AGENDA
FOR
202nd OCC MEETING

Date: 20.04.2023
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700033

EASTERN REGIONAL POWER COMMITTEE

AGENDA FOR 202ND OCC MEETING TO BE HELD ON 20.04.2023 (THURSDAY) AT 10:00 HRS

PART – A

ITEM NO. A.1: Confirmation of Minutes of 201st OCC Meeting held on 16th March 2023 through MS Teams online platform.

The minutes of 201st Operation Coordination sub-Committee meeting held on 16.03.2023 was circulated vide letter dated 17.03.2023.

Members may confirm the minutes of 201st OCC meeting.

PART B: ITEMS FOR DISCUSSION

ITEM NO. B.1: Ensuring sufficient margin for Primary Frequency Response: ERLDC

Sufficient primary frequency response is one of the fundamental requirement of power system operation. Generation capacity over and above installed capacity up to 105% of installed capacity are exclusively kept for providing primary frequency response (IEGC 5.2.f.ii.a):

"..for any fall in grid frequency, generation from the unit should increase by 5% limited to 105% of the MCR of the unit."

Based on ERLDC SCADA data it is observed that few units are generating more than installed capacity for very high percentage of the time in day and the pattern is repetitive for many days. From ERLDC control room repeated communication has been sent for corrective action and compliance of the grid code.

Darlipalli unit-1 is major violator among the regional generating units. One communication also sent to Head of the plant on 29th March, 2023. However, no such improvement observed till now. The list of units generated more than 100% of I/C with average % time of the day as follows:

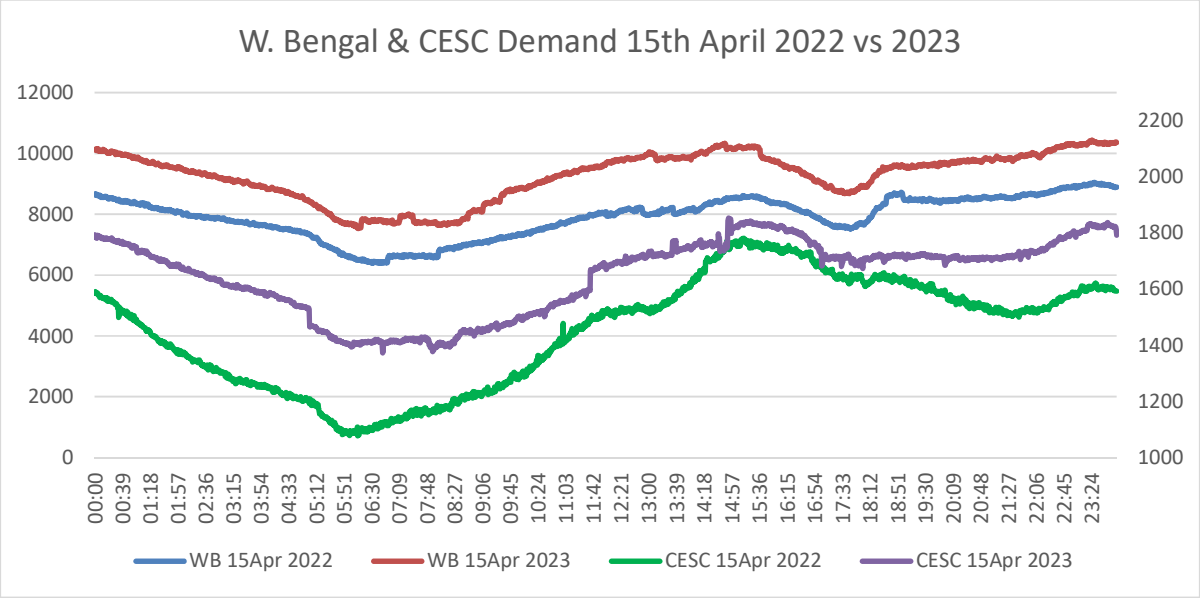
Unit	Install Capacity (MW)	Generated more than 100% for % time (15-03-23 to 15-04-23)
Talcher STPS Stage I Unit -1	500	26
Darlipali STPP Unit -1	800	67
GMR - Unit -1	350	70
Tenughat Unit -1	210	100
Sagardighi Unit -1	300	23
Sagardighi Unit -2	300	53
Sagardighi Unit -4	500	84
Bakreswar Unit -1	210	48

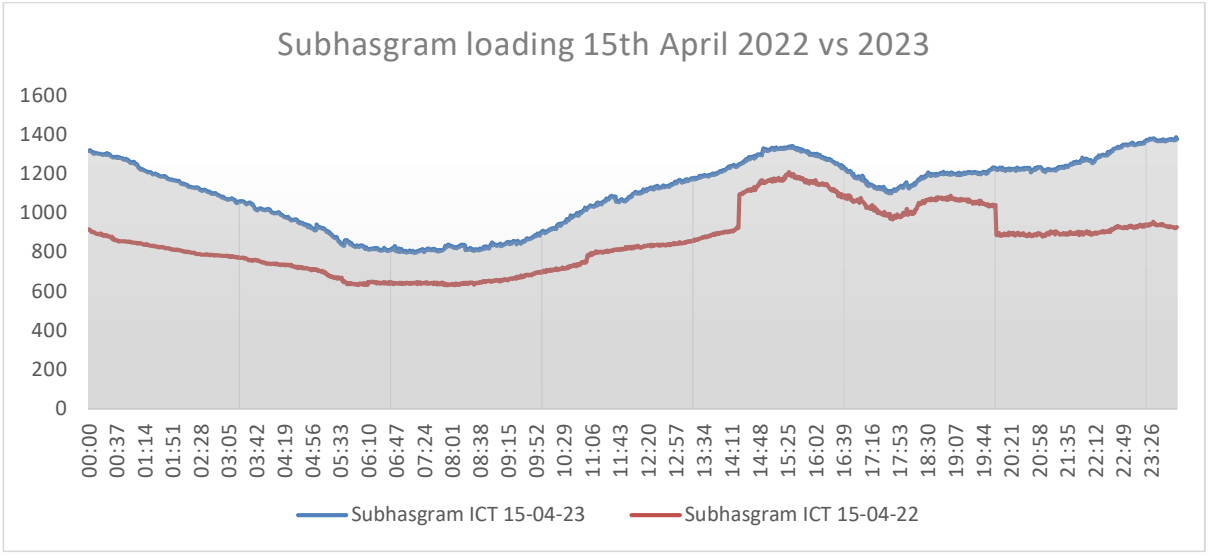
Bakreswar Unit -2	210	49
Bakreswar Unit -3	210	52
Bakreswar Unit -4	210	86
Bakreswar Unit -5	210	92
Santaldih Unit -6	250	100
DPL Unit -8	250	22
Budge Budge Unit -3	250	61

All generating station may restrict their generation as per schedule and ensure sufficient margin for primary frequency response.

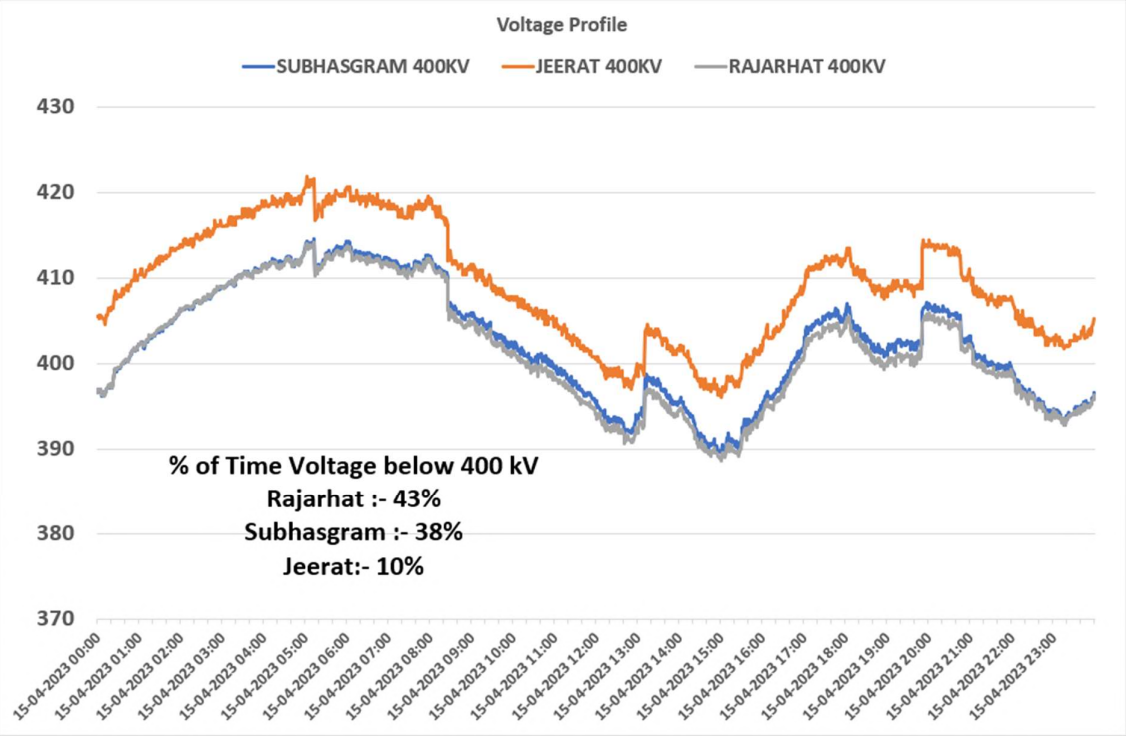
ITEM NO. B.2: Improving voltage in load centers through effective Reactive Power Management: ERLDC

Over the last 10 days, there has been a significant increase in demand. West Bengal has already crossed all time highest demand and it is already touched 11000 MW. The regional demand has also crossed 27000 MW and energy met has crossed 600MU.





This high demand is resulting in lower voltage levels in load centres, particularly in the south Bengal area. In fact, voltage less than 390 kV have been recorded in all 400 kV substations in this area.



To address this issue, the following measures are suggested:

- Increase the reactive power generation from nearby generators (Bakareshwar TPS, HEL, Kolaghat TPS, Budge-Budge TPS Sagardighi TPS and Farakka TPS) to maximize the system's reactive power capacity.
- Ensure that all distribution capacitor banks are in service and expedite the commissioning of new capacitor banks already planned to enhance the system's reactive power support.
- Optimize tap settings in sub-transmission and distribution systems to improve the voltage regulation and minimize voltage drops.

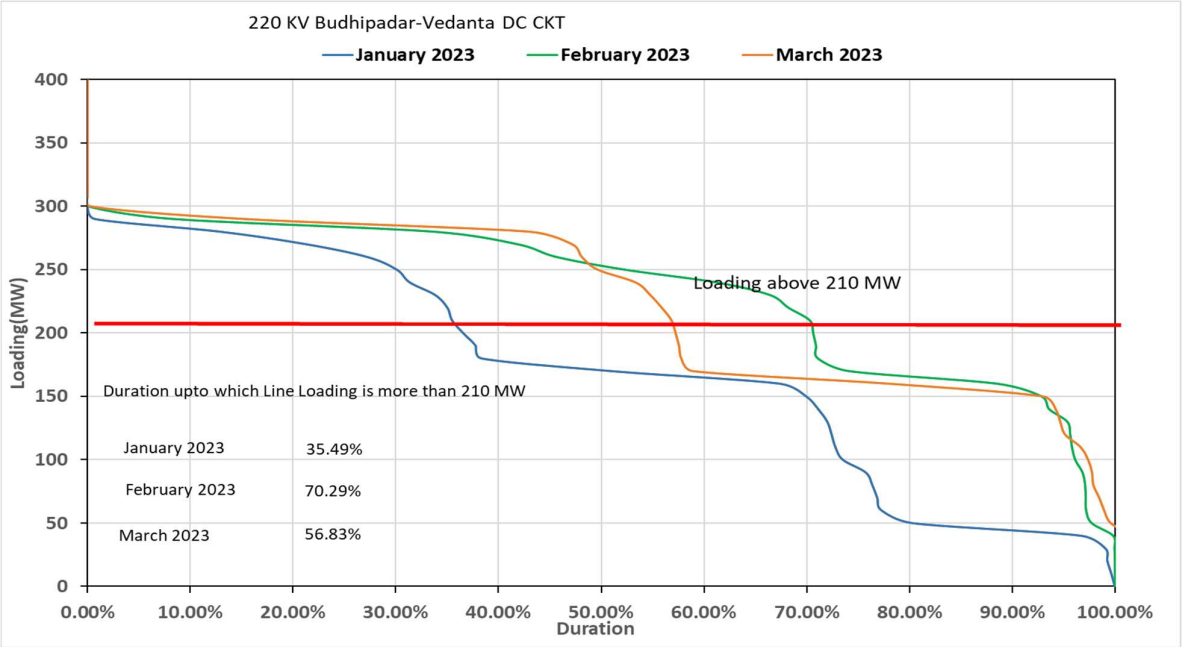
Members may note/discuss.

ITEM NO. B.3: Violation of N-1 of 220 KV Budhipadar Vedanta D/c: ERLDC.

High loading is being observed in 220 kV Budhipadar Vedanta D/C on continuous basis in month of Jan-Mar 2023 and going 125-150 MW/Ckt (refer attached figure). This makes these circuits N-1 non-compliant which is not desirable from captive plant. In past OCC also this issue was flagged and it was assured by Orissa SLDC that the injection will be controlled in order to assure N-1 compliant. Further this has been highlighted by ERLDC in operational feedback given to CEA, CTU and CERC. Further, this will also impact the 220/132 kV Budhipaddar, Tarkera and Lapanga substation security and reliability.

It may kindly be noted that any fault on one circuit would result in tripping of other circuit on overcurrent protection or can cause damage to circuit with high loading above its thermal capacity and can result in permanent damage. In addition, with such high injection loss during N-

1-1 tripping, islanding scheme of Vednata CPP will not be successful as already has been observed in the past.



In view of the same, Odisha SLDC is requested to furnish the reason of allowing such high loading in 220 kV Budhipadar Vedanta D/C and persistent operation of such line by violating N-1 security criteria.

SLDC Odisha may update.

ITEM NO. B.4: Request for using OPTCL/OPGC/ PGCIL 400 kV transmission line for LILO connection for Ind Barath Energy (Utkal) ltd (IBEUL): JSW

Ind- Barath Energy (Utkal) ltd has installed2 X 350 MW thermal power plant at Sahajbahal, dist• Jharsuguda(Odisha). The project was taken over by JSW Energy Ltd, through corporate insolvency resolution process.

JSW would like to revive the IBEUL Unit # 1 in 6 to 8 months' time & Unit # 2 in 12 to 15 months' time. IBEUL is connected to PGCIL Sundergarh substation through 400kV double circuit transmission line for power evacuation.

Since the plant was not operational for >7 years the 400kV transmission line is damaged heavily, the revival of the transmission line will take 10 to 12 months' time. As we have to commission our units on fast track, we need 400 kV connection on priority. For this we have explored three possibilities of nearby transmission lines where we may connect our line through LILO arrangement on temporary basis till we complete the erection & commissioning of our 400 kV transmission line. These are three possibilities:

1. OPTCL400KV D/C line from IB Thermal Power Station to Lapanga substation- crossing Ind Barath line at 11 KM
2. OPGC 400 KV D/C line from 1B Thermal Power Station to PGCIL, Sundergarh- crossing Ind

Barath Line at 11 KM.

3. PGCIL 400 KV D/C Raigarh-Rourkela Line -crossing nearby Ind Barath line at 20 KM (This was earlier LILO connection of Ind -Barath)

Keeping in view the stability of the grid we have carried out the load flow study from M/s DNV for feasibility of LILO connection, as per M/s DNV all the above-mentioned options are feasible.

We have approached OPTCL for option-1, however OPTCL denied for Li-Lo stating that the line is heavily loaded and critical for power transmission for Odisha, in view of state grid requirements and line loading we see Option-2 as more viable option for LILO arrangements also the LILO point is in the close vicinity of IBEUL plant and the transmission network from IBEUL to LILO point (Option-2) is having less damages and the system can be revived earlier.

To achieve the target dates of revival of U-1 by Oct-2023 & U-2 by Mar-2024, we are in requirement of startup power by Jun-2023 so that we can start the commissioning activities.

Since ERPC is the right forum for discussion and decision, it is therefore requested to kindly consider our case and include the same as agenda point for upcoming 202nd OCC meeting scheduled on 20.04.23.

So, it is therefore you are requested to accord your approval for connecting IBEUL 400 kV transmission line through LILO connection with one of the three possibilities, all execution, protection and metering will be done by IBEUL. We require LILO connection for maximum 1-year time from June-2023.

IBEUL may update.

ITEM NO. B.5: Frequent Tripping & Auto-reclosure of 400kV Baripada (POWERGRID)-Kharagpur (WBSETCL) Line : PGCIL Odisha

400kV Baripada (POWERGRID)-Kharagpur (WBSETCL) Line {erstwhile 400kV Rengali-Kolaghat} is an important transmission link which evacuates Power from Rengali (Hydro Power) to West Bengal.

a) LILO of 400kV Rengali-Kolaghat done at Baripada in March 2005, subsequently 400kV Rengali-Kolaghat line changed as 400kV Rengali-Baripada line & 400kV Baripada-Kolaghat Line

b) LILO of 400kV Baripada-Kolaghat Line done at Kharagpur in 2012 ;hence 400kV Baripada-Kolaghat changed as 400kV Baripada-Kharagpur & 400kV Kharagpur-Kolaghat.

Out of total 100km length of 400kV Baripada (POWERGRID)-Kharagpur (WBSETCL) Line, 18 km is being looked after by POWERGRID and balance 82 km is being looked after by WBSETCL.

Recently it has been observed that the number of A/R and Tripping in this Line has been drastically increased.

Summary of Auto-reclosure & Tripping occurred in WBSETCL portion of this line for last 3 financial years are as follows:

Financial Year	No. of Tripping	No. of Auto-Reclosure	No. of Shutdown taken by WBSETCL
2020-21	6	16	0
2021-22	2	13	6
2022-23	4	11	8
Total	12	40	14

(Details attached at Annexure-B.5)

Despite multiple shutdowns availed by WBSETCL for maintenance of the Line, there is no significant improvement in controlling the Tripping & auto-reclosure operation in the line.

Frequent fault in line may affect the life of ICT due to feeding of fault current.

To avoid unwanted stress/loading of fault current in the installed ICT at Baripada S/s, M/s WBSETCL may be advised to take up the required maintenance in this line in a time frame manner. If there is no improvement after corrective action; the complete shutdown of the Line may be taken till rectification of all defects.

Powergrid and WBSETCL may update.

ITEM NO. B.6: Request Planned annual overhauling of Unit # I & Unit # 2- for FY 23-24: JITPL/BSPHCL

In accordance with Power Supply Agreement between NBPDCL, SBPDCL & JITPL dated 06.05.2016 under clause 15.4, this is to inform you that we are going to take the shutdown of Unit # 1 tentatively on/around 1s Week of July 2023 for the period of 45 days for Annual Overhauling and for Unit # 2 Annual Overhauling will tentatively on/around 2nd Week of November 2023 for 30 days. The deployment of overhauling manpower, spares and other resources are being arranged accordingly.

SL No.	Unit	Tentative Overhauling Start Date	Tentative Revival Date
1	Unit # 1	1st July 2023 – 14th Aug 2023	14th Aug 2023
2	Unit # 2	15th Nov 2023 – 14th Dec 2023	14th Dec 2023

However, JITPL undertakes to update you the status of the shutdown/revival time, if the same undergoes any further/other changes. In this regard, it is pertinent to note that during the period of such Annual Overhauling of Unit # I & Unit # 2, since we would be operating the plant with one unit We will be able to provide power under the aforementioned PSA on pro-rata basis in terms of the Indian Electricity Grid Code 2010. Kindly note, power available under PSA will be on Pro Rata basis from only one unit based on availability during the overhauling period. We will further update on this matter before start of annual overhauling or for any change.

BSPHCL vide letter dated 03.04.2023 submitted that the proposed shutdown of JITPL unit # 1 for planned annual overhauling coincides with Bihar's peak demand period (July, August and September). According to the demand projections for aforementioned months, Bihar is expected to experience power deficit scenario particularly in peak hours.

Therefore, in view of the above scenario, it is requested that either the proposed overhauling of JITPL Unit # 1 be postponed to off peak period i.e. November 2023 to March 2024, or

otherwise affected quantum must be supplied from an alternative source in accordance with Clause 18.6 of the Power Supply Agreement dated 06.05.2016. The consent on power supply from alternate source is subject to the condition that no additional financial implication in any form on account of substitute supply shall be passed on or borne by BSPHCL/Bihar DISCOMs. However, JITPL may proceed with the proposed annual overhauling of JITPL Unit 2 in November-2023.

JITPL and BSPHCL may update.

ITEM NO. B.7: Planned over-hauling of Thermal Power Plants for FY 2023: BSPHCL

The LGBR of FY-2023-24 has approved the shutdown of many thermal power plants as mentioned in the following table, which coincides with the peak demand period of Bihar i.e. June, July, August and September 2023. According to the demand projections for aforementioned months, Bihar is expected to experience power deficit scenario particularly in peak hours.

SL No.	Plant Name	From Period	To Period	No. of Days	Quantum Affected - MW
1	Nabinagar STPS (NPGCL) unit - 3	01.06.2023	05.06.2023	5	545.66
2	KhSTPS (NTPC) unit - 3	01.07.2023	04.08.2023	35	85.75
3	Nabinagar STPS (BRBCL) unit - 2	01.07.2023	14.08.2023	45	25
4	Nabinagar STPS (NPGCL) unit - 2	01.07.2023	18.09.2023	80	545.66
5	JITPL (IPP) unit - 1	01.07.2023	14.08.2023	45	114
6	KBUNL unit - 3	21.08.2023	04.10.2023	45	141.5
7	GMR (IPP) unit - 2	25.09.2023	09.10.2023	15	130

It is worth mentioning that in the current scenario, Bihar's overall demand is reaching 6000 MW and is expected to further increase in the upcoming months. Unavailability of above units will be a serious concern in optimal management of power portfolio.

Therefore, in view of the above scenario, it is requested that the proposed shutdown of aforesaid plants be postponed to the lean demand period of Bihar i.e. November 2023 to March 2024.

Bihar may update. Members may discuss.

ITEM NO. B.8: Frequent Tripping and Disturbances at 220 KV Ramchandrapur – JUSNL: ERLDC

Repeated tripping of the 220 kV Ramchandrapur-Joda line has been observed between 9th April to 12th April 2023. Unfortunately, on two of these occasions (10th and 12th April), the breaker at Ramchandrapur failed to operate, leading to a complete outage of the 220 kV Ramchandrapur

substation due to backup protection operation. Additionally, on these occasions, we observed a loss of power of approximately 200 MW for a duration of roughly two hours. This is highly undesirable, especially during the peak summer season, as it can cause discomfort to the public.

These repeated disturbances and tripping of the 220 kV Ramchandrapur-Joda line have serious implications for the entire power system. Therefore, we urgently request a thorough investigation to identify the root cause of the problem and implement appropriate measures to rectify it. It is vital to ensure that all equipment and systems at the substation are functioning optimally to avoid any further loss of load or tripping incidents.

Jharkhand is requested to informed about the developments and actions taken to resolve the issue.

JUSNL may update.

ITEM NO. B.9: Issues due to OPGW Stringing work: ERLDC.

Large nos. of OPGW works of lines are under progress in ER .In the current month, some of tripping occurred due to mismanagement of rope /pulley which led to generation loss. In view upcoming thunderstorm, lightning and norwester season, the problem will be exaggerated. All kind effort need to be taken to reduce such tripping.

Trippings occurred due to poor workmanship involved OPGW work:

Sr. No.	Element Name	Tripping Date	Tripping Time	Reason	Revival Date	Revival Time	Time taken to restore SD (Hrs)	Any Generation loss
1	400KV-PUSAULI(PG)-NABINAGAR(BRBCL)-2	31-03-2023	19:04	Pusuali : Z1,R-E,Distance 47KM,6.9KA Nabinagar(BRBCL): R-E,Z1,Distance 40KM,6.6KM	01-04-2023	12:37	>17	No
2	400KV-TEESTA-III-RANGPO-1	17-04-2023	20:53	Zone-1, Y-B ,20.90 KM, Iy-6.5 KA, Ib-5.7 KA; Rangpo: Y-B , 32.41 km, Iy=6.679 KA, Ib=7.416 KA			Not revived yet	Approx. 1250 MW
3	400KV-RANGPO-DIKCHU-(Tripped thrice)	17-04-2023 & 18-04-2023	21:33,22:53,03:27	Rangpo: B-N fault, Fd= 15.9 Km, Ib=7.414 KA Dikchu: Z-1, B-N, 25.5km, 4.72kA	18-04-2023	22:07,23:19 & 04:00	>1.5	

ERLDC may update.

ITEM NO. B.10: Repairing/Replacement of 63 MVAR Line Reactor of 400 KV Malda-Purnea-I at Malda SS: PGCIL ER-II

63 MVAR non-switchable Line Reactor available for 400 KV Malda-Purnea-D/C Line at Malda SS. The Reactors originally commissioned as LR of 400 KV Malda-Bingaigaon-D/C Lines, under Kathalguri Transmission System in 1992, however after various LILO of the subject line, now presently it is serving as LR of 400 KV Malda-Purnea-D/C lines (Line Length-167 KM).

Under the subject package, 63 MVAR LR of BHEL make commissioned in the year 1994 and details are as follows: -

Item Description: 400 KV, 63 MVAR Line Reactor of Malda-I.
Size: 63 MVAR.
Date of commissioning: 28.07.1994.
Make: BHEL.
Year of Mfg:1994.
Serial No: 6005289.

LR for Malda-Purnea-I having serial number- 6005289 has once repaired in a major way already in 2015 and further after repairing at factory reinstated in September-2017. Further again in January-2023, certain violation observed in the DGA parameters (Huge concentration of Acetylene (C2H2) & Hydrogen (H2) in sample data) which forced maintenance team to take out the Reactor from service in urgent manner.

Subsequently own expert manpower of POWERGRID and then OEM representative of BHEL examined the Reactor thoroughly and based upon LV test results & DGA data, it can be opined that definite fault is there within the reactor but cannot be traced or eligible to be repaired at site. OEM recommends to send the Reactor to BHEL works/Factory for assessment and then it may require replacement of the winding also.

Now, considering the already elapsed service age of the Reactor at Malda SS and deteriorating parameters indicates a major cost involved (May be including replacement of winding also). The reactor already crossed the useful life in service (More than 25 Years) and any major maintenance at this juncture may not be fruitful enough to ensure a further longer service period considering cellulose ageing and fault history.

In view of above, it is now required to review the requirement of 63 MVAR L/R at Malda end for Purnea Line and based upon findings, a new suitable Reactor may be planned under separate package in place of the old age equipment. The subject Reactor will then be dealt as per procedure laid out by CERC.

Powergrid may update.

ITEM NO. B.11: Proposal for procurement of Reactor spares (Cold spares) for Eastern Region: Powergrid ER-II.

In Eastern Region-II following Reactors are in service at present as POWERGRID asset:

STATE	VOLTAGE LEVEL	CAPACITY	IN SERVICE (In No)	Number of Spares available (In No)
WEST BENGAL	400 KV	125 MVAR	13	NIL
		80 MVAR	07	NIL
		63 MVAR	05	NIL
		50 MVAR	08	01 at Maithon
Odisha	400 KV	125 MVAR	15	01 at Angul
		80 MVAR	08	01 at Rourkella
		63 MVAR	07	NIL

		50 MVAR	06	01 at Rourkella
SIKKIM	400 KV	80 MVAR	02	NIL
	220 KV	31.5 MVAR	02	NIL
BIHAR	400 KV	125 MVAR	16	NIL
		80 MVAR	12	NIL
		63 MVAR	11	NIL
		50 MVAR	10	01 at Biharsariff
JHARKHAND	400 KV	125 MVAR	8	NIL
		80 MVAR	3	NIL
		63 MVAR	2	01 at Dalton Ganj
		50 MVAR	8	01 at Jamshedpur

However, apart from 400 KV, 50 MVAR Reactor at Maithon SS, no other spare Reactor are available till date. As per CEA spare norms (circulated in July-2020, refer page-18/19), for maintaining spares under GST regime, each state should be provisioned with respective sized Reactor. Accordingly, as per available sizing following Reactors are required at following locations: -

STATE	VOLTAGE	SIZE	STORAGE PLACE
WEST BENGAL	400 KV	125 MVAR	DURGAPUR SS
		80 MVAR	BINAGURI SS
		63 MVAR	BINAGURI SS
SIKKIM	400 KV	80 MVAR	RANGPO SS
	220 KV	31.5 MVAR	NEW MELLI SS
BIHAR	400 KV	125 MVAR	BIHARSARIFF SS
		80 MVAR	PATNA SS
		63 MVAR	MUZAFFARPUR SS
JHARKHAND	400 KV	125 MVAR	NEW RANCHI SS
		80 MVAR	RANCHI SS
ODHISSA	400 KV	63 MVAR	ROURKELLA SS

All above Reactors will be kept as regional spare and based upon urgency the same shall be utilised in ISTS system and as per CEA spare norms in state level.

Members may discuss and approve the technical requirements for further submission of cost data to subsequent meetings.

ITEM NO. B.12: Replacement of old static LBB Relays in ER-II on account of enhancement of Reliability of protective system: Powergrid ER-II.

Under various Transmission scheme implemented in Eastern Region earlier, everywhere Static LBB relays are used only. The static relay model comprises RAICA (From ABB) & CTIG (From GE)/ MCTI4 (From AREVA). In many occasions, it is observed that due to maloperation of Static Relay & its auxiliary system, entire Bus & associated elements got tripped.

In addition to that as those Relays are Static in nature analysis of various events, post fault is very difficult. Replacement of those Static LBB relays by available Numerical Relays are only possible solution to avoid such malfunctions. Moreover, in latest Numerical relays, additional Re-Trip function (Opening of self CB after 100 ms) is available which gives additional flexibility in protective system.

Under ADDCAP 2019-24 Tariff block, all old protection system of Chukha TS (Namely Birpara/ Siliguri/Dalkhola/Malda) are taken for complete upgradation and this upgradation is included the

replacement of LBB relays also. However, stations namely Maithon (KTPS) & Binaguri are also fitted with old static type LBB relays, which require complete replacement.

A list of such LBB Relays mainly installed at Maithon & Binaguri SS are attached for reference (**Annexure B.12**). Total 58 No's Relay require complete replacement and tentative Cost estimate comes to Rs. 2.0 Crores Including all applicable Taxes and duties.

Considering the criticality for continuing of such elements, it is proposed to provide in-principle approval for replacement of such old Static Relays, necessary cost shall be booked in ADDCAP 2019-24 tariff block and actual expenditure shall be placed during truing up.

Powergrid may update.

ITEM NO. B.13: Cyber Security activities to be taken up by SLDCs: ERLDC.

13.1 Dedicated manpower availability at SLDCs for cyber security:

Availability of dedicated manpower for cyber security is crucial for carrying out the activities related to Cyber Security. Presently SLDCs are operating with very skeletal manpower for Cyber Security activities.

The consolidated manpower availability at each constituent for cyber security related activity other than CISO and Alternate CISO, is tabulated below. There is urgent need of dedicated manpower in addition to CISO and Alternate CISO, for cyber security & related work. It is requested to all the SLDCs to take up this matter with their higher management.

Constituents	West Bengal	DVC	Odisha	Bihar	Jharkhand	Sikkim
Dedicated manpower for cyber security related work (In addition to CISO and Alt. CISO)	Nil	Nil	05 (No exclusive person for cyber security works. All are engaged for cyber security related works in addition to their other original duties.)	1	Nil	Nil

13.2 Details of status of other Cyber Security related activities has been tabulated below:

The status of various cyber security activities being followed up by ERLDC are tabulated below. All SLDCs are requested to update the present status and take up the pending matters at the earliest.

Description	West Bengal	DVC	Odisha	Bihar	Jharkhand	Sikkim
CSK on-boarding of SLDC IPs	On-boarded	On-boarded	On-boarded	On-boarded	On-boarded	On-boarded

CII Status	CII declared	CII declared	CII declared	CII declared	CII declared	Under Vetting by NCIIPC
CCMP status	CCMP approved	CCMP approved	CCMP approved	CCMP approved	CCMP under process	CCMP under process
ISO 27001 certification status	order placed to Prime Infoserve	Order placed to CDAC	Already Certified through OPTCL LOA	Order placed to Digital Age	Committee formed, under progress	Approval yet to be taken, To be initiated
Last VAPT of OT (SCADA)	Feb 2022, report awaited	March 2022, report awaited	Completed in June 2022 by Digital Age	March 2022, report awaited	March 2022, report awaited	Jan2021, not done in 2022
Last VAPT of IT	Not being done, as no proper IT system	Feb 2022	June 2022 (for OPTCL DC), Not being done for SLDC, as no proper IT system	Sep 2022	Not being done as no proper IT system	Not being done, as no proper IT system
SOC implementation	DPR to be prepared for PSDF funding	to be taken up along with the upgradation and shifting work	DPR to be prepared for PSDF funding	Tender under progress through State Govt own funds	DPR to be prepared for PSDF funding	CII declaration pending, DPR to be prepared afterwards
Basic Level Cyber Security Certification from NPTI- Status of certification of Manpower in IT/OT/Cyber Security	Please update	Please update	6	5	Please update	Please update

ERLDC may update.

ITEM NO. B.14: Guidelines to promote development of Pumped Storage Projects (PSP): ERPC Secretariat

Ministry of Power's vide letter of even number dated 15th February' 2023 circulated the draft PSP Guidelines for comments / suggestions. Subsequently, a webinar was held on 23'd February 2023 on the topic of "Green Growth", wherein, inter alia, suggestions were also received on the framework for Pumped Storage Projects in the country.

Based on the comments / suggestions received from the stakeholders, the Guidelines to promote development of Pump Storage Projects in the country have been finalized which is provided at **Annexure B.14**.

Members may note.

ITEM NO. B.15: Follow up Agenda

SL No	Issue/Agenda	Discussion in last OCC Meetings	Update/Status
1.	**Continuous Continuous S/D of 220kV D/C Siliguri-Kishanganj TL(Ckt-1 & Ckt-2) and 220kV D/C Dalkhola-Kishanganj TL (Ckt-1 & Ckt-2) for carrying out Diversion of tower location no.-29 of 20kV D/C Dalkhola - Kishanganj TL & Loc No.-30 of 220kV D/C Siliguri-Kishanganj TL vulnerable due to bank erosion on Mahananda River** 1. Location no.-29 of 220kV D/C Dalkhola-Kishangnaj TL & Loc No.-30 of 220kV D/C Siliguri-Kishanganj TL have become vulnerable due to change in course of River Mahananda. The location is situated on the left bank of River Mahananda (Main channel). Further, after this season monsoon a secondary channel (approximately 20-30 m wide) have also been formed such that location no.-29 of 220kV D/C Dalkhola-Kishangnaj TL & Loc No.-30 of 220kV D/C Siliguri-Kishanganj TL are now coming in-between the main river and new formed channel. Presently, location no.-29 & 30 are 30 mtr away from the main river bank and approx. 10 mtr away from secondary channel. During last season monsoon heavy soil erosion has been observed from the main river bank as well as newly	In the 201st OCC meeting, Powergrid representative submitted that the line would be restored by 20th March'2023.	

	developed channel. 2. Last year the locations were somehow saved by temporary protection wall with sand bags and bamboo piling. 3. However, considering the last year trend and present site condition, it has been felt prudent to shift the affected 2 Double Ckt towers on a single Multi-ckt Pile Foundation. 4. However, during construction of Pile and during tower erection (Top part and X-arm fixing) & stringing work we require continuous S/D of 220kV D/C Siliguri-Kishanganj TL (Ckt-1 & Ckt-2) and 220kV D/C Dalkhola-Kishanganj TL (Ckt-1 & Ckt-2) for 14 days (2 weeks) tentatively w.e.f. 2nd week of Mar-23 to End of Mar-23.		
2.	**132 KV GIS Commissioning planning and shutdown requirement for Malda S/s** As per ERSS-XXII, complete AIS portion of 132 KV system at Malda S/S will be converted to 132 KV GIS along with provision of additional 02 No's 132 KV Line Feeder (Malda-Manikchak-D/C). Earlier in October-2022 a detail work plan submitted considering phase wise segregation of ICT/Feeders such that GIS erection work and Feeders, both are in service and with calculated risk proportion the work could be completed. However, during actual execution it is observed that while going for erection in between Section-I & II, both section required S/D and only one feeder and one ICT (Namely ICT-4) will be in service.	In the 201st OCC meeting, representative of West Bengal informed that ICT-1 & 1 no ckt will be charged on GIS by 1st week of April'23.	
3.	**De-stringing of overhead conductor in Power Line Crossing span of 220kV D/C Farakka-Lamatia Line in between span (Location No.-5 & Location No.-6) by JUSNL in order to protect underlying 400 kV S/C Farakka Sagardighi I & II TL (Loc No.- 3 & 4) of POWERGRID due to severe/repetitive**	In the 201st OCC meeting, representative of Jharkhand informed that the line is expected to be restored by May'23.	

	theft incidents by miscreants near to Farakka Plant 220kV Farakka-Lalmatia TL is under break-down condition due to tower collapse incidents since 21.04.2021. Since the line is under off condition for long, at several locations of the said line near to Farakka serious tower member theft/conductor theft incidents are occurring. During patrolling of 400 kV S/C Farakka Sagardighi I & II TL on dated 07.11.2022, huge no. of missing members has been observed in the Powerline crossing towers of 220 KV Farakka Lalmatia TL (owned by JUSNL) situated in village: Jorpukuria, Farakka crossing over Loc 03 & 04 of both 400 kV S/C Farakka Sagardighi I & II TL of POWERGRID. Considering the fact that any incident of collapse of towers of the mentioned crossing towers of Farakka Lalmatia line shall damage our existing 400 kV Farakka Sagardighi TL which is already more than 35 years old. Earlier also, an incident of Tower collapse of 220 kV Farakka Lalmatia line over POWERGRID 400 kV S/C Farakka Durgapur 1 & 2 TL had occurred in the year 2020 which had severely damaged the 400 kV S/C Farakka Durgapur 1 & 2 lines. Restoration of the lines were carried out under extreme ROW situations. Considering the seriousness of the issue JUSNL was requested to rectify the towers Loc No.-5 & 6 of 220kV Farakka-Lamatia Line on urgent basis. Vide mail dated 08.12.2022, JUSNL have informed that they have rectified the affected towers but considering the area being severe theft prone they will not able to save the towers in near future. In view of above considering the seriousness/repetitive theft incidents in towers near to Farakka Plant, M/s JUSNL is requested to remove the conductors in		

	between Span Loc No.-5 & 6 of 220kV D/C Farakka-Lalmatia so that underlying POWERGRID lines 400kV Farakka-Sagardighi-I & II may be protected.		
4.	**Islanding Schemes in Eastern Region** **4.1. Patna Islanding Scheme:** In the meeting held on 28th December 2020 and chaired by the Hon'ble Minister of State (IC) it was directed that islanding schemes should be implemented for all major cities of the country considering all the strategic and essential loads. Subsequently, in line with the direction given in the meeting, the subject matter was discussed in PCC meeting of ERPC, and it was finalized that new islanding scheme would be implemented for capital city of Patna & Ranchi.	In the 200th OCC Meeting, Representative of NTPC submitted that Internal approval is under process. 3 months of timeline would be required before award.	
	4.2. Chandrapura Islanding Scheme: The scheme detail in brief is as follows: ➢ The CTPS-B islanding scheme is to de designed with two units of CTPS-B (2x250 MW) generating station as participating generator and connected loads at CTPS, Putki, Biada, Nimiaghata & Patherdih. The estimated off-peak and peak load in the proposed islanding system is 280 MW & 420 MW respectively. ➢ The islanding frequency for CTPS-B islanding system was decided as 48.4 Hz.	In the 196th OCC meeting, DVC representative submitted that the work is expected to be completed as per the given timeline.	-
	4.3. IB-TPS Islanding Scheme: The scheme was finalized in the special Meeting on Islanding Scheme of IB-TPS held at ERPC, Kolkata on 12th December 2018. In special meeting held on 06.08.2021, OPGC representative informed that work order had been placed on OEM (M/s BHEL) for implementation of the Islanding scheme at IB TPS units.	In the 197th OCC meeting, OPGC representative was not present during the discussion. OPTCL representative submitted that the details would be shared shortly. Representative of OPGC informed that during AOH in the month of March'2023 if the turbine vibration issue gets resolved then they would go ahead with the	-

	OPGC was also advised to take up the issue with their highest authority as well as with the OEM for expediting the implementation of islanding scheme.	testing.	
5.	**Reliable Power Supply to Lalmatia/Godda/Dumka areas of JUSNL** **5.1. Restoration of 220kV Farraka-Lalmatia S/C line** The 220 kV Farakka-Lalmatia S/C was out of service since April 2021 due to tower collapse. The 220/132/33 kV Lalmatia substation is relying on only 132 kV lines. At present the local load at 220 kV Dumka and Godda S/S were being radially fed from 400/220 kV Maithon S/S through 220 kV Maithon-Dumka D/C and 220 kV Dumka-Godda D/C.	In 49th TCC & ERPC Meeting , Representative of JUSNL assured that the erection and stringing of the line would be completed by May'2023 TCC advised JUSNL to provide weekly update along with photographs to ERPC and ERLDC.	-
6.	**Outage of Important Transmission System** **132kV Sagbari–Melli.** Sikkim vide mail dated 09.06.2021 updated the following status: 1) In loc 82,83 & 84 we have low ground clearance which need hill cutting but if needed TL can be charged after putting temporarily barbed wire fencing. 2) In loc 98-99 a house had been constructed just below the line and warning had been issued to the owner for not to do vertical extension of the house till any such arrangement is made. 3) In loc 116 &117 land owner demanding for intermediate tower and not allowing for us to clear the jungles. 4) Loc 128 is in dilapidated condition due to sinking effect posing threat to lives and properties. Local public are asking to shift the tower in safe place before restoration of supply in the TL. 5) 80% of jungle clearance has been completed and remaining 20% is in Forest area most of it is under west district and	In 49th TCC & ERPC Meeting, Sikkim representative submitted that the 132kV Sagbari–Melli line would be restored by 15th April 2023.	

	waiting for permission from Forest department. 6) The delay in obtaining permission for following trees in forest land is that it cannot be ascertained whether FCA clearance during construction of TL was obtained as the record is not available either in power department or in DFO Office. Regarding this it had been told by ERPC that once obtaining environment clearance at the time of construction there need not to take permission for further clearance of ROW from Forest dept and this matter is been conveyed to the Forest department but they informed us as per Forest Act of Sikkim state permission has to be obtained for fresh felling with payment of compensation. File for approval is being send to conservator of Forest from DFO on 10/6/2021.		
7.	**Ensuring N-1 reliability criteria at 400/220 KV Subhashgram (PG) S/s.** The reliability issue of Subhasgram (PG) was discussed in the 46th TCC and ERPC meeting. In the meeting it was deliberated that there is an urgent requirement for installation of 6th 400/220kV, 500 MVA ICT at Subhasgram (Powergrid) S/s. On request of West Bengal, CESC agreed to bear the cost associated with the installation of the said ICT and its future maintenance. Further, CESC requested Powergrid to execute the project on deposit work basis. In the 194th OCC meeting, Powergrid representative submitted that decision in this regard would be taken by their corporate office and they would submit the details as and when it is received. ERLDC suggested Powergrid for applying requisition of shutdown regarding implementation of SPS scheme. However, no shutdown request has been received by ERLDC till date.	In the 201st OCC meeting, it was informed that CESC has given confirmation. Matter has been forwarded to Powergrid Corporate Office. 50% Bill would be raised to CESC. After that tendering would be done.	
8.	**Integration of (Interface Energy Meter) IEMs into SCADA/EMS system for telemetry of meter data to SLDCs.** The existing SEMs are having two	In the 201st OCC meeting, representative of Powergrid submitted that meeting with Genus is going on. The update regarding the same would be	

	communication ports, which can function independently for fetching the SEM data. The optical port is being used for fetching the weekly DSM data through Common Meter Reading Instrument (CMRI), for accounting purpose. The other RS 232 port available remains unused, the online real time data can be fetched from the existing SEM through the unused RS 232 port. This arrangement does not require additional meters or new communication facilities and therefore no additional cost is involved.	given in 202nd OCC Meeting.	
9.	**Status of SAMAST, ABT implementation and certification of system operators in states.** Implementation of SAMAST and ABT in all the states is a prerequisite for improving the reliability of grid considering the complexities involved in managing the large interconnected Indian grid. Further skilled, certified manpower is the key to operate the grid safely and securely. Various initiatives are being taken mutually by ERLDC and the states for successful implementation of the SAMAST/ABT in the states. The status of SAMAST, ABT implementation and certification of system operator of various states of eastern region is given below: **Name of the state** / **Status of implementation of SAMAST** / **Number of Certified Operator** **Bihar** / Completed / 4 **Jharkhand** / / Nil **Odisha** / / 11 **DVC** / / Nil **West Bengal** / / 2 **Sikkim** / / 1	The status of SAMAST implementation and certification of system operator of various states of Eastern Region, as updated by respective utilities in the 49th ERPC Meeting, is given below: **Name of the state** / **Status of implementation of SAMAST** / **Number of Certified Operator** **Bihar** / Completed / 4+(1 appearing in the exam in March' 23) **Jharkhand** / / 2 **Odisha** / / 11 **DVC** / / 50% of the operators will appear for the certification exam by Sep'23 **WB** / / 2 **Sikkim** / / 14 nos. system operato	

					rs will be appearing for certification exam in March' 2023	

10.

Replacement of Heavily time drifted L&T meters in Eastern Region

In 47th TCC & ERPC meeting, it was deliberated that in view of stringent provisions in new DSM regulations, the heavily time drifted L&T make SEMs need to be replaced on priority basis. Accordingly, PowerGrid was advised to replace the heavily time drifted meters on priority basis in co-ordination with ERLDC & concerned utilities.

Accordingly, ERLDC has provided a phase-wise replacement list of L&T meters to Powergrid for further necessary action at their end.

Utility	Substation	SEM to be replaced	SEM replaced
NTPC	KAHALGAON	38	2
	BARH	13	0
	BRBCL	3	0
	KANTI	6	6
	TALCHER	39	1
	FARAKKA	14	0
DVC	DHANBAD	2	2
WB	NBU	1	0
	HALDIA	2	0
	DALKHOLA	3	0
	BIDHANNAGR	3	0
	MALDA	2	0
	BIRPARA	1	0
PGCIL	BINAGURI	2	0
	BIRPARA	5	0
	DURGAPUR	5	5
	MALDA	4	0
	SUBHASGRAM	2	0

In the 201st OCC meeting, Representative of NTPC submitted that installation of meters by Powergrid on behalf of CTU should not be on chargeable basis. He further added that the same is in violation to Grid Code/Regulations.

OCC opined that the agenda maybe referred to TCC for further deliberation.

11.	**Ensuring healthiness of ADMS**		-

State	Criteria for ADMS operation	Number of instances for which ADMS criteria satisfied	Number of instances for which detail received	Discussion regarding previous month performance	Update in 201st OCC meeting
West Bengal	1. System Frequency < 49.7 Hz 2. WB over-drawl > 150 MW 3. Delay = 4 min	Nil	Nil	-	
Jharkhand	1. System Frequency < 49.9 Hz 2. Jharkahnd over-drawl > 25 MW 3. Delay = 3 min	58	Nil	-	
DVC	1. System Frequency < 49.9 Hz 2. DVC over-drawl > 150 MW 3. Delay = 3 min	46	Nil	-	
Odisha	1. System Frequency < 49.9 Hz 2. Odisha over-drawl > 150 MW 3. Delay = 3 min	30	Nil	-	

12.	**Commissioning status of ADMS** Automatic demand management scheme (ADMS) is already commissioned in West Bengal, DVC and Jharkhand. However, for Bihar it is yet to be implemented, the last status as confirmed in the earlier meeting is as follows.	In the 201st OCC meeting, Representative of Bihar submitted that the commissioning will be done by end of 1st week of March'2023.	
13.	**Revised connectivity for Laxmikantpur 400/132 KV S/s and split bus arrangement at Laxmikantpur S/s**	In 49th TCC Meeting, The Committee submitted the following: 1. Two meetings have been	

	In the 2nd meeting of ERSCT held on 05-07-2019, CTU informed that the scope of works for establishment of 400/132kV New Laxmikantpur substation through LILO of Subhashgram (POWERGRID) – Haldia 400kV D/c line at New Laxmikantpur S/s under intra-state has already been approved on technical grounds by all the stakeholders including HEL and CESC (also recorded in the minutes of the meeting). HEL was requested to provide go ahead on the said scope before the next CEMTS-ER as further delays in implementation of New Laxmikantpur S/s may jeopardise reliability of power supply in Kolkata area.	conducted on 20.12.2022 and on 24.01.2023 to discuss revised connectivity for Laxmikantpur 400/132 KV S/s. The final report is under preparation. 2. Two measures have been recommended by the Committee: a) Final arrangement: One circuit of 400kV New Jeerat-Subhasgram D/C to be LILOed at 400/132 KV Laxmikantpur S/s. Necessary load flow study has to be conducted by CTU for this arrangement. b) Interim arrangement: One circuit of 400kV HEL-Subhasgram D/C to be LILOed at 400/132 KV Laxmikantpur S/s. Transient study has already been conducted by HEL and the same has been submitted to OEM for suggestions/feedback. However, the same is awaited from OEM. 3. The Committee requested TCC for extension of timeline for submission of the final report. TCC advised the following: 1. HEL to expedite the matter with OEM in getting their feedback. 2. CTU to conduct the load flow study at the earliest. 3. Committee to submit the final report by April'2023.	-
14.	**<u>Operational challenges in Jharkhand network due to multiple long outages/tripping</u>** In Jharkhand network, 400/220 kV 2 X 315 MVA Ranchi ICTs and 400/220 kV 2 X 315 MVA Patratu ICTs and 220 kV	**<u>400 kV/220kV 315 MVA ICT 1 & ICT2 AT PATRATU</u>** In the 49th TCC Meeting: The following deliberations took place: 1. Representative of Powergrid informed that:	

	Tenughat-PTPS S/C were meeting the demand of Ranchi capital city. At present, 400/220 kV Patratu substation both ICTs are out of service. This led to shifting of loads being fed from this substation back to Ranchi substation's ICTs. In addition, due to the outage of 220 kV Patratu-Tenughat S/C, there is no support from Tenughat (TTPS) power plant. This is leading to the entire Ranchi City demand being fed by 2X315 MVA ICTs Ranchi (PG). Presently Ranchi ICTs loading is to the tune of 160-190 MW/ICT. In this network configuration, Ranchi S/s one 315 MVA 400/220 kV ICT outage sensitivity on other ICT is more than 90%. Further degrading the overall situation is outage of 220 kV Ranchi-Hatia 2 on tower collapse. This is leading to n-1 loading violation for other two circuits i.e., 220 kV Ranchi-Hatia 1 and 3 which are loaded above more than 150 MW/ckt. **A list of major elements outages in JUSNL are provided below:** • 400 KV/220KV 315 MVA ICT 2 AT PATRATU: 27-09-2022 (DGA violation) • 400 KV/220KV 315 MVA ICT 1 AT PATRATU: 01-08-2022 (Buchholz Relay) • 220 KV/132KV 100 MVA ICT 2 AT LALMATIA: 22-01-2019 (FAILURE OF HV SIDE BREAKER) • 220 KV/132KV 100 MVA ICT 3 AT CHANDIL: 30-04-2020 (ICT failed due to fire) • 220 kV Tenughat-Patratu S/C: Under long shutdown for shifting work • 220 KV-RANCHI-HATIA-2: 24-09-2022 (Tower collapse) • 220 KV-FSTPP-LALMATIA-1: 21-04-2021 (Tower collapse)	a. 315 MVA ICT-1 would be ready for testing by 18th April'2023. b. By 28th April'2023 it would be dispatched. c. By 15th May'2023 the ICT will be available at site. d. By end of May'2023 the said ICT will be put in service. 2. TCC advised Powergrid to carry out necessary activities at Patratu end to make the site ready for installation of the ICT. TCC further advised Powergrid to provide weekly progress report to ERPC, ERLDC and Jharkhand. 3. TCC also advised Powergrid to arrange for transport of ICT-2 in such a way that once the bay at M/s CGL workshop in Bhopal gets empty after shifting of ICT-1 to Patratu, rectification work of the ICT-2 may be started. 4. Representative of DVC apprised the forum that early restoration of the ICTs is also essential for enabling Jharkhand to provide power assistance of around 30-35 MW through 132 KV Tie line Patratu (JUSNL) - Patratu (DVC) for reconductoring work of 132 kV D/C Ramgarh - Patratu line. 5. Representative of NTPC submitted that start-up power for 3*800 MW PUVNL Super Thermal Power Plant would be required by May-2023. Early restoration of 2*315MVA 400/220kV ICTs is required so that s/d of 400kV TTPS-PTPS may be facilitated which is currently charged at 220KV voltage level and to be charged at 400kV level (after necessary modification) to provide start-	

		up power to PUVNL. TCC referred the issue to ERPC for information. **220kV/132 100 MVA ICT-2 AT LALMATIA (FAILURE OF HV SIDE BREAKER)** In this regard estimate has been obtained from field, estimate is being scrutinized at Head Quarter level to get the work done with minimum cost. The expected date of completion is 31.03.2023. In the 201st OCC meeting it was informed that 220kV/132 100 MVA ICT-2 AT LALMATIA (FAILURE OF HV SIDE BREAKER): W.O. would be issued by 1st week of April'2023. **220kV/132kV 100 MVA ICT-3 AT CHANDIL** In place of this ICT new ICT of 100 MVA will be procured soon. The tender is under technical evaluation stage and work order would be placed soon. The expected timeline of completion is July 2023. **220kV FSTPP-LALMATIA-1** In 200th OCC meeting, regarding 220kV FSTPP-LALMATIA-1, representative of Jharkhand submitted foundations for 17 nos of tower have been completed. Foundation of 2 towers is under progress. Foundations for 3-4 towers are left. Stringing and erection activities to commence after 10th March. OCC advised JUSNL to complete the work by May'23.	
15.	**Power assistance from M/s JUSNL through 132 KV Patratu (DVC) -PTPS (JUSNL) tie line**	In the 201st OCC, OCC opined that for the time being, considering constraints(Power	

	As per earlier discussions in TCC and in a special meeting with JUSNL on 03-01-2023, arranged by ERPC, DVC had requested to accord approval towards power assistance of around 30-35 MW thru' 132 KV Tie line Patratu (JUSNL) - Patratu (DVC). However, no specific date was conveyed mentioning readiness on the part of JUSNL. Confirmation from M/s JUSNL on tentative date from which the 30-35 MW power assistance thru' 132 KV Tie line Patratu (JUSNL) - Patratu (DVC) for 48 days on continuous basis would be made available to DVC.	crunch) Jharkhand is facing due to unavailability of Patratu ICT 1 and 2, it is not possible to provide power assistance. However, if the Powergrid's spare ICT at Muzaffarpur can be installed at Patratu, the possibility of providing power assistance to DVC may be explored at that time.	
16.	**<u>Installation of Transmission Line Arrestor in 220 KV lines in North Bengal – PGCIL ER-II.</u>** 220 KV D/C Siliguri-Kishanganj TL (erst 220kV D/C Siliguri-Dalkhola TL), 220kV D/C Birpara-Chukha TL, 220kV D/C Birpara-Alipurduar TL (erst 220kV D/C Birpara-Salakati TL) and 220kV S/C Birpara-Malbase TL were commissioned in the year 1986 under Chukha Transmission System. All the above-mentioned lines are located in the Himalayan Foothills and encounter severe lightning incidents during the monsoon period starting from April-Oct. As stated by NASA, The Himalayan Foreland is declared as Principal Lightening Hotspot zone. TFR measurement were carried out on the towers as well as section of line identified during Post Fault Tripping Analysis. Tower Footing Impedance measurement shows high values in most of the tower locations in the said lines. Considering the increase in lightning phenomenon over North-Bengal area, it seems that existing Tower Earthing system seems not sufficient and as such as a system improvement measure it has been felt necessary to adopt installation of Transmission Line Arresters as per latest practices adopt world-wide in certain stretches of lines where instances of auto-	In the 201st OCC meeting the following were deliberated: 1. On query, representative of Powergrid submitted that inspection of 1st lot would start from 20th March'2023. And expected delivery at site is 27th March'2023. 2. OCC advised Powergrid to submit the weekly status of material supply to ERPC/ERLDC. 3. Representative of DGPC submitted that the tentative timeline, as submitted by Powergrid, is acceptable from their side. However, any change in the timeline, may be intimated to Bhutan. 4. OCC advised Powergrid to complete the work on priority basis in those line which are currently under shutdown and also to do work in multiple lines parallelly, whenever possible. 5. OCC in-principle approved the shutdown. However, ERLDC would allow the shutdown on real time basis, depending upon the grid condition. 6. OCC advised Powergrid to complete their work by	

	reclosures and tripping are high. Matter has been discussed in detail during 198th OCC, 199th OCC meeting and subsequently in recently concluded 48th CCM at ERPC.	April'2023. In no circumstances, shutdown will be allowed in the month of May'2023.	
17.	**<u>Removal of Internet Connectivity from AMR server at ERLDC as per compliance against cyber security guidelines.</u>** Presently total 163 No's SS are connected in AMR system, and total 142 No's stations are now communicating over LAN, and remaining 21 No stations are communicating over GPRS which require internet connectivity at AMR server at ERLDC. As per CEA directive, segregation to be done between IT/OT network for cyber security compliance and to maintain that Public IP based internet connectivity (Very much vulnerable) to be removed immediately from AMR server.	In the 201st OCC meeting, OCC decided the following: 1. Data would be sent in parallel through GPRS as well as through mail from 15.04.2023-30.04.2023. 2. Hands-on training for sending the data through mail would be provided to the concerned utilities latest by 15.04.2023. 3. The internet connectivity from AMR Server would be disconnected w.e.f 01.05.2023. 4. All the concerned utilities are advised to send the weekly meter data strictly by Tuesday of every week.	

PART C: ITEMS FOR UPDATE

ITEM NO. C.1: ER Grid performance during March 2023.

The average and maximum consumption of Eastern Region and Max/Min Demand (MW), Energy Export for the month March-2023 were as follows:

Average Consumption (MU)	Maximum Consumption (MU)/ Date	Maximum Demand (MW) Date/Time	Minimum Demand (MW) Date/Time	Schedule Export (MU)	Actual Export (MU)
466.6 MU	514.5 MU 29-03-2023	23779 MW, 14-03-2023 at 18:34 Hrs.	14996.6 MW, 20-03-2023 at 05:04 Hrs.	4701	4818

ERLDC/ERPC may highlight the performance of the ER grid.

ITEM NO. C.2: Primary Frequency Response of generating units in ER.

The availability of sufficient primary frequency response is one of the fundamental requirements of power system operation not only from reliability point of view but also from regulatory compliance point of view. Based on the assessed FRC re-testing of primary frequency response can be recommended. Therefore, the accurate and high-resolution data from generator end is extremely important in absence of which assessment of FRC is done as per low resolution ERLDC SCADA data. The plant wise data submission statistic for frequency event flagged by ERLDC during July and August is given below:

Event	Frequency Change	ER FRC
Event 1: At 09:16 hrs of 16.03.2023, both running units of MB Power tripped due to loss of evacuation path and resulted in generation loss of around 1105 MW.	Initial Frequency:50.033 Hz Nadir Frequency: 49.932 Hz Final Frequency : 50.000 Hz. Frequency change= 0.03 Hz	**54.3 %**
Event 2: On 28th March 2023,at 10:37 hrs KSTPS 400kV Bus-4 was under Emergency shutdown. At 10:37 hrs, 400kV Bus-1,2 & 3 also got tripped due to fault in 400kV Bus-3 and resulted in black out of KSTPS Station.During the event generation loss of around 2416 MW observed .	Initial Frequency:49.995 Hz Nadir Frequency:49.795 Hz Final Frequency : 49.926 Hz. Frequency change= 0.07 Hz	**19.1 %**

STATIONS	20.12.2022	12.01.2023	14.01.2023				17.01.2023	09.02.2023		16.03.2023	28.03.2023
	06:48	05:52	12:06	13:03	14:55	15:18	09:56	11:45	12:29	09:16	10:37
ADHUNIK	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
BARH	Receive	Receive	Pendi	Pendi	Pendi	Pendi	Receive	Pendin	Pendi	Pending	Pending

	d	d	ng	ng	ng	ng	d	g	ng		
BRBCL	Received	Received	Received	Received	Received	Received	Received	Pending	Pending	Received	Pending
DARLIPALLI	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending
DIKCHU	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
FARAKKA	Received	Pending	Received	Received	Received	Received	Pending	Pending	Pending	Pending	Pending
GMR	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
JITPL	Pending	Pending	Pending	Pending	Pending	Pending	Received	Received	Received	Received	Received
KAHALGAON	Received	Received	Received	Received	Received	Received	Received	Received	Received	Pending	Pending
MPL	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received	Received
NPGC	Received	Received	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending	Pending
TALCHER	Received	Received	Received	Received	Received	Received	Pending	Received	Received	Pending	Pending
TEESTA III	Received	Received	Received	Received	Received	Received	Received	Received	Received	Pending	Pending
TEESTA V	Pending	Received	Received	Received	Received	Received	Received	Received	Received	Pending	Received

In view of the same all utilities are once again requested to kindly look into the matter and take necessary action to ensure consistent data submission for every frequency event flagged by ERLDC.

ITEM NO. C.3: Review of implementation of PSDF approved projects of ER.

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

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

Concerned utilities may update the present status of the project as given in the **Annexure-C.3**.

Respective utilities may update.

ITEM NO. C.4: Status of implementation of AGC as a pilot project in States.

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

WBPDCL informed that they have already collected offer from Siemens for implementation of

AGC and they are awaiting the concurrence from SLDC.

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

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

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

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

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

In the 185th OCC meeting, DVC representative informed that the NIT for implementation of AGC will be floated by 9th December 2021.

OPGC representative was not present during the discussion.

In the 186th OCC meeting, DVC representative informed that the NIT would be floated by 31st December 2021.

In the 187th OCC meeting, OPGC and DVC representative were not present during the discussion.

In the 188th OCC meeting, DVC representative informed that NIT was floated on 29th December 2021 and the bid opening would be done on 19th February 2022.

SLDC Odisha representative submitted that the order has been place to M/s Siemens for AGC implementation and the feasibility test would be conducted on 3rd May 2022.

Members may update.

ITEM NO. C.5: Status of UFRs healthiness installed in Eastern Region.

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

Members may update.

ITEM NO. C.6: Status of Islanding Schemes healthiness installed in Eastern Region.

As per the decision taken in the meeting held on 8th July 2021 and chaired by member (GO&D),

CEA, data in prescribed formats may be submitted by concerned utilities to RPCs on monthly basis to certify the healthiness of the Islanding Schemes.

a. Format - I for RLDC/SLDCs

S.NO	Name of Islanding Scheme	Healthiness of Communication channel

b. Format - II for Generating Station

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

c. Format - III for Transmission Utility/DISCOMs

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

* Where dedicated UFR relay have been installed for tripping of the feeders under Islanding scheme

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

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

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

S.NO	Description	UFRs-for load relief (A)	df/dt -for load relief (B)	Relay for Island creation(C)
1	Relay location (S/s name)			
2	Relay make & model			

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

e. Format - V for Contact details of all Nodal Officer

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

Members may update.

ITEM NO. C.7: Latest Status of States ATC/TTC declared by States for the month of May-2023.

To harmonize the ATC/TTC calculation methodology and timeline One to one meeting and hands on training with each SLDC was conducted in the month of Sep-21 and Oct-21. As per the common agreed procedure and timeline ATC/TTC calculation in three-month advance and reconciliation of the TTC/ATC figure for the upcoming month between RLDC and SLDC has started from month Dec-21. Reconciled ATC/TTC figures for **May-2023** are as follows:

As per the agreed philosophy the status of month wise ATC/TTC submission is as follows:

Sl No	State/Utility	TTC (MW)		RM(MW)		ATC Import (MW)		Remark
		Import	Export	Import	Export	Import	Export	
1	BSPTCL	6990	--	0	--	6850	--	May-23
2	JUSNL	1651	--	40	--	1611	--	May-23
3	DVC	**1940**	**3371**	72	56	**1868**	**3315**	June-23
4	OPTCL	3911	1311	145	70	3766	1241	May -23

5	WBSETCL	6621	--	450	--	6171	--	May-23
6	Sikkim	170	--	1	--	169	--	May-23

As per the agreed philosophy the status of month wise ATC/TTC submission is as follows:

State / Month	Bihar	Jharkhand	DVC	Odisha	West Bengal	Sikkim
April-23	Submitted	Submitted	Submitted	Submitted	Submitted	Pending
May-23	Submitted	Submitted	Pending	Submitted	Submitted	Submitted
June-23	Pending	Pending	Submitted	Submitted	Submitted	Pending
July-23	Pending	Pending	Pending	Submitted	Pending	Pending
Aug-23	Pending	Pending	Pending	Pending	Pending	Pending

Declaration of TTC/ATC on SLDC Website

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

All the states having net export schedule should declare their export TTC. In view of the same West Bengal is once again requested to share export TTC. Sikkim are requested to share the ATC/TTC on regular basis. All states are again requested to follow the time line and make necessary changes for being able to calculate TTC on 11 month ahead basis once T-GNA regulation comes into effect.

ITEM NO. C.8: Mock Black start exercises in Eastern Region

As per IEGC Clause 5.8(b), Mock trial runs of the procedure for different subsystems shall be carried out by the Users/CTU/STU at least once every six months under intimation to the RLDC. Accordingly, the Black Start Schedule of different hydro stations for 2022-23 are given below:

Sl No	Name of Hydro Station	Schedule of Mock Black Start	Actual Date of Test	Schedule of Mock Black Start	Actual Date of Test
		Test-1		Test-2	
1	U. Kolab	June-2022	21st July-2022	Jan-2023	
2	Balimela	July-2022	09th Sep-2022	Feb-2023	
3	Rengali	June-2022	27- June-2022	Dec-2022	

4	Burla	July-2022	23-June-2022	Jan-2023	
5	U. Indravati	May-2022	25-May-2022	Feb-2023	
6	Maithon	DVC representative submitted that upgradation work is under progress due to issues in the governing system. Detailed timeline would be submitted to ERPC and ERLDC. Detail timeline yet to be received from DVC SLDC		Dec-2022	
7	TLDP-III	Oct-2022		Jan-2023	
8	TLDP-IV	Oct-2022		Feb-2023	
9	Subarnarekha	Sep-2022		Dec-2022	
10	Teesta-V	Oct-2022		Jan-2023	
11	Chuzachen	Oct-2022		Feb-2023	
12	Teesta-III	April-2022	08-April-2022	Dec-2022	
13	Jorethang	Oct-2022		Jan-2023	
14	Tasheding	Oct-2022		Feb-2023	
15	Dikchu	Oct-2022		Dec-2022	
16	Rongnichu	Oct-2022		Jan-2023	

- Note:

*DVC representative submitted that upgradation work is under progress due to issues in the governing system. Detailed timeline would be submitted to ERPC and ERLDC. Detail timeline yet to be received from DVC SLDC.

**Jorethang intimated that Black Start provision is not incorporated in Jorethang HEP System

It is proposed that in case Mock black start is not feasible at Maithon HEP and Jorethang HEP, they may be deleted from this list for tracking.

Further all the generators are requested to express their readiness and provide the tentative date of mock black start exercise for the year 2022-23.

In the 197th OCC meeting OCC advised all the utilities to update the status of Mock Black Start exercise, if any, to ERPC and ERLDC. Jharkhand SLDC has intimated that mock black start exercise of Subarnarekha HEP is scheduled on 13.12.2022. However, no detail has been received from others yet.

Members may update.

ITEM NO. C.9: Requirement of cold spares for ICTs in Eastern Region to meet any exigency.

As per CEA guidelines for availability of spares and inventories for power transmission system

(transmission lines & substation/switchyard) assets, adequate cold spare for ICTs has to be maintained at regional as well as state level. Key guidelines for determining spare as per the guidelines are provided below:

- At present PGCIL along with multiple ISTS licensee is operating and maintaining most of the Inter-State Transmission System (ISTS) assets The transmission lines of above power utilities are spread across more than one states in the country.

- Regional level spare: For regional power utilities (PGCIL & Transmission licensees), the spare at regional level would be required for these assets. These spares should be increased, optimized and limited to double the quantities mentioned for State Level based on transmission line assets in that region in order to avoid unnecessary storage of inventories.

- State level spare: The spares at 'State level' can be maintained at a centralized location which could be conveniently accessed to meet the emergency requirement of various substations/switchyards spread across the State.

- Requirement of state level: ICT and Shunt Reactor: One number single phase/three-phase unit of each rating, as applicable

- Utility for State level spare: If there are five or more substations/switchyards (of same voltage class) of a utility in a State, the 'State Level' spares shall be maintained by the utility.

- Spare at state level by utility having spread in different states: If any utility has five or more substations/switchyards (of same voltage class) spread across different States, spare recommended for 'State Level' shall be maintained for these cluster of substations/switchyards at one or more appropriate locations in any of these States.

- Higher spare for areas having higher probability of damage with natural disaster events: The quantities of spares specified shall be applicable to transmission lines and substations / switchyards in all areas including cyclone / whirlwind / tornado prone areas. However, higher quantity of spares (for some spare items) shall be kept for cyclone / whirlwind / tornado prone areas as indicated in guideline.

- Support between utilities for sharing of spare and associated commercial mechanism: There may be cases, where the extent of damage is so much that specified minimum quantum of spares/inventories may be inadequate in meeting the eventuality. In such cases, support from central power utilities (PGCIL/NTPC/DVC etc.)/transmission licensees/neighboring State utilities may be requested. The financial modalities for providing spares to other utility shall be mutually decided between the utilities.

- Replenishment of Consumed spare: Replenishment of the consumed mandatory spares shall be made at the earliest but in any case, not later than six months from the date of its consumption depending on the criticality of equipment component/material.

With a significant rise in state demands and regional demand along with the number of ICTs, it would be desirable to have an adequate spare to improve reliability and resilience in case of any exigency. Recently, a substantial delay in restoration of damaged ICTs in eastern region has been observed.

Thus, maintaining adequate regional and state level cold spare is important. Table 1-4 provides various details for deciding the requirement of regional and state level cold spare in Eastern region

Table 1: State wise ICTs at various voltages in ER

State Wise ICT	315 MVA 400/220 kV	500 MVA 400/220 kV	315 MVA 400/132 kV	200 MVA 400/132 kV	270 MVA 400/132 kV	250 MVA 400/220 kV	1500 MVA 765/400 kV	255 MVA 765/132 kV	Cold Spare Availability
Bihar	6	27	3	15			5		
Jharkhand	15	6				1	2		
Sikkim	5				1				
Odisha	30	5					8	2	
West Bengal	38	5					4		

Table 2: Utility wise ICTs detail at various voltage level in ER

Utility	315 MVA 400/220 kV	500 MVA 400/220 kV	315 MVA 400/132 kV	200 MVA 400/132 kV	270 MVA 400/132 kV	250 MVA 400/220 kV	1500 MVA 765/400 kV	255 MVA 765/132 kV	Cold Spare Availability
PGCIL	47	27	3				15		
Other ISTS (NKTL, PMJTL, PMTL, DMTCL)		8		2			4		
IPP (Dikchu)					1				
NTPC/NPGC/BRBCL	4			9				2	
WBSETCL/WBPDCL/CESC	22			4					
OPTCL/SEL	11	2							
DVC	10								
BGCL		4							
JUSNL/TTPS		2				1			

Table 3: Utility wise number of substations with ICTs in ER

Utility Substation with ICTs	Number of Substation
PGCIL ERTS 1	15
PGCIL ERST 2	8
PGCIL Odisha	10
WBSETCL	5
WBPDCL	2
OPTCL	5
BGCL	2
DVC	5
JUSNL	1
ISTS (NKTL/DMTCL/PMTL/PMJTL)	7
NTPC	7

Table 4: Spread of substations of various utilities in different states

State	PGCIL ERTS 1	PGCIL ERTS 2	PGCIL Odisha	DVC	WBSETCL	OPTCL	Other ISTS	BGCL	JUSNL	NTPC	Others
Bihar	9						4	2		4	
Jharkhand	6			3			1		1		
Sikkim		1									
Odisha			10			5				2	1
West Bengal		6		2 + 1 (MTPS)	5		2			1	2

In the 192nd OCC meeting, ERLDC representative submitted that as per the CEA guidelines, maintenance of adequate spares at State level as well as at regional level had to be ensured.

ERPC representative submitted that as per the CEA guidelines, the inventory of spares should be digitized and reports of the same should be submitted to CEA on half-yearly basis.

OCC advised all the states to digitize the inventory of spares and submit the report to CEA with a copy to ERPC on half yearly basis.

Further, ERLDC was advised to make a standard format mentioning the date of procurement of ICTs, date of COD of ICTs, declared age of ICTs, remaining life etc and circulate among the concerned utilities.

OCC advised all the concerned utilities to follow the guidelines and submit the report on availability of spares ERPC and ERLDC at the earliest.

Further, Powergrid representative raised a concern regarding diverting the spares from ISTS pool to the states which may pose reliability issues and thereby requested the states to maintain a pool for cold spare ICTs.

MS, ERPC was of the view that the pool of cold spare ICTs may be maintained by a central agency like Powergrid. In case of any requirement of spare ICT on emergency basis by any utility, the same may be provided and the commercial modalities may be decided mutually. Further, to avoid any reliability issues arising out of insufficient spares for the existing ISTS systems, the required optimum number of cold spare ICTs to be maintained by Powergrid may be enhanced which may be put up for approval subsequently.

In the 193rd OCC meeting, Powergrid Odisha representative submitted that 500 MVA and 160 MVA ICT are under procurement which would be placed at Pandiabili and Baripada S/s respectively and cater to the requirement of Odisha. A 315 MVA ICT was recently used in Jeypore S/s. After detailed cost benefit analysis, decision regarding procurement of 315 MVA ICT would be approved.

Powergrid ER-II representative submitted that a 500 MVA ICT is under procurement which would be located at Maithon or Subhashgram. 315 MVA spare ICT (released after augmentation) is available at Durgapur and Malda S/s. one 160 MVA spare ICT is available at Siliguri and one 50MVA ICT was available at Gangtok which was used recently.

Powergrid ER-I representative submitted that regional spare is available at Jamshedpur and Biharshariff S/s. The spare available at Jamshedpur was utilized at Chaibasa. One 315 MVA spare is available at Mujaffarpur S/s. one 160 MVA spare ICT of 220/132 KV is available at Purnea. Further, approval has been taken regarding procurement of one 500 MVA and one 160 MVA spare ICT at Pusauli and Daltonganj respectively.

OPTCL representative submitted that a 315 MVA spare ICT was available at Duburi S/s which was utilized in Meramundali S/s. Procurement of one 500 MVA spare ICT is under progress which would be located at new Duburi S/s. One 500 MVA ICT is available at Meramundali B. Regarding 315 MVA spare ICT, discussions are going on for procuring the same. SLDC DVC representative submitted that one 315 MVA ICT would be replaced by 500 MVA ICT which would be kept as spare and will be located at Ramkanali S/s.

OCC was of the view that a detailed representation highlighting the ICTs under procurement and ICTs available at present would be prepared by ERLDC, based on which decision regarding maintaining pool of spares and procurement of spares would be anticipated.

Present Situation of spare ICTS as per update in 193rd OCC Meeting

Utility	500 MVA 400/220 kV	315 MVA 400/220 kV	160 MVA 220/132 kV
PGCIL ERTS 1	1: Under procurement; will be put at Sasaram	1: Muzaffarpur (released with ICT upgradation) 1: Bihar Sharif 1 : Under Procurement	1: Purnea 1: Daltonganj
PGCIL ERTS 2	1 : Under procurement will be put at either Malda or Shubhasgram	1 : Malda (released with ICT upgradation) 1: Durgapur (released with ICT upgradation)	1 : Silliguri
PGCIL Odisha	1: Under procurement and will be put at Pandiabili	1: Will be procured	1 : Baripada
OPTCL	1: Under procurement	Under discussion with management	Not available
DVC	Not available	1 will be spare in future as per new approved plan	Not available
WBSETCL	No detail	No detail	Not available

- **For 43 numbers of 400/220 kV 500 MVA ICTs:** 3 regional and 1 state spare are under procurement
- **For 94 numbers of 400/220 kV 315 MVA ICTs:** 3 old and 1 new is available and 2 are under procurement
- **For 220/132 kV 160 MVA ICTs:** 4 regional spares are available.

Members are requested to update the status regularly.

ITEM NO. C.10: Availability of ERS in the Eastern Region and update on the status by various utilities including inter-state and intra-state transmission licensees

In line with CEA guidelines for the availability of spares and inventories for power transmission system (transmission lines & substation/switchyard) assets 2020 and the CEA disaster management plan for power sector 2021, adequate ERS is required to be maintained in ER grid for early restoration of transmission line due to any tower collapse. The Eastern region is prone to cyclones, Norwester/Kalbaisakhi localized storms, hilly terrain with landslides, floods, changes in river course, substation flooding, etc. due to which each year tower collapse occurs causing forced outages of transmission lines. This necessitates adequate ERS maintenance by various utilities in the eastern region for early restoration.

Present status available at ERLDC on ERS as collected during cyclone Yaas in 2021 is provided in the attached table. All transmission utilities are requested to kindly update the ERS availability and any ERS which are already engaged.

Status Update by: PGCIL ERTS 1, PGCIL ERST 2, PGCIL Odisha, WBSETCL and OPTCL (if any ERS is already engaged then same may be put as remarks)

Utility to provide details of available ERS in the attached format:

- State-level: BSPTCL, BGCL, DVC, JUSNL, Sikkim power department (SPD)
- ISTS: Indigrid (OGPTL, PKTCL, ENICL), PGCIL Subsidiaries (CBPTCL, PMTL, PMJTL), Powerlink Transmission limited (PTL), DMTCL, Adani transmission (ATL, NKTL), TPTL

In the 192nd OCC meeting, TPTL representative submitted that they would provide the details by the end of June 2022.

DVC representative submitted that procurement of 7 nos. (Combination of suspension and tension) of ERS is under progress. Further, pile and structures (2 nos.) at Putki and Maithon are available as immediate remedial measures up to 220 KV level.

West Bengal representative submitted that 10 nos. of ERS towers which can be used at all levels are available out of which 6 nos. have been used. Of the remaining, 3 nos. are tension towers and 1 is suspension tower.

JUSNL representative submitted that 8 nos. of ERS are available which could be used for up to 220 KV levels.

Bihar representative submitted that 36 nos. of ERS (for 220 KV and 132 KV level) are available and all are engaged at present.

The details have been received from OPTCL, PGCIL ERTS-1, ATL, PGCIL Odisha, PGCIL ERTS-2, PTL, ENICL, OGPTL, PKTCL. The details are awaited from WBSETCL, TPTL, BSPTCL, JUSNL and Sikkim Power Department. The utilities are requested to share the details at the earliest.

Present status available at ERLDC on ERS as collected during July 2022 is provided in the attached table.

Sl	**Utility**	**voltage levels**	**Number of ERS towers available**	**Location of ERS situated**	**Type of ERS (Suspension/ Tension/ any other)**
1	OPTCL	400 kV	14	Mancheswar Grid - 4 nos. (Hitech)	Can be used for both suspension and Tension
				Mancheswar store - 8 nos. (Hitech)	
				Mancheswar store - 2 nos. (Lindsey)	

Sl	Utility	voltage levels	Number of ERS towers available	Location of ERS situated	Type of ERS (Suspension/ Tension/ any other)
			18 (Newly procured)	Mancheswar store - 18 nos. (Hitech)	
		220 kV	42	Budhipadar - 14 nos. (Lindsey)	
				Mancheswar grid – 14 Nos. (Lindsey)	
				Chatrapur - 14 nos. (Lindsey)	
2	PGCIL ERTS 1	765 kV -24 sets	24 Sets	GAYA	15 Suspension & 9 Tension tower
		400 KV -30 sets	30 Sets	Jamshedpur, Purnea, Lakhisarai	Total 20 nos. Suspension & 10 nos. Tension ERS towers
3	Adani transmission limited (ATL)	400 KV	1 set (12 Column). Nos of ERS towers shall depend on line configuration, type of tower and extension of towers. Approximate 6 suspension towers/ set for 400kV D/C twin conductor.	Central India (Koradi, Maharashtra)- **48 Hours**	Modular aluminum guyed towers- Suspension tower
4	PGCIL (Odisha)	400 KV ERS - 3	3	Rourkela	Suspension - 2 & Tension-1
		765 KV ERS - 24	24	Rengali	Suspension - 15 & Tension-9

Sl	Utility	voltage levels	Number of ERS towers available	Location of ERS situated	Type of ERS (Suspension/ Tension/ any other)
5	PGCIL ERTS 2	400 KV	1 Set (consisting of 10 towers) - 400 KV Voltage level	Durgapur	7 Set-Suspension 03 Set-Tension
6	WBSETCL	400, 220, 132 kV	05+05set (can be used with 400/220/132 kV level) 6 used for Durgapur - asansol line diversion. 4 available	at Arambagh & Gokarno	Can be used for both suspension and Tension
7	TPTL		MoU with PGCIL Tie up with Supreme Industry in progress	-	-
8	CBPTCL		No ERS	PTC does not own any ERS, however, in case of any such requirement for deployment of ERS, CPTC has an existing agreement with POWERGRID for deployment of ERS.	-
9	PMTL	-	No ERS	-	-
10	PMJTL	765 kV	NO ERS	-	-
11	PTL	400 kV	07 towers set ERS structures suitable for Twin Moose Configuration 400 or 220 kV.	Siliguri (W.B.)	Lindsey Manufacturing Company Ltd USA Model 600

Sl	Utility	voltage levels	Number of ERS towers available	Location of ERS situated	Type of ERS (Suspension/ Tension/ any other)
			07 towers set ERS structures suitable for Twin Moose Configuration 400 or 220 kV.	Muzaffarpur (Bihar)ER1	
12	Indigrid (ENICL, OGPTL & PKTCL)	400 KV & 765 KV Line	765 KV- 6 Sets / 400 KV- 8 Sets	Siliguri, WB.	For 765 KV- 4 Suspension & 2 Tension. For 400 KV- 6 Suspension & 2 Tension.
13	DMTCL	400 kV Lines	Arrangement of ERS with M/s Supreme Engineering at Kolkata.	Can be Dispatched in 2–3-weeks periods	-
14	BSPTCL	220 kV & 132 kV	38 ERS which can be used for 220 and 132 kV	18 Towers in use for 132 kV Kishanganj-Barsoi ckt 4 towers for 220 kv BTPS-Hazipur ckt 4 towers for 220 kV Bodhgaya- Chandauti Purnea : 1 Dehri on sone: 2 Sultanganj: 2 Fatuah: 2 Muzaffarpur : 4	Can be used for both suspension and Tension
15	BGCL	-	No ERS	No ERS	-

Sl	Utility	voltage levels	Number of ERS towers available	Location of ERS situated	Type of ERS (Suspension/ Tension/ any other)
16	JUSNL	220 kV	Total 8 ERS	Hatia: 3 Jamshedpur: 2 Dumka: 3	Details awaited
17	DVC	400 kV and 220 kV	400 kV: 7 (under procurement) 220 kV: 2 set Pilon structure	400 kV: **Under procurement** 220 kV: 1 at putki and 1 at Maithon	-
18	Sikkim Power Department		Details awaited	Details awaited	Details awaited

In the 193rd OCC meeting, TPTL representative submitted that they do not have any ERS towers of their own. In this regard, a MoU with PGCIL is there.

WBSETCL representative submitted that 10 nos. of ERS towers are available which could be used at all the voltage levels. Out of 10 nos., 6 nos. are used for Durgapur-Asansol line and 4 nos. are available. Procurement of additional 6 nos. of ERS towers (which could be used both under suspension and tension) is under planning stage.

Bihar representative submitted the status of ERS towers which is mentioned below.

Location	Status	Usage	Type	Quantity
Kishanganj-Barsoi Line	engaged	220/132 KV	Suspension/Tension	18
BTPS-Hajipur Line	engaged	220/132 KV	Suspension/Tension	4
Bodh Gaya-Chandauti	to be engaged	220/132 KV	Suspension/Tension	4
Purnea	**Spare**	220/132 KV	Suspension/Tension	**1**
Dehri	**Spare**	220/132 KV	Suspension/Tension	**2**
Fatuha	**Spare**	220/132 KV	Suspension/Tension	**3**
Mujaffarpur	**Spare**	220/132 KV	Suspension/Tension	**4**
Sultanganj	**Spare**	220/132 KV	Suspension/Tension	**2**
Total				**38**

OCC was of the view that many lines of BGCL and other new sub-stations like Mokama, Hajipur, etc. in Bihar fall under the coverage of river corridor and advised Bihar to keep provisions of ERS towers for those lines.

Members may update.

ITEM NO. C.11: List of lines of Eastern Region violating N-1 security criteria.

The list of such lines for which necessary planning needs to be done to make the system N-1 secure are given below:

Sl. No	Name of Element	Short Term Measures	Long term Measures	The target date for long term measures
Transmission Constraint in Odisha Network				
1	i. 220 kV Budhipadar-Lapanga D/C, ii. 220 kV Budhipadar Vedanta D/C iii. 220 kV Rourkela-Tarkera D/C	SPS available only for 220 kV Rourkela-Tarkera D/C. However, even with SPS N-1 criteria is not satisfied for all the conditions. **Action Required**:- Load trimming scheme needs to be planned	1. Reconductoring of 220 kV Rourkela-Tarkera D/C with HTLS. 2. 220 kV Rourkela-Tarkera second D/C 3. Shifting of Vedanta from 220 kV to 400 kV	**OPTCL to provide a target date for Long term measures**
2	i. 220 kV Lapanga-Katapalli D/C , ii. 220 kV Katapali-New Bargarh-Sadepalli (New Bolangir) S/C iii. 220 kV Katapali-Bolangir (PG)- S/C	No SPS Available. **Action Required:-** SPS/Load trimming scheme needs to be planned	Odisha to share long-term remedial action to make the system N-1 secure.	**OPTCL to provide a target date for Long term measures**
Transmission Constraint in West Bengal Network				
3	i. 220 kV Waria-Bidhan Nagar D/C ii. 220 kV Waria-Mejia D/C	Opening of 220 kV Waria-Bidhan Nagar D/C as and when required	400/220kV, 315MVA (3^{rd}) ICT at Bidhannagar	Target Date 2022-23. **WBSETCL may update the present Status**
Transmission Constraint in DVC Network				

Sl. No	Name of Element	Short Term Measures	Long term Measures	The target date for long term measures
4	**i. 220 kV DSTPS-Waria D/C***	No SPS is Available. **Action Required:-** SOP/SPS/Load trimming scheme needs to be planned for the time being	i. 220 kV Connectivity at 400 kV Mejia-B ii. LILO of 220 kV Mejia-A and Barjora at Mejia-B	**DVC may update the target date**
5	ii. 220 kV Maithon-Dhanbad D/C, iii. 220 kV Maithon-Kalyaneshwari D/C	No SPS is Available. **Action Required:-** SOP/SPS/Load trimming scheme needs to be planned for the time being	iii. 220 kV Connectivity at 400 kV Mejia-B iv. 220 kV Connectivity at 400 kV RTPS	**DVC may update the target date**
*** The N-1 violation of 220 kV DSTPS- Waria D/C or DSTPS ICT 1&2 may result in large-scale disturbance, impacting an area between Durgapur and Maithon. To avoid any such mishap DVC needs to plan and implement an SPS on an urgent basis. Further, the long term measure also needs to be implemented in time bound manner.**				
Transmission Constraint in Jharkhand Network				
6	220 kV Maithon Dumka D/C	No SPS Available. **Action Required:-** SPS/Load trimming scheme needs to be planned	i. LILO of 1st circuit of 220kV Dumka – Govindpur D/c line at Dhanbad	Target Date 2023. **Jharkhand may update the target date**
Transmission Constraint in West Bengal Network				
6	i. 220 kV Rajarhat-Newtown AA3 D/C, ii. 220 kV Subhasgram-EMSS D/C	SPS is Available for both the Ckts	1. 220 kV Rajarhat-Newtown AA3 D/C line with HTLS. 2. No Strenthing planned for 220 kV Subhasgram-EMSS D/C	1. Target Date November 2022 for recondutoring **WBSETCL may update the present Status**
7	i. 220 kV Subhasgram (PG) – Subhasgram (WB) D/C ii. 220 kV Subhasgram (WB)-Lakshmikantp	SPS Available for 220 kV Subhasgram (PG) – Subhasgram (WB) D/C	i. 220 kV Subshagram – Baruipur D/C ii. 400/132 kV Substation at Lakshimikantpur.	i. Line antitheft charged from Subhasgram end ii. Lakshimikantpur tareget date is December 2024 **WBSETCL may update the present Status**

Sl. No	Name of Element	Short Term Measures	Long term Measures	The target date for long term measures
	ur D/C			
			Transmission Constraint in Bihar Network	
8.	220 kV Darbhanga-Darbhanga(BH) D/C	No SPS Available. **Action Required:-** SPS/Load trimming scheme needs to be planned	Bihar to share long-term remedial action to make the system N-1 secure.	**Bihar to provide a target date for Long term measures**
9.	220 kV Muzzafarpur-Hazipur D/C	No SPS Available. **Action Required:-** SPS/Load trimming scheme needs to be planned	1. 220 kV Muzzafarpur-Amnour D/C	**Bihar to provide a target date for Long term measures**
10.	220 kV Gaya Bodhgaya D/C	No SPS Available. **Action Required:-** SPS/Load trimming scheme needs to be planned	1. 220 kV Gaya Bodhgaya Second D/C	**Bihar to provide a target date for Long term measures**

In the 193rd OCC meeting, ERLDC representative submitted that outage of DSTPC ICTs or DSTPS Waria D/C line may create a large scale disturbance.

DVC representative submitted that the contracts for connectivity between MTPS 220 KV to 400 KV and RTPS connectivity have already been awarded and the work is expected to be completed by December 2023. The 400 KV bus connectivity would extend some relief in case of evacuation problem from 220 KV bus due to MTPS generation.

Under long-term measures, programs for augmentation of DSTPS ICT and DSTPS-DTPS HTLS is under progress. Necessary approval from ERPC and CTU has already been taken in this regard.

Moreover, Parulia (PG)-Parulia (DVC) line has already been given to Powergrid for HTLS connectivity. After the HTLS connectivity, possibilities of switching-off of DSTPS ICT may be explored. Further, possibilities of bus-splitting at MTPS may also be worked out.

ERLDC representative requested DVC to maintain some minimum generation in Mejia. DVC representative submitted that Mejia unit-6 would be synchronized by 21st July 2022.

ERLDC representative was of the view that as per the study undergone by them, closing of

Bidhannagar-Waria circuit would not cater to the generation loss issues and advised DVC to explore the possibilities of bus splitting and connectivity to 400 KV of MTPS and RTPS.

Members may update.

ITEM NO. C.12: ICT Constraints violating N-1 security criteria.

The list of ICTs which are not N-1 complaint are given below:

Sl. No	Name of ICT	Short Term Measures	Long term Measures	The target date for long term measures
ICT Constraint in West Bengal Network				
1	i. 400/220 kV 2 X 315 MVA ICTs at Gokarna & ii. 400/220 kV Sagardighi 1 X 315 MVA ICTs	SPS Available for Gokerno ICTs **Action Required**:- Load trimming scheme needs to be planned for Sagardighi	i. 3rd ICT at Gokerno	Target Date Dec-22 **WBSETCL may update the present Status**
2	i. 400/220 kV ICT-1 & 2 at Bidhannagar	No SPS Available **Action Required**:- SPS needs to be planned	i. 400/220kV 315MVA (3rd) ICT at Bidhannagar	Target Date 2022-23 **WBSETCL may update the present Status**
ICT Constraint in ISTS Network				
3	i. 400/220 kV Ranchi 2 X 315 MVA ICTs	SPS Available	i. 3rd 500 MVA ICT at Ranchi	**POWERGRID may update the target date**
ICT Constraint in DVC Network				
4	i. 400/220 kV Bokaro A 2 X 315 MVA ICTs	No SPS Available **Action Required**:- SPS needs to be planned	i. Upgradation with 500 MVA ICTs	**DVC may update target date**
5	**i.400/220 kV ICT-1 & 2 at DSTPS ***	No SPS Available **Action Required**:- SPS needs to be planned	i. Upgradation with 500 MVA ICTs	**DVC may update target date**
ICT Constraint in Odisha Network				

Sl. No	Name of ICT	Short Term Measures	Long term Measures	The target date for long term measures
6	i. 400/220 kV New Duburi 2 X 315 MVA ICTs	No SPS Available **Action Required**: - SPS needs to be planned	i) 3rd ICT at New Duburi	**Odisha may update the target date**

In the 193rd OCC meeting, ERLDC representative submitted that outage of DSTPC ICTs or DSTPS Waria D/C line may create a large-scale disturbance.

DVC representative submitted that under long-term measures, programs for augmentation of DSTPS ICT is under progress. Necessary approval from ERPC and CTU has already been taken in this regard.

Moreover, Parulia (PG)-Parulia (DVC) line has already been given to Powergrid for HTLS connectivity. After the HTLS connectivity, possibilities of switching-off of DSTPS ICT may be explored.

Members may update.

PART D: OPERATIONAL PLANNING

ITEM NO. D.1: Anticipated power supply position during May 2023.

The abstract of peak demand (MW) vis-à-vis availability and energy requirement vis-à-vis availability (MU) for the month of May 2023 were prepared by ERPC Secretariat (**Annexure D.1**) on the basis of LGBR for 2023-24 and feedback of constituents, keeping in view that the units are available for generation and expected load growth etc.

Members may update.

ITEM NO. D.2: Shutdown proposal of generating units for the month of May 2023.

Proposed Maintenance Schedule of Thermal Generating Units of ER in the month of May' 2023

System	Station	Unit No.	Capacity (MW)	Period (as per LGBR 2023-24)		No. of Days	Reason	Remarks
				From	To			
WBPDCL	Kolaghat TPS	4	210	16.05.2023	04.06.2023	20	AOH/BOH	

Members may update.

ITEM NO. D.3: Major Generating Units/Transmission Element outages/shutdown in ER Grid (as on 10.04.2023)

a) Thermal Generating Stations outage report:

SL No	STATION	STATE	AGENCY	UNIT NO	CAPACITY (MW)	REASON(S)	OUTAGE DATE
1	CHANDRAPURA TPS	DVC	DVC	7	250	Initially Generator Electrical Fault and then unit went into Capital overhauling	07-Feb-2023
2	BARAUNI TPS	BIHAR	NTPC	7	110	Excessive chemical deposits on Turbine blades (turbines need to be opened for assessment of the extent of deposits and the repairs required to address the issue of High First Stage pressure in HP Turbine)	19-Feb-2022
3	MEJIA TPS	DVC	DVC	2	210	Initially unit tripped due to Fire ball disturbance and loss of AC Supply. Later on unit is declared under RSD	07-Mar-2023

4	ADHUNIK	JHARKHAND	APNRL	2	270	Generator stator earth fault 100% (stator winding flash over)	12-Mar-2023
5	GMR	ODISHA	GMRKEL	1	350	Problem in Submerged Scrapper Conveyor-1	10-Apr-2023

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 (MW)	REASON(S)	OUTAGE DATE
1	BALIMELA HPS	ODISHA	OHPC	3	60	The unit taken out under R & M for 18 months.	08-Jul-2022
2	BALIMELA HPS	ODISHA	OHPC	4	60	The unit taken out under R & M for 18 months.	08-Jul-2022
3	RENGALI HPS	ODISHA	OHPC	2	50	Annual Maintenance	12-Nov-2022
4	INDRAVATI	ODISHA	OHPC	4	150	Capital maintenance for 6 Months	09-Dec-2022
5	U.KOLAB	ODISHA	OHPC	2	80	Stator Earth Fault	29-Mar-2023

d) Long outage report of transmission lines (As on 10.04.2023):

Transmission Element / ICT	Outage From	Reasons for Outage
400 KV IBEUL JHARSUGUDA D/C	29.04.2018	TOWER COLLAPSE AT LOC 44,45
220 KV PANDIABILI - SAMANGARA D/C	03.05.2019	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
220/132 KV 100 MVA ICT II AT LALMATIA	22.01.2019	FAILURE OF HV SIDE BREAKER
220/132 KV 100 MVA ICT 3 AT CHANDIL	30.04.2020	DUE TO FIRE HAZARD ICT DAMAGED AND BURNT
400KV/220KV 315 MVA ICT 4 AT JEERAT	09.04.2021	DUE TO FIRE HAZARD ICT DAMAGED AND BURNT. NEW TRANSFORMER PROCUREMENT UNDER PIPELINE AND SHALL BE REPLACED IN THE NEAR FUTURE.
220KV-FSTPP-LALMATIA- 1	21.04.2021	THREE TOWER COLLAPSED NEAR LALMATIA

220KV-WARIA-BIDHANNAGAR-1	08.06.2022	TO CONTROL OVERLOADING OF 220 KV WARIA-DSTPS (ANDAL) D/C LINE
220KV-WARIA-BIDHANNAGAR-2	08.06.2022	TO CONTROL OVERLOADING OF 220 KV WARIA-DSTPS (ANDAL) D/C LINE
400KV/220KV 315 MVA ICT 1 AT PATRATU	01.08.2022	ICT TRIPPED ON A FEW OCCASIONS DUE TO OPERATION OF BUCHOLZ RELAY LATER DGA VIOLATION FOUND, INTERNAL FAULT IN TRANSFORMER TO BE RECTIFIED
400KV/220KV 315 MVA ICT 2 AT PATRATU	27.09.2022	ICT TRIPPED ON A FEW OCCASIONS DUE TO OPERATION OF BUCHOLZ RELAY LATER DGA VIOLATION FOUND, INTERNAL FAULT IN TRANSFORMER TO BE RECTIFIED
220KV/132KV 160 MVA ICT 1 AT MALDA	04.01.2023	FOR 132 KV GIS COMMISSIONING WORK (GIB ERECTION OF ICT-I)
400KV-CHANDWA-LATEHAR(JUSNL)-1	27.01.2023	TRIPPED DUE TO INTERNAL FLASHOVER OF 400KV MAIN BAY OF LATEHAR-1 AT CHANDWA
400KV-ALIPURDUAR (PG)-PUNASANGCHUN-JIGMELING-1 & 2	08.02.2023	FOR RECTIFICATION OF DAMAGED TOWER
400KV-BINAGURI-TALA-4	12.02.2023	VOLTAGE REGULATION, CHARGING ATTEMPTED ON 06.04.23 AND 07.04.23 BUT FAILED. FAULT IN BHUTAN JURISDICTION
400KV/220KV 315 MVA ICT 2 AT MEJIA-B	14.03.2023	ANNUAL MAINTENANCE WORK
400KV-BINAGURI-TALA-2	20.03.2023	ANNUAL MAINTENANCE WORK
400KV-BINAGURI-BONGAIGAON-1	08.04.2023	RECONDUCTORING WORKS WITH HTLS CONDUCTOR
400KV/220KV 500 MVA ICT 2 AT NABAUTPUR(BH)	05.04.2023	DUE TO FLASHING IN ISOLATOR
400KV/220KV 315 MVA ICT 3 AT ROURKELA	09.04.2023	BUCHHOLZ RELAY OPERATED

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

Members may note.

ITEM NO. D.4: Commissioning of new units and transmission elements in Eastern Grid in the month of March-2023

The details of new units/transmission elements commissioned in the month of March - 2023 based on the inputs received from beneficiaries:

LIST OF NEW ELEMENTS COMMISSIONED DURING MARCH, 2023

GENERATING UNITS

SL. NO.	Location	OWNER/UNIT NAME	Unit No/Source	Capacity added (MW)	Total/Installed Capacity (MW)	DATE	Remarks
1	Barh	NTPC Barh Stage 1 Unit #2	2	660	660	19-03-2023	Format IV was issued on 17-02-2023. Unit #2 was first time synchronized on 19-03-2023 at 08:05 Hrs.

ICTs/ GTs / STs

SL. NO.	Agency/Owner	SUB-STATION	ICT NO	Voltage Level (kV)	CAPACITY (MVA)	DATE	Remarks
1	OPTCL	Kalingangar	3	400/220	315	14-03-2023	ICT 3 at TSL Kalingangar SS was first time charged on 14-03-2023 vide Format IV issuance date of 08-03-2023 along with associated bay number 406.

TRANSMISSION LINES

SL. NO.	Agency/Owner	LINE NAME	Length (KM)	Conductor Type	DATE	Remarks
1	BSPTCL	220 kV Sitamarhi (PMTL) - Raxaul Line 1 along with associated bays at Raxaul end	88.6	ACSR Moose	30-03-2023	Format IV was issued on 29-03-2023. Line was charged for the first time on 30-03-2023 on 14:05 Hrs. Line was previously charged as anti-theft from Sitamarhi end.
2	BSPTCL	220 kV Sitamarhi (PMTL) - Raxaul Line 2 along with associated bays at Raxaul end	88.6	ACSR Moose	30-03-2023	Format IV was issued on 29-03-2023. Line was charged for the first time on 30-03-2023 on 14:05 Hrs. Line was previously charged as anti-theft from Sitamarhi end.
3	Sikkim	132 kV Ranpo (PG) - Samardong (EPD, Sikkim) Line 1 as anti-theft measure from Rangpo end	2.84	Twin Moose ACSR & 220 kV XLPE	30-03-2023	Line was anti-theft charged (2.8 km) from Rangpo end on 30-03-2023 at 17:44 Hrs.
4	Sikkim	132 kV Ranpo (PG) - Samardong (EPD, Sikkim) Line 2 as anti-theft measure from Rangpo end	2.84	Twin Moose ACSR & 220 kV XLPE	30-03-2023	Line was anti-theft charged (2.8 km) from Rangpo end on 30-03-2023 at 17:54 Hrs.

LILO/RE-ARRANGEMENT OF TRANSMISSION LINES

SL. NO.	Agency/Owner	Line Name/LILO at	Length (KM)	Conductor Type	DATE	Remarks
NIL						

BUS/LINE REACTORS

SL. NO.	Agency/Owner	Element Name	SUB-STATION	Voltage Level (kV)	DATE	Remarks
NIL						

Odisha:

Elements charged for first time in March-2023			
Sl No.	Name of the element charged first time	Date	Time
1	132KV 2-Phase S/C line on DC tower from M/S Jabamayee Ferro Alloys sub-station to proposed RTSS at Sukinda along with 01no 132KV feeder bay extension at M/S Jabamayee Ferro Alloys sub-station.	3/3/2023	14:44HRS
2	1X25MW TG#2 of 132KV Rungta Mines Ltd, Dhenkanal Steel Plant with OPTCL system through 132KV Meramundali-RML DSP Feeder at M/S RML, DSP end.	3/3/2023	12:44HRS
3	3X20MW CGP of M/S Rungta Mines Ltd at Kamanda Steel Plant with OPTCL network through dedicated 132KV Barbil-Kamanda Line.	10/3/2023	17:21HRS
4	3.66MW Solar PV Plant at 11kV level in 132/11kV switchyard of M/S Shree Cement Limited connected through 132kV OPTCL Khuntuni-Shree cement feeder.	17/3/2023	15:00HRS
5	400/220KV 315 MVA ICT-III at BPRS, Tata Steel Limited Kalinganagar along with associated bay	14/3/2023	12:42HRS
6	132KV Bhatli feeder Bay extension at 220/132/33kV GSS, Bargarh New.	22/3/2023	19:30HRS
7	33kV GEDCOL Solar Bay extension at 220/132/33kV GSS, Bolangir New for 2.0MW Soalr PV Plant.	23/3/2023	13:17HRS
8	400/220KV 315 MVA ICT-I at Indravati PH after breakdown work.	30/3/2023	11:52HRS (220kV side)
		31/3/2023	14:00HRS (400kV side)

Bihar:

GSS Name	Description	FTC Date	FTC Time	Remarks
Bikramganj	132 kV Bikramganj - Bikramganj TSS S/C T/L	31-03-2023	20:00	
Raxaul (New)	200 mva transformer Sr. No. PT 8281	30-03-2023	18:40	
Raxaul (New)	220 kv raxaul (new)-sitamarhi(new)- CKT- 02	30-03-2023	15:01	
Raxaul (New)	220 kv raxaul (new)-sitamarhi(new)- CKT- 01	30-03-2023	14:05	
Begusarai	220KV BEGUSARAI-BTPS BARAUNI CKT-I	21-03-2023	19:34	Charged after reconductoring work(Reconductoring is balance between Railway crossing)
Begusarai	220KV BEGUSARAI-BTPS BARAUNI CKT- II	21-03-2023	19:35	Charged after reconductoring work(Reconductoring is balance between Railway crossing)
Harnaut	132 kV S/C BARIPAHARI-HARNAUT TRANSMISSION LINE	18-03-2023	17:19	Charged after reconductoring work for the LILO at Bakthiyarpur New
Ekma	132KV -Chhapra New -Ekma ckt-II	15-03-2023	17:33	
Ekma	132kv-chhapra New -Ekma ckt -I	15-03-2023	17:25	
Gopalganj	132 KV Gopalganj-Hathua S/C	11-03-2023	16:55	Charged after reconductoring work
BGCL	100MVA ICT-02 (220/33kV Sl.No.- 14140-1) at 220/33kV Bhusaula GIS	02-03-2023	16:06	
132 Supaul	132 Kv Madhepura - Supaul ckt 02 T/L	02-03-2023	12:35	Charged after reconductoring work

Members may note.

ITEM NO. D.5: UFR operation during the month of March 2023.

Frequency profile for the month as follows:

Month	Max (Date/Time)	Min (Date/Time)	Less IEGC Band (%)	Within IEGC Band (%)	More IEGC Band (%)
March, 2023	50.48 Hz on 04.03.2023 at 18:02 Hrs.	49.56 Hz on 07.03.2023 at 15:16 Hrs.	9.18	65.63	25.19

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

Members may note.

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Annexure B.5

Sl. No.	Voltage Level (kV)	Name of Line	Tripping (Date & time)	Restoration (Date & time)	Remarks
		From April 2020 to March 2021			
1	400	400KV-BARIPADA - KHARAGPUR-1	06-04-2020 10:44	06-04-2020 10:44	Auto Reclose operated sucessfully from both ends/ Relay Indications at Baripada End: M1- Zone # 2, Rph-G, F/C : 2/989 KA, Distn: 90/99 Km
2	400	400KV-BARIPADA - KHARAGPUR-1	10-04-2020 13:12	10-04-2020 13:12	successful operated from both end/ Details of fault are as follows from Baripada SS Fault - Y phase to Ground, Zone # 2,Fault Distance- 95 KM, Fault Current- 2/86 KA, (Fault is under WBSETCL Jurisdiction/)
3	400	400KV-BARIPADA - KHARAGPUR-1	10-04-2020 13:21	10-04-2020 13:21	400KV-BARIPADA -KHARAGPUR-1 Line A/R successful operated from both end/ Details of fault are as follows from Baripada SS Fault - B phase to Ground,Zone # 2, Fault Distance- 90/73 KM, Fault Current- 1/2KA (Fault is under WBSETCL Jurisdiction/)
4	400	400KV-BARIPADA - KHARAGPUR-1	30-06-2020 11:22	30-06-2020 11:22	A/Reclose Operated Successfully at both ends: R/Indications at Baripada End: M1, Z2 Carrier Aided, Yph-G, F/C: 3.562 KA, F/Dist: 77.34 KM and M2, Z2 Carrier Aided, Yph-G, F/C: 3.462 KA, F/Dist: 75.52 KM. (Fault Jurisdiction comes under WBSETCL)
5	400	400KV-BARIPADA -	30-06-2020 12:20	30-06-2020 20:31	
6	400	400KV-BARIPADA - KHARAGPUR-1	12-07-2020 13:54	12-07-2020 13:54	Auto Reclose Successful. Baripada: M1: Z2, R-ph, 99.27 KM.3.142 KA M2: Z2, R-ph, 100.3 KM (Fault distance under WBSETCL jurisdiction)
7	400	400KV-BARIPADA - KHARAGPUR-1	16-08-2020 13:54	16-08-2020 17:16	Fdr. Tripped due to Yph-Bph (Phase to Phase Fault) Fault. Relay Indication at Baripada end: M#2, Z1, Yph-Bph- G (Ground) Fault, Iy-2.139 KA,Ib-3.16 KA. F/Dist: 40.6 Km. (Fault is under WBSETCL
8	400	400KV-BARIPADA - KHARAGPUR-1	19-08-2020 13:12	19-08-2020 13:12	Auto reclose successful.Relay details from Baripada end :Fault- Yph, Z1, 2.926 kA,42.86km. (Under WBSETCL Juridiction)
9	400	400KV-BARIPADA - KHARAGPUR-1	22-08-2020 12:31	22-08-2020 12:59	Tripped:Baripada end details : R-G,Z1,45.73KM,3.504KA (Under WBSETCL Jurisdiction)
10	400	400KV-BARIPADA - KHARAGPUR-1	08-09-2020 16:14	08-09-2020 16:14	Auto Reclose Successful: Baripada End: M1: Z1, Y- Ph, 3.554 KA,77.02 Km. M2: Z1, Y-ph, 3.388 KA, 77.04 Km. (under WBSETCL Jurisdiction).
11	400	400KV-BARIPADA - KHARAGPUR-1	17-09-2020 03:51	17-09-2020 03:51	Auto Reclose sucessful . Baripada : Z1, R Ph, 31.9 Km, 5.9KA (Under WBSETCL Jurisdiction)
12	400	400KV-BARIPADA - KHARAGPUR-1	18-09-2020 05:44	18-09-2020 05:44	A/Reclose optd.Successful at both ends: R/Ind.At Baripada:M1:Z1,Yph-G,F.C:3.43 KA, F/Dist:79.44 Km. (Fault is under WBSETCL end)
13	400	400KV-BARIPADA - KHARAGPUR-1	18-09-2020 05:47	18-09-2020 07:03	Fdr tripped at both ends due Phase to Gnd persisting Fault. R/Ind. at Baripada End: M1:Z2, Carrier aided, Yph-G, F/C: 0.155 KA, F/Dist: 81.09 Km. (Fault is under WBSETCL end)
14	400	400KV-BARIPADA - KHARAGPUR-1	19-09-2020 12:00	19-09-2020 12:00	A/R Succesful Baripada end details: M1:Z2,R-G, 3.924KA, 82.81KM
15	400	400KV-BARIPADA - KHARAGPUR-1	10-10-2020 13:04	10-10-2020 13:29	Tripped. Relay at Baripada : Z-1, Y-ph, 42.3 km, 3.5 KA (Under WBSETCL jurisdiction
16	400	400KV-BARIPADA - KHARAGPUR-1	27-10-2020 13:25	27-10-2020 13:25	Relay Indication at BPD End: M1, Z1, R-N, F/C-5.158 KA, F/D-35.72 KM. (Fault jurisdiction comes under WBSETCL)
17	400	400KV-BARIPADA - KHARAGPUR-1	06-11-2020 11:13	06-11-2020 11:13	A/R Successful operated from both end. Relay indication at Baripada End : M1, Z2 Carrier Aided Trip, Y-G, F/C-3.782 kA, F/D-95.74 kM. (Fault jurisdiction under WBSETCL)
18	400	400KV-BARIPADA - KHARAGPUR-1	16-11-2020 11:11	16-11-2020 11:11	A/R Succesful: Baripada end details:Y-phase,Z2 (Added trip), IY-3.725KA, Location:93.45KM (Under WBSECTL jurisdiction)

Sl. No.	Voltage Level (kV)	Name of Line	Tripping (Date & time)	Restoration (Date & time)	Remarks
19	400	400KV-BARIPADA - KHARAGPUR-1	31-01-2021 05:47	31-01-2021 05:47	A/R succesful, Baripada:Z2 aided trip,B-G,Distance-84.83KM, IB-4.12KA (Fault comes under WBSTCL)
20	400	400KV-BARIPADA - KHARAGPUR-1	25-02-2021 03:28	25-02-2021 03:28	A/R Succesful at both ends & Baripada end: B-G, Z2 carrier added, 4.12KA, 85.43KM (location comes under WBSETCL
21	400	400KV-BARIPADA - KHARAGPUR-1	28-02-2021 11:38	28-02-2021 11:38	Auto reclose sucessful. BPD: Z1, Y-ph, 48.03 Km 3.98 KM (Fault under WBSETCL Jurisdiction)
22	400	400KV-BARIPADA - KHARAGPUR-1	28-02-2021 12:13	28-02-2021 19:27	Tripped. BPD: Z1, Y-ph, 47.46 Km 3.17 KM (Fault under WBSETCL Jurisdiction))
		From April 2021 to March 2022			
1	400	400KV-BARIPADA - KHARAGPUR-1	02-05-2021 16:23	02-05-2021 16:58	Tripped , Rly Detials Baripada end: R-Ph, Z1,65.43KM 3.84KA. Comes under WBSETCL Jurisdiction
2	400	400KV-BARIPADA - KHARAGPUR-1	23-05-2021 11:12	23-05-2021 11:12	A/R successful from both end. Relay Indication at Baripada End: B-N, 4.063 KA, 49.17 KM. Kharagpur End: B-N, 3.306 KA, 55.35 KM.
3	400	400KV-BARIPADA - KHARAGPUR-1	26-06-2021 14:47	26-06-2021 14:47	A/R Successful Relay details: M1,Z1, Y-Ph, 64.42KM, 3.09KA M2, Y-Ph, 64.5KM, 3.1KA (Under WBSETCL Jurisdiction)
4	400	400KV-BARIPADA - KHARAGPUR-1	07-07-2021 18:57	07-07-2021 18:57	A/Reclose Successful : R/Indication at Baripada End: M#1, Z#1, Rph-G, F/C: 4.002 KA, F/Dist: 48.69 Km, (Fault is under WBSETCL Jurisdiction)
5	400	400KV-BARIPADA - KHARAGPUR-1	15-07-2021 07:28	15-07-2021 17:21	Line Maintenance works SD taken by WBSETCL
6	400	400KV-BARIPADA - KHARAGPUR-1	22-07-2021 15:19	22-07-2021 15:19	A/R Succesful, Barpada end:Y-G,Z1, 4.53KA, 46.41KM (Under WBSETCL Jurisdiction)
7	400	400KV-BARIPADA - KHARAGPUR-1	07-08-2021 11:07	07-08-2021 11:07	A/R successful : R/I at Baripada End: M1: Bph-G, FC: 4.382 KA, F/Dist: 45.94 Km M2: Bph-G, FC: 4.376 KA, F/Dist: 45.40 Km. (Note: The Fault is under the Jurisdiction of WBSETCL)
8	400	400KV-BARIPADA - KHARAGPUR-1	13-08-2021 11:56	13-08-2021 12:14	Tripped, Relay Indication at baripada: M1, Z1, R- Ph, 75KM, 3.3KA, M2, Z1,R-Ph,73.2KM, 3.22KA (Fault under WBSETCL Jurisdiction)
9	400	400KV-BARIPADA - KHARAGPUR-1	14-08-2021 12:42	14-08-2021 12:42	A/Reclose Successful, Relay Indication at Baripada: M1, Z1, Yph-G, FD: 49.27KM, FC: 4.133 KA, M2, Z1,Yph-G, FD:47.80 KM, FC: 4.067KA (Fault under WBSETCL Jurisdiction)
10	400	400KV-BARIPADA - KHARAGPUR-1	23-08-2021 10:06	23-08-2021 10:06	Line A/Reclose successful ,R/I at Baripada end: M1:Bph-G, Z2 Carrier aided Trip, FD: 84.32 Km, FC: 3.989 KA. M2: Bph-G, Z2 Carrier aided Trip, FD: 82.59 Km, FC: 3.05 KA. Note: Fault is under WBSETCL Jurisdiction.
11	400	400KV-BARIPADA - KHARAGPUR-1	24-08-2021 11:17	24-08-2021 11:43	Tripped due to Yph-G permanent fault; Baripada end details: M1:Z2, FD: 77.2KM, FC: 3.074KA, M2: Z2, FD: 78.611KM, FC: 3.112 KA. (Under WBSETCL jurisdiction)
12	400	400KV-BARIPADA - KHARAGPUR-1	30-08-2021 10:09	30-08-2021 10:09	A/Reclose Successful, Baripada End: M1: R-Ph, Z2 Carrier aided Trip, 81.49 KM 3.905 KA, M2: R-Ph, Z2 Carrier aided Trip, 3.326 KA. Note : Fault is under WBSETCL Jurisdicrion.
13	400	400KV-BARIPADA - KHARAGPUR-1	29-10-2021 10:55	29-10-2021 10:55	A/R Successful. Relay indication at Baripada End: M1, B-N, 3.169 KA, 86.08 KM. Fault under WBSETCL Jurisdiction.
14	400	400KV-BARIPADA - KHARAGPUR-1	07-11-2021 11:18	07-11-2021 11:18	A/R Successful. Relay at Rengali : M1: R-ph, Z1, 10.41 km, 9.58 KA M2: R-ph, Z1, 16.9 km km, 9.02 KA Talcher : M1: R-ph, Z1, 12.7 km , 14KA (Under Rengali Jurisdiction)
15	400	400KV-BARIPADA - KHARAGPUR-1	08-11-2021 14:27	08-11-2021 14:27	A/R successful,R/I at Baripada End:M1: Z1,Yph- G, FD: 46.94 Km, FC:4.546 KA, M2: Z1,Yph-G, FD: 48.7 Km, FC:4.55 KA, (Note: Fault is under WBSETCL Jurisdiction.)
16	400	400KV-BARIPADA -	09-12-2021 07:44	09-12-2021 14:26	Shut Down availed by WBSETCL
17	400	400KV-BARIPADA - KHARAGPUR-1	10-12-2021 10:51	10-12-2021 10:51	A/R successful Baripada : Z2, B-ph, 90.68 Km, 2.57 KA (Fault Under WBSETCL Jurisdiction)
18	400	400KV-BARIPADA - KHARAGPUR-1	04-01-2022 08:47	04-01-2022 18:59	SD taken by WBSETCL to attend damaged insulator
19	400	400KV-BARIPADA -	07-01-2022 08:30	07-01-2022 17:18	SD taken by WBSETCL
20	400	400KV-BARIPADA -	08-02-2022 07:15	08-02-2022 17:34	SD taken by WBSETCL
21	400	400KV-BARIPADA -	15-02-2022 07:31	15-02-2022 16:11	SD taken by WBSETCL
		From April 2022 to March 2023			
1	400	400KV-BARIPADA -	29-04-2022 07:04	29-04-2022 16:55	SD taken by WBSETCL
2	400	400KV-BARIPADA -	06-05-2022 07:23	06-05-2022 17:57	SD taken by WBSETCL
3	400	400KV-BARIPADA -	23-07-2022 07:12	23-07-2022 18:15	SD taken by WBSETCL
4	400	400KV-BARIPADA -	24-08-2022 07:20	24-08-2022 17:41	SD taken by WBSETCL
5	400	400KV-BARIPADA -	26-08-2022 09:48	26-08-2022 15:15	SD taken by WBSETCL
6	400		14-09-2022 07:21	14-09-2022 17:23	SD taken by WBSETCL

Sl. No.	Voltage Level (kV)	Name of Line	Tripping (Date & time)	Restoration (Date & time)	Remarks
7	400		21-09-2022 11:57	21-09-2022 20:25	SD taken by WBSETCL
8	400	400KV-BARIPADA - KHARAGPUR-1	22-09-2022 08:31	22-09-2022 08:31	AR successful. R/I at Baripada: M1: Yph-G, Z#1, Iy: 3.798 kA, FL:69.28 kM. M2: Yph-G, Z#1, Iy:3.612 kA, FL:69.84 kM. (Note:Line belongs to M/s WBSETCL & fault is under their jurisdiction)
9	400		22-09-2022 13:56	22-09-2022 17:31	SD taken by WBSETCL
10	400	400KV-BARIPADA - KHARAGPUR-1	12-10-2022 12:17	12-10-2022 17:56	Fdr tripped. Relay details at Baripada: M1: YG, 101.8 km, 3.529 kA; M2: YG, 98.054 km, 2.606 kA. Charging attempt was made from Baripada end but line did not hold (SOTF operated) at 13:12 Hrs. (Fault was under jurisdiction of M/s WBSETCL)
11	400	400KV-BARIPADA - KHARAGPUR-1	20-11-2022 14:59	20-11-2022 14:59	A/R Succesful at both ends . R/I at Baripada end : M2,R-G, F/C: 4.597kA FD: 60.646KM .Comes under WBSETCL
12	400	400KV-BARIPADA - KHARAGPUR-1	15-01-2023 07:05	15-01-2023 07:05	M-1, Z-2 car aid Trip, R-N, dist-91.88KM, Fault Current - 3.796kA. Fault under WBSETCL Jurisdiction.
13	400	400KV-BARIPADA - KHARAGPUR-1	26-01-2023 12:45	26-01-2023 12:45	A/R successful. Releay indiacations: M1-B-G, Z23.427 KA, 89.59 KM & M2-B-G, Z2 carrier aided 2.648 KA, 89.37 KM
14	400	400KV-BARIPADA - KHARAGPUR-1	06-02-2023 11:23	06-02-2023 11:23	A/R sucessful. Baripada : M1: Z2 carrier aided, 52.82 km,Y-G fault, 4.26KA. M2: 62.04 KM, 1.97KA (WBSETCL Jurisdiction) aided 2.648 KA, 89.37 KM
15	400	400KV-BARIPADA - KHARAGPUR-1	06-02-2023 11:30	06-02-2023 18:01	A/R unsucessful due to persisting fault. Baripada : M1: Z1 , 44.17 km,Y-G fault, 4.09KA. (WBSETCL Jurisdiction)
16	400	400KV-BARIPADA - KHARAGPUR-1	07-02-2023 12:32	07-02-2023 12:32	A/R sucessful. R/I at Baripada : M1: Z1, R-G fault, 54.46 KM, 4.065 KA. (WBSETCL Jurisdiction)
17	400	400KV-BARIPADA - KHARAGPUR-1	11-02-2023 14:37	11-02-2023 14:37	A/R Successful, R/I at Baripada: M1:Rph-G, Z#1 Ir- 4.446 kA FD: 48.63km M2:Rph-G, Z#1, Ir: 2.379kA FD: Not Recorded. (Fault is under WBSETCL Jurisdiction)
18	400	400KV-BARIPADA - KHARAGPUR-1	23-02-2023 15:25	23-02-2023 15:45	Line tripped before reclaim time. Relay details at Baripada: M1: Z1, YG fault, 42.09 km, 4.7 kA; M2: Z1, YG fault, 41.22 km, 4.68 kA. (WBSETCL J urisdiction.)
19	400	400KV-BARIPADA - KHARAGPUR-1	03-04-2023 11:54	03-04-2023 12:32	A/R unsuccesfull due to persisting fault . Baripada : Y-ph-G, Zcom trip, 0.87KA, 100.3 KM. Kharagpur : Y-ph, 21.58km,4.05KA. (Fault under WBSETCL Jurisdiction)
20	400	400KV-BARIPADA - KHARAGPUR-1	06-04-2023 11:12	06-04-2023 11:12	Auto Reclosed successful. Relay details at Baripada: M1: YG, 1.593 kA, 91.35 km; M2: YG, 0.868 kA, 100.3 km. Fault under WBSETCL Jurisdiction.
21	400	400KV-BARIPADA - KHARAGPUR-1	06-04-2023 11:22	06-04-2023 11:53	Tripped. Auto Reclosure Unsuccessful. Relay details at Baripada: M1: YG, 2.7 kA, 90.67 km; M2: YG, 0.967 kA, 100.3 km. Fault under WBSETCL Jurisdiction.
22	400	400KV-BARIPADA - KHARAGPUR-1	09-04-2023 12:24	09-04-2023 20:44	A/R unsuccessful due to persisting fault. Relay details from Baripada Main-I (P442),Y-Ph to Gr fault,Z1,Iy- 4.085 kA,57.45 KM and Main-2 (REL670),Y-Ph to Gr fault,Z1,Iy- 3.926 kA, 57.08 KM.Line Belongs to WBSETCL
23	400	400KV-BARIPADA - KHARAGPUR-1	11-04-2023 12:08	11-04-2023 12:08	A/R Successful Relay details Baripada: M1, Y-Ph, 89.18KM, 1.49KA. M2, Y-Ph, 0.4KA,

Annexure B.12

ELECTROMECHANICAL LBB RELAY INSTALLED AT 400/220 KV BINAGURI SUBSTATION

SL NO.	FEEDER NAME	RELAY MODEL
1	401 TALA-4 MAIN BAY	MCTI
2	402 TALA-3 & 4 TIE BAY	MCTI
3	403 TALA-3 (MALBASE) MAIN BAY	MCTI
4	404 ICT-2 MAIN BAY	MCTI
5	405 TALA-2 & ICT-2 TIE BAY	MCTI
6	406 TALA-2 MAIN BAY	MCTI
7	407 ICT-1 MAIN BAY	RAICA
8	408 TALA-1 & ICT-1 TIE BAY	RAICA
9	409 TALA-1 MAIN BAY	RAICA
10	410 RANGPO-1 MAIN BAY	2DAB
11	411 RANGPO-1 & BONG-1 TIE BAY	RAICA
12	412 BONGAIGAON-1 MAIN BAY	RAICA
13	413 RANGPO-2 MAIN BAY	2DAB
14	414 RANGPO-2 & BONG-2 TIE BAY	MCTI
15	415 BONGAIGAON-2 MAIN BAY	MCTI
16	416 KISHANGANJ-1 MAIN BAY	MCTI
17	417 KISHANGANJ-1 & BR-1 TIE BAY	MCTI
18	418 BUS REACTOR-1 MAIN BAY	MCTI
19	419 KISHANGANJ-2 MAIN BAY	MCTI
20	420 KISHANGANJ-2 & BR-2 TIE BAY	MCTI
21	421 BUS REACTOR-2 MAIN BAY	MCTI
22	422 PURNEA-1 MAIN BAY	MCTI
23	423 PURNRA-1 & ALPD-1 TIE BAY	MCTI
24	425 PURNEA-2 MAIN BAY	MCTI
25	426 PURNRA-2 & ALPD-2 TIE BAY	7SV6001
26	201 ICT-1 220KV SIDE	RAICA
27	203 ICT-2 220 KV SIDE	MCTI
28	205 SILIGURI -1	RAICA
29	206 SILIGURI-2	RAICA
30	207 BUS COUPLER	RAICA
31	208 TRANSFER BUS	RAICA
32	209 BIRPARA -1	RAICA
33	210 BIRPARA-2	RAICA
34	213 M1 BUS SECTION-1	RAICA
35	213 M2 BUS SECTION-2	RAICA

TOTAL QUANTITY OF MCTI RELAY	**18**
TOTAL QUANTITY OF RAICA RELAY	**14**
TOTAL QUANTITY OF EASUN REYROLLE RELAY	**2**

TOTAL QUANTITY OF 7SV6001 RELAY	**1**
TOTAL	**35 NOS**

ELECTROMECHANICAL LBB RELAY INSTALLED AT 400/220 KV MAITHON SUBSTATION

SL NO.	FEEDER NAME	RELAY MODEL
1	MAITH-MAIN_BAY_406	VAJSM43SF102B
2	MAITH-MAIN_BAY_407	VAJSM43SF102B
3	MAITH-TIE__BAY_408	RAICA
4	MAITH-MAIN_BAY_409	RAICA
5	MAITH-TIE__BAY_411	RAICA
6	MAITH-MAIN_BAY_412	RAICA
7	MAITH-MAIN_BAY_413	RAICA
8	MAITH-TIE__BAY_414	RAICA
9	MAITH-MAIN_BAY_415	RAICA
10	MAITH-MAIN_BAY_416	RAICA
11	MAITH-TIE__BAY_417	RAICA
12	MAITH-TIE__BAY_420	RAICA
13	MAITH-MAIN_BAY_421	RAICA
14	MAITH-TIE__BAY_423	RAICA
15	MAITH-MAIN_BAY_424	RAICA
16	200KV Maithon-DHN-1_205	RAICA
17	200KV Maithon-DHN-2_204	RAICA
18	500MVA ICT-1_206	RAICA
19	220KV TBC_209	RAICA
20	220KV Bus Coupler_210	RAICA
21	500MVA ICT-2_213	RAICA
22	220KV Kalensawari-1_214	RAICA
23	220KV Kalensawari-2_215	RAICA

TOTAL QUANTITY OF VAJSM RELAY	**2**
TOTAL QUANTITY OF RAICA RELAY	**21**
TOTAL	**23 NOS**

TOTAL	**58 NO'S RELAY**

Annexure B.14

F. No. 15-14/9/2022-H-II(Part)
भारत सरकार / Government of India
विद्युत मंत्रालय / Ministry of Power
Shram Shakti Bhawan, Rafi Marg
New Delhi - 110001, Tel: 011-23705841

Dated: 10th April, 2023

To

1. **The Secretaries of all the Ministries / Departments of Government of India**
2. **The Chief Secretaries of the State Governments & Union Territories**
3. **Principal Secretaries (Energy / Power) - All the State Governments & UTs**
4. **CMDs - PGCIL, NTPC, NHPC, SJVN, THDC, NEEPCO, Grid India, PFC, REC**
5. **The Chairman - BBMB, DVC**

Sub: Guidelines to promote development of Pump Storage Projects (PSP) - reg.

Sir / Madam,

This has reference to Ministry of Power's letter of even number dated 15th February, 2023 vide which the draft PSP Guidelines were circulated for comments / suggestions. Subsequently, a webinar was held on 23rd February 2023 on the topic of "Green Growth", wherein, inter alia, suggestions were also received on the framework for Pumped Storage Projects in the country.

2. Based on the comments / suggestions received from the stakeholders, the Guidelines to promote development of Pump Storage Projects in the country have been finalized. A copy of the PSP guidelines is enclosed herewith for information and necessary action.

This issues with the approval of Hon'ble Minister of Power and New & Renewable Energy.

Yours sincerely,

10/4/23

(Mohd. Afzal)
Joint Secretary
Email: afzal_mdp@nic.in
/hydro2-mop@gov.in
Tel.: 011-23714000

Copy to:-

1. CEO, NITI Aayog
2. Secretary, CERC / All SERCs
3. Chairperson, CEA
4. Chairperson, CWC

Copy also to:

In-charge, NIC Cell, MoP: with request to upload the Guidelines on the website of the Ministry of Power.

Guidelines on Pumped Storage Projects

1. Introduction

Energy Transition entails increasing presence of variable and intermittent Renewable Energy Sources (VREs) like solar & wind in the energy mix. This presents a grid-level challenge for stability and a need for addressing the temporal considerations in power availability. Storage and ancillary services would be the attributes that require incentivization in the power system to ensure appropriate capacity. Comprehensive storage guidelines are required to set the direction of developments in this regard. Amongst the various technologies available for addressing this requirement of storage and ancillary services, Pumped Storage Projects (PSPs) are clean, MW scale, domestically available, time tested and internationally accepted.

The positive aspects of PSPs are not limited to the attributes of storage and ancillary services. PSPs are clean, green and safe. They don't produce any poisonous/ harmful by-products or pose problems of disposal. The advantages of promoting PSPs are not only based on their usefulness in maintaining grid stability and facilitating VRE integration but also their other positive attributes when compared to other available energy storage systems.

1.1 Perspectives

Flexible Energy Generation Assets that can supply both Base Load & Peaking Power efficiently and economically are the need of the future and necessary to address the dynamically evolving energy needs of India. At present, Variable Renewable Energy Sources (VRE) such as wind and solar are being connected to the grid at a rapid pace owing to their low cost of installation and the thrust on sustainable & green energy. The energy supply from VREs can't be regulated since they are dependent on the time of the day, seasons, and the vagaries of weather. Hence, there is an ever- increasing demand for Energy Storage Assets. PSPs are best suited in the present scenario for addressing this demand. PSPs are also known as 'the Water Battery', which is an ideal complement to modern clean energy systems.

PSPs provide the necessary scale of storage and have a long service life of more than 40-50 years. This is much more than any other energy storage technology presently available. This also results in a low cost of delivered energy over the life of the projects. PSPs are also non-polluting and are more environmentally friendly. Pumped Storage Projects account for over 95 percent of installed global energy storage capacity. It is estimated that pumped hydro projects worldwide store up to 9,000 gigawatt hours (GWh) of electricity worldwide.

(a) Energy Transition Considerations

India is on the path towards a clean energy transition, guided by the Nationally Determined Contribution (NDC) targets, to reduce the emission intensity of its Gross Domestic Product (GDP) by 45% by 2030, get to 50% of installed capacity from non-fossil fuel sources by 2030 and achieve net zero carbon emissions by 2070. Given the ongoing energy transitions in the country, the development of PSPs is of paramount importance for providing greater inertia and balancing power to the grid as battery storage solutions are still being scaled up and are required for short duration storage needs in grid management, PSPs are a natural enabler for integrating greater amounts of wind and solar power. With its ability to store a large amount of energy, frequent starts/stops, and faster ramp-ups/ramp-downs, PSPs are ideally suited to address the dynamic supply and demand. PSPs can also be used for peaking operation and improve the reliability of the power system.

(b) Ancillary Services Considerations

Wind and Solar power have become one of the lowest-cost sources of renewable energy. However, their inherent variable, uncertain and intermittent nature presents a huge challenge for integrating large quantities of renewables, while maintaining grid stability. Curtailment of wind and solar power is already being witnessed in some areas although they presently constitute only around 25% of total energy capacity. With the increasing presence of VREs, the need for curtailment will be more acute if there is insufficient storage in the grid. PSPs present a viable solution to the integration issues of large RE capacities. They are best equipped for peak load requirements. PSPs can store a large amount of energy during off-peak hours and discharge over longer period. Thus, PSPs would help reduce RE curtailment and improve the plant load factor of VREs.

(c) Temporal Considerations

It is anticipated that with the increasing presence of VRE in the energy mix, the generation of wind and solar energy may be at its peak where the energy demand is the lowest. If the energy from these sources is not stored during off-peak hours in times to come, there will be an increasing need for large operating reserves from thermal power plants (typically high carbon coal and gas) to meet the peak demands of the country. PSPs provide an economical solution by off taking a large amount of energy from the grid during off-peak hours, increasing the load factor of other systems, and also providing additional capacity to meet the peak loads. Pumped hydro storage provides a dynamic response and offers critical backup during periods of excess demand along with maintaining grid stability. Without PSPs, full decarbonisation of the electricity sector will not be achievable at reasonable costs. Thus, PSPs provide 'green storage' and make VREs dispatchable by firming up the capacities.

1.2 Advantages of Pumped Storage Projects

(a) Ecologically friendly

PSPs would have minimal impact on the environment in their vicinity as they are mainly envisaged on the existing Hydro Electric Projects, reservoirs, or as off-the-river projects. All components of PSPs would be connected, operated, and maintained in an environmentally friendly manner. There are no residual environmental impacts in the case of PSPs.

(b) Atmanirbhar Bharat

The guidelines for the development of storage systems synchronize with the vision of Atmanirbhar Bharat. The PSPs primarily use indigenous technologies and domestically produced materials. Most of the electrical & mechanical parts of PSPs are also made in India. Other alternate solutions to storage such as batteries are heavily import-dependent.

(c) Tested Technology

The PSPs operate on time-tested technology thereby infusing confidence in the lending institutions for a longer duration of loans. Additionally, the cost of technologies involved in the construction has reduced rendering PSPs a viable proposition. The technological surety associated with PSPs has opened the possibility for the developers to claim a higher debt-equity ratio in the projects.

(d) Local developmental

The development of PSPs is highly capital intensive and involves the development of local transport infrastructure for the mobilization of men and materials. Local industries such as cement and steel also get impetus and drive job creation in the economy. This in turn have a salutary effect on local area development. PSPs are an ideal investment for socio-economic and regional development considerations like infrastructure up-gradation and employment generation.

(e) Longer and reliable duration of discharge

PSPs are generally designed for a longer duration of discharge of more than 6 hours to meet the peak demand or for compensating the variability in the grid due to VREs. Currently, Battery Energy Storage Systems are designed for up to 4 hours of discharge generally. The firm capacity of PSPs during peak hours is guaranteed and relatively immune to the grid conditions.

1.3 Pumped Storage Potential and Development Status

As of date, the CEA estimates regarding on-river pumped storage potential is 103 GW in India. Apart from the above, a large capacity of off-river pumped storage potential is also available which is being estimated. Suitable support is to be extended to the identification and evaluation of such potential.

As of now, 8 projects (4745.60 MW) are presently in operation, 4 projects (2780 MW) are under construction, and 27 projects (29930 MW) have been allotted by States which are under different stages of development.

1.4 Long Term Plan for Pumped Storage Hydro Development

The long-term approach to the development of pumped storage projects will be driven by various factors regarding the requirement of the grid to achieve the energy transition. As per the revised draft NEP published by the Central Electricity Authority, the country would require 26.7 GW of Pumped Storage Projects and 47.2 GW of BESS (5 hour) to integrate the RE capacity envisaged till 2032. The PSP capacity requirement may further increase if the cost of BESS does not come down as expected. The Central Electricity Authority will continue modelling and forecasting the energy demand and energy mix over the long term and providing an indication of the probable requirement of the various forms of storage. This exercise would mean factoring in the aspects of viability and technology change. The Resource Adequacy Plan will consider storage as an element of planning.

1.5 Barriers in the development of Pumped Storage Projects

(a) Environmental clearances

Presently, the environmental clearance and forest clearance process of PSPs is very cumbersome, since these projects are treated at par with the conventional hydro projects for the purpose of grant of EC and FC. The environment impact of PSPs constructed on existing reservoirs on on-the-river sites and on the off-the-river sites is much less than conventional HEPs. Further, unlike the conventional hydro projects, development of PSPs do not lead to significant displacement of the people and thus, require minimum R&R. Therefore, PSPs constructed on existing reservoirs and on off-the-river sites may be treated as a separate category for processing of clearances.

(b) Free power

PSPs are fundamentally energy storage projects designed to cater the need of grid stability during the peak hours. Unlike conventional hydro projects, PSPs do

not produce electricity. They are net consumers of electricity. Therefore, there is no question of imposing the requirement of free power on PSPs.

(c) Cost of pumping power

The cost of power from PSPs has three components - cost of storage, cost of conversion losses and cost of input power. One of the prerequisites to ensure the commercial viability of a PSP unit is availability of input power at affordable tariff. However, this constraint is likely to be overcome in near future, with the availability of solar and wind power at relatively cheaper rates

(d) Value of peak power

The importance of PSP lies in its capability to offer peaking power. Further, other services offered by PSPs, like spinning reserves, reactive support, black start ability, frequency response ancillary services and faster start-up and shutdown, which are essential for grid stability, are not adequately monetized.

2. Measures already taken by Government of India for promotion of PSPs

2.1 Utilization of financial and project execution capabilities of CPSUs

Government of India vide its order dated 08.08.2022 has indicated identified PSP sites against CPSUs to facilitate their development. A state-wise indication has also been carried out to help the States with work related to PSPs. States are encouraged to allocate the PSPs to CPSUs for early and prompt development aligned with the national interest. The present indication is at **Annexure-I**.

2.2 Energy Storage Obligation

Government of India has, vide its order dated 22.07.2022, notified the trajectory of Energy Storage Obligation for the distribution companies to ensure the capacities regarding storage as a grid element. This would create demand for storage. The present trajectory is at **Annexure-II**.

2.3 Waiver of ISTS charges for PSPs

Given the importance of facilitating RE integration in the grid and in pursuance of National Tariff Policy 2016, waiver of ISTS and other transmission charges have also been made available to Pumped Storage Projects vide Ministry of Power's Order dated 23.11.2021 which is given at **Annexure-III**.

In order to promote the development of PSPs, the waiver of ISTS charges shall be extended to all those PSPs where construction work is awarded by

30.06.2025. ISTS charges shall be levied on PSPs where construction work is awarded after 30.06.2025 as per the following trajectory:

S. No.	Award of construction work	ISTS charges
1.	01.07.2025 to 30.06.2026	25% of applicable ISTS charges
2.	01.07.2026 to 30.06.2027	50% of applicable ISTS charges
3.	01.07.2027 to 30.06.2028	75% of applicable ISTS charges
4.	From 01.07.2028	100% of applicable ISTS charges

2.4 Budgetary Support for Enabling Infrastructure

The hydro projects and PSPs are often taken up in remote areas which have infrastructure deficits. The infrastructure created for hydropower / PSP enables further development of the area as the same is available for reuse for other purposes. Given the same, the Central Government is providing budgetary support for funding the enabling infrastructure of hydropower projects. This scheme also covers PSPs. The grant for enabling infrastructure is for the creation of infrastructure facilities that have alternate developmental value. The present dispensation in this regard is at **Annexure-IV,** and also applies to PSPs.

2.5 Timelines for formulation and concurrence of Detailed Project Reports for Pumped Storage Projects

The Central Electricity Authority has issued revised guidelines for formulation and for examination & concurrence of Detailed Project Reports for Pumped Storage Projects in July 2022 and August 2022 respectively. As per revised guidelines, the timelines for preparation of DPR for PSPs has been reduced from 900 days to 720 days. CEA shall further reduce these timelines for off-stream closed loop PSPs and PSPs on existing Hydro projects (where one reservoir is available).

In addition, since no tariff / financial evaluation is required to be done by CEA for PSP projects allotted through Tariff Based Competitive Bidding or as part of integrated Renewable Energy Project or as captive plants, CEA has reduced the timeline for concurrence of such projects from 150 days to 75 days. For other PSPs, the timelines for concurrence has been reduced from 150 days to 125 days.

3. Guidelines for promotion of PSPs

The following guidelines are being issued for the promotion of Pumped Storage Projects:

3.1 Allotment of project sites

The State Governments may allot project sites to developers in the following manner:

(i) On nomination basis to CPSUs and State PSUs

For early development, States may award projects directly to hydro CPSUs or State PSUs on a nomination basis. Due consideration shall be given to the experience and financial strength of the CPSUs/State PSUs. The projects may also be allotted to Joint Ventures (JVs) between CPSUs and/or State PSUs for development of such PSPs. Further the CPSU/State PSU shall ensure that award of contracts for the supply of equipment and construction of the project, either through a turnkey or through well-defined packages, is done based on competitive bidding.

(ii) Allotment through competitive bidding

PSP project may also be awarded to private developers by following a two stage competitive bidding process. PSUs may also be allowed to participate in the bidding process. The first stage shall be for pre-qualification based on criteria of financial strength, experience of developing infrastructure projects of similar size, past track record of developing projects, turnover and ability to meet performance guarantees. In the second stage, bids are to be called based on quantifiable parameters such as concession period of the project or any other parameter as specified by the Central/State Government.

In case of allocation through modes 3 (i) & (ii) above, the home state shall have the right of first refusal upto 80% of the project capacity and tariff shall be fixed by the Appropriate Commission u/s 62 of the Electricity Act, 2003 The developer would be free to sell the balance storage space under short / medium / long term PPA, or in power markets or through bilateral contract.

(iii) Allotment through TBCB

PSPs may also be awarded on a TBCB basis to developers. For this purpose, the task of carrying out S&I and preparation of DPR may be given to an SPV under a CPSU/State PSU. SPV may be responsible for pre-construction activities such as preparation of project report, land acquisition, environment and forest clearance, etc. Such a dispensation would ensure the possibility of tariff determination based on competitive bidding. The DPR may be subsequently bid out for construction and SPV transferred to the successful bidder on the basis of:

a. Composite tariff (including the cost of input power) in case input power is arranged by the developer; or
b. Tariff for storage on a per Megawatt Hour basis if the input power is to be arranged by the procurer of the storage capacity.

The appropriate Commission shall adopt the above tariff u/s 63 of the Electricity Act, 2003.

(iv) **Self-Identified off-stream Pumped Storage Projects**

In addition to the above methods, developers may also self-identify potential off-stream sites where PSPs can be constructed. Since these sites are away from the riverine system and do not utilize the natural resources like river streams, allotment from State Governments would not be required for the development of PSP projects on such sites. Further, all statutory clearances need to be obtained from State and Central agencies before starting construction. It will help in harnessing the off-stream potential in the country at a faster pace. Projects developed in such a manner would be provided all concessions mentioned in these guidelines, subject to the directions issued by the Government from time to time.

3.2 Timelines for Start of Construction work after award of Project

Developers shall start construction work within a period of 2 years from the date of allotment of the project, failing which allotment of the project site shall be cancelled by the State. However, relaxation of 1 year may be granted to those projects where delay in start of construction is attributable to pending Environment Clearance (EC) and Forest Clearance (FC), provided that the applications are submitted to concerned authorities within timelines agreed at the time of award of the project.

3.3 No Upfront Premium for Project Allocation

In order to ensure the viability of the Pumped Storage Projects, States shall ensure that no Upfront Premium is charged for project allocation.

3.4 Market reforms

The comparison of PSPs with other conventional and VRE sources purely based on financial aspects is undervaluing and de-emphasizing the economic benefits extended by these projects. The monetization of Ancillary services provided by Pumped Storage Projects will give a much-needed boost to the sector. For this purpose, the following reforms may be undertaken:

i. The appropriate Commission shall ensure that services like spinning reserves, reactive support, black start, peaking supply, tertiary and ramping support, faster start-up and shutdown, which help in supporting grid stability are suitably monetized.
ii. Appropriate Commission shall notify Peak and Off-Peak tariffs for Generation to provide appropriate pricing signal to Peak and Base Load Generating Plants.

iii. PSPs and other storage projects shall be allowed to participate in all market segments of the power exchange, including the high price segment of the Day Ahead Market (HP-DAM) so that they can take suitable advantage of the price differential between Peak and Off-Peak tariffs.

iv. 80% power generated when PSPs operate as conventional hydro power stations during monsoon period (i.e. no pumping energy required for power generation) would be offered to the Home State at the rate of secondary energy fixed by the Central Electricity Regulatory Commission. The developer shall be allowed to sell the remaining energy to cover their Operation & Maintenance costs and other expenses.

v. In the event of capacity contracted not being fully utilized by the contracting agency, the developer would be free to transfer the usage of the capacity to other interested entities so that resources do not remain idle. The gains made shall be shared with the original beneficiary in the ratio of 50:50.

3.5 Financial Viability

The current power scenario indicates an imminent deep penetration of electricity storage in future and PSPs would be required to be operated invariably in two cycles for as long as variable RE infusion keeps on increasing. Thus, PSPs are expected to be utilized or run to their full capacities. This ensures recovery of costs in a minimum period. With high rates during peak hours in the power exchanges, PSP developers have the opportunity to optimize their operations and earn suitable returns.

To ensure that only viable PSPs are taken up for construction, the Central Government may notify a benchmark tariff of storage for investment decisions of developers considering 6-8 hours of operation of the PSP. This will be based on the prevailing and anticipated difference between peaking and non-peaking rates. Efforts would be made to ensure that only those PSP projects are taken up for development whose levelized cost of storage is within the benchmark cost of storage.

Financial institutions like PFC, REC, and IREDA shall treat PSPs at par with other renewable energy projects while extending long term loans of 20-25 years tenure. The debt equity ratio of PSP projects can be upto 80:20, in consultation with the financial institutions.

3.6 Taxes and duties

To reap the long-term benefits and socio-economic development of states due to PSP projects, State Government shall consider reimbursement of SGST on PSP project components. States may exempt land to be acquired by off-the-river PSPs from payment towards stamp duty and registration fees. Government land, if available, may be provided at a concessional rate to the developers on annual lease rent basis.

Storage is an intermediary system where energy is stored and released later. In line with the principles of double taxation avoidance, Electricity Duty (ED) and Cross Subsidy Surcharge (CSS) shall not be applicable on pumping power for charging of PSPs as PSPs are merely facilitating conversion of energy. Electricity is stored during off-peak hours and discharged during peak hours. ED and CSS may only be levied on the final consumption of electricity.

Government of India from time to time has stated that no Water Cess should be levied on Hydro Power Projects since there is no consumptive use of water. Similarly, no water cess shall be levied on PSPs.

3.7 Exemption from Free Power obligation

PSPs are energy storage schemes. They do not produce energy. They are net consumers of energy. Hence, the PSPs would be kept out of the liability of free power.

3.8 Local Area Development Fund

PSPs have a minimal environmental impact and have no R&R issues. Therefore, there will be no requirement of creation of a Local Area Development Fund.

4. Utilization of exhausted mines to develop PSPs

The discarded mines including coal mines in different parts of the country could be used as Hydro Storage and thereby become natural enablers for development of Hydro Pumped Storage Projects (PSPs). Efforts would be made to identify and develop exhausted mines / coal mines as prospective PSP sites in consultation with the Ministry of Coal, Ministry of Mines and respective State Governments.

5. Rationalization of Environmental Clearances for PSPs

The off-river PSPs, are located away from the river course and have minimum impact on the riverine ecology. Hence they need to be treated differently for grant of Environmental Clearance.

Ministry of Environment Forest & Climate Change (MoEF&CC) has already initiated action in this regard. As per draft notification issued by MoEF&CC on 11.10.2022, PSPs which meet the following criteria would be appraised under B2 category for grant of Environmental Clearance (EC) irrespective of power generation capacity:

(a) Projects which do not attract Forest Clearance (FC) and/or Wildlife Clearance (WC)
(b) Projects wherein no new Reservoir(s) is (are) created.
(c) Projects wherein the existing reservoir (s) is (are) not expanded and/or structurally modified {i.e. no increase in the capacity of reservoir(s) and no increase in submergence area of reservoir(s)}.

In addition, further liberalisation would be taken up for allowing base line data collection for one (1) season for off-stream closed loop PSPs and two (2) seasons for off-stream open loop PSPs (excluding monsoon season) for the purpose of carrying out Environment Impact Assessment (EIA) and preparing Environment Management Plan (EMP) required for EC, and for allowing collection of baseline data for carrying out EIA/EMP studies before issuance of Terms of Reference (ToR).

6. Green Finance

Pumped storage projects are essential for the integration of renewable energy sources in the grid and their utilization, thereby avoiding greenhouse gas emissions. Hence, in order to initiate and accelerate the pace of establishment, PSPs may be supported through concessional climate finance. Sovereign green bonds issued for mobilizing resources for green infrastructure as a part of the Government's overall market borrowings may be deployed in the development of PSPs which utilize renewable energy for charging.

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ANNEXURE - I

No.15-23/3/2021-HYDEL-II(MoP)
Government of India
भारत सरकार
Ministry of Power
विद्युत मंत्रालय
****

Shram Shakti Bhawan, Rafi Marg
New Delhi, dated 08th August, 2022

To
The Chairman – BBMB, DVC
The CMDs – NTPC, NHPC, SJVN, THDCIL, NEEPCO

Subject: Revised indication of Pumped Storage Projects (PSPs) to the Hydro CPSEs / BBMB / DVC – regarding.

Sir,

In supersession of this Ministry's letter of even no. dated 06.04.2022, I am directed to enclose herewith the 'revised indication of identified PSP sites to Hydro CPSEs / DVC / BBMB' and 'revised indication of States to Hydro CPSEs / BBMB / DVC' for development of Pumped Storage Projects (PSPs).

2. The concerned utilities would be responsible to take up the matter with the concerned State Governments, carry out suitable analysis and prepare the evaluation reports expeditiously on the projects indicated. Progress made by the utilities in this regard will be reviewed by this Ministry at regular intervals.

This issues with the approval of Hon'ble Union Minister of Power and New & Renewable Energy.

Encl: as above

Yours faithfully,

(R. P. Pradhan)
Director (Hydro-II)
Email: hydro2-mop@nic.in

Copy to:
(I) The Chief Secretaries of all the State Government / UTs – with request to extend all the necessary support to the Organizations.
(II) The Chairperson, Central Electricity Authority.
(III) The Chairman, Central Water Commission.

Copy for information to:
(I) O/o Hon'ble Minister of Power and New & Renewable Energy.
(II) O/o Hon'ble Minister of State for Power.
(III) Sr. PPS to Secretary (Power) / PPS to Joint Secretary (Hydro) / PS to Director (H-I) / DD (H-II) / DD (NHPC) / DD(BBMB) / US(H-I), MoP.

Annexure-I

Indication of Identified PSP sites to Hydro CPSEs / DVC / BBMB

S. No.	Name of Project	State/UT	Probable IC (MW)	Earlier Indicated Agency	Revised indication / Changes proposed
1	Matlimarg	Jammu & Kashmir	1650	NHPC	NHPC
2	Majra	Himachal Pradesh	1800	BBMB	BBMB
3	Jaspalgarh	Uttarakhand	1935	THDCIL	THDCIL
4	Ulhas	Maharashtra	1000	NHPC	NHPC
5	Pinjal	Maharashtra	700	NHPC	NHPC
6	Kengadi	Maharashtra	1550	NHPC	NHPC
7	Jalond	Maharashtra	2400	NHPC	NHPC
8	Kolmondapada	Maharashtra	800	SJVNL	SJVNL
9	Kalu	Maharashtra	1150	NHPC	NHPC
10	Sidgarh	Maharashtra	1500	SJVNL	SJVNL
11	**Amba**	**Maharashtra**	**2500**	**THDCIL**	**NTPC**
12	Chornai	Maharashtra	2000	SJVNL	SJVNL
13	Savitri	Maharashtra	2250	NHPC	NHPC
14	**Madliwadi**	**Maharashtra**	**900**	**SJVNL**	**NTPC**
15	Baitarni	Maharashtra	1800	SJVNL	SJVNL
16	Morawadi	Maharashtra	2320	THDCIL	THDCIL
17	Gadgadi	Maharashtra	600	THDCIL	THDCIL
18	**Kundi**	**Maharashtra**	**600**	**SJVNL**	**NTPC**
19	Aruna	Maharashtra	1950	THDCIL	THDCIL
20	Kharari	Maharashtra	1050	THDCIL	THDCIL
21	Jalvara	Maharashtra	2000	SJVNL	SJVNL
22	**Tigaleru**	**Andhra Pradesh**	**1650**	**SJVNL**	**NTPC**

23	**Varahi****	**Karnataka**	**700**	**SJVNL**	**Karnataka Power Corporation Ltd. (KPCL)**
24	Nallar	Tamil Nadu	2700	THDCIL	THDCIL
25	Idukki	Kerala	300	THDCIL	THDCIL
26	Pallivasal	Kerala	600	THDCIL	THDCIL
27	Jharlama	Odisha	2500	NHPC	NHPC
28	Kulbera	West Bengal	1110	DVC	DVC
29	Panchet Hill	West Bengal	600	DVC	DVC
30	Lugupahar	Jharkhand	2800	DVC	DVC
31	Boro	Jharkhand	500	DVC	DVC
32	Tuivai	Manipur	2100	NEEPCO	NEEPCO
33	Hengtam	Manipur	2250	NEEPCO	NEEPCO
34	KhuaiLui	Assam	2100	NEEPCO	NEEPCO
35	LeivaLui	Mizoram	2100	NEEPCO	NEEPCO
36	Pakwa	Mizoram	1000	NHPC	NHPC
37	TuithoLui	Mizoram	1050	NEEPCO	NEEPCO
38	Mat	Mizoram	1400	NEEPCO	NEEPCO
39	TuiphaiLui	Mizoram	1650	NEEPCO	NEEPCO
40	Nghasih	Mizoram	1250	NEEPCO	NEEPCO
41	DaizoLui	Mizoram	2000	SJVNL	SJVNL
42	**Sandynalla**	**Tamil Nadu**	**1200**		**NTPC**
43	**Upper Bhavani**	**Tamil Nadu**	**1000**		**NTPC**
44	**Sigur**	**Tamil Nadu**	**1200**		**NTPC**
45	**Sillahalla Stage-II**	**Tamil Nadu**	**1000**		**NTPC**
46	**Netravathy Stage-I**	**Karnataka**	**1500**		**NTPC**
47	**Indira Sagar – Omkareshwar**	**Madhya Pradesh**	**500**		**NHPC**
48	**Panyor**	**Arunachal Pradesh**	**660**		**NEEPCO**

49	**Kopili**	**Assam**	**320**		**NEEPCO**
50	**CheraKhad**	**Himachal Pradesh**	**500**		**SJVNL**
51	**Dhurmu**	**Himachal Pradesh**	**1600**		**SJVNL**
52	**TaalKhad**	**Himachal Pradesh**	**135**		**SJVNL**
53	**Sadda**	**Himachal Pradesh**	**220**		**SJVNL**
54	**Purthi and Sach Khas PSP**	**Himachal Pradesh**	**190**		**SJVNL**
55	**MalshejGhat**	**Maharashtra**	**700**		**THDCIL**
56	**Humbarli**	**Maharashtra**	**400**		**THDCIL**

** Government of Karnataka has allotted the Varahi PSP to Karnataka Power Corporation Limited (KPCL) and KPCL has already prepared that PFR with installed capacity of 1500 MW.

Summary

Agency	Number of Projects		Capacity (in MW)	
	Earlier	Revised	Earlier	Revised
NHPC	9	**10**	14200	**14700**
SJVNL	10	**11**	13950	**12745**
THDCIL	9	**10**	13955	**12555**
NEEPCO	8	**10**	13900	**14880**
DVC	4	**4**	5010	**5010**
BBMB	1	**1**	1800	**1800**
NTPC	-	**9**	-	**11550**
Total	**41**	**55**	**62815**	**73240**

Annexure-II

Indication of States to Hydro CPSEs / BBMB / DVC for development of Pumped Storage Projects (PSPs)

S. No.	State	Earlier Proposed Agency	Revised Proposed Agency
	Northern Region		
1	UT of Jammu & Kashmir and Ladakh	NHPC	-
2	Himachal Pradesh	SJVN	
3	Uttarakhand	THDCIL	
4	Punjab	BBMB	
5	Haryana	BBMB	
6	Rajasthan	BBMB	
7	Uttar Pradesh	THDCIL	
	Western Region		
8	Maharashtra	NHPC, SJVN, THDCIL	NHPC, SJVN, THDCIL, **NTPC**
9	Gujarat	SJVN	-
10	Madhya Pradesh	NHPC	
11	Chhattisgarh	THDCIL	
	Eastern Region		
12	Jharkhand	DVC	-
13	Bihar	SJVN	
14	Odisha	NHPC	
15	West Bengal	DVC	
16	Sikkim	NHPC	
	Southern Region		
17	Andhra Pradesh	SJVN	**NTPC**
18	Telangana	NHPC	-
19	Tamil Nadu	THDCIL	**NTPC**
20	Karnataka	SJVN	**NTPC**
21	Kerala	THDCIL	-
	North Eastern Region		
22	NER	NHPC, SJVN, THDCIL, NEEPCO	-

ANNEXURE-D

F. No. 09/13/2021-RCM
Ministry of Power
Government of India

Shram Shakti Bhawan, New Delhi
Dated 22 July, 2022

ORDER

Subject: Renewable Purchase Obligation (RPO) and Energy Storage Obligation Trajectory till 2029-30 - regarding.

In exercise of the powers conferred under section 3(3) of Electricity Act, 2003, the Central Government had notified the revised Tariff Policy, which was published in Gazette of India, Extraordinary, Part-I, Section-1 dated 28.01.2016.

2. Para 6.4(1) of the Tariff Policy 2016 provides as follows:

> *"Pursuant to provisions of section 86(1)(e) of the Act, the Appropriate Commission shall fix a minimum percentage of the total consumption of electricity in the area of a distribution licensee for purchase of energy from renewable energy sources, taking into account availability of such resources and its impact on retail tariffs. Cost of purchase of renewable energy shall be taken into account while determining tariff by SERCs.* ***Long term growth trajectory of Renewable Purchase Obligations (RPOs) will be prescribed by the Ministry of Power in consultation with MNRE.***
>
> *Provided that cogeneration from sources other than renewable sources shall not be excluded from the applicability of RPOs."*

3. Energy from Hydro Power Projects is Renewable Energy (RE) as has been recognized world over. On 8th March 2019, the Government of India had also recognized Large Hydro Power Projects (LHPs) including Pumped Storage Projects (PSPs), having capacity of more than 25 MW, as part of RE. It was further specified that energy from all LHPs, commissioned after 8th March 2019, will be considered as part of Renewable Purchase Obligation (RPO) through a separate obligation, i.e. Hydro power Purchase Obligation (HPO).

4. Accordingly, the Ministry of Power (MoP), after detailed consultation with Ministry of New and Renewable Energy (MNRE), notified the HPO trajectory for the period from 2021-22 to 2029-30 vide order dated 29th January, 2021 and subsequent clarification dated 1st April, 2021. The revised trajectory of RPOs for Solar and Other Non-Solar power was also notified for the period from 2019-20 to 2021-22. The aforesaid order also mentioned that the RPO trajectory beyond 2021-22 will be specified later.

5. To recommend RPO trajectory beyond 2021-22, a Joint-Committee under the Co-chairmanship of Secretary, Ministry of Power and Secretary, Ministry of New and Renewable Energy, was constituted on 17th December, 2020. Based on the recommendations of the Joint Committee and further discussions with MNRE, MoP hereby specifies the following RPO Trajectory beyond 2021-22:

Year	Wind RPO	HPO	Other RPO	Total RPO
2022-23	0.81%	0.35%	23.44%	24.61%
2023-24	1.60%	0.66%	24.81%	27.08%
2024-25	2.46%	1.08%	26.37%	29.91%
2025-26	3.36%	1.48%	28.17%	33.01%
2026-27	4.29%	1.80%	29.86%	35.95%
2027-28	5.23%	2.15%	31.43%	38.81%
2028-29	6.16%	2.51%	32.69%	41.36%
2029-30	6.94%	2.82%	33.57%	43.33%

(a) Wind RPO shall be met only by energy produced from Wind Power Projects (WPPs), commissioned after 31st March 2022.

(b) HPO shall be met only by energy produced from LHPs (including PSPs), commissioned after 8th March 2019.

(c) Other RPO may be met by energy produced from any RE power project not mentioned in (a) and (b) above.

6. From F.Y. 2022-23 onwards, the energy from all Hydro Power Projects (HPPs) will be considered as part of RPO. The HPO trajectory, as has been notified earlier will continue to prevail for LHPs commissioned after 8th March 2019. All other HPPs will be considered as part of 'RPO' under category of 'other RPO'.

7. RPO shall be calculated in energy terms as a percentage of total consumption of electricity.

8. HPO obligations may be met from the power procured from eligible LHPs (including PSPs) commissioned on and after 8th March, 2019 to 31st March, 2030.

9. HPO obligation of the State/Discom may be met out of the free power being provided to the State from LHPs (including PSPs), commissioned after 8th March, 2019 as per agreement at that point of time excluding the contribution towards LADF, if consumed within the State/Discom. Free power (not that contributed for Local Area Development) shall be eligible for HPO benefit.

10. In case, the free power mentioned above is insufficient to meet the HPO obligations, then the State would have to buy the additional hydro power to meet its HPO obligations or may have to buy the corresponding amount of Renewable Energy Certificate corresponding to Hydro Power.

11. The Renewable Energy Certificate mechanism corresponding to Hydro Power to be developed by CERC to facilitate compliance of HPO Obligation would have a capping price of Rs.5.50/Unit of electrical energy w.e.f. 8th March, 2019 to 31st March, 2021 and with an annual escalation @ 5% thereafter for the purposes of ensuring HPO compliance.

12. The above HPO trajectory shall be tried up on an annual basis depending on the revised commissioning schedule of Hydro projects. The HPO trajectory for the period between 2030-31 and 2039-40 shall be notified subsequently.

13. Hydro power imported from outside India shall not be considered for meeting HPO.

14. Any shortfall remaining in achievement of 'Other RPO' category in a particular year can be met with either the excess energy consumed from WPPs, commissioned after 31st March 2022 beyond 'Wind RPO' for that year or with excess energy consumed from eligible LHPs (including PSPs), commissioned after 8th March 2019 beyond 'HPO' for that year or partly from both. Further, any shortfall in achievement of 'Wind RPO' in a particular year can be met with excess energy consumed from Hydro Power Plants, which is in excess of 'HPO' for that year and vice versa.

15. The following percentage of total energy consumed shall be solar/wind energy along with/ through storage.

F.Y.	Storage (on Energy basis)
2023-24	1.0 %
2024-25	1.5 %
2025-26	2.0 %
2026-27	2.5 %
2027-28	3.0 %
2028-29	3.5 %
2029-30	4.0 %

16. The Energy Storage Obligation in para 15 above shall be calculated in energy terms as a percentage of total consumption of electricity and shall be treated as fulfilled only when at least 85% of the total energy stored in the Energy Storage System (ESS), on an annual basis, is procured from renewable energy sources.

17. The Energy Storage Obligation to the extent of energy stored from RE sources shall be considered as a part of fulfilment of the total RPO as mentioned in para 5 above.

18. The Energy Storage Obligation shall be reviewed periodically considering the commissioning/ operation of PSP capacity, to accommodate any new promising commercially viable Energy Storage technologies and also reduction in cost of Battery Energy Storage Systems (BESS).

19. POSOCO will maintain a data related to compliance of RPO Obligations.

20. Further, the State Commissions may consider notifying RPO trajectory including HPO and Energy Storage Obligation trajectory for their respective States, over and above the RPO, HPO and Energy Storage Obligation trajectory given in para 5. Moreover, the Central Commission shall consider devising a suitable mechanism similar to Renewable Energy Certificate (REC) mechanism to facilitate fulfilment of HPO.

21. This issues with the approval of Hon'ble Minister of Power and New & Renewable Energy.

(Piyush Singh)
Joint Secretary to the Government of India
Tele No: 011-23714367

To

1. ACS/Principal Secretary/Secretary (Power/Energy), State Governments/UTs.
2. Secretary (CERC/FOR), New Delhi
3. Secretary, State Electricity Regulatory Commissions/Joint Electricity Regulatory Commissions

Copy to:

1. Secretary, MNRE, New Delhi
2. Chairperson, CEA, New Delhi

Copy also for information to;

1. PS to Hon'ble Minister for Power and NRE
2. Additional PS to Hon'ble Minister of State for Power
3. Sr. PPS to Secretary(P)/PPS to AS&FA, MoP/ PPS to AS(AT), MoP
4. PPS to All Joint Secretaries/ EA/ CE, MoP

ANNEXURE-III

No. 23/12/2016-R&R
Government of India
Ministry of Power
***

Shram Shakti Bhawan, Rafi Marg,

New Delhi, 23rd November, 2021

ORDER

Subject: Waiver of inter-state transmission charges on transmission of the electricity generated from solar and wind sources of energy under Para 6.4(6) of the Tariff Policy, 2016.

1.0 In exercise of the powers conferred under section 3(3) of Electricity Act, 2003, the Central Government notified the revised Tariff Policy on 28.01.2016.

2.0 In accordance with the Para 6.4(6) of the Tariff Policy 2016, Ministry of Power issued Order No. 23/12/2016-R&R dated 30.09.2016 on waiver of inter-state transmission charges on transmission of the electricity generated from solar and wind sources of energy. This order was amended vide orders dated 14.06.2017, 13.02.2018, 06.11.2019, 05.08.2020, 15.01.2021 and 21.06.2021.

3.0 With a view to encourage faster capacity addition based on solar or wind energy sources, in supersession of aforesaid orders and in accordance with para 6.4 (6) of the Tariff Policy, 2016 and sub-rule 12 of rule 5 of the Electricity (Transmission System Planning, Development and Recovery of Inter-State Transmission Charges) Rules, 2021, the following are notified:

3.1 For the solar, wind, Hydro PSP and BESS Projects commissioned upto 30.06.2025, the waiver of inter-state transmission charges shall be applicable for the following:

(i) Solar or wind energy generation set up by any person/entity. The power generated from such sources can be self consumed or sold to any entity either through competitive bidding, Power Exchange or through bilateral agreement.

(ii) Electricity from solar and/or wind sources used by Hydro Pumped Storage Plant (PSP) and Battery Energy Storage System (BESS) projects and subject to the following conditions:

(a) atleast 51% of the annual electricity requirement for pumping of water in the Hydro Pumped Storage Plant is met by use of electricity generated from solar and/or wind power plants.

(b) atleast 51% the annual electricity requirement for charging of the Battery Energy Storage System is met by use of electricity generated from solar and/or wind power plants.

(iii) Electricity generated / supplied from such Hydro PSP and BESS power plants as mentioned in (ii) above.

(iv) For trading of electricity generated/supplied from solar, wind and sources mentioned in (ii) and (iii) above, in Green Term Ahead Market (GTAM) and Green Day Ahead Market (GDAM) are upto 30.06.2025.

(v) For Green Hydrogen production plants commissioned upto 30.06.2025. i.e Hydrogen produced using the electricity produced from solar, wind and sources mentioned in (ii) and (iii) above. This waiver shall be applicable for a period of 8 years from the date of commissioning of such hydrogen plant.

(vi) For the power generated from solar and wind energy as per RE bundling scheme issued by Ministry of Power on 16.11.2021. Provided that the evacuation of this solar and/or wind power is being made from the main substation of the Thermal/Hydro power plant and this does not lead to any additional cost in augmentation of transmission system.

Further, no transmission charges for use of Inter State Transmission System (ISTS) shall be levied, when solar and/or wind power from power plant situated at one Thermal/Hydro Generating Station is supplying to procurers of another Generating Station, of the same Generating Company, located at a different location.

3.2 In order to have long term visibility and certainty to the renewable power generation, it is also provided that ISTS charges shall be levied for the solar, wind, Hydro PSP and BESS Projects commissioned after 30.06.2025, gradually as per following trajectory:

S.No.	Period of Commissioning	Inter-State Transmission Charges
1	01.07.2025 to 30.06.2026	25 % of the applicable ISTS charges
2	01.07.2026 to 30.06.2027	50% of the applicable ISTS charges
3	01.07.2027 to 30.06.2028	75% of the applicable ISTS charges
4	From 01.07.2028	100% of the applicable ISTS charges

4.0 The waiver shall be applicable, for a period of 25 years for solar, wind and Hydro PSP or for a period of 12 years for BESS or for a period subsequently notified for future projects by the Central Government, from the date of commissioning of the power plant.

5.0 It is also clarified that waiver is allowed for Inter-state transmission charges only and not losses. However, it is clarified that waiver of losses shall be applicable for the projects whose bidding was completed upto 15.01.2021.

6.0 This order shall be applied prospectively i.e. from the date of issue of order.

7.0 This issues with the approval of Minister for Power and NRE.

(Ghanshyam Prasad)
Joint Secretary to the Govt. of India
Tel: 2371 0389

To

Secretary, CERC, New Delhi.

Copy to:

1. Secretary, MNRE, New Delhi.
2. Chairperson, Central Electricity Authority, New Delhi.
3. Secretary in charge, Power/Energy Dept., State Governments/UTs.
4. Secretary, State Electricity Regulatory Commissions/Joint Electricity Regulatory Commissions.

Copy for information to:

1. PS to Minister for Power and NRE, APS to MoSP.
2. Joint Secretaries/Chief Engineer/Economic Adviser, Ministry of Power.
3. Sr. PPS to Secretary (Power), PPS to AS (SKGR), PPS to AS (VKD), Sr. PPS to JS (R&R)

ANNEXURE- IV

No.15/2/2016-H.I(Pt.)(230620)
Government of India
Ministry of Power
***

Shram Shakti Bhawan, New Delhi,
Dated, the 28th September, 2021

OFFICE MEMORANDUM

Subject: Budgetary Support towards Cost of Enabling Infrastructure, i.e., roads/ bridges - regarding.

1. Ministry of Power (MoP), vide OM no. 15/2/2016-H-I(Pt.)(230620) dated 08.03.2019, notified various measures approved by the Union Cabinet to promote Hydropower in the country. This included budgetary support for Enabling Infrastructure i.e., roads/ bridges for Hydropower projects on case-to-case basis. The basic objective of budgetary support for enabling infrastructure is to reduce tariff of Hydropower projects by ensuring that consumers are charged cost related to power components only. The budgetary support shall be provided for projects starting construction after 08.03.2019, i.e., date of notification. It was also mentioned that the budgetary support would be provided after appraisal/approval of each project by PIB/ CCEA as per the extant rules/due process and would be provided by MoP through its budgetary grants. The limit of this budgetary support for such roads and bridges would be i) Rs. 1.5 crore per MW for projects upto 200 MW and ii) Rs. 1.0 crore per MW for projects above 200 MW.

2. **Eligibility for Budgetary Support towards Cost of Enabling Infrastructure**

i. All large Hydropower projects (above 25 MW capacity) including Pumped Storage Projects (PSPs), concurred either by Central Electricity Authority (CEA) or the State Government, wherein Letter of Award (LoA) for the first major works package (Dam/ HRT/ Power House etc.) is issued after 08.03.2019, shall be eligible for budgetary support towards Cost of Enabling Infrastructure.

ii. All Roads and Bridges required to connect major components like Dam, Power House, Adits, Surge shaft, Pressure Shaft, TRT, etc. of the project to the nearest

State/ National Highway including any strengthening/ widening works shall be considered eligible for budgetary support. However, these roads/ bridges would exclude the works, for which either the Letter of Award have been issued or are currently under implementation by any Central/ State Agency like NHAI, BRO, PWD, SRRDA, RWD, PWD (Roads), REO(Rural Engineering Organisation) etc. or Central Schemes like PMGSY (Pradhan Mantri Gram Sadak Yojna), MGNREGA or State specific schemes like Mukya Mantri Sadak Yojana etc.

iii. Cost of roads and bridges normally covered under head "R-Communications" in the concurred DPR including the following related costs shall be eligible for release as budgetary support:

a. Land acquisition cost
b. All statutory taxes/ levies, duties, cess, etc.

The specifications/ requirements like carrying capacity, turning radius, vertical clearance, width and gradient etc. of the roads/ bridges shall be as per concurred DPR.

3. The grant of Budgetary Support for the 'Enabling Infrastructure' shall be in the form of 'Reimbursement' after achievement of milestones mentioned in succeeding paragraphs related to the construction of project.

4. This OM shall be applicable to all eligible hydro projects i) wherein tariff is determined by CERC/ SERC under Section 62 of the Electricity Act 2003, ii) tariff is determined through competitive bidding under Section 63 of the Electricity Act 2003 iii) projects developed by agencies like BBMB which do not approach CERC/SERC for tariff determination/ adoption.

5. **'In-principle' approval of Ministry of Power for Grant of Budgetary Support**

The procedure for obtaining 'In-principle' approval of Ministry of Power for grant of budgetary support for 'Enabling infrastructure' prior to commencement of construction is given below:

a. After the DPR is concurred by CEA/ State Govt., the developer shall submit an application for 'in-principle' approval of budgetary support to CEA in the specified format **(Annexure-I)**. For DPRs concurred before the issue of these guidelines, the developer shall submit the updated cost of Enabling Infrastructure (based on indexation issued by CWC) in the application for 'in-principle' approval.

b. CEA shall examine applications received in consultation with CWC and forward its recommendations in the specified format **(Annexure-II)** to Ministry of

Power within one month of the end of the quarter in which application is received.

c. Ministry of Power shall issue 'in-principle' approval for Budgetary Support in the specified format **(Annexure-III)** to the Developer after receiving recommendations from CEA.

The 'in-principle' approval by Ministry of Power would be only for the purpose of facilitating financial closure, etc. of projects from Banks/ FIs and will not create any obligation or commitment on part of Government to provide Budgetary Support subsequently till all the conditions for grant of the same are satisfied.

6. Procedure for Release of Grant towards Budgetary Support

The grant of Budgetary Support for the 'Enabling Infrastructure' shall be provided to the developer in the form of 'Reimbursement' as per the following procedure:

i. After achievement of 25% financial progress w. r. t. approved / original project cost, the Developer shall submit the application in the specified format **(Annexure–IV)** to CEA for Reimbursement of Budgetary Support towards Enabling Infrastructure.

ii. The developer shall submit a Bank Guarantee in specified format **(Annexure-V)** to the CEA for an amount equivalent to eligible Budgetary Support (or the Support requested whichever is less) with validity period up to the date of determination of tariff by the regulatory commission. Ministry of Power may encash the Bank Guarantee, in part or full, upon the recommendation of CEA, in cases where (a) the project is delayed by more than two years beyond the scheduled commissioning date excluding any delays attributable to force majeure conditions and (b) in cases where the funds are found being used/ diverted for works other than those related to enabling infrastructure. CEA shall maintain a proper account of the Bank Guarantee and shall be the custodian of such Bank Guarantee.

iii. The developer shall submit verification records viz., auditor's certificate, self-certification, etc. along with the application as specified in para 6 (i) above in support of his claim for release of Grant.

iv CEA shall examine the applications received during each quarter in consultation with CWC and forward its recommendations in the given format **(Annexure-VI)** to Ministry of Power within one month of end of each quarter.

v On receiving recommendation from CEA, Ministry of Power shall process and obtain the approval of the competent authority for grant as per delegation of powers and General Financial Rules issued by Ministry of Finance, GoI which would be released through budgetary Provisions of Ministry of Power.

vi The Grant shall be limited to the amount as per "In-Principle' approval or the actual expenditure incurred on Enabling Infrastructure whichever is lower under the overall ceilings mentioned in para 1 above.

7. The physical progress of the enabling infrastructure works of each of the projects shall be monitored by a Monitoring Committee to be constituted by CEA and a Status Report, in this regard, shall be submitted to MoP on quarterly basis.

8. By 15th July of every year, the CEA shall send Estimates for Annual Budgetary Grants for the next financial year to Ministry of Power. These budgetary estimates would be based on projects scheduled for completion of milestone, as specified in para 6 above, during the next year.

9. A Report on the 'In-principle' approvals granted and Budgetary Support released during the year shall be sent by CEA to Ministry of Power every year by 31st May.

10. If ownership of the project changes before the commissioning of the project, MoP and CEA would be duly informed within three (03) months of such change.

11. This issues with the approval of Hon'ble Minister for Power.

29/9/21.

(Raghuraj Rajendran)
Joint Secretary

To:

1. **Principal Secretary/Secretary (Power / Energy), State Governments/UTs.**
2. **Secretary, CERC/FOR, Chanderlok Building, Janpath, New Delhi**
3. **Secretary, State Electricity Regulatory Commissions/Joint Electricity Regulatory Commissions**

Copy to:

1. **Secretary, MNRE, CGO Complex, New Delhi**
2. **Secretary, Ministry of Jal Shakti**
3. **Chairperson, CEA, Sewa Bhawan, RK Puram, New Delhi**
4. **Chairperson, CWC, RK Puram, New Delhi**

Copy also for information to:

1. **PS to Hon'ble Minister of Power/ Ps to Hon'ble Minister of State for Power.**
2. **Sr. PPS to Secretary (Power)/ Sr.PPS to AS&FA/ PPS to AS(Hydro)/ PPS to JS(Hydro)**
3. **PPS/Ps to All Joint Secretaries/Directors/Deputy Secretaries in the Ministry of Power.**

Annexure-C.3

POWER SYSTEM DEVELOPMENT FUND

Status of the Projects in Eastern Region

Sl No	State	Entity	Name of the scheme	Grant Approved	Grant sanctioned on	1st Installment grant released on	Completion Schedule	Completion schedule w.r.t date of 1st instalment	Grant aviled so far	Under process of release	Total awards amount of placed of till date	Latest status
1	**Bihar**	**BSPTCL**	Renovation and Upgradation of protection system of substations. (18)	64.22			24		56.04		69.195	90% grant availed on award cost.
2			Installation of Capacitor bank in 20 Nos of Grid Sub Station. (74)	19.40			24		18.62		21.55	
			Total	**83.10**					**73.03**		**90.745**	
5	**Jharkhand**	**JUSNL**	Renovation & Upradation of protection system of Jharkhnad. (161)	138.13	15-Nov-17	28-Mar-19	16	28-Jul-20	114.68	1.01	145.674	Project Completed.
6			Reliable Communication & data acquisition system upto 132kV Substations ER. (177)	22.36	24-May-19		24					Price bid has been opened. Tender on awarding stage.
			Total	**160.49**					**114.68**		**145.674**	
7	**Odisha**	**OPTCL**	Renovation and Upgradation of protection system of substaions. (08)	162.50	11-May-15	22-Mar-16	24	22-Mar-18	46.04		63.31	Project Completed on Dec-20. Request for release of final 10 % fund has been placed.
8			Implementation of OPGW based reliable communication at 132 kv and above substations. (128)	25.61	15-Nov-17	29-Mar-19	36	29-Mar-22	23.04		51.22	90% grant availed on award cost. Work In Progress
9			Installation of 125 MVAR Bus Reactor along with construction of associated by each at 400kV Grid S/S of Mendhasal, Meramundali & New Duburi for VAR control & stabilisation of system voltage. (179)	27.23	27-Jul-18	1-Apr-19	18	1-Oct-20	8.17		24.5	90% grant availed . Rest work in progress
10			Implementation of Automatic Demand Management System (ADMS) in SLDC, Odisha. (196)	2.93	24-May-19	19-Feb-20	10	19-Dec-20	0.713		0.713	30% grant availed. Work in Progress.
11			Protection Upgradation and installation os Substation Automatic System (SAS) for seven nos of 220/132/33kV Substations (Balasore, Bidanasi, Budhipadar, Katapali, Narendrapur, New-Bolangir & Paradeep). (209)	29.56	24-May-19	13-Feb-20	18	13-Aug-21	8.87		32.85	30% grant availed. Work in Progress.
12		**OHPCL**	Renovation and Upgradation of protection and control system of OHPC. (109)	22.35	22-May-17	25-May-18	24	25-May-20	14.94		21.25	90% grant availed on award cost.
			Total	**270.18**					**101.35**		**193.42**	
14	**West Bengal**	**WBSETCL**	Installation of switchable reactor & shunt capacitor for voltage improvement. (88)	43.37	22-May-17	22-Jun-18	19	22-Jan-20	33.07		40.83	90% grant availed on award cost. Will get completed by Oct'21
15			Renovation & Modernisation of Transmission System. (87)	70.13	22-May-17	25-Jun-18	25	25-Jul-20	63.12		96.44	90% grant availed on award cost. Will get completed by Mar'22
16			Installation of Bus Reactors at different 400kV Substation within the state of West Bengal for reactive power management of the Grid. (210)	71.74	24-May-19	23-Oct-19	19	23-May-21	39.3		45.62	30% grant availed on award cost. 04 Nos. of Reactors will be commissioned by December 2021. LoA of the 5th Reactor is yet to be placed.
17			Project for establishment of reliable communication and data acquisition at different substation at WBSWTCL. (222)	31.19	24-May-19	23-Oct-19	25	23-Nov-21	3.12			The tender has been been cancelled for OPGW. Re-tendering has to be done.
18			Implementation of Integated system for Scheduling, Accounting, Metering and Settlement of Transactions (SAMAST) system in West Bengal. (197)	10.08	43910		12					10% grant not yet requested
19		**WBPDCL**	Renovation and Modernization of 220/ 132 kV STPS switch yard and implementation of Substaion Automation System. (72)	23.48	5-Sep-16	18-May-17	18	18-Nov-18	21.13		32.09	Project Completed
21			Renovation and Modernization of switchyard and related protection system of different power stations (BTPS, BKTPS and KTPS) of WBPDCL (155)	45.16	27-Jul-18	27-Mar-19	12	27-Mar-20	34.52		41.68	Project Completed.
			Total	**295.15**					**194.26**		**256.661**	

POWER SYSTEM DEVELOPMENT FUND												
Status of the Projects in Eastern Region												
Sl No	**State**	**Entity**	**Name of the scheme**	**Grant Approved**	**Grant sanctioned on**	**1st Installment grant released on**	**Completion Schedule**	**Completion schedule w.r.t date of 1st instalment**	**Grant aviled so far**	**Under process of release**	**Total awards amount of placed of till date**	**Latest status**
22	**DVC**	**DVC**	Renovation and Upgradation of the protection and control system of Ramgarh Sub Station. (81)	25.96	2-Jan-17	31-May-17	24	31-May-19	22.95	2.57	28.603	Project Completed.
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)	140.50	16-May-17	14-Dec-17	24	14-Dec-19	102.43	0.98	127.684	
			Total	**166.46**					**125.38**		**156.287**	
24	**Sikkim**	**ENPD, Sikkim**	Drawing of optical ground wire (OPGW) cables on existing 132kV & 66kV transmission lines and integration of leftover substations with State Load Despatch Centre, Sikkim. (173)	10.00	24-May-19		18		3.00		20	30% grant availed on award cost
				10.00					**3.00**		**20.00**	
26	**ERPC**	**ERPC**	Creation and Maintenance of web based protection database management. (67)	20.00	17-Mar-16	28-Jun-16	18	28-Dec-17	14.83		16.48	Project Completed
27			Study Programme on power trading at NORD POOL Academy for Power System Engineers of Eastern Region. (122)	5.46	27-Jul-18	27-Mar-19	13	27-Apr-20	4.61		5.37	
28			Traning Program for Power system Engineers of various constituents of Eastern Region. (117)	0.61	27-Jul-18	11-Apr-19	24	11-Apr-21	0.54		0.60888	90% grant availed on award cost.
			Total	**26.07**					**19.98**		**22.45888**	
			GrandTotal	**1,011.46**					**631.68**		**885.25**	

Annexure D.1

Updated Anticipated Peak Demand (in MW) of ER & its constituents for May 2023

1	BIHAR	Demand (MW)	Energy Requirement (MU)
	NET MAX DEMAND	7414	4141
	NET POWER AVAILABILITY- Own Sources	554	311
	Central Sector+Bi-Lateral	7063	4292
	SURPLUS(+)/DEFICIT(-)	203	462
2	JHARKHAND		
	NET MAXIMUM DEMAND	2000	1152
	NET POWER AVAILABILITY- Own Source	351	212
	Central Sector+Bi-Lateral+IPP	915	648
	SURPLUS(+)/DEFICIT(-)	-944	-293
3	DVC		
	NET MAXIMUM DEMAND	3347	2314
	NET POWER AVAILABILITY- Own Source	6065	3822
	Central Sector+MPL	380	251
	Bi- lateral export by DVC	2189	1456
	SURPLUS(+)/DEFICIT(-) AFTER EXPORT	909	303
4	ODISHA		
	NET MAXIMUM DEMAND (OWN)	6000	3905
	NET MAXIMUM DEMAND (In Case of CPP Drawal)	6629	3235
	NET POWER AVAILABILITY- Own Source	3958	2168
	Central Sector	1942	1317
	SURPLUS(+)/DEFICIT(-) (OWN)	-100	-420
	SURPLUS(+)/DEFICIT(-) (In Case, 600 MW CPP Drawal)	-729	250
5	WEST BENGAL		
5.	WBSEDCL		
	NET MAXIMUM DEMAND	7023	4466
	NET MAXIMUM DEMAND (Incl. Sikkim)	7028	4470
	NET POWER AVAILABILITY- Own Source (Incl. DPL)	5422	2902
	Central Sector+Bi-lateral+IPP&CPP+TLDP	2681	1625
	EXPORT (To SIKKIM)	5	4
	SURPLUS(+)/DEFICIT(-) AFTER EXPORT	1075	57
5.	CESC		

	NET MAXIMUM DEMAND	2240	1118
	NET POWER AVAILABILITY- Own Source	830	559
	IMPORT FROM HEL	540	379
	TOTAL AVAILABILITY OF CESC	1370	938
	DEFICIT(-) for Import	-610	-180
	WEST BENGAL (WBSEDCL+CESC+IPCL)		
	(excluding DVC's supply to WBSEDCL's command area)		
	NET MAXIMUM DEMAND	9263	5584
	NET POWER AVAILABILITY- Own Source	6252	3461
	CS SHARE+BILATERAL+IPP/CPP+TLDP+HEL	3221	2004
	SURPLUS(+)/DEFICIT(-) BEFORE WBSEDCL'S EXPORT	210	-119
	SURPLUS(+)/DEFICIT(-) AFTER WBSEDCL'S EXPORT	205	-123
6	SIKKIM		
	NET MAXIMUM DEMAND	108	50
	NET POWER AVAILABILITY- Own Source	8	1
	Central Sector	81	50
	SURPLUS(+)/DEFICIT(-)	-19	1
	EASTERN REGION		
	NET MAXIMUM DEMAND	27581	17146
	NET MAXIMUM DEMAND (In Case of CPP Drawal of Odisha)	28197	16476
	BILATERAL EXPORT BY DVC (Incl. Bangladesh)	2189	1456
	EXPORT BY WBSEDCL TO SIKKIM	5	4
	EXPORT TO B'DESH & NEPAL OTHER THAN DVC	642	478
	NET TOTAL POWER AVAILABILITY OF ER	28602	17081
	(INCLUDING CS ALLOCATION +BILATERAL+IPP/CPP+HEL)		
	SURPLUS(+)/DEFICIT(-)	1017	-69
	SURPLUS(+)/DEFICIT(-) (In Case, 600 MW CPP Drawal of Odisha)	400	601