging through 132 KV Kishanganj(old) – Dalkola(WBESTCL) transmission line (which is ISTS line) through LILO arrangement.

i. Erection and commissioning of Remote Terminal Unit (RTU) is being under progress.
ii. Shifting of ABT meter installed at Kishanganj (old) end in Dalkola feeder to Baisi end of Dalkola feeder also under process.

BSPTCL requested for charging of 132/33 KV Baisi GSS through LILO in 132 KV Kishanganj(old) – Dalkola(WBESTCL) transmission line.

In 144th OCC, BSPTCL informed that the construction of 132/33 KV GSS Baisi S/s is almost at completion stage. They are planning to LILO 132 KV Kishanganj(old) – Dalkola(WBESTCL) transmission line at 132/33 KV GSS Baisi S/s. After LILO, 132kV Baisi – Dalkola(WBESTCL) would become an interstate tie line.

In 146th OCC, BSPTCL informed that Baisi-Dalkhola line was charged on 22nd May, 2018.

ITEM NO. C17 :	THIRD PARTY PROTECTION AUDIT AND UFR AUDIT IN EASTERN REGION

1. 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 POWERGRID are related to PLCC problems at other end.*

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

2. Status of 2nd Third Party Protection Audit:

2nd Third Party Protection Audit for Sub-stations of Eastern Region has been started from July, 2015. Till date the audit team has completed two nos 765kV, 36 nos of 400 kV, 11 nos 220kV and 13 nos 132kV Sub-stations. The list is enclosed at **Annexure-C17.2**.

The list of observations for the above sub-stations is already available at ERPC website (www.erpc.gov.in). Respective constituents are requested to comply and submit the report to ERPC for regular update.

3. UFR audit report of OPTCL substations visited on 02.01.2018 & 05.01.2018

The ERPC UFR inspection group visited 220/33kV Durgapur (DVC) S/s for UFR Audit on 30.05.2018. The report is enclosed at **Annexure-C17.3**.

ITEM NO. C18 :	**HIGHLIGHTS & GRID PERFORMANCE FOR THE PERIOD FROM FEB' 2018 TO MAY' 2018**

A) Real time operation:

During the period under review, power supply position in the region was as under:

	FEB-17	MAR-17	APR-17	MAY-17	FEB-18	MAR-18	APR-18	MAY-18
AvgFrq. (Hz)	50.00	49.99	49.99	49.99	49.98	49.97	49.97	49.95
PkDmd (MW)	18647	19649	20582	19794	19416	21587	21361	21994
Energy Consum. (MU/day)	351	369	413	408	382	416	408	438
ISGS Gen (MU)	3510	4009	3915	4393	3935	4236	4053	4616
Region Gen (MU)	12608	14297	14271	15292	13545.2	15767.4	15122	15950
% increase in Reg Gen.					7.4	10.3	5.9	4.3

B) System Operational Discipline during the period from Feb-18 to May-18

i) The month-wise energy drawls of ER constituents were as given hereunder:

	FEB-18		MAR-18		APR-18		MAY-18	
	SCH	ACT	SCH	ACT	SCH	ACT	SCH	ACT
BSPHCL	1747.5	1735.7	2109.8	2079.8	2336.9	2319.8	2581.7	2557.2
JUVNL	422.2	449.0	443.2	479.5	451.2	472.4	561.0	582.1
DVC	-1292.4	-1323.5	-1564.0	-1577.2	-1620.9	-1603.7	-1451.9	-1408.2
OPTCL	877.2	987.5	1029.3	1163.9	792.9	847.9	1120.7	1192.2
WBSETCL	522.7	580.6	944.4	1016.3	1040.8	1059.6	1352.0	1411.7
SIKKIM	42.5	43.6	42.0	41.7	44.0	41.1	43.2	39.4

C) Frequency & Voltage

i) Frequency profile for the period during **Feb-18 to May-18** is given hereunder. The frequency mostly remained within the allowable range for the entire period

Month	% of time for which frequency			
	<49.9	**49.9-50.05**	**> 50.05**	**IEGC band 49.9-50.05**
FEB-18	9.69	80.25	10.06	80.25
MAR-18	12.99	79.30	7.72	79.30
APR-18	12.77	79.60	7.63	79.60
MAY-18	21.27	71.16	7.56	71.16

ii) Maximum and minimum voltages recorded at some important 765/400 kV sub-stations were as follows:

	FEB-18		MAR-18		APR-18		MAY-18	
SUB-STATION/	MAX.	MIN	MAX.	MIN	MAX.	MIN	MAX.	MIN
POWER STN.	(KV)	(KV)	(KV)	(KV)	(KV)	(KV)	(KV)	(KV)
(765 KV) NEW RANCHI	791	763	792	762	797	763	805	756
MUZAFFARPUR	412	385	417	387	421	386	422	387
BINAGURI	424	400	429	400	428	397	425	394
JEERAT	427	394	423	383	428	383	427	379
MAITHON	422	405	422	406	425	405	426	405
BIHARSHARIFF	420	398	423	402	425	398	427	398
JAMSHEDPUR	425	411	423	404	426	406	426	407
ROURKELA	417	404	416	394	411	402	413	402
JEYPORE	425	383	429	381	430	372	427	396
MERAMUNDALI	417	405	411	398	417	396	415	398
SASARAM	411	383	417	391	420	389	416	384
SUBHASHGRAM	428	395	423	379	428	383	428	376

D) Constituent-wise demand met is given below:

		FEB-17	MAR-17	APR-17	MAY-17	FEB-18	MAR-18	APR-18	MAY-18
BSPHCL	AVG MAX DMD(MW)	3481	3447	3669	3793	4221	4188	4326	4537
	MU/DAY	63	64	70	74	71	76	82	86
JUVNL	AVG MAX DMD(MW)	1136	1118	1142	1133	1129	1121	1104	1150
	MU/DAY	24	23	25	24	24	24	23	24
DVC	AVG MAX DMD(MW)	2603	2561	2721	2701	2814	2716	2769	2740
	MU/DAY	61	63	66	65	70	68	70	70
ODISHA	AVG MAX DMD(MW)	3639	3809	3998	3925	3979	4100	3865	4200
	MU/DAY	70	75	84	83	80	85	80	93
W. BENGAL	AVG MAX DMD(MW)	7025	7398	8025	7687	7060	7876	7690	7911
	MU/DAY	132	143	167	163	138	162	159	165

E) Inter-regional energy exchange during the review period were as follows: (Figures in MU)

Region	FEB-18		MAR-18		APR-18		MAY-18	
	SCH	ACT	SCH	ACT	SCH	ACT	SCH	ACT
NER	108.0	148.9	106.8	8.3	138.3	240.8	-39.6	78.0
SR	745.5	1070.0	734.5	1338.3	611.9	1354.6	47.6	837.0
WR	389.0	-285.7	649.3	-425.0	220.9	-543.0	-209.7	-1002.9
NR	1491.1	1566.5	1311.3	1563.5	1487.2	1374.2	2266.3	2014.2
TOTAL	2733.7	2499.6	2801.9	2485.1	2458.3	2426.6	2064.7	1926.3

F) Reservoir levels of important hydro stations in ER during review period (as on last day of the month) is given below:

STATION	MDDL/ FRL	**FEB-18**	**MAR-18**	**APR-18**	**MAY-18**
BURLA	590/630 FT	621.22	616.67	611.17	606.41
BALIMELA	1440/ 1516 FT	1459.00	1456.50	1453.30	1449.70
RENGALI	109.7/ 123.5 MTR	121.67	119.69	117.88	113.86
U. KOLAB	844/ 858 MTR	852.03	850.74	849.53	847.77
INDRAVATI	625/ 641 MTR	634.12	632.65	631.22	628.83
MACHKUND	2685/ 2750 FT	2744.35	2736.70	2724.80	2712.60

G) IMPORTANT EVENTS :

Feb-18: NIL

Mar-18:

SL NO	Element Name	Owner	Charging Date	Charging Time	Remarks
1	220 kV Patna Sipara 3	BSPTCL	05/03/18	10:09	Loaded at 09:16hrs of 08/03/18
2	315 MVA, 400/220 kV ICT # I at Daltonganj	PGCIL	08/03/18	0:59	
3	160 MVA ATR # I at Daltonganj	PGCIL	08/03/18	0:12	
4	132 kV Daltonganj (JUSNL) – Daltonganj (PG) # II	PGCIL	07/03/18	23:50	
5	132 kV Daltonganj (JUSNL) – Daltonganj (PG) # I	PGCIL	10/03/18	0:52	
6	80 MVAr Bus reactor at Daltangunj	PGCIL	20/03/18	18:58	
7	240 MVAR L/R 3 of 765 KV AngulJharsuguda 3	PGCIL	31/03/18	13:09	Charged as B/R in Jharsuguda

Apr-18:

SL NO	Element Name	Owner	Charging Date	Charging Time	Remarks
1	240 MVAr Line reactor of 765 KV Angul-Jharsuguda IV at Angul end	PGCIL	12/04/18	22:00	Only Line Reactor charged
2	400 KV New-Duburi-TSL (Kalinganagar) I	OPTCL	17/04/18	15:49	

May-18:

SL NO	Element Name	Owner	Charging Date	Charging Time	Remarks
1	ICT-I at NPGC SS	NPGC	04-05-2018	13:54	
2	220kV Alipurduar(PG)-Alipuduar(WB)-II	WBSETCL	22-05-2018	17:53	Loaded on 06/06/18 at 16:04hrs.
3	315MVA, 400/220/33KV ICT#2 at DSTPS	DVC	23-05-2018	13:37	Idle charged from 400kv Side & 220kV side not constructed yet
4	220kV Darbhanga(DMTCL)-laukhai I	BSPTCL	23-05-2018	18:42	
5	220kV Darbhanga(DMTCL)-Laukahi II	BSPTCL	23-05-2018	18:48	
6	220kV Alipurduar(PG)-Alipuduar(WB)-I	WBSETCL	31-05-2018	15:41	Loaded on 06/06/18 at 16:04hrs.

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ANNEXURES

A. Projects approved:

SN	Name of Constituent	Name of Project	Date of approval from PSDF	Target Date of Completion	PSDF grant approved (in Rs.)	Amount drawn till date (inRs.)	Latest status
1	WBSETCL	Renovation & up-gradation of protection system of 220 kV & 400 kV Substations in W. Bengal	31-12-14	April 2018	108.6 Cr	18.26 Cr.	100 % Supply is Completed 100 % Erection is completed Claim is submitted for releasing of 22.27 Cr., the same is yet to be received.
2		Renovation & modernisation of transmission system for relieving congestion in Intra-State Transmission System.	22-05-17	25 months from date of release of 1st instalment	70.13	Nil	Order has been placed for 96.44 Cr. 1st instalment is yet to be received.
3		Installation of switchable reactor at 400kV & shunt capacitors at 33kV	22-05-17	19 months from date of release of 1st instalment	43.37	Nil	Order has been placed for 12.53 Cr. 1st instalment is yet to be received.
4	WBPDCL	Implementation of Islanding scheme at Bandel Thermal Power Station	*10.04.17*	*March 2018*	1.39 Cr		*The implementation at Power station would be completed by May 2018. Implementation part at Substation for load segregation would be done by WBSETCL.* *WBSETCL agreed to send their plan within 7 days.*
5		Upgradation of Protection and SAS			23.48		Approved by Ministry of Power. Fresh tendering is in progress.
6	OPTCL	Renovation & Up-gradation of protection and control systems of Sub-stations in the State of Odisha in order to rectify protection related deficiencies.	10.05.15	30.11.18	162.5 Cr.	37.79 Cr	Total contract awarded for Rs. 51.35 Cr
7		Implementation of OPGW based reliable communication at 132kV and above substations	15.11.2017		25.61 Cr.		Agreement signed on 03.01.2018
8	OHPC	Renovation and up-gradation of protection and control system of 4 nos.OHPC substations.		*U.Kolab-March 19 Balimela-Feb 2019 U.Indravati-Jan 19 Burla-Nov 2018, Chiplima Dec 2018*	*22.35 Cr.*		Tendering under progress.
9	BSPTCL	Renovation and up-gradation of 220/132/33 KV GSS Biharshariff, Bodhgaya, Fatuha, Khagaul, Dehri -on-sone& 132/33 kV GSS Kataiya	11/5/2015	31.07.2018	64.02 crore	56.04 crore	85% of work has been completed. Contract awarded for Rs.71.37 Cr till date.
10		Installation of capacitor bank at different 35 nos. of GSS under BSPTCL	5/9/2016	12th March 2019	18.88 crore	Nil	Work awarded for all GSS.
11		Renovation & up-gradation of protection and control system of 12 nos. 132/33 KV GSS under BSPTCL.	02.01.17	31st March 2018	49.22 Cr.		75% work completed for seven no. GSS as part of R & M work. Revised DPR is to be submitted for rest 5 no. GSS.

12	JUSNL	Renovation and up-gradation of protection system	*September 2017*	*2 years*	*138.13 crores*		LOA issued to PRDC on 22nd March 2018 for monitoring the project. Tendering is in progress.
13	DVC	Renovation and upgradation of control & protection system and replacement of Substation Equipment of 220/132/33 kV Ramgarh Substation	02.01.17	01.06.2019	25.96 Cr	2.596 Crore on 01.06.2017	Work awarded for 28.07 Cr.
14		Renovation and upgradation of control & protection system including replacement of substation equipment at Parulia, Durgapur, Kalyaneshwari, Jamshedpur, Giridih, Barjora, Burnpur, Dhanbad and Burdwan Substation of DVC	27.11.17	24 Months from the date of release of fund.	140.5 Cr.	1st installment of 14.05 Cr. received on 21.12.2017	Work awarded for 6.45 Cr.
15	POWERGRID	Installation of STATCOM in ER		June 2018	*160.28 Cr*	*16.028 Cr*	Work is in progress, expected to complete by June 2018. STATCOM at Rourkela has been commissioned.
16	ERPC	Creation & Maintenance of web based protection database and desktop based protection calculation tool for Eastern Regional Grid	17.03.16	Project is alive from 30th October 2017	20 Cr.	4.94 Cr. + 9.88 Cr.	1) Protection Database Project has been declared 'Go live' w.e.f. 31.10.17. 2) Pending training on PDMS at Sikkim and 3rd training on PSCT has been also completed at ERPC Kolkata.
17a	ERPC	Training for Power System Engineers					The proposal was approved by Appraisal Committee. The proposal was sent to CERC. CERC has sought some queries from the Appraisal Committee. The matter shall be taken up by the Appraisal Committee during its next meeting.
17b		Training on Power market trading at NORD POOL Academy for Power System Engineers of Eastern Regional Constituents					

B. Projects under process of approval:

SN	Name of Constituent	Name of Project	Date of Submission	Estimated cost (in Rs.)	Latest status
1	Sikkim	Renovation &Upgradation of Protection System of Energy and Power Department, Sikkim.	09-08-17	68.95 Cr	Scheme was examined by TSEG. Inputs sought from entity. Sikkim submitted the relevant information.
2		Drawing of optical ground wire (OPGW) cables on existing 132kV & 66kV transmission lines and integration of leftover substations with State Load Despatch Centre, Sikkim	09-08-17	25.36 Cr	Scheme was examined by TSEG. Inputs sought from entity. Sikkim submitted the relevant information.
3	JUSNL	Reliable Communication & Data Acquisition System upto 132kV Substations.	23-08-17	102.31 Cr	Scheme was examined by TSEG. Inputs sought from entity. Scheme has been revised as suggested by TSEG and it would be submitted within a week.
4	OPTCL	Installation of 125 MVAR Bus Reactor along with construction of associated bay each at 400kV Grid S/S of Mendhasal, Meramundali& New Duburi for VAR control &stabilisation of system voltage	28-08-17	31.94 Cr	Scheme was examined by TSEG. Inputs sought from entity. OPTCL submitted the relevant information.

C. Projects recently submitted:

SN	Name of Constituent	Name of Project	Date of Submission	Estimated cost (in Rs.)	Latest status
1	WBSETCL	Implementation of Integated system for Scheduling, Accounting, Metering and Settlement of Transactions (SAMAST) system in West Bengal	22-12-17	25.96 Cr	
2	OPTCL	Implementation of Automatic Demand Management System (ADMS) in SLDC, Odisha	22-12-17	3.26 Cr	
3	OPTCL	Protection upgradation and installation of SAS for seven numbers of 220/132/33kV Grid substations (Balasore, Bidanasi, Budhipadar, Katapalli, Narendrapur, New-Bolangir&Paradeep).	20.02.2018	41.1 Cr.	

No.23/70/2017-R&R
Government of India
Ministry of Power
***

Shram Shakti Bhawan, Rafi Marg,
New Delhi, the 5th April, 2018

To

1. Principal Secretaries/Secretaries (Power/Energy) of all State Governments/UTs.
2. CMD/MDs of State Gencos/ Discoms
3. CMD of all CPSUs under administrative control of Ministry of Power

Sub: Flexibility in Generation and Scheduling of Thermal Power Stations to reduce emissions.

Sir/Madam,

The concept of Flexible utilization of coal as introduced by the Central Government in year 2016, allows the use of coal within its basket in optimal manner. This avoids unnecessary coal transportation and reducing the power generation cost. In a similar manner, it is has been decided that there should be some flexibility in Generation and scheduling of Thermal Power Stations so that Discoms are able to meet their RPO without facing any additional financial burden.

2. Further, due to large scale integration of Grid connected renewables which inherently has huge variability of generation, there is a need of balancing power to maintain security and stability of Grid. Under present regulation, such balancing power is to be arranged by the Discoms. Hence, the responsibility of arranging balancing power requirement will now also be shared by the Generators.

3. This flexibility will provide the Power Generators an opportunity to optimally utilize generation from RE sources and also help in reducing emissions and it shall also facilitate further RE Capacity addition.

4. The detailed mechanism of allowing Flexibility in Generation and Scheduling of Thermal Power Stations is enclosed at **Annexure**.

5. All stakeholders are requested to take necessary action in this regard.

6. This issues with the approval of Hon'ble Minister of State (I/C) for Power and New & Renewable Energy.

Enclosure: as above

Yours sincerely,

5/4/18

(Ghanshyam Prasad)
Chief Engineer
Tel. No. 011-23710389

Copy to:
1. Secretary, Ministry of New & Renewable Energy, New Delhi
2. Secretary, Ministry of Coal, New Delhi
3. Chairperson, CEA, New Delhi
4. Secretary, CERC, Chanderlok Building, Janpath, New Delhi
5. Secretaries of all State Electricity Regulatory Commissions/JERCs

Copy for information to:
PS to MOSP (I/C), PPS to Secretary (Power), All Joint Secretaries/EA/ CE (OM&RR) and Directors/ DS, MoP

Flexibility in Generation and Scheduling of Thermal Power Stations to reduce emissions.

A. Background

The Government of India has given commitment that as part of Nationally Determined Contributions (NDC), India would have 40% of its installed capacity from non-fossil fuel sources by the year 2030.

In pursuance of this, as per provisions of Tariff Policy issued on 28th January, 2016, Ministry of Power has issued 'Long term growth trajectory of RPOs' for Non-solar as well as solar sources, uniformly for all States/UTs, initially for three years from 2016-17 to 2018-19.

Long Term trajectory	2016-17	2017-18	2018-19
Non-Solar	8.75%	9.5%	10.25%
Solar	2.75%	4.75%	6.75%
Total	11.5%	14.25%	17.00%

In the year 2016, Government has introduced the concept of flexible utilization of coal. Earlier, each power plant owned by a company had to sign Fuel Supply Agreements (FSA) for supply of coal from a specified coal mine. The policy for flexible utilization of coal allowed a company to use coal within its basket in the most optimal manner such that unnecessary coal transportation is avoided and lower costs of power generation could be passed on to the beneficiary states.

In a similar manner, there should be some flexibility provided in electricity Generation so that Discoms are able to meet their RPO without facing additional financial burden.

B. Need for allowing flexibility in Generation

Due to larger procurement of Renewables, the issues being faced by the stakeholders including Discoms which need to be addressed inter-alia are:

i) Need for balancing power: RE Generation sources have the benefits of cleaner energy sources but Solar and Wind energy is available only during some part of the day and is generally infirm in nature. This necessitates the user of RE energy

(mainly Discoms) to make arrangements for balancing power to meet the power requirement when RE energy will not be available. Thus, due to large scale integration of Grid connected renewable which inherently has huge variability of generation, there is a requirement of balancing power which matches with such variations so that the security and stability of Grid is maintained. Under present regulation, such balancing power is to be arranged by the Discoms.

ii) Additional financial burden to Discoms to meet RPO: Most of the states already have adequate PPA. In order to meet the RPO, Discoms will have to tie up additional RE power which will pose additional financial burden on them.

Thus, considering the impact of new environmental norms on thermal power generation capacity, energy storage capability of Hydro stations, infirm nature of RE Generation sources, balancing power requirements by Discoms and the benefit of Renewable Sources of energy in reducing environmental emissions, there is a need to provide flexibility to the Generating Stations to generate RE power and supply power under existing / future contractual agreements. Discoms will have flexibility to procure RE power within their existing PPA and meet their RPO.

C. Flexibility to Generating company

The generating company shall have the flexibility of using its Thermal power or renewable power to meet its scheduled generation from the specific thermal generating station. This flexibility will provide the Power Generators an opportunity to optimally utilize generation from RE sources and also help in reducing emissions. Beneficiaries of the Power will also get the firm power including Renewable power, which will help them to meet their RPO obligations and also the responsibility of arranging balancing power requirement will be shared by the Generators.

D. Proposed Mechanism for allowing Flexibility in Generation

i) Any generating company having coal/lignite/gas based thermal generating stations, may establish or procure renewable energy generating capacity anywhere in the country either at existing stations or at new locations.

ii) The generating companies would be allowed to utilize such renewable capacities for supplying power against existing commitments to supply the power from thermal station(s) anywhere in India.

iii) **Scheduling and commercial mechanism**

a. Declared Capacity (DC) shall be declared by the existing Thermal generating station as per the extent regulations. Once the schedule for the next day is received, the generating station shall have the flexibility of using its Thermal power or the generating company owned renewable power or procured RE Power to meet its generating station scheduled generation. Thus the RE power shall replace the Thermal power of any of the thermal generating station of the generating company, wherever found feasible by the generating company.

b. The sum total of all the power actually supplied from various generating sources shall be considered for DSM purposes.

c. The Declared Capacity of the Thermal Generating station shall be with respect to the terms of the PPA and the availability of primary fuel. The declared capacity of thermal generating station cannot be based on the availability of the additional RE power.

d. The changes in the regulation, if any, required for implementation of the above scheme shall be done by the appropriate Electricity Regulatory Commission.

e. The Power from RE stations would be supplied to the Beneficiaries at a Tariff which shall be equal to Energy Charge Rate (ECR) of the power station which was originally scheduled. This would include the balancing cost and the tariff risk to be taken by the Generator.

f. The net gain realized, if any, from supply of RE power in place of thermal power under existing PPA shall be passed on to the beneficiary appropriately considering balancing power support provided and the risk taken by the

generator. For this purpose, at the end of the year, truing-up can be done by the Appropriate Commission and the net gain , if any, earned by the Generator shall be shared with the beneficiary in the ratio of 50 (Beneficiary) : 50 (Generator).

g. This shall not be applicable to RE Projects for which PPAs have already been signed by the Generator and Beneficiaries.

h. The extra generation capacity available from existing thermal station(s) corresponding to the renewable generation capacity and up to the existing contracted capacity would make available additional power which at the time of need can be utilized by the beneficiaries.

iv) **RPO/ RGO -** Power which is generated from such renewable energy shall be eligible for any cross subsidies notified by the Government from time to time including waiver from ISTS transmission charges and losses as per notification from the Government. Such renewable energy procured by the beneficiaries shall qualify towards meeting their Renewable Purchase Obligations (RPO obligations). Further, such renewable power in capacity terms shall also qualify for Renewable Generation Obligations (RGO obligations) for the generators as envisaged in the Tariff Policy and as and when notified by Government of India.

v) **Deviation Settlement Mechanism (DSM)& Scheduling-**

For the purposes of flexible scheduling and operation of thermal stations, while giving the DC of the existing thermal station the generator shall not take into the account the forecast of generation from renewable component. Once the schedule for specific thermal generating station has been received, then depending upon the forecast available for RE energy, that Generating Station shall supply power either from existing thermal station or combination of thermal and RE power to meet its scheduled power as defined earlier in this scheme. Thus the deviation, if any, shall be made applicable to the scheduled generation from thermal station and sum total of actual generation from thermal/RE sources. No DSM shall be payable/receivable by the generating station if it is able to meet its scheduled generation by supplying thermal and RE power in any ratio.

vi) Procurement and supply of RE power by the Generator for supply under this scheme shall be allowed and necessary License required need to be fulfilled by the respective Generating Company.

vii) The proposed scheme shall be applicable only for the Thermal projects developed / being developed under Section 62 of the Electricity Act, i.e., "Regulated Tariff based Projects".

viii) Use of flexibility in generation as proposed in the scheme is optional and only if found feasible Generator can use power from RE sources to replace its existing thermal power to meet its schedule generation from thermal power station.

ix) Changes, if any, required in the Regulation for implementation of the above scheme shall be made by the appropriate Electricity Regulatory Commission.

x) Central Electricity Authority shall monitor the implementation and suggest changes, if required, in the scheme to the Central Government. In doing so, CEA may consult MNRE, POSOCO, CERC, Discoms and other stake holders.

xi) CEA shall also suggest a road map for implementation of the scheme at the Generating company level i.e a change from Station wise flexibility to company-wise flexibility

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Annexure-B6

Scope of work of the project'Upgradation of SCADA/RTUs/SAS in Central Sector stations and strengthening of OPGW network in Eastern Region'

A. Replacement of RTUs/SAS and Upgradation of SAS:

Replacement of existing S-900 and C264 RTUs installed in ULDC phase-I along with upgradation of RTU/SAS/ Remote Operation RTUs for dual reporting to both Main ERLDC & Backup ERLDC over IEC 60870-5-104 Protocol and lack of maintenance support due to non-availability of spares.

S.no	Region	Name of Substations	Remarks
1	ER-II	Durgapur	RTU to be replaced
2	ER-II	Malda	RTU to be replaced
3	ER-II	Binaguri	RTU to be replaced
4	ER-II	Siliguri220	RTU to be replaced
5	ER-II	Birpara	RTU to be replaced
6	ER-II	Subhasgram	RTU to be replaced
7	ER-II	Dalkhola	RTU to be replaced
8	ER-II	Gangtok	RTU to be replaced
9	ER-II	Maithon	RTU to be replaced
10	ER-II	Newmelli	Hardware/License upgradation
11	ER-II	Berhampore	Hardware/License upgradation
12	ER-II	Rangpo	Hardware/License upgradation
13	ER-I	Biharsharif	RTU to be replaced
14	ER-I	Jamshedpur	RTU to be replaced
15	ER-I	Purnea 400	RTU to be replaced
16	ER-I	Purnea 220	RTU to be replaced
17	ER-I	Sasaram HVDC	RTU to be replaced
18	ER-I	Muzaffarpur	RTU to be replaced
19	ER-I	Patna	SAS to be replaced
20	ER-I	Banka	Hardware/License upgradation
21	ER-I	Lakhisarai	Hardware/License upgradation
22	ER-I	Ranchi	SAS to be replaced
23	ER-I	New Ranchi	Hardware/License upgradation
24	ER-I	Chaibasa	Hardware/License upgradation
25	ER-I	Gaya	Hardware/License upgradation
26	ER-I	Sasaram 765	Hardware/License upgradation
27	ER-I	Ara	Hardware/License upgradation
28	Odisha Projects	Jeypore	RTU to be replaced
29	Odisha Projects	Baripada	RTU to be replaced
30	Odisha Projects	Indravati	RTU to be replaced
31	Odisha Projects	Rourkela	RTU to be replaced
32	Odisha Projects	Rengali	RTU to be replaced
33	Odisha Projects	Angul	Hardware/License upgradation
34	Odisha Projects	Jharsuguda	Hardware/License upgradation
35	Odisha Projects	Bolangir	Hardware/License upgradation
36	Odisha Projects	Pandiabili	Hardware/License upgradation
37	Odisha Projects	Keonjhar	Hardware/License upgradation
38	Odisha Projects	Talcher HVDC	Hardware/License upgradation

B. Implementation of BCU based Substation Automation System at Purnea 220 KV, Ara 220 KV, Birpara220KV, Siliguri220KV, Sasaram S/s in addition to the replacement of RTUs for data reporting to ERLDC through single RTU/SAS as per advice of ERLDC.

C. Replacement of DCPS for replacement of old DCPS commissioned in ULDC phase-I:
Following old DCPS & UPS in 18 nos.Central Sector locations is decided to be replaced:

Sr. No.	Location	Item
1	Durgapur	UPS
2	ERLDC, Kolkata	2x4 kw DCPS with parallel operation
3	Durgapur	DCPS
4	Kanchanpur	
5	Barkot	
6	Jamui	
7	Maldah	
8	Siliguri 400	
9	Jamshedpur	
10	Siliguri 220	
11	Rengali	
12	Birpara	
13	Rourkela	
14	Purnea 220	
15	Indravati	
16	Muzaffarpur	
17	Biharsharif	
18	Sasaram HVDC	

D. Laying of OPGW in the second circuit of following links commissioned in ULDC Phase-I:

S/n	**Name of links**	**Length (Km)**
1	Rourkela-Talcher	171
2	Durgapur-Jamshedpur	175
3	Durgapur-Farakka	150
4	Biharsharif-Sasaram	193
5	Biharsharif-Kahalgaon	202
6	LILO portion of Biharsharif-Balia at Ara	12
	Total	**903**

Name of the Substation / Lines	Observation	Recommendation
220 / 132 kV NJP 220 kV Binaguri (PG) – NJP # 1 & 2	Higher Voltage (>103% of nominal voltage) injection of Reactive Energy (MVARh) into ISTS observed particularly in the months of November to April (low hydro condition) as WBSETCL System is found surplus in Reactive Energy and pushing MVARh in the reverse direction.	i. WBSETCL should plan for requisite shunt compensation at 220 kV NJP (WB) or else. ii. Adjustment of Binaguri 400 / 220 kV ICT tap may also be explored to maintain voltage at 220 kV or below. iii. WBSETCL may explore shifting some more loads on NJP S/s from Dalkola S/s. iv. As a last resort, 220 kV lines adjacent to NJP, which are generating reactive power due to low loading may be kept off during lean period.

Name of the Substation / Lines	Observation	Recommendation
400 kV Subhasgram (PG) S/S i. 400 kV Subhasgram (PG) – HEL (CESC) #1 & 2	Higher Voltage (>103% of nominal voltage) injection of Reactive Energy (MVARh) takes place particularly during April to September. However, HEL units provide sufficient reactive support below 400 kV level.	HEL should consider absorption of reactive energy (within its limits) during high voltage condition. As a long term measure, HEL may consider installing 50 MVAR shunt (line) reactor for each of the 400 kV lines for helping the remote end voltage rise while charging of the lines after tripping.
ii. 220 kV Subhasgram (PG) – Subhasgram(WB) #1 & 2	Being a major load centre and feeding loads in radial nature, high import of reactive power at low voltage (<97% of the nominal voltage) takes place most of the period of the whole year except winter season (lean period loads are significantly low)	WBSETCL should insist upon more capacitive shunt compensation at the downstream Sub-stations.
iii. 220 kV Subhasgram (PG) – EM Bypass (CESC) #1& 2	Reactive Energy drawl by CESC System at Lower voltage (<97% of the nominal voltage) generally takesplace between March to September only.	CESC may explore shifting of some low power factor loads from EM Bypass to their Kasba or Budge Budge source, instead of importing power from ISTS, otherwise arrange for more shunt capacitive compensation in near future.
iv. 220 kV Subhasgram (PG) – KLC Bantala / New Town	Lower voltage (<97% of the nominal voltage) import of reactive power takes place only from March to June, whereas higher voltage (>103% of nominal voltage) reactive energy injection takes place between February to October.	As a short term measure, WBSETCL may explore shifting of loads either at Kasba or at Jeerat during March to June and more loads towards Bantala& New Town during October to February by rearrangement of STU / downstream Network.

Name of the Substation / Lines	Observation	Recommendation
400kV Sagardighi TPS (WBPDCL) 400 kV Sagardighi - Durgapur (PG) # 1 & 2	Sagardighi is experiencing higher voltage (>103% of nominal voltage) high reactive (MVAR) injection round the year, since the 400 kV lines remain lightly	i. Sagardighi TPS (2x300 + 2x500 MW) units need to absorb more reactive power or else one of the D/C may be kept open to control injection of reactive power to ISTS. ii. 400 / 220 kV ICT may adjust / revise the tap setting as per requirement.

	loaded and has not provided with any line reactor.	iii. As a long term measure, WBPDCL may consider installing 50 MVAR line reactor for both the circuits.

Name of the Substation / Lines	Observation	Recommendation
400 / 220 kV Durgapur (PG) S/s 400 kV Bidhannagar – Durgapur D/C of WBSETCL	Higher Voltage (>103% of nominal voltage) high injection of reactive energy takes place round the year.	i. DPL (660 MW) units must absorb more reactive power. ii. Change / Revision of 400/ 220 kV ICT tapat Bidhannagar S/s. iii. One of 400 kV PPSP – Bidhannagar D/C line may be kept open from Bidhannagar end whenever needed.

Name of the Substation / Lines	Observation	Recommendation
400 kV PPSP (New) of WBSEDCL 400 kV PPSP (New) –Ranchi (New) (PG) # 1 & 2	Higher Voltage (>103% of nominal voltage) is presenting almost round the year, although only one 80 MVAR shuntreactor is available at PPSP (New). There are 6 nos. of 400 kV long lines from PPSP without any line reactors.	PPSP units should provide requisite reactive support during their operation both as generator and motor mode. Whenever the units are not in bar, one of the circuits of PPSP (New) - Ranchi (New) or PPSP – Bidhannagar may be kept open during lean hours till line compensation by way of line reactor installation is completed on the above lines.

Name of the Substation / Lines	Observation	Recommendation
220 / 132 kV Malda S/s of Powergrid 132 kV Malda (PG) – Malda (WB) # 1 & 2	Lower voltage (<97% of the nominal voltage) high drawl of Reactive power is predominant particularly during March to October, because Malda being a major load centre of W Bengal.	Load shifting from Malda to Dalkola may be explored with suitable network arrangement. As a long term measure, establishment of 220 / 132 kV Gazol S/s is expected to relieve higher drawl of MVAR from Malda S/s may be reduced.

Time	Frequency	Bihar Actual	Bihar Dev	JUSNL Dev	DVC Dev	OPTCL Dev	WBSETCL Dev	Sikkim Dev
14-03-2018 21:20	49.67	3924.55	119.97	83.51	-17.59	-127.62	38.33	1.60
12-04-2018 22:18	49.70	4189.45	229.19	-93.91	181.99	-46.74	13.78	18.39
12-04-2018 22:20	49.69	4186.81	226.55	-95.48	106.19	4.74	7.83	17.90
16-04-2018 22:18	49.70	4429.93	117.33	40.05	-50.93	35.21	104.24	-7.31
16-04-2018 22:20	49.68	4415.69	103.09	48.90	13.61	-3.10	115.32	-7.87
23-04-2018 10:46	49.61	3050.36	-99.10	50.61	-117.84	-207.82	148.96	-2.57
23-04-2018 10:48	49.68	3058.39	-91.07	6.97	-90.53	-196.77	167.83	-2.85
23-04-2018 10:50	49.69	3076.74	-72.72	17.72	-46.44	-189.09	179.28	-3.46
23-04-2018 22:36	49.69	4319.42	138.51	109.50	-15.39	-219.63	-62.00	-26.64
05-05-2018 22:54	49.70	4360.88	140.01	43.70	-234.65	-200.75	235.51	-55.35
05-05-2018 22:56	49.67	4357.64	136.78	6.00	-238.00	-237.75	230.52	-55.59
05-05-2018 22:58	49.62	4369.00	148.13	20.50	-295.98	-180.47	201.99	-56.26
05-05-2018 23:00	49.63	4350.15	124.08	-1.85	-242.55	-157.32	329.04	-59.51
05-05-2018 23:02	49.68	4349.84	123.76	-41.23	-224.07	-167.78	272.24	-60.21
05-05-2018 23:22	49.68	4356.47	179.79	-24.97	-260.18	-130.60	100.72	-60.43
05-05-2018 23:24	49.68	4361.60	184.92	-31.22	-339.82	-111.37	110.74	-60.22
09-05-2018 21:06	49.70	4325.81	-158.21	106.62	306.40	-106.38	115.98	-7.00
10-05-2018 15:24	49.67	3094.30	-170.65	213.74	170.50	-157.61	114.76	28.32
10-05-2018 15:26	49.69	3101.01	-163.94	235.16	166.33	-162.07	73.82	26.57
10-05-2018 22:14	49.69	4070.88	-187.86	43.65	79.62	-204.34	-20.25	-30.20
10-05-2018 22:16	49.68	4074.74	-214.83	195.03	124.64	-175.82	-102.30	-23.28
10-05-2018 22:18	49.66	4063.79	-225.77	210.92	76.81	-143.43	-111.42	-22.72
11-05-2018 22:22	49.69	4390.62	-116.59	53.27	35.53	67.02	-215.52	-1.09
14-04-2018 22:18	49.70	4145.59	-190.60	104.97	49.80	-92.78	26.60	-5.65
16-05-2018 14:16	49.68	3015.67	22.47	69.15	8.10	139.19	-171.03	-12.89
16-05-2018 20:22	49.70	4360.71	-41.65	10.37	-15.37	-155.72	-46.60	-5.01
16-05-2018 22:12	49.68	4280.46	-61.62	31.67	76.90	-191.65	-70.20	3.08
14-04-2018 22:08	49.68	4213.35	37.10	183.85	-98.70	-158.63	-178.93	-12.25
14-04-2018 22:10	49.68	4212.32	36.07	185.11	-39.04	-308.94	-192.13	-12.53
14-04-2018 23:22	49.67	4186.77	71.94	59.10	113.05	-53.64	-200.24	-13.98
14-04-2018 23:24	49.68	4182.28	67.45	53.95	148.19	-110.37	-216.39	-14.73
19-05-2018 03:34	49.69	3932.21	62.66	-32.42	-44.64	-101.44	-31.81	-32.90
19-05-2018 03:36	49.68	3930.47	60.92	-35.48	65.74	-143.50	-51.71	-33.75
19-05-2018 03:38	49.68	3906.01	36.46	-40.05	55.97	-54.95	-66.79	-34.61
21-05-2018 15:30	49.68	3339.33	-104.66	65.04	55.03	-40.30	232.24	-13.28
21-05-2018 15:34	49.63	3354.58	-89.41	84.46	103.03	-88.22	201.15	-12.05
21-05-2018 15:36	49.62	3354.80	-89.19	84.22	-69.44	-43.62	189.14	-12.39
21-05-2018 15:38	49.70	3359.67	-84.32	50.25	-67.17	72.87	123.09	-12.54
22-05-2018 14:16	49.69	3561.35	24.64	97.93	-155.26	-67.14	3.93	-9.37
22-05-2018 14:28	49.66	3550.13	13.42	95.41	-81.82	-14.65	45.79	-8.36
22-05-2018 15:18	49.66	3385.03	157.15	93.46	50.29	37.94	-265.76	-10.99
22-05-2018 15:20	49.68	3327.98	100.10	76.79	67.49	16.26	-294.56	-10.43
22-05-2018 22:10	49.69	4497.31	-41.82	38.20	39.39	-99.54	-162.71	5.18
26-05-2018 12:48	49.70	3476.02	-122.19	-13.11	-42.28	-226.88	61.70	-29.85
26-05-2018 16:24	49.70	3182.36	-183.34	149.10	10.71	-171.17	-104.25	-22.61
26-05-2018 19:20	49.68	4399.17	20.38	-34.86	129.56	7.33	85.63	0.34
26-05-2018 19:22	49.68	4422.05	43.27	-44.12	39.30	50.73	91.63	0.53
26-05-2018 19:44	49.68	4544.45	103.23	-66.71	-131.00	-4.52	165.34	-0.16

26-05-2018 19:46	49.66	4520.27	-19.21	82.84	-146.88	-26.31	159.19	1.38
26-05-2018 19:48	49.61	4549.06	9.58	114.42	-118.17	14.94	159.34	1.73
26-05-2018 19:50	49.58	4540.89	1.41	99.59	-55.96	-63.86	136.36	1.59
26-05-2018 19:52	49.66	4502.42	-37.06	37.24	-125.45	-48.69	13.44	0.32
26-05-2018 22:12	49.68	4591.37	73.44	21.78	23.93	-19.76	171.16	3.58
26-05-2018 22:14	49.68	4494.43	-23.50	13.43	23.23	94.81	182.03	3.79
26-05-2018 22:42	49.69	4531.01	62.51	96.76	133.16	44.38	140.64	7.24
26-05-2018 23:36	49.66	4457.16	24.08	63.64	81.54	122.58	147.76	5.96
26-05-2018 23:38	49.63	4441.03	7.94	106.10	119.38	67.97	173.00	6.88
26-05-2018 23:40	49.65	4451.81	18.73	95.27	104.69	113.02	172.42	5.05
26-05-2018 23:42	49.69	4455.69	22.61	55.75	116.59	57.31	188.58	5.43
28-05-2018 14:46	49.69	3229.56	207.30	86.72	-11.73	-21.05	17.42	-16.79
31-05-2018 14:16	49.66	3092.51	161.58	-81.14	-1267.32	-32.14	670.61	16.74
31-05-2018 14:18	49.70	3102.37	171.44	-81.36	-1296.69	-70.97	721.81	17.42
31-05-2018 14:46	49.70	3207.47	276.54	-10.97	-1318.72	-205.50	521.22	12.91
31-05-2018 14:48	49.67	3209.74	278.81	4.82	-1311.93	-197.76	513.27	14.20
31-05-2018 14:50	49.66	3183.38	252.45	-2.28	-1320.73	-61.39	528.60	13.32
31-05-2018 14:52	49.65	3161.36	230.43	11.11	-1278.59	-119.72	506.45	11.65
31-05-2018 14:54	49.68	3144.68	213.75	3.64	-1264.37	-226.48	470.97	11.79
31-05-2018 15:16	49.68	3052.73	151.13	38.33	-1345.35	-74.27	470.94	13.54
01-06-2018 14:18	49.69	2919.58	-202.91	-63.98	-200.82	71.06	-15.63	22.41
04-06-2018 14:17	49.70	3471.47	99.66	98.29	-94.14	-31.05	-31.52	18.13
04-06-2018 14:18	49.68	3464.25	92.44	100.30	-124.72	14.40	-50.89	16.26
04-06-2018 14:19	49.67	3477.50	105.69	97.99	-129.24	-30.26	-32.95	17.95
04-06-2018 14:20	49.68	3467.55	95.74	97.07	-97.14	-41.66	-31.49	17.69
04-06-2018 14:21	49.68	3471.87	100.06	112.90	-148.73	-76.98	-31.93	17.10
14-06-2018 20:22	49.70	4565.18	147.62	-67.27	34.79	409.28	162.67	-14.40
14-06-2018 20:23	49.68	4573.58	156.02	-65.68	32.74	367.97	164.15	-14.78
14-06-2018 20:24	49.68	4571.68	154.12	-68.29	13.67	314.65	178.42	-15.23
14-06-2018 20:26	49.70	4573.40	155.84	-84.97	65.69	269.66	170.54	-16.11
14-06-2018 22:15	49.69	4508.69	104.75	-36.01	33.75	-95.23	95.86	-13.14
14-06-2018 22:18	49.68	4504.36	100.43	-52.00	56.42	-52.92	107.81	-13.42

Computation- AUFLS

NPC

Freqn dependence = 1.5 **Assumed Power Number (P) = 7,000**

Frequency (A)	Deviation from 50 Hz (B)=50-(A)	% Change in Freq. (C) =(B/50)*100	% Change in MW (D) =FD*C	Freq. Factor Correction(E) = 100/(100-D)	Voltage correction factor (F)= 1/0.855	Daily load fluctuation factor (G) = 1/0.7)	Overall Correction factor (H) = E*F*G	Required Load Relief = P*H
49.2	0.8	1.6	2.4	1.025	1.17	1.43	1.7142	**12000**
49.0	1	2	3	1.031	1.17	1.43	1.7248	**12074**
48.8	1.2	2.4	3.6	1.037	1.17	1.43	1.7356	**12149**
48.6	1.4	2.8	4.2	1.044	1.17	1.43	1.7465	**12225**

			Load Relief in MW				
Region	MW (Peak) met in 2017-18	Ratio % (Region to all India)	49.2 Hz	49.0 Hz	48.8 Hz	48.6 Hz	Total
NR	58,448	32.70	**3920**	**3950**	**3970**	**4000**	15840
WR	50,085	28.02	**3360**	**3380**	**3400**	**3430**	13570
SR	47,210	26.41	**3170**	**3190**	**3210**	**3230**	12800
ER	20,485	11.46	**1380**	**1380**	**1390**	**1400**	5550
NER	2,520	1.41	**170**	**170**	**170**	**170**	680
Total	**178,748**	100.00	**12000**	**12070**	**12140**	**12230**	**48440**

Computation- AUFLS

NPC

Freqn dependence = 1.5 **Assumed Power Number (P) = 7,000**

Frequency (A)	Deviation from 50 Hz (B)=50-(A)	% Change in Freq. (C) =(B/50)*100	% Change in MW (D) =FD*C	Freq. Factor Correction(E) = 100/(100-D)	Voltage correction factor (F)= 1/0.855	Daily load fluctuation factor (G) = 1/0.7)	Overall Correction factor (H) = E*F*G	Required Load Relief = P*H
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Total	**178,748**	100.00	**12000**	**12070**	**12140**	**12230**	**48440**

2nd Third Party Protection Audit Observations of DVC Sub-stations in Eastern Region

Sl. No.	Name of Sub-station	Date of Audit	Observations/Remarks	Category
1	Chandrapura TPS B (New) 220kV - DVC	01-06-2018	1. Only one DCDB is available. Other DCDB may be provided and protection relays should be subdivided into two groups to provide redundancy	B
			2. Time synchronizing equipment is not available	B
			3. Old ABB make PLCC panels are being used for BTPS lines.PLCC system may be upgraded to new system as availability of spares is an issue.	B
			4. Line CVT is available for only one phase and distance relay measurement voltage input is taken from bus CVT. Line CVT may be installed in all three phases and distance relay voltage measurement input may be taken from line CVT.	B
2	Chandrapura TPS A (old) 220kV - DVC	01-06-2018	1. Isolation of 220 V DC supply positive w.r.t. Ground is not proper. All DC cables are old and needs replacement.	B
			2. Event logger is not available	B
			3. LBB protection CAG 34 A for 220kV level is not service	B
			4. Only one DCDB is available. Other DCDB may be provided and protection relays should be subdivided into two groups to provide redundancy	B
			5. Electromechanical relays of primary and backup protection are to be replaced with numerical relays	B
			6. CVTs, CTs, CBs, Isolators and Surge Arresors of 132kV system are 50 years old and these equipments needs to be replaced.	B
			7. Panel and control cable wirings are old and needs replacement.	B
			8. All indicating instruments in control room may be upgraded to digital meters as old analog instruments give high burden to CT	B
			9. Line CVT is available for only one phase and distance relay measurement voltage input is taken from bus CVT. Line CVT may be installed in all three phases and distance relay voltage measurement input may be taken from line CVT.	B
			10. Busbar protection for 220kV system CAG 34 A is not service	A
			11. Time synchronizing equipment is not available	B
			12. Old PLCC panels are being used in some 220kV and 132kV lines. PLCC system may be upgraded to new system as availability of spares is an issue.	B
			13. Autorecloser is not in service for 220kV Kalyaneswari lines and 132kV Rajabera lines	B
			14. Overflux protection is not available for 150 and 160 MVA, 220/132 kV ATRs	B
			15. Backup directional over current Earth Fault protection is not available for 150 and 160 MVA, 220/132 kV ATRs	B
			16. Main protection of 132kV Purulia (L58) and Gola(L6) are not in service.	B
			17. Huge vegetation up to 3 feet grass was observed in the switchyard. The same has to be removed and proper gravelling is to be done.	A
3	Bokaro TPS B 220/132/33kV - DVC	31-05-2018	1. Isolation of 220 V DC supply negative w.r.t. Ground is not proper. All DC cables are old and needs replacement.	B
			2. Event logger is not available	B
			3. DG set is not available	B
			4. Only one DCDB is available. Other DCDB may be provided and protection relays should be subdivided into two groups to provide redundancy	B
			5. Electromechanical relays of primary and backup protection are to be replaced with numerical relays	B
			6. CVTs, CTs, CBs, Isolators and Surge Arresors are 30 years old and these equipments may be upgraded to present fault level	B
			7. Panel and control cable wirings are old and needs replacement.	B
			8. All indicating instruments in control room may be upgraded to digital meters as old analog instruments give high burden to CT	B
			9. Line CVT is available for only one phase and distance relay measurement voltage input is taken from bus CVT. Line CVT may be installed in all three phases and distance relay voltage measurement input may be taken from line CVT.	B
			10. Terminal connections directly connected to CVT needs to be modified i.e. Line dropper to Surge Arrestor then CVT	A
			11. Time synchronizing equipment is not in service	B
			12. 0.5 class CTs may be replaced with 0.2 class	B
			13. REL 670 of 220kV Ramgarh line may be used as Main II distance protection and backup directional over current E/F protection may be enabled in SEL 311C and REL 670.	A
			14. Overflux protection is not available for 150 MVA, 220/132 kV ATRs	B
			15. Backup directional over current Earth Fault protection is not available for 150 MVA, 220/132 kV ATRs	B
			16. Autorecloser and carrier tripping are not in service for all 132kV lines	B
4	400kV Bokaro TPS - DVC	31-05-2018	1. 315 MVA, 400/220kV ICT-II is charged from 400kV side only 220kV side bay is yet to be commissioned.	B
5	Durgapur 220/33kV - DVC	30-05-2018	1. Busbar protection is not in service	B

			2. Event logger is not available	B
			3. One 220 V DC source is available. Second source may be provided	B
			4. Electromechanical relays of primary and backup protection are to be replaced with numerical relays	B
			5. Time synchronizing equipment is not available	B
6	Durgapur TPS 220/132kV - DVC	30-05-2018	1. Busbar protection is not available	B
			2. Event logger is not available	B
			3. LBB is not available	B
			4. Dedicated 220 V DC source may be provided for 220kV Switchyard or DC source of 132kV switchyard may be extended for 220kV Switchyard.	B
			5. Electromechanical relays of primary and backup protection of ATRs are to be replaced with numerical relays	B
			6. CVTs, CTs, CBs, Isolators and Surge Arresors are 30 years old and these equipments may be upgraded to present fault level	B
			7. Backup directional over current Earth Fault protection is not available for 160 MVA, 220/132 kV ATRs	B
			8. Overflux protection is not available for 160 MVA, 220/132 kV ATRs	B
			9. Line CVT is available for only one phase and distance relay measurement voltage input is taken from bus CVT. Line CVT may be installed in all three phases and distance relay voltage measurement input may be taken from line CVT.	B
			10. Terminal connections directly connected to CVT needs to be modified i.e. Line dropper to Surge Arrestor then CVT	A
			11. Time synchronizing equipment is not service	B
			12. RED 670 is yet to be commissioned for 132kV ASP lines	A
			13. DG set is not available	
			14.Autorecloser is not service for all 220kV lines	B
7	Mejia TPS 220kV - DVC	29-05-2018	1. Isolation of 220 V DC supply positive w.r.t. Ground is not proper. All DC cables are old and needs replacement.	B
			2. Event logger is not available	B
			3. Autorecloser is not service for all 220kV lines	A
			4. Only one DCDB is available. Other DCDB may be provided and protection relays should be subdivided into two groups to provide redundancy	B
			5. Electromechanical relays of primary and backup protection are to be replaced with numerical relays	B
			6. CVTs, CTs, CBs, Isolators and Surge Arresors are old and these equipments may be upgraded to present fault level	B
			7. Panel and control cable wirings are old and needs replacement.	B
			8. All indicating instruments in control room may be upgraded to digital meters as old analog instruments give high burden to CT	B
			9. Line CVT is available for only one phase and distance relay measurement voltage input is taken from bus CVT. Line CVT may be installed in all three phases and distance relay voltage measurement input may be taken from line CVT.	B
			10. DR and Fault locator are not available for Kalyaneswari, Burnpur DTPS lines	B
			11. Time synchronizing equipment is not available	B
			12. PLCC is not available for 220kV MTPS-Gola line	B

Note:

1. As per CERC order dated 21st Feb 2014 protection deficiencies are categorised as
Category-A : The deficiencies which can be corrected without any procurement.
Category-B : The deficiencies involving procurement of equipments.

400/132 kV Motihari(DMTCL) and 400/220 kVDarbhanga(DMTCL) Substation Auidt Findings and Recommendations

In view of repeated tripping of various lines from Motihari 400/132KV(DMTCL) substation and unreliable operation of the protection system, an audit team was formed by MS, ERPC during the 67th PCC meeting for auditing the protection system of 400/ 132 KV Motihari and 400/220 KV Dharbhanga substation of DMTCL. Members of the above Protection Audit team were:

1) Sh. J. Ganeswara Rao, EE, ERPC
2) P.P. Jena, AEE, ERPC
3) Sh. Chandan Kumar, Sr. Engineer, ERLDC
4) Sh. Saibal Ghosh, Engineer, ERLDC
5) Sh. Vivek Pushphakar, Manager, NTPC Barh
6) Sh. Mohsin Raza, Manager, POWERGRID

Protection Audit team visited the 400/132 KV Motihari Substation on 11/06/18 and inspected all the settings and relay test reports in presence of DMTCL executives and matter of concerns and protection standard violation along with operational issues were flagged to them for taking the corrective action. A brief summary of findings of the audit team at 400/132 KV Motihari S/S is as below:

1) **Wiring issues:** In Disturbance Recorder, the wrong status of CB opening was noticed which was also highlighted during the tripping report by ERLDC. Along with this for Zone 1 fault, the pickup for zone 2 and zone 3 is not being observed. The above indicates wrong connection and the same was informed to DMTCL protection team for a thorough check for all the disturbance reorders available in the substation.
2) **Non-operation of Pole Discrepancy relay:** Pole Discrepancy relay for Gorakhpur -2 line has not operated properly, so its time setting and wiring need to be checked. Similar activity has to be done for all the 400 kV as well as 132 kV lines.
3) **Distance protection issue:**
    a. For some line, distance setting for all the zones was found to be incorrect and further, the Main 1 and Main 2 relays were found to having different settings for the same line. In one of the Main protection, (7SA522) for 400 kV lines, the carrier receipt is not configured in distance protection logic.
    b. Zone 2, Zone 3 and zone 4 time delay settings are to be reviewed as per the ERPC protection philosophy.
    c. **P.O.P Z2 scheme Usage:** P.O.P Z2 scheme has been used instead of Under reach scheme for the 400 kV lines.
    d. Reversal guard timer has been used which is not required.
    e. **Power swing block:** Blocking is used for all zones, but for the zone -1 it should be unblocked.
    f. **SOTF:** This was inactive in 7SA522 relay and DMTCL was asked to activate it.

400/132 kV Motihari(DMTCL) and 400/220 kVDarbhanga(DMTCL) Substation Auidt Findings and Recommendations

4) **Directional Earth Fault:** DT send for DEF protection have been activated however in practice utilities do not use a direct trip in case of DEF
5) **Disturbance Recorder timing:** DR timing was found to be 1.5 sec, which is quite less and does not capture the entire event in one DR file. DMTCL was intimated to make it 5 sec (0.5 s pre and 2,5post-fault) or higher as per the capability of Disturbance recorder file.
6) **Coordination of Overcurrent Protection of 400/132 kV ICTs:** The 400/132 kV ICT overcurrent protection need proper coordination with respect to the downstream 132 kV network in order to avoid any unwanted tripping due to a downstream network fault. Presently 400/132 kV ICTs are set to trip at 110% of rated current. However, the overcurrent tripping of the ICT needs to be set as per the overload alarm and overcurrent tripping also need to be reviewed with respect to the capacity of the ICTs.
7) **Station Operating Procedure during Blackout:** The details of action required to be done during any substation level blackout were found to be not available in the Control Room to assist the operator under emergency. This document is quite necessary in order to help and guide operator under such situation.
8) **Spares Management for GIS Substation:** As the 400 kV Gorakhpur-Motihari 2 Inter-regional circuit is on prolonged outage due to the issue of unavailability of spare at the Motihari substation. The Audit team is of the view that adequate spare need to be maintained at GIS substation to meet such contingency.
9) **Training of the Manpower:** It was observed that the shift personnel need adequate training for real-time operation of the GIS substation and the same has been informed to the DMTCL.
10) **Switchyard maintenance:** Lot of vegetation in the yard was found. So proper anti-weed treatment in regular interval need to be carried out.

The Audit team has also visited the 400/220 kV Darbhanga substation on 12/06/18 and the issues observed in the Motihari Substation were also found in Darbhanga substation.

Recommendations of Protection Audit Team for 400/132 kV Motihari and 400/220 kV Darbhanga Substation:

In view of the above issues, the Protection Audit Team informed DMTCL operation and protection team to for the smooth operation of both the 400 kV substations

1. Thoroughly check all the soft logic, setting and wiring connection for ensuring protection reliability of this important inter-regional corridor.
2. Adequate spare management to meet contingency
3. Training of control room operator for GIS substation operation
4. System Operating procedure availability in control room
5. Ensuring the protection coordination with the downstream network

Annexure - B28.1

SUMMARY OF DEVIATION CHARGE RECEIPT AND PAYMENT STATUS

BILL UPTO 13.05.18 (Week -6 of 2018 - 19)

Last Payment Disbursement Date - 01.06.18

Figures in Rs. Lakhs

CONSTITUENTS	Receivable	Received	Payable	Paid	Outstanding
WR	24.73225	0.00000	290416.30639	281338.96691	-9052.60723
SR	114097.33110	108563.41562	1999.68784	2358.48935	5892.71700
NER	88372.35147	89795.77876	12912.32488	13579.97506	-755.77711
NR	48514.39682	46893.42117	11326.64663	10273.47019	567.79921
BSPHCL	12845.28011	12002.70430	298.65354	0.00000	543.92227
JUVNL	12075.36024	10395.47072	22.38118	0.00000	1657.50834
DVC	9164.13620	8619.00826	3582.20458	3580.56764	543.49100
GRIDCO	27989.10743	27898.62662	619.20859	1389.59627	860.86849
WBSETCL	30744.25863	29544.75144	19.21540	19.22040	1199.51219
SIKKIM	604.03636	0.00000	782.21343	242.21842	64.04135
NTPC	8703.15388	8446.72502	85.86347	83.30815	253.87354
NHPC	21.58420	0.00000	3057.80101	2924.78625	-111.43056
MPL	175.04030	156.70698	619.08534	619.08129	18.32927
MTPS STG-II	142.65073	60.83025	0.00000	0.00000	81.82048
APNRL	348.23837	152.42236	372.38671	132.90648	-43.66422
CHUZACHEN (GATI)	44.02426	43.50945	418.36607	387.89674	-29.95452
NVVN (IND-BNG)	429.16151	431.83387	286.29180	281.93475	-7.02941
JITPL	718.74280	711.97977	811.00214	802.80868	-1.43043
GMR	398.59100	250.92860	1612.54479	1565.39602	100.51363
IND BARATH	112.50429	0.00000	0.00000	0.00000	112.50429
TPTCL(DAGACHU)	2274.24288	2127.20260	36.24336	36.24336	147.04028
JLHEP (DANS ENERGY)	702.84132	656.56963	201.43673	201.41313	46.24809
BRBCL(NABINAGAR)	198.25119	216.25254	998.83526	1005.91648	-10.92013
NVVN (IND-NEPAL)	2778.88795	2753.71853	406.49690	393.53384	12.20636
HVDC SASARAM	2.33430	2.33430	132.50774	127.24840	-5.25934
HVDC-ALIPURDUAR	0.90856	0.90856	198.53507	190.20318	-8.33189
TEESTA-III(TUL)	1039.16725	1039.14725	1594.11474	1592.82872	-1.26602
DIKCHU	83.05531	90.22371	703.26113	678.90078	-31.52875
Tashiding (THEP)	212.59277	125.10718	63.17603	63.17603	87.48559
OPGC	11.12218	7.13928	0.00000	0.00000	3.98290
NPGC	7.29253	0.00000	0.00000	0.00000	7.29253
Pool Balance	0.00000	649.72102	-4425.60403	0.02596	3775.90897
Addl Deviation charge	17054.98648	30080.42802	0.00000	0.00000	-13025.44154
IRE	0.00000	0.00000	-51.15352	0.00000	51.15352
VAE	0.00000	0.00000	16672.14570	0.00000	-16672.14570
TOTAL	32033.08424	18804.54507	31122.43748	16722.39371	

	% Realization	**58.70**	**As on**	**01.06.18**
Receivable:	Receivable by ER POOL		Payable	Payable by ER POOL
Received	Received by ER POOL		Paid	Paid by ER POOL

"- ve" Payable by ER pool "+ ve" Receivable by ER pool

Annexure-B28.2

Deviation Interest Bill due to delay payment during FY 2017-18

Sl No.	Name of Constituent	Interest amt Payable by Party(in Rs)	Amount Paid/ recovered by Party(in Rs)	Interest amt receivable by Party(in Rs)	Amount paid to the Party(in Rs)	Outstanding Interest as on 31.05.18 (in Rs)
1	BSPHCL	17017374	14268439			**2748935**
2	JUVNL	15402615	14617761			**784853**
3	DVC			14278	14278	**0**
4	GRIDCO			25776	25776	**0**
5	WBSETCL	0				**0**
6	SIKKIM	1143998				**1143998**
7	NTPC	0				**0**
8	NHPC			5860	5860	**0**
9	MPL	1443				**1443**
10	APNRL			57900	57900	**0**
11	CHUZACHEN	8617				**8617**
12	NVVN(IND-BD)	765				**765**
13	JITPL	38619				**38619**
14	GMR	56974				**56974**
15	IND BARATH	1030904				**1030904**
16	TPTCL(DAGACHU)	304143				**304143**
17	JLHEP	230359				**230359**
18	BRBCL	5315				**5315**
19	NVVN(IND-NEP)	23086				**23086**
20	TUL(TEESTA-III)			5772	5772	**0**
21	DIKCHU			9475	9475	**0**
22	HVDC-PSL			127	127	**0**
23	HVDC-ALPD			355	355	**0**
24	TASHIDING	138753				**138753**
25	OPGC	0				**0**
26	WR POOL			15688104	15688104	**0**
27	SR POOL	2099668				**2099668**
28	NR POOL	777950	4197023			**-3419073**
29	NER POOL	71742				**71742**
	Total	**38998004**	**33083223**	**15807647**	**15807647**	**5914781**

Annexure - B28.3

STATUS OF REACTIVE CHARGES

RECEIVABLE IN ER POOL AS PER PUBLISHED A/C UPTO 13.05.18 (2018 -19)
AS ON 01.06.18

CONSTITUENT	AMOUNT RECEIVABLE IN THE POOL (Rs.)	AMOUNT RECEIVED IN THE POOL (Rs.)	TOTAL OUTSTANDING(Rs.)
BSPHCL	378537	378537	0
JSEB	1137688	1137688	0
DVC	357122	357122	0
GRIDCO	239932341	239932341	0
WBSETCL	581959944	548594340	33365604
SIKKIM	623206	325817	297389
TOTAL	824388838	790725845	33662993

Note: (+ve) means payable by utility & (-ve) means receivable by utility

Annexure - B29

Current Status of Letter of Credit (LC) amount against UI charges for ER constituents

Figures in Lacs of Rupees

Sl No	ER Constituents	No. of weeks in which Deviation Charge payable	No of times payment was delayed during 2017-18	Total Deviation charges payable to pool during 2017-18	Average weekly Deviation Charge liability (C)/52 weeks	LC Amount 110% of (B)	Due date of expiry	Remarks
		(A)	(B)	(C)	(D)	(E)	(F)	(G)
1	JUVNL	50	50	10486.92151	201.67157	221.83872	Expired on 31.01.2018	Letter Issued but Not Renewed
2	SIKKIM	26	26	577.40815	11.10400	12.21440	Expired on 07.03.2018	Letter Issued but Not Renewed
3	CHUZACHEN	9	4	43.51171	0.83676	0.92044	Expired on 31.03.2018	Letter Issued but Not Renewed
4	BRBCL	21	4	198.25119	3.81252	4.19378	Expired on 31.03.2018	Letter Issued but Not Renewed
5	IND-BARATH	47	47	107.23938	2.06230	2.26853	Not Opened	Not Opened
6	TEESTA-III(TUL)	12	2	1039.16725	19.98399	21.98238	Not Opened	Not Opened
7	SNEHA KINETIC(DIKCHU)	9	7	53.96014	1.03770	1.14146	Not Opened	Not Opened
8	SHIGA ENERGY(TASHIDING)	25	15	148.94874	2.86440	3.15084	Not Opened	Not Opened
9	BSPHCL	48	48	12297.15842	236.48382	260.13220	16.11.2018	Opened for 213.53049 Lac
10	MPL	12	2	148.83104	2.86214	3.14835	31.03.2019	Opened for 3.14835 Lac
11	APNRL	18	16	307.81318	5.91948	6.51143	31.05.2018	Opened for ₹ 10.67046 Lacs
12	JITPL	18	3	656.5622	12.62620	13.88882	31.03.2019	Opened for 13.88882 Lac
13	GMR	21	10	257.62983	4.95442	5.44986	18.04.2019	Opened for 7.62525 Lacs
14	TPTCL	49	7	2092.89162	40.24792	44.27271	31.03.2019	Opened for 112.03686 Lacs
15	JLHEP	37	24	652.25964	12.54345	13.79780	24.09.2018	Opened for 7.18644 Lacs
16	NVVN(IND-NEP)	36	7	2742.53984	52.74115	58.01527	26.09.2018	Opened for ₹ 8.69683 Lacs

Date of Commercial Operation(DOCO) of the Asstes

Annexure-B40.4

A	Associated Transmission System for Nabinagar-II TPS(3x660MW)	DOCO	Approved Cost	Standing Committee Reference	RPC Meeting Reference	Sharing of Charges
01	400 kV D/C(Quad) Nabinagar II – Gaya Transmission line along with 2nos associated bays at Gaya substations	12/05/18	Rs.790.13 Cr.(including IDC of Rs. 50.00 Cr.).	SCM meeting of ER on 20.09.10.	15th ERPC meeting on 28.09.10 & 16th ERPC meeting 18.12.10.	# Mention in Note
B	**Eastern Region Strengthening Scheme-XV.**	**DOCO**	**Approved Cost**	**Standing Committee Reference**	**RPC Meeting Reference**	**Sharing of Charges**
01	Coversion of 50 MVAR fixed line reactor at Subhasgram end of Sagardighi-Subhasgram 400kV S/C line to switchable line reactor	08/03/18	Rs.454.11 Cr.(including IDC of Rs.26.73 Cr.).	17th SCM meeting of ER on 25.05.15	30th ERPC Meeting on 26.06.15	As per New Sharing methodology of PoC
02	1 no 125 MVAR Bus Reactor and 1 no 400kV line bay at Baharampur	30/03/18				
C	**Eastern Region Strengthening Scheme-IX**	**DOCO**	**Approved Cost**	**Standing Committee Reference**	**RPC Meeting Reference**	**Sharing of Charges**
01	Installation of 1x125 MVAR Bus Reactor by replacing existing 1x50 MVAR Bus Reactor at 400kV Rourkela Substation.	07/01/18	Rs.196.58 Cr.(including IDC of Rs.10.65 Cr.).	SCM meeting of ER on 05.01.13.	22nd ERPC Meeting on 25.08.12 & 24th ERPC meeting on 27.04.13	As per New Sharing methodology of PoC
D	**Eastern Region Strengthening Scheme-XII**	**DOCO**	**Approved Cost**	**Standing Committee Reference**	**RPC Meeting Reference**	**Sharing of Charges**
01	Spare 1 no unit of 765Kv, 110 MVAR Single Phase Reactor to be stationed at Sasaram	29/03/18	Rs.522.29 Cr.(including IDC of Rs.33.24 Cr.).	2nd 2013 SCM meeting of ER on 27.08.13.	25th ERPC meeting on 21.09.13	As per New Sharing methodology of PoC
02	Modification of 132kV Bus arrangement at 220/132kV Purnea substation with GIS bays	12/03/18				
03	Installation of 3rd 500 MVA, 400/220kV ICT at Patna (POWERGRID) substation along- with associated bays	14/02/18				
E	**Eastern Region Strengthening Scheme-III**	**DOCO**	**Approved Cost**	**Standing Committee Reference**	**RPC Meeting Reference**	**Sharing of Charges**
01	400 kV D/C Sasaram–Daltonganj transmission line along-with associated bays at Sasaram & Daltonganj substation.	31/03/18	Rs. 1512.08 Cr. (including IDC of Rs. 96.92 Cr.).	08/11/2008 at Bhubaneswar	Special(9th) ERPC meeting on 30/12/2008 & 10th ERPC meeting on 11/04/2009 at Port Blair	As per New Sharing methodology of PoC
02	400/220 kV,315 MVA ICT I at Daltonganj substation and associated bays	31/03/18				
03	400kV,80 MVAR Bus Reactor at Daltonganj substation and associated bay	31/03/18				
F	**Eastern Region Strengthening Scheme-XVII (Part A)**	**DOCO**	**Approved Cost**	**Standing Committee Reference**	**RPC Meeting Reference**	**Sharing of Charges**
01	220/132 kV,160 MVA ICT I at Daltonganj substation and associated bays	31/03/18	Rs. 34.90 Cr. (including IDC of Rs. 1.39 Cr.).	17th SCM of ER held at NRPC New Delhi on 25th May'15	30th ERPC meeting on 20/06/2015 at Shimla & 31st ERPC meeting on 14/11/2015 at Bhubaneshwar	As per New Sharing methodology of PoC
02	220/132 kV,160 MVA ICT II at Daltonganj substation and associated bays	31/03/18				
03	2 nos 132 kV line bays at Daltonganj substation for Daltonganj(PG)-Daltonganj(JUSNL) line	31/03/18				
G	**POWERGRID works associated with common transmission system for Phase II Generation Projects in Odisha**	**DOCO**	**Approved Cost**	**Standing Committee Reference**	**RPC Meeting Reference**	**Sharing of Charges**
01	LILO of both Circuit of 400kV D/C (2nd line) Rourkela-Raigarh at Jharsuguda(Sundargarh) Substation and 4 nos 400kV GIS line bays for termination of LILO of both circuits of 400kV (2nd line) Rourkela-Raigarh at Jharsuguda(Sundargarh) Substation	07/01/18	Rs. 844.64 Cr. (including IDC of Rs. 50.27 Cr.).	16th SCM meeting of ER on 02.05.14 & 17th SCM of ER on 25.05.15	24th ERPC meeting on 27.04.13 & 30th ERPC meeting on 20.06.15	As per New Sharing methodology of PoC
H	**SCADA/EMS systema at SLDCs of ER**	**DOCO**	**Approved Cost**	**Standing Committee Reference**	**RPC Meeting Reference**	**Sharing of Charges**
01	(b) Integration of RTUs to Main Control Centre & RTU for BSTPCL - 10 nos	19/09/2017				

 # Note : **6th Amendment to CERC (Connectivity and LTA/MTOA in ISTS & Related matters) Regulation 2009 was notified on 17.02.17 As per the amendment of Clause (8) of Regulation 8 "The transmission charges for the dedicated transmission line shall be payable by Generator from date of COD of the dedicated line till operationalisation of LTA of the generating station of the generating company". Hence Nabinagar Power Generating Company Private Limited(NPGCPL) will bear the transmission charges of the line till operationalisation of LTA. NPGCPL has communicated vide letter dated 15.05.18 to POWERGRID.**

Annexure - C3.1

SUMMARY OF RRAS CHARGE RECEIPT AND PAYMENT STATUS

BILL from 02.04.18 to 13.05.18 (upto Week - 6 of 2018 - 19)
Last Payment Disbursement Date -01.06.18

Figures in Rs. Lakhs

CONSTITUENTS	Receivable	Received	Payable	Paid	Outstanding
FSTPP STG-I & II	1.06195	0.00473	414.39629	308.75363	**-104.58544**
FSTPP STG-III	0.34424	0.00000	417.12401	347.50744	**-69.27231**
KhSTPP STG-I	5.99360	0.42077	1125.10546	967.22156	**-152.31107**
KhSTPP STG-II	3.87356	0.33028	2045.12895	1659.88156	**-381.70411**
TSTPP STG-I	1.80566	0.00000	31.49088	26.46583	**-3.21940**
BARH STG-II	8.59414	0.00000	556.15172	470.22650	**-77.33108**
BRBCL (Nabinagar)	1.22183	0.00000	527.66569	455.67920	**-70.76467**
TOTAL	**22.89497**	**0.75578**	**5117.06300**	**4235.73572**	**-859.18806**

As on 28.05.18

Receivable: Receivable by ER POOL Payable Payable by ER POOL

Received Received by ER POOL Paid Paid by ER POOL

"- ve" Payable by ER pool "+ ve" Receivable by ER pool

Annexure - C3.2

SUMMARY OF CONGESTION CHARGE RECEIPT AND PAYMENT STATUS

Bill upto 07.01.2013
Last Payment Disbursement Date - 13.05.2013

Figures in Rs. Lakhs

CONSTITUENTS	Receivable	Received	Payable	Paid	Outstanding
BSEB	0.67823	0.67823	0.39118	0.39118	0.00000
JSEB	16.37889	16.37889	2.61323	2.61323	0.00000
DVC	0.00000	0.00000	6.24040	6.24040	0.00000
GRIDCO	5.34488	5.34488	0.00000	0.00000	0.00000
WBSETCL	0.00000	7.42249	4.32834	11.75083	0.00000
SIKKIM	0.65609	6.20909	0.00000	5.55300	0.00000
NTPC	6.93152	6.93152	7.42249	7.42249	0.00000
NHPC	0.70445	0.70445	0.05875	0.05875	0.00000
MPL	4.81694	4.81694	0.85169	0.85169	0.00000
STERLITE	7.70504	7.70504	0.00000	0.00000	0.00000
Pool Balance	0.00000	0.00000	21.30996	21.30996	0.00000
TOTAL	**43.21604**	**56.19153**	**43.21604**	**56.19153**	0.00000

% Realization **As on 31.05.2015**

Receivable:	Receivable by ER POOL	Payable	Payable by ER POOL
Received	Received by ER POOL	Paid	Paid by ER POOL

"- ve" Payable by ER pool "+ ve" Receivable by ER pool

Annexure - C3.3

DETAILS OF DISBURSEMENT TO POWER SYSTEM DEVELOPMENT FUND

Sl No	Nature of Amount	Amount transferred to PSDF (Rs in Lac)	Date of Disbursement	Cheque No	Remarks
1	**Opening Balance (upto 31.03.16)**	**86464.58111**			
2	Addl. Dev	83.33978	01.04.16		Addl Dev Charge 15-16
3	Addl. Dev	43.77416	05.04.16		Addl Dev Charge 15-16
4	Addl. Dev	31.83984	07.04.16		Addl Dev Charge 15-16
5	Addl. Dev	52.08622	11.04.16		Addl Dev Charge 15-16
6	Addl. Dev	107.23773	13.04.16		Addl Dev Charge 15-16
7	Addl. Dev	220.15330	19.04.16		Addl Dev Charge 15-16
8	Addl. Dev	76.84824	21.04.16		Addl Dev Charge 15-16
9	Addl. Dev	20.84026	26.04.16		DSM Interest 2014-15(Paid by APNRL)
10	Addl. Dev	10.01920	26.04.16		Addl Dev Charge 16-17
16	Addl. Dev	432.25696	28.04.16		Addl Dev Charge 16-17
17	Addl. Dev	117.08707	02.05.16		Addl Dev Charge 16-17
18	Addl. Dev	41.65418	04.05.16		Addl Dev Charge 16-17
19	Addl. Dev	114.33049	06.05.16		Addl Dev Charge 15-16 & 16-17
20	Deviation Interest	38.50018	06.05.16		Deviation Interest
21	Addl. Dev	35.54178	10.05.16		Addl Dev Charge 16-17
22	Addl. Dev	448.87953	31.05.16		Addl Dev Charge 16-17
23	Addl. Dev	170.51274	29.06.16		Addl Dev Charge 16-17
24	Reactive Charges	530.57497	28.09.16		Reactive Charges_15-16
25	Reactive Charges	1000.00000	26.12.16		Reactive Charges_16-17
26	Reactive Charges	779.39811	14.02.17		Reactive Charges_16-17
27	Reactive Charges	500.00000	29.03.17		Reactive Charges_16-17
28	Reactive Charges	203.61904	26.04.17		Reactive Charges_16-17
29	Reactive Charges	394.80618	30.05.17		Reactive Charges_16-17
30	Reactive Charges	256.53944	28.06.17		Reactive Charges_16-17
31	Reactive Energy Charge	248.26904	31.07.17		Reactive Charges_17-18
32	Reactive Energy Charge	128.44284	29.08.17		Reactive Charges_17-18
33	Reactive Energy Charge	103.22685	26.09.17		Reactive Charges_17-18
34	Reactive Energy Charge	249.14078	31.10.17		Reactive Charges_17-18
35	Reactive Energy Charge	172.20693	30.11.17		Reactive Charges_17-18
36	Reactive Energy Charge	200.00000	15.12.17		Reactive Charges_17-18
37	Reactive Energy Charge	100.00000	05.01.18		Reactive Charges_17-18
38	Reactive Energy Charge	558.45339	06.02.18		Reactive Charges_17-18
39	Reactive Energy Charge	171.95546	06.03.18		Reactive Charges_17-18
40	Reactive Energy Charge	129.35497	04.04.18		Reactive Charges_17-18
41	Reactive Energy Charge	126.21494	07.05.18		Reactive Charges_17-18
	Total	**94361.68571**			

Annexure-C4.1

	2016-17				2017-18			
DSM account Reconciliation Status of ER constituents and Inter Regional								
Name of The Utility	**Q1 (04.07.16)**	**Q2 (03.10.16)**	**Q3 (04.01.17)**	**Q4 (05.04.17)**	**Q1(04.07.17)**	**Q2(09.10.17)**	**Q3(08.01.18)**	**Q4(09.04.18)**
Inter Regional								
WR	NO	NO	YES	NO	NO	NO	NO	NO
SR	YES	YES	NO	YES	YES	NO	NO	NO
NER	NO	NO	YES	YES	YES	NO	YES	NO
NR	NO	NO	NO	NO	NO	NO	YES	NO
Intra Regional								
BSPHCL	YES	YES	YES	YES	YES	YES	YES	NO
JUVNL	YES	YES	YES	YES	YES	YES	YES	NO
DVC	YES	YES	YES	YES	YES	YES	YES	NO
GRIDCO	YES	YES	YES	YES	YES	YES	YES	YES
WBSETCL	YES	YES	YES	YES	YES	YES	YES	YES
SIKKIM	YES	YES	YES	NO	NO	NO	NO	NO
NTPC	YES	YES	YES	YES	YES	YES	YES	YES
NHPC	YES	YES	YES	YES	YES	YES	YES	YES
MPL	YES	YES	YES	YES	YES	YES	YES	YES
VEDANTA	NO	NO	NO	NO	N/A	N/A	N/A	N/A
APNRL	YES	YES	YES	YES	YES	YES	YES	YES
CHUZACHEN(GATI)	YES	YES	YES	YES	YES	YES	YES	YES
NVVN(Ind-Bng)	YES	YES	YES	YES	YES	YES	YES	YES
NVVN(Ind-Nep)	YES	YES	YES	YES	YES	YES	YES	YES
GMR	YES	YES	YES	YES	YES	YES	YES	NO
JITPL	YES	YES	YES	YES	YES	YES	YES	NO
INBEUL	NO	NO	NO	NO	NO	NO	NO	NO
TPTCL (DAGACHU)	YES	YES	YES	YES	YES	YES	YES	NO
JLHEP(DANS ENERG	YES	YES	YES	YES	YES	NO	NO	NO
BRBCL	YES	YES	YES	YES	YES	YES	YES	NO
POWERGRID (ER-I)	N/A	N/A	YES	YES	YES	YES	YES	NO
POWERGRID (ER-II)	N/A	N/A	N/A	N/A	N/A	N/A	YES	YES
TUL (TEESTA-III)	N/A	N/A	N/A	YES	YES	YES	NO	NO
DIKCHU	N/A	N/A	N/A	N/A	YES	NO	YES	NO
SHIGA (TASHIDING)	N/A	N/A	N/A	N/A	N/A	N/A	NO	NO
OPGC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	YES

Note:
(1)The dates in the bracket indicates the date of sending the Reconciliation statements by ERLDC to utilities.
(2) YES Indicates that signed reconciliation statement received by ERLDC
(3) NO Indicates that signed reconciliation statement is not received by ERLDC

Annexure-C4.5

Reconciliation Between Open Access department of ERLDC and SLDCs, STUs					
Sl. No.	**STUs / SLDCs Name**	**Quarter-I (Apr-17-June-17)**	**Quarter-II (Jul-17-Sep-17)**	**Quarter-III (Oct-17-Dec-17)**	**Quarter-IV (Jan-18-Mar-18**
1	DVC - SLDC	YES	YES	YES	**NO**
2	OPTCL-SLDC and STU	YES	YES	YES	**NO**
3	West Bengal - SLDC and STU	YES	**NO**	**NO**	**NO**

Reconciliation Between Open Access department of ERLDC and Applicants					
Sl. No.	**Applicants Name**	**Quarter-I (Apr-17-June-17)**	**Quarter-II (Jul-17-Sep-17)**	**Quarter-III (Oct-17-Dec-17)**	**Quarter-IV (Jan-18-Mar-18**
1	Calcutta Electric Supply Company	YES	YES	YES	Not Applicable
3	GMR Kamalanga Energy Limited	YES	YES	YES	Not Applicable
4	Jindal India Thermal Power Limited	YES	YES	YES	YES
5	Jharkhand State Electricity Board	YES	YES	YES	**NO**
6	West Bengal State Distribution Company Ltd.	YES	YES	Not Applicable	**NO**

Annexure-C7

List of Meter & Location for AMR 4th Phase

S.No	MAKE	Meter Serial No	LOCATION
1	L&T	NP-7885-A	LAKHISARAI(PG)
2	L&T	NP-7886-A	
3	L&T	NP-7429-A	
4	L&T	NP-7429-A	
5	L&T	NP-7887-A	
6	L&T	NP-7430-A	
7	L&T	NP-7888-A	
8	L&T	NP-7431-A	
9	ELSTER	NR-4451-A	ALIPURDUAR(PG)
10	ELSTER	NR-4452-A	
11	ELSTER	NR-3717-A	
12	ELSTER	NR-4622-A	
13	ELSTER	NR-4625-A	
14	ELSTER	NR-4447-A	
15	ELSTER	NR-4446-A	
16	ELSTER	NR-3725-A	
17	ELSTER	NR-4617-A	
18	ELSTER	NR-3716-A	
19	ELSTER	NR-3718-A	
20	GENUS	ER-1104-A	
21	GENUS	ER-1146-A	
22	GENUS	ER-1005-A	
23	GENUS	ER-1006-A	
24	GENUS	ER-1002-A	
25	GENUS	ER-1004-A	
26	ELSTER	ER-1295-A	KISHANGANJ(BSPTCL)
27	GENUS	ER-1158-A	
28	GENUS	ER-1156-A	
29	GENUS	ER-1157-A	
30	GENUS	ER-1287-A	NPGC(BSPTCL)
31	GENUS	ER-1282-A	
32	GENUS	ER-1052-A	

68 Meters

S.No	MAKE	Meter Serial No	LOCATION
69	GENUS	ER-1290-A	APNRL
70	GENUS	ER-1135-A	BERHAMPORE(PG)
71	GENUS	ER-1140-A	
72	GENUS	ER-1265-A	BIHARSHARIFF(PG)
73	GENUS	ER-1108-A	BINAGURI(PG)
74	GENUS	ER-1102-A	
75	GENUS	ER-1076-A	
76	GENUS	ER-1128-A	
77	GENUS	ER-1125-A	
78	GENUS	ER-1106-A	BIRPARA(PG)
79	GENUS	ER-1109-A	
80	GENUS	ER-1110-A	
81	GENUS	ER-1071-A	DALKHOLA(PG)
82	GENUS	ER-1072-A	
83	GENUS	ER-1166-A	DARBHANGA(DMTCL)
84	GENUS	ER-1263-A	GAYA(PG)
85	GENUS	ER-1170-A	
86	GENUS	ER-1297-A	JAMSHEDPUR(PG)
87	GENUS	ER-1215-A	
88	GENUS	ER-1043-A	KHARAGPUR(WB)
89	GENUS	NR-4615-A	KISHANGANJ(PG)
90	GENUS	NR-4434-A	
91	GENUS	ER-1293-A	
92	GENUS	ER-1296-A	
93	GENUS	ER-1159-A	
94	GENUS	ER-1154-A	
95	GENUS	ER-1143-A	MALDA(PG)
96	GENUS	ER-1150-A	
97	GENUS	ER-1008-A	MEJIA(DVC)
98	GENUS	ER-1031-A	
99	GENUS	ER-1055-A	MIRAMUNDALI(GRIDCO)
100	GENUS	ER-1054-A	

h 68 Meters

33	GENUS	ER-1063-A	OPGC	16 New Locations with	101	GENUS	ER-1165-A	MOTIHARI(DMTCL)	25 Existing Locations wit
34	GENUS	ER-1027-A			102	GENUS	ER-1167-A		
35	GENUS	ER-1112-A			103	GENUS	ER-1122-A	MPL	
36	GENUS	ER-1026-A			104	GENUS	ER-1123-A		
37	GENUS	ER-1030-A			105	GENUS	ER-1124-A		
38	GENUS	ER-1053-A			106	GENUS	ER-1129-A		
39	GENUS	ER-1066-A			107	GENUS	ER-1226-A	MUZAFFARPUR(PG)	
40	GENUS	ER-1068-A			108	GENUS	ER-1299-A	NABINAGAR(BRBCL)	
41	GENUS	ER-1060-A			109	GENUS	ER-1292-A		
42	ELSTER	NR-3714-A	TEESTA-III		110	GENUS	ER-1294-A		
43	ELSTER	NR-3715-A			111	ELSTER	NR-4620-A	NEW MELLI(PG)	
44	ELSTER	NR-4450-A			112	ELSTER	NR-4621-A		
45	ELSTER	NR-3720-A			113	GENUS	ER-1099-A	PANDIABILI(PG)	
46	ELSTER	NR-4623-A			114	L&T	NP-8052-A		
47	ELSTER	NR-3719-A			115	GENUS	ER-1175-A	PURNEA(PG)	
48	ELSTER	NR-4456-A			116	GENUS	ER-1176-A		
49	ELSTER	NR-4618-A			117	GENUS	ER-1298-A	RAMCHANDARPUR(PG)	
50	ELSTER	NR-4454-A			118	GENUS	ER-1020-A	RENGALI(PG)	
51	ELSTER	NR-4453-A			119	GENUS	ER-1028-A	ROURKELA(PG)	
52	GENUS	ER-1250-A	MOTIHARI(BSPTCL)		120	GENUS	ER-1029-A		
53	GENUS	ER-1245-A			121	GENUS	ER-1012-A	SUNDERGARH(PG)	
54	GENUS	ER-1286-A	MOTIPUR(BSPTCL)		122	GENUS	ER-1093-A		
55	GENUS	ER-1288-A			123	GENUS	ER-1100-A		
56	GENUS	ER-1111-A	ATRI(GRIDCO)		124	GENUS	ER-1019-A		
57	GENUS	ER-1007-A			125	GENUS	ER-1118-A		
58	GENUS	ER-1248-A	RAXAUL(BSPTCL)		126	GENUS	ER-1022-A		
59	GENUS	ER-1249-A			127	GENUS	ER-1021-A		
60	GENUS	ER-1113-A	SAMANGARA(GRIDCO)		128	GENUS	ER-1023-A		
61	GENUS	ER-1073-A			129	GENUS	ER-1117-A		
62	GENUS	ER-1223-A	SAMASTIPUR(BSPTCL)		130	GENUS	ER-1119-A		
63	GENUS	ER-1121-A	EMSS(CESC)		131	GENUS	ER-1062-A		
64	GENUS	ER-1126-A			132	GENUS	ER-1067-A		
65	GENUS	ER-1227-A	BETIAH(BSPTCL)		133	GENUS	ER-1061-A		
66	GENUS	ER-1173-A			134	GENUS	ER-1070-A		
67	GENUS	ER-1116-A	BHOGRAI(GRIDCO)		135	GENUS	ER-1065-A		
68	GENUS	ER-1114-A	JALESWAR(GRIDCO)		136	GENUS	ER-1064-A		

Annexure-C10

Location details of Elster Meter in Eastern Region

Sl No	Meter No	Location	Region
1	NR-3714-A	TEESTA-III	ER-II
2	NR-3715-A	TEESTA-III	ER-II
3	NR-4450-A	TEESTA-III	ER-II
4	NR-3720-A	TEESTA-III	ER-II
5	NR-4623-A	TEESTA-III	ER-II
6	NR-3719-A	TEESTA-III	ER-II
7	NR-4456-A	TEESTA-III	ER-II
8	NR-4618-A	TEESTA-III	ER-II
9	NR-4454-A	TEESTA-III	ER-II
10	NR-4453-A	TEESTA-III	ER-II
11	NR-4451-A	ALIPURDUAR	ER-II
12	NR-4452-A	ALIPURDUAR	ER-II
13	NR-3717-A	ALIPURDUAR	ER-II
14	NR-4622-A	ALIPURDUAR	ER-II
15	NR-4625-A	ALIPURDUAR	ER-II
16	NR-4447-A	ALIPURDUAR	ER-II
17	NR-4446-A	ALIPURDUAR	ER-II
18	NR-4435-A	ALIPURDUAR	ER-II
19	NR-4619-A	ALIPURDUAR	ER-II
20	NR-3725-A	ALIPURDUAR	ER-II
21	NR-4617-A	ALIPURDUAR	ER-II
22	NR-3718-A	ALIPURDUAR	ER-II
23	NR-4620-A	NEW MELLI	ER-II
24	NR-4621-A	NEW MELLI	ER-II
25	NR-4435-A	RANCHI NEW	ER-I
26	NR-4619-A	RANCHI NEW	ER-I
27	NR-4615-A	KISHENGANJ	ER-I
28	NR-4434-A	KISHENGANJ	ER-I

Annexure-C11

List of drifted meters to be replaced in Phase-III

SNO	LOCATION	METER SNO	FEEDER NAME	Region
1	JEERAT(WB)	NP-6445-A	400 KV JEERAT (WBSETCL) - BERHAMPORE(PG)	ER-II
2	JEERAT(WB)	NP-6446-A	400 KV JEERAT (WBSETCL) - SUBHASGRAM	ER-II
3	RANCHI(PG)	NP-7853-A	400 KV RAGHUNATHPUR 1	ER-I
4	RANCHI(PG)	NP-7871-A	400 KV RAGHUNATHPUR 2	ER-I
5	ALIPURDUAR(PG)	NR-3716-A	400 KV POLE-3 MAIN BAY-AGRA(NR)	ER-II
6	ALIPURDUAR(PG)	NR-3718-A	400 KV POLE-3 TIE BAY AGRA(NR)	ER-II
7	NEW MELLI(PG)	NR-4620-A	220 KV JORETHANG(JLHEP)-1	ER-II
8	NEW MELLI(PG)	NR-4621-A	220 KV JORETHANG(JLHEP)-2	ER-II
9	TEESTA-III	NR-3714-A	400 KV SIDE OF TEEST-III HEP GT-1	ER-II
10	TEESTA-III	NR-3715-A	400 KV SIDE OF TEEST-III HEP GT-2	ER-II
11	TEESTA-III	NR-4450-A	400 KV SIDE OF TEEST-III HEP GT-3	ER-II
12	TEESTA-III	NR-3720-A	400 KV SIDE OF TEEST-III HEP GT-4	ER-II
13	TEESTA-III	NR-4623-A	400 KV SIDE OF TEEST-III HEP GT-5	ER-II
14	TEESTA-III	NR-3719-A	400 KV SIDE OF TEEST-III HEP GT-6	ER-II
15	TEESTA-III	NR-4456-A	400 KV TEESTA-III - DICKCHU (MAIN)	ER-II
16	TEESTA-III	NR-4618-A	400 KV TEESTA-III - DICKCHU (CHECK)	ER-II
17	TEESTA-III	NR-4454-A	400 KV TEESTA-III - RANGPO (MAIN)	ER-II
18	TEESTA-III	NR-4453-A	400 KV TEESTA-III - RANGPO (CHECK)	ER-II
19	JINDAL (GRIDCO)	NP-6502-A	220KV JAMSHEDPUR (DVC)	ODHISA PROJECT
20	JAMSHEDPUR (DVC)	NP-6010-B	220 KV JINDAL	ER-I
21	GANGTOK(PG)	NP-6026-A	132KV CHUZACHEN(GATI)	ER-II
22	RANGPO(PG)	NP-7958-A	132 KV CHUZACHEN (GATI)	ER-II

List of Sub-stations:

1)	400kV Jeerat (PG)	Completed on 15th July 2015
2)	400kV Subashgram (PG)	Completed on 16th July 2015
3)	400kV Kolaghat TPS (WBPDCL)	Completed on 7th August 2015
4)	400/220kV Kharagpur (WBSETCL)	Completed on 7th August 2015
5)	400 &220kV Bidhannagar (WBSETCL)	Completed on 8th September, 2015
6)	400kV S/s Durgapur (PG)	Completed on 10th September, 2015
7)	400/220kV DSTPS(DVC)	Completed on 9th September, 2015
8)	400/220kV Mejia (DVC) TPS	Completed on 11th September, 2015
9)	400/220/132kV Mendhasal (OPTCL)	Completed on 2nd November, 2015
10)	400/220kV Talcher STPS (NTPC)	Completed on 3rd November, 2015
11)	765/400kV Angul (PG)	Completed on 4th November, 2015
12)	400kV JITPL	Completed on 5th November, 2015
13)	400kV GMR	Completed on 5th November, 2015
14)	400kV Malda (PG)	Completed on 23rd February, 2016
15)	400kV Farakka (NTPC)	Completed on 24th February, 2016
16)	400kV Behrampur(PG)	Completed on 25th February, 2016
17)	400kV Sagardighi (WBPDCL)	Completed on 25th February, 2016
18)	400kV Bakreswar (WBPDCL)	Completed on 26th February, 2016
19)	765kV Gaya(PG)	Completed on 1st November, 2016
20)	400kV Biharshariff(PG)	Completed on 3rd November, 2016
21)	220kV Biharshariff(BSPTCL)	Completed on 3rd November, 2016
22)	400kV Maithon (PG)	Completed on 18th May, 2017
23)	132kV Gola (DVC)	Completed on 17th May, 2017
24)	132kV Barhi (DVC)	Completed on 18th May, 2017
25)	132kV Koderma (DVC)	Completed on 18th May, 2017
26)	132kV Kumardhubi (DVC)	Completed on 19th May, 2017
27)	132kV Ramkanali (DVC)	Completed on 19th May, 2017
28)	220kV Ramchandrapur	Completed on 1st June, 2017
29)	400kV Jamshedpur (PG)	Completed on 1st June, 2017
30)	132kV Patherdih (DVC)	Completed on 31st May, 2017
31)	132kV Kalipahari (DVC)	Completed on 30th May, 2017
32)	132kV Putki (DVC)	Completed on 31st May, 2017
33)	132kV ASP (DVC)	Completed on 30th May, 2017
34)	132kV Mosabani (DVC)	Completed on 2nd June, 2017
35)	132kV Purulia (DVC)	Completed on 1st June, 2017
36)	400kV Jaypore(PG)	Completed on 2nd January, 2018
37)	220kV Jeynagar (OPTCL)	Completed on 2nd January, 2018
38)	400kV Indravati (PG)	Completed on 4th January, 2018
39)	400kV Indravati (OHPC)	Completed on 4th January, 2018
40)	220kV Theruvali (OPTCL)	Completed on 5th January, 2018
41)	220kV Mejia TPS (DVC)	Completed on 29th May, 2018
42)	220/132kV Durgapur TPS (DVC)	Completed on 30th May, 2018
43)	220/33kV Durgapur (DVC)	Completed on 30th May, 2018
44)	400kV Bokaro TPS (DVC)	Completed on 31st May, 2018
45)	220/132/33kV Bokaro TPS B (DVC)	Completed on 31st May, 2018
46)	220kV Chandrapura TPS A (Old) (DVC)	Completed on 1st June, 2018
47)	220kV Chandrapura TPS B (New) (DVC)	Completed on 1st June, 2018
48)	400/132kV Motihari (DMTCL)	Completed on 11th June, 2018
49)	400/220kV Darbhanga (DMTCL)	Completed on 12th June, 2018
50)	132/33kV Hazipur old (BSPTCL)	Completed on 12th June, 2018
51)	132/33kV Samastipur old (BSPTCL)	Completed on 12th June, 2018
52)	220/132kV Kanti TPS (KBUNL)	Completed on 13th June, 2018
53)	400/220/132kV Muzaffarpur (PG)	Completed on 13th June, 2018

UFR Inspection Report of 220/33kV Durgapur (DVC) substation on 30.05.2018

The ERPC UFR inspection group visited 220/33kV Durgapur (DVC) S/s for UFR Audit on 30.05.2018. The team physically inspected the feeders which are connected with UFRs at the above sub-stations. The report of the inspection is furnished below:

Sl. No.	Name of the substations	Feeder connected with UFR	Voltage rating	Adopted UFR setting	Tested initiated frequency	UFR make
			(kV)	(Hz)	(Hz)	
1	220/33kV Durgapur	Graphite India I & II	33	48.6	48.6	Siemens 7SJ8042
2		Jai Balaji Industries	33			
3		SRB Steel I & II, VSP	33			
4		Brahma Alloy	33			
5		Venky steel	33			

The above UFR setting were tested with help of Secondary injection Kit owned by DVC. The UFRs are provided with direct trip wiring and tripped at desired frequency.