GOVERNMENT OF INDIA

MINISTRY OF POWER

Eastern Regional Power Committee

AGENDA

FOR

55TH TCC MEETING

DATE: 16.12.2025

TIME: 10:00 HRS

MAYFAIR HIMALAYAN SPA RESORT, KALIMPONG

Contents

Eastern Regional Power Committee, Kolkata
AGENDA FOR 55th TCC MEETING
Date: 16th December, 2025(Tuesday) at 10:00 Hrs Mayfair Himalayan Spa Resort, Kalimpong

1. PART-A: CONFIRMATION OF MINUTES

1.1. Confirmation of Minutes of 54th TCC Meeting held physically at Chennai, Tamilnadu 23rd June, 2025(Monday).

The minutes of 54th TCC Meeting held on 23.06.2025 was circulated vide letter dated 18.07.2025.

Members may confirm the minutes of 54th TCC Meeting.

2. PART-B: ITEMS FOR DISCUSSION

2.1 Items for follow up

a) Urgent Review of Phase I Compliance for CEA Flexible Operation Regulations, 2023: ERPC

CEA has issued a gazette notification dated January 30, 2023, regarding flexible operation of coal-fired generating units.

As per CEA gazette notification extraordinary, part III, section 4, no. 61 (CG-DL-E-31012023-243299) , the coal-based power generating units shall have flexible operation capability with minimum power level of 55%. This capability includes a ramp rate of 2% between 55%-70% and a ramp rate of 3% above 70%. This capability was mandated within one year of the notification, i.e., by Jan 2024. Further, the regulation mandates that generating units not capable of achieving a minimum power level of 40% shall achieve the same as per the phasing plan (Attached as **Annexure B.2.1.a**).

It may be noted that CEA's flexible operation regulations were notified after successful pilot test/study conducted across the country in association with international partners and BHEL.
In this regard, it is pertinent to mention that 91 Units of total installed Capacity 51,080 MW in aggregate of various thermal power plants have been notified under Phase I (July 2024 – June 2026) for operation at 40% MTL (Minimum Technical Load). These units are required to carry out the necessary retrofitting/modifications as recommended by the respective OEMs so as to be fully prepared for sustained operation at 40% MTL by June 2026 , as mandated under the provisions of the aforesaid Regulations.

It may also be noted that successful and sustained operation at 40% MTL with Indian coal has been demonstrated by other generating utilities (Under Pilot Phase) such as West Bengal Power Development Corporation Limited (WBPDCL) at Sagardighi Unit-8

and Damodar Valley Corporation (DVC) at Mejia Unit-8, following suitable retrofits as advised by the OEMs.

Further, in order to compensate the losses on account of flexible operation, CERC has already incorporated most of the recommendations of CEA's compensation methodology such as for additional Capex, oil consumption, additional auxiliary power consumption, and heat rate degradation.

Therefore, all generating utilities are requested to complete the retrofit, control system tuning, trial runs etc. of all units under Phase I by June 2026 in consultation with the OEM positively.

It is also requested to furnish the progress and updates (as per attached format) of First Phase units by the end of November 2025 and thereafter every month.

DVC & IBEUL may update. Members may discuss.

b) Provision for Reliable Power Evacuation from NKSTPP

Vide 227th OCC dated 26.05.25: Presently, only the 400 KV D/C Chandwa line is available for power evacuation from NKSTPP, as the 400 KV NKSTPP–Gaya D/C line is still under construction.

• As per the system study conducted by ERLDC for power evacuation, in the scenario where all three units at NKSTPP are operational, stable operation is possible only up to 1700 MW in the event of a trip or shutdown of one circuit of the 400 kV D/C Chandwa line.

• The second evacuation corridor i.e. the 400 kV NKSTPP–Gaya D/C line, is under construction and is being expedited by M/s NKTL.

Deliberation in the 54th TCC meeting:

➢ NTPC updated that 5 foundations and 20 tower erections are yet to be completed and the work is expected to be completed by Dec, 2025.

➢ TCC opined that in case of delaying in bring the line into operation, such project could attract Commercial implication on NKTL.

➢ Since there was no representative from NKTL, the forum advised ERPC Secretariat to issue a letter to NKTL for regular updation of the status of the transmission line and requested all the concern utilities viz. Jharkhand & Bihar to facilitate for addressing issues regarding RoW & forest clearance.

In 230th OCC Meeting, NTPC updated that in Jharkhand portion foundation work of 205 out of 207 towers and stringing work in 15 KM out of 71 KM is finished and in the Bihar portion, the work is almost complete.

As per latest information received from NKTL, Construction of 400 kV NKSTPP–Gaya D/C line has been completed but due to some pending issues at NTPC & PowerGrid end line could not be charged. (**Annexure B.2.1.b**)

NKTL may update. Members may discuss.

c) IB Valley TPS Islanding Scheme: OPTCL

IB valley TPS Islanding scheme has also been put on hold for long time. The status regarding the same has been sought on urgent basis by Ministry of Power (Govt of India). 229th OCC Decision:

➢ OCC advised ERLDC to conduct the dynamic studies of the OPGC network at the earliest in association with SLDC Odisha and OPGC.

➢ OCC advised OPTCL to prepare the DPR after the completion of dynamic studies. ERLDC has done dynamic study of the proposed islanding scheme, and one online meeting was arranged on 19.08.25 to discuss about the study result, where SLDC Odisha, OPGC (IB Thermal) & OPTCL were present.

In 233rd OCC Meeting,

OPTCL updated that DPR i.r.o IB Valley TPS Islanding Scheme is not yet prepared and the proposed scheme is under review of Director, OPTCL.

➢ OCC took a serious note on slow progress in implementation of IB Valley TPS Islanding Scheme since this scheme has been pursued by ERPC since last five months.

➢ OCC advised OPTCL to highlight the importance of IB Valley TPS Islanding Scheme at the appropriate level and revert back within fortnight of December and the matter is referred to TCC for detailed deliberations.

SLDC, Odisha may update. Members may discuss.

d) Intrastate Transmission Network Assessment & Mitigation-Odisha

As deliberated in 231st OCC meeting held on 22.09.2025, OPTCL and SLDC Odisha were directed to submit actions taken report i.r.o. near miss event in Odisha on 12th August 2025 and constitute the committee as recommended earlier, comprising of members of ERPC, ERLDC, SLDC, & OPTCL to review the protection settings and the short-term/long-term measures as suggested by ERLDC.

OCC also advised SLDC Odisha to obtain approval from appropriate authority for implementation of UVLS scheme proposed for safeguarding the load of capital city and nearby areas from cascaded failure.

In 232nd OCC meeting,

OCC advised Odisha SLDC to obtain approval from the appropriate authorities for the implementation of the UVLS scheme so that the proposed scheme may be implemented at the earliest.

Update:

The action taken report is yet to be received from OPTCL and SLDC Odisha. Any communication related to approval from appropriate authority is yet to be received from SLDC.

In 233rd OCC Meeting,

OPTCL informed that UVLS scheme is still purview of their higher management and if any progress is made, the same shall be communicated to ERPC/ERLDC.

- OCC took a serious note on the inordinate delay in decision making in the implementation of UVLS scheme as a contingency measure, considering the growing demand and increased congestion in the Odisha system.
- OCC further advised OPTCL to pursue the issue with their higher management with utmost priority and the matter was referred to TCC for detailed deliberations.

OPTCL & Odisha SLDC may update. Members may discuss.

e) Intrastate Transmission Network Assessment & Mitigation – West Bengal

Modification of Existing SPS Scheme at Subhasgram (PG) with Undervoltage Logic

ERLDC Proposed modification of existing SPS at Subhasgram (PG) to include undervoltage logic with time delay to prevent voltage collapse. OCC advised SLDC, West Bengal, WBSEDCL and CESC to meet after puja for discussing the proposed modified SPS scheme at Subhasgram and share the outcome in next OCC.

232nd OCC decision:

State-level meeting already done by SLDC as updated in 232nd OCC meeting.

OCC advised WBSLDC to finalize the UVLS scheme by carrying out a joint study and present the same in the next OCC.

In 233rd OCC meeting,

WBSLDC updated that joint study meeting is yet to be conducted with CESC & WBSEDCL and the same shall be duly shared with ERPC & ERLDC.

Latest update:

A physical meeting was held at POWERGRID ER-II RHQ on 08.12.2025 to discuss the modification of the existing SPS at Subhasgram (PG) by incorporating an under-voltage logic with time delay to prevent voltage collapse in and around the South Bengal network of West Bengal. Representatives from WB SLDC, CESC, WBSEDCL, POWERGRID, and ERLDC attended the meeting.

It was agreed that 200 MW of the 350 MW load presently under the existing SPS at Subhasgram (PG) will be integrated into the under-voltage load relief scheme as Stage-1. Provision for an additional 150 MW load as Stage-2 will be kept for future incorporation, based on actual system conditions during the upcoming summer.

It was further deliberated that the revised SPS scheme shall be implemented only after commissioning of the 6th ICT at Subhasgram (PG), which is currently under the commissioning stage and is tentatively expected to be completed between 15–25 January 2026

WBSLDC may update. Members may discuss.

f) Bus split operationalization at NTPC Kahalgaon: ERPC

As decided in 219th OCC Meeting, a committee comprising of members from ERPC and ERLDC visited NTPC Kahalgaon on 17-10-2024 to assess the status of Bus splitting at 400kV level and way forward for operationalization of 400 KV Bus sectionalizer.

Following works need to be done to complete the installation of ICT 3 & 4:
1. Determination of underground cable conduit path for 400/132 kV ICT-3, 4 and 5 allocated for stage 2 supply.
2. Excavating the existing cable and relaying from Stage-1 132kV to New Stage-2 132kV switchyard, where ICT 3 & 4 will be connected.
3. Laying of additional 22.8 ckt. km control cable for STs.
4. Jumpering of ICTs in 132kV & 400kV level.
5. Bay equipment testing.

In 54th TCC meeting:
As the issue is long pending, TCC sought a firm timeline from NTPC for its completion.
- NTPC informed that the delay was caused by the intermittent rain and failure of a 132 kV power cable.
- He updated that to expedite the process, NTPC approached Bihar for providing the cable jointing kit. Bihar agreed to supply the required kit within a week and accordingly, the work is expected to be completed by August 2025.
- TCC advised NTPC to strictly adhere to the timeline and implement the bus splitting scheme at Kahalgaon within Aug-2025.

In 229th OCC Meeting,
NTPC informed that 132 kV cable joining kit has been received from BSPTCL and as per the present work progress, KSTPP ICT 3 charging will be done by 15.08.2025.
• The expected bus splitting operationalization was expected to be completed by Oct, 2025.
NTPC may update. Members may discuss.

g) Upgradation of 220kV Network in Kolkata Region: WBSETCL

Vide 217th OCC dated 24.07.24 Due to persistent N-1 violation, Upgradation of these 220 KV feeders to be planned:
- 220kV Subhasgram (WB)-Lakshmikantpur D/C
- 220 kV Jeerat-Barasat D/C
- 220 kV Barasat-Kasba D/C

In 229th OCC Meeting, WBSETCL updated that the approval for PSDF grant has not yet been received.
They also apprised that only the following lines have been listed for upgradation.
✓ 220 kV Jeerat-Barasat D/C
✓ 220 kV Barasat-Kasba D/C

✓ 220 kV Subhasgram-Kasba

✓220KV Kolaghat-Foodpark

✓ 220KV Foodpark-Jangalpur

OCC advised WBSETCL to expedite the upgradation work of above lines since it has already been delayed by more than 2 years and in case PSDF grant is not possible then other avenues of funding maybe explored since the loading of the above lines are going to be critical in the coming summer months.

WBSETCL may update. Members may discuss.

h) Review of AUFLS in Eastern Region: SCADA Integration & Data Updation: ERPC

Based on the recommendation and decisions in 14th NPC meeting held on 05.02.24, 214th OCC meeting and special meeting on 10.07.2024, a load relief quantum of 6916MW was finalized for Eastern Region. UFR Feeders real time monitoring has been discussed in NPC as well as various fora of ERPC.

Further, with new IEGC 2023 the same has been mandated as quoted below: IEGC 2023, Clause 13.d: "SLDC shall ensure that telemetered data of feeders (MW power flow in real time and circuit breaker status) on which UFR and df/dt relays are installed is available at its control centre. SLDC shall monitor the combined load in MW of these feeders at all times.

SLDC shall share the above data with the respective RLDC in real time and submit a monthly exception report to the respective RPC. RLDC shall inform SLDCs as well as the concerned RPC on a quarterly basis, durations during the quarter when the combined load in MW of these feeders was below the level considered while designing the UFR scheme by the RPC. SLDC shall take corrective measures within a reasonable period and inform the respective RLDC and RPC, failing which suitable action may be initiated by the respective RPC."

The UFR integration work is pending with Bihar, Jharkhand & Sikkim. Besides, the SCADA integration and data availability of the UFR feeders is very low and needs immediate attention by the states. I.r.o significance of healthy AUFLS, it is pertinent to mention that grid frequency had dipped to 49.42 Hz (on verge of stage-I of AUFLS) due to sustained overdrawl by some ER states. A list is prepared highlighting present status of UFR feeders and presented below:

Constituent	Stage	Quantum Approved in MW	Quantum Installed in MW	Installation Pending MW
JUSNL	Stage 1	87	87	0
	Stage 2	105	111	-6
	Stage 3	122	98	24

	Stage 4	122	10	112
	Total	**436**	307	129
BSPTCL	**Stage 1**	315	304	11
	Stage 2	379	373	6
	Stage 3	442	384	58
	Stage 4	442	406	36
	Total	**1578**	1467	**111**
ODISHA	**Stage 1**	306	316	-10
	Stage 2	367	354	13
	Stage 3	428	334	94
	Stage 4	428	364	64
	Total	**1529**	1368	**161**
West Bengal (WBSEDCL)	**Stage 1**	377	440	-63
	Stage 2	457	434	23
	Stage 3	536	552	-16
	Stage 4	536	555	-18.5
West Bengal (CESC)	**Stage 1**	120	120	0
	Stage 2	140	140	0
	Stage 3	160	160	0
	Stage 4	160	160	0
	Total	**2486**	2561	
DVC	**Stage 1**	172	173	-1
	Stage 2	207	209	-2
	Stage 3	241	242	-1
	Stage 4	241	239	2
	Total	**861**	864	
Sikkim	**Stage 1**	5	0	5
	Stage 2	6	0	6
	Stage 3	7	0	7
	Stage 4	7	0	7
	Total	25	0	25
	TOTAL	**6915**	6565	350

All STUs are also requested to update UFR testing & SCADA Integration status.

i) Replacement of CLR insulators of PMJTL lines: ERPC

In 229th OCC meeting, Powergrid submitted:

• Insulator failure in the 400 kV line is mainly due to insulator flashover and in the 765 kV line due to breakdown of insulator FRP rod.

• Following is the breakup of insulators installed in the PMJTL line:

kV	Insulators	Decan insulators	Identified defective Decan insulators	Defective insulator replaced
765	58092	17795	1082	1044
400	16162	10273	3619	3500
Total	74254	28068	4701	4544

• Long term planning: Replacement of balance Decan insulators (excluding the already replaced and identified defective ones) will be completed by Feb'26 for 400 kV lines and by Oct'26 for 765 kV lines.

• OCC took a serious note of the repeated failures of CLR insulators in the above-mentioned lines jeopardizing the critical power corridor of Kolkata.

• OCC advised Powergrid that Deccan make insulators being installed as replacement may be tested by any certified testing agency like CPRI to ensure its reliability and the testing certificate maybe shared with ERPC.

PMJTL/Powergrid may update. Member may discuss.

j) Additional Items for follow up

<table>
<tr><td>Sl No</td><td>Issues</td><td>Decision taken in ERPC</td></tr>
<tr><td>1</td><td>Spare Reactor procurement under Eastern Regional Pool as per CEA norms</td><td>In 52nd ERPC meeting, estimated expenditure of Rs. 55.67 Crores (exclusive of GST but including transportation cost) was concurred towards procurement of spare reactors in ER pool by Powergrid ER-II as per CEA spare norms.
<table>
<tr><td>STATE</td><td>VOLTAGE</td><td>SIZE</td><td>STORAGE PLACE</td></tr>
<tr><td rowspan="2">WEST BENGAL</td><td rowspan="2">400 KV</td><td>125 MVAR</td><td>DURGAPUR SS</td></tr>
<tr><td>80 MVAR</td><td>BINAGURI SS</td></tr>
<tr><td>SIKKIM</td><td>220 KV</td><td>31.5 MVAR</td><td>NEW MELLI SS</td></tr>
<tr><td>JHARKHAND</td><td>400 KV</td><td>125 MVAR</td><td>NEW RANCHI SS</td></tr>
<tr><td>ODHISSA</td><td>400 KV</td><td>63 MVAR</td><td>ROURKELLA SS</td></tr>
</table>
In 53rd TCC Meeting, Powergrid updated that</td></tr>
</table>

		▪ Cost estimate towards procurement of approved spare reactors of different capacity has been prepared and proposal is under approval. ▪ LOA is expected by May'25. In 54th TCC meeting, Powergrid intimated that the tender evaluation is on progress. **POWERGRID may update the current status.**
2	**Sharing AMR system application web client access with Utilities-pilot testing / roll out for WBSETCL Utility: POWERGRID ER- II**	In 54th TCC meeting, PowerGrid apprised that AMR network of ER has been successfully updated to layer3/layer 4 and project has gone live on 18.06.2025. It was further informed that pilot testing of AMR data sharing for 59 meters in WB control area shall be carried out and subsequently the same shall be done for other state SLDCs as well. The total cost of the completion of this project is Rs. 1,03,07,428/- the excluding taxes and including HW/SW and application development and it was further proposed that PowerGrid should charge 15% consultancy charges post completion of the project. TCC concurred the proposal of Powergrid with the cost implications of 1,03,07,428 without taxes and consultation charges of 15% will be implied after completion. TCC directed the Powergrid to complete the Pilot testing for WB system. **POWERGRID may update the current status.**
3	**Update on Reconductoring of ISTS lines under Eastern Region Expansion Scheme-44**	In 230th OCC meeting, PowerGrid informed that the reconductoring of Chuka Transmission System involves significant financial implications. As such, the Letter of Award (LOA) will be issued after the approval of the POWERGRID Board, the meeting for which is tentatively scheduled for the end of August 2025. Additionally, PowerGrid apprised that once the LOA is awarded, the reconductoring work of the Malda–Gazole section (18 km) will commence. The work is planned to be completed by the end of the

		upcoming winter, as the line is heavily loaded during the summer season. **POWERGRID may update the current status.**
4	**Update on Restoration of 132kV Rangit Kurseong & 132kV Siliguri Melli Rangpo lines**	In 230th OCC Meeting, PowerGrid updated that the said 132KV lines are charged through newly erected tower at location 126 however at location 126, these lines are on stays. The pending restoration work shall be resumed after Durga Puja, during winter period. **POWERGRID may update the current status.**
5	**Status of DTL for Ind Barath TPP**	In 228th OCC meeting during discussion of challenges in intra-state network in Odisha system, Odisha representative highlighted the delay in DTL of Ind-Barath TPP and advised for early completion of the line. JSWEUL may update the present status. In 54th TCC meeting, JSW informed that the original proposal of 4 towers has been modified to one having 12 towers due to objections from MCL. The revised proposal has been agreed upon by MCL and is forwarded to Ministry of Coal for approval. Once approval will be granted, JSW has assured that the construction of the transmission line will be completed within 3 to 4 months. TCC advised JSW for expediting the construction of the transmission line and has referred the matter to ERPC for information. **IBEUL may update. Members may discuss.**

2.2 Reconductoring of 400KV Talcher-Meramundali and 400KV Farakka-Kahalgaon D/C

400kV Farakka-Kahalgaon D/C and 400kV Talcher-Meramundali D/C transmission corridors are critical for power import to West Bengal and Odisha, respectively. During recent summers, these lines have experienced high power flows nearing their thermal limits. To address this, reconductoring with HTLS conductors has been approved under ERES-43 scheme with SCOD of 02.03.2026.

POWERGRID has been entrusted with executing this reconductoring work under RTM. As demand remains lower between November and February due to favourable weather condition, it was discussed that the reconductoring work for both lines need to be completed by February 2026 to ensure reliable power supply.

In 233rd OCC Meeting:

Reconductoring of 400KV Talcher-Meramundali D/C

ERLDC informed that a special meeting was convened on 18th Nov 2025 via online mode (MS Teams) to discuss reconductoring plan of 400kV Talcher-Meramundali D/C. The minutes of the meeting is attached in **Annexure B.2.2.1**

- ERLDC further updated that LILO portion of Talcher-Meramundali Ckt-2 (17.158 KM) has already been taken under shutdown from 21st November 2025 by PG Odisha.
- POWERGRID informed that reconductoring of 400KV Talcher-Meramundali#1 will commence from 21st Dec 2025 after completion of ongoing reconductoring of LILO portion and it is expected that reconductoring of the said line will be completed by end of January 2026.
- OCC advised POWERGRID to complete the reconductoring of LILO part by 20th Dec'25 and instructed to start the work of 400KV Talcher-Meramundali circuit-1 from 21st Dec 2025 and complete by 5th Feb'26 and strictly adhere to the agreed time lines.
- OCC also advised POWERGRID to submit progress report on weekly basis and share all revised supply schedule and execution details to ERPC/ERLDC.

Latest update:

Weekly progress report shared by PowerGrid is attached in ***Annexure B.2.2.2.***

b) **Reconductoring of 400KV Farakka-Kahalgaon D/C**

POWERGRID submitted that Line shutdown earlier planned from 20.11.25 could not be taken up due to non-availability of material. Material expected to reach by last week of Nov'25.

- PG ER1 also informed that outage 400KV Farakka-Kahalgaon#1 required for 2 months starting 1st week of Dec'25 and Circuit#2 outage required for 2 months after completion of Circuit#1.
- ERLDC apprised that a special meeting was convened on 18th November 2025 via online mode to discuss reconductoring plan of 400KV Farakka-Kahalgaon D/C involving stakeholders from NTPC, PGCIL, ERLDC & ERPC. The MoM of the meeting is attached in **Annexure B.2.2.3**.
- OCC advised POWERGRID to strictly adhere to the said timeline and complete the reconductoring of at least one circuit before February 2026 with simultaneous upgradation of bay equipment at both ends in coordination with NTPC.

PowerGrid may update. Members may discuss.

2.3 Utilization of 7th ICT and of Bay-217 [for Baruipur 220 KV SS at Subhasgram 400 KV SS [PG]: WBSETCL

As per discussions held in the 54th ERPC meeting in June-2025 [SI-B-1.4 of the MoM] regarding utilization of 7th ICT at Subhasgram 400 KV SS [PGCIL], it was recorded as follows:

"… Considering, the load profile already detailed above the methodology of consideration of 500MVA ICT-7 (Interim) to be considered as a permanent asset under RTM".

It was also recorded i.r.o. Baruipur Bay that *"…The status quo of bay 217 will be maintained for future use by WBSETCL".* The same were agreed by the representatives of all the eastern regional entities, ERPC, ERLDC and CTUIL present in the meeting.

In the 48th CMETS meeting held on 30-10-2025, CTU pointed out that approval of CEA will be required for finalization of seven nos. of ICT (2760 MVA) at Subhasgram 400 KV SS[PG] and subsequent utilization of the bay by WBSETCL. Concerned entities requested CTU for necessary action at the earliest since the transportation and commissioning works for 6th ICT were in progress and scheduled to be commissioned by December-2025.

In line with the perusal of CTU, one meeting was convened by CEA in this regard on 04-12-2025. In the meeting CEA stated to carry out the work of installation of 6th ICT as per schedule and opined that the issue of installed capacity beyond 2500 MVA to be discussed on 09-12-2025 with Resource Adequacy Plan for West Bengal up-to Year 2034-35 which is under preparation.

Accordingly, the matter was further discussed and studied at CEA on 09-12-2025 jointly in presence of CEA, CTU and WBSETCL. CEA opined that the combination with 2760 MVA of installed ICT capacity at Subhasgram 400 KV SS[PG] may be continued as per requirement on temporary basis. However as of date no communication/decision has been received in this regard and regarding construction of bay-217 for Baruipur as well.

WBSETCL may update. Members may discuss.

2.4 Construction of Nawada–Durgapur–Jeerat (New) 765kV corridor for improve reliability in the Eastern Region and improve reliability of power supply to Kolkata: CTU

A 765kV ring was planned in ER from Ranchi (New) – Medinipur – Jeerat (New) – Gokarna – Banka – Gaya and Ranchi – Gaya through 400kV D/c (Quad) line. Ranchi (New) – Medinipur– Jeerat (New) 765kV D/c line has already been implemented. In order to 765kV ring was planned in ER from Ranchi (New) – Medinipur – Jeerat (New) – Gokarna – Banka – Gaya and Ranchi – Gaya through 400kV D/c (Quad) line. Ranchi (New) – Medinipur – Jeerat (New) 765kV D/c line has already been implemented. In order to improve reliability in the Eastern Region and improve reliability of power supply to Kolkata area, need for implementation of balance portion of the ring viz. Jeerat (New) – Gokarna – Banka – Gaya came up as per operational feedback.

The matter was discussed in the joint study meeting held on 25-09-2025 wherein to reduce the number of 765kV substations and to reduce line length, a new corridor option viz. Nawada – Durgapur – Jeerat (New) was explored. The Nawada S/s along with Nawada – Durgapur – Jeerat (New) 765kV corridor was agreed to be taken up for strengthening 765kV interconnection to Kolkata area. Further, for the drawal requirement of BSPTCL, 765/400/220kV ICTs shall also be implemented at Nawada (ISTS). BSPTCL shall implement Nawada – Guraru – Kaler 220kV D/c line for drawal of power from ISTS. For seamless integration of Nawada into the ISTS grid, LILO of Gaya – Balia 765kV D/c line has also been proposed.

Accordingly, the "ERES-47: Nawada – Durgapur – Jeerat (New) 765kV corridor" scheme was agreed to be implemented as a strengthening scheme in the 47th CMETS-ER held on 29-09-2025. It was also observed that this link can also be utilized for grant of 1200MW ISTS Connectivity to NTPC for its Nabinagar STPP Stage-II generation plant (3x800MW).

The final scope of works was discussed and agreed in 48th CMETS-ER held on 30-10-2025.o improve reliability in the Eastern Region and improve reliability of power supply to Kolkata.

Detailed scope of works is enclosed at **Annexure B.2.5**

i. Establishment of Nawada (ISTS) 765/400/220kV S/s with 2x1500MVA+2x500MVA ICTs

ii. LILO of Gaya – Balia 765kV S/c line at Nawada (ISTS) S/s – (Loop in 82km and Loop out 82km)

iii. Establishment of 765kV level in GIS at existing Durgapur (POWERGRID) S/s along with installation of 765/400kV, 2x1500MVA ICTs in 400kV Section-B (the section having 400/220kV ICTs)

iv. Nawada (ISTS) – Durgapur (POWERGRID) 765kV D/c line along with 1x240MVAr (3x80MVAr 1-Ph) switchable line reactor in both ckts at both ends – about 258km

v. Durgapur (POWERGRID) – Jeerat (New) 765kV D/c line along with 1x240MVAr (3x80MVAr 1-Ph) switchable line reactor in both ckts at Jeerat (New) end – about 152km

vi. Extension at Jeerat (New) 765/400kV S/s

Estimated Cost of the project: INR 5676.25 Cr.

CTU may update. Members may discuss.

2.5 Establishment of proposed TCF-II 220/132/33 KV SS by WBSETCL.

Proposal for TCF-II 220/132 KV SS is an Intra-State sub-station with ISTS connectivity [D/C LILO of Siliguri PG-Kishanganj 220 KV D/C Line with HTLS conductor proposed]. The sub-station has been considered for meeting the growing load demand in and around

Ghoshpukur and TCF area as projected by WBSEDCL which includes increasing demand of Dinajpur(N) and Darjeeling district of West Bengal.

The proposal had already been discussed at CMETS-ER level for last few months [since May-2025] considering different scenarios and multiple operational aspects.

The latest PSSE studies were submitted prior to the last 48th CMETS-ER meeting held on 30-10-2025. It was found as per the study that loading of Binaguri PG - Siliguri PG under N-1 condition is 393 MW [considering 1500 MW setting for APD-Agra DC Link as suggested by Grid India] which is within the 90% of thermal limit of the line [considering 450 MW rating of HTLS conductor].

Observations of Grid India has been obtained on 14-11-2025. It is understood that Grid India has further considered 1000 MW setting for APD-Agra DC Link instead of 1500 MW during N-1 condition of peak load scenario creating additional contingency over and above N-1 condition.

However, loading of one circuit of Binaguri PG - Siliguri PG even under this additionally contingent condition is found to be 426 MW which is also well within the thermal limit of the line [considering 450 MW rating of HTLS conductor] as per Cl-4.4.2 of CEA's Manual on Transmission Planning Criteria-2023. It is also noteworthy that this quantum of power will flow for a limited period of time only satisfying the special conditions pointed out by Grid India.

In the last CMETS-ER meeting CTU proposed to pose the proposal before CEA to discuss with Resource Adequacy Plan for West Bengal by the Year 2034-35 which is in progress and may take time. Considering the immediate requirement, WBSETCL requested CTU to resolve the issue at CMETS-ER level.

The matter regarding feasibility of establishment of proposed TCF-II 220/132/33 KV SS is still pending and hence may be deliberated in the 55th TCC-ERPC meeting.

WBSETCL may update. Members may discuss.

2.6 A review of the Flue Gas Desulfurization (FGD) installation, in consultation with beneficiaries, is required for ongoing and operational Category 'C' thermal power projects of NTPC: GRIDCO

It is to mention that MoEF &CC has notified Environment (protection) Rules on 11.07.2025 wherein applicability of SO2 emission standards in thermal power plants has been revised based on their location/category. As per the above amendment, Sulphur dioxide emission standards shall not be applicable to all Category C thermal

power plants subject to ensuring compliance of stack height criteria notified vide notification number GSR 742 (E) dated 30th August 1990.

As understood CEA vide letter dtd 20.08.2025 intimated all RPCs that the generating utilities would be required to review the FGD installation in consultation with Discoms at the ongoing projects at Category C TPPs.

In the said letter, CEA referred a meeting that was held with GENCOs on 18.07.2025 and with vendors on 08.08.2025 with a request to RPCs to convene a special TCC/RPC meeting at the earliest and deliberate the matter and various proposals furnished by CEA (**Annexure-B.2.9.1**).

Further, as per the minutes of the meeting Dtd 25.07.2025, the generating companies were advised to discuss various aspects with the beneficiary Discoms their willingness to have FGD installed and pay for the cost attributable to FGD (CAPEX+OP-EX) or stop the project and pay the fixed cost (CAPEX) incurred so far **(Annexure-B.2.9.2).**

In this regard this is to be mentioned that, Darlipalli STPS of NTPC is coming under category 'C' as per MOEF Notification dtd 11.07.2025. FGD has been already installed and commissioned from 01.07.2024 for unit#2 and 27.01.2025 for unit#1.

NTPC has been raising bills approx. **1.5 Crs/month to 1.8 Crs/month** towards secondary energy charges (OP-EX) as Odisha has 50% allocation from the said project. Hence, GRIDCO vide letter dtd 02.09.2025 requested NTPC for discontinuation of supplementary energy charge (ECS) towards FGD for Darlipalli STPS to which NTPC replied that "FGD system has been declared Commercial Operation in accordance with the provision of CERC Tariff Regulation 2019, and the bills of supplementary variable charges are also being raised accordingly to all the constituent beneficiaries of the station. The matter is being looked into by concerned statutory authorities and any decision and subsequent direction issued in such cases will be duly complied by NTPC."

In view of the exemption for Category 'C' TPPs from SO_2, standards GRIDCO raises the following points for discussion:

1. **Discontinuation of FGD Operation:** NTPC is requested to **stop the operation of the FGD system** at Darlipali STPS, as it is no longer mandatory under the revised MoEF&CC notification.
2. **Assessment and Financial Justification:** NTPC should furnish the **project-wise status of FGD implementation** for all its generating stations in the Eastern Region. Furthermore, a detailed financial assessment must be conducted to compare the cost benefit of operating **with FGD** versus **without FGD**, ensuring beneficiaries are not burdened with unnecessary CAPEX and OP-EX.

GRIDCO may update. Members may discuss.

2.7 Request for Provision of Coal Invoices to Assess the Impact of GST Structure Revision & Verification of Fuel Parameters: GRIDCO

The GST Council, during its 56th Meeting, revised the tax structure applicable to coal, changing it from GST @ 5% plus a Compensation Cess of ₹400 per Metric Tonne (MT) to GST @ 18% with no Compensation Cess, effective from September 22, 2025.

To accurately assess the financial implications of this significant tax revision on energy costs, **coal invoices are essential**. We note that while other thermal generators in Odisha (such as OPGC, GMR, and Vedanta) are providing these invoices, which facilitates the necessary impact computation, NTPC has not been providing them along with the monthly energy bills.

The beneficiaries require the detailed coal invoices from NTPC for the following critical purposes:

1. **Computation of Revised GST Impact:** To precisely calculate the change in input tax credit (ITC) and the overall cost structure due to the shift from the cess-inclusive model to the 18% GST model.
2. **Verification of Fuel Parameters:** To verify key parameters, including **Gross Calorific Value (GCV)**, fuel price, and the details of any related credit or debit note adjustments, which are necessary for the accurate scrutiny of the energy bills.

Accordingly, NTPC is formally requested to provide the detailed **coal invoices** to all beneficiaries consistently, accompanying the monthly energy bills.

NTPC and the Members are invited to deliberate on this matter to ensure transparency, accurate cost calculation, and compliance with regulatory requirements.

GRIDCO may update. Members may discuss.

2.8 Status of spare Transformer/ICT in Eastern Region: ERPC

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:

• **Regional level spare**: For regional power utilities (POWERGRID & 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. (**Annexure B.2.7**)
• **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.
• **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.
In 54th TCC Meeting,
Powergrid ER-II intimated that as per CEA guidelines for maintaining spare, one number of spares is mandated for each element with population less than 20 for a particular utility. If the population of such element is more than 20, utility make decision on maintaining more than one spare.

- Director (Op), OPTCL opined that when n-1 criteria is satisfied for the ICTs for all individual stations of a utility, there is no need of maintaining a separate cold spare. III.
- Director (Op), WBSETCL opined that ICT being the most valuable item should not be a kept as cold spare instead it must be maintained as hot spare, ready to deploy.
- CTU representative informed that in the present scenario Transformer manufacturing & delivery timelines are significantly long which poses a challenge in procurement of a new transformer in an event of transformer failure.
- TCC advised state transmission utilities to maintain spare transformer/ICT as per CEA guidelines. TCC observed that it would be prudent in view of applicability of interstate GST for transportation of ICT.
- TCC opined that while planning augmentation of transformation capacity, transformers which have completed their significant life may be converted to cold spare and new ICT may be installed in place of the old one. In this way the financial burden on maintaining the spare can be minimized.

Members may update. TCC may discuss.

2.9 Proposal regarding procurement of capital spares for reliable operation of DVC Grid – DVC

DVC Grid consists of 5 nos. 400kV Powerhouse Switchyards, 14 nos. of 220kV Sub-stations, 3 nos. of 220kV Powerhouse Switchyards, 24 nos. of 132kV Sub-stations, 2 nos. of 132kV Hydel Switchyards & 1 no. 33kV Hydel Switchyards and 483 ckm of 400kV, 3029 ckm of 220kV, 3765 ckm of 132kV & 1841 ckm of 33kV transmission lines spread across the state of Jharkhand and West Bengal.

1. Evacuation of generation from DVC's Power Houses/RE Plants and transmission & distribution of power to DVC's internal system is done utilizing this grid. The grid supplies 3273 MVA of power to DVC's firm consumers across DVC Command Area in the state of Jharkhand and West Bengal. In addition, power of 1015 MW is fed to PPA beneficiaries like Tata Steel, Railways, IPCL, JBVNL and JUSCO in DVC Command Area.
2. At present, very less or nil capital spares are available with DVC.
3. In order to minimize down time in the event of equipment failure, an adequate number of capital spares, as per industry norms/standards, are to be maintained with DVC.
4. The following tables depict the exiting population of equipment viz a viz proposed quantity of capital spares:

A. ICTs, ATRs & PTRs:

Equipment Details	Existing population in DVC	Proposed quantity of Capital Spares to be maintained
500/315MVA, 400/220/33kV ICT	10	1 no. 500 MVA ICT
200/160/150 MVA, 220/132kV ATR	27	2 nos. 200 MVA ATR
100/80/50 MVA, 220/33kV PTR	26	2 nos. 100/80 MVA PTR
80/50 MVA, 132/33kV PTR	59	4 nos. 80/50 MVA PTR
31.5 MVA & below, 132/33kV PTR	7	1 no. 31.5 MVA PTR

Note: - Spares to be strategically located across DVC command area for ease of logistics and to minimize downtime in the event of failure.

B. Shunt Reactors:

Equipment Details	Existing population in DVC	Proposed quantity of Capital Spares to be maintained
50 MVAr, 400 kV Reactor	6	1 no. 50 MVAr, 400 kV

C. 220kV & 132kV Circuit Breakers:

Equipment Details	Existing population in DVC	Proposed quantity as Capital Spares (5%)
220kV Circuit Breakers	147	7

132kV Circuit Breakers	376	19

5. The **capital spares** as mentioned above are listed below and placed for kind deliberation/consideration at ERPC(TCC) meeting:

Equipment	Total Quantity
500/315MVA, 400/220/33kV ICT	1
50 MVAr, 400 kV Reactor	1
200/160/150 MVA, 220/132kV ATR	2
100/80/50 MVA, 220/33kV PTR	2
80/50 MVA, 132/33kV PTR	4
31.5 MVA & below, 132/33kV PTR	1
220kV Circuit Breakers	7
132kV Circuit Breakers	19

DVC may update. Members may Discuss.

2.10 Review of JUSNL's SAMAST implementation and readiness for commencement of PVUNL scheduling along with development of intrastate DSM and settlement mechanisms: ERPC

As per the directions of Hon'ble CERC in Petition No. 658/MP/2025, ERLDC commenced scheduling of Patratu Stage-1 w.e.f. 05.11.2025 upon COD of Unit-1 and in accordance with the share allocation issued by ERPC. In line with the deliberations of the 229th OCC Meeting held on 25th July 2025, JUSNL is required to take over the scheduling of PVUNL units from January 2026 subsequent to the completion of SAMAST implementation.

In 233rd OCC Meeting:

JUSNL informed that SAMAST scheme is under implementation and it's expected to be completed by December 2025.Thereafter scheduling of PVUNL shall be taken up by SLDC, Ranchi.

- ERLDC apprised that for billing and settlement of account, an intrastate DSM mechanism and pool account needs to be developed by JUSNL.

- OCC advised JUSNL to expedite the SAMAST implementation and complete within Dec 2025 so that scheduling of PVUNL shall be commenced by JUSNL from 1st Jan 2025 as per the direction of CERC.

- OCC also advised SLDC, Ranchi to highlight the need of DSM Mechanism and Pool account for settlement and billing to the higher management and simultaneously take up the matter with SERC for implementation of the same.

- OCC referred the matter to TCC for further deliberation. ¬ OCC noted the modalities of scheduling and accounting of Patratu Stage-1 highlighted by ERLDC.

JUSNL may update. Members may discuss.

2.11 URTDSM Phase-II Project (ISTS Portion) – Implementation through RTM route: POWERGRID

Background of URTDSM Phase-II project:

1. The WAMS system installed under URTDSM Phase-I project comprises of 1400+ PMUs and 32 Control centres. This project was implemented with 70% of the project cost as PSDF grant and 30% was through POWERGRID Equity (RTM for 30% portion and no tariff for 70% grant portion).
2. The URTDSM Phase-I project is proving its significance and usefulness to the Grid Operators for wide area monitoring of the Grid and Event Analysis. Further, the expanding Indian Power Grid with increased penetration of renewable energy sources and Govt of India's plan to achieve 500GW RE power by 2030, needs Smart Grid tools to proactively monitor, manage, and operate the Grid.
3. The URTDSM Phase-I Control centres at SLDCs, RLDCs and NLDCs (32 No's) are nearing their Operational life and are becoming technically obsolete. Hence to keep the WAMS URTDSM Control centres functional, the URTDSM Phase-II project which includes replacement of existing control centres, is to be implemented on priority. URTDSM Phase-II project also envisages advanced WAMS analytics for Oscillation monitoring, Disturbance analysis, inertia monitoring, measurement of RE generator(inverter) response, which shall enhance the Grid observability for efficient and safe operation of the Grid.
4. Brief BOQ Cost Estimate of URTDSM Phase-II ISTS portion is attached in **Annexure B.2.10**

5. Previous Deliberations for Approval of URTDSM Phase-II Project:

S No	NPC/RPC Meeting	Date of Meeting	Meeting Outcome	Remarks // Actions taken
i.	13th NPC Meeting	05.07.2023	"The DPR of URTDSM project phase-II in accordance with the recommendation of the committee may be prepared by the PowerGrid within three months. PSDF funding for URTDSM project phase-II may also be sought subsequently. RPCs were requested to provide full cooperation in preparation of DPR"	POWERGRID Prepared DPR for URTDSM Phase-II Project, which included 4000PMUs (new) and 34 control centres proposed with funding pattern of 70% PSDF grant and 30% POWERGRID equity in line with Phase-I. DPR with an estimate of Rs.3922 Crores, was submitted to NPC/CEA on 11.03.2024.

ii.	14th NPC Meeting	03.02.2024	"POWERGRID may revise the scope of DPR in line with above suggestions ((d) to (h)) and submit the DPR by March 2024"	POWERGRID presented Various options for optimisation and discussed with GRID-INDIA. These Options were presented to NPC on 30.05.2024 for further deliberations.
iii.	Email from NPC reg PSDF	18.04.2024	"In accordance with the decision of the 22nd Monitoring Committee meeting, funding for the DPR regarding URTDSM project Phase II will not be provided through PSDF as of now. **POWERGRID is hereby requested to explore alternative funding sources for URTDSM project Phase II".**	Hence, POWERGRID proposed to implement the URTDSM Phase-II Project on RTM basis (70% debt and 30% equity) and approached the Constituents in all the five RPCs for concurrence of the RTM proposal.
iv.	Various RPC meetings		SLDCs of all Regions have expressed in-principle technical acceptance for implementation of the URTDSM Phase-II Project, but the RTM proposal was not concurred by States due to funding constraints	The initial DPR prepared by POWERGRID was based on the sub-committee recommended philosophy of PMU placement. However, CEA was preparing a revised PMU placement philosophy to bring clarity in various regulation/guideline/recommendation. The new guidelines for unified philosophy of PMU placement in Indian Grid were published in March 2025, which will supersede all existing guidelines and sub-committee report etc.
v.	15th NPC Meeting	14.11.2024	"PowerGrid is to submit the revised proposal in consultation with Grid India, only for the existing network after segregating the PMUs and control centres under ISTS and STUs system.	Accordingly, POWERGRID prepared DPR for URTDSM Phase-II ISTS portion (upgradation of control centres at NLDCs, RLDCs and installation of new PMUs for Central Sector stations as per latest CEA guidelines) at an estimated cost of **Rs. 1124Crores** & discussed the same in **16th NPC** Phase-II project for ISTS portion

			The proposal may also be revised to optimized number of control centres and PMUs at ISTS & STUs system separately. The revised proposal for ISTS portion may be put up to the NCT for further consideration".	comprises of control centres (7 nos.) of NLDC and RLDCs and PMUs at central sector stations (1070 nos.) Tentative cost and BOQ for STUs portion (Control centres of SLDCs across India and new PMUs for State sector substations) is also prepared by POWERGRID for further deliberations in NPC at a cost of Rs. **2550 Crores** for **26** SLDC portion and 1210 PMUs
vi.	16th NPC	04.07.2025	The 16th NPC recommended following actions: "URTDSM project phase-II proposal may be put up in RPC forum for further discussion" "The mode of implementation of the URTDSM project phase-II may be put up in upcoming NCT meeting for deliberation and approval"	Accordingly, POWERGRID is taking up the URTDSM Phase-II ISTS proposal for discussion in RPC Meetings. A brief on the URTDSM Phase-II Project ISTS portion along with Cost Estimate and BOQ are attached for kind reference
vii.	52nd TCC & 55th SRPC Meeting	25.07.2025 & 26.07.2025	"SRPC approved the proposal for Unified Real time Dynamic State Measurement System (URTDSM) Phase-II Project with an estimated cost of Rs. 1122 Crores, for ISTS portion comprising of control centres (7 nos.) of NLDC and RLDCs and PMUs at central sector stations (1070 nos.) under RTM"	**SRPC Approved**
viii.	56th TCC & WRPC meeting	26.09.2025 & 27.09.2025	WRPC Members deliberated & agreed for the ISTS proposal	**WRPC Approved**

ix.	56th TCC & 81st NRPC Meeting	30.10.2025 & 31.10.2025	"TCC forum was of view that proposal for ISTS portion may be approved. "Forum technically agreed with the proposal for implementation of the URTDSM Phase-II Project (ISTS portion) on a pan-India basis, to be executed by POWERGRID under a cost-sharing mechanism via the 100% Regulated Tariff Mechanism (RTM) route, with a 70:30 Debt-Equity ratio, at a Detailed Project Report (DPR) cost of 1,124.00 crore".	**NRPC Approved**
x.	30th TCC & 30th NERPC Meeting	13.11.2025 & 14.11.2025	Deliberation of TCC: Powergrid informed that the all-India project cost has been brought down to **Rs.1111 crore** and that the quantum of PMUs has been reduced to 107 from 151 for installation of PMUs at 132 KV lines for NER and cost has been reduced by 12 crore (from Rs 161 cr to Rs 149 cr) after the meeting held on 10.11.2025 with concerned stakeholders. After detailed deliberation, the forum accorded	**NERPC Approved**

			technical concurrence for the Proposal. "After detailed deliberation RPC forum concurred for the same."	
xi.	229th OCC Meeting of ERPC	25.07.2025	**"ERPC OCC Decision"** OCC agreed with the proposal of POWERGRID regarding implementation of URTDSM Phase-II system.	To be taken up in upcoming 55th TCC & 55th ERPC Meeting

POWERGRID Proposal for URTDSM Phase-II ISTS Portion:

Keeping in view of the above factors, "***it is proposed to take up URTDSM Phase-II Project (for ISTS portion) on pan India basis, with an estimated cost of Rs. 1111 Crores, for ISTS portion comprising of control centres (7 nos.) of NLDC and RLDCs and PMUs at central sector stations (1026 nos.) under RTM on cost sharing mechanism (100% RTM route with 70:30 Debt Equity ratio) to be implemented by POWERGRID***".

URTDSM Phase-II ISTS proposal is approved by **SRPC, WRPC, NRPC, & NERPC**.

Upon Approval in all RPCs, POWERGRID will put up the proposal in NCT for final approval.

POWERGRID may update. Members may discuss.

2.12 Proposal for Installation of OPGW & associated communication systems on the existing lines of ISTS and STU: CTU

CEA has intimated vide letter dtd.22.05.2024 (attached at **Annexure-B.2.11.1**) that all the transmission lines of 110kV and above should have Optical Ground Wire (OPGW) along with necessary terminal equipment for speech transmission, line protection, and data channels. Further as per regulations & standards i.e. Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022, CEA Technical Standards for Communication Systems (2020) and the Manual of Communication Planning in Power System Operation (2022), primary path for tele-protection shall be on point-to-point Optical Ground Wire and alternative path shall be either on Power Line Carrier Communication or predefined physically diversified Optical Ground Wire paths.

In this regard, CEA requested CTU & POWERGRID to identify all such ISTS lines wherein OPGW implementation is yet to be done & take up its implementation. Subsequently, CEA vide their letter dtd. 22.11.24 (attached at **Annexure-B.2.11.2**) communicated that all the upcoming lines shall be provided with 48 Fiber OPGW to cater for broadband and internet requirements in the rural areas and hinterlands to provide reliable Telecom connectivity.

The growing power demand, coupled with the rapid expansion of generation capacity including renewables, necessitates the planning and implementation of LILO of existing transmission lines. However, the absence of OPGW on primary transmission lines results in challenges such as reduced tele-protection capability, lack of route diversity, and insufficient redundancy for transmitting Grid Operation SCADA data to RLDC. Subsequent planning & Installation of OPGW on existing lines which are undergoing LILO often leads to a mismatch in implementation timelines between proposed LILO and the OPGW installation on the main line, as OPGW work on the main line typically takes more time than executing planned TBCB/RTM LILO schemes, due to live-line installation requirements, PTW approvals from RLDCs, and ROW challenges.

Accordingly, CTU has prepared the list of lines which don't have OPGW in consultation with TSPs for planning of OPGW installation on such lines. The details of such lines are given below:

POWERGRID Transmission lines under RTM without OPGW: Tentative figure is given Below:

S.No	**Region**	**Total Transmission Length**
1	NR	4142
2	WR	4876
3	SR	810
4	ER	2297
5	NER	290
	Grand Total (Approx.)	**12415**

➢ Powerlink (Joint Venture of POWERGRID & TATA Power) Transmission lines without OPGW:

S.No	**Region**	**Total Transmission**

1	**ER**	**314**
2	**NR**	**846**
	Total	**1160**

➢ Parbati Koldam Transmission Company Limited (Joint Venture of POWERGRID & Reliance Power)

Transmission lines without OPGW:

S.No	**Region**	**Total Transmission Length**
1	NR	67
	Total	**67**

Private TBCB Transmission Lines without OPGW:

S.No	**TSP Name**	**Region**	**Total**
1	Indigrid	ER	721
2	Adani	WR	1356
3	Indigrid	WR	515
4	Sekura	SR	93
5	Sekura	NR	149
		Total	**2834**

Grand Total for the Transmission Lines without OPGW – 16,476 Kms (Pan-India).

It is requested that all the TSPs (POWERGRID, Adani, Indigrid, Sterlite/Resonia, TATA Power, Aparaava, etc.) and RLDC may also check and intimate if any lines without OPGW is not mentioned here so that same may be included for further consideration. Further, detail of required FOTE may also be checked and confirmed by respective TSPs.

State lines without OPGW

Many STU lines also got LILOed on the ISTS substations, for which OPGW installation in the main line is to be taken care by respective State Utilities. STUs are also requested to identify and list out such lines for planning OPGW installation and update RPC forum for timely implementation of ISTS/STU schemes.

As a proactive approach, all the Central and State Sector utilities are to prioritize the implementation of the 48 F-OPGW laying across the transmission network to` ensure compliance with regulatory requirements and directives as mentioned above.

Accordingly,

1. For ISTS lines CTU has prepared the schemes for implementation of OPGW on existing transmission lines of voltage 132kV and above, on which OPGW is not available, along with estimated cost are as follows:
a. For TBCB projects, the scheme would be implemented by respective TSP under Change in Law / RTM
b. For RTM projects, the scheme would be implemented by respective TSP under RTM
c. The tentative cost for implementing the OPGW laying scheme across **pan-India ISTS network is ₹985 crores**.

2. For intra state projects, it is suggested that STUs shall formulate the scheme of implementation of OPGW on existing system for their respective states.

This agenda has been discussed in 16th NPC dtd 04.07.2025. NPC suggested that the proposal for installation of OPGW on the existing lines of ISTS may be put in upcoming RPCs/NCT meeting for deliberation. STU may also put up the scheme for OPGW on existing lines in respective RPCs.

The agenda has already been discussed & in principally approved in **80th NRPC dtd. 18.07.2025** and **55th SRPC dtd. 26.07.2025**. This agenda for OPGW laying along with cost for NER has been approved in **30th NERPC dtd. 14/11/25.**

Accordingly, the scheme for laying of OPGW along with associated Communication System on existing ISTS lines wherein OPGW isn't present is being formulated on Pan-India basis. In ER Region, the total length of ISTS transmission lines that don't have OPGW is approx. **2992 km**. The approximate cost for laying OPGW on these lines in ER is **182.88 Crs**.

OPGW laying on cross border transmission lines shall be considered later in coordination with Bhutan as suggested by CEA & ERPC.

The detail of proposed scheme for laying of the OPGW along with associated Communication System on existing ISTS lines wherein OPGW isn't present for ER Region is attached as **Annexure -B.2.11**

CTU may update. Members may discuss.

2.13 Submission of Protection Audit Plan & Audit Reports: ERPC

The Clause (5) of Regulation 15 of IEGC Regulations, 2023 envisages as below:
Quote

(3) *All users shall conduct internal audit of their protection systems annually, and any shortcomings identified shall be rectified and informed to their respective RPC. The audit report along with action plan for rectification of deficiencies detected, if any, shall be shared with respective RPC for users connected at 220 kV and above (132 kV and above in NER). .....*
(4) All users shall also conduct third party protection audit of each substation at 220 kV and above (132 kV and above in NER) once in five years or earlier as advised by the respective RPC.
…….
(5) Annual audit plan for the next financial year shall be submitted by the users to their respective RPC by 31st October. The users shall adhere to the annual audit plan and report compliance of the same to their respective RPC.

Unquote

A. Internal Audit

Sl No.	Utility Name	Audit Plan for FY 2024-25	Audit Report for FY 2024-25	Audit Plan for FY 2025-26	Audit Plan for FY 2026-27
1	PG-ER-1 & PMTL				
2	PG-ER-2				
3	PG-Odisha				
4	WBSETCL				
5	BSPTCL				
6	OPTCL				
7	DVC				
8	JUSNL				
9	OPGC				
10	OHPC				
11	CESC				
12	NHPC				
13	DMTCL				
14	NTPC ER-I				
15	NTPC ER-II				

16	Tashiding HEP				
17	Jorethang HEP				
18	MPL				
19	JITPL				
20	GMR				
21	Adhunik				
22	IBEUL				

Received, Not Received

B. Third Party Audit

Third party Protection Audit has been completed, and report has been received for 220 kV Tashiding HEP & Jorethang HEP. Audit plan has been received from DMTCL, Dikchu HEP, IBEUL. Apart from this ERPC secretariat has conducted third party audit of seven nos. of critical substations in FY 2025-26.

In 152nd PCC Meting, ERPC representative updated that that for FY 2024-25, protection audit plan was received from various utilities however audit reports were not received from most of the utilities. For FY 2025-26, protection audit plan (internal and third party) is received from few utilities. The status is given in the table.

JUSNL representative informed that third party protection audit is already in progress at various S/s.

PCC advised concerned utilities to share the requisite information to ERPC secretariat within a week.

Members may update. TCC may discuss.

2.14 Third party protection audit for critical substations: ERPC

As per IEGC 2023 Clause 15.2, “All users shall also conduct third party protection audit of each sub-station at 220 kV and above (132 kV and above in NER) once in five years or earlier as advised by the respective RPC.”
Further, IEGC 2023 Clause 15.3 states that “After analysis of any event, each RPC shall identify a list of substations / and generating stations where third-party protection audit is required to be carried out and accordingly advise the respective users to complete third party audit within three months.”
As per deliberation in 52nd ERPC meeting ERPC approved expenditure of Rs. 35 lakhs (including taxes) for hiring of outsourcing services through an agency to assist in carrying out third party protection audit in some of the critical substations of ER in FY 2024-25.

Consequently, a bid was floated on 4th Jan 2025 by ERPC secretariat for hiring third party agency to assist in carrying out third party protection audit for 7 number of substations listed as follow

1. 400/220 k V Tenughat S/s
2. 400k V Kahalgaon S/s
3. 400/220 k V Jeerat S/s
4. 400/220 k V Lapanga S/s
5. 220/132 k V Biharsharif S/s
6. 400/220 k V Meeramundali S/s
7. 220/132 k V Ramchnadrapur S/s and after complete bid evaluation bid work order was issued to M/s PRDC on 20th May 2025 for price Rs 29,79,500 including GST and all taxes as applicable.

As audit was started in June 2025 for above mentioned substations hence in 54th ERPC Meeting, ERPC approved the budget of Rs. 35 lakhs in FY 2025-26 for the purpose of protection audit.

Protection audit for mentioned 7 numbers of substations has been completed successfully.

Hence, for FY 2026-27, third party protection audit of around 15 nos is proposed to be carried out by ERPC for which Rs 60 lakh will be required for expenses involved in hiring third party agency for assisting ERPC in carrying out third party protection audit.

Members may discuss.

2.15 Support Service for Protection Database Project of ER for FY 2026-27 : ERPC

As per clause 14(3a) of CERC(IEGC)-2023, RPCs are required to maintain a centralized database of relay and protection settings of their concerned region.
In 53rd ERPC Meeting held on 11.02.2025, the proposal for continuing support service for existing project “Creation and Maintaining a Web based Protection Database and Desktop based Protection Setting Calculation tool for Eastern Regional Grid” for an interim period of one year w.e.f. 01.04.2025 was approved which is continuing and support service will expire on 31st March 2026.

To ensure reliable and up-to -date database, continuation of support service of the project is very much necessary therefore it is proposed that support service may be extended/ renewed for period of one year for the protection database project.

It is further proposed that PDMS portal may be enhanced to include features such as sorting relay settings by type, generating summary reports for quick reference, and enabling automated checks for deviations from the standard protection philosophy. These enhancements will facilitate timely audits, ensure adherence to protection standards, and help prevent incidents caused by incorrect settings.

Based on scope of work and escalation factor, Rs 80 lac per annum needs to be approved for existing project "Creation and Maintaining a Web based Protection Database and Desktop based Protection Setting Calculation tool for Eastern Regional Grid" for an interim period of one year w.e.f 01.04.2026.

Members may discuss.

2.16 Renewal of AMC Services -for AMR system in Eastern Region for the period April-26 to March-29: POWERGRID

In the ongoing AMR project for the Eastern Region, the LOAs have been awarded on a phase manner by considering the number of Meters available at the time of LOA placement. Each LOA had scope of installation, warranty and AMC services. At present in AMR, there have been a total of five phases awarded with different sets of Meters. Each phases AMC scope is getting ended on different timelines. Details given below: -

Project	Meter Count	AMC Contract Start	AMC Contract End
AMR Phase1&2	656	01-Apr-21	31-Mar-26
AMR Phase3	326	01-Sep-22	31-Mar-26
AMR Phase5	300	19-Feb-26	19-Oct-26
AMR Phase4	200	1-May-23	30-Apr-27

AMR SEM data is critical for performing the weekly accounting for the constituents hence the renewal of the AMC contract is required. The scope of AMC Services will be the same as per the ongoing requirements and in addition to that, the newly developed requirements like 05 min Load Survey Data, 01 min instant data etc. will also be part of the AMC Services scope under this contract.

Detailed scope of work to be done in the AMC support period is attached in **Annexure B.2.13.**

Considering the same, year wise breakup as below:

Year-1 (same unit rate)					
Project	**Meter Count**	**AMC Start**	**AMC End**	**Unit AMC Rate (per year, per Meter)**	**Total AMC Rate**
AMR Phase 1 & 2 + AMR Phase-3	982	1-Apr-26	30-Apr-27	15117	16081969
AMR Phase5	300	1-Nov-26	30-Apr-27	15117	2267550

				Total	**18349519**
Year-2 (04% escalation on unit rate)					
Project	**Meter Count**	**AMC Start**	**AMC End**	**Unit AMC Rate (per year, per Meter)**	**Total AMC Rate**
AMR Phase1&2 + AMR Phase3+AMR Phase4+AMR Phase5	1482	1-May-27	31-Mar-28	15722	**21357902**
Year-3 (06% escalation on unit rate)					
Project	**Meter Count**	**AMC Start**	**AMC End**	**Unit AMC Rate (per year, per Meter)**	**Total AMC Rate**
AMR Phase1&2 + AMR Phase3+AMR Phase4+AMR Phase5	1482	1-Apr-28	31-Mar-29	16665	**24697502**
Total AMC cost for Three Years					**64404922**

Total cost of ownership of AMC extension till 31-Mar-29 will be 6,44,04,922 INR (without taxes).

In 232nd OCC Meeting,

- POWERGRID informed the forum that the Annual Maintenance Contracts (AMC) for AMR (Automated Meter Reading) systems under Phases 1, 2, and 3 are set to expire by March 2026, while those for Phases 4 and 5 will conclude by October 2026 and April 2027, respectively.
- In view of the above timelines, POWERGRID requested the forum to consider extending the AMC period for an additional three years, i.e., up to March 2029, to ensure continued support and maintenance of the AMR infrastructure.
- Additionally, POWERGRID highlighted that the hardware components of all AMR systems have already been updated, and only software updates remain pending.

In 55th CCM Meeting,

SE (Comml) informed that the issue was deliberated in details in the OCC meeting and OCC agreed with the operational necessity of extending the AMC for AMR to maintain reliable data acquisition and system functionality.

- Powergrid's representative apprised the Committee that the renewal of AMC services covering all five integrated phases of the AMR system in the Eastern Region up to 31st March 2029 is estimated to cost **Rs. 6,44,04,922/-**, exclusive of applicable taxes. It was further indicated that a final negotiation exercise with **M/s TCS** is planned to achieve cost optimization further.
- MS ERPC enquired whether any process has been initiated by Powergrid for installation of new AMR after expiry of integrated AMC services i.e., after March 2029 and the estimated cost involved for the new project.
- Representative of Powergrid submitted that the proposal is likely to be initiated during the year 2027. He further submitted that at this point of time no cost estimation is possible.
- **The Committee in-principally agreed with the proposal of extension of AMC till 31st March 2029 of all existing AMRs along with the estimated cost of Rs. 6,44,04,922/-, exclusive of applicable taxes and requested Powergrid to negotiate further with M/s TCS. It was decided to forward the agenda to the 55th TCC and ERPC meetings for consideration and necessary approval.**

POWERGRID may update. Members may discuss.

2.17 Concern Regarding the AMC Proposal Submitted by M/s Chemtrols for SCADA System Post-ULDC-II: WBSLDC

The SCADA AMC for the period 2015–2025 was awarded to M/s Chemtrols by Power Grid Corporation of India Ltd. (POWERGRID) on behalf of all Eastern Region constituents. Under the terms of this contract, the actual payment that SLDC made for one year AMC period (July 23 to July 2024) is Rs. 35.33 Lakh (highest amount paid for 1 year so far) including GST and price variation adjusted with consumer price index.

Upon the expiry of the existing AMC, M/s Chemtrols has submitted a proposal for continuation of the AMC for one additional year (until the commissioning of ULDC-III) at ₹1.32 crore, which has subsequently been negotiated by POWERGRID to ₹1.20 crore. This revised figure represents an escalation of nearly 300% over the prevailing combined annual cost (AMC + price variation). Such a steep increase is not commensurate with inflation levels, established price-indexation practices, or any other rational cost-justification mechanism.

SLDC, West Bengal wishes to formally record its strong objection to this disproportionately high quoted value. The absence of competitive alternatives—arising from M/s Chemtrols prior assignment as the ULDC-II vendor—appears to place constituents in a position where acceptance of an excessive, non-competitive rate becomes unavoidable. This not only poses a significant financial burden on the beneficiaries but also raises the possibility of future audit observations.

It is further requested that the representative from POWERGRID deliberate on the matter and initiate appropriate action to ensure that a fair, transparent, and financially prudent resolution is reached prior to finalizing the AMC extension.

Deliberations in the OCC meeting

WBSLDC reported that the existing AMC for the SCADA System maintaining by System Integrator i.e. M/s Chemtrols Industries Pvt. Ltd, expired in Oct' 2025. For the renewal of the AMC for one additional year (until the commissioning of ULDC-III), M/s Chemtrols has quoted a new price of ₹1.20 crore. This quoted price is a 300% escalation over the prevailing combined annual cost (AMC + price variation).

- ERLDC reiterated the background of this AMC extension, noting that it had been discussed in the 230th OCC meeting held on 22.08.2025, Bhubaneswar and subsequently in the 231st OCC meeting held on 22.09.2025 at the ERPC, Kolkata.
- Subsequently, in compliance to the direction of OCC, PowerGrid organized a special meeting held on 30.10.2025 at the POWERGRID, ER-II office in Kolkata to finalize the modalities, terms & conditions & cost. In this meeting, M/s. Chemtrols was advised to submit a fresh offer to each constituent in line with the recently awarded AMC of ERLDC, while also factoring in the specific facts, end of life of assets, scope, and requirements of each constituent.
- It was also deliberated that the unified negotiation approach was taken at the request of SLDC Bihar in the 230th OCC meeting to enable them to facilitate further approval processes at their respective organizations.
- ERLDC also updated that it will take another one year for implementation as well as integration of New SCADA system in ER.

In 233rd OCC Meeting,

OCC opined that SCADA AMC renewal is inevitable for a safe, secure and reliable operation of the Grid since SCADA is the backbone of modern power system.

- OCC opined that the choice of accepting the new price as quoted by M/S Chemtrols Pvt ltd lies with the States & accordingly advised all the states to take up the matter of SCADA AMC cost escalation with POWERGRID and to find a suitable resolution bilaterally.

In 55th CCM Meeting,

SE (Comml) intimated that the issue was discussed in OCC and OCC opined that SCADA AMC renewal is inevitable for a safe, secure and reliable operation of the Grid since SCADA is the backbone of modern power system.

- Representative of West Bengal informed the house that Rs. 35.33 Lakh (highest amount paid for 1 year so far) including GST and price variation adjusted with consumer price index was paid by SLDC made for one year AMC period (July 23 to July 2024). For the new AMC, after negotiation, M/s Chemtrols has quoted a new price of ₹1.20 crore.
- Representative of West Bengal raised their concern over abnormal high price (around 3 times of previous AMC value) offered by M/s Chemtrols for the AMC of the existing SCADA system for 1 year and subsequently the same may attract audit objection.

- Representative of Powergrid submitted that they had already carried out negotiation with M/s Chemtrols. The new SCADA system is likely to be commissioned within 6 months of time. Though the AMC is for a period of 1 year and as the payment mode is on quarterly basis, contract may be terminated after commissioning of the new SCADA system as per the contract agreement.
- Considering the essentiality of the SCADA, the Committee advised Powergrid to further negotiate with M/s Chemtrols for said AMC rate.

The matter is referred to 55th TCC for their kind consideration and advice.

POWERGRID may update. Members may discuss.

2.18 Withdrawal of RTDA charges for power scheduled from Dagachhu, Bhutan to WBSEDCL – TPTCL.

References:

1. ERPC 52nd Commercial Committee Meeting held on 28.01.2025 and Item no. B13
2. ERPC 53rd TCC Meeting held on 10.02.2025 and item no. 2.23

With reference to the outcome of 53rd TCC Meeting 10.02.2025; ED, ERLDC informed that NLDC is going to issue clarification in the above matter shortly and it was decided that ERPC Secretariat will revise the account accordingly.

Accordingly, ED, NLDC issued letter dtd. 11.02.205 clarifying that NLDC laid cognizance to the merits of scheduling power as per IEGC 2023 clause 45(14) and considering the contracts of Dagachhu HEP as legacy contracts as considered in CERC order dated 09.11.2021 in the petition number 214/MP/2019, NLDC had considered the contracted quantum of Dagachhu, Bhutan to WBSEDCL to be as a deemed grant of access for the generator.

Hence, with the above clarification and TPTCL's continued persuasion with related stake holders we submit this agenda for ERPC 55th Commercial Committee Meeting scheduled on 09.12.2025; with a hopeful anticipation of concluding this matter to withdraw the RTDA charges of Rs 77.70 lakhs and process for refund to TPTCL.

Submitted for consideration and approval by the competent authorities.
In 55th CCM meeting,
Representative of TPTCL explained the issue from their end.

- SE (Commercial), ERPC provided a brief background of the issue and submitted that the RTDA charges of TPTCL for March 2024 cannot be withdrawn, and the RTDA accounts placed on hold for the period from October 2023 to February 2024 cannot be held upon further by the ERPC Secretariat or the CCM forum on a Suo motu basis.

- ERPC Secretariat or the CCM forum could not take any decision in this regard. The matter requires detailed deliberation and approval at appropriate higher forums.
- The Committee referred the issue to the upcoming 55th TCC and ERPC meetings for further deliberation and take a suitable decision.

TPTCL may update. Members may discuss.

2.19 Implementation of Patna Islanding Scheme under PSDF: SLDC Bihar.

In 54th TCC meeting held on 23.06.2025, BSPTCL had proposed to implement Patna Islanding Scheme through Internal Resource Fund.

However, a meeting was held on 24th June 2025 under the chairmanship of the Hon'ble Minister of Power and Housing & Urban Affairs, wherein the matter of Islanding Patna city was discussed. In the meeting, it was decided that the State of Bihar would submit a proposal for funding the Islanding scheme by the Ministry of Power).

In compliance to minutes of the meeting held on dt. 24.06.2025, Board of Directors, BSPTCL has approved for implementation of Patna Islanding Scheme through PSDF in 131st BOD meeting held on dt. 17.07.2025 vide its resolution no. 131-06.

In line with the above, a proposal has been submitted for Implementation of Patna Islanding Scheme under PSDF to NLDC vide this office letter no. 549 dt. 18.07.2025 along with all the required documents in compliance to minutes of meeting held on dt. 24.06.2025.

Further, Chief Engineer (Generation), CEA has requested the recommendation of ERPC for implementation of Patna Islanding Scheme through PSDF.

In view of this, the Commercial Sub-Committee is requested for kindly examine the matter and place it before the upcoming 55th ERPC meeting scheduled on 16th & 17th December 2025 for obtaining recommendation of ERPC for implementation of the instant project under PSDF.

In 55th CCM meeting,
The issue of Patna Islanding Scheme has been deliberated earlier in various forums. Though it was earlier decided by BSPTCL to implement Patna Islanding Scheme through Internal Resources but on subsequent development on the issue they have now approached the forum for approval for PSDF funding for the same.

- Committee referred the above agenda to upcoming 55th TCC & ERPC meetings for their consideration and further decision on the issue.

SLDC Bihar may update. Members may discuss.

2.20 Upgradation of 66/11 kV Bulbuley Sub-station to 132 kV Level and Associated Transmission Infrastructure Works in Gangtok: Sikkim SLDC.

Upgradation of 66/11 kV sub-station at Bulbuley (Gangtok) to 132 kV voltage level, establishment of AIS extension bay at POWERGRID 132/66 kV sub-station at Lagyap and GIS bays at Bulbuley along with installation of 132/66 kV, 2x25 MVA transformers at Bulbuley along with construction of 132 KV LILO arrangement at 132 kV D/C transmission line.

Estimated Cost = Rs. 167.42 Crore.

Bulbuley is the only major substation within Gangtok proper that still has scope for upgradation and availability of ROW corridor for construction of transmission line. Capacity augmentation is not possible in remaining two other 66/11 kV sub-stations within Gangtok proper, i.e. Tadong and Sichey, owing to space and ROW constraints. These areas are now completely built up and commercialized.

Urgent need to upgrade the main power supply to main Gangtok city area to 132 kV voltage level due to current condition of the existing lines all of which are 66 kV lines.

Need to undertake the work soon since there will not be any ROW availability nor space for expansion of sub-station in Gangtok proper in the near future.

In 55th CCM meeting,
Representative of Sikkim explained the issue.

- Representative of Powergrid submitted that the issue is placed for the first time in this meeting and requested Sikkim to provide the single line diagrams and other necessary documents to Powergrid at the earliest for study at their end.
- Committee was of the view that the issue should have been placed before OCC forum. However, considering the urgency as expressed by Sikkim, advised Powergrid to carry out a detailed study in coordination with Sikkim and submit a report in the upcoming 55th TCC & ERPC meetings for their consideration and further decision on the issue.

SLDC, Sikkim may explain, Members may discuss.

2.21 Ramping impact on states due to bulk collective purchase by industries: SLDC, Odisha

The SLDC need to take corrective action on injection schedule of State / ISGS to manage the sizeable Collective purchase by industries under RTM / DAM.

As the purchase transaction has no offset of ramping and sudden change of more than 300 / 400 MW Collective purchase are common with respect to previous block.

To maintain the drawl parameter SLDC need to implement downward revision on the injection schedule of Generators. It is important to note here that this downward revision cannot be implemented at a stroke but with ramping which result under drawl / loss of revenue /penalty by the state for which it is not responsible and therefore it need to be compensated by the buying entity of exchange power.

SLDC, Odisha may update. TCC members may discuss.

2.22 CERC 9/SM/2025 order on Resource adequacy: ERLDC

Hon'ble Commission had issued Suo Motu Order in 9/SM/2024 on 07.10.2024 for planning for safe, secure, and reliable integrated operation of the power system during critical periods arising on account of seasonal variations wherein the electricity demand increases. The order was followed by submissions from NLDC, RLDCs and SLDCs, various meetings among CERC, NLDC, RLDCs and SLDCs, State regulators, discoms and the Report of the single member bench under Member (Technical), CERC.

Subsequently, CERC issued the order dated 05.10.2025, emphasizing adequacy of manpower at SLDCs, operational flexibility of thermal generating units up to 55% MTL, implementation of intra-state AGC, enhancement of forecasting capability, maintenance of reserves, cybersecurity preparedness, and formulation of regulations related to incentives for certified SLDC personnel.

ERLDC presented the key provisions and implementation requirements of the order during the 232nd OCC Meeting held on 24.10. 2025. As mentioned in the order dated 05.10.2025, the existing manpower of Eastern Region SLDCs is significantly lower than both the sanctioned strength and the manpower requirements prescribed in the MoP Resource Adequacy Guidelines dated 30th October 2024.

The matter regarding workforce adequacy has been discussed at length in various TCC & ERPC meetings. During the 233rd OCC Meeting held on 21.11.2025, SLDCs again highlighted that insufficient manpower continues to affect critical activities such as operational planning, resource adequacy assessment, real-time system operation, and compliance with Grid Code provisions.

Accordingly, ERLDC has issued letters to SLDCs of Bihar, Jharkhand, Odisha, West Bengal, and Odisha Power Department, stressing the urgent need to strengthen SLDC manpower in line with CERC directions, Ministry of Power guidelines, and ERPC recommendations.

Members may update the status.

3. PART-C: ITEMS FOR INFORMATION

3.1. Maintaining reserves and implementation of Automatic Generation Control for balancing and improving the grid frequency profile: NLDC

Secretary (Power), Govt. of India chaired a meeting on 22.10.2025 to discuss the deployment of Battery Energy Storage System (BESS) for Ancillary Services. During the meeting he also reviewed the availability of reserves and participation in ancillary services. Minutes of the meeting are enclosed (**Annexure C.3.1**).

In this regard, attention is invited to the following action point of the minutes:

"SLDCs and Intra-state generating stations shall be pursued to maintain adequate reserves and implement Automatic Generation Control for balancing and improving the grid frequency profile. (Action: GRID-INDIA, RPC, CEA)"

In view of the above it is requested that the matter may kindly be pursued further in the forthcoming RPC / NPC meetings for necessary action and implementation at the state level.

Members may Note.

3.2. Information and Update of Impact of Very Heavy Rainfall and Landslides in Darjeeling District and the Sub-Himalayan Region of 400 kV Teesta III – Kishanganj D/C transmission Line in the month of October 2025: SPTL

Sikkim Power Transmission Limited (formerly Teestavalley Power Transmission Ltd.), (SPTL), a JV of Sikkim Urja Limited & POWERGRID (A Govt. of India Enterprise), was entrusted with the responsibility to construct, operate & maintain the 400 kV Teesta-III-Rangpo- Kishanganj D/C Transmission Line. The 400 kV D/C Teesta-III – Rangpo-Kishanganj transmission line of SPTL is an ISTS line evacuating a major portion of power from HEPs in Sikkim Hydro Generating Complex.

The transmission line of length 215 km (589 towers) passes through Mangan, Gangtok & Namchi District of Sikkim, Darjeeling District of West Bengal and Kishanganj District of Bihar. The line passes through the difficult hilly terrain of altitude in the range of 1000m – 2600m and during monsoon period landslides & soil erosion occur in this range due to geological condition of the Eastern Himalayan Region. Also, the transmission line crosses chenga river in West Bengal & Bihar and Mahananda & Dauk River in Bihar which change their course often. The line was commissioned on 13.02.2019 and is under operation and maintenance since then.

During the 4th and 5th of October 2025, the district of Darjeeling in West Bengal, along with adjoining areas of the sub-Himalayan region, experienced episodes of very heavy to extremely heavy rainfall. The continuous and intense downpour over these two days triggered severe flooding and multiple landslides across the hilly terrain, resulting in significant damage to infrastructure, property, and loss of human lives.

The 400 kV Teesta III – Kishanganj Transmission Line corridor was notably affected due to the occurrence of multiple landslides in and around the tower locations. The observed impacts include:

- Damage to Approach Roads and Bridges: Access routes to several tower sites were washed away or blocked by landslide debris, hampering maintenance and inspection activities.
- Damage to Surrounding Areas: Landslides in proximity to the transmission line caused significant soil displacement, affecting nearby residential houses and agricultural fields.
- Accumulation of Debris: Considerable accumulation of loose soil, boulders, and vegetation debris was observed around several tower foundations, posing risks to structural stability and accessibility.

SPTL is continuously monitoring the tower locations for any further changes. SPTL is in process to take up protection measures near tower base (construction of Gabion walls, Rope Gabions etc.) near the tower area and for detailed assessment in the transmission line vicinity has been done. The required tower protection measures shall be taken based on the required design and engineering to protect these towers. The major tower protection works to be carried out under additional capital expenditure due to force majeure condition of CERC tariff regulations. The current status is put for information of the forum, and any other changes and protection works taken up will be informed subsequently to the forum.

Photographs of the tower and the eroded slope / riverbank and Newspaper cutting are attached as **Annexure-B.2.11**.

SPTL may update. Members may discuss.

3.3. Disaster Preparedness of Transmission Infrastructure: Procurement of 20 sets (300 Towers) of Emergency Restoration System under Make in India: POWERGRID

The Ministry of Power (MOP), through its letter No. 34/7/2025-TRANSMISSION dated 11.05.2025, has inter-alia directed POWERGRID to place an order for 20 sets comprising 300 towers of Emergency Restoration System (ERS). This directive follows a high-level meeting chaired by the Secretary (Power) on 10.05.2025, where the decision was finalized.

Subsequently, MOP vide letter ref. No. 34/7/2025-TRANSMISSION (MoP) dated 19.08.2025 has conveyed in-principle approval for procurement of 20 sets (300 towers) ERS under Public Procurement (Preference to Make in India) through Regulated Tariff Mechanism (RTM) to POWERGRID.

POWRGRID is to carry out procurement of 20 sets of ERS towers (300 towers) through emergency procurement process to meet potential requirement in the states. The proposed ERS shall be kept and maintained at suitable locations to meet the requirement of stake holders during contingencies, and the ERS shall be treated as spares under a common pool.

As per preliminary estimation, total expenditure towards said procurement is expected as approximately **Rs 440 Cr. Out of 20 sets of ERS (300 towers) suitable for 400kV Transmission Lines being procured, 4 sets of ERS towers (60 towers) shall be kept in Eastern Region, against which a preliminary expenditure of Rs 88 Cr is expected**.

In view of the above, POWERGRID has planned to procure the proposed ERS and subsequently, approach CERC through tariff petition for cost recovery of the expenditure in terms of the CERC Tariff regulations, 2024.

Members may note.

3.4. Development of Unified Accounting Software (UAS) for RPCs and NPC

NRPC Secretariat is the nodal RPC for implementation of Unified Accounting Software of RPCs & NPC.
Ministry of Power has sanctioned a PSDF grant of 31.298 ₹ crore (including GST) for the "Development of Unified Accounting Software for RPCs and NPC," covering software development, warranty, and four years of ETS. It is to note that tender documents have been prepared with a Bill of Quantities (BoQ) that includes some essential items which could not be proposed earlier to PSDF for funding, as these provisions emerged during detailed planning and expert consultations, primarily to strengthen cybersecurity and support long-term software operations. The revised BoQ now includes Web Application Firewalls (2 units), L-2 Access Switches (3 units), Network Attached Storage (1 unit), and Extended Technical Services (ETS) for the 5th and 6th year—items currently not covered under the sanctioned grant.
In the 81st NRPC Meeting, NRPC Secretariat was advised to proceed with the bidding process based on the revised BoQ and the updated project cost estimate of about 36.08 crores. NRPC Secretariat was also advised to approach the PSDF Secretariat to increase the sanction grant to include additional items as per revised BoQ and revised cost estimates as the project is of interest to larger number of utilities.
Members may note.

ANNEXURE B.2.1.a

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
तापीय परियोजना नवीनीकरण एवं आधुनिकीकरण प्रभाग
Thermal Project Renovation & Modernization Division

No.2/4/FLEX/TPRM/CEA/2025/1274-1305 **Dated:** 20.11.2025

Sub: CEA (Flexible Operration of Coal Based Thermal Power Generating Units) Regulation. 2023 -reg.

CEA has issued a gazette notification dated January 30, 2023 regarding flexible operation of coal fired generating units. As per CEA gazette notification extraordinary, part III, section 4, no. 61 (CG-DL-E-31012023-243299), the coal based power generating units shall have flexible operation capability with minimum power level of 55% along with ramp rate of 2% between 55%-70% and ramp rate of 3% above 70% within one year of notification of the above mentioned regulations i.e. by Jan 2024. Further, it mandates that the generating units which are not capable of achieving a minimum power level of 40%, shall achieve the same as per phasing plan (Attached as Annexure).

It may be noted that CEA's flexible operation regulations were notified after successful pilot test/study conducted across the country in association with international partner and BHEL.

In this regard, it is pertinent to mention that 91 Units of total installed Capacity 51080 MW in aggregate of various thermal power plants have been notified under the Phase I (July 2024-June 2026) for operation at 40% MTL. These units are required to carry out the necessary retrofitting/modifications as recommended by the respective OEMs so as to be fully prepared for sustained operation at 40% MTL by June, 2026, as mandated under the provisions of the aforesaid Regulations.

It may also be noted that successful and sustained operation at 40% MTL with Indian coal has been demonstrated by other generating utilities (Under Pilot Phase) such as West Bengal Power Development Corporation Limited (WBPDCL) at Sagardighi Unit-8 and Damodar Valley Corporation (DVC) at Mejia Unit-8, following suitable retrofits as advised by the OEMs.

Further, in order to compensate the losses on account of flexible operation, CERC has already incorporated most of the recommendations of CEA's compensation methodology such as for additional Capex , oil consumption, additional auxiliary power consumption and heat rate degradation.

Therefore, all generating utilities are requested to complete the retrofit , control system tuning ,trial runs etc of all units under phase I by June ,2026 in consultation with OEM positively. It is also requested to furnish the progress and updates (as per attached format) of **First Phase units** by the end of November 2025 and thereafter every month.

This may be treated as **MOST URGENT**.

Regards

Encl : As above

Surata Ram 21.11.2025

(Surata Ram)
Chief Engineer, TPRM

To:

1. CMD, NTPC Limited, NTPC Bhawan, SCOPE Complex, Institutional Area, Lodhi Road, New Delhi – 110003, (FAX NO.: 011 24361018), Email : cmd@ntpc.co.in
2. Managing Director, UPRVUNL, UP Rajya Vidyut Utpadan Nigam, Shakti Bhawan, Ashok Marg, Lucknow. (Fax No. 0522-2237922), Email: md@uprvunl.org
3. CMD, GVK Power, Paigah House, 156-159, SP Road, Secunderabad 500003,Telangana, India.,Telephone +91 -40-27902663/4, Email: pvrs@gvk.com
4. MD, Andhra Pradesh Generation Corporation (APGENCO), Vidyut Soudha, Gunadala, Vijaywada, Andhra Pradesh, India-520004, Email: apg.md@apgenco.gov.in
5. CMD, TSGENCO, Vidyut Saudha, Khaitrabad, Hyderabad-500082 (Fax-040-23499361), Email: cmd@tsgenco.co.in
6. CMD, TANGEDCO, NPKRR Maaligai, 144, Anna Salai, Chennai-60002 (Fax: 044-28521300), Email: chairman@tnebnet.org
7. CMD, R.K.M Powergen Private Limited , 14/45 Dr.Giriappa Road , T.Nagar,, Chennai - 600017, Tamil Nadu, India, Telephone : +91 -44-66291000, Email: m.malathi@rkmpowergen.in
8. Director, Adani Power Limited, Achalraj, Opp Mayor Bungalow, Law Garden, Ahmedabad-380006 ,Gujarat, India.,Tel:+91 79 2555 7555,Fax:+91 79 25557177 Email: deepak.pandya@adani.com
9. Chairman, DVC, DVC Head Quarters, DVC Towers, VIP Rod, Kolkata-700054 Email id : chairman@dvc.gov.in
10. MD/CMD, ITPCL, IL&FS Tamil Nadu Power Company Limited 4th Floor, KPR Tower, Old No. 21, New No. 2, 1st Street, Subba Rao Avenue,College Road, Chennai - 600 006, Email: info@itpclindia.com
11. CMD, Hinduja National Power Corporation Limited , Hinduja House, 171 , Dr. Annie Besant Road,, Worli , Mumbai - 40001 8, India, Phone : +91 -22-24960707, Fax : +91 -22-24960747 Email: sunil.hnp@hindujagroup.com
12. Chairman , RattanIndia Power Limited, 5th Floor, Tower-8, World mark 1 , Aerocity,, New Delhi - 110037 Email: powersectt@rattanindia.com
13. CMD, Tata Power, Bombay House, 24, Homi Mody Street, Mumbai 400 001 , Tel: (91 22) 66658282, Fax: (91 22) 6665 8801, Email: tatapower@tatapower.com
14. MD/CMD, Ind-Barath Power Infra Limited, Hyderabad, Plot No. 30-A, Road No. 1, Film Nagar, Jubilee Hills, Hyderabad - 500 096 , Andhra Pradesh, INDIA. Phone: +91-40-23553459 Fax: +91 40 23607522 Email: hyderabad@ibpil.com

15. MD/CMD, Shirpur Power Pvt. Ltd., 903, Shilp Building, Opposite Navrangpura Telephone Exchange, Ahmedabad, Gujarat- 380009, India, Email ID: nikunj.shah@shirpurpower.in
16. CMD, The Singareni Collieries Company Ltd., Kothagudem Collieries, Bhadradri Kothagudem Dist , Telangana State PIN: 507101. Ph No 08744-242301 /02/03/04 Fax: 08744-242305, Email: dp@scclmines.com
17. Chairman, Bharat Aluminium Company Limited (BALCO)Aluminium Sadan, Core – 6, Scope Office Complex, Lodi Road, New Delhi – 110 003
18. CMD, Rajasthan Rajya Vidyut Utpadan Nigam Limited, Vidyut Bhawan , Jyoti Nagar, Janpath , Jaipur -302005 (Fax No. 0141 - 2740633), Email: cmd@rrvun.com
19. CMD, Karnataka Power Corporation Ltd. (KPCL), Shakti Bhawan, Race Course Road, Banglore-560001, Email: kpclcetd@gmail.com
20. MD/CMD, M/S SKS ISPAT AND POWER LTD., B-501, Elegant Business Park, Andheri Kurla Road, J.B.Nagar, Andheri - (E), Mumbai - 400 059 Telephone: +91-22-3080 7000 Fax: +91-22-3080 7070 / 7080 E-Mail: corporateoffice@sksispat.com
21. MD/CMD , Sembcorp Energy India Limited, 5th floor, Tower C, Building No. 8, DLF Cybercity, Gurgaon 122002 Haryana, India Ph: (91) 12 4389 6700; Email: cs.india@sembcorp.com
22. TRN Energy Private Limited, 7th Floor, Office Tower ,Ambience Mall, NH-08 Gurugram, Haryana 122001
23. Chairman/CMD, MAHAGENCO, Maharashtra State Power Generation Co. Ltd., Prakashgad, Plot No. G-9, Bandra (East) Mumbai-400 051
24. MD, Talwandi Sabo Power Limited, Site Cum Regd. Office:,Village Banawala , Mansa - Talwandi Sabo Road, Distt. Mansa, Punjab - 15 1302 INDIA, Tel: +91 -1659-248000 Telefax: 01659-248083, Email: tspl.commercial@vedanta.co.in
25. MIS-IT O/o Executive Director (O&M), CSPGCL, Dangania, Raipur(C.G.)
26. CMD, MP Power Generating Co. Ltd, Shakti Bhawan, Vidyut Nagar, Rampur, Jabalpur-482009 (Fax: 0761-2665661), Email: mppgcl@mp.nic.in
27. MD/CMD, JSW Centre, Bandra Kurla Complex, Near MMRDA Grounds, Bandra East,Mumbai 400 051 Fax: +91 22 4286 3000, Email: contact@jsw.in

Copy to:

1. Chairperson , CEA
2. Additional Secretary (Thermal) , MoP
3. PCE-II , CEA
4. Member Secretary (WRPC/ERPC/SRPC/NRPC/NERPC)

FORMAT

S. No	Details	Unit 1	Unit2	Unit3	------
1	Name of Utility				
2	Plant Name and Address				
3	Capacity, MW				
4	Date of Commissioning				
5	Type of Unit: Supercritical/Subcritical/....				
6	Net Heat rate: Design/Actual				
7	Coal Quality (i) GCV (ii) Volatile matter (iii) Ash Content				
8	Maximum Generation (last 2 years) MW				
9	Minimum Generation (last 2 years) MW				
10	Maximum Ramp Rate Up (last 2 years)				
11	Maximum Ramp Rate Down (last 2 years)				
12	Whether 40% Minimum load Achieved (YES/NO) (i) If YES, specify the duration and time (ii) If NO, specify the reason for the same (iii) Whether low load test conducted at 40% (YES/NO) (a) If YES, measures identified/implemented for achieving the same. (b) If No, any action taken in this regard				
13	Any other details				

PHASE 1 (JULY , 2024 - JUNE , 2026)

Year	Month	Phase	Sector	Organisation	Name of Project	Unit No.	Capacity (MW)	DT-of COMMISSIONING	Pit head	Region
	November	Phase 1	State	UPRVUNL	HARDUAGANJ TPS	10	660	1/29/2022	N	NR
	November	Phase 1	Private	GPGSL (GVK)	GOINDWAL SAHIB	2	270	3/15/2016	N	NR
	November	Phase 1	State	APPDCL	DAMODARAM SANJEEVAIAH TPS	3	800	3/9/2023	N	SR
	November	Phase 1	State	TSGENCO	BHADRADRI TPP	4	270	1/9/2022	N	SR
	November	Phase 1	State	TANGEDCO	METTUR TPS-II	1	600	10/11/2012	N	SR
	November	Phase 1	Central	NTPC	GADARWARA TPP	2	800	2/16/2021	N	WR
	November	Phase 1	Private	RKMPPL	UCHPINDA TPP	3	360	9/12/2017	N	WR
	November	Phase 1	Central	NTPC	MAUDA TPS	3	660	3/28/2016	N	WR
	November	Phase 1	Private	APL	MUNDRA TPS	8	660	3/3/2012	N	WR
	November	Phase 1	Central	DVC	BOKARO TPS `A` EXP	1	500	3/22/2016	N	ER
				November Total		**10**	**5580**			
2024	December	Phase 1	Central	NTPC	TANDA TPS	6	660	3/31/2021	N	NR
	December	Phase 1	Private	GPGSL (GVK)	GOINDWAL SAHIB	1	270	2/14/2016	N	NR
	December	Phase 1	Private	ITPCL	ITPCL TPP	2	600	4/18/2016	N	SR
	December	Phase 1	Private	HNPC	VIZAG TPP	2	520	3/30/2016	N	SR
	December	Phase 1	Central	NTPC	SIMHADRI	4	500	3/30/2012	N	SR
	December	Phase 1	Central	NTPC	LARA TPP	2	800	7/12/2020	N	WR
	December	Phase 1	Private	RATTANINDIA	NASIK (P) TPS	5	270	5/30/2017	N	WR
	December	Phase 1	Private	APL	RAIKHEDA TPP	2	685	3/28/2016	N	WR
	December	Phase 1	Private	CGPL	MUNDRA UMTPP	1	800	2/25/2012	N	WR
	December	Phase 1	Private	IBPIL	UTKAL TPP (IND BARATH)	1	350	2/25/2016	N	ER
				December Total		**10**	**5455**			
				2024 Total		**20**	**11035**			
	January	Phase 1	Central	NTPC	MEJA STPP	2	660	1/12/2021	N	NR
	January	Phase 1	Private	SPPL	0	1	525	11/30/2021	N	SR
	January	Phase 1	State	SCCL	SINGARENI TPP	1	600	3/13/2016	N	SR
	January	Phase 1	Central	NTECL	VALLUR TPP	1	500	3/28/2012	N	SR
	January	Phase 1	Central	NTPC	KHARGONE STPP	2	660	3/24/2020	N	WR
	January	Phase 1	Private	RATTANINDIA	NASIK (P) TPS	4	270	5/19/2017	N	WR
	January	Phase 1	Private	BALCO	BALCO TPS	2	300	3/24/2016	N	WR
	January	Phase 1	Central	DVC	RAGHUNATHPUR TPP	2	600	1/18/2016	N	ER
				January Total		**8**	**4115**			
	Februrary	Phase 1	State	RRVUNL	Suratgarh SCTPP	7	660	3/15/2020	N	NR
	Februrary	Phase 1	Central	NTPC	UNCHAHAR TPS	5	210	9/28/2006	N	NR
	Februrary	Phase 1	State	TSGENCO	BHADRADRI TPP	3	270	3/26/2021	N	SR
	Februrary	Phase 1	State	KPCL	BELLARY TPS	3	700	3/1/2016	N	SR
	Februrary	Phase 1	Central	NTPC	KHARGONE STPP	1	660	9/29/2019	N	WR
	Februrary	Phase 1	Private	SKS	BINJKOTE TPP	2	300	4/25/2017	N	WR
	Februrary	Phase 1	Private	JHAPL	SEIONI TPP	1	600	3/22/2016	N	WR
	Februrary	Phase 1	Central	NTPC	KUDGI STPP	1	800	12/25/2016	N	SR
				Februrary Total		**8**	**4200**			
	March	Phase 1	Central	NTPC	TANDA TPS	5	660	9/28/2019	N	NR
	March	Phase 1	State	TSGENCO	BHADRADRI TPP	2	270	12/7/2020	N	SR
	March	Phase 1	Private	SEIL	PAINAMPURAM TPP	2	660	9/3/2015	N	SR
	March	Phase 1	Private	TRNE	NAWAPARA TPP	2	300	4/18/2017	N	WR
	March	Phase 1	State	MAHAGENCO	CHANDRAPUR(MAHARASHTRA) STPS	9	500	3/21/2016	N	WR
	March	Phase 1	Private	TSPL	TALWANDI SABO TPP	3	660	3/29/2016	N	NR
	March	Phase 1	State	CSPGCL	MARWA TPS	2	500	7/15/2016	N	WR
	March	Phase 1	Private	CGPL	MUNDRA UMTPP	3	800	10/16/2012	N	WR
	March	Phase 1	State	SCCL	SINGARENI TPP	2	600	11/25/2016	N	SR
2025				**March Total**		**9**	**4950**			
	July	Phase 1	State	RRVUNL	CHHABRA TPP	6	660	3/29/2019	N	NR
	July	Phase 1	State	TSGENCO	BHADRADRI TPP	1	270	6/5/2020	N	SR
	July	Phase 1	Central	NTPL	Thoothukudi (JV) TPP	2	500	7/9/2015	N	SR
	July	Phase 1	Central	NTPC	GADARWARA TPP	1	800	3/29/2019	N	WR
	July	Phase 1	Private	RATTANINDIA	NASIK (P) TPS	3	270	4/14/2017	N	WR
	July	Phase 1	Private	SEIL	SGPL TPP	1	660	11/12/2016	N	SR
	July	Phase 1	State	MAHAGENCO	KORADI TPS	9	660	3/15/2016	N	WR
				July Total		**7**	**3820**			
	November	Phase 1	Central	NTPC	MEJA STPP	1	660	3/31/2018	N	NR
	November	Phase 1	State	TSGENCO	KOTHAGUDEM TPS (STAGE-7)	12	800	12/26/2018	N	SR
	November	Phase 1	State	APPDCL	DAMODARAM SANJEEVAIAH TPS	2	800	3/17/2015	N	SR
	November	Phase 1	State	MPPGCL	SHREE SINGAJI TPP	4	660	3/27/2019	N	WR
	November	Phase 1	Central	NTPC	SOLAPUR STPS	1	660	4/7/2017	N	WR
	November	Phase 1	Private	RKMPPL	UCHPINDA TPP	2	360	1/28/2016	N	WR
	November	Phase 1	Central	NTECL	VALLUR TPP	2	500	2/28/2013	N	SR
	November	Phase 1	Private	CGPL	MUNDRA UMTPP	2	800	7/17/2012	N	WR
	November	Phase 1	Private	SPPL	SHIRPUR TPP	1	150	9/28/2017	N	WR
				November Total		**9**	**5390**			
	December	Phase 1	Central	NTPC	KUDGI STPP	3	800	3/12/2018	N	SR
	December	Phase 1	Central	NTPL	Thoothukudi (JV) TPP	1	500	3/10/2015	N	SR
	December	Phase 1	Private	RKMPPL	UCHPINDA TPP	4	360	3/20/2019	N	WR
	December	Phase 1	Central	NTPC	MAUDA TPS	4	660	3/18/2017	N	WR
	December	Phase 1	State	TANGEDCO	NORTH CHENNAI TPS	4	600	9/13/2013	N	SR
	December	Phase 1	Central	NTPC	LARA TPP	1	800	3/23/2018	N	WR
	December	Phase 1	Private	RATTANINDIA	AMARAVATI	5	270	3/12/2015	N	WR
				DecemberTotal		**7**	**3990**			
				2025 Total		**48**	**26465**			
	January	Phase 1	State	RRVUNL	CHHABRA TPP	5	660	4/4/2017	N	NR
	January	Phase 1	State	APGENCO	RAYALASEEMA TPS	6	600	3/12/2018	N	SR
	January	Phase 1	Private	SEIL	PAINAMPURAM TPP	1	660	2/7/2015	N	SR
	January	Phase 1	State	MPPGCL	SHREE SINGAJI TPP	3	660	11/18/2018	N	WR
	January	Phase 1	Private	RATTANINDIA	NASIK (P) TPS	2	270	2/15/2017	N	WR
	January	Phase 1	State	TANGEDCO	NORTH CHENNAI TPS	5	600	3/9/2013	N	SR
	January	Phase 1	Private	APL	MUNDRA TPS	9	660	3/9/2012	N	WR
	January	Phase 1	Private	WPCL	AKALTARA TPS	2	600	1/18/2018	N	WR
	January	Phase 1	Central	NTPC	MAUDA TPS	2	500	3/29/2013	N	WR
				January Total		**9**	**5210**			
	Februrary	Phase 1	Central	NTPC	UNCHAHAR TPS	6	500	3/31/2017	N	NR
	Februrary	Phase 1	State	KPCL	YERMARUS TPP	2	800	3/29/2017	N	SR
	Februrary	Phase 1	State	APPDCL	DAMODARAM SANJEEVAIAH TPS	1	800	8/28/2014	N	SR
2026	Februrary	Phase 1	Private	APL	MAHAN TPP	2	600	10/7/2018	N	WR
	Februrary	Phase 1	State	MAHAGENCO	KORADI TPS	10	660	12/28/2016	N	WR
	Februrary	Phase 1	Central	NTPC	SOLAPUR STPS	2	660	3/30/2019	N	WR
	Februrary	Phase 1	Private	CGPL	MUNDRA UMTPP	5	800	3/18/2013	N	WR
				February Total		**7**	**4820**			
	March	Phase 1	Central	NTPC	KUDGI STPP	2	800	3/23/2017	N	SR
	March	Phase 1	Central	NTECL	VALLUR TPP	3	500	2/28/2014	N	SR
	March	Phase 1	Private	SKS	BINJKOTE TPP	1	300	3/28/2018	N	WR
	March	Phase 1	Private	TRNE	NAWAPARA TPP	1	300	8/14/2016	N	WR
	March	Phase 1	State	MAHAGENCO	PARLI TPS	8	250	3/30/2016	N	WR

March	Phase 1	Private	MBPMPL	ANUPPUR TPP	2	600	3/30/2016	N	WR
March	Phase 1	Private	CGPL	MUNDRA UMTPP	4	800	1/16/2013	N	WR
March Total					**7**	**3550**			
TOTAL UNITS AND CAPACITY					**91**	**51080**			

Annexure B.2.1

भारत सरकार/Government of India
विद्युत मंत्रालय/Ministry of Power
केंद्रिय विद्युत प्राधिकरण/Central Electricity Authority
राष्ट्रीय विद्युत समिति प्रभाग /National Power Committee Division
Ist Floor, Wing-5, West Block-II, RK Puram, New Delhi-66

No. CEA-GO-15-14/1/2025-NPC Division/122 Date: 30.06.2025

To,

(All Members of the Committee)

विषय: ग्रिड स्थिरता और नवीकरणीय ऊर्जा एकीकरण के लिए तकनीकी न्यूनतम स्तर पर तापीय उत्पादन सुनिश्चित करने के लिए तंत्र विकसित करने हेतु समिति की रिपोर्ट के संबंध में।

Subject: Report of the Committee to Evolve the Mechanism for ensuring Thermal Generation at Technical Minimum level for Grid Stability and RE Integration -reg.

ग्रिड स्थिरता और नवीकरणीय ऊर्जा एकीकरण के लिए तकनीकी न्यूनतम स्तर पर तापीय उत्पादन सुनिश्चित करने के लिए तंत्र विकसित करने हेतु समिति की रिपोर्ट आपके सूचनार्थ और आवश्यक कार्रवाई हेतु संलग्न है।

The report of the committee to Evolve the Mechanism for ensuring Thermal Generation at Technical Minimum level for Grid Stability and RE integration is enclosed herewith for your kind information and necessary action, please.

भवदीय/Yours faithfully

30/6/25

(ऋषिका शरण /Rishika Sharan)
मुख्य अभियंता एवं सदस्य सचिव (एनपीसी)
Chief Engineer & Member Secretary (NPC)

Copy for kind information:-

1. SA to Chairperson, CEA
2. SA to Member (GO&D), CEA
3. SA to Member (Power System), CEA

Report of the Committee to evolve mechanism for ensuring Thermal Generation at Technical Minimum level for Grid Stability and RE Integration.

Prepared by

Central Electricity Authority (CEA)

June 2025

1. BACKGROUND

The rapid increase in renewable energy penetration, combined with periods of low demand has created significant operational challenges for the grid as well as thermal generators in India. During weekends/holidays solar hours, the availability from Variable RE is high, consequently the requisitions from several inter-state thermal stations by beneficiary is nil or negligible resulting in injection schedules below the minimum technical levels (MTL). However, these generators are still required to provide firm supply during non-solar hours/evening peak hours.

During the meeting dated 26.05.2025, Chairperson, CEA, observed that several thermal generators, particularly Central Sector owned units, were being scheduled below their technical minimum limits during day time despite their requirement during non-solar/evening peak demand. NLDC also reported persistent high frequency operation and the need for limiting RE generation especially during weekends with lower demand, by deployment of TRAS emergency provisions after exhausting the downward regulation capability from conventional sources.

To resolve the above issues, a committee was constituted under the chairmanship of the Member Secretary (NRPC) with representatives from RPCs, GM Division, CEA, CERC, NLDC, RLDCs as Members and Member Secretary, NPC as the Member Convener. **(Constitution of Committee order enclosed at Annexure -I)**

The primary mandate of the Committee was to evolve a common mechanism to ensure adequate scheduling of thermal generation during daytime hours upto technical minimum for ensuring sufficient ramp-up capabilities to maximize the thermal availability during evening/non-solar peak hours. This will ensure secure and reliable grid operations, support the integration of RE sources, and help avoid operational and commercial challenges for generating units nationwide.

The terms of reference of the meeting are as follows:

(a) Review the current scheduling and dispatch practices of all thermal generators, particularly during Solar/high RE hours and propose mechanism for ensuring technical minimum schedule of thermal generators to support grid balancing and reliability during Non-Solar/evening hours.

(b) Assess operational constraints, technical minimum limit issues, and ramp-up/ramp-down capabilities of all thermal generators, to ensure the maximum availability during Non-Solar hours.

(c) Recommend a common mechanism for:
   i. Ensuring all thermal units are scheduled above their technical minimum limits during solar hours and moderating other generation sources including RE for ensuring reliable grid operation during Non-Solar hours.
   ii. Maintaining sufficient ramp-up capability of thermal generating units to meet the Non-Solar/evening demand.

(d) Address commercial and regulatory aspects linked to the common mechanism being finalized for operation of thermal generating units.

2. KEY CHALLENGES AND REGULATORY PROVISIONS

2.1. Central Electricity Authority (Flexible Operation of Coal based Thermal Power Generating Units) Regulations, 2023

Central Electricity Authority (Flexible Operation of Coal based Thermal Power Generating Units) Regulations, 2023 is applicable to all coal based thermal power generating units owned or under control of the Central Government, State Governments or owned by any private company, connected with the grid and to the load despatch centre.

The regulation states that "minimum power level" means *the minimum output power expressed in percentage of maximum continuous power rating that the coal based thermal power generating unit can sustain continuously without oil support*.

The regulations mandate that "*the coal based thermal power generating units shall have flexible operation capability with minimum power level of forty percent. Provided that the generating units which are not capable of achieving minimum power level of fifty-five percent, shall achieve the same within one year of the notification of these regulations. Provided further that the generating units which are not capable of achieving minimum power level of forty percent, shall achieve the same as per phasing plan mentioned in the sub-regulation (2) of regulation 5 of these regulations*."

2.2. Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations 2023: Provisions for Minimum Technical Level (MTL) Regulations and Requisition by beneficiaries

Minimum Technical Level (MTL) for thermal generating stations, as per Regulation 45(12) of Indian Electricity Grid Code, 2023, is specified as 55% or such other minimum power level as specified in the CEA (Flexible Operation of coal based Thermal Generating Units) Regulations, 2023, whichever is lower, The procedure for scheduling and dispatch has been provided under regulation 49 of IEGC, which does not place any obligation upon beneficiaries to provide schedule upto MTL.

In its order in petition 18/SM/2023 for removal of difficulties, CERC provided the following directions:

"...while the beneficiaries/buyers shall have full flexibility to decide on their requisition from a generating station up to 14:30 hrs on 'D-1' day, their right to revision of schedules in the said generating station for 'D' Day shall be subject to the condition that such revision of schedule for 'D' Day shall not be below their respective share of minimum turndown level in the respective generating station..."

IEGC 1st amendment introduced the following provisions in Regulation 49(4) (b) (ii) with respect to downwards revision of schedule by beneficiaries:

"Provided that downward revision of schedules by the buyers for 'D' day, after 14:30 hrs. on 'D-1' day in the generating station is permissible only for beneficiaries which have scheduled above their respective share of minimum turndown level in the generating station: "

Provided also that downward revision by such beneficiaries, which have scheduled above their respective share of minimum turndown level in the generating station, shall be permissible limited to a quantum such that overall schedule of the generating station is at least at Minimum turndown level. The downward revision of schedules by such beneficiaries for 'D' day, after 1430 hrs on 'D-1' day shall be permissible on a pro-rata basis of the power scheduled above the minimum turndown level of their share at 1430 hrs of 'D-1' day"

Even with the above amendment, beneficiaries have complete freedom in providing requisition up to 14:30 hrs. of 'D-1', with restrictions on further downwards revision. On D-1 basis, beneficiaries often provide very low, or even zero requisitions during solar hours, while providing full requisitions during evening peak.

2.3. Security Constrained Economic Despatch (SCED) and SCED-MTL Support

The 1st amendment to the IEGC has introduced a provision for providing scheduling Sec 62 thermal generating stations through Security Constrained Economic Despatch (SCED), even when they are scheduled below the minimum turndown level (MTL) during off-peak hours (declared by RLDCs) with introduction of a new sub-clause(v-a) under regulation 49(2)(a). Accordingly, a detailed procedure for moderating schedule up to MTL has been prepared by NLDC, which was approved by CERC on 12.03.2025. In line with the procedure, an assessment is carried out for identifying units to be provided schedule up to MTL through SCED.

IEGC-2023 clause 49(2) (a)

Quote

"*……. the schedule below the minimum turndown level shall be adjusted under SCED such that the schedule in all time blocks of the day is at least at the minimum turndown level……."*

Unquote

Power plants with schedule less than MTL during any time block in off-Peak hours and schedule greater than MTL for at least 8 time blocks in peak hours are eligible for MTL support through SCED. The list of plants identified for MTL support is published on NLDC website on D-1 basis.

Generating stations identified under SCED-MTL receive SCED-Up support upto their MTL in real time, provided sufficient down reserves are available to accommodate the corresponding SCED-Down for system balancing and sufficient margins are available on inter-regional corridors to accommodate the resulting flows.

Security Constrained Unit Commitment (SCUC) Mechanism

In accordance with the CERC (IEGC), Regulations 2023, MTL support is also extended to eligible generators through the Security Constrained Unit Commitment (SCUC) mechanism. The SCUC Cat#1 program is executed daily at 15:00 hrs with the primary objective of creating up reserves in the system. The program has been prepared in-line with the detailed procedure approved by CERC.

IEGC-2023 clause 46(4) (d):

Quote

"*…….NLDC in coordination with the RLDCs……anticipates shortfall of reserves in D day due to (i) extreme variation in weather conditions; (ii) high load forecast; (iii) the requirement of maintaining reserves on regional or all India basis for grid security; (iv) network congestion, ……NLDC may schedule incremental energy from the generating units in the list referred to in sub-clause (c) of this clause, so as to bring such units to their minimum turndown level in order to maximize availability of onbar units, by 15:00 Hrs. of D-1 day.* "

Unquote

IEGC-2023 clause 47:

Quote

"47. UNIT SHUT DOWN (USD)

(1) The generating stations or units thereof, identified by NLDC in co-ordination with RLDCs, as per sub-clause (c) of clause (4) of Regulation 46 of these regulations, but not brought on bar under SCUC, shall have the option to operate at a level below the minimum turn down level or to go under Unit Shut Down (USD).

(2) In case a generating station, or unit thereof, opts to go under unit shut down (USD), the generating company owning such generating station or unit thereof shall fulfil its obligation to supply electricity to its beneficiaries who had made requisition from the said generating station prior to it going under USD, by arranging supply either (a) by entering into a contract(s) covered under the Power Market Regulation; or (b) by arranging supply from any other generating station or unit thereof owned by such generating company subject to honouring of rights of the original beneficiaries of the said generating station or unit thereof from which supply is arranged; or (c) through SCED subject to the stipulation under sub-clause (a)(vi) of clause (2) of Regulation 49 of these regulations, the details of which shall be provided in the Detailed Procedure to be specified by NLDC in this regard.

(3) In case of emergency conditions, for reasons of grid security, a generating station or unit thereof, which is under USD may be directed by NLDC to come on bar, and in such event the generating station or unit thereof shall come on bar under hot, warm and cold conditions as per the time period to be specified in the detailed procedure under subclause (i) of clause (4) of Regulation 46 of these regulations.

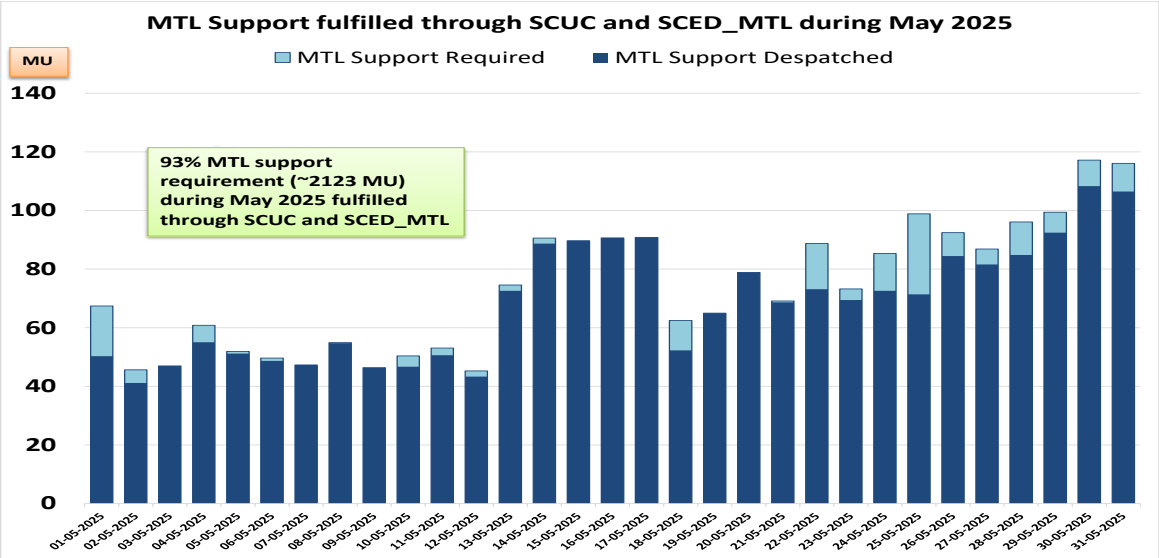
(4) Once a generating station is brought on bar as per clause (3) of this Regulation, it shall be treated as a unit under SCUC and scheduled and compensated as per Regulation 46 of these regulations."

Unquote

SCUC process considers reserve requirement, current plant schedules, and minimum turndown levels, and runs automatically to ensure sufficient reserves (typical requirement is in the evening peak hours). Generators with schedules below their MTL are identified as eligible. Among them, those capable of enhancing system reserves during periods of reserve deficit are selected for MTL support under SCUC. The reserve requirement is automatically calculated in line with the approved procedure by CERC, based on a statistical analysis of the area control error of the previous 7 days. The list of committed units under SCUC is published on NLDC website on D-1 basis. The identified plants receive SCUC-Up schedule up to MTL in real-time. Equivalent quantum of SCUC-Down is scheduled in other plants in SCED stack following merit order to balance the system.

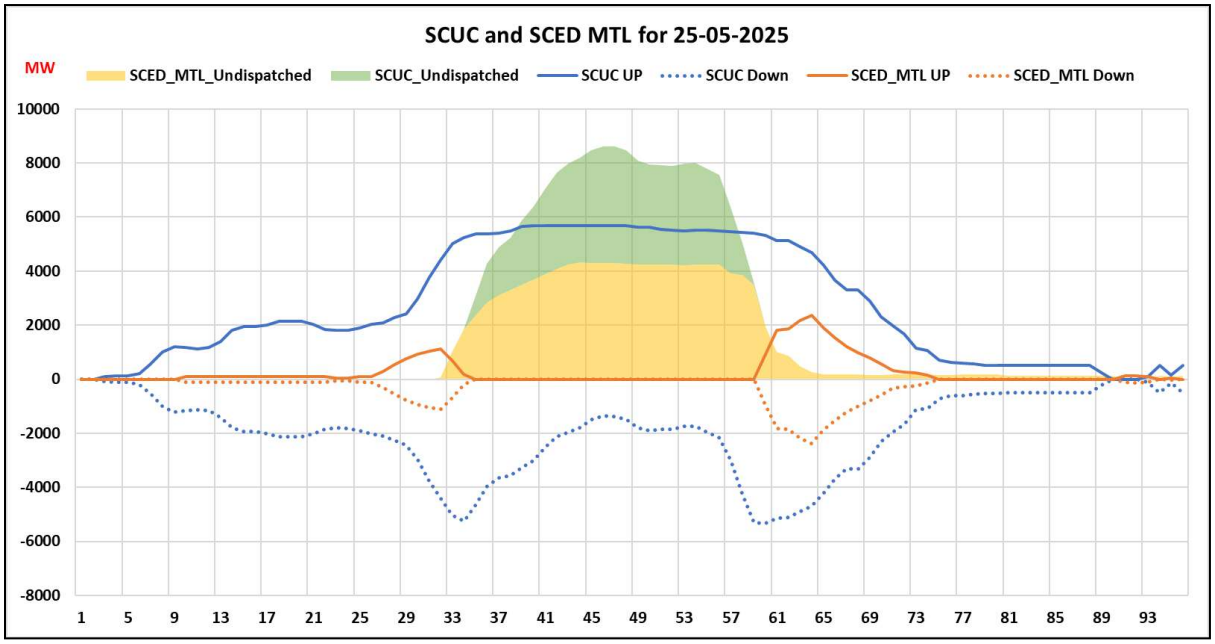
2.4. Challenges in SCUC and SCED-MTL Support Implementation

Due to very low requisitions from beneficiaries, the demand for support under SCUC and SCED-MTL remains significantly high during solar hours, often exceeding 8000 MW to 10000 MW. On several days, 25 to 45 generating stations required MTL support. The available down reserves from the remaining thermal ISGS are utilized to balance the support extended to these stations. The plots below illustrate the MTL support provided through SCUC and SCED during May 2025.

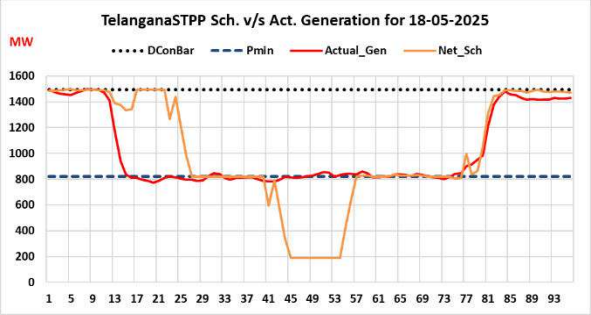


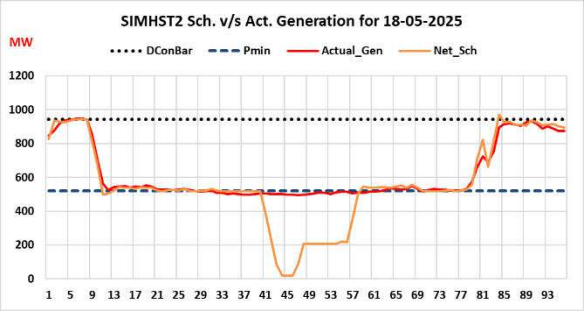
On an aggregate basis, 93% of the support requirement, ~2123 MU MTL support requirement was fulfilled out of 2285 MU, was fulfilled. Only 7% of the requirement of the plants couldn't be fulfilled because of insufficient down reserves in the system.

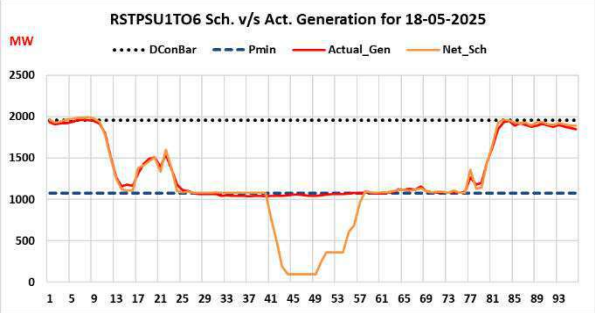
When the available down reserves are insufficient, it results in over-injection in the grid and high frequency, as matching decrease (SCED-Down or SCUC-Down) of generation cannot be provided to balance the increase (SCED-Up or SCUC-Up) in generation to achieve MTL. SCUC-Up is provided to support schedule till MTL but matching SCUC-Down cannot be scheduled as all other units in SCUC stack have reached MTL. Further, the generating stations which do not get MTL support through SCED in the real time due to shortfall in down reserves continue to operate at 55% of the Normative DC level, despite their schedules being lower. The plot below illustrates the over injection due to scheduling below MTL on 25th May 2025. The total quantum of support required due to scheduling below MTL was to the tune of 10000 MW (6000 MW under SCUC and 4000 MW under SCED). Against 6000 MW of SCUC-Up support provided, SCUC-Down could be booked for only 2000 MW resulting in net 4000 MW over injection. Support under SCED-MTL could not be provided to any plant, resulting in another 4000 MW over injection assuming the plants continued to operate at 55% level.



Schedule vs. actual plots for some sample stations unable to get support for meeting MTL are shown below:







2.5.Frequency Excursions Due to Shortfalls in Down Reserves

CERC (DSM & Related matters) Regulation 2024 clause 8(1)

Quote

" (1) Charges for Deviation, in respect of a general seller (other than an RoR generating station and a generating station based on municipal solid waste) shall be as under:

Deviation by way of over injection (Receivable by the Seller) @ zero when [50.05 Hz < f < 50.10 Hz] : Provided that such seller shall pay @ 10% of RR when [f ≥ 50.10 Hz]

Deviation by way of under injection (Payable by the Seller) @ 85 % of RR when [f > 50.05 Hz]"

Unquote

CERC (DSM & Related Matters) Regulation 2024 clause 8(7)

Quote

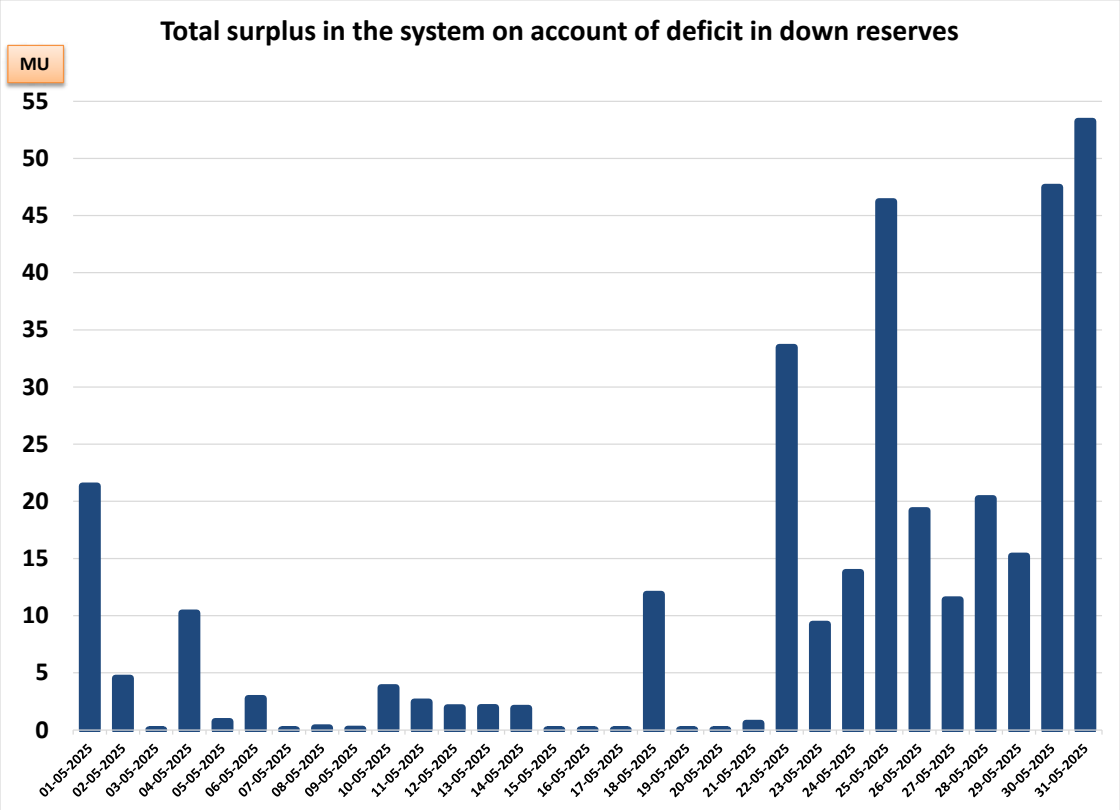
"(7) Charges for Deviation, in respect of a Buyer, shall be receivable or payable as under:

Deviation by way of under drawal (Receivable by the Buyer) @ zero when [50.05 Hz < f < 50.10 Hz] : Provided that such buyer shall pay @ 10% of NR when [f ≥ 50.10 Hz];

Deviation by way of over drawal (Payable by the Buyer)@ 50% of NR when [50.05 Hz < f < 50.10 Hz]: (iv) @ zero when [f ≥ 50.10 Hz];"

Unquote

The plot below depicts the over-injection during the May-2025 on account of deficit in down reserves.



These conditions arise during low demand periods, especially weekends and holidays coinciding with inclement weather in various parts of the country. The ability to control high frequency by decrementing generation under Secondary Reserves Ancillary Services (SRAS) and Tertiary Reserves Ancillary Services (TRAS) is hindered by unavailability of adequate down reserves, which are consumed in providing SCUC and SCED_MTL support to generators scheduled by beneficiaries below MTL.

As a result of the above, there were 18 days in May 2025, in which the frequency remained more than 50.05 Hz for more than 20% of time during the day, with sustained high frequency for several hours experienced on many days. To mitigate this, TRAS-DOWN despatch under the emergency provisions of the CERC Ancillary Services Regulations, 2022, is being invoked by Grid-India in real time. The plots below show the days with frequency remaining above 50.05 Hz more than 20% of time in May 2025 and the duration of longest sustained frequency excursions above the band.

Frequency > 50.05% (for more than 20% of time of the day) : May-25

Mon	Tue	Wed	Thu	Fri	Sat	Sun
			1 31%	2 37%	3	4 27%
5 29%	6 22%	7	8	9	10 27%	11
12	13	14	15	16	17	18 33%
19	20	21 27%	22 37%	23 24%	24 27%	25 30%
26 25%	27 22%	28 27%	29 36%	30 29%	31 32%	

Highlighted days when frequency remained above the band for 20% of the time of the day.
(The percentage of time frequency remained above the band is indicated against the date)

Frequency > 50.05% (persistently* during solar hours) : May-25

Mon	Tue	Wed	Thu	Fri	Sat	Sun
			1 03:24	2 02:44	3 00:50	4 03:24
5 00:33	6 02:04	7	8	9	10 00:37	11
12	13	14	15	16 00:35	17 00:44	18 04:48
19	20	21 01:19	22 04:33	23 01:18	24 01:11	25 03:40
26 01:30	27 01:14	28 03:04	29 03:22	30 01:49	31 02:02	

Highlighted days when frequency remained above the band persistently during solar hours (06:00–18:00 hrs).
Frequency remained above the band continuously for at least 30 minutes.
(The cumulative duration of such spans is indicated against each date.)

2.6. Regulatory Support Under Ancillary Services Regulations, 2022

CERC Ancillary Services (Regulations), 2022 clause 20(1)

Quote

"*In case of shortfall*

(1) All generating stations, whose tariff is determined by the Commission under Section 62 of the Act including those having URS power after declaration of the RTM results, shall be deemed to be available for use by the Nodal Agency for SRAS or TRAS or both, subject to technical constraints of such generating stations."

Unquote

CERC Ancillary Services (Regulations), 2022 clause 20(6)

Quote

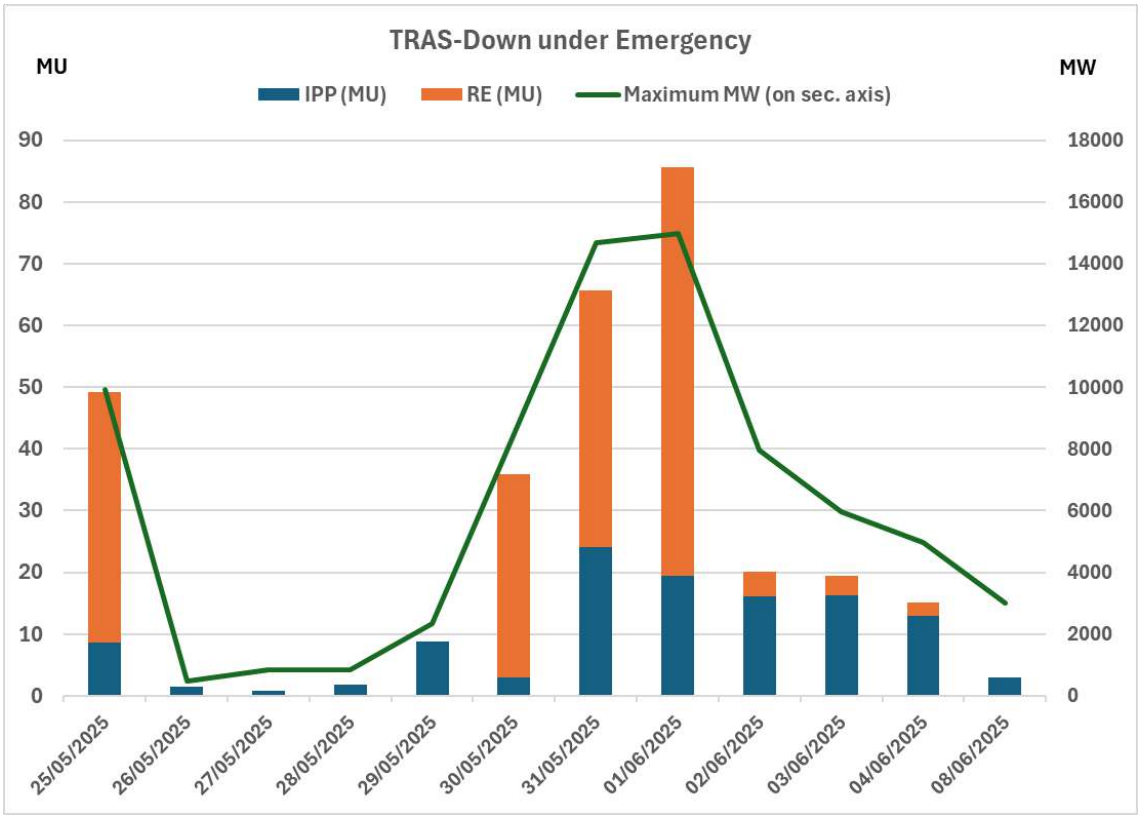
"In case of emergency conditions

(6) In case the Nodal Agency requires any generating station to provide Ancillary Services to meet the emergency conditions for reasons of grid security as per the provisions of the Grid Code, such generating station shall be compensated at the rate of the energy charge as determined under Section 62 of the Act or adopted under Section 63 of the Act, or at the rate of the compensation charge declared by the AS provider, as the case may be."

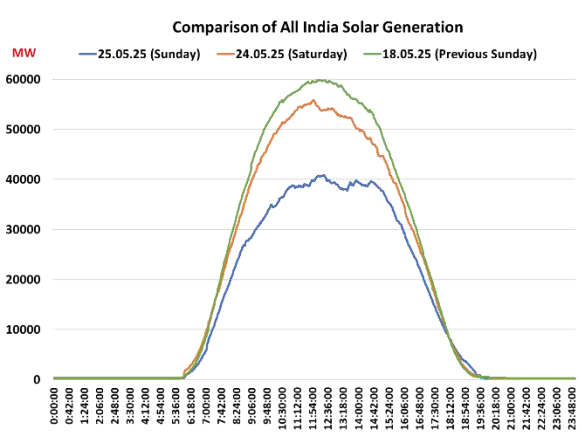
Unquote

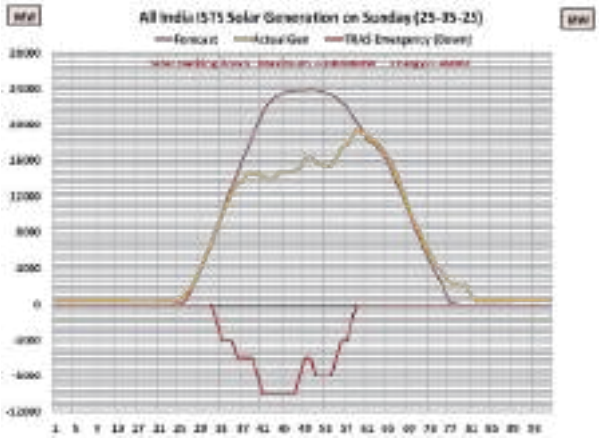
This involves instructing regional IPP generators to reduce generation to 55% of MCR during solar hours in lean demand periods, including weekends and holidays. If the required TRAS-Down

quantum cannot be met by IPPs, regional entity renewable generation is also moderated under TRAS emergency measures to contain high frequency. To start with, solar generating stations with installed capacity of 250 MW and above have been included. However, the scope may change as requirement further evolves. Maximum backing down under TRAS-Emergency to the tune of 15000 MW has been carried out so far. The plot below shows the quantum of TRAS-Down dispatched under Emergency conditions to regional IPPs and regional RE plants.



The plot below shows the trend of All India and ISTS solar generation on 25th May 2025, when TRAS-Down instruction of 40 MU was given to solar generation.





2.7. Intra-State Level MTL Provisions

At the same time, regulatory provisions for 55% MTL and compensation mechanism at the intra-state level are present only in some states. The table below summarizes the MTL provisions at the same level.

State	MTL guideline	Source	Remarks
Uttar Pradesh	55%	UPERC MOD Regulations, 2021	
Haryana	55%	HERC TCT Regulations, 2019	Includes compensation mechanism for part load operation and additional start/stop
Maharashtra	55%	MERC Grid Code, 2020	Includes compensation mechanism for part load operation and additional start/stop
Madhya Pradesh	55%	MPERC Grid Code, 2024	Includes compensation mechanism for part load operation and additional start/stop
Karnataka	55% (40% for two units)	KERC MOD Regulations, 2024	Includes compensation mechanism for part load operation
Telangana	In line with IEGC	TSERC Grid Code, 2018	
Andhra Pradesh	In line with IEGC	APERC RSD Procedure 2023	

Tamil Nadu	60-80%	Minutes of 210th OCC meeting of SR	55% as per draft state grid code.
West Bengal	70%	Minutes of 214th OCC meeting of ER	
Odisha	55-60%		

The table below shows the operating level of intra-state thermal units observed on 25th May 2025:

Less than 55%		More than 55%			
Plant Name	**% of DC**	**Plant Name**	**% of DC**	**Plant Name**	**% of DC**
UKAI	47%	BLTPS	100%	IEPL	64%
SLPP	55%	BHUSAWAL	92%	MARWA TPS	64%
PARLI	46%	KORBA(W) CSETCL	92%	SANJAY GANDHI TPS	63%
NASIK	48%	AMARKANTAK	91%	Tuticorin	63%
TATA TROMBAY Th	51%	Kolaghat TPS	91%	KHAPARKHEDA	63%
JPL DHULE (SHIRPUR)	48%	JP BINA	89%	SWPGL	63%
APML TIRODA	55%	HALDIA TPS	86%	CHANDRAPUR	62%
		KLTPS	84%	SINGAJI	62%
		METTUR-Stg1&2	84%	Kota	62%
		VSLPP	83%	RGTPS (Khedar)	62%
		PARAS	83%	VIJAYAWADA TPS	62%
		DPL TPS	80%	VADINAR	61%
		Bandel TPS	80%	Raichur TPS	61%
		KORBA EAST EXT(DSPM)	77%	WANAKBORI	61%
		HIRANMAYEE TPS	75%	KHURJA STPP	61%
		IB TPS Stg-1	73%	KORADI	59%
		Panipat	72%	Kawai	58%
		GANDHINAGAR(GTPS)	72%	APL MUNDRA	58%
		STCMS	71%	Anpara-D	57%
		Lehra MBBTTPS	71%	Chhabra	57%

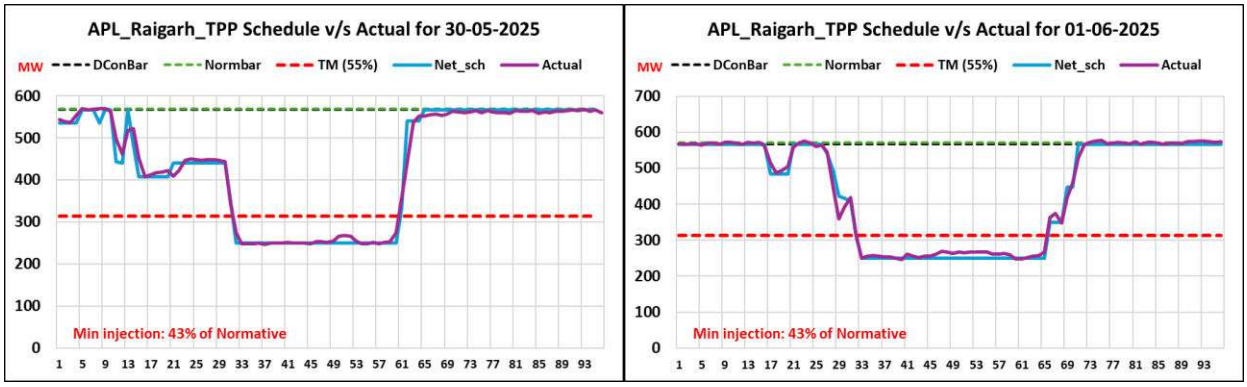
		Barsingsar	71%	DCRTPP	57%
		Bakreswar TPS	71%	Anpara A&B	57%
		GGSTPS Ropar	70%	Kalisindh	57%
		Suratgarh	70%	Surat-SCTPS	57%
		Tenughat TPS	70%	SATPURA II	56%
		Santaldih TPS	67%	Meja	56%
		JAIGAD	67%	IB AMARAVATI	56%
		Raj West	66%	GHATAMPUR TPS	56%
		SAGARDIGHI TPS	64%	DAHANU	56%

2.8.Performance of IPP thermal plants

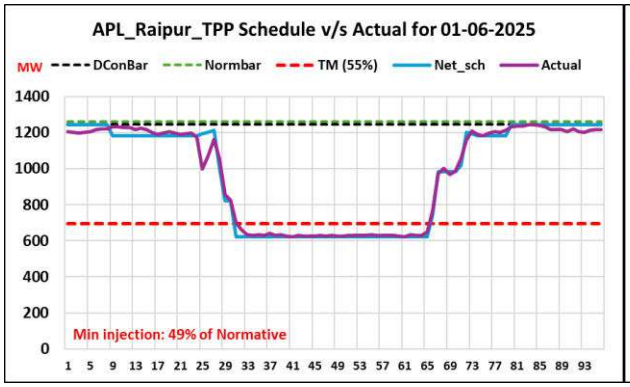
IPPs are generally dependent on a mix of long-term/short-term contracts including sale through DAM and RTM for securing injection schedules. Long term PPAs generally have provisions for minimum schedule up to MTL by beneficiaries. Thermal IPPs with merchant capacity obtain schedules through their participation in bilateral and collective short term markets. Many IPPs use products like block bids to ensure that they get minimum schedule during all periods while ensuring the average market price meets their requirement. It is observed that during lean periods, some IPPs are able to get schedules higher than 55% while there are also some IPPs which get minimum schedules in the range of 30-50%. IPPs having schedules above 55% have been backed down to 55% through TRAS-Down instructions under emergency conditions. Their actual generation is observed to generally match the schedule provided.

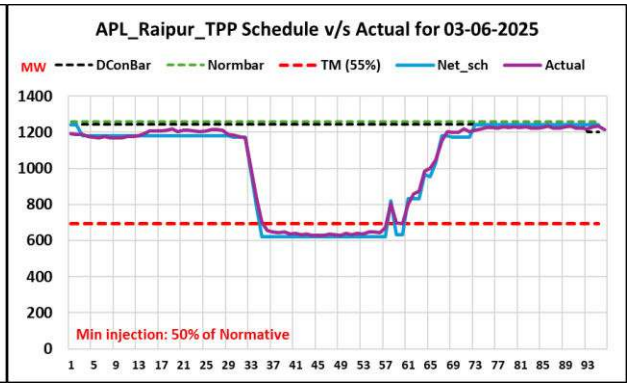
A number of thermal IPPs regularly get schedules lower than 55% (25-30% in case of one plant) and their actual injection is generally in line with their schedules. Sample plots of scheduled and actual injection of such plants are shown below:

- **APL_Raigarh_TPP**

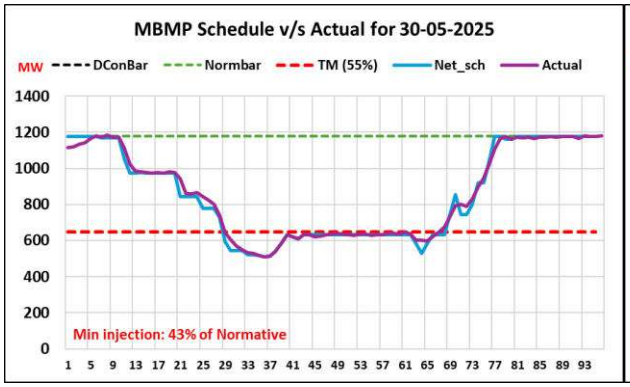


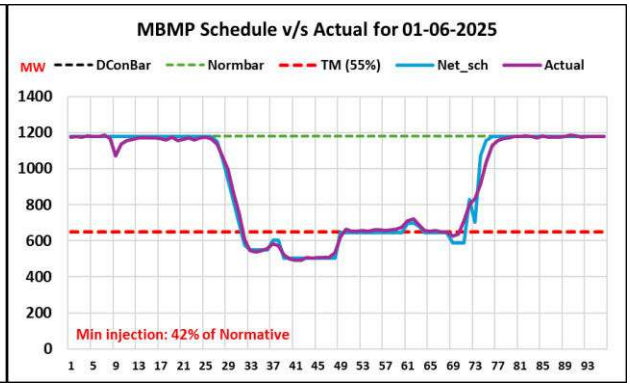
- **APL_Raipur_TPP**



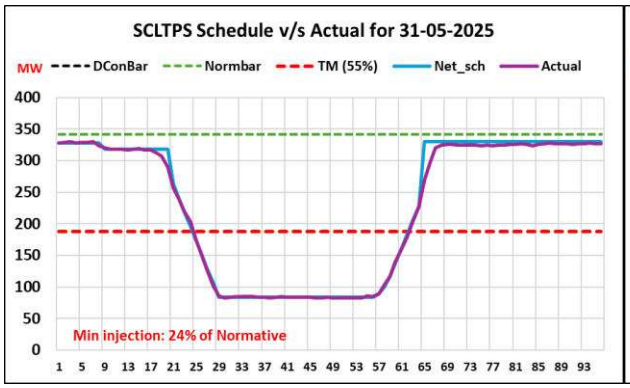


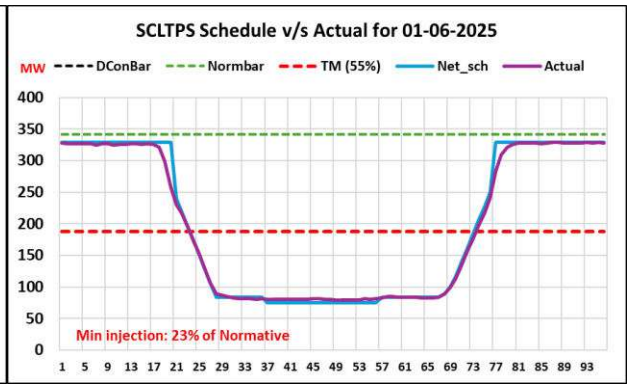
- **MBMP**



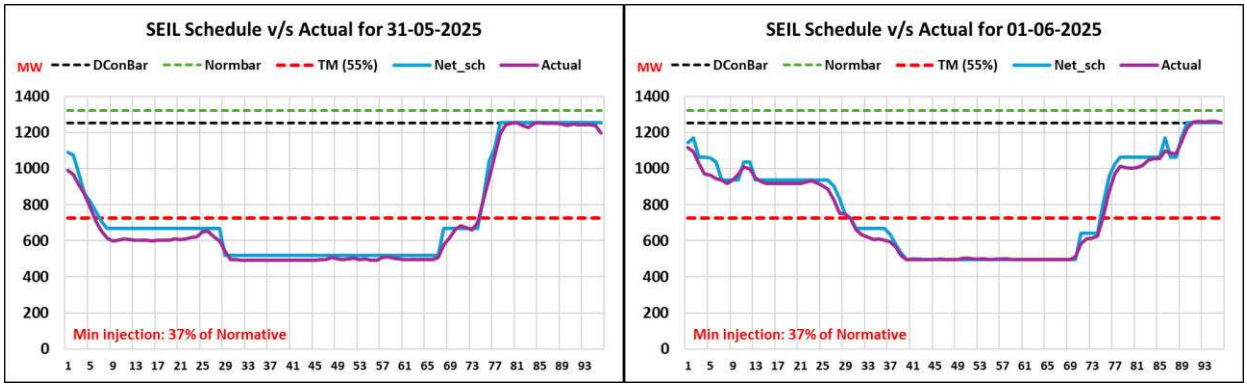


- **SCLTPS**

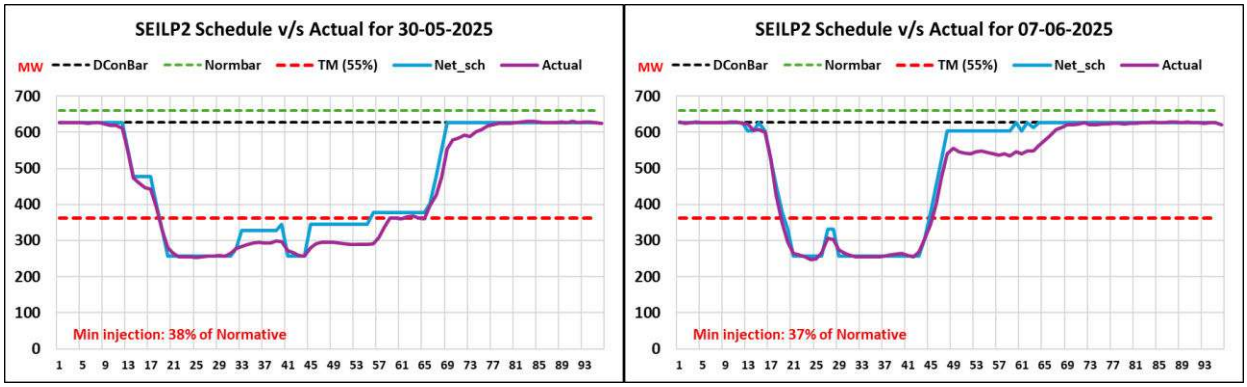




- **SEIL**



- **SEILP2**



The table below shows the minimum generation level of thermal IPPs observed on 31st May 2025.

Plant Name	Min. Injection (MW)	DC On-Bar (MW)	Normative On-bar (MW)	Min Injection (% of Normative)
SCLTPS	82	342	342	24%
SEIL	490	1254	1320	37%
MEENAKSHI	107	240	270	39%
COASTGEN	267	708	1200	44%
MBMP	570	1178	1178	48%
APL_Raigarh_TPP	279	567	570	49%
SEILP2	325	627	660	49%
JSPL_DCPP	124	240	243	51%
RKM_POWER	338	655	661	51%
LAMKPL	283	546	546	52%

MAHAN_ENERGEN_U2	297	560	564	53%
BALCO	599	1039	1110	54%
JPL	494	771	915	54%
APL_Raipur_TPP	682	1244	1260	54%
SIMHAPURI	293	540	540	54%
GMRKEL	358	660	660	54%
JHABUA_IPP	307	566	566	54%
KSK_MAHANADI	917	1683	1683	55%
TPCL_Mundra	2075	3800	3800	55%
SASAN	2033	3700	3722	55%
JPL2	1262	2310	2310	55%
JPNIGRIE_JNSTPP	678	1241	1241	55%
ILFS	312	557	570	55%
APNRL	270	491	491	55%
GMR_WARORA*	319	560	560	57%
DBPL	661	1137	1137	58%
TRN_ENERGY*	347	490	549	63%
SKS_Raigarh*	350	547	547	64%
JIPL*	753	1133	1138	66%

**Didn't follow TRAS Emergency Down Instructions.*

2.9.CERC order on pilot project for two shift operation

Considering the constraints in flexibility, CERC order dated 23.03.2025 in Suo-Motu Petition No. 2/SM/2025 in the matter 'Measures to mitigate the risks on the power system under Clauses (2) and (3) of the Regulation 30 of the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023' directed to take up a pilot project on two shift operation of thermal generating stations. Relevant extracts are quoted below:

"*As a pilot, regional entity thermal generating stations whose tariff is determined by this Commission under Section 62 of the Act, to be operated in two-shift operation, shall be identified by NLDC in consultation with the owner(s) of such thermal units and CEA. While identifying the*

units for such pilot, the experience of Tuticorin and Mettur as stated in Paragraph 15 of this Order shall be taken into account. To start with, rail-fed 500 MW Units may preferably be selected under the pilot. NLDC is directed to identify such pilot thermal units and issue a detailed procedure for operating such units under a two-shift cycle, within two months of the issue of this Order. The Detailed Procedure shall contain the guidelines regarding operational aspects, including scheduling, dispatch, accounting, settlement, compensation on account of expenses due to two-shift operation (including start-up cost, heat rate, etc.), and any residual matter. The same shall be shared with stakeholders and submitted to the Commission for approval."

In compliance with the above NLDC has identified a list of candidate thermal units that could be considered for the pilot on two shift operation. Vide its letter dated 22nd May 2025 NLDC had requested NTPC Ltd. to confirm its readiness for pilot. List of plants that were proposed by NLDC for the pilot are as below:

S. No.	Plant Name	Installed Capacity	Region	ECR (paise / kWh)	Warm Start Up Time (Minutes)
1	Dadri Stg2	2*490	NR	439	240
2	Jhajjar	3*500	NR	423	480
3	Vallur	3*500	SR	404.4	240
4	Simhadri Stg1	4*500	SR	375.4	240
5	Simhadri Stg2	2*500	SR	374	240
6	Ramagundam	3*500+1*500	SR	368.1	240
7	UNCHAHAR4	1*500	NR	339.2	240
8	Mauda Stg1	2*500	WR	315.5	240
9	Dadri Stg1	4*210	NR	526.3	240
10	BGTPP	3*250	NER	390.4	360
11	Ramagundam	3*200	SR	368.1	240
12	UNCHAHAR2	2*210	NR	357.5	240
13	UNCHAHAR3	1*210	NR	355	240
14	UNCHAHAR1	2*210	NR	354.1	240
15	KBUNL Stg2	2*195	ER	299.4	240

NTPC vide its letter dated 13.06.2025 **(Annexure-II)** shared their observations and requested to be exempted from participating in the proposed pilot study on two-shift operation.

2.10. Compensation for Part load operation of thermal Generators:

CERC (IEGC) Regulation 2010 (Fourth Amendment) clause 6.3 B.7:

Quote

"7. The RPCs shall work out a mechanism for compensation for station heat rate and auxiliary energy consumption for low unit loading on monthly basis in terms of energy charges and compensation for secondary fuel oil consumption over and above the norm of 0.5 ml/kWh for additional start-ups in excess of 7 start-ups, in consultation with generators and beneficiaries at RPC forum and its sharing by the beneficiaries."

Unquote

CERC vide order dated 05.05.2017 approved the Mechanism for Compensation for Degradation of Heat Rate, Aux Compensation and Secondary Fuel Consumption, due to Part Load Operation and Multiple Start/Stop of Units. At present, the same is for generating station whose tariff is determined under section 63 of the Electricity Act'2003. However, for Generating station whose tariff determined by commission under section 62 of Electricity Act' 2003, the compensation mechanism for part load operation will be as per

CERC (Tariff) Regulation 2024 (1st Amendment) clause 70(G):

Quote

"(G) Compensation for the operation of generating station below normative plant availability factor

(1) The generating stations whose tariff is determined by the Commission under Section 62 of the Act shall be compensated for degradation of station heat rate and auxiliary energy consumption, consumption of additional secondary fuel oil due to loading below the normative plant availability factor specified under Regulation 70(A) of these regulations……."

Unquote

3. COMMITTEE OBSERVATIONS AND DECISIONS IN COMMITTEE MEETINGS

3.1. OBSERVATIONS

1. On D-1 basis, beneficiaries often provide very low or even zero requisitions for thermal units during solar hours, while providing full requisitions during evening peak.
2. Despite the provision of the first amendment of IEGC, beneficiaries have complete discretion to submit requisitions up to 14:30 hrs of 'D-1', with restrictions on further downwards revision thereafter.
3. In case generating stations decide to take Unit Shut Down (USD) due to low schedules, supply obligation to the beneficiaries remains to the extent of full DC (including unit under USD), and beneficiaries have the freedom to revise their schedules upward.
4. A detailed procedure for moderating schedule up to MTL has been prepared by NLDC, which was approved by CERC on 12.03.2025. In accordance with this procedure, an assessment is carried out for identifying units to be provided schedule up to MTL through SCED.
5. The SCUC Cat#1 program is executed daily at 15:00 hrs, with the primary objective of creating up reserves in the system.
6. Due to very low requisitions from beneficiaries during solar hours, the demand for support under SCUC and SCED-MTL remains significantly high which has already reached in the range of 8000 MW to 10000 MW.
7. On several days, 25 to 45 generating stations required MTL support. The available down reserves from the remaining thermal ISGS are utilized to balance the support extended to these stations.
8. When the available down reserves are insufficient, it results in over-injection in the grid and high frequency, as matching decrease (SCED-Down or SCUC-Down) of generation cannot be provided to balance the increase (SCED-Up or SCUC-Up) in generation to achieve MTL. SCUC-Up is provided to support schedule till MTL but matching SCUC-Down cannot be scheduled as all other units in SCUC stack have reached MTL.
9. The ability to control high frequency by reducing generation under Secondary Reserves Ancillary Services (SRAS) and Tertiary Reserves Ancillary Services (TRAS) is hindered by unavailability of adequate down reserves, which are consumed in providing SCUC and SCED-MTL support to generators scheduled by beneficiaries below MTL.
10. When the required TRAS-Down quantum cannot be met by IPPs, regional entity renewable generation is also moderated under TRAS emergency measures to contain high frequency.
11. Inflexibility in market participation and bidding strategy based on recovering ECR in every single time block, as opposed to recovering ECR on average basis hinders ability to obtain MTL schedule from the market. IPPs with a more flexible market strategy are able to commit their units and obtain MTL schedules from the market itself.
12. Design side aspects such as price cap in spot markets and bid cap (120% of ECR) under LPS rules may be revisited to encourage flexible operation.

3.2. DECISIONS OF 1ST AND 2ND MEETINGS OF THE COMMITTEE:

3.2.1. 1ST MEETINGS OF THE COMMITTEE

The 1st Meeting of the committee held on 03.06.2025 and after detail deliberations, the followings short term and long term solutions were proposed in the first meeting of the committee for ensuring Thermal Generation at Technical Minimum level for Grid Stability and RE Integration: **(The copy of 1st MoM is enclosed at Annexure-III)**

1. Short Term solutions (within 1 year):

a) Implementation of minimum technical load (MTL) level of 55% immediately on pan-India basis and 40% as per phasing plan and establishment of monitoring mechanism to ensure compliance with the CEA (Flexible Operation of Coal based Thermal Power Generating Units) Regulations, 2023.

b) State Grid Codes shall be aligned with the Central Electricity Authority (CEA) "Flexible Operation of Coal based Thermal Power Generating Units" regulation 2022, notified in January 2023. Suitable directions needs to be issued to SERCs by Ministry of Power/CEA to notify commercial compensation mechanism as per CEA guidelines to ensure the MTL of 55%, which in force from 01.02.2024 as per CEA (Flexible Operation of Coal based Thermal Power Generating Units) Regulation 2023 on sustained basis.

c) Generators maintaining MTL of 40-45% may be given more preference (bypassing Merit Order when required for maintaining down reserves) and units may be kept on bar.

d) Directions from RPCs may be issued to existing PSPs to make all pumps operational and also use as a load during solar hours as envisaged in Optimal Generation Mix Report of CEA.

e) Time lines for scheduling for all Intra State generators also need to be streamlined with CERC IEGC Regulation 2023 (7-8 Time Block) which will ensure equitable comparison and similar provisions of scheduling of power.

f) Till two shift operation of thermal generators is being implemented, there is a need to create equitable balance between the supply obligation of generators under IEGC Regulation 2023 as well as offtake obligation of drawing entities/ beneficiaries of the generators. Beneficiaries requisitioning power during non-solar hours from an ISGS shall have Offtake obligations from those stations during solar hours. Beneficiaries may be mandated to maintain a minimum requisition as percentage of maximum requisition in a day, during the lean hours to ensure operationally reasonably schedule during lean hours and availability in non-solar hours.

g) Optimal number of thermal units may be kept on bar during solar hours by NLDC/RLDC/SLDCs to meet non-solar hours demand. Excess generation is leading to frequency excursions. Empowering NLDC/RLDC/SLDC to take out units under exigencies.

2. Long Term solutions (Beyond 1 year):

a) Ensuring 40% MTL for all coal based thermal generators both at ISTS & InSTS on sustained basis. Other technological intervention may be considered by generators (storage etc). Monitoring of the same has to be done rigorously.
b) Two shift operation/taking out units on weekends/holidays/high wind season needs to be implemented.
c) Peaking capacity may be considered with technical and commercial aspects with well-defined rules. This will further optimise number of units on bar, ensuring MTL at solar hours and also enable the states to meet the evening peak demand.
d) Energy storage (BESS, PSP etc.) need to be promoted rigorously to integrate the RE targets. BESS installation in existing thermal stations may be one of the options for storing excess energy during solar hours.
e) Each control area needs to maintain the reserves as calculated by NLDC on year ahead basis to control and manage the deviations and other grid parameters.
f) Demand response needs to be promoted. Initially large industries with captive generation may be focused.
g) TOD tariff with lower tariff during solar hours and higher tariff during evening needs to be implemented by all SERCs.

3.2.2. 2ND MEETINGS OF THE COMMITTEE:

The 2nd Meeting of the committee held on 12.06.2025 and after detailed deliberations, the followings were proposed in the second meeting of the committee for ensuring Thermal Generation at Technical Minimum level for Grid Stability and RE Integration: **(The copy of 2nd MoM is enclosed at Annexure-IV).**

a) There is a need to create **equitable balance** between the supply obligation of generators under IEGC Regulation 2023 as well as offtake obligation of drawing entities/ beneficiaries of the generators. Beneficiaries requisitioning power during non-solar hours from an ISGS shall have Offtake obligations from those stations during solar hours. Beneficiaries may be mandated to ensure that their minimum requisition in the day as percentage of maximum requisition in that day, is equal to or higher than a predefined value to ensure operationally reasonably schedule during lean hours and availability in non-solar hours. The ratio of minimum and maximum requisition by the beneficiary in a generating stations during a day could be 40%.

b) Regulatory provision for de-commitment of the Thermal units through SCUC to be introduced. The unit which is not committed under SCUC by NLDC 1500 hrs on day ahead and its schedule remains below MTL level by 2200 hrs on day ahead basis may be allowed to de-commit. The time between 1500 hrs and 2200 hrs would be the time available to the beneficiaries to revise their schedules to either support the unit by giving schedule above MTL or reduce their schedule from those units. The de-committed unit will have no supply obligation.

c) Suitable provisions may be provided for **higher DSM charges on entities for over-injection or under-drawl by the entities when the grid frequency exceeds 50.05 Hz during solar hours/off-peak hours**, irrespective of the nature (both RE and non-RE) of the entities. However, **under-injection/over-drawl by the entities when the grid frequency exceeds 50.05 Hz during solar hours/off-peak hours, irrespective of the entity type (RE or non-RE), should attract a lesser penalty and incentivization may be considered**. Further, during the schedule revision under TRAS Emergency provision, over injection may not be allowed and the volume limit may be made as Zero during such time period.

d) Two shift operation of thermal Generating units must be performed on pilot basis in each region and potential damage including wear & tear, O&M, and plant life spans should be thoroughly examined before final implementation. Wear & tear, O&M, plant life spans and cost implications may be properly recorded during pilot two shift operation.

e) Necessary Regulatory provisions for participation of all ISTS & InSTS generators for giving Ancillary Service support to the Grid are required. Ancillary service regulations should be brought out by SERC for intra state level in line with CERC Ancillary Service Regulation.

f) NTPC Ltd. shall develop and share Standards Operating Procedure for implementation of 55% minimum turn down level in intrastate thermal power stations. Training program to be conducted in NPTI with support from NTPC Ltd. for employees of state thermal generators for running intra state plants upto 55% MTL.

g) Energy storage capacity to be created/ augmented in interstate as well as intrastates may accelerate the commissioning of the required storage capacities.

h) To ensure non-discriminatory backing down across all grid connected generators during low loads, irrespective of ownership, the State Electricity Grid codes need to be aligned with CEA (Flexible operation of thermal power plants) Regulations, 2023 and IEGC. Regulatory provision to compensate intrastate generating plants for part load operations to be notified by State Electricity Regulatory Commissions.

i) Decisions taken in the 1st Meeting held on 03.06.2025 and 2nd Meeting would be considered while finalizing the final recommendations of the Committee.

4. RECOMMENDATIONS:

Based on extensive deliberations and inputs/comments received from members, the committee has recommended the following short term and long term solutions to ensure Thermal Generation at Technical Minimum level for Grid Stability and RE Integration:

1. **Short Term solutions (within 1 year):**

a) Implementation of minimum technical load (MTL) level of 55% immediately on pan-India basis and 40% as per phasing plan for all units, irrespective of their ownership at Intrastate/Interstate level and establishment of monitoring mechanism to ensure compliance with the CEA (Flexible Operation of Coal based Thermal Power Generating Units) Regulations, 2023. **Exemption, if any, may be granted by SERC/CERC on technical ground.**

b) **State Grid Codes shall be aligned** with the Central Electricity Authority (CEA) "Flexible Operation of Coal based Thermal Power Generating Units" regulation 2022, notified in January 2023 and IEGC 2023. Suitable directions needs to be issued to SERCs by Ministry of Power/CEA to notify commercial compensation mechanism as per CEA guidelines to ensure the MTL of 55%, which in force from 01.02.2024 as per CEA (Flexible Operation of Coal based Thermal Power Generating Units) Regulation 2023 on sustained basis.

c) Generators maintaining MTL of 40-45% may be given more preference (bypassing Merit Order when required for maintaining down reserves) and units may be kept on bar.

d) Directions from RPCs may be issued to existing PSPs to make all pumps operational and also use as a load during solar hours as envisaged in Optimal Generation Mix Report of CEA.

e) Time lines for scheduling for all Intra State generators also need to be streamlined/harmonized with CERC IEGC Regulation 2023 which will ensure equitable comparison and similar provisions of scheduling of power.

f) There is a need to create **equitable balance** between the supply obligation of generators under IEGC Regulation 2023 as well as offtake obligation of drawing entities/ beneficiaries of the generators. Beneficiaries requisitioning power during non-solar hours from an ISGS shall have Offtake obligations from those stations during solar hours.

Beneficiaries may be mandated to maintain a minimum requisition as percentage of maximum requisition in a day, during the lean hours to ensure operationally reasonably schedule during lean hours and availability in non-solar hours. If the ratio cannot be maintained, one or more units from that station could be allowed to be taken under reserve shutdown to replenish down reserves. Once the unit is taken under reserve shut down, the aggregate requisition by beneficiaries in that station should be restricted to the declared capacity corresponding to the units on bar in that station. The **proposed ratio of minimum and maximum requisition by the beneficiary in a generating stations during a day may be 40%.**

g) De-commitment of the Thermal units through SCUC is required to be included in regulatory provisions (CERC/SERC). The unit which is not committed under SCUC by NLDC 1500 hrs on day ahead and its schedule remains below MTL level by 2200 hrs on day ahead basis may be allowed to de-commit. The time between 1500 hrs and 2200 hrs would be the time available to the beneficiaries to revise their schedules to either support the unit by giving schedule above MTL or reduce their schedule from those units. **The de-committed unit will have no supply obligation while it will be able to maintain its DC.**

h) Optimal number of thermal units may be kept on bar during solar hours by NLDC/RLDC/SLDCs to meet non-solar hours demand. Excess generation is leading to frequency excursions. **Empowering NLDC/RLDC/SLDC to take out units under exigencies.**

i) Suitable provisions may be provided for **higher DSM charges on entities for over-injection or under-drawl by the entities when the grid frequency exceeds 50.05 Hz during solar hours/off-peak hours**, irrespective of the nature (both RE and non-RE) of the entities. However, **under-injection/over-drawl by the entities when the grid frequency exceeds 50.05 Hz during solar hours/off-peak hours, irrespective of the entity type (RE or non-RE), should attract a lesser penalty and incentivization may be considered**. Further, during the schedule revision under TRAS Emergency provision, over injection may not be allowed and the volume limit may be made as Zero during such time period.

j) Necessary Regulatory provisions for participation of all ISTS & InSTS generators for giving Ancillary Service support to the Grid are required. Ancillary service regulations should be brought out by SERC for intra state level in line with CERC Ancillary Service Regulation. TRAS Shortfall & TRAS Emergency needs to be brought out by all SERC which may include backing down of RE as last resort. Suitable directions needs to be issued to SERCs by Ministry of Power/CEA in this regard.

k) NTPC Ltd. shall develop and share Standards Operating Procedure for implementation of 55% minimum turn down level in intrastate thermal power stations. Training program to be conducted in NPTI with support from NTPC Ltd. for employees of state thermal generators/IPPs for running intra state plants upto 55% MTL.

l) Energy storage capacity to be created/ augmented in interstate as well as intra-state system. States may accelerate the commissioning of the required storage capacities.

2. Long Term solutions (Beyond 1 year):

a) Ensuring 40% MTL for all coal based thermal generators both at ISTS & InSTS on sustained basis. Other technological intervention may be considered by generators (storage etc.). Monitoring of the same has to be done rigorously.
b) Two shift operation/taking out units on weekends/holidays/high wind season needs to be implemented. Before implementation two shift operation of thermal Generating units must be performed on pilot basis in each region and potential damage including wear & tear, O&M, and plant life spans should be thoroughly examined before final implementation. Wear & tear, O&M, plant life spans and cost implications may be properly recorded during pilot two shift operation.

c) Peaking capacity may be considered with technical and commercial aspects with well-defined rules. This will further optimise number of units on bar, ensuring MTL at solar hours and also enable the states to meet the evening peak demand.

d) Energy storage (BESS, PSP etc.) need to be promoted rigorously to integrate the RE targets. BESS installation in existing thermal stations (Both Inter and Intra State thermal stations) may be one of the options for storing excess energy during solar hours.

e) Each control area needs to maintain the reserves (Up & Down) as calculated by NLDC in different timeframes to control and manage the deviations and other grid parameters.

f) Demand response needs to be promoted. Initially large industries with captive generation may be focused.

g) TOD tariff with lower tariff during solar hours and higher tariff during evening needs to be implemented by all SERCs.

****

Annexure-I

भारत सरकार/Government of India
विद्युत मंत्रालय/Ministry of Power
केंद्रिय विद्युत प्राधिकरण/Central Electricity Authority
राष्ट्रीय विद्युत समिति प्रभाग /National Power Committee Division
1st Floor, Wing-5, West Block-II, R.K. Puram, New Delhi-66

No. CEA-GO-15-14/1/2025-NPC Division/106 **Date: 30.05.2025**

To,

(As per distribution list)

विषय:- ग्रिड स्थिरता और नवीकरणीय ऊर्जा एकीकरण के लिए तापीय उत्पादन तकनीकी न्यूनतम स्तर पर सुनिश्चित करने के लिए तंत्र विकसित करने हेतु समिति का गठन

Subject: Constitution of Committee to Evolve the Mechanism for ensuring Thermal Generation at Technical Minimum level for Grid Stability and RE Integration -reg.

Sir/Madam,

A meeting was chaired by Chairperson, CEA, on 26.05.2025 to review the Power Supply Position, demand trends, generation availability, grid constraints, and readiness for managing the renewable energy (RE) variability.

2. During the said meeting, Chairperson, CEA, observed that several thermal generators, particularly Central Sector owned units, were being scheduled below their technical minimum limits during day time despite their requirement during non-solar/evening peak demand. The NLDC also reported the need for limiting RE generation under emergency conditions after exhausting all other avenues and due to inadequate downward regulation capability from conventional sources, especially during weekends with lower demand.

3. It was decided that a Committee may be constituted under the chairmanship of the Member Secretary, NRPC, with representatives from RPCs, GM Division, CEA, CERC, NLDC, RLDCs as Members and Member Secretary, NPC as the Member Convener. The primary mandate of the Committee is to develop a common mechanism to ensure adequate scheduling of thermal generation during daytime hours upto technical minimum for ensuring sufficient ramp-up capabilities to maximize the thermal availability during evening/non-solar peak hours. This will ensure secure and reliable grid operations, support the integration of RE sources, and help avoid operational and commercial challenges for generating units nationwide.

4. Accordingly, the Committee is constituted as follows:

S. No.	Name	Designation	Organization	
1.	Shri. V.K.Singh	Member Secretary	NRPC	**Chairman**

2.	Shri. N.S. Mondal	Member Secretary	ERPC	Member
3.	Shri. Asit Singh	Member Secretary	SRPC	Member
4.	Shri. K.B. Jagtap	Member Secretary	NERPC	Member
5.	Shri. Deepak Kumar	Member Secretary	WRPC	Member
6.	Shri. Brieflee Lyngkhoi	Chief Engineer	GM, CEA	Member
7.	Shri. Awdhesh Kumar Yadav	Chief (Engg.)	CERC	Member
8.	Smt. S. Usha	Executive Director	NLDC	Member
9.	Shri. V. Balaji	Executive Director	SRLDC	Member
10.	Shri. Rajib Sutradhar	Executive Director	ERLDC	Member
11.	Shri. Amaresh Mallick	Executive Director	NERLDC	Member
12.	Shri. Manoj Kumar Agarwal	Executive Director	NRLDC	Member
13.	Shri. Mahesh M. Mehendale	Executive Director	WRLDC	Member
14.	Smt. Rishika Sharan	Member Secretary	NPC, CEA	**Member Convener**

5. The Terms of Reference of the Committee are as follows: -

   a) Review the current scheduling and dispatch practices of all thermal generators, particularly during Solar/high RE hours and propose mechanism for ensuring technical minimum schedule of thermal generators to support grid balancing and reliability during Non-Solar/evening hours.
   b) Assess operational constraints, technical minimum limit issues, and ramp-up/ramp-down capabilities of all thermal generators, to ensure the maximum availability during Non-Solar hours.
   c) Recommend a common mechanism for:
      i. Ensuring all thermal units are scheduled above their technical minimum limits during Solar hours and moderating other generation sources including RE for ensuring reliable grid operation during Non-Solar hours.
      ii. Maintaining sufficient ramp-up capability of thermal generating units to meet the Non-Solar/evening demand.
   d) Address commercial and regulatory aspects linked to the common mechanism being finalized for operation of thermal generating units.

6. The Committee shall submit the report by 20th June, 2025.

This issues with the approval of the competent authority.

भवदीय,/Yours faithfully,

30/05/25

(सत्येंद्र कु. दोतान / Satyendra Kr. Dotan)
निदेशक (रा.वि.स.) / Director (NPC)

Distribution list:

1. Shri. V.K.Singh, Member Secretary, NRPC, 18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016.[Email: ms-nrpc@nic.in]
2. Shri. N.S. Mondal, Member Secretary, ERPC,14,Golf Club Road, ERPC Building, Tollygunje,Kolkata-700033. [Email: mserpc-power@nic.in]
3. Shri. Asit Singh, Member Secretary, SRPC, No.29, Race Course Cross Road, Bengaluru-560009. [Email: mssrpc-ka@nic.in]
4. Shri. K.B. Jagtap, Member Secretary, NERPC, NERPC Complex, Dong Parmaw, Lapalang, Shillong-793006. [Email: ms-nerpc@gov.in]
5. Shri. Deepak Kumar., Member Secretary, WRPC, Plot No- F-3, MIDC Area, Marol, Opp. SEEPZ, Central Road, Andheri (East), Mumbai-400093.[email: ms-wrpc@nic.in]
6. Shri. Brieflee Lyngkhoi, Chief Engineer GM, CEA, Sewa Bhawan, RK Puram. New Delhi. [Email: cegm-cea@gov.in]
7. Shri. Awdhesh Kumar Yadav, Chief (Engg.), CERC, World Trade Centre, Nauroji Nagar, New Delhi- 110029. [chiefengg@cercind.gov.in, awdhesh@nic.in]
8. Smt. S. Usha , Executive Director, NLDC, 18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110066. [Email:susha@grid-india.in]
9. Shri V. Balaji, Executive Director, SRLDC, No.29, Race Course Cross Road, Bengaluru-560009. [Email: vbalaji@grid-india.in]
10. Shri. Rajib Sutradhar, Executive Director, ERLDC, 14,Golf Club Road, ERPC Building, Tollygunje,Kolkata-700033.[Email: rajibsutradhar@grid-india.in]
11. Shri. Amaresh Mallick, Executive Director, NERLDC, Dongtieh,Lower Nongrah, Lapalang, Shillong-793006, Meghalaya [Email: amareshmallick@grid-india.in]
12. Shri. Manoj Kumar Agarwal, Executive Director, NRLDC, 18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110066. [Email: mkagarwal@grid-india.in]
13. Shri. Mahesh M. Mehendale, Executive Director, WRLDC, Plot No- F-3, MIDC Area, Marol, Opp. SEEPZ, Central Road, Andheri (East), Mumbai-400093. [Email: mehendale@grid-india.in]
14. Smt. Rishika Sharan, Chief Engineer, NPC, CEA,1st Floor, Wing-5, West Block-II, R.K. Puram, New Delhi-110066.[Email: cenpc-cea@gov.in/ rishika@nic.in]

Copy for kind information to:

1. SA to Chairperson, CEA,
2. SA to Member (GO&D), CEA

****

Annexure-II

Ref No: Scope/CORP. PLNG./2025-26/ Min. Ref./163645
Date: 13.06.2025

To,

Shri Vivek Pandey
Chief General Manager
National Load Despatch Center (NLDC)
New Delhi – 110019

Subject: CERC Suo Motu order in petition 2/SM/2025: Two-shift operation of thermal units

Sir,

This has reference to NLDC letter dated 22.05.2025 regarding two-shift operation of thermal units.

In this regard, NTPC inputs regarding two-shift operation are enclosed as **Annexure** for consideration.

Thanking you.

Yours faithfully

Sd/-
(B N Dhupal)
Addl. General Manager
Corporate Planning
NTPC Limited

Annexure

NTPC comments on two-shift operation of thermal units

- NTPC appreciates the concern to maintain the grid frequency by adopting various means to control the generation however it may be put on record that, frequent two-shift operations involving daily start-stop cycles have a significant adverse impact on the long-term health and reliability of thermal power plants due to design limitations and other issues.

- The repeated high cyclic load results in heavy stress particularly on thick wall component of boiler and turbine which deals with high temperature and pressure. This accelerates wear and tear on pressure parts, rotating machinery, and critical components such as boiler pressure parts, turbine casings, low-pressure (LP) turbines, stop valves, boiler tubes, and generator windings. Also, there will be lots of startup and shutdown hiccups during two shift operation and turbine passing through critical speed so frequently can be catastrophic.

- Additionally, frequent switching operations and flexing place increased stress on Generator, Electrical parts, High-tension circuit breakers and auxiliary systems leading to more failure. These operational stresses not only lead to higher operation and maintenance costs and reduced equipment life expectancy but also increases the consequential damage to capital equipment. Two shift operations will result in high deviation in emission parameters such as SoX, NoX and SPM. As large number of equipment's are involved hence efficiency will be poor.

- Many of these components are unique and custom-engineered, making spare planning and procurement a time-consuming process with long lead times. In the event of major outages, this can result in extended downtimes, thereby elevating the risk of forced outages and ultimately compromising grid reliability over the long term. Also, it is worth mentioning that damage control mechanism may not be effective to reduce detrimental effect of two shift operation.

- Further, impact of two shift operation on life and force outage may not visible immediately or during test duration rather they get first accumulated and get manifested in around 2-3 years' time, so considering this, purpose of getting data/impact through two shift operation trials may not be trustworthy.

- NTPC is demonstrating its commitment to grid flexibility by operating its thermal units down to their Minimum technical level of 55% as per the grid requirement and participating in ancillary services (SRAS, TRAS). In contrast, many of the other regional and state-controlled generating stations generally operate well above 55% of their rated capacity. Since these stations are not participating in the Ancillary Services, down reserves available in these stations above the level of 55% remain un-utilised. This disparity places a disproportionate burden on NTPC units and would lead to long-term asset degradation compromising health of national assets.

- The need for two-shift operation can be substantially mitigated through effective demand side management (DSM), including incentivizing peak load shifting for large industrial and commercial consumers, promoting time-of-day tariffs to

adjust the demand curve, and encouraging demand response programs to increase load during solar hours. Such measures can help align demand with generation availability, reducing the need for frequent cycling of thermal units.

- A uniform technical minimum loading level across all thermal generating stations can enhance flexibility in grid operations, improve down reserve margins during lean demand periods, and allow better utilization of available generation without resorting to unit shutdowns. We recommend a coordinated review of technical minimum norms across States to ensure equitable and efficient dispatch.

- It is also pertinent to highlight the growing role of storage systems, especially Battery Energy Storage Systems (BESS), in grid balancing. Several BESS projects are currently in the pipeline across the country. The recent advisory issued by CEA dated 18.02.2025 to incorporate minimum two-hour co-located BESS equivalent to 10% of installed solar capacity in future solar tenders will significantly enhance grid flexibility. These systems can absorb excess solar generation during the day and discharge during evening peaks, thereby reducing the need for thermal unit cycling.

- With a coordinated approach involving demand side management, implementation of uniform technical minimum norms, and installation of battery energy storage systems, the need for two-shift operation of thermal units can be effectively avoided.

- However, to prioritize units for load reduction, preference should be given to those with the lowest net generation efficiency, considering net heat rate, including energy consumed in coal transportation and those that contribute most significantly to environmental impact based on pollutant emissions.

- It may be noted that in the recently held meeting under the Chairmanship of the Secretary (P) on 27.05.2025 regarding "Grid Management and updated Projection of Summer Power Demand", NTPC expressed serious concerns over two-shift operations and 40% load flexing, citing their adverse impact on unit health. Operating units below 55% load is not technically feasible, particularly due to issues such as poor coal quality. NTPC is already experiencing high boiler tube leakages, frequent flame failures, and a significant increase in generator and turbine failures over the past three years. Repeated ramp-ups and ramp-downs are accelerating wear and reducing the lifespan of thermal units. Further, NTPC submitted that it is not in position to support two-shift operations.

Considering the above mentioned technical and operational constraints, reliability concerns, and the higher efficiency and environmental performance of NTPC units, it is requested that NTPC be exempted from participating in the proposed pilot study on two-shift operation. NTPC remains committed to supporting Grid-India in ensuring secure and reliable grid operations.

Annexure-III

भारत सरकार/Government of India
विद्युत मंत्रालय/Ministry of Power
केंद्रिय विद्युत प्राधिकरण/Central Electricity Authority
राष्ट्रीय विद्युत समिति प्रभाग /National Power Committee Division
Ist Floor, Wing-5, West Block-II, RK Puram, New Delhi-66

No. CEA-GO-15-14/1/2025-NPC Division/ 111 Date: 11.06.2025

To,

(All Members of the Committee)

विषय: 03.06.2025 को आयोजित ग्रिड स्थिरता और आरई एकीकरण के लिए तकनीकी न्यूनतम स्तर पर थर्मल उत्पादन सुनिश्चित करने के लिए तंत्र विकसित करने के लिए समिति की पहली बैठक के कार्यवृत्त के संबंध मे ।

Subject: **Minutes of the 1st Meeting of Committee to Evolve the Mechanism for ensuring Thermal Generation at Technical Minimum level for Grid Stability and RE Integration held on 03.06.2025 -reg.**

कृपया दिनांक 26.03.2025 को वीडियो कॉन्फ्रेंसिंग के माध्यम से आयोजित राष्ट्रीय संरक्षण स्थायी समिति (एनपीएससी) की पहली बैठक का कार्यवृत्त आपकी सूचना एवं आवश्यक कार्रवाई हेतु संलग्न है।

The Minutes of the 1st meeting of the committee held on 03.06.2025 through VC, is enclosed herewith for your kind information and necessary action, please. The 2nd meeting of the committee is scheduled to be held on 12.06.2025 at 4 PM. **The agenda for the 2nd meeting is also enclosed herewith at Annexure -II**

भवदीय/Yours faithfully

11/06/2025

(ऋषिका शरण /Rishika Sharan)
मुख्य अभियंता एवं सदस्य सचिव (एनपीसी)
Chief Engineer & Member Secretary (NPC)

Copy for kind information:-

1. SA to Chairperson, CEA
2. SA to Member (GO&D), CEA
3. SA to Member (PS), CEA

Minutes of 1st Meeting of Committee chaired by Member Secretary, NRPC held on 03.06.2025

List of Participants are attached at Annexure -I

1. The 1st meeting of the Committee to Evolve the Mechanism for ensuring Thermal Generation at Technical Minimum level for Grid Stability and RE Integration was held on 03.06.2025 through online mode. The list of participants is enclosed at **Annexure-I.**

2. **Member Secretary, NPC & Member Convener of the Committee** extended a warm and heartfelt welcome to the Chairperson of the meeting, and all other committee members. She stated that the committee was constituted to evolve the Mechanism for ensuring Thermal Generation at Technical Minimum level for Grid Stability and RE Integration.

3. **Member Secretary, NRPC & Chairperson of the Committee** also welcomed all the participants of the meeting and asked member convener to start the discussion.

Deliberations:

4. **Representative of NPC Secretariat** gave a brief presentation on the issue and also informed about the primary mandate of the Committee is to develop a common mechanism to ensure adequate scheduling of thermal generation during daytime hours upto technical minimum for ensuring sufficient ramp-up capabilities to maximize the thermal availability during evening/non-solar peak hours. Further, she informed that the terms of reference of the meeting are as follows:
    (a) Review the current scheduling and dispatch practices of all thermal generators, particularly during Solar/high RE hours and propose mechanism for ensuring technical minimum schedule of thermal generators to support grid balancing and reliability during Non-Solar/evening hours.
    (b) Assess operational constraints, technical minimum limit issues, and ramp-up/ramp-down capabilities of all thermal generators, to ensure the maximum availability during Non-Solar hours.
    (c) Recommend a common mechanism for:
        i. Ensuring all thermal units are scheduled above their technical minimum limits during Solar hours and moderating other generation sources including RE for ensuring reliable grid operation during Non-Solar hours.
        ii. Maintaining sufficient ramp-up capability of thermal generating units to meet the Non-Solar/evening demand.
    (d) Address commercial and regulatory aspects linked to the common mechanism being finalized for operation of thermal generating units.

5. **MS, NPC** briefed about the Compensation methodology for operating a Thermal Generating unit below 55% Minimum Technical Load (MTL) report published by CEA. She further explained that in the report it is clearly mentioned that how the power plant can be compensated for fixed cost due to infusion of capital investment and increased O&M cost, variable charges due to efficiency loss during part load operation and additional oil consumption due to increased Equivalent Forced Outage Rate (EFOR).

6. **MS, NRPC** opined that during the solar hours of low demand days, the thermal units could be operated at 55% of MCR in order to keep the optimum number of the units (InSGS & ISGS) on bar to meet demand during non-solar hours. However, Intra state Generators (InSGS) are not operating near 55% of their MCR leading to excess generation during Solar hours. Further, he stated grid instability due to the excess generation during solar hours of low demand days can not be addressed only by scheduling regional thermal generators at technical minimum, InSGS should also play their part to resolve the issue.

7. **MS, ERPC** stated that at regional level, it has been demonstrated that all thermal generating units above 200 MW are equipped to achieve 55% MTL and some of the power plants are also able to achieve 40% MTL.

8. He further stated that whatever technical modification is required to achieve the 40% Minimum Technical Load (MTL) will be addressed during the next annual scheduled overhauling of the units.

9. **MS, NRPC** stated that till date, most of the thermal power plants, except few state sector thermal power plants of smaller unit of 100 MW are capable to operate it at 55% of MTL. He further stated that we can work out how much RE baking down can be avoided once all thermal power plants can be operated at 55% of MTL during the solar hours.

10. **Chief Engineer, GM Division, CEA** stated that 40% MTL to be achieved by 2030 is in phase wise manner. The Phasing plan of CEA for 40% MTL is as follows:

    - **Phase-1** (Jul, 24 – June, 26): Around 91 units (51080 MW) capacity to be complied for 40% MTL
    - **Phase-2** (Jul, 26 – June, 28): Around 100 units (46825 MW) capacity to be complied for 40% MTL
    - **Phase-3** (Jul, 28 – Dec, 29): Around 101 units (37215 MW) capacity to be complied for 40% MTL
    - **Phase-4** (Jan, 30 – Dec, 30): Around 191 units (55767 MW) capacity to be complied for 40% MTL

11. He further stated that the pilot project till March, 2024 of achieving 40% MTL of 10 Units (5850MW) been implemented, the issue of excess generation in the grid as it is now, could have been resolved to an extent. Hence, strong monitoring has to ensure that generators comply with the timeline. Moreover, generators should perform of attaining 40% MTL during solar hours duration not just few time blocks to show that they are complied. Compensation mechanism may be put in place by CERC to encourage more generators to participate.

12. **ED, NLDC** stated that, as per SERC regulations, there is no mandate for operation at 55% of MTL for Intra State thermal generators, except for few states such as Uttar Pradesh, Haryana, Telangana, Andhra Pradesh, Karnataka, Madhya Pradesh, and Maharashtra. Other states continue to operate their intra state plants above 55% even when frequency is high. She added that the commercial mechanism for compensating the intrastate thermal stations is yet to be notified by the SERCs.

13. She further stated that the grid code of each SERC should be revised in accordance to **Central Electricity Authority (Flexible Operation of Coal based Thermal Generating Units) Regulations, 2023 and CERC (IEGC) Regulation'2023**. She also informed that all the Inter-state generating stations and IPPs are operating at 55% of MTL during the solar hours from almost 9:00 to 13.30 hours.

14. **Representative of NLDC** stated that the power plants which are connected at Inter state level fall under RLDC jurisdiction. The generating stations covered under section 62 of Electricity Act'2003 are already in the ancillary service mechanism. NLDC is invoking ancillary emergency provision of CERC regulations for the generating stations covered under Section 63 of Electricity Act'2003 and IPPs, which are not included in the ancillary shortfall mechanism. Under that clause, instruction are given to operate at up to 55% of MTL. Similar instructions are also being issued to merchant power stations, even when their schedules are part of the power exchange or outside bilateral arrangements. It was also explained that the decision of decommitting ISGS thermal units during surplus conditions in solar hours is constrained by inadequacy of generation resources during non-solar hours and reluctance of thermal stations for two-shift operation of units. He added that the beneficiaries requisition their full share during non-solar hours and thus closure of thermal units would result in load shedding.

15. He further informed that during shortfall in down reserves, they are compelled to invoke emergency ancillary regulation to interstate connected IPPs as well as VRE power plants. As of now, solar plants with installed capacity of above 250 MW are despatched under TRAS_emergency. These plants are asked to reduce their injection, without changes in the drawal schedules of their beneficiaries/procurers. They're not impacted commercially, because on the injections side, their schedules are being reduced by the ancillary down dispatch instruction from NLDC. This situation can be avoided if the margins available in the intra-state generating stations.

16. He also added that there is still a margin of around 8000 to 10,000 MW in the intra-state generating stations, which are presently operating at 70% or 80% of their full load capacity. If the Intra State Generator will operate further till 55%, then it can create an additional cushion of 8000 to 10,000 MW for down reserve and which in turn can avoid invoking emergency ancillary on the solar plants.

17. He also stated that right now, messages are being regularly sent by NLDC/RLDC to the respective SLDCs to reduce the generation in the intra-state plants. However, the intra State Generators are reluctant to reduce their generation in the absence of commercial compensation to cover the losses as per the formula worked out by CEA and CERC.

18. **ED, NLDC** stated that SCUC and SCED are mandatory for all generators covered under Section 62 of Electricity Act'2003 and other generators may opt SCUC and SCED. She further informed that as per LPSC procedure, which will come into effect from 1st July, no generators will be allowed to bid above 120% of their Energy Charge Rate (ECR). If a generator bids above 120% of ECR, then their corresponding MW fixed cost will be reduced.

19. **Chief (Engg.), CERC** stated that apart from achieving 55% MTL for intra state-generating stations long term technical solutions need to be explored on these issues, such as achieving thermal flexibility upto 40% as MTL for TPS, enabling two-shift operations and allowing thermal generating stations to install battery energy storage systems (BESS) at the switchyard. The Phasing Plan of CEA for achieving 40% MTL upto 2030, requires focussed steps towards enabling two-shift operations and BESS/PSP installation. BESS/PSP would enable them to store excess power during low-demand periods/ solar hours and supply it during peak hours. He also informed CERC through its Suo-Motu order 2/SM/2025 dated 29.03.2025 has already mandated regional entity thermal generating stations whose tariff is determined by this Commission under Section 62 of the Act, to be operated in two-shift operation, as pilot project . The unit for pilot project shall be identified by NLDC in consultation with the owner(s) of such thermal units and CEA.

20. **MS, SRPC** stated that the Compensation mechanism for part load and frequent start-ups from hot, warm & cold need to be brought by SERCs. Till it is notified by SERCs, the CERC mechanism may be adopted by states. He further stated that time lines for scheduling for all Intra State generators also need to be streamlined with CERC IEGC Regulation 2023 (7-8 Time Block) which will ensure equitable comparison and similar provisions of scheduling of power.

21. He further suggested some changes in IEGC/CERC Regulations:
    a) Obligation to supply power (Regulation 47(2) of IEGC Regulation 2023) may be dropped to facilitate USD/RSD on D-1 and on Intraday.
    b) RSD/USD procedure needs to be relooked to ensure that power is available to needy states and not booked to the states not requiring power (Regulation 47of IEGC).
    c) Since Intra State generators are not going upto 55% on sustained basis and the MTL/reserves are being managed through SCUC/MTL-SCED for ISTS generators, the power under the above may be booked to beneficiaries which will ensure scheduling of Intra State generators to lower levels.
    d) Empowering NLDC/RLDC/SLDC to take out units under exigencies. Commercial implications may covered in RSD/USD procedures of CERC/SERC.
    e) SRAS/TRAS down reserves as per Regulation 30(11) & 30(12) of IEGC may be ascertained and ensured by NLDC/RLDC as per notified Procedures. This will improve the ensuring MTL of units on bar during solar hours.
    f) SCUC for Intra State generators should be carried out by SLDC to identify optimum number of units to be kept on bar and same needs to be communicated to NLDC/RLDC for further optimising the SCUC at National/Regional level (Regulation 46). This will improve the ensuring MTL of units on bar during solar hours.
    g) Two shift operation for thermal units is need of hour (CERC Order 2/SM/2025 dated 29.03.2025 & CEA Construction Regulations – mandates 150 cold starts and 1000 warm starts). Converting cold start to warm start through preservation may be looked into.

h) AGC for RE for providing down reserve on proactive manner may be implemented (both ISTS & InSTS). Procedure for measuring of performance needs to be identified by NLDC which could be adopted at InSTS level.

i) TRAS emergency down to be made mandatory for all generators (ISTS & InSTS connected). The commercial aspects need to be finalised by CERC/SERC.

j) TRAS emergency down for RE may be considered with incentive of 1p to 5p based on performance. This may be implemented at frequency above 50.15 Hz. The same may be implemented at InSTS level also.

k) Regulation/Procedure for RE support (reserve down) under Emergency TRAS/SRAS may be formally brought out by CERC. The same may be adopted by SERCs.

l) Booking of some energy and corresponding cost of Ancillary deployment to causer may help in optimum utilisation of resources and more balanced sharing of the cost of Ancillary services. Presently the complete cost is getting socialised through Ancillary and Deviation Pool Account. This may help in curtailing UD & OD of the Regional Entities (States) since some cost implications will be there.

22. **CE (Engg.), CERC** informed that Tariff Regulations'2024 allows the expenditure required to enable flexible operation of the generating station at lower loads as part of the capital cost of the project which gets recovered in form of tariff. Flexible operation of thermal projects would result in operation of generating station below normative plant availability factor. To take care of part load operation compensation in the form Station Hear Rate (SHR) degradation, increase in Auxilary Power consumption (APC) has been brought out vide 1st Amendment to CERC tariff Regulations' 2024. He also informed that the detailed procedure has also been devised by NLDC and has been submitted to the Commission for approval.

23. He further stated that compensation mechanism developed under CERC (IEGC) Regulation-2010 was applicable for generators under sections 62 & 63 of electricity Act'2003. These have now been segregated, wherein the provisions of compensation for Section 63 generators will continue to be governed by the procedures under the IEGC-2010, while the provisions for compensation for Section 62 generators will be governed as per the 1st Amendment to the CERC Tariff Regulations, 2024.

24. **<u>Decisions of the Committee:-</u>**

After detailed deliberations, the followings short term and long term solutions were proposed for ensuring Thermal Generation at Technical Minimum level for Grid Stability and RE Integration:

1. Short Term solutions (within 1 year):

a) Implementation of minimum technical load (MTL) level of 55% immediately on pan-India basis and 40% as per phasing plan and establishment of monitoring mechanism to ensure compliance with the CEA (Flexible. Operation of Coal based Thermal Power Generating Units) Regulations, 2023.

b) State Grid Codes shall be aligned with the Central Electricity Authority (CEA) "Flexible Operation of Coal based Thermal Power Generating Units" regulation 2022, notified in January 2023. Suitable directions needs to be issued to SERCs by Ministry of Power/CEA to notify commercial compensation mechanism as per CEA guidelines to ensure the MTL of 55%, which in force from 01.02.2024 as per CEA (Flexible Operation of Coal based Thermal Power Generating Units) Regulation 2023 on sustained basis.
c) Generators maintaining MTL of 40-45% may be given more preference (bypassing Merit Order when required for maintaining down reserves) and units may be kept on bar.
d) Directions from RPCs may be issued to existing PSPs to make all pumps operational and also use as a load during solar hours as envisaged in Optimal Generation Mix Report of CEA.
e) Time lines for scheduling for all Intra State generators also need to be streamlined with CERC IEGC Regulation 2023 (7-8 Time Block) which will ensure equitable comparison and similar provisions of scheduling of power.
f) Till two shift operation of thermal generators is being implemented, there is a need to create equitable balance between the supply obligation of generators under IEGC Regulation 2023 as well as offtake obligation of drawing entities/ beneficiaries of the generators. Beneficiaries requisitioning power during non-solar hours from an ISGS shall have Offtake obligations from those stations during solar hours.. Beneficiaries may be mandated to maintain a minimum requisition as percentage of maximum requisition in a day, during the lean hours to ensure operationally reasonably schedule during lean hours and availability in non-solar hours.
g) Optimal number of thermal units may be kept on bar during solar hours by NLDC/RLDC/SLDCs to meet non-solar hours demand. Excess generation is leading to frequency excursions. Empowering NLDC/RLDC/SLDC to take out units under exigencies.

2. Long Term solutions(Beyond 1 year):

a) Ensuring 40% MTL for all coal based thermal generators both at ISTS & InSTS on sustained basis. Other technological intervention may be considered by generators (storage etc.). Monitoring of the same has to be done rigorously.
b) Two shift operation/taking out units on weekends/holidays/high wind season needs to be implemented.
c) Peaking capacity may be considered with technical and commercial aspects with well-defined rules. This will further optimise number of units on bar, ensuring MTL at solar hours and also enable the states to meet the evening peak demand.
d) Energy storage (BESS, PSP etc.) need to be promoted rigorously to integrate the RE targets. BESS installation in existing thermal stations may be one of the options for storing excess energy during solar hours.
e) Each control area needs to maintain the reserves as calculated by NLDC on year ahead basis to control and manage the deviations and other grid parameters.

f) Demand response needs to be promoted. Initially large industries with captive generation may be focused.
g) TOD tariff with lower tariff during solar hours and higher tariff during evening needs to be implemented by all SERCs.

The meeting ended with a vote of thanks to chair and all the participants.

****

Annexure-I

List of Participants of the 1st Meeting of the Committee held on 03.06.2025 through video conference.

NRPC:-

1. Shri. V.K.Singh, Member Secretary **-Chairperson**
2. Shri Praveen Jangra , EE

CEA:-

1. Smt. Rishika Sharan, CE (NPC)
2. Shri Brieflee Lyngkhoi, CE (GM Div.)
3. Shri. Satyendra Kumar Dotan, Director (NPC)
4. Shri. Ravi Shankar, DD (NPC)
5. Shri. Nikul Rohin, AD (NPC)
6. Ms. Bhawna Aggarwal, AD (NPC)
7. Shri. Rakesh Bairwa, AD (NPC)

CERC:-

1. Shri Awdhesh Kumar Yadav, CE (Engg.)

SRPC:-

1. Shri. Asit Singh, Member Secretary
2. Shri. J. B. Len, Superintending Engineer
3. Ms. Malini, Superintending Engineer

ERPC:-

1. Shri. N.S. Mondal, Member Secretary

WRPC:-

1. Shri. Deepak Kumar., Member Secretary

NLDC:-

1. Smt. S. Usha, Executive Director

NRLDC:-

1. Shri. Manoj Kumar Agarwal, Executive Director

SRLDC:-

1. Shri V. Balaji, Executive Director

ERLDC:-

1. Shri. Rajib Sutradhar, Executive Director

NERLDC:-

1. Shri. Amaresh Mallick, Executive Director

WRLDC:-

1. Shri. Mahesh M. Mehendale, Executive Director

Annexure-II

Agenda points for discussion on 2nd meeting of the committee to be held on 12.06.2025

a) Till two shift operation of thermal generators is being implemented, there is a need to create **equitable balance** between the supply obligation of generators under IEGC Regulation 2023 as well as offtake obligation of drawing entities/ beneficiaries of the generators. Beneficiaries requisitioning power during non-solar hours from an ISGS shall have Offtake obligations from those stations during solar hours.. Beneficiaries may be mandated to maintain a minimum requisition as percentage of maximum requisition in a day, during the lean hours to ensure operationally reasonably schedule during lean hours and availability in non-solar hours **OR** complete abeyance of supply obligation of generators.

b) Unit Shutdown by generators without any supply obligation needs to be obligated to bring back the unit on bar **within well defined timelines** as per the requirement of the beneficiaries.

c) In case of receipt of less schedule, if the thermal generator has to resort reserve shut down, the beneficiaries may agree to allow shut down **against payment of fixed charges**. However, the requisition of beneficiaries may be restricted to the On bar Declared capacity of the thermal generating stations. This will avoid fictitious schedule and ensure reliable load generation balance. Supply obligation under IEGC Regulation 2023 may be limited to the declared capacity of units on bar.

d) Optimal number of thermal units may be kept on bar during solar hours by NLDC/RLDC/SLDCs to meet non-solar hours demand. Excess generation is leading to frequency excursions. **Empowering NLDC/RLDC/SLDC to take out units under exigencies. Regulatory provisions to facilitate unit shutdown in case beneficiaries surrender power and unit cannot be supported through SCUC.**

e) Suitable provisions may be provided for **higher DSM charges for over injection or under drawl by the entities when the grid frequency exceeds 50.10 Hz**, irrespective of the nature (both RE and non RE) of the entities. Further, during the schedule revision under TRAS Emergency provision, over injection may not be allowed and the volume limit may be made as Zero during such time period.

f) The **decision**s taken in the 1st Meeting of the committee in respect of short term solutions and long term solutions.

g) **Any other agenda** points, if any.

Annexure-IV

भारत सरकार/Government of India
विद्युत मंत्रालय/Ministry of Power
केंद्रिय विद्युत प्राधिकरण/Central Electricity Authority
राष्ट्रीय विद्युत समिति प्रभाग /National Power Committee Division
Ist Floor, Wing-5, West Block-II, RK Puram, New Delhi-66

No. CEA-GO-15-14/1/2025-NPC Division/ 118 Date: 24.06.2025

To,

(All Members of the Committee)

विषय: 12.06.2025 को आयोजित ग्रिड स्थिरता और आरई एकीकरण के लिए तकनीकी न्यूनतम स्तर पर थर्मल उत्पादन सुनिश्चित करने के लिए तंत्र विकसित करने के लिए समिति की द्वितीय बैठक के कार्यवृत्त के संबंध मे ।

Subject: Minutes of the 2nd Meeting of Committee to Evolve the Mechanism for ensuring Thermal Generation at Technical Minimum level for Grid Stability and RE Integration held on 12.06.2025 -reg.

कृपया दिनांक 12.06.2025 को वीडियो कॉन्फ्रेंसिंग के माध्यम से आयोजित राष्ट्रीय संरक्षण स्थायी समिति (एनपीएससी) की द्वितीय बैठक का कार्यवृत्त आपकी सूचना एवं आवश्यक कार्रवाई हेतु संलग्न है।

The Minutes of the 2nd meeting of the committee held on 12.06.2025 through VC, is enclosed herewith for your kind information and necessary action, please.

भवदीय/Yours faithfully

24/06/2025

(ऋषिका शरण /Rishika Sharan)
मुख्य अभियंता एवं सदस्य सचिव (एनपीसी)
Chief Engineer & Member Secretary (NPC)

Copy for kind information:-

1. SA to Chairperson, CEA
2. SA to Member (GO&D), CEA
3. SA to Member (PS), CEA

Minutes of 2nd Meeting of Committee chaired by Member (Power System), CEA held on 12.06.2025

List of Participants are attached at Annexure -I

1. The 2nd meeting of the Committee to Evolve the Mechanism for ensuring Thermal Generation at Technical Minimum level for Grid Stability and RE Integration was held on 12.06.2025 through online mode. The list of participants is enclosed at **Annexure-I.**

2. **Member Secretary, NPC & Member Convener of the Committee** extended a warm and heartfelt welcome to the Chairperson of the meeting, and all other committee members.

3. **Member (PS), CEA & Chairperson of the Committee** also welcomed all the participants of the meeting and asked member convener to start the discussion on the agenda for the second meeting which was already circulated among the members.

Deliberations:

4. **MS, NPC** started the discussion with the first agenda of the meeting. She sought the opinion of all the members of the committee on whether to choose an equitable balance between the supply obligation of generators as well as offtake obligation of drawing entities of the generators **OR** complete abeyance of supply obligation of generators.

5. **Representative of NLDC** opined that there must be equal responsibility on generators as well as beneficiaries. Beneficiaries often provide nil requisition during solar hours and full requisition during non-solar hours against their entitlement resulting in injection schedule below minimum technical limit during solar hours and upto their Declared Capability during non-solar hours. The ISGS refrain from withdrawing their units and continue to over-inject during solar hours and keep their units on bar to honour the injection schedule during non-solar hours (supply obligation as per IEGC). Beneficiaries requisitioning power during non-solar hours from an ISGS should have off-take obligations from those stations during solar hours. The beneficiaries need to be mandated to ensure that their minimum requisition as percentage of maximum requisition in that day in a given thermal station, is not below a predefined value to ensure operationally reasonably schedule during lean hours and availability in non-solar hours.. If the ratio cannot be maintained, one or more units from that station could be allowed to be taken under reserve shutdown to replenish down reserves. Once the unit is taken under reserve shut down, the aggregate requisition by beneficiaries in that station should be restricted to the declared capacity corresponding to the units on bar in that station. .

6. **MS, NPC** stated that in the current practice there are more number of units kept on bar through SCUC support than optimal number of units actually required to be on bar.

7. **On query of CE(Engg.), CERC** regarding quantum of up reserves created by unit commitment during non-solar hours , NLDC clarified that there is no minimum cut-off quantum of up reserves creation criteria for unit commitment under SCUC. He suggested that the units which are not committed by NLDC may be allowed to go off-bar without any supply obligation after giving some time to its beneficiaries for schedule revision. Say, by

1500 hrs on day ahead basis the units which are not committed by NLDC are already known. The gate closure for revision of schedules by beneficiaries on these units may be introduced , say by 2200 hrs on day ahead basis, beyond which if the unit still is having schedule below MTL ,it can be allowed to go off-bar on D day without any supply obligation. .

8. **Representative of NLDC** further stated that regulatory provisions on SCUC may be reviewed to introduce provision for de-committing thermal units during surplus scenarios.. The aggregate requisition by beneficiaries in the station (whose one or more units is decommitted through SCUC) should be restricted to the declared capacity corresponding to the units on bar in that station to avoid unreasonable injection schedule. These provisions would encourage flexible operation of intrastate thermal units.

9. **Representative of NPC Secretariat** suggested that there should be stricter control over beneficiaries who under-draw during solar hours or off-peak hours under high grid frequency conditions. He proposed imposing higher DSM penalties on entities that under-draw or over-inject during solar hours or off-peak hours when the grid frequency exceeds 50.05 Hz.

10. He further stated as per direction of Ministry of Power, 2-shift operation of thermal stations must be performed on pilot basis and potential damage including wear & tear, O&M, and plant lifespans should be thoroughly examined before final implementation.

11. **Decisions of the Committee:-**

After detailed deliberations, the followings were proposed for ensuring Thermal Generation at Technical Minimum level for Grid Stability and RE Integration:

a) There is a need to create **equitable balance** between the supply obligation of generators under IEGC Regulation 2023 as well as offtake obligation of drawing entities/ beneficiaries of the generators. Beneficiaries requisitioning power during non-solar hours from an ISGS shall have Offtake obligations from those stations during solar hours. Beneficiaries may be mandated to ensure that their minimum requisition in the day as percentage of maximum requisition in that day, is equal to or higher than a predefined value to ensure operationally reasonably schedule during lean hours and availability in non-solar hours. The ratio of minimum and maximum requisition by the beneficiary in a generating stations during a day could be 40%.

b) Regulatory provision for de-commitment of the Thermal units through SCUC to be introduced. The unit which is not committed under SCUC by NLDC 1500 hrs on day ahead and its schedule remains below MTL level by 2200 hrs on day ahead basis may be allowed to de-commit. The time between 1500 hrs and 2200 hrs would be the time available to the beneficiaries to revise their schedules to either support the unit by giving schedule above MTL or reduce their schedule from those units. The de-committed unit will have no supply obligation.

c) Suitable provisions may be provided for **higher DSM charges on entities for over-injection or under-drawl by the entities when the grid frequency exceeds 50.05 Hz**

during solar hours/off-peak hours, irrespective of the nature (both RE and non-RE) of the entities. However, **under-injection/over-drawl by the entities when the grid frequency exceeds 50.05 Hz during solar hours/off-peak hours, irrespective of the entity type (RE or non-RE), should attract a lesser penalty and incentivization may be considered.** Further, during the schedule revision under TRAS Emergency provision, over injection may not be allowed and the volume limit may be made as Zero during such time period.

d) Two shift operation of thermal Generating units must be performed on pilot basis in each region and potential damage including wear & tear, O&M, and plant life spans should be thoroughly examined before final implementation. Wear & tear, O&M, plant life spans and cost implications may be properly recorded during pilot two shift operation.

e) Necessary Regulatory provisions for participation of all ISTS & InSTS generators for giving Ancillary Service support to the Grid are required. Ancillary service regulations should be brought out by SERC for intra state level in line with CERC Ancillary Service Regulation.

f) NTPC Ltd. shall develop and share Standards Operating Procedure for implementation of 55% minimum turn down level in intrastate thermal power stations. Training program to be conducted in NPTI with support from NTPC Ltd. for employees of state thermal generators for running intra state plants upto 55% MTL.

g) Energy storage capacity to be created/ augmented in interstate as well as intra States may accelerate the commissioning of the required storage capacities.

h) To ensure non-discriminatory backing down across all grid connected generators during low loads, irrespective of ownership, the State Electricity Grid codes need to be aligned with CEA (Flexible operation of thermal power plants) Regulations, 2023 and IEGC. Regulatory provision to compensate intrastate generating plants for part load operations to be notified by State Electricity Regulatory Commissions.

i) Decisions taken in the 1st Meeting held on 03.06.2025 and 2nd Meeting would be considered while finalizing the final recommendations of the Committee.

The meeting ended with a vote of thanks to chair and all the participants.

****

Annexure-I

List of Participants of the 1st Meeting of the Committee held on 12.06.2025 through video conference.

CEA:-

1. Shri. V. K. Singh, Member (Power System) **-Chairperson**
2. Smt. Rishika Sharan, CE (NPC)
3. Shri. Satyendra Kumar Dotan, Director (NPC)
4. Shri. Shishir Kumar Pradhan, DD (NPC)
5. Shri. Ravi Shankar, DD (NPC)
6. Shri. Nikul Rohin, AD (NPC)
7. Ms. Bhawna Aggarwal, AD (NPC)
8. Shri. Rakesh Bairwa, AD (NPC)

CERC:-

1. Shri Awdhesh Kumar Yadav, CE (Engg.)

NRPC:-

1. Shri Anjum Parvez, Superintending Engineer

SRPC:-

1. Ms. Malini, Superintending Engineer

ERPC:-

1. Shri. N.S. Mondal, Member Secretary

WRPC:-

1. Shri. Deepak Kumar., Member Secretary

NLDC:-

1. Smt. S. Usha, Executive Director

NRLDC:-

1. Shri. Manoj Kumar Agarwal, Executive Director

SRLDC:-

1. Shri V. Balaji, Executive Director

ERLDC:-

1. Shri. Rajib Sutradhar, Executive Director

NERLDC:-

1. Shri. Amaresh Mallick, Executive Director

WRLDC:-

1. Shri. Mahesh M. Mehendale, Executive Director

ANNEXURE B.2.1.b

Minutes of meeting held on 28.11.2025 through VC amongst POWERGRID, North Karanpura Transmission Ltd. (NKTL), NTPC North Karanpura and CTUIL to discuss the readiness of system pertaining to North Karanpura–Gaya 400kV D/c Transmission Line

In response to the concern raised by M/s North Karanpura Transmission Ltd. (NKTL) vide mail dtd. 28.11.2025 regarding issues in charging of North Karanpura- Gaya 400kV D/c Transmission Line, a meeting was held on 28.11.2025 to discuss the readiness of the system pertaining to North Karanpura- Gaya 400kV D/c Transmission Line. The list of participants is enclosed as **Annexure-I.**

CGM (CTUIL) welcomed all the participants in the meeting and gist of deliberations is as below:

1. North Karanpura Transmission Ltd. (NKTL)informed that North Karanpura- Gaya 400kV D/c line is physically completed & certification from Electrical Inspector in this regard has already been received.
2. M/s NKTL mentioned that the termination work at both ends is pending (In the scope of POWERGRID and NTPC at their respective ends as per Connection Agreement / RfP / TSA). Further, NKTL mentioned that Communication for expected readiness of the transmission line was made in time.
3. With reference to above, POWERGRID mentioned that the bays at Gaya substation were commissioned in March 2021. Also, as per TSA requirements, NKTL was to notify all stakeholders of system readiness 60 days prior to commissioning for the North Karanpura–Gaya Transmission Line; however, no such communication was received until a letter dated 14.11.2025 arrived by post on 20.11.2025. POWERGRID mentioned that as the work was completed long-back and resources were demobilized, time is required for mobilization for interconnection. Further they are taking all-out effort to expedite the work. POWERGRID also mentioned that the termination material can be taken by NKTL for carrying out the work. It was also discussed that NKTL to apply for necessary shutdown to POWERGRID so that necessary coordination can be done with RLDC for availing the shutdown and termination work at Gaya end can be completed.
4. Regarding readiness of bays at NTPC North Karanpura end, NTPC informed that except relay testing and SCADA work, all the works have been completed. NTPC mentioned that they will be ready for commissioning of the line by 10th Dec'25. Further, NTPC mentioned that commissioning of PLCC and DTPC work is balance which is to be done by POWERGRID.
5. POWERGRID mentioned that the prior contracts for PLCC and DTPC commissioning was closed due to prolonged delays. As NKTL's line readiness notice arrived only on 20.11.2025, OCC approval for December shutdown could not be sought, given the 1st - 5th monthly submission window. Based on the shutdown request POWERGRID will make all-out Effort for availing the shutdown.

Further, POWERGRID mentioned that they will put all-out effort for commissioning of PLCC/DTPC within 10 days after completion of the bay termination work at both the ends. In addition to above, energy meters in both lines need to be replaced at Gaya end as per the advice received from ERLDC.

6. NKTL mentioned that if there will be delay in commissioning of their asset, they will be applying for Deemed COD as per the provision in the TSA. CTUIL mentioned that after receipt of the letter, necessary action will be taken as per TSA.
7. CTUIL requested NTPC, POWERGRID & NKTL to complete the balance work on priority so that the long pending commissioning of 400kV North Karanpura- Gaya D/c line can be done at the earliest.

The meeting ended with a vote of thanks to all Participant

ANNEXURE B.2.2.1

Minutes of the Meeting held on 18.11.2025 between ERPC, SRPC, NLDC, ERLDC, SRLDC, SLDC Odisha & POWERGRID to discuss reconductoring plan of 400kV Talcher-Meramundali D/C

ERLDC convened a meeting on 18th Nov 2025 via online mode (MS Teams) to discuss reconductoring plan of 400kV Talcher-Meramundali D/C. The meeting was chaired by Member Secretary, ERPC. MS SRPC attended the meeting as a special invitee. Representative from Odisha SLDC, NTPC, NLDC, SRLDC and PGCIL were also present in the discussion. The list of participants is attached as **Annexure-I.**

GM (System Operation), ERLDC welcomed the participants to the meeting, briefed about the scheme and expressed need for proper outage planning to reduce the outage duration.

MS ERPC stated that the reconductoring work of 400kV Talcher - Meramundali D/c line is crucial for the system security in the Eastern Region and highlighted the need to complete the reconductoring work during winter to avoid operational difficulties in summer.

MS SRPC stated that the outage of the line will have significant impact on Southern Region and it needs to be completed for long term solution of the issue. He also stressed on need to complete the reconductoring work within winter. POWERGRID were requested to deliberate their outage requirement and action plan for completing the work.

The deliberations and summary of the meeting is as follows:

1. POWERGRID intimated that the scope of work involved reconductoring of Talcher-Meramundali Ckt-1 &2 along with bay upgradation work at both NTPC Talcher and Meramundali (OPTCL) end. The work has been awarded to M/s Apar (Sub vendor of POWERGRID) with completion date of Jun'2026. POWERGRID submitted that they want to start the work simultaneously in both LILO portion of Talcher-Meramundali Ckt-2 (17.158 KM) as well as Talcher-Meramundali Ckt-1(direct line approx. 51KM) in line with the supply schedule of the HTLS conductor, insulators and other hardware materials. POWERGRID intimated that the supply of material for bay upgradation work is expected to reach site by end of Mar'26. The presentation shared by POWERGRID is attached at Annexure-II.

2. MS ERPC expressed concern over the extended planning schedule of POWERGRID to complete the work and mismatch in supply schedules with action plan. He advised to expedite supply of material and double the manpower deployed to complete the work in winter. He further emphasised the need to complete the bay upgradation work along with reconductoring work to avoid further delay.

3. MS SRPC emphasised that the line after reconductoring will not be utilized for full capacity unless the bay upgradation is completed. In response, it was clarified that the bay equipment at Angul and Meramundali SS are capable of power flow up to 2000A i.e. approx. 1300MW with HTLS conductors.

4. ERLDC made a detailed presentation highlighting line loading pattern, HVDC power flow during the previous winter months. Various scenarios were presented based on actual power flow pattern of the lines keeping in mind of probable contingencies (Presentation attached in the Annexure-III). It was pointed that if shutdown of 400KV Talcher-Meramundali circuit-1 is facilitated with availability of 400KV Talcher-Meramundali circuit-2 along with LILO portion, then there will be minimal requirement of any generation backdown until Feb'26.

   With increase in demand of Odisha and outage of one circuit of Talcher-Meramundali, the ICT loading at TSTPP will also be close to its rated capacity without any redundancy as other ICT is already under long outage.

   ERLDC advised to start with shutdown of 400KV Talcher-Meramundali circuit-1. During the period of shutdown, the 400KV Talcher-Meramundali circuit 2 (longer line) should be available in its original configuration with LILO.

5. NLDC submitted that the reconductoring work needs to be completed by Feb'26 as the demand in Odisha remains on the lower side in winter. In the cases of HVDC pole tripping during reconductoring work, the generation backdown quantum will be very high. NLDC requested to increase no. of gangs and complete the reconductoring work within winter. NLDC reliability team also expressed to start

the shutdown of circuit-1 without bypassing LILO part as generation backdown requirement is minimal.

6. SRLDC intimated that high demand in Southern region remains from the month of February till May. In addition, elections are also expected to be held in Tamil Nadu, Kerala and Pondicherry. In this period, shutdowns cannot be permitted with high generation backdown at TSTPP. Besides, there have been cases in winter when Talcher HVDC goes to RVO mode reducing the export capability to SR. They suggested to allow shutdown of circuit-1 with circuit-2 availability with LILO part causing reduced power flow owing to increased line length of LILO portion. The shutdown planning needs to be done without any generation backdown in view of demand peaking after 15th January.

7. MS SRPC expressed that simultaneous shutdown of both the circuits cannot be permitted (as suggested by POWERGRID). He agreed to the view of allowing reconductoring of LILO part and then circuit-1 with availability of circuit-2 with LILO part. He also stated that once any circuit is taken out for reconductoring, it should be completed in all respect in one go without requirement of further shutdown. Secondly, while availing shutdown of circuit-2, the possibility of using circuit-1 along with LILO part may be explored which will reduce the generation backdown quantum. Thirdly, line shutdowns need to be completed by January as the examinations in SR states are scheduled in Feb. Besides, the shutdowns for bay upgradation may be planned after 15th May'26.

8. SLDC Odisha submitted that line shutdowns may be completed by 15th Feb'26, else it can be availed after 15th Aug'26. Secondly, the rating of the available circuit may be considered on higher side. Shutdown of circuit-1 needs to be prioritised as the LILO work can be taken up at any time.

9. NTPC Talcher submitted that unit#1 will be under outage for overhauling work for a period of 45 days starting 15th Dec'25. MS ERPC stressed to avail the unit outage opportunity to complete the work.

10. POWERGRID intimated that the executing vendor has started supply of conductor for the LILO part based on tower schedule to minimise the damage. POWERGRID submitted that they will be able to complete reconductoring the LILO part by December end and require further 45 days to complete reconductoring the 400KV Talcher-Meramundali circuit-1.

11. In view of peak demand season of SR, MS, SRPC further emphasized to complete the works by 30th Jan'26 (SR provides concurrence to the shutdown without any backdown at Talcher stage-2 generation and 400kV Talcher-Meramundali Ckt-1 works needs to be completed by 31st Jan'26). He suggested that NLDC/ERLDC may reassess the SPS for Talcher Kolar single/ bi-pole outages considering 400KV Talcher-Meramundali circuit-1/2 planned shutdowns. ERLDC clarified that till January 2026, the existing SPS will suffice based on system studies.

    He suggested the efficacy of the bays (rated and short circuit) to handle HPC conductor may be assessed without bay upgradation. ERLDC clarified that as per studies maximum flow is expected to be below the rated capacity of bus and bay equipment. He stated that PGCIL needs to put more gangs to complete the works as Talcher II generation and Talcher-Kolar links are very critical to Southern Region.

MS ERPC concluded to complete the reconductoring of LILO part by 20th Dec'25 and instructed to start the work of 400KV Talcher-Meramundali circuit-1 from 21st Dec 2025 and complete by 5th Feb'26. He also emphasized to submit progress report on weekly basis and share all revised supply schedule and execution details to ERPC/ERLDC. POWERGRID committed to complete the reconductoring work within the timeline as instructed by MS ERPC.

MS ERPC assured POWERGRID to provide all sorts of assistance for the work. However, no relaxation will be granted in completion timeline. He thanked everyone for participation in the meeting.

The meeting ended with a vote of thanks.

Annexure-I

List of Participants

ERPC

1. Sh. N. S. Mondal, Member Secretary
2. Sh. S Kejriwal, Director/ SE(Operation)
3. Sh. D. K. Khuntia, Asst. Director (Operation)

SRPC

1. Sh. Asit Singh, Member Secretary

NLDC

1. Sh. Sunil Kumar DJ, Ch. Manager
2. Sh. Saibal Ghosh, Ch. Manager
3. Sh. Raj Kishan, Asst. Manager

SRLDC

1. Sh. Pradeep Reddy, DGM
2. Sh. Gurram Praveen, Ch. Manager

SLDC Odisha

1. Sh. Sanjay Kumar Mishra, SGM
2. Manas Ranjan Samantaray, SGM
3. Sh. Debi Prasad Kar, GM

ERLDC, GRID-INDIA

1. Sh. Debabrata Biswas, GM
2. Sh. Bilash Achari, DGM
3. Sh. Manas Das, DGM
4. Sh. Rakesh Kumar Pradhan, Ch. Manager
5. Sh. Chandan Mallick, Ch. Manager
6. Sh. Alok Pratap Singh, Ch. Manager
7. Sh. Laldhari Kumar, Manager
8. Sh. Pritam Mukherjee, Manager
9. Sh. Srimalya Ghosal, Asst. Manager

POWERGRID

1. Sh. K. K. Prusti, Sr. GM
2. Sh. Prahlad Bhola, Sr. GM
3. Sh. Debadatta Padhy, DGM

NTPC Talcher

1. Sh. Tapas Bachar, AGM
2. Sh. P Guruprasad, AGM
3. Sh. Premkumar V, AGM
4. Sh. T Ravikumar, DGM
5. Sh. Sudhanshu Sekhar, Sr. Manager

ANNEXURE B.2.2

RECONDUCTORING WORKS OF TALCHER (NTPC) - MERAMUNDALI (OPTCL) 400 KV D/C TRANSMISSION LINE AND BAY UPGRADATION WORKS AT TALCHER & MERAMUNDALI.

Progress Report

As on 09/12/2025

1. INTRODUCTION

1.1 Project Description

Reconductoring Package OH02 including upgradation of Bays under Eastern Region Expansion Scheme-43 (ERES-43)

a) Reconductoring of Talcher (NTPC) – Meramundali (OPTCL) 400KV D/C (Twin Moose) line of 140 km (one circuit via Angul and bypassed at Angul) with Twin HTLS Conductor with ampacity of single HTLS as 1228A

b) Upgradation of associated 400KV Bay equipment at Talcher (NTPC)

c) Upgradation of associated 400KV Bay equipment at Meramundali (OPTCL)

1.2 Project Objective

Reconductoring of 400kV transmission double circuit line with HTLS conductor approximately 140km from the Talcher (NTPC) to Meramundali (OPTCL) is required for reliable operation of grid.

2. MAIN FEATURES

Name of the Project	:	Reconductoring Works of Talcher (NTPC) – Meramundali (OPTCL) 400 KV D/C Transmission Line and Bay Upgradation
RTM/ Consultancy	:	POWERGRID (Under RTM)
LOA Ref NO	:	CC/NT/W-COND/DOM/A00/24/14484/CA-1/25-105312/01 (Supply of Goods) & CC/NT/W-COND/DOM/A00/24/14484/CA-2/25-105312/02 (Service) dated 29-05-2025
Name & Address of the Contractors		M/s Apar Industries Limited. 301, Panorama Complex, R.C Dutta Road, Alkapuri, Vadodara, Gujarat-390007

3. SCOPE OF WORKS

Following elements are included in the scope of works of the subject package

a. Transmission Lines

Reconductoring of 400KV D/c (Twin ACSR moose) Talcher (NTPC) – Meramundali (OPTCL) Transmission line of 140km (one circuit via Angul and bypassed at Angul) with Twin HTLS Conductor with ampacity of single HTLS as 1228A.

Line length: 52.5 Km from Talcher S/S to Meramundali + 17.5 km LILO portion to Angul S/S

(Ckt-I – 52.5km. from Talcher to Meramundali)
(Ckt-II- 87.5 km From Talcher-Angul-Meramundali)

b. Sub stations

Upgradation of associated 400KV Bay equipment each at Talcher (NTPC) S/S and Meramundali (OPTCL) S/S with standard equipment rating of 3150A in associated bays (in existing D type one & half Breaker scheme) used for interconnection of 400KV D/c Twin HTLS conductor as mentioned at (a) above.

4. Review Meetings carried out with Agency during the period: 02/12/2025

5. Status of Major Material Supply:

5.1. **Status of Hardware:**

S.l No	Description	Qty
1	DOUBLE TENSION STRING (WITHOUT CLAMP)	512
2	SINGLE SUSPENSION PILOT STRING (WITHOUT CLAMP)	110
3	SINGLE SUSPENSION STRING (WITHOUT CLAMP)	193
4	COMPRESSION DEAD END CLAMP FOR GTACSR 570MM	1020
5	TWIN SPACER DAMPER FOR GTACSR 570MM	2669
6	T-CONNECTOR FOR GTACSR 570MM	24
7	TWIN RIGID SPACER (450MM) FOR GTACSR 570MM	369
8	CORONA FREE SUSPENSION CLAMP 205 X 85 MM (26-32 MM)	220
9	SUSPENSION CLAMP FOR GTACSR 570MM	404

5.2. HTLS Conductor:

Conductor Received at site/Total Conductor to be supplied- 481.69/ 886 KM (including 40 KM Spare)

- Schedule of supply for another 396.5 km
- 150 km by 05/01/2026
- 150Km by 25/01/2026
- 96.5Km by 05/02/2026

5.3. CLR Insulator:

Total Requirement: - (i). 160 KN: 2880 Nos. (ii). 120 KN: 759 Nos.

- Insulator Diverted from other POWERGRID Substation to Site on 27/11/2025: (i). 160 KN: 360 Nos., (ii). 120 KN: 84 Nos.
- Schedule of supply for another 2520 (160 KN) & 675 (120 KN) insulator
- (i). 160 KN: 700 Nos., (ii). 120 KN: 300 Nos. by 17/12/2025

- (i). 160 KN: 1000 Nos. (ii). 120 KN: 300 Nos. by 20/12/2025:
- (i). 160 KN: 820 Nos., (ii). 120 KN: 75 Nos. by 15/01/2026:

6. Major T&P:

TSE Machine: Total Requirement- 3 Nos.

- Already Received at Site: 2 Nos.
- 3rd TSE machine to be reached at site by 22/12/2025: 01 No.

7.0 **Work Execution Plan in 400kV Talcher-Angul_Meramundali LILO Portion:**

7.1 Work status:
Presently gangs deployed at site : 3 nos, 4th Gang shall be reaching site by 11/12/2025.

Sl. No.	Gang	Location	Span in KM	Total	Status
1	Gang-1	17-18	390 Mtr	780 Mtr	Completed
2	Gang-2	1-2	213 Mtr	426 Mtr	Completed
3	Gang-1	3-6	1162 Mtr	2324 Mtr	Completed
4	Gang-2	6-7	397 Mtr.	794 Mtr.	WIP . Both Ckt to be completed by 12-12-2025

7.2 Work Planned for Next Week:

Sl. No.	Gang	Location	Span in KM	Total	Start Date	Completion Target Date
1	Gang-1	7-12	1684 Mtr	3368 Mtr	10/12/2025	17/12/2025
2	Gang-3	36-37	371 Mtr.	742 Mtr.	10/12/2025	15/12/2025
3	Gang-2	14-17	1116 Mtr.	2232 Mtr.	13/12/2025	18/12/2025
4	Gang-3	22-23	170 Mtr	340 Mtr	16/12/2025	21/12/2025
5	Gang-4	27-28	426 Mtr.	852 Mtr.	16/12/2025	23/12/2025

8.0 Major Issues:

a. ROW & Challenges:
Work stopped for 9 days due to encounter of ROW issues from 24/11/2025 to 02/12/2025 at Section Tower No-3 to Tower No-6 and Tower No-6 to Tower No-7. The same was resolved with the support & intervention of District Magistrate, Angul. Photographs w.r.t. Right of Way issues attached for kind reference.

9.0 Photographs


POW

10. **Right of Way Photographs**

ANNEXURE B.2.3

Minutes of the Meeting held on 18.11.2025 between ERPC, SRPC, NLDC, ERLDC, SRLDC, SLDC Odisha & POWERGRID to discuss reconductoring plan of 400kV FSTPP-KHSTPP D/C

ERLDC convened a meeting on 18th Nov 2025 via online mode (MS Teams) to discuss the action plan for commencing reconductoring of 400kV Farakka-Kahalgaon D/C (line length ~ 95Km). The meeting was attended by representatives of ERPC, ERLDC, FSTPP, KHSTPP, POWERGRID ER-I and ER-II. The list of participants is attached as **Annexure-I**. The deliberations and summary of the meeting is as follows:

- POWERGRID stated that the reconductoring work initially planned to start from 20th Nov'25 could not be started due to non-availability of materials at site. They intimated their revised plan to start the reconductoring work in the first week of December considering expected supply of materials in last week of November. As the bay upgradation work of Farakka Ckt#1 at NTPC Kahalgaon is in progress, it is prudent to start reconductoring in 400kV Farakka-Kahalgaon Ckt#1. The bay upgradation work will be taken up as per scheme approved in 22nd NCT meeting.
- POWERGRID presented L2 schedule of supply materials and action plan for the reconductoring works. They requested shutdown requirement of 2 months for Circuit#1 starting from first week of Dec'25 and further 2 months (February and March of 2026) for completing reconductoring of Circuit#2.
- Representative of West Bengal SLDC were not present in the meeting. They had intimated through email that their views remain same as discussed in 232nd OCC outage meeting i.e. to complete the reconductoring works by Jan'26.
- NTPC, Kahalgaon intimated that upgradation of Main Bay of Farakka Ckt#1 is going as per schedule and expected to be completed by approved schedule till 8th Jan'26.
- NTPC Farakka intimated that materials for bay upgradation are available at site and will be taken up during outage of line for reconductoring work. Upgradation of Main and tie bay of KHSTPP Ckt#1 are expected to be completed by 6th Jan'26. However, they need to rework on their plan for bay upgradation of KHSTPP Ckt#2 which is planned from 21st Mar'26 to 30th Apr'26.
- ERLDC clarified that simultaneous shutdowns of 400kV Farakka-Kahalgaon Ckt#1 and Ckt#2 cannot be permitted. ERLDC stated that it will be beneficial if all the reconductoring works be completed by January 2026 considering lesser demand of ER states.
- ERPC stated that considering the line to be crucial link for power import to West Bengal, the works needs to be completed latest by February 2026 by increasing manpower.

After deliberation, the forum was of consensus view to complete the reconductoring work by Feb'26. POWERGRID intimated that they will give best efforts to complete the work within the suggested timeline.

The meeting ended with a vote of thanks.

Annexure-I

List of Participants

ERPC

1. Sh. D. K. Khuntia, Asst. Director (Operation)

ERLDC

1. Sh. Rakesh Kumar Pradhan, Ch. Manager
2. Sh. Laldhari Kumar, Manager
3. Sh. Pritam Mukherjee, Manager
4. Sh. Ramashankar Kumar, Asst. Manager

POWERGRID

1. Sh. Achyutanand Parhi, Sr. DGM (ER-I)
2. Sh. Rajesh Kumar, DGM (ER-I)
3. Sh. Sudeep Kumar, DGM (ER-I)
4. Sh. Prosun Kumar Mallick, DGM(ER-II)
5. Sh. Uttam Kumar, DGM (ER-I)
6. Sh. Sanjay Kumar Singh, Ch. Manager (ER-I)
7. Sh. Tarak Chandra Biswas, Ch. Manager (ER-II)
8. Sh. Ponda Tudu, Asst. Manager (ER-I)
9. Sh. Biswajit Roy, Asst. Manager (ER-II)
10. Lutfor Rehman, Engineer (ER-II)

NTPC Farakka

1. Rajesh Kumar Meena, AGM
2. Jayathran P S, DGM

NTPC Kahalgaon

1. Deborshi Chakraborty, DGM

ANNEXURE B.2.5

सेंट्रल ट्रांसमिशन यूटिलिटी ऑफ इंडिया लिमिटेड
(पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड के स्वामित्व में)
(भारत सरकार का उद्यम)
CENTRAL TRANSMISSION UTILITY OF INDIA LTD.
(A wholly owned subsidiary of Power Grid Corporation of India Limited)
(A Government of India Enterprise)

Ref: CTU/E/00/ERPC/ERES-47

Date: 11-12-2025

Member Secretary
Eastern Regional Power Committee (ERPC)
14, Golf Club Road, Tollygunge
Kolkata-700033

Subject: Agenda for forthcoming TCC & ERPC Meetings – reg.

Dear Sir,

As you are aware, "ERES-47: Nawada – Durgapur – Jeerat (New) 765kV corridor" scheme has been evolved to improve the reliability of power supply in Kolkata area and Eastern Region. This scheme would also facilitate power dispersal of 1200MW from upcoming Nabinagar STPP Stage-II (3x800MW) generation project in Bihar.

The said scheme was agreed in the 48th CMETS-ER held on 30-10-2025 for implementation under ISTS. As per MoP's Office Order no. 15/3/2018-Trans-Pt(5) dated 28-10-2021 regarding "Re-constitution of the National Committee on Transmission (NCT) - reg.", for schemes costing more than ₹500 Cr. CTU has to submit the scheme to NCT for their consideration after consulting the RPC.

In view of the above, it is requested that the above scheme may be taken up for deliberations in the forthcoming meeting of ERPC and observations/views may be communicated to CTU for further processing of the scheme. Details of the said scheme as per requisite format of NCT are annexed herewith as **Annexure-I.**

Thanking you.

Yours faithfully,

(R.V.M.M. Rao)
Chief General Manager

Annexure-I

Agenda for ERPC

ERES-47: Nawada – Durgapur – Jeerat (New) 765kV corridor

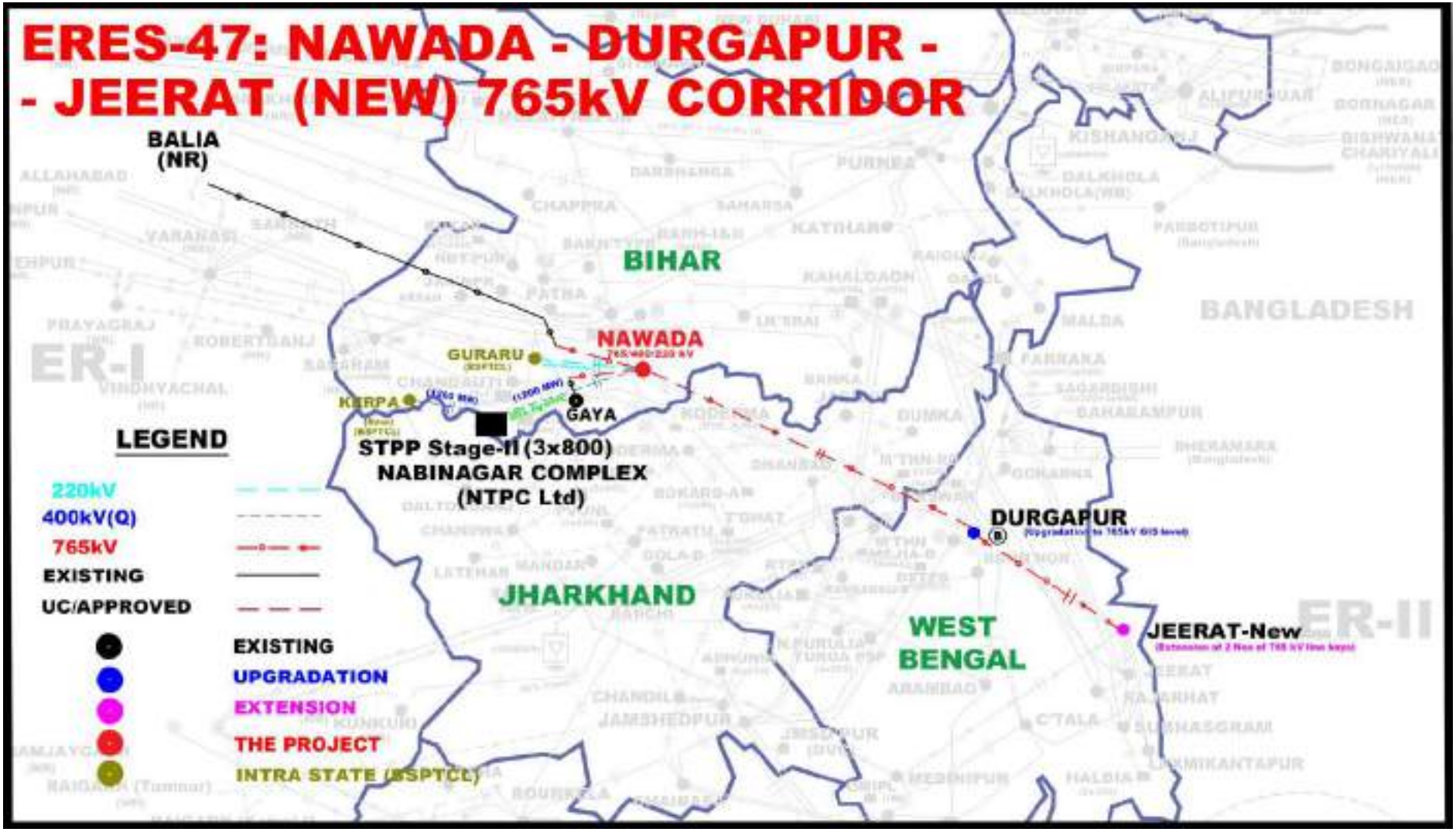
Sl. No.	Items	Details
1.	**Name of scheme**	ERES-47: Nawada – Durgapur – Jeerat (New) 765kV corridor
2.	**Scope of the scheme**	Brief scope of works is given below. Detailed scope of works is enclosed at **Appendix-A.** i. Establishment of Nawada (ISTS) 765/400/220kV S/s with 2x1500MVA+2x500MVA ICTs ii. LILO of Gaya – Balia 765kV S/c line at Nawada (ISTS) S/s – (Loop in 82km and Loop out 82km) iii. Establishment of 765kV level in GIS at existing Durgapur (POWERGRID) S/s along with installation of 765/400kV, 2x1500MVA ICTs in 400kV Section-B (the section having 400/220kV ICTs) iv. Nawada (ISTS) – Durgapur (POWERGRID) 765kV D/c line along with 1x240MVAr (3x80MVAr 1-Ph) switchable line reactor in both ckts at both ends – about 258km v. Durgapur (POWERGRID) – Jeerat (New) 765kV D/c line along with 1x240MVAr (3x80MVAr 1-Ph) switchable line reactor in both ckts at Jeerat (New) end – about 152km vi. Extension at Jeerat (New) 765/400kV S/s
3.	**Depiction of the scheme on Transmission Grid Map**	Refer **Exhibit-1**.
4.	**Upstream/downstream system associated with the scheme**	Upstream: NIL Downstream: Nawada (ISTS) – Guraru (BSPTCL) 220kV D/c line (under the scope of BSPTCL)
5.	**Objective / Justification**	A 765kV ring was planned in ER from Ranchi (New) – Medinipur – Jeerat (New) – Gokarna – Banka – Gaya and Ranchi – Gaya through 400kV D/c (Quad) line. Ranchi (New) – Medinipur – Jeerat (New) 765kV D/c line has already been implemented. In order to improve reliability in the Eastern Region and improve reliability of power supply to Kolkata

Sl. No.	Items	Details
		area, need for implementation of balance portion of the ring viz. Jeerat (New) – Gokarna – Banka – Gaya came up as per operational feedback. The matter was discussed in the joint study meeting held on 25-09-2025 wherein to reduce the number of 765kV substations and to reduce line length, a new corridor option viz. Nawada – Durgapur – Jeerat (New) was explored. The Nawada S/s along with Nawada – Durgapur – Jeerat (New) 765kV corridor was agreed to be taken up for strengthening 765kV interconnection to Kolkata area. Further, for the drawal requirement of BSPTCL, 765/400/220kV ICTs shall also be implemented at Nawada (ISTS). BSPTCL shall implement Nawada – Guraru – Kaler 220kV D/c line for drawal of power from ISTS. For seamless integration of Nawada into the ISTS grid, LILO of Gaya – Balia 765kV D/c line has also been proposed. Accordingly, the "ERES-47: Nawada – Durgapur – Jeerat (New) 765kV corridor" scheme was agreed to be implemented as a strengthening scheme in the 47th CMETS-ER held on 29-09-2025. It was also observed that this link can also be utilized for grant of 1200MW ISTS Connectivity to NTPC for its Nabinagar STPP Stage-II generation plant (3x800MW). The final scope of works was discussed and agreed in 48th CMETS-ER held on 30-10-2025.
6.	**Estimated Cost**	INR 5676.25 Cr.
7.	**Impact on the total Annual Transmission Charges in % along with the existing ATC**	A. ATC (considering levelized tariff @15% of estimated cost): ₹851.44 Cr. B. Present ATC: ₹45999.41 Cr.* C. A/B: 1.85%
8.	**Need of phasing, if any**	Nil
9.	**Implementation timeframe**	31-03-2029
10.	**Inclusion of any wild life/ protected area along the transmission line route**	**(a) LILO on Balia-Gaya line at Nawada:** No major NP, WLS, other protected areas observed. However, for details of other forest/protected areas, survey is required to be done.

Sl. No.	Items	Details
		(b) Nawada - Durgapur: No major NP, WLS, other protected areas observed. However, for details of other forest/protected areas, survey is required to be done. **(c) Durgapur - Jeerat:** No major NP, WLS, other protected areas observed. However, for details of other forest/protected areas, survey is required to be done.
11.	**Deliberations with RPC along with their comments**	**ERPC may add their deliberations here.**
12.	**System Study for evolution of the proposal**	Refer **Exhibit-2**.

**Total YTC allowed for Oct 2025, as per notification of transmission charges payable by DICs for billing month of Dec 2025 dated 25-11-2025 published on NLDC website (available @ https://posoco.in/transmission-pricing/notification-of-transmission-charges-for-the-dics/)*

Exhibit-1


ERES-47: NAWADA - DURGAPUR -
- JEERAT (NEW) 765kV CORRIDOR
BALIA
(NR)
BIHAR
NAWADA
GURARU
KERPA
GAYA
STPP Stage-II (3x800)
NABINAGAR COMPLEX
(NTPC Ltd)
DURGAPUR
JHARKHAND
WEST
BENGAL
JEERAT-New
BANGLADESH
ER-I
ER-II
LEGEND
220kV
400kV(Q)
765kV
EXISTING
UC/APPROVED
EXISTING
UPGRADATION
EXTENSION
THE PROJECT
INTRA STATE (WBSPTCL)

Appendix-A

ERES-47: Nawada – Durgapur – Jeerat (New) 765kV corridor

Sl. No.	Scope of works	Capacity (MVA) / Line length (km)/ Nos.
1.	Establishment of new 765/400/220kV S/s at Nawada in Bihar **Additional space for future expansion**: - 765kV bus sectionaliser bay: 1 set (to establish Sec-II) - 400kV bus sectionaliser bay :1 set (to establish Sec-II) - 220kV bus sectionaliser bay: 1 set (to establish Sec-II) - 220kV bus coupler bay: 1 set (1 No. on bus Sec-II) - 220kV transfer bus coupler bay: 1 set (1 No. on bus Sec-II) - 765/400kV, 4x1500MVA (12x500MVA single phase units) ICTs along with associated ICT bays at both voltage levels o 765kV side: - 1 No. on Bus Sec-I & 3 Nos. on Bus Sec-II) o 400kV side: - 1 Nos. on Bus Sec-I & 3 Nos. on Bus Sec-II) - 400/220kV, 4x500MVA ICTs along with associated ICT bays at both voltage levels o 400kV side: - 1 No. on Bus Sec-I & 3 Nos. on Bus Sec-II) o 220kV side: - 1 Nos. on Bus Sec-I & 3 Nos. on Bus Sec-II) - 765kV, 2x330MVAr (6x110MVAr single phase units) bus reactor along with associated bay (on Bus Sec-II) - 420kV, 2x125MVAr bus reactor along with associated bay (on Bus Sec-II) - 765kV line bays (along with space for switchable line reactor) for future lines: 8 Nos. (2 Nos. on Bus Sec-I and 6 on Bus Sec-II) - 400kV line bays (along with space for switchable line reactor) for future lines: 10 Nos. (4 Nos. on Bus Sec-I and 6 on Bus Sec-II) - 220kV line bays for future lines: 10 Nos. (4 Nos. on Bus Sec-I and 6 on Bus Sec-II)	- 765/400kV, 2x1500MVA ICT (7x500MVA single phase units including one spare unit) - 765kV, 2x330MVAr bus reactor (7x110MVAr single phase units including one spare unit) - 400/220kV, 2x500MVA ICT - 420kV, 125MVAr bus reactor: 2 nos. - 765kV ICT bays: 2 nos. - 765kV Bus reactor bays: 2 nos. - 400kV ICT bays: 4 nos. - 400kV Bus reactor bays: 2 nos. - 220kV ICT bays: 2 nos. - 765kV line bays: 4 nos. (2 nos. for Nawada – Durgapur 765kV D/c line and 2 nos. for LILO of Gaya – Ballia 765kV S/c line) - 765kV, 240MVAr (3x80MVAR single phase units) switchable line reactor along with associated switching equipment in both circuits of Nawada – Durgapur 765kV D/c line at Nawada end - 765kV, 240MVAr (3x80MVAR single phase units) switchable line reactor along with associated switching equipment in Nawada – Ballia 765kV S/c line section at Nawada end formed after LILO of Ballia – Gaya 765kV S/c line at Nawada - 765kV spare reactor: 1x80MVAr - 400kV line bays: 2 nos. [for Nabinagar-II Stage-II – Nawada (ISTS) 400kV D/c (Quad) line viz. DTL, under the scope of NTPC Ltd.] - 220kV line bays: 2 nos. [for Nawada (ISTS) – Guraru 220kV D/c line – line under scope of BSPTCL] - 220kV bus coupler bay: 1 set (1 No. on bus Sec-II) - 220kV transfer bus coupler bay: 1 set (1 No. on bus Sec-II) -
2.	Upgradation of existing 400/220kV Durgapur S/s (Sec-B having 400/220kV ICTs) to 765kV level (in GIS) **Additional space for future expansion**:	- 765/400kV, 2x1500MVA ICT (7x500MVA single phase units including one spare unit) - 765kV, 2x330MVAr bus reactor (7x110MVAr single phase units including one spare unit)

Sl. No.	Scope of works	Capacity (MVA) / Line length (km)/ Nos.
	- 765kV GIS line bays (along with space for switchable line reactor) for future lines: at least 4 nos. - 765/400kV, 1500MVA ICT (3x500MVA single phase units) along with associated bays at both levels: at least 1 no. - 765kV, 330MVAr bus reactor (3x110MVAr single phase units) along with associated bay: at least 1 no.	- 765kV GIS ICT bays: 2 nos. - 765kV GIS Bus reactor bays: 2 nos. - 400kV GIS ICT bays: 2 nos. - 765kV GIS line bays: 4 nos. (2 nos. for Nawada – Durgapur 765kV D/c line and 2 nos. for Durgapur – Jeerat (New) 765kV D/c line) - 765kV, 240MVAr (3x80MVAR single phase units) switchable line reactor along with associated switching equipment in both circuits of Nawada – Durgapur 765kV D/c line at Durgapur end - - 765kV spare reactor: 1x80MVAr
3.	LILO of Gaya – Ballia 765kV S/c line at Nawada S/s	Loop in 82km Loop out 82km
4.	Nawada – Durgapur 765kV D/c line	258km
5.	Durgapur – Jeerat (New) 765kV D/c line	152km
6.	Extension at Jeerat (New) 765/400kV S/s	- 765kV line bays: 2 Nos. (for Durgapur – Jeerat (New) 765kV D/c line) - 765kV, 240MVAr (3x80MVAR single phase units) switchable line reactor in Durgapur – Jeerat (New) 765kV D/c line – 2 Nos. - Switching equipment for line reactors – 2 Nos. - Provision for utilization of existing 765kV, 1x80MVAr single phase spare reactor to be made for the above 2x240MVAr (6x80MVAR single phase units) switchable line reactor to be installed at Jeerat (New) end in Durgapur – Jeerat (New) 765kV D/c line

Note:

1. BSPTCL shall take up implementation of Nawada (ISTS) – Guraru 220kV D/c line along with Guraru 220/132kV substation and other associated 220kV & 132kV lines in matching time-frame of Nawada (ISTS) S/s.
2. POWERGRID shall provide space for above scope of work at the existing Durgapur (POWERGRID) S/s free of cost.
3. M/s POWERGRID Medinipur Jeerat Transmission Limited (PMJTL) shall provide space for above scope of work at the existing Jeerat (New) S/s free of cost.
4. Line lengths mentioned above are tentative. Exact line length shall be ascertained after detailed survey.

*****

ANNEXURE B.2.7

Agenda: Requirement of spare ICT under regional pool of Eastern Region ISTS System in line with CERC norms.

As per **CERC guidelines (July 2020)**, each region (state wise) must maintain spare single-phase and three-phase transformer/reactor units for ISTS reliability. **POWERGRID** has been maintaining these spares as per norms.

However, with increasing demand and recent utilization of spares in **non-ISTS systems**, it's essential to **review state-wise spare requirements** to ensure system reliability.

A consolidated requirements of spare transformer under regional pool of Eastern Region has been prepared considering:

- Transformer population installed
- Spares utilized
- Current availability

This review of proposed requirement of spare will help determine the **adequate number of spares** to be maintained under the **Regional Pool** for contingency readiness in the evolving power system.

Region-ER-I/POWERGRID

Voltage Rating (kV)	Capacity (MVA)	Total Installed Qty.		Spares available		Required as per CERC guidelines	Remarks
		Bihar	Jharkhand	Bihar	Jharkhand		
400/220	500 MVA	14	1	1	0	1	01 No for Jharkhand
	315 MVA	6	9	2*	1*	1	1 no. Augmented spare ICT at Muzaffarpur SS/Bihar, has been diverted to DVC Koderma on loan basis as per 54th ERPC approval. 1 no. available spare of Jamshedpur/Jharkhand is under diversion to

							Subhasgram, ER2 as per 54th ERPC approval. After completion of diversion, spare at **Jharkhand will be ZERO.**
400/132	315 MVA	2	NIL	0	NA	1	01 No required for Bihar
	200 MVA	4	NIL	0	NA	1	01 No. Spare required for 200 MVA at Bihar.
220/132	200 MVA	1	NIL	0	NA	1	1 No. Spare required for 200 MVA at Bihar.
	160 MVA	4	2	1	1	NIL	
	100 MVA	2	NIL	0	NA	1	Higher rating of 160 MVA available

Region-ER-II/POWERGRID

Voltage Rating (kV)	Capacity (MVA)	Total Installed Qty		Spares available		**Required as per CERC guidelines**	Remarks
		West Bengal	Sikkim	West Bengal	Sikkim		
400/220	500 MVA	10	NIL	1*	NA		Available spare already consumed as 7th ICT of Subhasgram SS and approved in 54th ERPC. 01 No for Maithon SS, approved vide 52nd ERPC meeting. LOA placed to M/S. Kanohar on dated 10.06.2025. Schedule-24 Months.
	315 MVA	12	NIL	1*	NA		1 no. Augmented spare ICT of Malda SS has been

						1	diverted to WBSETCL/Jeerat on loan basis as per ERPC approval on Dec-2023. 01 No at Durgapur is more than 35 years old.
	105 MVA	0	15	0	2	NIL	01 No spare Unit under commissioning at Siliguri SS. Approved in ERPC meeting on August-2022.
220/132	160 MVA	7	0	1*	0	NIL	Regional spare consumed against 2nd ICT failed at Birpara SS on Aug-24. Presently failed unit is under repairing at Birpara SS.
	100 MVA	NIL	4	NA	0	1	01 No spare required for Sikkim
132/66	50 MVA	NIL	3	NA	0	1	01 No available spare commissioned as 3rd ICT at Gangtok vide approval of 7th CMETS.

Region-Odisha/POWERGRID

Voltage Rating (kV)	Capacity (MVA)	Total Installed Qty	Spares available	**Required as per CERC guidelines**	Remarks
400/220	500 MVA	4	01	0	Spare unit available at Pandiabili.
	315 MVA	14	01	0	
	105 MVA	7	0	1	No hot/cold spare available for 04 units installed at Jaypore and 03 units installed at Indravati.
220/132	160 MVA	2	1	0	Spare unit available at Baripada.

The consolidated requirements of spare transformers under regional pool of Eastern Region ISTS system are as follows:

Sl NO.	Voltage Rating (KV)	Capacity (MVA)	Spare required as per CERC guidelines	State	Remarks
1.	400/220	500	01	Jharkhand	400KV Ranchi S/S
2.	400/220	315	01	Jharkhand	
3.	400/220	105	01	Odisha	Jaypore & Indravati
4.	400/132	315	01	Bihar	
5.	400/132	200	01	Bihar	Lakhisarai & Banka S/S
6.	220/132	200	01	Bihar	
7.	220/132	100	01	Sikkim	Rangpo S/S. Timeline and other transportation factor will be included in DPR as Rangpo situated in hill terrain.

Members may please deliberate.

ANNEXURE B.2.10

Brief on
Unified Real Time Dynamic State Measurement (URTDSM)
Project Phase-II (for ISTS Portion)

Contents

Brief on
Unified Real Time Dynamic State Measurement
URTDSM Project Phase-II
for discussion in RPCs

1.0 Background of URTDSM Phase-II Proposal:

POWERGRID has been entrusted to prepare the DPR for URTDSM Phase-II project in the 13th NPC meeting held on 05.07.2023. The DPR is to be made on basis of 'Report of the Sub-Committee on PMU Placement and Analytics under URTDSM Phase II' constituted by National Power Committee.

Presently 1400 PMUs and 32 Control centres have been established under the URTDSM Phase-I project. This project was implemented with 70% of the project cost as PSDF grant and 30% was through POWERGRID Equity (RTM for 30% portion and no tariff for 70% grant portion).

Similarly, DPR for URTDSM Phase-II Project, which included 4000PMUs(new) and 34 control centres was prepared with funding pattern of 70% PSDF grant and 30% POWERGRID equity in line with Phase-I. The DPR, with an estimate of Rs.3922 Crores, was submitted to NPC/CEA on 11.03.2024. The scope included replacement of 34 control centres and supply of 4000 new PMUs including integration of 1400 existing PMUs.

In the 14th NPC meeting held in Bengaluru on 03.02.2024, DPR status was updated to members. It was suggested to optimize the cost. Further, NPC vide email dated 18.04.2024 has informed that PSDF funding shall not be available for the project and alternate sources of funding shall be explored by POWERGRID. Hence, POWERGRID approached all the Constituents in the RPCs for concurrence for execution of the URTDSM Phase-II Project on RTM basis.

In the 15th NPC Meeting held on 14.11.2024, the committee recommended that "PowerGrid is to submit the revised proposal in consultation with Grid India, only for the existing network after segregating the PMUs and control centers under ISTS and STUs system. The proposal may also be revised to optimize the number of control centers and PMUs at ISTS & STUs system separately. The revised proposal for ISTS portion may be put up to the NCT for further consideration."

During previous NPC & RPC meetings for URTDSM phase-II project, it was discussed that the number of PMUs for URTDSM Phase-II need to be optimized for reducing the overall project cost. The initial DPR prepared by POWERGRID was based on the sub-committee recommended philosophy of PMU placement. However, CEA has published new guidelines for unified philosophy of PMU placement in Indian Grid in March 2025, which will supersede all existing guidelines and sub-committee report etc.,

According to 15th NPC, POWERGRID was entrusted to put up proposal for ISTS portion to NCT and revised proposal for ISTS and STU portion separately for discussion. ISTS portion comprises of Control Centers of Grid-India (NLDCs and RLDCs) and PMUs for Central Sector locations as per latest CEA Guidelines referred above.

POWERGRID prepared DPR for URTDSM Phase-II ISTS portion (upgradation of control centers at NLDCs, RLDCs and installation of new PMUs for Central Sector stations as per latest CEA guidelines). Tentative cost and BOQ for STUs portion (Control centers of SLDCs across India and new PMUs for State sector substations) is also put up for discussion in the 16th NPC.

Upon the concurrence of 16th NPC for proposed DPR for ISTS portion, the same will be put up to NCT for approval in RTM route. For the State Sector, funding methodology is to be finalized in reference to the tentative cost and BOQ.

2.0 Brief Details of URTDSM Phase-I Project:

POWERGRID took up the implementation of URTDSM phase-1 in Jan 2014 and the project was commissioned progressively from 2018 to 2021 with installation of 1409 PMUs and PDCs at 32 control centers, the project was funded 70% from PSDF grant and 30% from POWERGRID equity.

The existing system of URTDSM Phase-I is under maintenance support through Annual Maintenance contract with the contractor, which will end in Jan 2027. The PMUs installed at substations can be in service for fifteen years from their date of commissioning.

3.0 Need for URTDSM Phase-II Project

3.1 Need for new PMUs

After commissioning of URTDSM Phase-I Scheme, expansion of power system has taken place at considerable pace with addition of large-scale renewable generation and incorporation of new transmission system technologies (SVC, STATCOM, FSC, etc.,). Over the years, there have been significant organizational, regulatory, Market operations, and technological changes. The placement of PMUs at new renewable generation plants and other new technology devices (FACTS) is required to know their dynamic response during disturbances and to verify that they are operating under the limits stipulated as per the regulatory norms.

The Committee report on PMU has defined a new philosophy for placement of PMUs and suggested to cover additional equipment such as ICTs, SVCs, Bus Reactors, FSC, TCSC etc. have been considered for measurement through PMU, which were not in Phase-I implementation.

3.2 Upgradation of Control centers

AMC support for the existing control centers will lapse by Jan 2027. Due to this, the maintenance of the existing hardware and software beyond its design life cycle of 7 years will be very challenging owing to lack of spares and services, poor performance and increasing cyber vulnerabilities due to obsolete technologies.

Moreover, the existing hardware and software cannot support the new analytics being envisaged under Phase-II project for better monitoring of the power system.

The URTDSM phase-1 Control centres are having issues of End of Life/End of support due to technical obsolescence of software, hardware, and cyber security appliances and will become technically obsolete. Hence to keep the WAMS URTDSM Control centres functional, the URTDSM phase 2 project which includes the upgrade of existing control centres, is to be implemented on priority.

Increased penetration of Renewable energy has required increase in more monitoring of the regional grids which requires more deployment of PMUs. The URTDSM phase 2 includes installation of PMUs as per latest CEA Guidelines on PMU placement.

3.3 Additional technical factors to establish the need for URTDSM Phase-II System

In addition to the reasons mentioned above, the following are some of the power system aspects which are being handled only with URTDSM system, which is based upon Wide Area Measurement System (WAMS) technology:

(i) PMU measurements provide synchronized voltage, current and phase angle measurements, which is not possible in RTU measurements. The phase angle measurement is valuable information about the state of the grid and the grid operators can take decisions based upon precise measured information instead of thumb rule based upon their experience.

(ii) Based upon the phase angle measurements from both the ends of the line enhanced utilization of Transmission lines closer to thermal loading of line can be achieved.

(iii) In case of system separations, the Synchrophasor measurements display the load angle separation and can be used to determine the change required in generation to synchronize the two isolated systems, this being more accurate data facilitates faster restoration and avoid any jerks or oscillations in the power system.

(iv) One of the most important applications of PMU measurement is post facto analysis so that an incident can be analyzed with high resolution data so the behavior of each element-generator, RE generator, FACTS devices, Power system islands etc.

(v) With increasing grid size and installed capacity from multiple generation sources, the approved placement shall provide a wider footprint of PMU data, increasing observability by the Operator for Grid management.

4.0 DPR for URTDSM Phase-II

As per 15th NPC recommendation, DPR of URTDSM project phase-II (for ISTS portion) in accordance with the latest CEA Guidelines on unified philosophy for PMU placement in Indian Grid is prepared by POWERGRID.

Accordingly, DPR Cost Estimate for URTDSM Phase-II (for ISTS portion) is Rs 1124.35 Cr (including the AMC charges)

POWERGRID proposes to take up URTDSM Phase-II Project (for ISTS portion) on RTM basis (upgradation of all Control Centres for NLDCs and RLDCs of Grid-India, and installation of new PMUs at Central Sector locations as per latest CEA PMU Placement Philosophy), on cost sharing PoC mechanism pan India (**100% RTM route with 70:30 Debt equity ratio**).

5.0 Approach for Implementation for URTDSM Phase II Project

The approach for Implementation for URTDSM phase-II project is as follows:

(i) The URTDSM Phase-II project shall be implemented initially for ISTS portion covering NLDCs (2), RLDCs (5), new PMUs at Central Sector locations and remote consoles for all SLDCs.

(ii) Phase-II for STU portion (SLDCs and State sector/IPP stations) shall be implemented separately, subject to finalization of funding method for state portion.

6.0 Scope of Work for URTDSM Phase II Project:

The scope of work under URTDSM Phase-II project is proposed as follows.

1. Installation of approximately 1070 nos. of PMUs at the Central Sector Substations and Power plants across the country as per the lates CEA Guidelines for unified PMU placement philosophy in Indian Grid.
2. Replacement/Establishment of PDCs and associated control center equipment comprising of software and hardware at 7 Control centers.
    a. Main and Backup NLDCs (2 nos.)
    b. All RLDCs (5 nos.)
    c. Remote Consoles for CEA/RPCs/SLDCs - 31 nos
3. The hardware and software to be installed at Control Centers shall be sized to accommodate all the PMUs currently installed under Phase-I, and the proposed PMUs under Phase-II with provision for future expansion of about 100% over and above.
4. The FO based communication system existing and being established by POWERGRID and Constituents shall meet the requirement of Phase-II. *The addition/augmentation of communication link is NOT envisaged under the scope of URTDSM Phase-II project DPR*.

5. **New Analytical applications**: Analytical applications have been suggested by the subcommittee for deployment under Phase-II scheme. Few of them, like Linear State Estimator and Oscillation Monitoring Application, are already deployed in Phase-I. However, due to obsolescence of the hardware/software issues in the existing control centers, they need to be replaced with new software and hardware. The following are the new analytical applications being proposed under Phase-II at all 7 control centers:

    a. Linear State Estimator
    b. Oscillation Monitoring Application.
    c. Real time automated event detection along with early warning system and ROCOF calculation over variable window.
    d. Voltage Stability analytics (VSA)
    e. WAMS based contingency analysis, security assessment & Islanding Detection.
    f. Real time Inertia Estimation and monitoring.
    g. Post-mortem analytics.
    h. Generator Model Validation
    i. Wide Area Control Systems (at selected nodes only)
        (i) WAMS based automatic load shedding (AUFLS and df/dt):
        (ii) Control of HVDC, PSS and STATCOM for damping system oscillations
    j. Response of Wind Farm and Solar PV for LVRT, Reactive Power etc.

    The above analytical applications are the requirements suggested based on the feedback of the system operator. It will be explored to procure them either from the prospective Bidders/Software OEMs or to develop them in association with premier academic institutes.

6. Integration of the existing PMUs.

7. Integration of the Phase-II PDCs with the existing SCADA/EMS systems at each location.

8. Integration with existing Video Projection System (VPS) (supplied under separate project) at each location.

9. Consultancy Services from premier academic institutions for development of new analytics under phase-II implementation, if required.

10. Engagement of Consultant for design of large scale WAMS system comprising of IT infrastructure for handling the vast amount of PMU data in real-time and historical data.

11. Capacity building through training of engineers from Grid-India (for Control center portion) & Central Sector Utilities (for PMU portion) are proposed as part of this URTDSM Phase-II project.

In addition to the Supply and Services under Phase-II, it is also proposed to include the Annual Maintenance Contract (AMC) charges through 100% RTM basis (70% debt and 30% Equity from POWERGRID), similar to the AMC contract being operated by POWERGRID for existing Phase-I system.

6.1 Location of SLDCs for PDC replacement and no of PMUs in each Region under URTDSM Phase II Project (ISTS portion):

Region→	NR	ER	NER	WR	SR
No of Control Centers	2	2	1	1	1
Location of 7 control centers	1. Main NLDC 2. NRLDC	1. Backup NLDC 2. ERLDC	1. NERLDC	1. WRLDC	1. SRLDC
PMUs (1070 No's) in Central Sector locations of each Region (as per latest CEA Guidelines)	218	303	151	309	89

7.0 URTDSM Phase II Project DPR Cost for ISTS portion across India:

BoQ Category	Software	Hardware	Auxiliary Power System	Services	Training	AMC	Total (including T&D)	T&D
PDCs at NLDC	144.03	21.26	2.06	2.76	0.00	3.34	173.46	25.62
PDCs at RLDC	348.57	53.9423	4.00	6.90	7.43	8.35	429.19	63.44
PMUs	17.568	321.1894	0.00	0.00	2.11	20.11	360.98	53.37
Mandatory Spares	0.00	17.1105	0.68	0.00	0.00	0.00	17.79	2.63
Total	**510.17**	**413.50**	**6.74**	**9.66**	**9.54**	**31.80**	**981.42**	**145.05**

DPR is based on a 100% RTM basis with 70% debt and 30% equity from POWERGRID.

Sl. No.	Description	Total Cost (Rs. in crores)
1	Unified Real Time Dynamic State Measurement Phase-II *(Supply, services, taxes & duties, testing & commissioning)*	949.62
2	Overheads *(IEDC, Contingencies)*	75.97
3	Consultancy charges for Panel of Experts	10.00
	Sub-Total	1035.59
4	Interest during Construction (IDC)	56.96
	TOTAL (Supply, Services)	1092.55
5	AMC charges and other services during AMC	**31.80**
	GRAND TOTAL including AMC	**1124.35**

The abstract cost estimate is given at ***Annexure***
The above project cost including AMC is based on the Budgetary quote from M/s L&T, the actual project and AMC charges will be known after the process of tendering and award, subject to approval of this proposal by Regulatory Authority.

7.1 Target Beneficiaries

The beneficiaries of the project would be all the designated ISTS customers (DICs) *as per POC mechanism for the URTDSM Phase-II (ISTS portion) as per CERC regulations.* ***(as per Clause no. 78 of CERC Tariff Regulations 2024-29).***

7.2 Project Strategy

The Unified Real Time Dynamic State Measurement System (URTDSM) Phase-II Project shall be implemented by POWERGRID. The PMU installation shall be taken up at those locations where Fiber Optic based communication system is either existing or is being installed under various projects, which shall be available by Dec' 2027. The tariff on the investments for the same shall be recovered from the beneficiaries (SLDCs) as per CERC regulations.

Upon the concurrence of POWERGRID's RTM proposal for ISTS portion by NPC/NCT, POWERGRID shall proceed for further tendering process.

The project shall be planned for a lifetime of 7 years for the IT infrastructure at Control Centers. The AMC shall be taken for 1-year (Defect liability period) and 6 years (AMC period) after operational acceptance (with an additional provision to extend the AMC by another 2 years on the same terms and conditions.

8.0 O&M facilities

The URTDSM system shall be used by respective NLDC/ RLDC/ Central Sector substations and the maintenance responsibility for the subject project shall be under the scope of Grid-India (for all 7 Control centers) and by respective Central Sector Utility for the PMU locations.

After the defect liability period (DLP) of 1 year, 6-year maintenance support by OEM shall be kept in the Project.

POWERGRID hereby proposes for funding the AMC charges also along with Supply and Services charges for SLDCs portion through 100% RTM route under this URTDSM Phase-II scheme. However, The charges for O&M of the system shall be finalized as per CERC/ RPC approval.

9.0 Time Frame

The subject project is scheduled to be commissioned within **36 months** from the date of Investment Approval.

10.0 Conclusion:

The URTDSM phase-1 Control centres are nearing their Operational life and will become technically obsolete. Hence to keep the WAMS URTDSM Control centres functional, the URTDSM Phase-II project which includes an upgrade of existing control centres, is to be implemented on priority.

Increased penetration of Renewable energy has required increase in more monitoring of the regional grids which requires more deployment of PMUs. The proposal for URTDSM Phase-II (ISTS portion) includes installation of PMUs at Central Sector locations as per the latest CEA guidelines.

1. *"**POWERGRID proposes to take up URTDSM Phase-II Project (for ISTS portion) on pan India basis, on cost sharing mechanism (100% RTM route with 70:30 Debt Equity ratio)**".*

2. ***Deliberation on URTDSM Phase-II for STU portion, subject to finalization of funding methodology for States.***

   Put up for deliberation in NPC/RPCs.

URTDSM Phase-II WAMS System - BoQ for Main & Backup NLDC				
Sr.No	Name of the item	Unit	Main NLDC Qty	Backup NLDC Qty
A	SOFTWARE			
1	PDC Software	Lot	1	1
2	WAMS Visualisation (UI) Software	Lot	1	1
3	Analytical Applications			
(a)	Linear State Estimator	Lot	1	1
(b)	Oscillation Monitoring Application	Lot	1	1
(c)	Real time automated event detection along with early warning system and ROCOF calculation over variable window	Lot	1	1
(d)	WAMS based Voltage Stability analytics (VSA)	Lot	1	1
(e)	WAMS based contingency analysis, security assessment & Islanding Detection	Lot	1	1
(f)	Generator Model Validation, Real time Inertia Estimation and monitoring	Lot	1	1
(g)	Post-mortem analytics	Lot	1	1
(h)	Wide Area Control Systems			
i.	WAMS based automatic load shedding (AUFLS and df/dt)	Lot	1	1
ii.	Control of HVDC, PSS and STATCOM for damping system oscillations	Lot	1	1
(i)	Response of Wind Farm and Solar PV for LVRT, Reactive Power.	Lot	1	1
4	Programming Development System (PDS) Software	Lot	1	1
5	Commercial Off-The-Shelf (COTS) Softwares			
(a)	Data Historian Software	Lot	1	1
(b)	Identity Management Software	Lot	1	1
(c)	Network Access Control (NAC)	Lot	1	1
(d)	Patch Management Software	Lot	1	1
(e)	Virtualisation Software for all the virtual servers envisaged and required under the project along-with centralised management software	Lot	1	1
(f)	Operating System for all the servers	Lot	1	1
(g)	Host based intrusion prevention system (HIPS) with centralised management	Lot	1	1
(h)	End Point Security Solution	Lot	1	1
(i)	Centralised Management and Log Analyser of all FWs	Lot	1	1
(j)	Network Management System (NMS)	Lot	1	1
(k)	SIEM (Security Information and Event management)	Lot	1	1
(l)	VAPT Tool	Lot	1	1
6	Report Development & Generation Software	Lot	1	1
7	Storage system			
(a)	SAN Software	Lot	1	1

(b)	NAS Software	Lot	1	1
8	SMS & Email Interface	Lot	1	1
9	Backup Solution Software	Lot	1	1
10	Data exchange Software with external applications	Lot	1	1
B	**HARDWARE**			
1	PDC Server sized for data of 10000 PMUs	No.	2	2
2	Analytical Applications Servers	No.	2	2
3	Historian Servers	No.	2	2
(a)	Data Historian Server			
(b)	Report Development & Generation Server			
4	WAMS Visualisation (UI) Server	No	2	2
5	Programming Development System (PDS) Server	No	1	0
6	Management Applications Servers			
(a)	Identity Management Server	No.	2	2
(b)	NMS Server			
(c)	Network Access Control (NAC) Server	No.	2	2
(d)	End Point Security Solution			
(e)	Centralised Management & Log analyser of Firewall (Internal)			
7	Internal DMZ Servers			
(a)	SIEM Server	No	2	2
(b)	Centralised Management & Log analyser of Firewall (External)			
8	External DMZ Servers			
(a)	End Point Security Solution	No	2	2
(b)	Patch Management Server			
9	Anti APT	No	1	1
10	Storage System			
(a)	Storage Solution of Minimum 1200TB, RAID10, SAN or equivalent along with SAN Management Server	No.	1	1
(b)	NAS Storage of 100TB	No.	1	1
11	Workstation consoles with 23.8" dual monitor			
(a)	PDC application	No.	2	2
(b)	PDS Application	No.	1	1
(c)	Analytical Applications	No.	1	1
(d)	External DMZ	No.	1	1
(e)	Inernal DMZ	No.	1	1
(f)	Management Applications	No.	1	1
(g)	Historian Applications	No.	1	1
(h)	Server Management Console	No	1	1
(i)	Remote Diagnostic Console	No	1	1
12	Color Laser Printer	No.	1	1
13	Time System (NavIC & GPS based)	Lot	2	2
14	Firewalls (with Minimum 10Gbps NGTP)			
(a)	External Firewall with NIPS for Internet and Remote consoles	No.	2	2
(b)	External Firewall with NIPS for PDC/PMU/SCADA data	No.	2	2
(c)	Internal Firewall with NIPS	No.	2	2
15	WAN Router cum Firewall			

(a)	For Communicating with PDCs at RLDCs (8 x Fiber Optic Ports, 8 Ethernet ports (1Gbps))	No.	2	2
(b)	For communicatiing with Remote Consoles (8 x Fiber Optic ports, 8 Ethernet ports (1Gbps))	No.	2	2
(c)	For Internet/Corporate Intranet connectivity (8 x Fiber Optic ports, 8 Ethernet ports (1Gbps))	No.	2	2
(d)	WAN router at Remote Console end (4 Ethernet ports (1Gbps))	No.	3	
16	L3 LAN Switches (10G FO ports) for the following LANs			
(a)	48-port L3 LAN Switch for PDC LAN	No.	2	2
(b)	24 port L3 LAN Switch for Historian LAN	No.	2	2
(c)	24 port L3 LAN Switch for External DMZ LAN	No.	2	2
(d)	24 port L3 LAN Switch for Internal DMZ LAN	No.	2	2
(e)	24 port L3 LAN Switch for Management LAN	No.	2	2
(f)	24 port L3 LAN Switch for Analytics LAN	No.	2	2
(g)	32 port FC Switch for SAN system	No.	2	2
17	Remote Consoles, equivalent to Work station console mentioned at Item No.4 above (for NTAMC and other Strategic locations)	No.	7	
18	Server for Backup Solution	No.	1	1
19	Backup Appliance	No.	1	1
20	Laptop for VAPT	No	1	1
21	Server for Data Exchange with external applications	No	1	1
22	Any other additional hardware at Control center end for implementing Wide Area Measurement Protection and Control (WAMPAC) system	No	1	1
C	**Auxiliary Power System**			
(a)	120 kVA (96kW at 0.8 pf) UPS running in parallel	No.	2	2
(b)	VRLA type Battery banks for above UPS (each bank of 230.4 kVAH)	No.	2	2
(c)	Input ACDB (600kVA rating)	No.	1	1
(d)	Output ACDB (400kVA rating)	No.	1	1
(e)	Accessories for maintenance of VRLA type batteries	Lot	1	1
(f)	Power Distribution and cabling work required to establish UPS	Lot	1	1
(g)	UPS Monitoring System and it's integration with URTDSM System	Lot	1	1
D	**SERVICES**			
1	Integration of WAMS system with following units/applications:			
(a)	Integration with the SCADA/EMS Sytem at NLDC and backup NLDC respectively	No.	1	1
(b)	Integration with 3rd party applications	Lot	1	1
(c)	Integration (at Control center end) of existing PMUs	No	3,000	3,000
(d)	Integration (at control center end) of new PMUs supplied under this project	No	1,100	1,100
(e)	Integration of WAMS System with existing Video Projection System (VPS) of SCADA/EMS System in respective control center	Lot	1	1
(f)	Cyber Security Audit by Cert-IN certified Auditors during FAT.	Lot	1	1
(g)	Cyber Security Audit by Cert-IN certified Auditors during SAT.	Lot	1	1
(h)	Dismantling and Buyback of existing WAMS system of URTDSM Phase-I (after successful parallel operation)	Lot	1	1
(i)	SMS integration with service provider Email integration with owner email system	Lot	1	1

E	**Training**			
1	Training - Man days @15 Days x 18 persons	Man-days	270	
F	**Annual Maintenance Contract**			
(a)	Annual maintenance contract of WAMS System and all the equipment supplied in the project for a period of 7 years (1 year DLP and 6 years AMC)	Lot	1	1
(b)	Annual Training under AMC period	Lot	1	1
(c)	Six Monthly Cyber Security Audit by Cert-IN certified Auditors during 7 years AMC period	Lot	1	1
(d)	Patch Management including Signature updates for all Cyber security equipments for 7 years	Lot	1	1
(e)	Integration of new PMUs data from PDCs at respective RLDCs with PDC at NLDC during entire AMC period	No	5,000	5,000

>> The sizing for Historian Storage at NLDCs is considered @25 samples/second reporting rate of the existing and new PMUs including 100% expansion

URTDSM Phase-II WAMS System - BoQ for 5 RLDCs								
Sr.No	Name of the item	Unit	Name of RLDC					Total Qty
			NRLDC	ERLDC	NERLDC	SRLDC	WRLDC	
A	**SOFTWARE**							
1	PDC Software	Lot	1	1	1	1	1	5
2	WAMS Visualisation (UI) Software	Lot	1	1	1	1	1	5
3	Analytical Applications							
(a)	Linear State Estimator	Lot	1	1	1	1	1	5
(b)	Oscillation Monitoring Application	Lot	1	1	1	1	1	5
(c)	Real time automated event detection along with early warning system and ROCOF calculation over variable window	Lot	1	1	1	1	1	5
(d)	WAMS based Voltage Stability analytics (VSA)	Lot	1	1	1	1	1	5
(e)	WAMS based contingency analysis, security assessment & Islanding Detection	Lot	1	1	1	1	1	5
(f)	Generator Model Validation, Real time Inertia Estimation and monitoring	Lot	1	1	1	1	1	5
(g)	Post-mortem analytics	Lot	1	1	1	1	1	5
(h)	Wide Area Control Systems							
i.	WAMS based automatic load shedding (AUFLS and df/dt)	Lot	1	1	1	1	1	5
ii.	Control of HVDC, PSS and STATCOM for damping system oscillations	Lot	1	1	1	1	1	5
(i)	Response of Wind Farm and Solar PV for LVRT, Reactive Power.	Lot	1	1	1	1	1	5
4	Programming Development System (PDS) Software	Lot	1	1	1	1	1	5
5	Commercial Off-The-Shelf (COTS) Softwares							
(a)	Data Historian Software	Lot	1	1	1	1	1	5
(b)	Identity Management Software	Lot	1	1	1	1	1	5
(c)	Network Access Control (NAC)	Lot	1	1	1	1	1	5
(d)	Patch Management Software	Lot	1	1	1	1	1	5
(e)	Virtualisation Software for all the virtual servers envisaged and required under the project along-with centralised management software	Lot	1	1	1	1	1	5
(f)	Operating System for all the servers	Lot	1	1	1	1	1	5
(g)	Host based intrusion prevention system (HIPS) with centralised management	Lot	1	1	1	1	1	5
(h)	End Point Security Solution with centralised management	Lot	1	1	1	1	1	5
(i)	Centralised Management and Log Analyser of all FWs	Lot	1	1	1	1	1	5
(j)	Network Management System	Lot	1	1	1	1	1	5
(k)	SIEM (Security Information and Event management)	Lot	1	1	1	1	1	5
(l)	VAPT Tool	Lot	1	1	1	1	1	5
6	Report Development & Generation Software	Lot	1	1	1	1	1	5
7	Storage system							
(a)	SAN Software	Lot	1	1	1	1	1	5
(b)	NAS Software	Lot	1	1	1	1	1	5
8	SMS & Email Interface	Lot	1	1	1	1	1	5
9	Backup Solution Software	Lot	1	1	1	1	1	5
10	Data exchange Software with external applications	Lot	1	1	1	1	1	5
B	**HARDWARE**							
1	PDC Server sized for data of 2500 PMUs	No.	2	2	0	2	2	8
2	PDC Server sized for data of 1000 PMUs	No.	0	0	2	0	0	2
3	Analytical Applications Servers	No.	2	2	2	2	2	10
4	Historian Servers	No.	2	2	2	2	2	10

(a)	Data Historian Server							
(b)	Report Development & Generation Server							
5	WAMS Visualisation (UI) Server	No	2	2	2	2	2	10
6	Programming Development System (PDS) Server	No	1	1	1	1	1	5
7	Management Applications Servers							
(a)	Identity Management Server	No.	2	2	2	2	2	10
(b)	NMS Server							
(c)	Centralised Management & Log analyser of Firewall (Internal)	No.	2	2	2	2	2	10
(d)	Network Access Control (NAC) Server							
(e)	End Point Security Solution							
8	Internal DMZ Servers	No	2	2	2	2	2	10
(a)	SIEM Server							
(b)	Centralised Management & Log analyser of Firewall (External)							
9	External DMZ Servers	No	2	2	2	2	2	10
(a)	End Point Security Solution							
(b)	Patch Management Server							
10	Anti APT	No	1	1	1	1	1	5
11	Storage System							
(a)	Storage Solution of Minimum 600TB, RAID10, SAN or equivalent along with SAN Management Server	No.	1	1	0	1	1	4
(b)	Storage Solution of Minimum 250TB, RAID10, SAN or equivalent along with SAN Management Server	No.	0	0	1	0	0	1
(c)	NAS Storage of 50TB	No.	1	1	0	1	1	4
(d)	NAS Storage of 20TB	No.	0	0	1	0	0	1
12	Workstation consoles with dual monitor							
(a)	PDC application	No.	2	2	2	2	2	10
(b)	PDS Application	No.	1	1	1	1	1	5
(c)	Analytical Applications	No.	1	1	1	1	1	5
(d)	External DMZ	No.	1	1	1	1	1	5
(e)	Inernal DMZ	No.	1	1	1	1	1	5
(f)	Management Applications	No.	1	1	1	1	1	5
(g)	Historian Applications	No.	1	1	1	1	1	5
(h)	Server Management Console	No	1	1	1	1	1	5
(i)	Remote Diagnostic Console	No	1	1	1	1	1	5
13	Color Laser Printer	No.	1	1	1	1	1	5
14	Time System (NavIC & GPS based)	Lot	2	2	2	2	2	10
15	Firewalls (With Minimum 8Gbps NGTP)							
(a)	External Firewall with NIPS for Internet and Remote consoles	No.	2	2	2	2	2	10
(b)	External Firewall with NIPS for PDC/PMU/SCADA data	No.	2	2	2	2	2	10
(c)	Internal Firewall with NIPS	No.	2	2	2	2	2	10
16	WAN Router cum Firewall							
(a)	For Communicating with PDCs at NLDCs (8 x Fiber Optic Ports, 8 Ethernet ports (1Gbps))	No.	2	2	2	2	2	10
(b)	For Communicating with PDCs at SLDCs (8 x Fiber Optic Ports, 8 Ethernet ports (1Gbps))	No.	2	2	2	2	2	10
(c)	For communicatiing with Remote Consoles (8 x Fiber Optic ports, 8 Ethernet ports (1Gbps))	No.	2	2	2	2	2	10
(d)	For Internet/Corporate Intranet connectivity (8 x Fiber Optic ports, 8 Ethernet ports (1Gbps))	No.	2	2	2	2	2	10
(e)	WAN router at Remote Console end (4 Ethernet ports (1Gbps))	No.	2	2	2	2	2	10

17	L3 LAN Switches (10G FO ports) for the following LANs							
(a)	48-port L3 LAN Switch for PDC LAN	No.	2	2	2	2	2	10
(b)	24 port L3 LAN Switch for Historian LAN	No.	2	2	2	2	2	10
(c)	24 port L3 LAN Switch for External DMZ LAN	No.	2	2	2	2	2	10
(d)	24 port L3 LAN Switch for Internal DMZ LAN	No.	2	2	2	2	2	10
(e)	24 port L3 LAN Switch for Management LAN	No.	2	2	2	2	2	10
(f)	24 port L3 LAN Switch for Analytics LAN	No.	2	2	2	2	2	10
(g)	32 port FC Switch for SAN system	No.	2	2	2	2	2	10
18	Remote Consoles, equivalent to Work station console mentioned at Item No.4 above	No.			10			10
19	Server for Backup Solution	No.	1	1	1	1	1	5
20	Backup Appliance	No.	1	1	1	1	1	5
21	Laptop for VAPT	No	1	1	1	1	1	5
22	Server for Data Exchange with external applications	No	1	1	1	1	1	5
23	Any other additional hardware at Control center end for implementing Wide Area Measurement Protection and Control (WAMPAC) system	No	1	1	1	1	1	5
C	**Auxiliary Power System**							
(a)	60 kVA (48kW at 0.8 pf) UPS running in parallel	No.	2	2	2	2	2	10
(b)	VRLA type Battery banks for above UPS (each bank of 115.2 kVAH)	No.	2	2	2	2	2	10
(c)	Input ACDB (450kVA rating)	No.	1	1	1	1	1	5
(d)	Output ACDB (300kVA rating)	No.	1	1	1	1	1	5
(e)	Accessories for maintenance of VRLA type batteries	Lot	1	1	1	1	1	5
(f)	Power Distribution and cabling work required to establish UPS	Lot	1	1	1	1	1	5
(g)	UPS Monitoring System and it's integration with URTDSM System	Lot	1	1	1	1	1	5
D	**SERVICES**							
1	Integration of WAMS system with following units/applications:							
(a)	Integration with the SCADA/EMS Sytem at respective RLDC	No.	1	1	1	1	1	5
(b)	Integration with 3rd party applications	Lot	1	1	1	1	1	5
(c)	Integration (at Control center end) of existing PMUs	No.			3,000			3000
(d)	Integration (at Control center end) of new PMUs supplied under this project	No.	218	303	151	89	309	1070
(e)	Integration of WAMS System with existing Video Projection System (VPS) of SCADA/EMS System in respective region	Lot	1	1	1	1	1	5
(f)	Cyber Security Audit by Cert-IN certified Auditors during FAT.	Lot	1	1	1	1	1	5
(g)	Cyber Security Audit by Cert-IN certified Auditors during SAT.	Lot	1	1	1	1	1	5
(h)	Dismantling and Buyback of existing WAMS system of URTDSM Phase-I (after successful parallel operation)	Lot	1	1	1	1	1	5
(i)	SMS integration with service provider Email integration with owner email system	Lot	1	1	1	1	1	5
E	**Training**							
1	Training - Man days @15 Days x 24 persons in each Region	Man-days	360	360	360	360	360	1,800
F	**Annual Maintenance Contract**							
(a)	Annual maintenance contract of WAMS System and all the equipment supplied in the project for a period of 7 years (1 year DLP and 6 years AMC)	Lot	1	1	1	1	1	5

(b)	Annual Training under AMC period	Lot	1	1	1	1	1	5
(c)	Six Monthly Cyber Security Audit by Cert-IN certified Auditors during 7 years AMC period	Lot	1	1	1	1	1	5
(d)	Patch Management including Signature updates for all Cyber security equipments for 7 years	Lot	1	1	1	1	1	5
(e)	Integration of new PMUs (from existing substations or from new substations) with PDCs at RLDCs during entire AMC period	No	1,200	800	700	1,100	1,200	5000
(f)	Integration of PDCs at SLDCs with PDCs at respective RLDCs during AMC period	No	9	5	3	5	4	26

>> The sizing for Historian Storage at RLDCs is considered @50 samples/second reporting rate of the existing and new PMUs including 100% expansion

BOQ for Central Sector PMUs to be procured under URTDSM Phase-II								
S.No	Name of the item	Unit	Regionwise Qty					Total Qty
			NR	ER	NER	SR	WR	
A	**SOFTWARE**							
1	PMU configuration software	Lot	12	6	4	6	4	32
B	**HARDWARE**							
1	PMUs		218	303	151	89	309	1070
2	Panel for mounting PMUs (complete with all necessary accessories, cables etc. as per specification) along with identified analog channels / modules	Lot	1	1	1	1	1	5
3	Time System (GPS receiver)	Lot	218	303	151	89	309	1070
4	Substation Grade Layer-3 LAN Switches with 10 ports minimum i.1 Gbps Fibre port- 4 nos. ii.1 Gbps Cu ports- 2 nos. iii.100 Mbps Cu ports- 4 nos	No.	135	170	55	75	210	645
5	Substation Grade Layer-2 LAN Switches with 10 ports minimum i.1 Gbps Fibre port- 4 nos. ii.100Mbps Fibre ports- 4 nos. iii.100Mbps Cu ports – 2 nos.	No.	109	152	76	45	155	535
6	Armored Fibre Optic Cable and associated termination	Lot	135	170	55	75	210	645
7	LIU - FO PATCH PANEL-12 PORT	No.	244	322	131	120	365	1180
8	PMU configuration tool (Laptop)	No.	12	6	4	6	4	32
9	Integration (at substation end) of new PMUs supplied under this project with PDCs of respective Control center	No.	218	303	151	89	309	1070
B	**TRAINING**							
1	Training (For All Central Sector locations in each Region, 3 days for 5 persons)	Man days	150	90	90	90	90	510
C	**Annual Maintenance Contract**							
(a)	Annual maintenance contract of PMUs and all the associated equipment supplied in the project for a period of 7 years (1 year DLP and 6 years AMC)	Lot	1	1	1	1	1	5

>> The PMU quantity mentioned above is indicative requirement under Phase-II for only Central Sector portion.
>> Each PMU shall be supporting measurement of 2sets of Voltage and Current phasors (i.e, of 2 elements) as a minimum and shall comply with latest version of IEEE C37.118.2 and IS/IEC 60255-118.1standards with latest amendments.

URTDSM Phase-II - BOQ for Mandatory Spares			
Sl.no	**Item description**	**Unit**	**Total Qty**
A	**Spares for URTDSM system**		
1	Servers one of each type at every RLDC & NLDC	Lot	1
2	**Storage System**		
(i)	10% of the critical items at every control center like Dual redundant power supplies, controllers and storage disks/ specialized storage etc.	Lot	1
3	Workstation console with dualcolour monitor (@10% of Total Supply in each Region/State)	Lot	1
4	LAN switch one of each type at every RLDC/NLDC	Lot	1
5	Internal Firewall at every RLDC and NLDC	Lot	1
6	External Firewall at every RLDC and NLDC	Lot	1
7	WAN Routers one of each type at every RLDC and NLDC	Lot	1
8	Time System (GPS receiver) (@10% of Supply)	Lot	1
9	PMU (complete with all necessary accessories, cables etc. as per specification) along with additional analog channels / modules	No.	110
B	**Spares for Auxiliary Power Supply system**		
1	MCCB/MCB/Isolator/ Switch/Contactor of each type & rating (as applicable & used inside UPS panel)	Lot	7
2	Fuse of each type & rating (if applicable)	Lot	35
3	DC Filter assembly	Lot	7
4	Input AC Filter assembly	Lot	7
5	Output AC Filter assembly	Lot	7
6	Electronic Printed Circuit Board / Card of each type (including all cards/modules for rectifier/charger, inverter, system card, display module, interface cards etc.)	Lot	7
7	Power Semiconductor devices of each type & rating such as SCRs, IGBTs etc. for rectifier/charger module, Inverter module, Static Switch module for all the three phases (exclude those items which are covered under item-6 above)	Lot	7

ANNEXURE - 4.0

ABSTRACT COST ESTIMATE

(BASE COST)

Unified Real Time Dynamic State Measurement (URTDSM)
Project Phase-II

DPR Cost Estimate (Based on budgetary offers)

Sl. No.	DESCRIPTION		AMOUNT (Rupees in Crs.)
	Equipment Cost		
A	**Supply**		
	Sub- Total A		949.62
B	**Services**		
i	Installation, Testing and Commissioning		
ii	Training charges		
	Sub- Total B (i to ii)		**Included above in A**
C	**Taxes and Duties**		
i	GST @ 18%, 28% (as applicable on Supply cost & Services) on **(A+B)**		**Included above in A**
D	Inland Freight and Insurance (as applicable on **A**)		**Included above in A**
E	**Sub Total A TO D**		**949.62**
F	Incidental Expediture During construction (IEDC)	**@ 5% of [F]**	47.48
G	Contingencies	**@ 3% of [F]**	28.49
H	Consultancy charges for URTDSM Phase-II for Panel of Experts		10.00
I	**Sub Total (A TO H)**		**1,035.59**
J	Interest During Construction (IDC)		56.96
K	**GRAND TOTAL**		**1,092.55**
L	Maintenance charges for 1 year during warranty period and 6 years after warranty period excl. GST* (AMC) incl. Cyber Security Audit		**26.95**
	GST @ 18% on AMC		**4.85**

Note:
1. Debt:Equity ratio has been considered as 70:30.
2. Interest rate on Loan has been considered @ 11.00% for Domestic Loan subject to actuals.
3. The project is scheduled to be commissioned by 01.09.2028. However, for the purpose of phasing of funds, Investment approval has been assumed on 01.09.2025.
4. IDC has not been calculated on AMC. Annual Maintenance Charges is not part of the Project cost. However, the same shall be part of bidding documents and to be borne out of O&M expenditure

ANNEXURE B.2.11.1

ANNEXURE -A
(CEA Letter for OPGW on 110 kV & Above)

सत्यमेव जयते

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत प्रणाली संचार विकास प्रभाग
Power System Communication Development Division

सेवा में / To

As per list enclosed

विषय/ Subject: Compliance with CEA (Technical Standards for Construction of Electric Plants and Lines), 2022 – Installation of Optical Ground Wire on Transmission Lines - reg

This is to bring to the attention , the crucial requirement outlined in the Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022, pertaining to the installation of Optical Ground Wire (OPGW) on transmission lines of 110 kV and above voltage level.

The aforementioned CEA standard **under Chapter IV, PART-A "SUBSTATIONS AND SWITCHYARDS (66 kV AND ABOVE)" Clause 48 , sub clause (5),** mandates the provision of Optical Ground Wire, along with necessary terminal equipment, on transmission lines of voltage rating 110 kV and above for speech transmission, line protection, and data channels. Additionally, it specifies that the primary path for tele-protection should be on point-to-point Optical Ground Wire, with an alternative path on either Power Line Carrier Communication or predefined physically diversified Optical Ground Wire paths.

The use of Optical Ground Wire facilitates speech transmission, data channels and also plays a crucial role in enhancing line protection. Ensuring compliance with these standards is paramount for the efficient and reliable operation of grid.

Therefore, as directed by Chairperson, CEA in the 19th meeting of National Committee on Transmission, it is requested that all the Central and State Sector utilities prioritize the implementation of the OPGW laying across its transmission network to ensure compliance with regulatory requirements.

Transmission utilities are requested to furnish the monthly progress report pertaining to OPGW installation.

Powergrid and CTU are requested to identify all such ISTS links wherein the OPGW implementation is still to be done and take up its implementation.

Signed by Suman Kumar Maharana
Date: 22-05-2024 17:25:26

भवदीय,
(एस.के.महाराणा / S. K. Maharana)
मुख्य अभियन्ता /Chief Engineer

सेवा भवन, आर. के. पुरम-I, नई दिल्ली-110066 टेलीफैक्स: 011-26102045 ईमेल: cepcd.cea@gov.in वेबसाइट: www.cea.nic.in
Sewa Bhawan, R.K Puram-I, New Delhi-110066 Telefax: 011-26102045 Email: cepcd.cea@gov.in Website: www.cea.nic.in

ANNEXURE B.2.11.2

Annexure-B
CEA Letter for 48F

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत प्रणाली विकास प्रभाग
Power Communication Development Division

CEA-PS-17-24/1/2024-PCD Division/ Date: 22-11-2024

To,

(As per the attached list)

Subject: Facilitating Broadband expansion by allowing leasing of fiber on OPGW - regd.

This has reference to the DO letter dated 11th November 2024(No. 5-5/NBM-2024/TOCIL-OPGW) addressed to Secretary (MoP) from Department of Telecommunications, Ministry of Communications, wherein MoP has been requested to consider laying at least 48F (48 Fibres) OPGW (Optical Ground Wire) in future transmission projects making provision for leasing of additional fibers for the use of telecom licensees i.e TSP (Telecom Service Provider)/ ISP (Internet Service Provider)/ IP (Internet Protocol)-1 etc.

During a review meeting of NER (North Eastern Region) Telecom projects, Hon'ble Minister for Communication had directed to facilitate broadband expansion by allowing leasing of fibers on OPGW of POWERGRID in place of leasing of bandwidth, so that rural areas and hinterlands can get good and reliable telecom connectivity.

In view of this, CTU (Central Transmission Utility), POWERGRID, STUs (State Transmission Utilities) and all the TSPs (Transmission Service Providers) are requested to incorporate the necessary provisions in the technical specifications of their future transmission schemes supporting the laying of at least 48F OPGW instead of 24F OPGW for the upcoming TBCB (Tariff based Competitive Bidding)/RTM (Regulated Tariff Mechanism) schemes. It is further advised that the schemes which are presently in bidding stage may also be modified accordingly by the BPCs (Bid Process Coordinators) wherever applicable.

This issues with the approval of Chairperson, CEA.

22/11/24

Chief Engineer (PCD)

ANNEXURE B.2.11.3

Annexure -II

Proposal for Installation of OPGW & associated communication systems on the existing ISTS lines of in ER Region

<table>
<tr><th>S. No.</th><th>Items</th><th>Details</th></tr>
<tr><td>1.</td><td>Scope of the scheme</td><td>A. Supply and installation of OPGW (48F/96F) along with required accessories, approach cables, required Fiber Optic Terminal Equipment (FOTE) and amplifiers/optical interfaces etc. for commissioning of optical fibre links on ISTS lines which is as follows:
<table>
<tr><th>Sl.No</th><th>Owner of the Line</th><th>48F OPGW (Length in Km)</th><th>96F OPGW (Length in Km)</th><th>STM-64 FOTE(Nos.)</th><th>STM-16 FOTE(Nos.)</th></tr>
<tr><td>A.1</td><td>POWERGRID</td><td>2262.15</td><td>35</td><td>8</td><td>19</td></tr>
<tr><td>A.2</td><td>POWERLINKS*</td><td>314</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>A.3</td><td>ENICL*</td><td>218.78</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>A.4</td><td>PKTCL*</td><td>161.67</td><td>-</td><td>-</td><td>1</td></tr>
</table>
The detailed OPGW/FOTE requirement of the scheme is enclosed as Appendix-I.

Note: a) The OPGW laid under the scheme shall be terminated in existing/proposed FOTE by IA/ Implementing Agency & integrate it with existing ISTS Communication Network. IA shall place FOTE under this scheme to cater all the required existing & upcoming directions, configure all the required power system services including Tele- Protection and integrate it with existing ISTS communication network for seamless data transmission to respective load dispatch centres. STM-16 FOTE provided under the scope of this scheme should be upgradable to STM-64.</td></tr>
</table>

		*PKTCL: Purulia Kharagpur Transmission Company Limited *ENICL: East-North Interconnection Company Limited *POWERLINKS: JV of POWERGRID & TATA Power
2.	**Depiction of the scheme**	As per **Appendix II** and **Annexure II(a)**.
3.	**Objective / Justification**	In the present scenario of increased RE penetration, frequent system expansion and strengthening, many of the existing lines are proposed for LILO frequently during transmission planning. However, it has been observed many times during planning/execution of these LILO systems that main line is not having OPGW, which leads to issues such as compromising on the alternate path/ redundancy/ protection. Further, installation of OPGW on the existing lines being LILOed leads to time mismatch. CEA has intimated vide letter dtd. 22.05.2024 that all the transmission lines of 110kV and above shall have Optical Ground Wire (OPGW) along with necessary terminal equipment. Accordingly, CTUIL prepared a comprehensive agenda for installation of OPGW on all those transmission lines of 110kV and above which don't have OPGW on pan-India basis. This agenda was discussed in 16th NPC dtd 04.07.2025. NPC suggested that the proposal for installation of OPGW on the existing lines of ISTS may be put in upcoming RPCs/NCT meeting for deliberation. Accordingly, CTUIL requested all the TSPs in ER region to provide the details of ISTS lines of 110kV and above which don't have OPGW. Based on the Inputs received from the TSPs and deliberations held in various meetings with TSPs and constituents in ER region, it has been found that ISTS lines mentioned at Appendix-I don't have OPGW. FOTE requirement for commissioning of the said OPGW links has been sought from Regional UNMS and respective TSPs and the same was deliberated and confirmed with the concerned TSPs. Further, 400kV Alipurduar–Bongaigaon line is planned to be bypassed at Bongaigaon S/s under NERES-XXV Part-A scheme and to be integrated with upcoming Bornagar-Bongaigaon line (upto bypass point) with 24F OPGW to form Bornagar- Alipurduar line. Since this line is an Inter-Regional line OPGW laying on this line was deliberated in 32nd NETeST meeting held on 29.08.2025 wherein the forum suggested for deliberations in ERPC meetings as most part of

<table>
<tr><td></td><td></td><td>the line belongs to ER region. Accordingly, OPGW laying on Binaguri - Alipurdwar - Bongaigaon (upto bypass point) excluding LILO portion has also been considered in this scheme. Cost of laying OPGW on Binaguri-Alipurduar-Bongaigaon (upto bypass point) excluding LILO portion is 11.99 Crs for 218 kms which is included in the scheme.</td></tr>
<tr><td>4</td><td colspan="2">Implementing Agency, Implementation Mode, Cost estimate and Time line of the Scheme:
<table>
<tr><th>Scope</th><th>Implementing Agency</th><th>Implementation Mode</th><th>Cost Estimate (Approx.) in Crs</th><th>Implementation Timeline</th></tr>
<tr><td>For Scope A.1</td><td>POWERGRID</td><td>RTM</td><td>144.04</td><td>30 months from the date of allocation.
Note: Implementation schedule of OPGW installation on 400kV Varanasi – Biharsharif D/c shall be in the matching timeframe of Transmission Scheme "Transmission Scheme for Rajasthan REZ Ph-IV (Part-6: 6GW) (Bikaner Complex)” which consists of LILO of 400kV Varanasi – Biharsharif D/c at upcoming ISTS S/s Asana or 30 months, whichever is earlier.</td></tr>
<tr><td>For Scope A.2</td><td>POWERLINK</td><td>RTM</td><td>17.27</td><td>30 months from the date of allocation</td></tr>
</table></td></tr>
</table>

	For Scope A.3	ENICL (Indigrid)	Change in Law	12.03	Matching time frame with NERES-XXV (part A)or 30 months from the date of allocation whichever is earlier.	
	For Scope A.4	PKTCL (Indigrid)	Change in Law	9.51	24 months from the date of allocation	
	Total Cost of the scheme				**182.88 Crs.**	
5.	**Deliberations**	This agenda has been discussed in 16th NPC dtd 04.07.2025(MoM attached as **Annexure C**). NPC suggested that the proposal for installation of OPGW on the existing lines of ISTS may be put in upcoming RPCs/NCT meeting for deliberation. STU may also put up the scheme for OPGW on existing lines in respective RPCs. Accordingly, this agenda was discussed in 8th ER CPM meeting held on 03.09.2025(MoM attached as **Annexure D**) wherein members agreed for laying OPGW in ER region for the ISTS lines not having OPGW. Further, this agenda regarding availability of OPGW on POWERGRID lines was deliberated in a separate meeting held between CTUIL & POWERGRID dtd 13.11.2025. POWERGRID confirmed the requirement of OPGW and FOTE that has been sought from UNMS for the ISTS lines considered for OPGW laying in this scheme. This agenda was also deliberated in a special meeting held on dtd 02.12.2025 among CEA, ERPC, CTUIL, POWERGRID, INIDIGRID, POWERLINKS wherein the forum agreed for the installation of OPGW on the ISTS lines that doesn't have OPGW excluding cross border lines. CEA suggested OPGW installation on the Cross-border lines has to be carried out in coordination with Bhutan. Accordingly, OPGW laying on Cross border lines shall be taken up in time bound manner after meeting among CEA, ERPC, CTUIL, POWERGRID & Bhutan Power Corporation. Further, deliberations were held regarding OPGW installation on 400kV Purulia-Ranchi & 400kV Purnea- Biharsharif line. 400kV Purulia-Ranchi is planned to be LILOed at upcoming Jamshedpur (New) S/s and hence healthy OPGW fibres are required on the main line. INDIGRID confirmed they have laid OPGW on their own cost and most of the fibres in OPGW on the said lines are faulty				

		and requested to consider the line for OPGW laying. CEA/CTUIL has requested to submit the OTDR report of fibers on the abovementioned lines in support of the healthiness of the fibres for further assessment. Indigrid stated that OTDR report will be submitted in one week time. ERPC & CEA stated that the decision of OPGW laying on these lines shall be taken up after receipt of said OTDR report and further deliberation in ERPC. **The revised cost of the scheme including these two lines i.e length of 341kms shall be Rs 201.61 Crs as mentioned in clause V of Appendix-I.** **Further, for Scope A.4 implementation timeline shall be as follows:** • **400kV Purulia- Ranchi:** In matching timeframe of ER-WR Expansion Scheme (Part -A) or 30 months from the date of allocation whichever is earlier • **400kV Chaibasa - Kharagpur:** 30 months from the date of allocation. In view of above, the scheme for OPGW laying on existing ISTS lines which aren't having OPGW in ER region as per scope mentioned in S.no. 1 is put up for kind review of ERPC and post ERPC review this scheme shall be put up for NCT approval.

Appendix- I

I. List of ISTS lines without OPGW in ER Region

Sl No	Voltage level	Name of the Line	Proposed IA for OPGW laying/Line Ownership	Length (km)	FOTE requirement at Node A	FOTE requirement at Node B	Remarks/TL implementation mode
1	132	ARA-ARA (BSPTCL)-1	POWERGRID	1.70	1 No. (STM-16)	1 No. (STM-16)	RTM
2	132	ARA (PG)-DUMRAON-1(BSPTCL)	POWERGRID	1.70	No	1 No. (STM-16)	RTM
3	220	ARA(PG)-Pusauli(PG) • Ara(PG)-Dumraon(BSPTCL) -30.68km • Dumraon(BSPTCL)- Pusauli BSPTCL(Nadokhar)- 80.68 km • Nadokhar-Pusauli (PG)-1.75 km	POWERGRID	112.20	No	1 No. (STM-16) at Nadokhar	Including LILO portion for 220kV Dumraon (BSPTCL) S/s & Nadokhar S/s that belongs to BSPTCL. However, OPGW laying work is proposed to be done by POWERGRID. Main line in RTM and belongs to POWERGRID
4	400	BIHARSHARIF VARANASI	POWERGRID	321.00	1 No. (STM-64)	1 No. (STM-64)	RTM

Sl No	Voltage level	Name of the Line	Proposed IA for OPGW laying/Line Ownership	Length (km)	FOTE requirement at Node A	FOTE requirement at Node B	Remarks/TL implementation mode
5	132	DEHRI-KUDRA -1	POWERGRID	62.00	1 No. (STM-16)	1 No. (STM-16)	RTM
6	220	DEHRI(BSPTCL)-SASARAM(BSPTCL) -1(LILO)	POWERGRID	4.88	No	1 No. (STM-16)	RTM
7	765	GAYA BALIA -1	POWERGRID	237.70	1 No. (STM-64)	1 No (STM-64)	RTM
8	220	GAYA-BODHGAYA (BSPTCL) -2 (LILO PART.)	POWERGRID	12.70	No	1 No. (STM-16)	Main line is from Gaya- Dehri and got LILOed at Bodhgaya and Chandauti (PG). LILO portions at Bodhgaya belongs to BSPTCL However, OPGW laying work is proposed to be done by POWERGRID . Main line and LILO at Chandauti belongs to POWERGRID.
9	220	Chandauti-DEHRI -2	POWERGRID	15.90	No	No	

Sl No	Voltage level	Name of the Line	Proposed IA for OPGW laying/Line Ownership	Length (km)	FOTE requirement at Node A	FOTE requirement at Node B	Remarks/TL implementation mode
							OPGW is present on the main line Gaya-Chandauti PG section). OPGW to be laid from Chandauti to Dehri Section & Gaya-Bodhgaya -2 (BSPTCL) only LILO Section. RTM
10	400	GAYA-MAITHON	POWERGRID	276.00	No	No	RTM
11	400	JAMSHEDPUR-TISCO-2	POWERGRID	32.71	No	1 No. (STM-16)	RTM
12	400	KODERMA-GAYA	POWERGRID	125.00	1 No. (STM-16)	No	RTM
13	132	KUDRA-SASARAM	POWERGRID	10.84	No	No	RTM
14	132	MOHANIA-KARMANASHA	POWERGRID	16.74	1 No. (STM-16)	1 No. (STM-16)	RTM
15	132	PURNEA-PURNEA(BSEB)-1 LILO part	POWERGRID	0.50	No	1 No. (STM-16)	RTM
16	400	RANCHI-RAGHUNATHPUR-1 (LILO of Maithon-Ranchi -II at Raghunathpur)	POWERGRID	155.79	1 No. (STM-64)	1 No. (STM-16)	RTM Main line (Maithon - Ranchi II) belongs to POWERGRID &

Sl No	Voltage level	Name of the Line	Proposed IA for OPGW laying/Line Ownership	Length (km)	FOTE requirement at Node A	FOTE requirement at Node B	Remarks/TL implementation mode
							LILO at Raghunathpur belongs to DVC. However, OPGW laying work is proposed to be done by POWERGRID
17	220	SASARAM-ARA-1	POWERGRID	112.14	No	No	RTM
18	132	SASARAM-MOHANIA	POWERGRID	13.26	No	No	RTM
19	220	SASARAM-SAHUPURI-1	POWERGRID	4.88	No	1 No. (STM-16)	RTM
20	400	TISCO -BARIPADA-2	POWERGRID	140.28	1 No. (STM-16)	No	RTM
21	400	TALCHER - MERAMUNDALI-2	POWERGRID	51.00	No	1 No. (STM-16)	RTM
22	400	ANDAL-JAMSHEDPUR	POWERGRID	156.76	1 No. (STM-16)	1 No. (STM-64)	RTM Andal is DSTPS (DVC)
23	400	MAITHON -MEJIA-1	POWERGRID	59.18	1 No. (STM-64)	No	RTM
24	400	MAITHON-MEJIA-3	POWERGRID	83.74	No	No	RTM
25	400	MERAMUNDALI-ANGUL-1	POWERGRID	25.34	No	No	RTM

Sl No	Voltage level	Name of the Line	Proposed IA for OPGW laying/Line Ownership	Length (km)	FOTE requirement at Node A	FOTE requirement at Node B	Remarks/TL implementation mode
26	400	Maithon-Jamshedpur-1(Including LILO Part at Mejia)	POWERGRID	167.74	1 No. STM-64 at Mejia	No	OPGW available in both peak upto 35km from Jamshedpur (Repeater connectivity of 765kV Medinipur-New Ranchi) Replacement of 24F with 96F for 35km (From Jamshedpur S/s to Crossing point of 765kV Ranchi Medinipur) on one peak. 48F for remaining part including LILO (132.74km) on one peak. All the sections belong to POWERGRID. RTM

Sl No	Voltage level	Name of the Line	Proposed IA for OPGW laying/Line Ownership	Length (km)	FOTE requirement at Node A	FOTE requirement at Node B	Remarks/TL implementation mode
27	132	RANGIT-RAMMAM-1	POWERGRID	27.15	No	1 No. (STM-16)	RTM
28	400	TALCHAR-ANGUL-2	POWERGRID	68.35	No	No	RTM
29	400	Kishanganj-Purnea	POWERLINKS	71(main line)+5 (LILO part at Kishenganj)	No	No	RTM LILO part at Kishanganj belongs to POWERGRID. However, OPGW laying work is proposed to be done by POWERLINK as agreed in 8th ER CPM.
30	400	Purnea-Muzaffarpur	POWERLINKS	238	No	No	RTM
31	400	Bongaigaon - Alipurduar- Siliguri (upto by pass point of Bongaigaon S/s and excluding LILO at Alipurdwar)	ENICL/INDIGRID	218.78	No	No	TBCB. OPGW to be integrated with upcoming OPGW from bypass point for Bongaigaon S/s and also to be integrated with existing OPGW in

Sl No	Voltage level	Name of the Line	Proposed IA for OPGW laying/Line Ownership	Length (km)	FOTE requirement at Node A	FOTE requirement at Node B	Remarks/TL implementation mode
							LILO Section to form Alipurdwar-Bornagar link. Main line belongs to ENICL & LILO belongs to POWERGRID.
32	400	Kharagpur - Chaibasa	PKTCL/INDIGRID	161.67	1 No. (STM-16)	No	TBCB
33	400	Purnea - Biharsharif	ENICL/INDIGRID	229	No	No	OPGW is laid by Indigrid by its own cost,20/24 F laid are faulty. OPGW laying to be deliberated. TBCB
34	400	Purulia - Ranchi	PKTCL/Indigrid	112	No	No	OPGW is laid by Indigrid by its own cost, 17/24 F laid are faulty. OPGW laying to be deliberated. TBCB
Total Length (Km)		**3332.63 Km**					

Note:

The above data has been provided from the TSPs. TSPs are requested to confirm the above-mentioned data regarding availability of OPGW on the lines and requirement of FOTE at end stations.

Wherever end stations belong to state constituents power supply and space shall be provided by the states for installation of FOTE.

II. Summary of ISTS lines Constructed under RTM and not having OPGW

Sl.No	TOTAL Length of OPGW to be laid(km)	Total No of FOTE required	Proposed Implementation mode	Proposed Implementing Agency	Total cost estimate in Crs.
1	2297.18	STM-64: 8 Nos. STM-16: 19 Nos.	RTM	POWERGRID	144.04
2	314	Nil	RTM	POWERLINK	17.27
Total	**2611.18**				**161.31**

III. Summary of lines Constructed under TBCB and not having OPGW

Sl.No	TOTAL Length of OPGW to be laid(km)	Total No of FOTE required	Proposed Implementation mode	Proposed Implementing Agency	Total cost estimate in Crs.
Excluding 400kV Purulia- Ranchi & 400kV Purnea- Biharsharif					
1	161.67	STM-16: 1 Nos.	Change in Law	PKTCL	9.51
2	218.78	Nil	Change in Law	ENICL	12.03
Total	**380.45**				**21.54**
Including 400kV Purulia- Ranchi & 400kV Purnea- Biharsharif					
1	273.67	STM-16: 1 Nos.	Change in Law	PKTCL	15.67
2	447.78	Nil	Change in Law	ENICL	24.62
Total	**721.45**				**40.29**

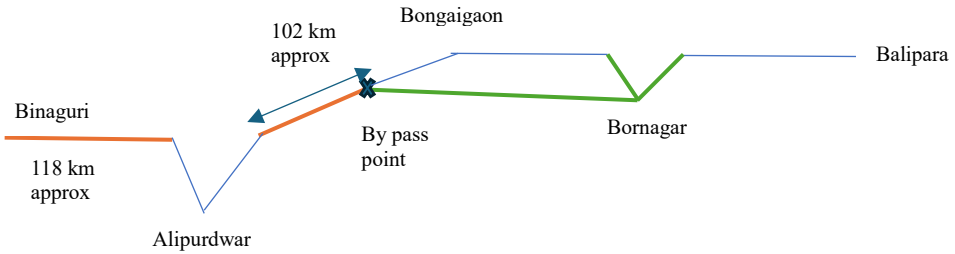
IV. Summary of Scheme for OPGW Laying on ISTS Transmission lines excluding 400kV Purulia- Ranchi & 400kV Purnea- Biharsharif

Number of lines considered:	**32**	**Cost per item**	**Total Cost Estimate in Crs (Approx)**
Total Length of OPGW	**2991.63Km**	5.5 lakhs/Km	164.53
No of STM-64 Equipment	**8**	74 Lakhs/Equipment	5.92
No of STM-16 Equipment	**20**	62 Lakhs/Equipment	12.40
			182.88

V. Summary of Scheme for OPGW Laying on ISTS Transmission lines Including 400kV Purulia- Ranchi & 400kV Purnea- Biharsharif

Number of lines considered:	**34**	**Cost per item**	**Total Cost Estimate in Crs (Approx)**
Total Length of OPGW	**3332.63 km**	5.5 lakhs/Km	183.29
No of STM-64 Equipment	**8**	74 Lakhs/Equipment	5.92
No of STM-16 Equipment	**20**	62 Lakhs/Equipment	12.5
			201.61

Appendix II



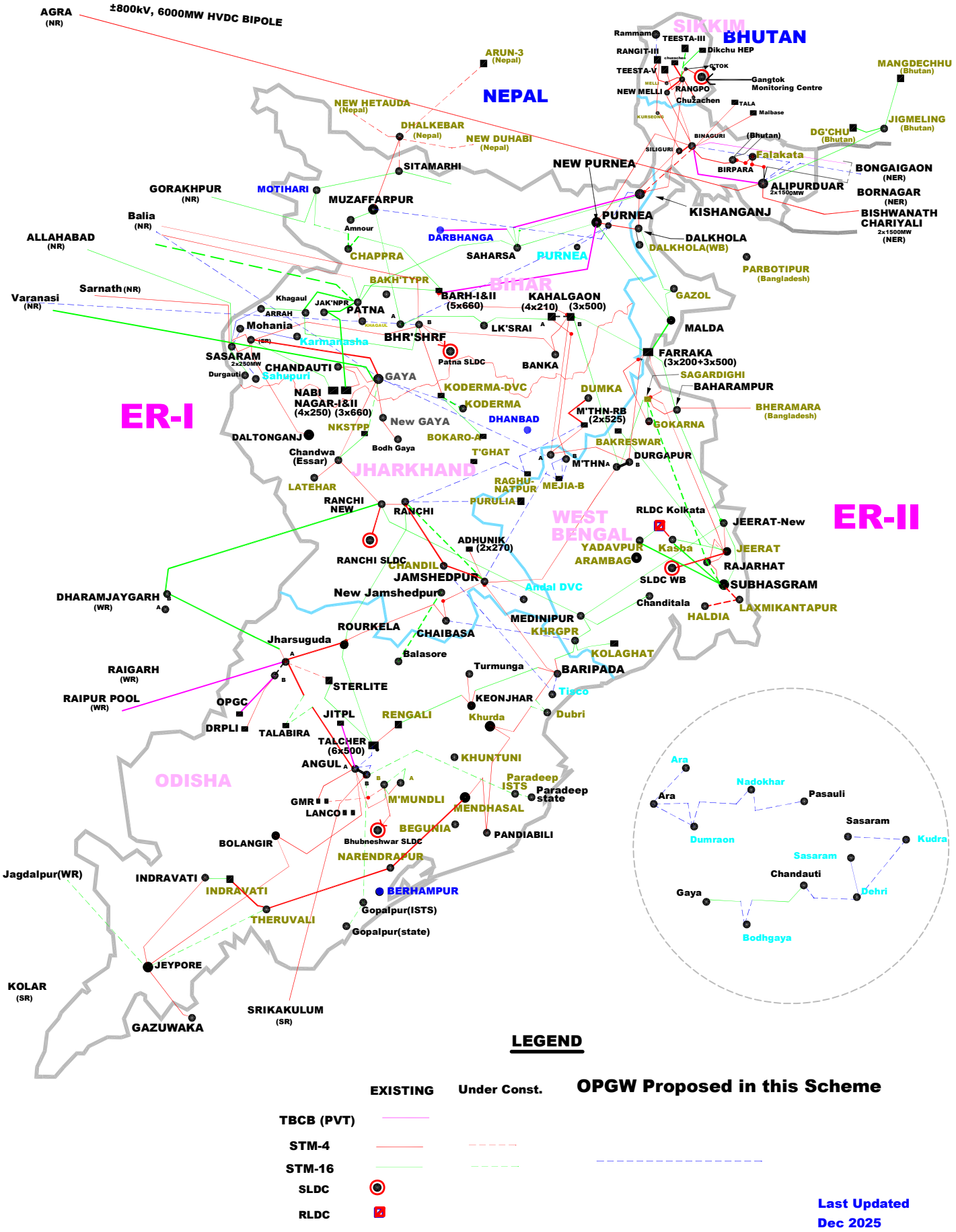
LEGEND

Under the scope of instant agenda

Under the scope of NERES XXV Part A

Fibre Optic Network of ER

CTUIL



LEGEND

	EXISTING	Under Const.	OPGW Proposed in this Scheme
TBCB (PVT)			
STM-4			
STM-16			
SLDC			
RLDC			

Last Updated
Dec 2025

ग्रिड-इंडिया
GRID-INDIA

ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
GRID CONTROLLER OF INDIA LIMITED
(A Government of India Enterprise)
[formerly Power System Operation Corporation Limited (POSOCO)]
राष्ट्रीय भार प्रेषण केन्द्र / National Load Despatch Centre

आज़ादी का अमृत महोत्सव

कार्यालय : बी-9, प्रथम एवं द्वितीय तल, कुतुब इंस्टीट्यूशनल एरिया, कटवारिया सराय, नई दिल्ली - 110016
Office : 1st and 2nd Floor, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi -110016
CIN : U40105DL2009GOI188682, Website : www.grid-india.in, E-mail : gridindiacc@grid-india.in, Tel.: 011- 42785855

Ref No: NLDC/SO/Nov25/BESS/251

Date: 12th Nov 2025

To,

The Member Secretary, NRPC, New Delhi
The Member Secretary, WRPC, Mumbai
The Member Secretary, SRPC, Bengaluru
The Member Secretary, ERPC, Kolkata
The Member Secretary, NERPC, Shillong

Subject: Maintaining reserves and implementation of Automatic Generation Control for balancing and improving the grid frequency profile – reg.

Madam/Sir,

Secretary (Power), Govt. of India chaired a meeting on 22.10.2025 to discuss the deployment of Battery Energy Storage System (BESS) for Ancillary Services. During the meeting he also reviewed the availability of reserves and participation in ancillary services. Minutes of the meeting are enclosed.

In this regard, attention is invited to the following action point of the minutes:

Quote:

"SLDCs and intra-state generating stations shall be pursued to maintain adequate reserves and implement Automatic Generation Control for balancing and improving the grid frequency profile.

(Action: GRID-INDIA, RPC, CEA)"

Unquote

In view of the above it is requested that the matter may kindly be pursued further in the forthcoming RPC / NPC meetings for necessary action and implementation at the state level.

Enclosed: As above

(Vivek Pandey) 12/11/2025

Chief General Manager (SO), NLDC

Copy for kind information to:

1. Member (Thermal) / Member (Hydro), CEA
2. Member Secretary, NPC
3. Executive Director, NLDC
4. Head NRLDC / WRLDC / SRLDC / ERLDC / NERLDC, with a request to pursue the matter in the regional forums

To be kept as an agenda item in OCC/TCC

SE(Opn.)

SE(Commn.) 1/5

SE(Op)

सं. 22-17/2/2020-ओ एम [252889]
भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power

Nirman Bhawan, New Delhi
Dated : 04th November, 2025

OFFICE MEMORANDUM

Subject: Minutes of the meeting held under the Chairmanship of Secretary (Power) on 22.10.2025 to discuss the deployment of Battery Energy Storage System (BESS) for Ancillary Services– reg.

Please find enclosed herewith a copy of minutes of the meeting held under the Chairmanship of Secretary (Power) on 22.10.2025 to discuss the deployment of Battery Energy Storage System (BESS) for Ancillary Services for information and necessary action.

Encl: As above

04.11.2025

(Thenkholal Baite)
Under Secretary to the Government of India
Telefax: 23062492; Email:opmonitor-power@nic.in

To

1. Chairperson, CEA
2. CMD, Grid India
3. CGM, Grid-India with the request to forward a copy of minutes of the meeting to all concerned RPCs.

Copy to:—

PPS to Secretary (Power)/ PS to Addl. Secretary (OM/R&R/ Transmission)/ PPS to Director (OM/FSC).

Minutes of meeting held under the chairmanship of the Secretary (P) on 22.10.2025 to discuss the deployment of Battery Energy Storage Systems (BESS) for Ancillary Services

****

A meeting was held under the Chairmanship of Secretary (P) on 22.10.2025 to discuss the deployment of Battery Energy Storage Systems (BESS) for Ancillary Services. The meeting was attended by senior officers of the MoP, CEA and Grid-India. The list of participants is **Annexed.**

2. Grid-India made a detailed presentation on the subject highlighting the following points:

(i) Ancillary services are essential to maintain grid stability and reliability by balancing real time demand and generation.

(ii) Ancillary Services are broadly classified into three main categories based on their functionality and mode of operation viz. Frequency Control Ancillary Services (FCAS), Voltage Control Ancillary Services (VCAS) and Black Start Ancillary Services (BSAS).

(iii) Frequency Control Ancillary Services are intended to maintain the system frequency within the permissible band by balancing generation and demand. FCAS are divided into three levels of control such as Primary Control through Governor action, Secondary Control through Automatic Generation Control (AGC) and Tertiary Control through Market-based dispatch. Voltage Control Ancillary Services are designed to maintain voltage levels within acceptable operational limits and Black Start Services used to restore the grid following a total or partial blackout.

(iv) A total of 83 power plants (215 generating units) encompassing 81,130 MW installed capacity have been integrated under AGC including coal, hydro, gas-based stations and pilot projects on Solar, BESS and Pumped Storage Plants (PSP). Pilot testing of 20 MW/40 MWh Battery Energy Storage System (BESS) at BRPL Kilokari-1 was conducted in May'2025. The BESS pilot demonstrated effective response to AGC signals in both charging and discharging modes. Similarly, Tehri Pumped Hydro Station was pilot-tested in September, 2025.

(v) The ongoing expansion of the ambit of AGC to bring intra-state plants and IPPs into the SRAS, alongside pilots with new technologies such as solar, BESS, and pumped hydro, approx. 6500 MW of intra-state generation has already been integrated under Secondary Reserve Ancillary Services (SRAS) and further inclusion is under progress.

(vi) Participation of intra-state plants will strengthen system reliability, provide operational experience and enhance SLDC readiness to implement intra-state AGC in the future. **Secretary (Power)** emphasized the need to expeditiously replicate AGC implementation across all generating stations and SLDCs to enable real-time frequency control and integration with AGC. **Secretary (Power)** advised Chairperson, CEA to take up the matter with the heads of IPPs, State generating companies and SLDCs and monitor commissioning of AGC and participation in SRAS.

(vii) During the evening peak period, plants are fully requisitioned to meet the high demand. Consequently, there are no upward reserves available in this duration. In the solar hours, plants are scheduled at or below their Minimum Technical Load (MTL) due to high renewable generation. As a result, there are no downward reserves available during these hours. In other periods, TRAS capacity is available in the range of 3,000 MW- 4,000 MW. Secretary (Power) emphasized that as per the Resource Adequacy, reserve monitoring is equally important and directed that Reserves being maintained and despatched at the intrastate and interstate level should be included as a regular agenda item in review meetings.

(viii) Apart from continuing present balancing activities, a BESS capacity of around 2500 MW/ 5000 MWh dedicated for Ancillary Services would keep frequency to almost 90% of the time within the permissible band on typical days. A 2-hour BESS configuration was found optimal for ancillary services. As per study, the second cycle availability will boost the ability to counter the evening peak dip in frequency when needed. Further, one-hour and two-hour BESS satisfy the required frequency improvement target while 0.5 hour BESS may be inadequate under energy deficit scenarios.

(ix) It was highlighted that Grid-India's studies have suggested that there is a value proposition in utilizing a portion of a BESS's capacity for Ancillary Services to support grid balancing, even while the remaining capacity is engaged in energy arbitrage or generation as per its PPA schedule.

(x) It was proposed to undertake a pilot of 500 MW / 1000 MWh BESS exclusively for ancillary services at the inter-state level to define technical requirements and regulatory modalities.

3. Secretary (Power) advised that advance procurement of reserves from BESS may be considered for completion by 2027 and directed Grid-India to initiate necessary actions in consultation with CERC. Secretary (Power) also noted that with the growing availability of cost-effective storage, the same should be leveraged for Ancillary Services.

4. After detailed discussions, following action points emerged in the meeting:

(i) SLDCs and Intra-state generating stations shall be pursued to maintain adequate reserves and implement Automatic Generation Control for balancing and improving the grid frequency profile.

(Action: Grid-India / RPC / CEA)

(ii) Considering the growing need for system balancing, CEA to work with Independent Power Producers, State generation companies and SLDCs towards establishment of infrastructure for Automatic Generation Control and participation in intra-state AGC/secondary reserve ancillary services. A monthly update may be provided by CEA to MoP.

(Action: CEA)

(iii) Reserves being maintained and despatched at the intrastate and interstate level shall be reviewed in the National and Regional Power Ministers' Conference.

(Action: Grid-India, CEA & MoP)

(iv) Grid-India shall initiate actions for regulatory approvals for advance procurement of reserves from Battery Energy Storage Systems for despatch under ancillary services.

(Action: Grid-India)

(v) Grid India to undertake Pilot of 500 MW / 1000 MWh BESS exclusively for ancillary services at interstate level for devising the future roadmap.

(Action: Grid-India)

5. The meeting ended with vote of thanks to all participants.

****

Annexure

List of the participants

Ministry of Power

1. Shri Pankaj Agarwal, Secretary (Power) ------ In chair
2. Shri Srikant Nagulapalli, Additional Secretary (R&R/ Transmission)
3. Shri Parveen Dudeja, Director (OM)
4. Shri Thenkholal Baite, Under Secretary (OM)

CEA

1. Shri Ghanshyam Prasad, Chairperson
2. Shri Vijay Kumar Singh, Member (Power System)
3. Smt. Ammi Ruhama Toppo, Chief Engineer (Power System Planning & Appraisal-I)

GRID- INDIA

1. Shri S.C Saxena, CMD
2. Shri. R.K Porwal, Director (SO)
3. Shri Vivek Pandey, CGM
4. Shri Phanishankar Chilkuri, Chief Manager

5/5