AGENDA

FOR

178th OCC MEETING

Date:20.04.2021

Eastern Regional Power Committee

14, Golf Club Road, Tollygunge

Kolkata:700033

EASTERN REGIONAL POWER COMMITTEE

AGENDA FOR 178th OCC MEETING TO BE HELD ON 20.04.2021(TUESDAY) AT 10:30 HOURS

PART – A

ITEM NO. A.1: Confirmation of Minutes of 177th OCC Meeting held on 17th March 2021 through MS Teams.

The minutes of 177th Operation Sub-Committee meeting held on 17.03.2021 circulated vide letter dated 09.04.2021.

Members may confirm the minutes of 177th OCC meeting.

PART B: ITEMS FOR DISCUSSION

ITEM NO. B.1: Change in Control Logic at HVDC Sasaram

Powergrid has requested for shutdown of following elements for facilitating the Shutdown of HVDC Pole for operation checking of CB, Isolator from Mimic Panel of HVDC.

- 400 kV Biharsariff-Sasaram D/C,
- 400 kV Sasaram-Allahabad,
- 400 kV Sasaram-Varanasi and
- AC by pass at Sasaram.

Further HVDC has some hardwired logic which restricts the Power order of HVDC to 250 MW in case of an outage/non-availability of any Biharsariff circuit. Also, it cannot be taken into service when both Biharshariff circuits are out.

The above logic was implemented during commissioning of the HVDC as at that time, Sasaram was getting infeed only from Biharsariff at 400 kV level. However, with available of multiple connectivity now, it is proposed that the above logic may be reviewed.

Members may discuss.

ITEM NO. B.2: Finalization of metering arrangement for 33 kV Power Supply to Dulanga Mines from Darlipali STPP—NTPC

NTPC vide email informed that in-principle approval has been accorded by GRIDCO, Bhubaneswar, Odisha for availing 15 MVA power supply connection from Darlipali STPP by Dulanga Coal Mine of NTPC Ltd as a consumer of local DISCOM i.e. WESCO (presently TPWODL) for mining operation at Dulanga Coal Mine which will be treated as part of drawl of Odisha share from Darlipli STPP.

Accordingly, two number 33 feeders in 33 KV Misc SWGR, DSTPP have been envisaged for providing power supply to Dulanga for mining operation.

In replying to WESCO's query on the subject power supply connection to SMASL vide letter no 1677(5) dated 31.12.2020, M/s GRICO has opined vide their letter no 106 dated 20.01.2021 to get approval from ERPC/ERLDC regarding the connectivity and the metering scheme for availing the power supply connection as Darlipali STPP is a central generating power station.

NTPC may elaborate. Members may discuss.

ITEM NO. B.3: Repeated disturbances at 132/66 kV Melli S/S in March 2021

The occurrence of repeated grid events at 132/66 kV Melli S/S has been reported in March 2021 resulting in power failure at Melli and Kalimpong areas. A summary of the grid events in March 2021 is given in the following table:

Sr No	Date	Time (Hrs.)	Brief Description	Relay Indication of RangpoMelli S/C	Relay Indication of SiliguriMelli S/C	Power loss
1	11-03-2021	16:17	132 kV SiliguriMelli S/C was out of service. Kalimpong was radially fed from Melli through 66 KV Kalimpong-Melli D/C. 132 kV Rangpo – Melli S/C tripped ON R-Y phase fault leading to power failure at Melli.	R-Y, IR=1.2 kA, IY=1.1 kA, 2.1 km from Rangpo	--	Melli: 15 MW Kalimpong: 5 MW
2	24-03-2021	18:41	Both 132 kV Rangpo-Melli S/C and 132 KV Siliguri-Melli S/C tripped due to R & Y phase to earth fault resulting in total power failure at Melli and Kalimpong. Kalimpong was radially fed from Melli through 66 KV Kalimpong-Melli D/C.	R-Y, IR=1.6 kA, IY=1.5 kA, 2.1 km from Rangpo	R-Y, IR=1.4 kA, IY=1.3 kA, 104 km from Siliguri;	Melli: 12 MW Kalimpong: 6 MW
3	28-03-2021	16:42	132 kV Rangpo-Melli S/C and 132 KV Siliguri-Melli S/C tripped due to R & Y phase to earth fault resulting in total power failure at Melli and Kalimpong. Kalimpong was radially fed from Melli through 66 KV Kalimpong-Melli D/C.	R-Y, IR=1.4 kA, IY=1.4 kA, 2 km from Rangpo	R-Y, IR=1.4 kA, IY=1.3 kA, 105 km from Siliguri	Melli: 15 MW Kalimpong: 5 MW

In 101st PCC Meeting held on 13.04.2021, the agenda was placed for discussion. PCC referred the issue to OCC for discussion as Sikkim representative were not present in the meeting.

Sikkim may explain.

ITEM NO. B.4: 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 132 kV 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 43rd ERPC Meeting, Powergrid informed that the tower at location no. 79 is in vulnerable condition and needs immediate attention so as to avoid any further devastation.

Sikkim informed that they are in process of obtaining approval from State Govt. for rectification of the defective tower

In view of importance of the said line for power supply to State Capital, ERPC advised Sikkim to resolve the issue on priority basis and same shall be monitored in lower forum of ERPC.

Sikkim may update.

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

1. 132kV Sagbari –Melli.

In the 174th OCC meeting, Sikkim informed that 132kVMelli-Sagabari S/C is under outage because of faulty breaker issue at Sagabari end. Sikkim informed that 132 kV Sagabari S/s is under DISCOM jurisdiction.

In the 176th OCC meeting, Sikkim informed that the circuit breaker issue has been resolved.

They further informed that as the line was under outage for more than two years, there were vegetation &RoW issues. They added that there is conductor snapping in the line between loc. 20 and loc. 29.

In 177th OCC Meeting, Sikkim informed that necessary RoW clearance has been received for 80% section of the line and it would take two more weeks to get the clearance for remaining section of the line OCC advised Sikkim to expedite the work and restore the line at the earliest.

Sikkim may update.

2. 400 kV Maithon- Maithon RB D/C

400KV Maithon-Maithon RB D/C is under continuous shutdown from 12-01-21, for re-conductoring work.
In 177th OCC Meeting, Powergrid submitted that 14 km of stringing has been completed out of 31 km for each circuit.

OCC advised powergrid to submit the detailed plan and timeline of restoration of the line to ERPC secretariat/ERLDC within a week.

Powergrid may update.

3. 400 KV main bay of Patna-1 at Kishanganj S/s.

The said bay remains out of service due to problem in Y-ph CB mechanism from 10/04/20.

In the 177thOCC meeting, Powergrid informed that they are planning to carry out the work with in-house expertise and the restoration of bay is expected by April'21.

Power Grid may update.

4. 400KV New Purnea-Gokarna & 400KV New Purnea-FSTPP.

In the 175th OCC meeting, Powergrid informed that the line has already been restored.

Regarding PLCC work of 400 kV New Purnea-Farakka S/C, they informed that LOA has already been placed for new data card to be replaced at 400 kV Farakka end. The PLCC channel will be restored by Feb'21.

In the 176thOCC meeting, Powergrid informed that the permanent restoration of 400 kV New-Purnea-Gokarna & 400 kV New Purnea-FSTPP is going to be completed by March-2021 and the PLCC issue would be resolved during the permanent restoration of the line.

In 177th OCC Meeting, Powergrid informed that two out of two pile foundations had been completed and tower erection is under progress along with one open cast foundation.

They further informed that they want to avail the shutdown of both the lines from 23rdMarch 2021 for the bypass arrangement from Farakka to Gokarna as discussed in 177th OCC Maintenance programme meeting.

Powergrid may update.

5. 315MVA ICT-1 at Jeyore

315MVA ICT-1at Jeypore taken under outage from 25.03.2021 for commissioning of the 315MVA ICT-3 in parallel with the existing ICT-1. The shutdown was approved upto 31.03.2021 as per requisition received from Powergrid Odisha. However, the 315MVA ICT-1 at Jeypore is still under outage.

Powergrid may explain.

ITEM NO. B.6: Prolonged outage of Line reactor of 400 kV Motihari-Gorakhpur D/C -- ERLDC

400 kV Gorakhpur-Motihari D/C line reactor at Motihari (DMTCL) end is kept out since 2017 due to issue of failure of NGR breaker. It has been observed that these circuits have 139 MVAR of Line charging with 80 MVAR L/R at Gorakhpur and 50 MVAR L/R at Motihari end. The overall compensation on the circuit is around 93 % making it susceptible to LC resonance. In a report submitted by the DMTCL, it has been confirmed regarding LC resonance during line tripping. Following is suggested for taking the line reactor at Motihari in service.

1. Line Reactor tripping on single-phase fault to be adopted on the switchable reactor at Gorakhpur (PG).
2. Line reactor at Motihari (DMTCL) should be made switchable or in case not the above may be applied.
3. During any Maintenance, first, the line reactor at Gorakhpur is to be tripped and thereafter the line has to be opened to perform the rest of the activity.

Member may discuss.

ITEM NO. B.7: Outage of 400 kV main bays of 315MVA ICT 3 & 4 at Subhasgram S/s-- ERLDC

315MVA ICT 3 & 4 at 400 kV Subhasgram S/s was taken shutdown to complete the bay related work for upcoming 400kV-Subhasgram-New_Jeerat-DC lines which are in the same dia with ICT 3 & 4 respectively. Shutdown was availed on 12th & 13th February 2021 for the ICT 3 & 4 respectively.

During application of shutdown, reason was cited that "*Bay Upgradation Work under ERSS-XVIII - Dropper opening from 412-89B Isolator required for dismantling of Old and Erection of New Upgraded Isolator & C*T".

However, it was not specified that the outage of main bay of ICT 3 & 4 is required. The same was intimated to ERLDC control room during the returning of the shutdown and both the ICTs were charged only through the tie bay & other main bay of the Dia.

The above-mentioned bays were under outage since 12th & 13th February 2021. This is serious network depletion for such an import substation which fed the capital city of West Bengal during summer season.

Powergrid may explain.

ITEM NO. B.8: Replacement of existing 50 MVAR LR of 400 kV Maithon-Gaya-I with new 50 MVAR LR (Natural Easter Oil) at Maithon S/s.

Presently, 400 KV Maithon-Gaya-I Line is having switchable Line Reactor (50 MVAR) installed at Maithon end. Generally, all the oil filled equipment's (Transformer/Reactors) at EHV switchyards are filled with conventional mineral oil. However, considering latest technological

advancements in the field of cooling medium and further increasing materials which are more eco-friendly in nature, first 400 KV class Reactor with natural easter oil is developed as per POWERGRID design with 50 MVAR capacity.

Few salient features of Easter oil over mineral oil are given in tabular forms for understanding.

Criteria	Mineral oil characteristic	Easter Oil characteristic
Key properties	Produced from increasingly scarce and non-renewable special petroleum crude	Produced from domestically grown, renewable sources, such as soybeans.
Environmental Properties	Contains compounds that do not readily biodegrade. May contain traces of a confirmed carcinogen.	Highly biodegradable; non-toxic, does not contain petroleum, silicone, or halogens.
Fire Risks	Catches fire more easily, leading to higher probability of transformer fires. Typical Flash point 140 °C	Higher fire point reduces the frequency and impact of transformer fires; virtually eliminates sustained fires. Typical Flash point 320 °C
Stability	Higher thermal stability can be achieved through addition of inhibitors	Esters have higher temperature stability than mineral oil, meaning esters can be exposed to a higher temperature for longer periods with less degradation than would be expected when using mineral oil
Transformer Performance	Does not slow down the standard insulation aging rate; requires special and expensive processing to dry out the paper insulation	Proven to slow down the aging rate of the insulation system, resulting in an increase in the expected life of a transformer by decades: also promotes automatic dry-out of paper insulation

For subject replacement, existing 50 MVAR LR will be dismantled and kept at spare foundation as spare Reactor, while, the new asset will be commissioned as 50 MVAR switchable LR of GAYA-I.

For above activity following S/D's will be required (Dates are tentative, S/D will be taken only after receipt of Reactor at Maithon):-

SL NO	NAME OF ELEMENT	FROM DATE	TO DATE	FROM TIME	TO TIME	REMARKS
01.	50 MVAR L/R OF GAYA-I.	08.05.21	15.06.21	10:00 Hrs	16:00 Hrs	On continuous basis.
01.	400 KV Maithon-Gaya-I.	10.05.21	10.05.21	09:00 Hrs	17:00 Hrs	For bushing dismantling.
03.	400 KV Maithon-Gaya-I.	28.05.21	28.05.21	09:00 Hrs	17:00 Hrs	For erection of bushing.
04.	400 KV Maithon-Gaya-I.	14.06.21	14.06.21	09:00 Hrs	17:00 Hrs	For testing purpose.

This is first of its kind for such equipment to be charged in India and performance of the same shall be updated also for future references such that system improvement steps along with eco-friendly measure can maximize the benefit for the users.

Member may discuss.

ITEM NO. B.9: Assessment of O&M activities for Repetitive Tripping of lines

In recent months, frequent tripping on various lines on account of RoW issues has been observed. This directly impacts the Eastern regional grid reliability and security.

The below Tables provides a list of such lines where such issues have been observed from July 2020 to March 2021.

It is important to find the real cause of these events and the need for taking preventive action and remedial measures to avoid such tripping. Due care must be taken by Line owners to ensure such events are reduced.

Name of Transmission Line	No of tripping	Remarks	Owner
400 kV PPPSP-Bidhannagar-2	12	All single-phase fault, and 5 times at a distance of 140 km approx. from PPSP end	WBSETCL
400 kV MeeramundaliBolangir	10	All single-phase fault, 5 times B-earth	PGCIL
400 kV-Meramundali-Lapanga 2	10	All single-phase fault, and 7 times at a distance of 170 km approx. from Meramundali end	OPTCL
400 kV Meramundali-Lapanga 1	8	All single-phase fault	OPTCL
400 kV-Kharagpur-Kolaghat-1	8	All at a distance of 30-33 km from Kolaghat	WBSETCL

Name of Transmission Line	No of tripping	Remarks	Owner
220 kV Chandil- STPS(WBPDCL)	23	No A/R at STPS and mostly faults at 90 km from Chandil end.	WBSETCL/ JUSNL
220 kV Khagaria-New Purnea-2	18	Many times, A/R successful only from Purnea end, but no A/R from Khagaria which could have avoided tipping	BSPTCL
220 kV Joda-Ramchandrapur	14	Generally high resistive fault, with delayed clearance and no A/R .	OPTCL/ JUSNL
220 kV Begusarai-New Purnea-1	11	7-time fault at a distance of 70 km from Purnea.	BSPTCL
220 kV Tenughat-Bihar Sharif	11	Fault mostly in JUSNL portion	JUSNL/BSPTCL
220 kV Farakka-Lalmatia	11	Fault at a distance of 85 km from fstpp .	NTPC
220 kV Budhipadar-Korba-2	10	Multiple tripping either on fault or due to bus bar mal operation at Buddhipadar	OPTCL/ CSPTCL

Name of Transmission Line	No of tripping	Remarks	Owner
132 kV Chuzachen-Rangpo-1	38	mostly B phase fault at a distance of 3 km from Rangpo.	Sikkim Power Dept
132 kV Sultanganj-Deoghar-1	38	Most faults at distance of 90-100 km from Sultanganj.	BSPTCL/ JUSNL
132 kV Banka (PG)-Sultanganj-2	26	All faults are R phase Fault in ckt-2 at a distance of 17-20 km from banka, and ckt-1 tripping on O/C	BSPTCL
132 kV Banka (PG)-Sultanganj-1	22	All faults are R phase Fault in ckt-2 at a distance of 17-20 km from banka, and ckt-1 tripping on O/C	BSPTCL
132 kV Rihand-Garwah-1	21	Multiple tripping, No Root cause shared	JUSNL/ UPPCL
132 kV Kahalgaon-Sabour-1	18	Vegetation related tripping	BSPTCL
132 kV Raxaul-Parwanipur-1	17	Multiple tripping,	BSPTCL/ Nepal
132 kV Rihand-Sonenagar-1	16	No Root cause shared	BSPTCL/ UPPpCL
132 kV Rangit-Sagbari-1	15	Vegetation related tripping	Sikkim Power Dept
132 kV Baripada(PG)-Bhogarai-1	14	Multiple tripping, No Root cause shared	
132 kV Sonnagar-Japla-1	13	Multiple tripping, No Root cause shared	BSPTCL /JUSNL
132 kV Khstpp-Lalmatia-1	12	Vegetation related tripping	BSPTCL/ JUSNL
132 kV Purnea (PG)-Barsoi-1	11	Multiple tripping, No Root cause shared	BSPTCL

Member may discuss.

ITEM NO. B.10: Agenda item by BSPTCL

1. Bihar DISCOMs i.e. NBPDCL and SBPDCL are purchasing power as mandated by Electricity Act 2003.
2. Accordingly, PPAs are signed with ISGS and intra-state generating stations as well. Also, power is purchased from IEX/PXI.

Power is being exported to Jharkhand from Bihar periphery through following tie-lines:

Import/Export Energy details of Inter-State Transmission Lines between Bihar and Jharkhand for FY 2020-21					
Transmission Line Details	**Meter sl No.**	**GSS**	**Voltage Level (kV)**	**Import Energy (kWh)**	**Export Energy(kWh)**
132 KV Sultanganj-Deoghar	Q0200965	Sultanganj_ 132/33kV	132	9576	168364607

132 KV Kahalgaon-Lalmatia	Q0201711	Kahalgaon_ 132/33kVV	132	437	211343282
132 KV Sonenagar-Garhwa	Q0303049	Sonenagar_ 132/33kV	132	2225.7	150758807.2
Total				12238.7	530466696.2

Further, 400/220/132 KV level transformer loss as well transmission losses for power being exported to Jharkhand are being borne by DISCOMs.

Hence, following actions/ measures are being proposed:

1. De-registration of above tie-lines from the list of ISTS.

2. Jharkhand may be requested to purchase power from Bihar either as a consumer or through open access.

BSPTCL may elaborate. Members may discuss.

ITEM NO. B.11: Shutdown proposal of generating units for the month of May' 2021.

Generator unit shutdown schedule for May' 2021 is given in the table.

Proposed Maintenance Schedule of Thermal Generating Units of ER in the month of May '21 (as finalised in LGBR meeting for 2021-22)							
System	**Station**	**Unit**	**Capacity (MW)**	**Period (as per LGBR 2021-22)**		**No. of Days**	**Reason**
				From	**To**		
DVC	Koderma TPS	1	500	15.05.21	19.06.21	35	COH, FGD, DeNox

Members may update.

ITEM NO. B.12: Status of implementation of AGC as a pilot project in States

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

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

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

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

Summary of status of implementation:

State	Station/Unit	Action plan
DVC	Mejia unit#7 &8	NIT has been floated. Order placement :30th March2020 Commissioning of AGC:31st July2020
West Bengal	Unit-5 of Bakreswar TPP	SLDC, WB to establish the required hardware for generating AGC signal at SLDC.
Odisha	Unit#3 of OPGC	Joint meeting between SLDC, Odisha and OPGC was held wherein, it was decided to visit Barh, NTPC and NLDC to get acquainted with the AGC Implementation and formulate a plan.

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

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

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

Members may update.

ITEM NO. B.13: Reliability of Power Supply to Gangtok

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

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

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

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

Member may discuss.

ITEM NO. B.14: Preparedness for meeting summer demand in 2021--ERLDC

This year, the mercury has started rising sharply from February end, which is a bit earlier than previous year and indicative of scorching summer that lies ahead. As per IMD forecast, higher Maximum temperature than usual is expected in Odisha, Jharkhand and Bihar in Eastern Region. With India's reasonably well fight back against COVID-19 and largest vaccination drive, this summer is likely to be extremely challenging for system operators to ensure reliable power supply, particularly to the remote corners of the region.

Therefore, very robust planning and preparedness is absolutely essential for meeting the system demand in a reliable manner. In view of this, dissemination of the following information and formulating action plans are extremely important:

Information:

1. Realistic forecast of peak and off-peak load to be met by each state for the months of April-21 to June-21.
2. Proper projection of availability of state internal generation
3. Anticipated network congestion in STU systems
4. Areas likely to experience low voltage in each state
5. Identification of nodes (at 132kV level) by each state, where very high amount of Air conditioning load is anticipated.

Action plan:

6. Ensuring maximum VAR support from all state generators as per their capability curve.
7. Ensuring timely completion of all over hauling maintenance activity of all generators and transmission elements and maintaining maximum possible resource adequacy.
8. Strengthening of network by restoring elements under long outage before April-21, where ever it is possible.
9. Timely Switching off/on of Bus reactors as per real time voltage as well as under RLDC instruction.
10. Monitoring the compliance of proper reactive power support by RE resources, as per CEA connectivity standard.
11. With higher maximum temperature higher sag of overhead transmission lines is expected. So regular tree cutting activity and preventing encroachment of vegetation in the corridor is extremely important. SLDCs to inform all transmission licensees under their respective jurisdiction, accordingly.

In addition to the above, SLDCs too may share their comprehensive summer preparedness plan.

In 177th OCC Meeting, all SLDCs were advised to submit the required information to ERLDC by March' 2022.

Members may upate.

ITEM NO. B.15: Review of implementation of PSDF approved projects of Eastern Region.

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

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

Concerned utilities may update the present status of the project as given in the Annexure-B15.

Members may update.

ITEM NO. B.16: Review of System Protection Scheme (SPS) designed for NEW-SR grid integration - NLDC.

The existing SPS on NEW-SR corridor (for 765 kV Solapur-Raichur lines) were implemented during the synchronization of SR grid with NEW grid in the year 2014. Over the years, SR grid has been integrated with NEW grid through many inter-regional lines apart from 765 kV Solapur-Raichur. The newly commissioned HVDC Raigarh (WR)-Puglur (SR) Bipole is very soon expected to be in operation which will further strengthen the network connecting Southern Region.

In 176th OCC Meeting, ERLDC informed that the draft SOP has been prepared which is enclosed at Annexure B16.

OCC advised SLDC Odisha and others to go through the SOP and submit their comments/observation, if any,at the earliest.

177th OCC advised SLDC Odisha to submit their comments to ERLDC within a week.

SLDC, Odisha may update.

ITEM NO. B.17: High variation in demand pattern of States--ERLDC

It is observed that the demand of Odisha is varying to a large extend on day to day basis. On further analysis, it is found those on days when there is an outage of units at Sterlite CPP, Odisha reports higher demand (which is calculated by adding tie line interchange with internal generation). While on days when generation at Sterlite is available Odisha's demands remain on the lower side.

Such large variation in system demand for outage of units at any Captive power plant is not observed at any other location.

In view of the above all SLDCs are requested to furnish details of their respective Captive Power Plant generation & interchange details.

Members may discuss.

ITEM NO. B.18: Short Term and Long-Term Transmission Plan for Intra state Constraints in Odisha

Based on January 2020-2021 Base case and real-time data, the following constraints have been observed in the State network which does not satisfy N-1 reliability criteria. The details are given below:

Transmission Lines having N-1 Reliability Issue	Present Actual Loading Observed (MW)	Loading observed in Simulation (MW)	Sensitivity of N-1 on Parallel Element	Action Plan by STU and SLDC	Remarks and Details from SLDC/STU
220 kV Rourkela-Tarkera D/C (Loading is low in Real time with High Injection by Vedanta)	24	120	80 %	OPTCL	
220 kV Vedanta-Buddhipadar D/C (High Loading in Injection by Vedanta)	155-160	0	100%	OPTCL	
220 kV Buddhipadar-Lapanga D/C (High loading in injection by Vedanta)	120-140	16	67 %	OPTCL	

In the 174th OCC meeting, ERLDC informed that the N-1 criteria are not being satisfied when the injection from Vedanta is above 130 or 140 MW.

OCC advised Odisha to submit the action plan for removing the constraints in above lines to ERPC and ERLDC.

In the 177th OCC Meeting, OPTCL was advised to submit the action plan by 23rd March, 2021.

OPTCL may update.

ITEM NO. B.19: Reliability Issue at 220/132 kV Buddhipadar Complex-- ERLDC

Recently on 08-04-2021, there was black out at 220 kV Budhhipadar substation and one of the primary reasons was that the N-1 reliability of the 220 kV Budhhipadar-Lapanga D/C, 220 kV Buddhipadar-Tarkera D/C and 220 kV Buddhipadar -Vedanta D/C were not being satisfied.

Power swing has also been observed causing tripping of lines connecting Buddhipadar to Korba East/ Raigarh substations. It has been observed that there has been significant injection continuously from 220 kV Vedanta into the Odisha system which also is among one prominent reason behind the above N-1 issue being observed.

Orissa SLDC and OPTCL may kindly provide:

1. What is the plan for strengthening the 220 kV system and avoiding this N-1 reliability constraint at Lines from Buddhipadar and Rourkela?

2. Why there is a continuous injection in order of 250-300 MW from Vedanta resulting in higher loading of 220 kV Buddhipadar-Tarkera and Buddipadar-Lapanga D/C?

OPTCL may explain.

ITEM NO. B.20: Monthly Data on Category-wise consumption of electricity in states.

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

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

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

Members may update.

ITEM NO. B.21: Disabling 400 kV Rangpo-Kishanganj and Teesta-III -Kishanganj SPS at Rangpo Substation.--ERLDC

400 kV Rangpo-Bingauri D/C was under outage for HTLS reconductoring work. These lines are now restored after the completion of the HTLS Reconductoring activity. The circuit now has an ampacity of 1574 Amp, 157^0 C. The end equipment for these circuits is rated at 3000 Amp so the line loading capability now is 2078 MW per circuit. This has strengthened the corridor for Sikkim Hydro evacuation.

The present installed capacity of Sikkim Hydro Generation complex is around 2222 MW.

(Teesta 3: 1200 MW, Teesta 3: 510 MW MW, Dikchu: 96 MW, Tashiding: 97 MW, Jorethang: 96 MW, Chujachen: 110 MW, Rongnichu: 113 MW (Upcoming)) with Gangtok Load in range of 50-70 MW.

With the availability of all four lines, ERLDC issued the instruction to disable this SPS scheme on 30th March 2021. After this, all utilities have confirmed that the SPS signal is made disabled at their respective end.

Member may note.

PART C: ITEMS FOR UPDATE

ITEM NO. C.1: ER Grid performance during February'2021.

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

Average Consumption (mu)	Maximum Consumption(mu)/ Date	Maximum Demand (MW)	Minimum Demand(MW)	Schedule Export	Actual Export
		Date/Time	Date/Time	(Mu)	(Mu)
450.7	500.7 24-03-2021	23467 MW, 31-03-2021 19:12 Hrs.	13596 MW, 13-03-2021 14:07 Hrs.	3753	3641

ERLDC may present performance of Eastern Regional Grid.

ITEM NO. C.2: Primary frequency response of ER generating units in March 2021

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

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

Event	Frequency Change	Power Number (ΔMW/Δf)	ER FRC
Event 1: On 10th March 2021 at 19:35:34:200 hrs, around 1560 MW generation loss occurred in Sikkim hydro complex in ER.	50.01 Hz to 49.87 Hz. Later stabilized at 49.94 Hz	10764	30 %
Event 2: On 24th March 2021 at 12:16:19:360 hrs, around 2000 MW generation loss and 450 MW load loss occurred in Badla in NR.	50.022 Hz to 49.856 Hz. Later stabilized at 49.907 Hz	9554	16%

Summary of the analysis of these events are given below:

1. In spite of repeated reminders, generation end data (generation output in MW and frequency/speed measured at generator end) and FRCs are yet to be received from few regional generating stations (ISGS and IPP) and SLDCs respectively. List of such regional generating stations/SLDCs are shown below (as per status on 15th April 2021)

Generating Station/ SLDC	Event 1	Event 2
NTPC Farakka	Data received	**Yet to be received**
NTPC Kahalgaon	Data received	**Yet to be received**

NTPC Talcher	Data received	**Yet to be received**
NTPC Darlipalli	**Yet to be received**	**Yet to be received**
MPL	Data received	**Yet to be received**
Bihar SLDC	**Yet to be received**	**Yet to be received**
Jharkhand SLDC	**Yet to be received**	**Yet to be received**
WB SLDC	**Yet to be received**	**Yet to be received**

2. Based on data received from regional generating stations & SLDCs and SCADA data archived at ERLDC, regional generating stations' and state control areas' performance have been analyzed and summarized in table 2.
3. Based on data received from state generating stations & SLDCs, the performance of state generating stations has been analyzed and summarized in table 3.

Table 2: performance of regional generating stations and state control areas for the events in March 2021*

Generating Station/ SLDC	**Event 1**	**Event 2**
NTPC Farakka	**Satisfactory response** for unit 6. Other unit's response was not satisfactory. All the units were running at or more than installed capacity.	**Non – Satisfactory**(as per ERLDC SCADA data)
NTPC Kahalgaon	**Non – Satisfactory**except unit 5	**Non – Satisfactory**(as per ERLDC SCADA data)
NTPC Talcher	**Non – Satisfactory**(Only unit 6 has response of around 10 MW; ideal response 25 MW). Unit 1, 4 and 6 were running at more than installed capacity.	**Non – Satisfactory**(as per ERLDC SCADA data)
NTPC Barh	**Non - Satisfactory**	**Non - Satisfactory**
NTPC Darlipalli	**Non – Satisfactory**(as per ERLDC SCADA data)	**Non – Satisfactory**(as per ERLDC SCADA data)
BRBCL	**Non – Satisfactory;** 5 MW response has been observed (Ideal response 12.5 MW)	**Non – Satisfactory**
NPGC Nabinagar	**Non - Satisfactory**	**Non - Satisfactory**
GMR	**Non – Satisfactory**for unit 2; **Satisfactory** for unit 1. Both the units were running at more than installed capacity.	**Non – Satisfactory**for unit 2 (Around 10 MW response observed; ideal response 17.5 MW); **Satisfactory** for unit 1.
JITPL	**Non - Satisfactory**	**Non - Satisfactory**
MPL	**Non – Satisfactory; Unit 1 was running at VWO mode. Response of unit 2 was around 8 MW (Ideal response around 25 MW).**	**Non – Satisfactory**(as per ERLDC SCADA data)
Adhunik	**Non – Satisfactory; Unit was being run at more than Installed capacity.**	**Non - Satisfactory**
Teesta V HEP	Unit tripped during the event	Unit was not in service
Teesta III HEP	Unit tripped during the event	Unit was not in service
Dikchu HEP	Unit tripped during the event	Unit was not in service
Bihar SLDC	**Satisfactory**(as per ERLDC SCADA data)	**Non – Satisfactory**(as per ERLDC SCADA data)
Jharkhand SLDC	**Non – Satisfactory**(as per ERLDC SCADA data)	**Non – Satisfactory**(as per ERLDC SCADA data)

Generating Station/ SLDC	Event 1	Event 2
DVC SLDC	**Non – Satisfactory**(28% of ideal response)	**Non – Satisfactory**(34% of ideal response)
GRIDCO SLDC	**Non – Satisfactory**(14% of ideal response)	**Non – Satisfactory**(11% of ideal response)
WB SLDC	**Non – Satisfactory**(as per ERLDC SCADA data)	**Non – Satisfactory**(as per ERLDC SCADA data)

Following points may be shared by respective SLDC/generating stations:

1. Reason for non-sharing of generator end data/FRC by NTPC Farakka, NTPC Kahalgaon, NTPC Talcher, NTPC Darlipalli, MPL, Bihar SLDC, Jharkhand SLDC and WB SLDC.

2. During PFR testing, response was satisfactory for unit 2, 3, 4, 5 & 6 at Farakka STPS and unit 5, 6 and 7 at Kahalgaon STPS. But during real time events, response is non-satisfactory. Reason may be shared by NTPC Farakka and Kahalgaon.

Members may update.

ITEM NO. C.3: Primary Frequency Response Testing of Generating Units—ERLDC.

In the 173rd OCC Meeting, NTPC informed that Farakka has already plannedto carry out the teston1st of Feb 2021.Kahalgaon is planning to carry out test after 15th Jan 2021 and BRBCL is planning to carry out the test after Dec 2020.

MPL informed that they have placed the order with Siemens and the dates for testing would be finalized in coordination with ERLDC and Siemens.

OCC further, advised all the other Generators, especially theHydro-ElectricPlants to plan thePrimary Frequency Response Testing in thewinter season.

A presentation on Primary Frequency Response Testing was given by M/s Siemens on 11.12.2020.

NTPC Kahalgaon informed that they had already placed the PO with M/s Solvinafor Primary Frequency Response Testing and it is expected that the testing will be done in the second fortnight of Jan-2021 as confirmed by the agency.

In 176th OCC Meeting, ERLDC informed that as per preliminary report received for units where PFR have been completed, the primary frequency response observed during testingwere satisfactory.

In 177th OCC Meeting, ERLDC informed that information regarding testing schedule of JITPL & GMR has not been received.

OCC advised GMR & JITPL to share their schedule for PFR testing to ERLDC.

The status of the testing schedule for the generators is enclosed at Annexure C.3.

Respective Generators may update.

ITEM NO. C.4: Testing of Primary Frequency Response of state generating units by third party agency

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

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

Sl. No.	Name of the Units	Capacity (MW)
1	BTPS-A	500
2	CTPS Unit #7&8	2X250
3	DSTPS Unit#1&2	2X500
4	KTPS Unit # 1&2	2X500
5	MTPS Unit # 3 to 8	2 X 210 MW +2 X 250 MW + 2X 500 MW
6	RTPS Unit # 1 & 2	2 X 600 MW

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

In the 176th OCC meeting,
OPGC informed that they would finalize the order with Siemens by end of Feb'2021.

SLDC, DVC informed that indent has been placed for PFR testing of their generating units.

On request from WBPDCL, OCC advised ERLDC to share all relevant documents related to selection of the vendor for PFR Testing along with contact details of the vendors to West Bengal SLDC for further sharing by them with their state generators.

In 177th OCC Meeting, SLDC, Bihar informed that PFR testing for Barauni TPS would be completed by April '2021.

OHPC informed that PFR testing is being planned to be carried out for units of Indravati & Rengali. OCC advised OHPC to submit a schedule for testing to ERLDC/ERPC secretariat.

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

Members may update.

ITEM NO. C.5: PSS tuning of Generators in Eastern Region

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

In 176th OCC Meeting, NTPC informed that PSS tuning schedule for BRBCL & Barh has been submitted. OCC advised NTPC to submit a complete schedule for PSS Tuning of all of their units to ERPC secretariat/ERLDC within two weeks.

OHPC informed that they have already taken up with OEM for PSS tuning of their units. OCC advised to submit a status report in this regard.

In 177th OCC Meeting, DVC informed that PSS tuning of Unit#5 of Bokaro TPS had been completed.

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

The updated schedule for PSS tuning of the units is attached at Annexure C5.

Members may update.

ITEM NO. C.6: Updated Operating Procedure of Eastern Region, 2020.

The Operating Procedure of every region must be updated and revised annually by the concerned RLDC, in compliance to section 5.1(f) of the IEGC. The procedure is finalized and uploaded at ERLDC website by

20- 07-2020, taking into consideration comments received till 18-07-20. To discuss the revised operating procedure of Eastern Region, one special meeting was held on27-11-2020.

Based on the deliberation in the meeting, operating procedure of Eastern Region has been revised and the final procedure was shared with all regional utilities vide mail dated 04-01-2021. The final procedure is also uploaded on the ERLDC website.

In 176th OCC Meeting, after detailed deliberation on the comments submitted by Powergrid, the followings were concluded:

- Regarding First time charging procedure, OCC reiterated that the procedure as documented by NLDC shall be followed.
- Regarding clause 3.7, It was decided that ERLDC would share the relevant details/band details of STATCOM while issuing instruction to utility for changing of setpoint of STATCOM.
- It was found that remaining observations of Powergrid have already been addressed in the revised operating procedure circulated vide e-mail dated 04.01.2021.
- OCC advised Powergrid to go through the revised operating procedure and submit their comments, if any.

SLDC West Bengal requested for two weeks time to review the operating procedure in view of the changes in SLDC management due to recent transfer/retirement.

OCC agreed and advised all utilities to go through the revised document and submit their final observation/comments within two weeks.

In 177th OCC Meeting, ERLDC informed that they have received comments from SLDC, West Bengal recently.

OCC opined that ERLDC should discuss those points with SLDC, West Bengal and the final outcome to be placed before next OCC

Members may update.

ITEM NO. C.7: Status of UFRs healthiness installed in EasternRegion

UFRs healthiness status has been received from Jharkhand and CESC.

Members may update.

ITEM NO. C.8: Status of Islanding Schemes healthiness installed in Eastern Region

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

Details received from the constituents are as follows:

Sl. No	Name of Islanding Scheme	Confirmation from Generator utility	Confirmation from Transmission Utility end
1	CESC as a whole Islanding	Healthy	Healthy
2	BkTPS Islanding Scheme		
3	Tata Power Islanding Scheme, Haldia		
4	Chandrapura TPS Islanding Scheme, DVC	Not in service	
5	Farakka Islanding Scheme, NTPC		
6	Bandel Islanding Scheme, WBPDCL		

Members may update.

ITEM NO. C.9: Transfer capability determination by the states--ERLDC.

Latest status of State ATC/TTC declared by states for the month of May-2021

Sl No	State/Utility	TTC (MW)		RM(MW)		ATC Import (MW)		Remark
		Import	Export	Import	Export	Import	Export	
1	BSPTCL	6075	--	122	--	5953	--	May-21
2	JUSNL	1578	--	52	--	1525	--	July-21
3	DVC	1663	2925	67	53	1596	2872	May-21
4	OPTCL	2167	1340	88	61	2079	1279	April-21
5	WBSETCL	5283	--	400	--	4883	--	April-21
6	Sikkim	315	--	2.44	--	315.56	--	Feb-21

Declaration of TTC/ATC on SLDC Website

Sl No	SLDC	Declared on Website	Website Link	Constraint Available on Website	Type of Website Link
1	BSPTCL	Yes	http://www.bsptcl.in/ViewATCTTCWeb.aspx?GL=12&PL=10	Yes	Static Link-Table
2	JUSNL	Yes	http://www.jusnl.in/pdf/download/ttc_atc_nov_2020.pdf	Yes	Static link – pdf file
3	DVC	Yes	https://application.dvc.gov.in/CLD/atcttcmenu.jsp#	Yes	Static Link-Word file
4	OPTCL	Yes	https://www.sldcorissa.org.in/TTC_ATC.aspx	Yes	Static Link-pdf file
5	WBSETCL	Yes	http://www.wbsldc.in/atc-ttc	No (Not updating)	Static Link-Table
6	Sikkim	Yes	https://power.sikkim.gov.in/atc-and-ttc	No (Not updating)	Static Link-Excel file

After collecting state ATC/TTC value from SLDCs, NLDC is publishing all value at a single location in their website, it is available under monthly ATC subsection of Market section.

As some of the state in Eastern Region are not declaring ATC/TTC on 3- Month ahead while few don't declare constraint, it becomes very difficult to publish the values uniformly for all the states in a timely manner.

Members may update.

ITEM NO. C.10: Mock Black start exercises in Eastern Region

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

Sl. No	Name of Hydro Station	Schedule	Tentative Date	Schedule	Tentative Date
		Test-I		Test-II	
1	U. Kolab	Last week of Oct 2021		Second Week of Feb 2022	
2	Balimela	Second week of Nov 2021		First Week of March 2022	
3	Rengali	Second week of Nov 2021		First 2eek of March 2022	
4	Burla	Second week of Nov 2021		First Week of March 2022	
5	U. Indravati	Last week of Oct 2021		Second Week of Feb 2022	
6	Maithon	Third Week of Nov 2021		First Week of March 2022	
7	TLDP-III	Second week of Nov 2021		Second Week of Feb 2022	
8	TLDP-IV	Third Week of Nov 2021		First Week of March 2022	
9	Subarnarekha	Second week of Nov 2021		Second Week of Feb 2022	
10	Teesta-V	Third Week of Nov 2020		Third Week of March 2022	
11	Chuzachen	Second week of Nov 2021		First Week of March 2022	
12	Teesta-III	Third Week of Nov 2021		First Week of March 2022	
13	Jorethang	Third Week of Nov 2021		First Week of March 2022	
14	Tasheding	Second week of Nov 2021		First Week of March 2022	
15	Dikchu	Second week of Nov 2021		Second Week of Feb 2022	

Members may update.

PART D: OPERATIONAL PLANNING

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

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

Members may update.

ITEM NO. D.2: Major Generating Units/Transmission Element outages/shutdown in ER Grid (as on 11.04.2021).

S.No	Station	State	Agency	Unit No.	Capacity in Mw	Reason(s)	Outage Date
1	KOLAGHAT	WEST BENGAL	WBPDCL	1	210	ESP R & M	07-Jun-2018
2	KOLAGHAT	WEST BENGAL	WBPDCL	2	210	ESP & Ash Handling R & M	26-Dec-2019
3	BOKARO'B'	DVC	DVC	3	210	INITAILLY OUT DUE TO ASH PONDAGE PROBLEM UPTO 31/12/20. LATER OUT DUE TO POLLUTION CLERANCE ISSUE	21-Oct-2020
4	WARIA TPS	DVC	DVC	4	210	TAKEN OUT OF BAR DUE TO NON RECEIPT OF ENVIRONMENTAL CLEARANCE	31-Dec-2020
5	TSTPP	ODISHA	NTPC	2	500	ANNUAL OVERHAULING	01-Mar-2021
6	BARAUNI TPS	BIHAR	BSPHCL	9	250	PROBLEM IN GT	05-Mar-2021
7	TTPS	ODISHA	NTPC	6	110	HAND TRIPPED DUE TO SMOKE IN GENERATOR; Permanently closed	07-Mar-2021
8	BARAUNI TPS	BIHAR	BSPHCL	7	110	MAINTENANCE WORK	17-Mar-2021
9	BARAUNI TPS	BIHAR	BSPHCL	6	110	ABNORMAL TSI PARAMETER	17-Mar-2021
10	MEJIA TPS	DVC	DVC	3	210	Generator inter-turn fault	19-Mar-2021
11	TTPS	ODISHA	NTPC	1	62.5	Hand tripped due to coal shortage; Permanently closed	22-Mar-2021
12	TTPS	ODISHA	NTPC	2	62.5	Hand tripped due to coal shortage; Permanently closure	23-Mar-2021
13	TTPS	ODISHA	NTPC	4	62.5	Hand tripped due to coal shortage; Permanently closed	23-Mar-2021

14	TTPS	ODISHA	NTPC	5	110	Hand tripped due to coal shortage; Permanently closed	23-Mar-2021
15	TTPS	ODISHA	NTPC	3	62.5	CLOSURE OF TTPS; Permanently closed	31-Mar-2021
16	FSTPP	WEST BENGAL	NTPC	4	500	Cooling Water Shortage	03-Apr-2021
17	MEJIA TPS	DVC	DVC	7	500	BTL	11-Apr-2021
18	OPGC	ODISHA	OPGC	4	660	BTL	11-Apr-2021

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

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

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

c) Hydro Unit Outage Report: -

S.No	Station	State	Agency	Unit No	Capacity	Reason(s)	Outage
1	BALIMELA HPS	ODISHA	OHPC	1	60	R & M WORK	05-Aug-2016
2	BALIMELA HPS	ODISHA	OHPC	2	60	R & M WORK	20-Nov-2017
3	BURLA HPS/HIRAKUD I	ODISHA	OHPC	5	37.5	R & M WORK	25-Oct-2016
4	BURLA HPS/HIRAKUD I	ODISHA	OHPC	6	37.5	R & M WORK	16-Oct-2015
5	BURLA HPS/HIRAKUD I	ODISHA	OHPC	7	37.5	ANNUAL MAINTENANCE	20-Jan-2020
6	BALIMELA HPS	ODISHA	OHPC	5	60	STATOR EARTH FAULT	13-Dec-2020
7	RENGALI HPS	ODISHA	OHPC	2	50	Heavy oil leakage in cylinder of first gate	20-Mar-2021
8	U.KOLAB	ODISHA	OHPC	2	80	TGB PAD VIBRATION HIGH	19-Mar-2021
9	U.KOLAB	ODISHA	OHPC	3	80	Turbine Guide Bearing Problem	07-Jan-2021
10	JORETHANG	SIKKIM	DANS	1	48	ANNUAL MAINTENANCE	26-Feb-2021
11	RENGALI HPS	ODISHA	OHPC	5	50	ANNUAL MAINTENANCE WORK	16-Dec-2020

It is seen that about 552..5 MW hydro capacities in Odisha is under forced outage / planned outage and therefore not available for providing the much needed peaking support during evening peak. SLDC / OHPC may please indicate restoration plan of the units.

ITEM NO. D.3: Long outage report of transmission lines:

SL NO	Transmission Element / ICT	Agency	Outage DATE	Reasons for Outage
1	400 KV IBEUL JHARSUGUDA D/C	IBEUL	29-04-18	TOWER COLLAPSE AT LOC 44,45
2	220/132 KV 100 MVA ICT I AT LALMATIA	FSTPP/JUSNL	22-01-19	FAILURE OF HV SIDE BREAKER

3	220 KV PANDIABILI - SAMANGARA D/C	OPTCL	03-05-19	49 NOS OF TOWER COLLAPSED.AS REPORTED BY SLDC OPTCL, TOTAL 60 NOS OF TOWER IN BETWEEN 220KV PANDIABILI – SAMANGARA LINE IN WHICH 48 NOS TOWERS FULLY DAMAGED AND 12 NOS TOWERS PARTIALLY DAMAGED. WORK UNDER PROGRESS.PRESENTLY CHARGED FROM PANDIABILLI END (LOC 156) TO LOC 58
4	220kV Barauni-Hajipur Ckt-1	BSPTCL	28-09-19	TOWER COLLAPSE AT LOCATION 38 & 39. CKT-2 IS ON ERS SINCE 13.01.2020.
5	220/132 KV 100 MVA ICT 3 at Chandil	JUSNL	30-04-20	ICT BURST AND DAMAGED AFTER FIRE REPORTED
6	400KV-ALIPURDUAR (PG)-PUNATSANGCHUN-JIGMELLING-II	PGCIL/ Bhutan	21-03-21	OVERVOLTAGE AT BHUTAN END.
7	800KV HVDC ALIPURDUAR-AGRA-POLE-IV	PGCIL	10-04-21	BLOCKED after healthiness testing,for overvoltage mitigation
8	800KV HVDC ALIPURDUAR-AGRA-POLE-III	PGCIL	10-04-21	BLOCKED after healthiness testing,for overvoltage mitigation --- Hand Tripped after tripping of all 400/220 icts at rangpo on 8.4.21 after disturbance and therafter developed relay reset problem
9	220KV/132 KV 100 MVA ICT 4 AT RANGPO	PGCIL	08-04-21	
10	400KV/220KV 315 MVA ICT 2 AT RANGPO	PGCIL	20-02-21	SD FOR SF6 GAS LEAKAGE RECTIFICATION WORK IN ICT-2 GIS MODULE UP TO 16/03/2021 16:00 HRS, FURTHER EXTENSION REQUESTED.
11	400KV/220KV 315 MVA ICT 2 AT Meeramandali	OPTCL	21-02-21	FIRE HAZARD --- VOLTAGE REGULATION
12	765KV-ANGUL-JHARSUGUDA-4	PGCIL	03-04-21	
13	220KV-CHUKHA-BIRPARA-2	PGCIL	06-04-21	VOLTAGE REGULATION
14	400KV-MAITHON-MAITHON RB-1	PGCIL	19-03-21	FOR RE-CONDUCTORING WORK UP TO 02/04/2021 EXTENDED UPTO 13.4.21
15	400KV/220KV 315 MVA ICT 1 AT JEYPORE	PGCIL	25-03-21	SD FOR 220KV CABLE TERMINATION AND JUMPER CONNECTION FROM EXISTING ICT-I TO ICT-3 TRANSFORMER BAY UPTO 31.3.21.S/D REQUESTED TO EXTEND UPTO 12.04.21
16	400KV-BINAGURI-TALA-4	PGCIL/ Bhutan	09-04-21	VOLTAGE REGULATION AT BHUTAN END AND LATER ON S/D AVAILED BY BHUTAN AT 09:39HRS OF 09.04.2021.
17	400KV-BINAGURI-TALA-2	PGCIL/ Bhutan	09-04-21	VOLTAGE REGULATION
18	400KV/220KV 315 MVA ICT 4 AT JEERAT	WBSETCL	09-04-21	TRIPPED ON DIFFERENTIAL AND PRD PROTECTION PROTECTION OPTD

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

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

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

SL No	Element Name	Owner	Charging Date	Charging Time	Remarks
1	400KV MAIN BAY OF SAGARDIGHI-2 AT JEERAT	PMJTL	01-03-2021	13:54	
2	400KV MAIN BAY OF NEW JEERAT-2 AT JEERAT	PMJTL	01-03-2021	13:40	
3	400KV MAIN BAY OF NEW JEERAT-1 AT JEERAT	PMJTL	01-03-2021	13:38	
4	400KV MAIN BAY OF SUBHASGRAM-1 AT JEERAT	PMJTL	01-03-2021	13:41	
5	125MVAR 400KV B/R-2 AT CHANDAUTI	PMTL	01-03-2021	17:50	
6	125MVAR 400KV B/R-1 AT CHANDAUTI	PMTL	01-03-2021	16:21	
7	220KV/132KV 200 MVA ICT 3 AT CHANDAUTI	PMTL	05-03-2021	18:16	Charged from 220 kV side
8	220KV/132KV 200 MVA ICT 1 AT CHANDAUTI	PMTL	05-03-2021	16:15	First timed charged from 220 kv side
9	400KV MAIN BAY OF GAYA-1 AT CHANDAUTI	PMTL	08-03-2021	13:28	
10	220KV MAIN BAY OF SONENAGAR-2 AT CHANDAUTI	PMTL	08-03-2021	13:18	
11	220KV MAIN BAY OF SONENAGAR-1 AT CHANDAUTI	PMTL	08-03-2021	13:19	
12	220KV MAIN BAY OF GAYA -2 AT CHANDAUTI	PMTL	08-03-2021	13:26	
13	132KV MAIN BAY OF CHANDAUTI(BSPTCL)-2 AT CHANDAUTI	PMTL	09-03-2021	16:09	
14	132KV MAIN BAY OF CHANDAUTI-1(BSPTCL) AT CHANDAUTI	PMTL	09-03-2021	16:10	
15	132KV MAIN BAY OF RAFIGANJ-1 AT CHANDAUTI	PMTL	09-03-2021	16:08	
16	132KV MAIN BAY OF SONENAGAR-1 AT CHANDAUTI	PMTL	09-03-2021	16:07	
17	132KV MAIN BAY OF 220/132KV 200 MVA ICT 3 AT CHANDAUTI	PMTL	09-03-2021	16:05	
18	132KV MAIN BAY OF 220KV/132KV 200 MVA ICT 2 AT CHANDAUTI	PMTL	09-03-2021	16:03	
19	132KV MAIN BAY OF 220KV/132KV 200 MVA ICT 1 AT CHANDAUTI	PMTL	09-03-2021	15:54	
20	220KV MAIN BAY OF SONENAGAR-1 AT CHANDAUTI	PMTL	16-03-2021	18:38	
21	400 KV GORAKHPUR MOTIHARI 2	DMTCL	17-03-2021	16:33	
22	220KV-CHANDAUTI -SONENAGAR-2	PMTL	19-03-2021	11:02	
23	400 kv PATNA KISHANGANJ D/C LINE	PGCIL	23-03-2021	14:54	Restoration on permanent

					tower in Koshi river portion.
24	23.5/765 KV, 3x315 MVA, GT-2, DARLIPALLI (NTPC)	DSTPP	23-03-2021	04:37	
25	400 KV RANGPO-BINAGURI D/C	PGCIL	24-03-2021	16:27 for CKT 1 16:55 for CKT 2	Reconductoring from Twin Moose to HTLS.
26	400KV-ALIPURDUAR (PG)-JIGMELLING-1	PGCIL	26-03-2021	17:42	Anti theft charged upto 55 km
27	400KV-ALIPURDUAR (PG)-JIGMELLING-2	PGCIL	26-03-2021	17:57	
28	220KV - GAYA CHANDAUTI 1	PMTL	27-03-2021	17:21	Idle charged from Gaya end only
29	220KV MAIN BAY OF RONGNICHU -2 AT RANGPO	MBPCL	28-03-2021	17:35	
30	220KV MAIN BAY OF RONGNICHU -1 AT RANGPO	MBPCL	28-03-2021	17:03	
31	220KV-RONGNICHU-RANGPO-2	MBPCL	28-03-2021	17:35	
32	220KV-RONGNICHU-RANGPO-1	MBPCL	28-03-2021	17:03	
33	400 KV BARH MOTIHARI 1	DMTCL	28-03-2021	16:48	
34	400/22 KV 3*260 MVA GT 3 AT NPGC	NPGC	28-03-2021	10:15	
35	220KV - GAYA CHANDAUTI 2	PMTL	29-03-2021	11:14	Idle charged from Gaya end only
36	400KV/220KV 500 MVA ICT 3 AT MALDA	PGCIL	29-03-2021	14:46	First time Loaded with 178 MW
37	400 KV GORAKHPUR MOTIHARI 1	DMTCL	29-03-2021	13:55	
38	220KV BUS SECTIONALIZER BAY OF (220KV BUS 1A AND 220KV BUS 1B) AT RONGNICHU	MBPCL	30-03-2021	15:45	
39	400KV TIE BAY OF (125MVAR B/R-1 AND DARBHANGA (DMTCL)-1) AT SITAMARHI	PMTL	31-03-2021	18:03	
40	400KV MAIN BAY OF SITAMARHI -1 AT DARBHANGA (DMTCL)	PMTL	31-03-2021	14:02	
41	400KV MAIN BAY OF DARBHANGA (DMTCL)-1 AT SITAMARHI	PMTL	31-03-2021	14:02	
42	400KV MAIN BAY OF B/R 1 AT SITAMARHI	PMTL	31-03-2021	18:03	
43	400KV-SITAMARHI-DARBHANGA (DMTCL)-1	PMTL	31-03-2021	14:02	
44	125MVAR 400KV B/R-2 AT SITAMARHI	PMTL	31-03-2021	19:45	

Members may update.

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

Frequency profile for the month as follows

Month	Max (Date/Time)	Min (Date/Time)	% Less IEGC Band	% Within IEGC Band	% More IEGC Band
March, 2021	50.32 Hz, 21-03-2021 18:02 Hrs.	49.66 Hz , 17-03-2021 22:09 Hrs	7.14	72.81	20.05

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

POWER SYSTEM DEVELOPMENT FUND

Status of the Projects in Eastern Region

Sl No	State	Entity	Name of the scheme	Estimated Cost	Grant Approved	Grant sanctioned on	Agreement signed on	1st Installment grant released on	Completion Schedule	Completion schedule w.r.t date of 1st instalment	Grant aviled so far	Under process of release	Total awards amount of placed of till date	Claim Amount
1	Bihar	BSPTCL	Renovation and Upgradation of protection system of substations. (18)	71.35	64.22	11-May-15	3-Dec-15	16-May-16	24	16-May-18	56.04		69.195	90% grant availed on award cost.
2			Installation of Capacitor bank in 20 Nos of Grid Sub Station. (74)	20.98	18.88	5-Sep-16	14-Mar-18	26-Mar-19	24	26-Mar-21	16.99		20.98	
3			Renovation and Upgradation of the protection and control system of 12nos 132/33 Grid Sub Station. (73)	54.69	49.22	2-Jan-17	Scheme withdrawn	NA	24		0.00			
4			Implementation of Schedulling, Accounting, Metering and settlement of Transcation in Electricity (SAMAST)in SLDC Bihar.(208)	7.61	6.85	20-Mar-20	Agreement not signed	NA	12					Project already executed. Requested for reimbursement
			Total	**154.63**	**139.17**						**73.03**		**90.175**	
5	Jharkhand	JUSNL	Renovation & Upradation of protection system of Jharkhnad. (161)	153.48	138.13	15-Nov-17	3-Jul-18	28-Mar-19	16	28-Jul-20	114.68	1.01	145.674	90% grant availed on award cost.
6			Reliable Communication & data acquisition system upto 132kV Substations ER. (177)	46.82	22.36	24-May-19	16-Mar-20		24					10% grant not yet requested
			Total	**200.3**	**160.49**						**114.68**		**145.674**	
7	Odisha	OPTCL	Renovation and Upgradation of protection system of substaions. (08)	180.56	162.50	11-May-15	5-Aug-15	22-Mar-16	24	22-Mar-18	46.04		60.261	90% grant availed on award cost.
8			Implementation of OPGW based reliable communication at 132 kv and above substations. (128)	51.22	25.61	15-Nov-17	3-Jan-18	29-Mar-19	36	29-Mar-22	7.68		51.22	30% grant availed on award cost.
9			Installation of 125 MVAR Bus Reactor along with construction of associated by each at 400kV Grid S/S of Mendhasal, Meramundali & New Duburi for VAR control & stabilisation of system voltage. (179)	30.26	27.23	27-Jul-18	21-Sep-18	1-Apr-19	18	1-Oct-20	2.72			10% grant availed
10			Implementation of Automatic Demand Management System (ADMS) in SLDC, Odisha. (196)	3.26	2.93	24-May-19	18-Dec-19	19-Feb-20	10	19-Dec-20	0.29			
11			Protection Upgradation and installation os Substation Automatic System (SAS) for seven nos of 220/132/33kV Substations (Balasore, Bidanasi, Budhipadar, Katapali, Narendrapur, New-Bolangir & Paradeep). (209)	40.7	36.63	24-May-19	18-Dec-19	13-Feb-20	18	13-Aug-21	3.66			
12		OHPCL	Renovation and Upgradation of protection and control system of OHPC. (109)	24.83	22.35	22-May-17	19-Sep-17	25-May-18	24	25-May-20	10.96		17.983	90% grant availed on award cost.
			Total	**330.83**	**277.25**						**71.35**		**129.464**	
13	West Bengal	WBSETCL	Renovation and Upgradation of protection system of substations. (07)	120.67	108.60	31-Dec-14	10-Feb-15	4-Feb-16	15	4-May-17	46.10		51.2255	Project Completed
14			Installation of switchable reactor & shunt capacitor for voltage improvement. (88)	48.19	43.37	22-May-17	10-Aug-17	22-Jun-18	19	22-Jan-20	33.07		40.83	90% grant availed on award cost.
15			Renovation & Modernisation of Transmission System. (87)	93.51	70.13	22-May-17	10-Aug-17	25-Jun-18	25	25-Jul-20	63.12		93.51	
16			Installation of Bus Reactors at different 400kV Substation within the state of West Bengal for reactive power management of the Grid. (210)	79.71	71.74	24-May-19	24-Jun-19	23-Oct-19	19	23-May-21	15.38		45.621	30% grant availed on award cost.
17			Project for establishment of reliable communication and data acquisition at different substation at WBSWTCL. (222)	62.39	31.19	24-May-19	24-Jun-19	23-Oct-19	25	23-Nov-21	3.12			10% grant availed

POWER SYSTEM DEVELOPMENT FUND

Status of the Projects in Eastern Region

Sl No	State	Entity	Name of the scheme	Estimated Cost	Grant Approved	Grant sanctioned on	Agreement signed on	1st Installment grant released on	Completion Schedule	Completion schedule w.r.t date of 1st instalment	Grant aviled so far	Under process of release	Total awards amount of placed of till date	Claim Amount
18	West Bengal		Implementation of Integated system for Scheduling, Accounting, Metering and Settlement of Transactions (SAMAST) system in West Bengal. (197)	11.2	10.08	20-Mar-20	22-Jun-20		12					10% grant not yet requested
19		WBPDCL	Renovation and Modernization of 220/ 132 kV STPS switch yard and implementation of Substaion Automation System. (72)	26.09	23.48	5-Sep-16	29-Dec-16	18-May-17	18	18-Nov-18	21.13		26.09	90% grant availed on award cost.
20			Implementation of Islanding scheme at Bandel Thermal Power Station. (97)	1.54	1.39	16-May-17	10-Aug-17	14-Dec-17	8	14-Aug-18	1.39		1.39	Project Completed
21			Renovation and Modernization of switchyard and related protection system of different power stations (BTPS, BKTPS and KTPS) of WBPDCL (155)	50.18	45.16	27-Jul-18	20-Dec-18	27-Mar-19	12	27-Mar-20	12.02		41.68	30% grant availed on award cost.
			Total	**493.48**	**405.14**						**195.33**		**300.3445**	
22	DVC	DVC	Renovation and Upgradation of the protection and control system of Ramgarh Sub Station. (81)	28.85	25.96	2-Jan-17	11-Apr-17	31-May-17	24	31-May-19	22.95		28.273	90% grant availed on award cost.
23			Renovation and Modernization of control and protection system and replecement of equipment at Parulia, Durgapur, Kalyanewari, Giridhi Jamsedpur, Barjora, Burnpur, Dhanbad and Bundwan substation. (106)	156.11	140.50	16-May-17	21-Jun-17	14-Dec-17	24	14-Dec-19	102.34		122.754	
			Total	**184.96**	**166.46**						**125.29**		**151.027**	
24	Sikkim	ENPD, Sikkim	Drawing of optical ground wire (OPGW) cables on existing 132kV & 66kV transmission lines and integration of leftover substations with State Load Despatch Centre, Sikkim. (173)	20.00	10.00	24-May-19	4-Dec-19		18		3.00		20	30% grant availed on award cost
				20.00	**10.00**						**3.00**		**20.00**	
25	POWERGRID	PGCIL	Installation of STATCOMs in ER at Ranchi-New, Rourkela, Kishanganj and Jeypore substations of POWERGRID. (56)	700.31	630.28	5-Jan-16	29-Sep-16	31-Mar-17	30	30-Sep-19	577.64		630.28	Project Completed
26	ERPC	ERPC	Creation and Maintenance of web based protection database management. (67)	20	20.00	17-Mar-16	26-Apr-16	28-Jun-16	18	28-Dec-17	14.83		16.48	Project Completed
27			Study Programme on power trading at NORD POOL Academy for Power System Engineers of Eastern Region. (122)	5.46	5.46	27-Jul-18	21-Sep-18	27-Mar-19	60	27-Mar-24	4.61		5.37	
28			Traning Program for Power system Engineers of various constituents of Eastern Region. (117)	0.61	0.61	27-Jul-18	21-Sep-18	11-Apr-19	60	11-Apr-24	0.18		0.60888	
			Total	**726.38**	**656.35**						**597.26**		**652.73888**	
			GrandTotal	**2,110.58**	**1,814.87**						**1,179.94**		**1,489.42**	

Standard Operating Procedure(SoP) to be referred for restoration of 765 kV Angul – Srikakulam D/c in case high standing phase angle is observed

The existing Special Protection Scheme (SPS) on NEW-SR corridor (namely for 765kV Solapur-Raichur2x S/c lines & HVDC Talcher-Kolar Bipole) were implemented long back as per the system requirements. Over the years, the connectivity of Southern region with NEW grid has strengthened through many high capacity inter-regional lines.In view of strengthening of transmission system as stated above, both the aforesaid SPS schemes were reviewed in consultation with RPCs. NLDC communication dated 21st Oct 2020 for review of HVDC Talcher – Kolar Bipole & NLDC communication dated 09th Dec 2020 for review of SPS of 765kV Solapur-Raichur-2 X S/c lines was shared with all concerned RPCs. The copies of both the communication are enclosed as Annexure I. The proposal for review of SPS were discussed, deliberated and agreed in ERPC/SRPC. After deliberation at ERPC(174th and 175th OCC) /SRPC (38th TCC), it was agreed that Standard Operating Procedure need to be developed to tackle the issue of high Standing Phase Angle (SPA) between Angul and Srikakulam station in case of outage of 765 kV Angul-Srikakulam-D/C. The extracts of the NLDC communication dated 09th Dec 2020 is given below:

"The 765 kV Angul-Srikakulam-D/c is carrying 1583 MW each circuit in the limiting case with 13900 MW of import in SR. The line length is 276 kM and under high loading the angular separation between two buses may reach more than 25 degrees. Under N-1 scenario of tripping of one circuit of 765 kV Angul-Srikakulam-D/c, it is observed that loading on other circuit reaches 2606 MW. In case the double circuit line trips (a highly probable contingency since line crosses through the terrain near to Eastern Coast of India bordering Bay of Bengal which is prone to tropical cyclones with high speeds), the Standing Phase Angle (SPA) between Angul and Srikakulam station would become high. The high SPA would cause the delay in restoration and many a times would make it impossible for the smooth synchronisation of line. Therefore an Standard Operating Procedure need to be developed to tackle the issue and to minimise the possible delays in restoration."

The SoP in this regard is proposed for tackling this issue which may be implemented as per existing real time conditions in the system.

SoP Proposed: The standing phase angle between 765 kV Angul station (Eastern Region) and 765/400 kV Srikakulam station (Southern Region) has been observed to be very high in case of 765 kV Angul – Srikakulam D/C outage during high import by Southern Region. In order to reduce this angular separation and facilitate synchronization of lines, following actions need to be followed in real-time to restore 765 kV Angul – Srikakulam D/C after outage: -

1. HVDC towards southern region shall be maximized to the extent possible.

    a. HVDC Gazuwaka has the highest sensitivity (-0.87 degrees per 100 MW) on the angle between Angul and Srikakulam and power order of HVDC may be increased to 800 MW keeping in view the constraints of associated line loadings and voltages in Eastern/Southern region.

    b. Overload capacity of HVDC Talcher – Kolar and HVDC Raigarh – Pugalur may be utilized.

2. Import of SR shall be reduced to bring the angle within safe limits through increase in generation, reduction in load in southern region or a combination of both. The generation reduction may also be carried out in Eastern region.

    a. Generation in southern region shall be increased based on the existing system conditions. The generators in the vicinity of Srikakulam station such as Simhadri Stage-I & II, HNPCL, KTPS etc have higher sensitivity on the angle difference.

    b. Similarly, generation in eastern region may be reduced based on the existing system conditions. The generators in the vicinity of Angul station such as GMR (IPP), JITPL etc. have higher sensitivity on the angle difference.

    c. Load reduction in Southern region may be carried out based on the existing system conditions.

    The sensitivities of change in HVDC power orders, Generation Reduction/Increase in Eastern/Southern region and load reduction in Southern region on angular difference between Angul and Srikakulam stations are given as Table-1.

3. Based on the sensitivities of various actions as mentioned in Sl. No. 1 and 2 above and real time conditions, the suitable actions may be taken in real time to reduce the Standing Phase Angle.

Table-1

765 kV Angul - Srikakulam D/C Outage - Angle Sensitivity

S. No.	Description	Angular Separation (Deg) (Angul - Srikakulam)	Relief in Angle (Deg)	Relief in Angle (Deg) per 100 MW change in Power Order/Generation/Load
1	Base Case	11.25	-	
2	Base Case + N-1 of 765 kV Angul - Srikakulam S/C	18.99	-	
3	Base Case + N-1-1 of 765 kV Angul - Srikakulam D/C	56.17	-	
	Relief from change in HVDC Power Order			
1	HVDC Talcher - Kolar Bipole (+500 MW)	53.75	-2.42	-0.48
2	HVDC Gazuwaka (+150 MW)	54.87	-1.30	-0.87
3	HVDC Raigarh - Pugalur (+100 MW)	55.66	-0.51	-0.51
4	HVDC Bhadrawati (-200 MW)	57.03	0.86	+0.43
	Relief from change in Generation (ER)			
1	GMR IPP (-100 MW Generation)	55.87	-0.30	-0.30
2	JITPL (-100 MW Generation)	55.88	-0.29	-0.29
3	OPGC (-200 MW Generation)	55.99	-0.18	-0.09
4	Talcher Stage -II (-500 MW Generation)	55.83	-0.34	-0.07
5	Indarvati (-200 MW Generation)	56.03	-0.14	-0.07
6	Balimela (-100 MW Generation)	56.1	-0.07	-0.07
7	Odisha Generation (-500 MW Generation in Odisha)	55.64	-0.53	-0.11
	Relief from change in Generation (SR)			
1	Simhadri Stg-II (+100 MW Generation)	55.36	-0.81	-0.81
2	HNPCL (+100 MW Generation)	55.37	-0.80	-0.80
3	KTPS (+200 MW Generation)	55.57	-0.60	-0.60
4	AP Generation (+500 MW Generation in AP)	52.97	-3.20	-0.64
5	SR Generation (+500 MW Generation in SR)	53.42	-2.75	-0.55
	Relief from change in Load			
1	Srikakulam Load (-100 MW Load in Srikakulam Area)	55.23	-0.94	-0.94
2	Viz-Nagar Load (-100 MW Load in Vizianagaram Area)	55.26	-0.91	-0.91
3	Vishakhapatnam Load (-200 MW Load in Vizag Area)	54.47	-1.70	-0.85
4	AP Load (-500 MW Load in AP)	52.71	-3.46	-0.69
5	SR Load (-1000 MW Load in SR)	50.33	-5.84	-0.58

Assumptions: -

a) SR Limiting Case (13900 MW) considered for study purpose.

b) HVDC Power Orders in Limiting case: -

Talcher - Kolar: 2000 MW

Raigarh - Pugalur: 1500 MW

Bhadrawati: 1000 MW

Gazuwaka: 650 MW

Annexure-C3

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

Sr. No	Station	Generating Unit	Test schedule	Remarks
1	TALCHER STAGE 2	3	Unit 3 - 5: 23-11-2020 to 28-11-2020	Testing for unit 6 yet to be conducted
2		4		
3		5		
4		6		
5	Farakka	2	01-02-2021 to 10-01-2021	Testing completed
6		3		
7		4		
8		5		
9		6		
10	Kahalgaon	1	23-02-2021 to 02-03-2021	Scheduled
11		5		
12		6		
13		7		
14	Barh	4	18-02-2021 to 21-02-2021	Scheduled
15		5		
16	Teesta V	1	07-01-2021 - 08-01-2021	Testing completed
17	Teesta III	1	30-01-2021 - 10-02-2021	Testing completed
18		2		
19		3		
20		4		
21		5		
22		6		
23	Dikchu	1	Unit#1: 6th & 7th April' 21 Unit#2: 8th & 9th April' 21	Scheduled
24		2		
25	MPL	1	11th – 20th March 2021	Scheduled
26		2		

Power Plant	Unit No	PSS tuned (Yes/No)	PSS in Service (Yes/No)	Last PSS Tuning Date	Whether Done in Last 3 Years	Whether Next to be planned	Planned Next PSS Tuning
West Bengal							
Kolaghat-WBPDCL	1	No	Yes	Long Back	No	Yes	Under retirement
Kolaghat-WBPDCL	2	No	Yes	Long Back	No	Yes	Under retirement
Kolaghat-WBPDCL	3	No	Yes	Long Back	No	Yes	When Unit will be on Bar
Sagardighi-WBPDCL	2	No	No	Long Back	No	Yes	When Unit will be on Bar
Bakreshwar-WBPDCL	2	Yes	Yes	2019	Yes	Yes	Retuning to be done as from plot response is not good
Bakreshwar-WBPDCL	3	Yes	Yes	2019	Yes	Yes	Retuning to be done as from plot response is not good
Bakreshwar-WBPDCL	4	Yes	Yes	2019	Yes	Yes	Retuning to be done as from plot response is not good
Bakreshwar-WBPDCL	5	Yes	Yes	2019	Yes	Yes	Retuning to be done as from plot response is not good
DPL	7	No	No	N.A	No	Yes	Planned in March 2021
DPL	8	No	Yes	No	No Detail	Yes	To be updated by WBPDCL/DPL
PPSP	1	No	Yes	2009	No	Yes	To be updated by WBSEDCL
PPSP	2	No	Yes	2009	No	Yes	To be updated by WBSEDCL
PPSP	3	No	Yes	2009	No	Yes	To be updated by WBSEDCL
PPSP	4	No	Yes	2009	No	Yes	To be updated by WBSEDCL
TLDP III	4 x 33			No Detail	No Detail	Yes	To be updated by WBSEDCL
TLDP IV	4 X 44			No Detail	No Detail	Yes	To be updated by WBSEDCL
CESC							
Budge Budge-CESC	1	Yes	Yes	2015	No	Yes	2021-22
Budge Budge-CESC	2	Yes	Yes	2015	No	Yes	2021-22
DVC							
Bokaro B 210 MW	3				No Detail	Yes	Unit Is out of Service
Mejia-DVC	4	Yes	Yes	2009	No	Yes	Jun-21
Raghunathpur-DVC	1	No	No		No Detail	Yes	Will be done after AOH
Raghunathpur-DVC	2	No	No		No Detail	Yes	Jun-21
Koderma-DVC	1	Yes	Yes	2013	No	Yes	Sep-21
Waria	4	Yes	Yes	2008	No	Yes	Unit Is out of Service
ISGS							
Kahalgaon NTPC	1	Yes	Yes	2017	Yes	Yes	Apr-21
Kahalgaon NTPC	2	Yes	Yes	2018	Yes	Yes	April 2021 (During AOH)
Kahalgaon NTPC	3	Yes	Yes	2016	Yes	Yes	Jul-21
Kahalgaon NTPC	4	Yes	Yes	2015	No	Yes	Mar-21
Kahalgaon NTPC	6	Yes	Yes	2009	No	Yes	Mar-21
Talcher Stage 2	3	Yes	Yes	2016	Yes	Yes	July 2021 (As per SRPC decision)

Talcher Stage 2	4	Yes	Yes	No Details	No Details	Yes	July 2021 (As per SRPC decision)
Talcher Stage 2	5	Yes	Yes	No Details	No Details	Yes	July 2021 (As per SRPC decision)
Talcher Stage 2	6	Yes	Yes	2016	Yes	Yes	July 2021 (As per SRPC decision)
Barh NTPC	4			2015		Yes	In Next AOH
Barh NTPC	5			During Unit commissioning		Yes	June 2021 (AOH)
Teesta V	1	Yes	Yes	2008	No	Yes	Jun-21
Teesta V	2	Yes	Yes	2008	No	Yes	Jun-21
Teesta V	3	Yes	Yes	2008	No	Yes	Jun-21
BRBCL	1	No	Yes	Vendor to Do	No	Yes	Jun-21
BRBCL	2	Yes	Yes	2019	Yes	Yes	Jun-21
BRBCL	3	No	Yes	Vendor to Do	No	Yes	Jun-21
KBUNL	1	Yes	Yes	2014	No	Yes	2021-22
KBUNL	2	Yes	Yes	2014	No	Yes	2021-22
KBUNL	3	Yes	Yes	Not Available	No	Yes	2021-22
KBUNL	4	Yes	Yes	Not Available	No	Yes	2021-22
Rangit	3 x 20			Not Available	No	Yes	To be updated by NHPC
IPP							
Jorethang	1	Yes	Yes	2015	No	Yes	Apr-21
Jorethang	2	Yes	Yes	2015	No	Yes	Apr-21
ADHUNIK	1	Yes	YES	2013	No	Yes	Mar-21
ADHUNIK	2	Yes	YES	2013	No	Yes	Mar-21
JITPL	1	Yes	Yes	2016	Yes	Yes	Jul-21
JITPL	2	Yes	Yes	2016	Yes	Yes	Jul-21
GMR	1	Yes	Yes	2013	No	Yes	May-21
GMR	2	Yes	Yes	2013	No	Yes	May-21
GMR	3	Yes	Yes	2013	No	Yes	May-21
Orissa							
IB TPS	1	Yes	Yes	2011	No	Yes	Mar'2021
IB TPS	2	Yes	Yes	2012	No	Yes	Mar'2021
Upper Indravati	1	Yes	No	2015	No	Yes	To be updated by OHPC
Upper Indravati	2	Yes	No	2015	No	Yes	To be updated by OHPC
Upper Indravati	3	Yes	No	2000	No	Yes	To be updated by OHPC
Upper Indravati	4	Yes	No	2001	No	Yes	To be updated by OHPC
Balimela	1 (60 MW)			No detail		Yes	To be updated by OHPC
Balimela	2 (60 MW)			No detail		Yes	To be updated by OHPC
Balimela	3 (60 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Balimela	4 (60 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Balimela	5 (60 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Balimela	6 (60 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Balimela	7 (75 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC

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

Annexure-D1

SL.NO	P A R T I C U L A R S	PEAK DEMAND IN MW	ENERGY IN MU
1	**BIHAR**		
i)	NET MAX DEMAND	6075	3550
ii)	NET POWER AVAILABILITY- Own	537	185
iii)	Central Sector+Bi-Lateral	5674	2864
iv)	SURPLUS(+)/DEFICIT(-)	395	-315
2	**JHARKHAND**		
i)	NET MAXIMUM DEMAND	1690	860
ii)	NET POWER AVAILABILITY- Own Source	389	187
iii)	Central Sector+Bi-Lateral+IPP	1111	618
iv)	SURPLUS(+)/DEFICIT(-)	-190	-55
3	**DVC**		
i)	NET MAXIMUM DEMAND	3160	2111
ii)	NET POWER AVAILABILITY- Own Source	5260	2978
iii)	Central Sector+MPL	417	266
iv)	Bi- lateral export by DVC	2199	1636
v)	SURPLUS(+)/DEFICIT(-) AFTER EXPORT	317	-503
4	**ODISHA**		
i)	NET MAXIMUM DEMAND(OWN)	4450	2946
ii)	NET MAXIMUM DEMAND(In Case,600 MW CPP Drawal)	5050	3018
ii)	NET POWER AVAILABILITY- Own Source	4140	2498
iii)	Central Sector	1563	954
iv)	SURPLUS(+)/DEFICIT(-) (OWN)	1253	506
v)	SURPLUS(+)/DEFICIT(-) (In Case, 600 MW CPP Drawal)	653	434
5	**WEST BENGAL**		
5.1	**WBSEDCL**		
i)	NET MAXIMUM DEMAND	7425	4385
ii)	IPCL DEMAND	130	84
iii)	TOTAL WBSEDCL's Energy Requirement (incl.B'Desh+Sikkim+IPCL)	7560	4473
iv)	NET POWER AVAILABILITY- Own Source	4684	2133
v)	Contribution from DPL	450	243
vi)	Central Sector+Bi-lateral+IPP&CPP+TLDP	2604	1331
vii)	EXPORT (TO B'DESH & SIKKIM)	5	4
viii)	SURPLUS(+)/DEFICIT(-) AFTER EXPORT	178	-766
5.2	**CESC**		
i)	NET MAXIMUM DEMAND	2250	1150
ii)	NET POWER AVAILABILITY- Own Source	770	550
iii)	FROM OTHER SOURCE (INCL. IPP/CPP-29-30 MU/M)	940	205
iv)	IMPORT FROM HEL	540	395
v)	TOTAL AVAILABILITY OF CESC	2250	1150
vi)	SURPLUS(+)/DEFICIT(-)	0	0
6	**WEST BENGAL (WBSEDCL+DPL+CESC)**		
	(excluding DVC's supply to WBSEDCL's command area)		
i)	NET MAXIMUM DEMAND	9805	5619
ii)	NET POWER AVAILABILITY- Own Source	5904	2926
iii)	CS SHARE+BILATERAL+IPP/CPP+TLDP+HEL	4084	1931
iv)	SURPLUS(+)/DEFICIT(-) BEFORE WBSEDCL'S EXP.	183	-762
v)	SURPLUS(+)/DEFICIT(-) AFTER WBSEDCL'S EXP.	178	-766
7	**SIKKIM**		
i)	NET MAXIMUM DEMAND	107	47
ii)	NET POWER AVAILABILITY- Own Source	8	1
	- Central Sector	188	110
iii)	SURPLUS(+)/DEFICIT(-)	90	64
8	**EASTERN REGION**		
i)	**NET MAXIMUM DEMAND**	**24790**	**15133**
ii)	**NET MAXIMUM DEMAND (In Case, 600 MW CPP Drawal of Odisha)**	**25390**	**15205**
iii)	**BILATERAL EXPORT BY DVC**	**2199**	**11636**
iv)	**EXPORT BY WBSEDCL TO SIKKIM**	**5**	**4**
v)	**EXPORT TO B'DESH & NEPAL OTHER THAN DVC**	**642**	**605**
v)	**NET TOTAL POWER AVAILABILITY OF ER**	**29274**	**115518**
	(INCLUDING CS ALLOCATION +BILATERAL+IPP/CPP+HEL)		
vi)	**SURPLUS(+)/DEFICIT(-) OF ER**	**1638**	**-1861**
vii)	**SURPLUS(+)/DEFICIT(-) OF ER (In Case, 600 MW CPP Drawal of Odisha)**	**1038**	**-1933**
	AFTER EXPORT (v = iv - i -ii - iii)		