AGENDA

FOR

210TH OCC MEETING

Date: 15.12.2023

Eastern Regional Power Committee

14, Golf Club Road, Tollygunge

Kolkata: 700033

Contents

1. PART-A 4

1.1 Confirmation of Minutes of 209th OCC Meeting held on 23rd November 2023 physically at ERPC Secretariat, Kolkata 4

2. PART-B: ITEMS FOR DISCUSSION 4

2.1 Resource adequacy plan of states should be finalized at the earliest in consultation with CEA & MOP may be informed of the status of finalization.- CEA 4

2.2 Capacity addition by State Gencos & IPPs to meet growing energy Demand-CEA .. 5

2.3 Implementation of Draft phasing plan of R&M/LE for identified coal based thermal units-CEA 6

2.4 Seeking Project Appraisal from ERPC for PSDF Grant for Renovation and Modernization of intra-state transmission systems for relieving congestion in the state of West Bengal-WBSETCL 6

2.5 Procurement, Erection and Commissioning of Two Nos. 400 KV 125 MVAR (Each) Reactors at KTPS and Two Nos. 220 KV 125 MVAR (Each) Reactors (With New 220 KV Bays) at DSTPS-DVC 7

2.6 Shutdown proposal of generating units for the month of January'2023-ERPC 8

2.7 Re-conductoring and earth wire replacement in 220kV Lines (more than 35 years in service) commissioned under CTS.- POWERGRID ER-II 9

In 209th OCC Meeting , POWERGRID ER-II was advised to submit a detailed survey report along with health assessment report from NSIC of conductor installed in old 220kV Lines commissioned under CTS. 9

2.8 Discrepancy regarding resolution of availability declaration data on WBES portal-JITPL 10

2.9 Implementation of SPS for LILO arrangement/Power evacuation of 350 MW -IBEUL 11

2.10 Proposed shutdown of both circuits of OPGC-Sundergarh line for LILO connection of Ind Barath 350 MW unit -IBEUL 11

2.11 Furnishing of data for various studies mandated under IEGC 2023-ERLDC 12

2.12 Review of UFR setting- ERLDC 14

2.13 Reactive capability assessment- ERLDC 12

3. PART-C: ITEMS FOR UPDATE/FOLLOW-UP 17

3.1 ER Grid performance during October 2023 17

3.2 Ensuring the healthiness of ADMS 17

3.3 Commissioning status of ADMS 18

3.4 Primary frequency response of generating units in ER 18

4. PART-D: OPERATIONAL PLANNING 20

4.1 Anticipated power supply position during January 2023 20

4.2 Major Thermal Generating Units/Transmission Element outages/shutdown in ER Grid (as on 12-12-2023) 20

4.3 Commissioning of new units and transmission elements in Eastern Grid in the month of November-2023..... 24

4.4 UFR operation during the month of November 2023. 26

EASTERN REGIONAL POWER COMMITTEE

AGENDA FOR 210TH OCC MEETING TO BE HELD ON 15.12.2023 (FRIDAY) AT 10:30 HRS

1. PART-A

1.1. Confirmation of Minutes of 209th OCC Meeting held on 23rd November 2023 physically at ERPC Secretariat, Kolkata

The minutes of 208th Operation Coordination sub-Committee meeting held on 23.11.2023 was circulated vide letter dated 01.12.2023.

Members may confirm the minutes of 209th OCC meeting.

2. PART-B: ITEMS FOR DISCUSSION

2.1 Resource adequacy plan of states should be finalized at the earliest in consultation with CEA & MOP may be informed of the status of finalization: CEA

In exercise of powers conferred under the rule 16 of Electricity(Amendment)Rules,2022, Ministry of power in consultation with CEA has issued the guidelines for **Resource adequacy.**

The guidelines were issued in June 2023 after stakeholder consultations. The guidelines aim to institutionalize the Resource adequacy framework to be followed by distribution licensees for power procurement & capacity contracting.

The Resource adequacy framework lays down the optimal capacity mix required to minimise the total cost in meeting the projected demand for the future.

This includes determining new generation capacities to meet future demand.

All individual states are requested to finalize Resource adequacy Plan at the earliest in consultation with CEA and Ministry of Power and may also inform the status of finalization.

Members may discuss.

2.2 Capacity addition by State GENCOs & IPPs to meet growing energy Demand-CEA

Currently, India is the fifth largest economy in the world & is poised to become the third largest economy by 2030.This would entail availability of sufficient electricity to meet power demand of a growing economy. India's electrical energy demand has grown at CAGR of 4.5% while peak demand has grown at CAGR OF 5.6% during 2018-23. In the recent past, the energy demand growth has been much higher & it was 9.5% during 2022-23 & is showing a sustained rising trend. A peak demand of 243GW was recorded on 1st September 2023.

The future demand growth rates are likely to be higher primarily due to increased electrification of the economy, penetration of EVs etc. As per 20th Electric power survey(EPS),peak electricity demand & energy requirement is poised to grow at CAGR of 6.42% & 6.67% during 2022-27 & at a CAGR of 5.74% & 5.33% during 2027-32. respectively. Further as per the same survey, the projected All India peak electricity demand & electrical energy requirement is likely to be 277.2GW & 1907.8 BU respectively.

Therefore, adequate generation capacity addition is required matching with the growth in demand. As per the National Electricity plan 2022-32 notified by CEA, the likely installed capacity in the country for the year 2026-27 & 2031-32 is estimated to be 609.5GW(including 235.1GW from coal & 52.4GW from Large Hydro) & 900.4 GW(including 283GW from coal & 62.1GW from Large Hydro) respectively.

To meet the increased power demand, capacity addition in thermal & hydro sectors has been undertaken by the GOI. A total of 68.8 GW central sector capacity additions are likely to be achieved by 2029-30 through construction of Thermal & Hydro power plants by the GOI. A list of under construction/planned thermal & Hydro power plants in the central sector is enclosed for your information at **Annexure B.2.**

However the growing power needs of country can't be met without active participation from all stake holders viz state govts & IPPs.IT is therefore essential that state Govts & its PSUs should also immediately plan & make concerted efforts to achieve capacity addition programme.

For those states which have already finalized & initiated the capacity addition activity, it is requested to inform the status of their capacity addition programme at the earliest to Ministry of Power.

GENCOs may update. Members may discuss.

2.3 Implementation of Draft phasing plan of R&M/LE for identified coal based thermal units-CEA

The Central Electricity Authority (CEA) has prepared a guideline for Renovation and Modernization (R&M) in 2023, which was circulated to power utilities in August 2023. A draft phasing plan of identified thermal units for R&M/LE until 2030 was prepared and discussed in meetings held on 12th, 13th, 14th, 15th, and 16th of June 2023 at the CEA office in New Delhi.

After receiving suggestions from stakeholders, the phasing plan for R&M/LE of identified coal-based thermal units has been revised. It is therefore requested to provide inputs/comments on revised draft phasing plan for R&M/LE for identified coal based thermal units(upto 2030) at earliest convenience.

Communication from CEA in this regard and draft phase-wise plan for identified coal based thermal units are attached at **Annex B.3.1** and **Annex B.3.2** respectively for perusal and ready reference.

GENCOs may update. Members may discuss.

2.4 Seeking Project Appraisal from ERPC for PSDF Grant for Renovation and Modernization of intra-state transmission systems for relieving congestion in the state of West Bengal-WBSETCL

Intra-state transmission networks of West Bengal have constraints in meeting the demand for power in several pockets/ regions within the State of West Bengal. Whereas new lines/ connectivity could not be established due to severe ROW problem, replacement of existing conductor by high performance conductor has been envisaged to relieve the congestion.

The use of High Temperature and Low Sag (HTLS) Conductors is an attractive method of increasing transmission line thermal rating. The conventional ACSR Conductors are able to withstand a continuous temperature of 75 deg C to 85 deg C. In case of emergency, for a short duration the conductors can work up to 105 deg C without any sign of deformation. In order to increase the thermal rating of existing lines, one method involves replacing ACSR conductors with special “High-Temperature Low-Sag” (HTLS) conductors having approximately the same diameter as the original ACSR but being capable of operation at temperatures as high as 250 deg C, with less thermal elongation than ACSR. Ideally, these special HTLS conductors can be installed and operated without the need for extensive modification of the existing structures and foundation. With the use of this new generation HTLS conductor, power carrying capacity will be raised almost double from its existing capacity.

Following projects have been considered in present proposal:

a) Replacement of existing ACSR Zebra Conductor by high capacity HTLS Conductor along with replacement of 220 KV Feeder and TBS bay CT of the following transmission lines:

1. KTPP-Food Park 220 KV D/C Transmission Line (R.L. ≃ 51.0 KM).

2. Food Park-Jangalpur 220 KV D/C Transmission Line (R.L. ≃ 6.0 KM).
3. Barasat-Kasba 220 KV D/C Transmission Line (R.L. ≃ 39.1 KM).
4. Subhasgram-Kasba 220 KV D/C Transmission Line (R.L. ≃ 23.0KM).
5. Jeerat-Barasat 220 KV D/C Transmission Line (R.L. ≃ 23.3 KM).

In this regard a DPR has been prepared for grant of funding from PSDF as per Clause No 6.3(i) as per guideline of GoI, MoP issued vide no 10/1/2014-OM Dtd. 18.09.2014. The in-principle approval of the competent authority of WBSETCL has already been obtained.

The DPR has been placed before ERPC on 03-11-2023 for appraisal on the project as per the requirement under PSDF Application Format-A5.

WBSETCL may update. Members may discuss.

2.5 Procurement, Erection and Commissioning of Two Nos. 400 KV 125 MVAR (Each) Reactors at KTPS and Two Nos. 220 KV 125 MVAR (Each) Reactors (With New 220 KV Bays) at DSTPS-DVC

This is to lay before notice of all that, 400 KV bus voltage of DVC system occasionally crosses the higher operational voltage limit of 103% i.e. 412 KV as stipulated in IEGC-2010. Moreover, with the introduction of charges for exchange of VAR during violation of either the lower limit (97% of 400 KV) or the higher limit (103% of 400 KV) as a disciplinary measure it has become important to operate the system buses within these two limits. Hence to maintain 400 KV Bus voltage within 412 KV it has become necessary to install and commission 2 nos. of 400 KV, 125MVAR Reactor at KTPS and 2 nos. of 220 KV 125 MVAR Reactors at DVC, DSTPS.

In line with above CTU has already extended their consent vide MOM No. CTU/E/00/DVC dated 26.06.23 towards installation of suitable number of bus Reactors of 125MVAR at various generation switchyard to control the voltage excursions.

Detailed study of VAR flow in DVC system had been carried out and as per study report installation of two nos.50 MVAR reactors at DVC DSTPS 220 KV Switchyard along with erection & commissioning of new 220 KV bays and rest two nos. 125 MVAR reactors at DVC KTPS 400 KV Switchyard replacing the existing 2 x 125 MVAR reactors has become essential.

The detailed study report (**Annex B.5.1)** and the CTU MOM(**Annex B.5.2**) are attached herewith for scrutiny and subsequent approval towards implementation of the proposal.

DVC may update. Members may discuss.

2.6 Shutdown proposal of generating units for the month of January'2023-ERPC

Maintenance Schedule of Thermal Generating Units of ER during 2023-24 in the month of January '2023							
System	**Station**	**Unit No.**	**Capacity (MW)**	**Period (as per LGBR 2023-24)**		**No. of Days**	**Reason**
				From	**To**		
DVC	Mejia TPS	3	210	21.01.2024	14.02.2024	25	AOH-BIr, LPT, FGD
	Mejia TPS	7	500	O1.01.2024	28.01.2024	28	AOH-BIr, LPT, Gen
WBPDCL	Santaldih TPS	5	250	04.01.2024	23.01.2024	20	AOH/BOH
	APPROVED DATE **(as per 208th OCC)**			**26.01.2024**	**14.02.2024**	19	AOH/BOH
	Kolaghat TPS	3	210	26.01.2024	14.02.2024	20	AOH/BOH
NTPC	KhSTPS	4	210	01.12.2023	04.01.2024	35	Boiler + HP + IP + Generator
	APPROVED DATE **(as per 209th OCC)**			**01.12.2023**	**04.01.2024**	35	Boiler + HP + IP + Generator
	KhSTPS	5	500	01.12.2023	14.01.2024	45	Boiler+LP+Gen.+ Combustion Modification (Approved in LGBR 2022-23)
	APPROVED DATE **(as per 209th OCC)**			**Shutdown not to be availed as per 209th OCC**			
	KhSTPS	7	500	10.01.2024	08.02.2024	30	Boiler Maintenance
	Barh-I	2	660	01.12.2023	14.01.2024	45	Boiler +Generator
	Barh-ll	5	660	20.01.2024	18.02.2024	30	BLR Modification Balance work

	Darlipalli STPS	2	800	15.11.2023	13.01.2024	60	COH
BRBCL	Nabinagar TPS	4	250	01.12.2023	09.01.2024	40	Boiler+ LPT O/H + Generator rotor thread out and checking +NOX Work
DPL	DPL	8	250	01.01.2024	10.01.2024	10	Boiler License Renewal
HEL	HEL	1	300	06.01.2024	20.01.2024	15	AOH/BOH
	APPROVED DATE (as per 209th OCC)			02.12.2023	20.12.2023	19	AOH & De-NOx modification
MPL	MPL	2	525	17.12.2023	25.01.2024	40	AOH/COH
	Decided to be postponed as per 209th OCC						

Members may discuss.

2.7 Re-conductoring and earth wire replacement in 220kV Lines (more than 35 years in service) commissioned under CTS.- POWERGRID ER-II

In 209th OCC Meeting , POWERGRID ER-II was advised to submit a detailed survey report along with health assessment report from NSIC of conductor installed in old 220kV Lines commissioned under CTS.

Accordingly, vide mail dated 12.12.2023, Powergrid ER-II has shared detail test report of old 220kV Lines , carried out by NSIC Howrah.(**Annex B.7.1)**

From the test report, it can be observed that the conductor sample has failed in mostly all Technical parameters. A summary of the TS requirements on which the conductor has failed during Testing are stated below:-

Sl No.	Tests performed	Observation/Findings	Remarks
1	Freedom from defects (Visual Inspection)	Conductor found blackened & surface not smooth	Condition Poor
2	Surface Condition Test	Upon applying 50% of UTS Load, the diameter of the conductor measured at 4 places are more than the sum of minm. Specified diameter of the individual Al & Steel strands	Failed
3	Ultimate Breaking Load (Whole conductor & individual Aluminium Strands also)	Conductor strength found (114.25kN) way below the minm. UTS requirement of 130.32kN	Failed
4	DC Resistance test	Average value of resistance observed (0.12846 ohm/KM) is way above the Max. allowable DC resistance (0.06868 ohm/KM) of conductor as per TS.	Failed

Standard technical specifications for ACSR conductors is attached at **Annex B.7.2**

In addition, POWERGRID ER-II has also conducted detailed field survey at Alipurduar, Birpara, Binaguri, Dalkhola & Malda Transmission Line maintenance offices entrusted for maintenance of those lines. From the survey report, it is evident that condition of conductor & earth-wire in 220kV Lines under CTS have really deteriorated resulting in repeated conductor & earth-wire snapping incidents which is causing untoward line trippings as well as chances of any major accident cannot be ruled out in future.

Considering the increase in conductor & earth-wire snapping, it is proposed to consider the re-conductoring of 220kV Lines commissioned under CTS under the ADDCAP 2024-2029 tariff block of Chukha Transmission System.

POWERGRID ER-II may update. Members may discuss.

2.8 Discrepancy regarding resolution of availability declaration data on WBES portal-JITPL

Jindal India Thermal Power Limited (JITPL) has 2x600 MW thermal power plant located in the village of Derang, District Angul, State Odisha.

As per IEGC Regulations, 2023 Clause 49 (vi) the availability declaration by regional entity generating station shall have a resolution of two decimal (0.01) MW and three decimal (0.001) MWh but still the availability declaration by regional entity generating station is showing a resolution of six decimal in MW and MWh on WBES portal Full Schedule and at the same portal in GNA report the availability declaration by regional entity generating station is showing a resolution of two decimal in MW and resolution of six decimal in MWh due to this mismatch

in availability declaration it is very confusing that what schedule to be considered for the purposes of scheduling, accounting and billing.

In this regard, it is requested to kindly consider the same resolution of two decimal in MW and three decimal in MWh as per IEGC Regulations, 2023 in every report uploaded on WBES portal for the purposes of scheduling, accounting and billing.

JITPL and ERLDC may update. Members may discuss.

2.9 Implementation of SPS for LILO arrangement/Power evacuation of 350 MW - IBEUL

With reference to 209th OCC meeting held on 23.11.2023, it has been decided that line loading of each circuit of D/C 400 kV OPGC-Lapanga line will be restricted upto 1000 MW and accordingly SPS to be designed for power evacuation of 350 MW through LILO connection with one circuit of OPGC-Sundergarh 400 kV line, while mentioned as 1000 MVA in MOM.

Also, ERPC is requested vide mail dated 27.11.2023 on observation on SPS logic,that in place of alarm triggering and unit tripping on MW signal,it should be considered on basis of current signal as there may be constraint in relay for MW signal. Tripping on MW or current logic can be finalized after engineering to be carried out considering available installed relay at OPGC end.

In this regard, OPGC is requested by IBEUL vide letter no.IBEUL/23-24/0184 dtd 08.12.2023 for providing data of 400 kV Lapanga line and other data required for LILO connection.

OCC is requested to intervene in this matter to facilitate requisite support from OPGC as well as getting access to OPGC end for SPS implementation.

IBEUL may update. Members may discuss.

2.10 Proposed shutdown of both circuits of OPGC-Sundergarh line for LILO connection of Ind Barath 350 MW unit -IBEUL

Ind Barath is in advance stage of its LILO agreement with CTU and subsequent approval from CEIG and ERLDC for the first time charging and may be ready for physical connection in January (any day).

So it has been proposed for shutdown of both circuits of OPGC-Sundergarh for LILO connection of Ind Barath both circuit with OPGC-Sundergarh Circuit#2. After physical connection, OPGC-Sundergarh Circuit#1 may be charged while circuit#2 may be kept off for protection testing.

The proposed shutdown duration is as per below:

OPGC-Sundergarh Circuit#1 & 2	2 days
OPGC-Sundergarh Circuit#2	7 days

Presently, exact shutdown date could not be provided but OCC is requested to consider shutdown of OPGC-Sundergarh line in January and it is assured that Ind- Barath may submit shutdown request at least 7 days before availing the same.

IBEUL may update. Members may discuss.

2.11 Reactive capability assessment- ERLDC

As per IEGC 2023 39.3

All generating stations connected to the grid shall generate or absorb reactive power as per instructions of the concerned RLDC or SLDC, as the case may be, within the capability limits of the respective generating units, where capability limits shall be as specified by the OEM.

Periodic testing is mandated by **IEGC 2023 clause no 40.2(c) and** The tests shall be performed once every five (5) years or whenever major retrofitting is done. **If any adverse performance is observed during any grid event, then the tests shall be carried out even earlier, if so advised by SLDC or RLDC or NLDC or RPC, as the case may be.**

Suitable extract of testing requirement for synchronous generators are mentioned below,

Power System Elements	Tests	Applicability
Synchronous Generator	(1) Real and Reactive Power Capability assessment. (2) Assessment of Reactive Power Control Capability as per CEA Technical Standards for Connectivity (3) Model Validation and verification test for the complete Generator and Excitation System model including PSS. (4) Model Validation and verification of Turbine/Governor and Load Control or Active Power/ Frequency Control Functions. (5) Testing of Governor performance and Automatic Generation Control.	Individual Unit of rating 100MW and above for Coal/lignite, 50MW and above gas turbine and 25 MW and above for Hydro.

As discussed in winter preparedness meeting on 30 November 2023 and based on the performance the list of non-performing units for reactive support is mentioned below which should take corrective measures to provide suitable reactive support as per capability curve .Not fulfilling the same units may have to go under revised **reactive capability assessment as per IEGC Clause 40.2(C).**

1. **JITPL Unit 1& 2 ,600MW Each**
2. **Mejia B Unit 7&8 ,500Mw Each**
3. **BRBCL Units 2&3 , 250 Mw each**
4. **NPGC Unit 1, 660 MW**
5. **Kolaghat Units , 210 MW Each**

ERLDC may update. Members may discuss.

2.12 Furnishing of data for various studies mandated under IEGC 2023-ERLDC

As per IEGC 2023, various studies are mandated to be done at SLDC/RLDC and NLDC levels. They broadly comprise of **operational planning studies, interconnection studies and transfer capability assessment studies.**

As per IEGC 2023 Clause no 31, **Operational planning** shall be carried out in advance by NLDC, RLDCs and SLDCs within their respective control areas in various timelines ranging from monthly and yearly time horizons in co-ordination with CTU, RPCs or STUs, to Intra-day, Day Ahead, Weekly time horizons. Methodology of carrying out such studies has been described under section 2.4 of Operating procedures for Eastern region. The roles and timelines are again reproduced in the **Annexure B.12.1**.

Interconnection study is to be performed at SLDC, RLDC and NLDC level which involves analyzing the impact of all elements to be commissioned within six months on a rolling basis each month and evaluating the impact these elements on the transfer capability of import/export of state, at interstate, intra and inter regional levels. '**Procedure for carrying Out Inter-Connection Studies of New Power System Elements**' published by Grid-India in September,2023, lays down the guidelines for data submission and performing the interconnection studies for new power system elements to be integrated into the Indian grid. All Users ,which may include, Concerned Transmission Licensee (s)/ Settlement Nodal Agency (SNA), ISTS Licensee, Intra- state (In STS) Licensee through SLDC, Generation Entity/ Load Serving Entity / Connectivity Grantee responsible for providing the necessary data for first time integration of elements shall furnish the information each month on a rolling basis The format specified for submitting the data is given at **Annexure-I** of the **interconnection procedure** mentioned. The necessary technical and modelling data of all the elements expected to be energized in the "M" month shall be submitted as per the formats specified in Grid-India/NLDC's procedure for ***"First Time Charging /Energization (FTC) an Integration of New or Modified Power System Element"***, as amended from time to time, for carrying out the necessary studies.

The role specified for SLDCs, RLDCs and NLDC after receipt of the above data is taken from the above mentioned **Interconnection procedure** and **Procedure for transfer capability capability assessment methodology** ,both published by Grid India in September 2023. Respective SLDC, in consultation with respective RLDC and STU, shall carry out a joint study on the impact of new elements to be energized in the intra-state system within its jurisdiction in the next six (6) months and shall share the results with the concerned RLDC. Respective

RLDC, in consultation with concerned SLDCs, STUs, NLDC and CTU, shall carry similar joint study in (a) the ISTS of the region and (b) the intra-state system on the inter-state system and shall share the results of the studies with NLDC while NLDC shall carry out similar study on the impact of new for (a) inter-regional system, (b) cross-border links and (c) intra-regional system on the inter-regional system and share the results with the RLDCs/SLDCs. The overall workflow with timelines at M-7th and M-6th month for month M are shown in **Annexure B.12.2**. **Item NO. B.23 and annexure B.23 of 208th OCC** briefly touched upon these aspects.

On 208th OCC, under ITEM NO. B.22, the commencement of twelve month ahead transfer capability assessment as mandated by IEGC 2023 was intimated. The requirement of base case submission by SLDC to RLDC and assessing of transfer capability (TTC/ATC) and sharing its results, on a rolling basis, were introduced in three separate sets of timelines which are

1) twelve month in advance with elements already commissioned,

2) Review of the above case one month ahead with updation of elements commissioned .

3) six month ahead including the upcoming elements considered for interconnection study

The aspects of TTC assessment for six month (3rd point)ahead are already covered in the interconnection study itself. The timeline for 1st and 2nd point are reproduced in **Annexure B.12.3** and **Annexure B.12.4.**

Previously , all state planning agencies(STUs) and SLDCs were requested to furnish data on an email dated 6th September,2023 for facilitation of transfer capability assessment and interconnection study as per the timelines above. A separate email to ISTS licensees and regional generation entities has also been sent on 17th November. However, so far no inputs in form of raw data of upcoming elements, modelling such data for base case, sharing of study results of their impact in transfer capability , or even case incorporating twelve month ahead LGBR and their transfer capability has been received from concerned agencies involved. In this context, it is requested to share these data at the earliest and then on a rolling basis every month as per the timelines mentioned above such that relevant provisions in IEGC are complied. The given timelines can also be found in 'Procedure for Transfer Capability Assessment Methodology', 'Procedure for carrying Out Inter-Connection Studies of New Power System Elements' published by Grid India on September 2023.

ERLDC may update. Members may discuss.

2.13 Review of UFR setting- ERLDC

As per the IEGC 2023 Following to be adhered with respect to UFR.

The following shall be factored in while designing and implementing the UFR and df/dt relay schemes:

a) The under-frequency and df/dt load shedding relays are always functional.
b) Demand disconnection shall not be set **with any time delay in addition to the operating time** of the relays and circuit breakers.

c) There shall be **a uniform spatial spread of feeders selected for UFR and df/dt disconnection**.

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.

e) 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 72 inform the respective RLDC and RPC, failing which suitable action may be initiated by the respective RPC.

f) RPC shall undertake a monthly review of the UFR and df/dt scheme and also carry out random inspection of the under-frequency relays. RPC shall publish such a monthly review along with an exception report on its website.

g) SLDC shall report the actual operation of UFR and df/dt schemes and load relief to the concerned RLDCs and RPCs and publish the monthly report on its website.

The load shedding for each stage of UFR operation, in percentage of demand or MW shall be as finalised by the respective RPCs.

- In 10th NPC meeting it was finalized that **Total 25% relief to be planned in all 4 stages-49.4 Hz, 49.2 Hz, 49.0 Hz & 48.8 Hz.**
- Percentage of UFR installed with respect to all time highest demand met is calculated. For Bihar it seems very low for other states also it may be reviewed.
- Based on the last event of Under frequency operation and in view of the implementation of IEGC 2023 from 01st October. State wise UFR status, additional intentional time delay other than the measurement delay, Relay type has been collected and compiled with major observations as shown below in the table which needs to be rectified as mandated in IEGC-2023.

State	STG-I/49.4	STG-II/49.2	STG-III/49	STG-IV/48.8	Total	Maximum Demand Met	Percentage load relief by UFR(%)	Remarks
DVC	122	145	147	138	552	3751	**14.7**	100 Ms Intentional delay, All are Numerical relay
BIHAR	84.5	104.5	133	82.5	404.5	7578	**5.3**	Uneven stage wise distribution, No intentional delay but mostly Static relay

WEST BENGAL	381	374	390	386	1531	11868	**12.9**	200 Ms Intentional Delay, with mostly Numerical type.
ODHISHA	183	184	184	186	737	7192	**10.2**	No time delay with mostly numerical type.
JHARKHAND	70	69	45	79	263	1923	**13.7**	Uneven stage wise distribution, No intentional delay with all numerical relays.
CESC	65	90	125	120	400	2606	**15.349 19417**	
SikkiM	**No UFR Installed**							

- Percentage of UFR installed with respect to all time highest demand met is calculated. **For Bihar it seems very low for other states also it may be reviewed.**
- **Intentional Delay as observed should be removed as mandated in IEGC.**
- **Distribution of UFR quantun should also be uniform in each stage which is not for Bihar ,CESC.**
-

ERLDC may update. Members may discuss.

3. PART-C: ITEMS FOR UPDATE/FOLLOW-UP

3.1. ER Grid performance during October 2023.

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

AVERAGE CONSUMPTION (MU)	MAXIMUM CONSUMPTION(MU)/ DATE	MAXIMUM DEMAND (MW)	MINIMUM DEMAND (MW)	SCHEDULE EXPORT	ACTUAL EXPORT
		DATE/TIME	DATE/TIME	(MU)	(MU)
432 MU	482 MU 02.11.2023	23216 MW, 02.11.2023 at 17:54 Hrs.	15135 MW, 27.11.2023 at 02:56 Hrs.	5026	5647

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

3.2. Ensuring the healthiness of ADMS

State	Criteria for ADMS operation	Number of instances for which ADMS criteria satisfied	Number of instances for which detail received	Discussion regarding previous month performance	Update in 209th OCC meeting
West Bengal	1. System Frequency < 49.7 Hz 2. WB over-drawl > 150 MW 3. Delay = 4 min	0	-	-	-
Jharkhand	1. System Frequency < 49.9 Hz 2. Jharkahnd over-drawl > 25 MW 3. Delay = 3 min	117	Nil	-	-
DVC	1. System Frequency < 49.9 Hz	10	Nil	-	-

	2. DVC over-drawl > 150 MW 3. Delay = 3 min				
Odisha	1. System Frequency < 49.9 Hz 2. Odisha over-drawl > 150 MW 3. Delay = 3 min	11	Nil	-	-

Members may note.

3.3. Commissioning status of ADMS

Automatic demand management scheme (ADMS) has been already commissioned in West Bengal, DVC, Odisha and Jharkhand. However for Bihar it is yet to be implemented, the last status as confirmed in the earlier meeting is as follows.

Sl No	State/Utility	Logic for ADMS operation	Target Date
1	Bihar	F <49.7 AND deviation > 12 % or 150 MW	

Bihar may update the status of the implementation of ADMS scheme.

Members may note.

3.4. Primary frequency response of generating units in ER

The availability of sufficient primary frequency response is one of the fundamental requirement of power system operation not only from reliability point of view but also from regulatory compliance point of view. Based on the assessed FRC re-testing of primary frequency response can be recommended. Therefore, the accurate and high-resolution data from generator end is extremely important in absence of which assessment of FRC is done as per low resolution ERLDC SCADA data. The plant wise data submission statistic for frequency event flagged by ERLDC upto 30.11.2023 is given below:

STATIONS	20.12.2022	12.01.2023	14.01.2023				17.01.2023	09.02.2023		16.03.2023	28.03.2023	01.05.2023	15.05.2023	28.06.2023	20.07.2023	31.07.2023	06.08.2023
	06:48	05:52	12:06	13:03	14:55	15:18	09:56	11:45	12:29	09:16	10:37	13:23	11:51	02:28	13:53	10:36	09:48
ADHUNIK																	
BARH																	
BRBCL																	
DARLIPALLI																	
DIKCHU																	
FARAKKA																	
GMR																	
JITPL																	
KAHALGAON																	
MPL																	
NPGC																	
TALCHER																	
TEESTA III																	
TEESTA V																	
North Karanpura	Not Applicable																

4. PART-D: OPERATIONAL PLANNING

4.1. Anticipated power supply position during January 2023

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

Members may update.

4.2. Major Thermal Generating Units/Transmission Element outages/shutdown in ER Grid (as on 12-12-2023)

a) Thermal Generating Stations outage report:

S.No	Station	Fuel	State	Agency	Unit No	Capacity	Reason(s)	Outage
1	KHSTPP	COAL	BIHAR	NTPC	4	210	Annual Overhauling	01-Dec-2023
2	NABINAGAR (BRBCL)	COAL	BIHAR	NTPC	1	250	Annual Overhauling	01-Dec-2023
3	KBUNL	COAL	BIHAR	NTPC, BSPHCL	1	195	Due Flame failure, later unit taken under annual overhauling for 45 days	30-Nov-2023
4	FSTPP	COAL	WEST BENGAL	NTPC	3	200	Initially the unit was out due to RSD. Later, from 00:00 Hrs of 01-12-2023 the unit was taken under annual overhauling.	30-Nov-2023
5	BARH	COAL	BIHAR	NTPC	1	660	Initially the unit was out due to Boiler Tube Leakage. Later, from 00:00 Hrs of 24-11-2023 the unit was taken under annual overhauling.	19-Nov-2023
6	DSTPS	COAL	DVC	DVC	1	500	FGD related work	10-Dec-2023
7	BAKRESHWAR	COAL	WEST BENGAL	WBPDCL	2	210	For Overhauling Purpose	08-Dec-2023
8	HALDIA ENERGY LTD	COAL	WEST BENGAL	HEL,CESC	1	300	For Overhauling & De-NOx modification activities	02-Dec-2023
9	SAGARDIGHI	COAL	WEST BENGAL	WBPDCL	3	500	For Overhauling Purpose	23-Nov-2023
10	ADHUNIK	COAL	JHARKHAND	APNRL	1	270	Ash evacuation issue	11-Dec-2023
11	Sterlite	COAL	ODISHA	SEL	1	600	Due to Ash Handling Plant problem	11-Dec-2023
12	TENUGHAT	COAL	JHARKHAND	TVNL	2	210	BOILER TUBE LEAKAGE	10-Dec-2023
13	OPGC3	COAL	ODISHA	OPGC	3	660	Leakage in Ash slurry discharge pipe	10-Dec-2023
14	OPGC	COAL	ODISHA	OPGC	4	660	Leakage in Ash slurry discharge pipe	10-Dec-2023
15	DPL	COAL	WEST BENGAL	WBPDCL	8	250	problem in the turbine gland sealing.	25-Nov-2023

16	BARAUNI TPS	COAL	BIHAR	NTPC	8	250	Boiler tube leakage later generator hydrogen leakage detected	25-Nov-2023
17	BARAUNI TPS	COAL	BIHAR	NTPC	6	110	Low vacuum	22-Jul-2023
18	BARAUNI TPS	COAL	BIHAR	NTPC	7	110	Poor condenser vacuum	19-Jul-2023

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

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

S.No	Station	Fuel	State	Agency	Unit No	Capacity	Reason(s)	Outage
1	BARH	COAL	BIHAR	NTPC	5	660	Reserve shutdown	01-Dec-2023
2	MEJIA TPS	COAL	DVC	DVC	1	210	Reserve shutdown	02-Dec-2023
3	SOUTHERN	COAL	WEST BENGAL	CESC	1	67.5	Reserve Shutdown	29-Nov-2023

c) Hydro Unit Outage Report:

S.No	Station	Fuel	State	Agency	Unit No	Capacity	Reason(s)	Outage
1	INDRAVATI	HYDRO	ODISHA	OHPC	2	150	Capital Maintenance	23-Nov-2023
2	RENGALI HPS	HYDRO	ODISHA	OHPC	1	50	Annual maintenance work	15-Nov-2023
3	BALIMELA HPS	HYDRO	ODISHA	OHPC	4	60	The unit taken out under R&M since 08/07/2022 for 18 months.	08-Jul-2022
4	BALIMELA HPS	HYDRO	ODISHA	OHPC	3	60	The unit taken out under R&M since 08/07/2022 for 18 months.	08-Jul-2022
5	TEESTA HPS	HYDRO	SIKKIM	NHPC	1	170	Sudden cloudburst at glacier fed LOHNAK Lake followed by huge inrush of water in Teesta river and damage of Teesta III Dam & downstream Powerhouses	04-Oct-2023
6	TEESTA HPS	HYDRO	SIKKIM	NHPC	2	170		
7	TEESTA HPS	HYDRO	SIKKIM	NHPC	3	170		
8	DIKCHU Hep	HYDRO	SIKKIM	SKPPL	1	48		
9	DIKCHU Hep	HYDRO	SIKKIM	SKPPL	2	48		
10	TEESTA STG III Hep	HYDRO	SIKKIM	TUL	1	200		
11	TEESTA STG III Hep	HYDRO	SIKKIM	TUL	2	200		
12	TEESTA STG III Hep	HYDRO	SIKKIM	TUL	3	200		

13	TEESTA STG III Hep	HYDRO	SIKKIM	TUL	4	200		
14	TEESTA STG III Hep	HYDRO	SIKKIM	TUL	5	200		
15	TEESTA STG III Hep	HYDRO	SIKKIM	TUL	6	200		
16	TLDP	HYDRO	WEST BENGAL	WBPDCL	1	33		
17	TLDP	HYDRO	WEST BENGAL	WBPDCL	2	33		
18	TLDP	HYDRO	WEST BENGAL	WBPDCL	3	33		
19	TLDP	HYDRO	WEST BENGAL	WBPDCL	4	33		
20	U.KOLAB	HYDRO	ODISHA	OHPC	2	80	Rotar earth Fault	25-Aug-2023

d) Long outage report of transmission lines (As on 05.12.2023):

Transmission Element / ICT	Outage From	Reasons for Outage
400 KV IBEUL JHARSUGUDA D/C	29.04.2018	As information gathered, around 40-50 nos of towers were collapsed and conductor theft more than 400Ckm and restoration work is in progress. Interim arrangement/Power evacuation of IBEUL(2 x350MW) by LILOing between OPGC and ISTS Jharsuguda (one ckt) approved. Deadline for construction of 400KV IBEUL -Jh'da set as 30-03-2024.
220/132KV 100 MVA ICT II AT LALMATIA	22.01.2019	Commissioning work of 220/132KV, 100MVA Transformer and its associated control Panel under progress.
220 KV PANDIABILI - SAMANGARA D/C	03.05.2019	Tower Collapsed during Cyclone FANI (Restoration project is entrusted upon PGCIL & 220kV Samangara-Pandiabili ckt-I&II are anti-theft charged from Pandiabili end from loc no.01 to loc no.74)
220/132KV 100 MVA ICT 3 AT CHANDIL	30.04.2020	Due to Fire hazard ICT damaged and burnt.
400/220KV 315 MVA ICT 4 AT JEERAT	09.04.2021	Due to Fire hazard ICT damaged and burnt. It was decided that 315MVA, 400/220KV spare ICT from Regional Pool at Malda to be replaced in place of defective 315 MVA ICT (4th) at Jeerat 400 KV S/S(WB).Work under progress.

220KV-FSTPP-LALMATIA-I	21.04.2021	Conductor stringing 12.965 km has been completed and Stringing between Tower Loc. no. 152 to 159 is under progress. Transmission line is idle charged between Lalmatia GSS end to Tower Loc.no.169
220KV-MUZAFFARPUR(PG)-GORAUL(BH)-1	11.06.2022	Main Bay is under breakdown due to flashing in GIS module
220KV-WARIA-BIDHANNAGAR-1 & 2	08.06.2022	To control overloading of 220 kV Waria-DSTPS (Andal) D/C line
400/220KV 315 MVA ICT 2 AT PATRATU	27.09.2022	ICT tripped on few occasions due to Buchholz later DGA violation found, internal fault in transformer to be rectified. (DGA violation)
132KV-BARHI-RAJGIR-1	25.03.2023	Dismantling of tower no. 227, 228, and 229 crossing the premises of Mahabodhi Cultural centre along with Destringing of conductor of both circuits and Earthwire between tension tower no. 218-237 in same line.
132KV-NALANDA-BARHI(DVC)-1	25.03.2023	
220KV-TSTPP-MEERAMUNDALI-2	10.06.2023	Tower collapse at loc no 41, 42 (from Meramundali end). Ckt1 charged through ERS.
400KV-KHSTPP-BARH-1	04.08.2023	Upgradation of Bay equipments at KHSTPP
400KV/220KV 315 MVA ICT 3 AT BIDHANNAGAR	31.08.2023	For jumpering of 220 kV dropper from strung bus at 315MVA ICT-3. 220KV side Bay of said ICT is under construction at Bidhannagar.
400KV-RANGPO-TEESTA-V-1 & 2	04.10.2023	Tower near gantry of Teesta V powerhouse collapsed due to sudden cloudburst at glacier fed LOHNAK Lake followed by huge inrush of water in TEESTA river and damage of Teesta III Dam & downstream Powerhouses
400KV-TEESTA-III-RANGPO-1	04.10.2023	Hand tripped from Teesta-III end due to sudden cloudburst at glacier fed LOHNAK Lake followed by huge inrush of water in TEESTA river and damage of Teesta III Dam & downstream Powerhouses
400KV-TEESTA-III-DIKCHU-1	04.10.2023	
400KV-RANGPO-DIKCHU-1	04.10.2023	Hand tripped from Rangpo end due to sudden cloudburst at glacier fed LOHNAK Lake followed by huge inrush of water in

		TEESTA river and damage of Teesta III Dam & downstream Powerhouses
400KV JHARSUGUDA-ROURKELA-1 &3	26.10.2023	Reconductoring work
400KV-BINAGURI-BONGAIGAON-2	27.10.2023	Reconductoring work
400KV/220KV 315 MVA ICT 2 AT MTPS-B	20.11.2023	BPI, LA, ISOLATOR Foundation civil work activities near ICT#02
400KV-KISHANGANJ-NEW PURNEA-1 & 2	17.11.2023	To facilitate the Re-routing Pile project at new pile loc no 340 & 366
400KV PATNA-BALIA-1 & 2	22.11.2023	Diversion work under consultancy services to RVNL
400KV NEW PPSP-ARAMBAGH-1	22.11.2023	Initially on voltage regulation and then rectification of Tie bay (Under Breakdown since 30.12.2022) at New PSSP
220KV DEHRI-GAYA-1	25.11.2023	Conductor re-sagging work.
220KV/132KV 100 MVA ICT 2 AT RANGPO	28.11.2023	SF6 gas leakage rectification
220KV/132KV 160 MVA ICT 2 AT MALDA	30.11.2023	For shifting of the ICT- 2 from 132KV AIS to GIS
400KV-ALIPURDUAR (PG)-JIGMELLING-1	02-12-2023	SCADA rectification work at Jigmelling

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

4.3. Commissioning of new units and transmission elements in Eastern Grid in the month of November-2023.

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

NEW ELEMENTS COMMISSIONED DURING NOVEMBER, 2023							
GENERATING UNITS							
SL. NO.	**Location**	**OWNER/**	**Unit No/**	**Capacity**	**Total/**	**DATE**	**Remarks**

		UNIT NAME	Source	added (MW)	Installed Capacity (MW)		
1	Jharkhand	NORTH KARANPURA-UNIT 2	2	660	1320	11.09.2023	Unit#2 Synchronised on 09/11/2023 at 07:02 Hrs along with Generating transformer 2 and Bay No-413

ICTs/ GTs / STs

SL. NO.	Agency/ Owner	SUB-STATION	ICT NO	Voltage Level (kV)	CAPACITY (MVA)	DATE	Remarks
1	NTPC	NORTH KARANPURA	GT-02	242.48/21	265	11.09.2023	
2	PGCIL	MALDA(PG)	ICT-1	220/132	160	20.11.2023	Code issued for 220/132 kV ICT - 1 at Malda (out since 04/01/2023 for 132KV GIS Commissioning work (GIB erection of ICT-I)) and 132 kV main bus 1 at Malda

TRANSMISSION LINES

SL. NO.	Agency/ Owner	LINE NAME	Length (KM)	Conductor Type	DATE	Remarks
1	BSPTCL	220KV MUZAFFARPUR(PG)-AMNOUR-1	65.4	ACSR Zebra	11.07.2023	

LILO/RE-ARRANGEMENT OF TRANSMISSION LINES

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

BUS/LINE REACTORS

SL. NO.	Agency/ Owner	Element Name	SUB-STATION	Voltage Level (kV)	DATE	Remarks
1	WBSETCL	125MVAR 400KV B/R-1 AT NEW CHANDITALA	NEW CHANDITALA	400	11.09.2023	

HVDC /AC Filter bank / FACTS DEVICE associated System

SL. NO.	Agency/ Owner	Element Name	SUB-STATION	Voltage Level (kV)	DATE	Remarks
NIL						
BAYS						
SL. NO.	**Agency/ Owner**	**Element Name**	**SUB-STATION**	**Voltage Level (kV)**	**DATE**	**Remarks**
1	PGCIL	132KV MAIN BUS - 1 AT MALDA(PG)	MALDA(PG)	132	20.11.2023	132 KV Main Bus-I through ICT-I Bay (101). After charging 132 KV Bus voltage shall be available through Bus VT (Bus-I)
2	PGCIL	132KV MAIN BUS - 2 AT MALDA(PG)	MALDA(PG)	132	20.11.2023	
3	JUSNL	220KV MAIN BAY OF 315 MVA ICT -1(Bay No-205) AT LATEHAR(JUSNL)	LATEHAR (JUSNL)	220	30.11.2023	
4	NTPC NORTH KARANPURA	MAIN BAY OF GT-2(Bay No-413) NORTH KARANPURA UNIT -2	NTPC NORTH KARANPURA	400	11.09.2023	
5	PGCIL	ICT-1 Bay (Bay No-101) at MALDA(PG)	MALDA(PG)	132	20.11.2023	
6	PGCIL	ICT-4 Bay (Bay No-106) at MALDA(PG)	MALDA(PG)	132	26.11.2023	

Members may note.

4.4. UFR operation during the month of November 2023.

Frequency profile for the month as follows:

MONTH	MAX (DATE/TIME)	MIN (DATE/TIME)	% LESS IEGC BAND	% WITHIN IEGC BAND	% MORE IEGC BAND
Nov, 2023	50.39 Hz on 27-11-2023 at 00:02 hrs	49.55 Hz on 25-11-2023 at 14:17 hrs	6.8	74.4	18.8

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

Members may note.

****

Annexure B.2

ANNEXURE

Details of Under Construction Central Sector Thermal Capacity Addition Target (Financial Year Wise)						
S.No	**Project Name/ Impl. Agency**	**Sector**	**State**	**Unit No.**	**Capacity (MW)**	**Anticipated Trial Run Date**
F Y. 2023-24						
1	Telangana STPP, St-I (NTPC)	CENTRAL	Telangana	U-2	800	Nov-23
2	North Karanpura STPP (NTPC)	CENTRAL	Jharkhand	U-2	660	
3	Ghatampur TPP (NUPPL)	CENTRAL	Uttar Pradesh	U-1	660	
4	Ghatampur TPP (NUPPL)	CENTRAL	Uttar Pradesh	U-2	660	Feb-24
5	Khurja SCTPP (THDC)	CENTRAL	Uttar Pradesh	U-1	660	
6	Buxar TPP (SJVN)	CENTRAL	Bihar	U-1	660	Mar-24
				Sub-Total (FY 2023-24)	**4100**	
F Y. 2024-25						
1	Ghatampur TPP (NUPPL)	CENTRAL	Uttar Pradesh	U-3	660	May-24
2	North Karanpura STPP(NTPC)	CENTRAL	Jharkhand	U-3	660	Jun-24
3	Buxar TPP (SJVN)	CENTRAL	Bihar	U-2	660	Jul-24
4	Patratu STPP (PVUNL)	CENTRAL	Jharkhand	U-1	800	
5	Barh STPP St-I (NTPC)	CENTRAL	Bihar	U-3	660	Aug-24
6	Khurja SCTPP (THDC)	CENTRAL	Uttar Pradesh	U-2	660	
7	Patratu STPP (PVUNL)	CENTRAL	Jharkhand	U-2	800	Dec-24
				Sub-Total (FY 2024-25)	**4900**	
F Y. 2025-26						
1	Patratu STPP (PVUNL)	CENTRAL	Jharkhand	U-3	800	May-25
				Sub-Total (FY 2025-26)	**800**	
F Y. 2026-27						
1	Talcher TPP St-III (NTPC)	CENTRAL	Odisha	U-1	660	Nov-26
				Sub-Total (FY 2026-27)	**660**	
F Y. 2027-28						
1	Talcher TPP St-III (NTPC)	CENTRAL	Odisha	U-2	660	May-27
2	Lara STPP St-II (NTPC)	CENTRAL	Chhattisgarh	U-1	800	Dec-27
				Sub-Total (FY 2027-28)	**1460**	
F Y. 2028-29						
1	Lara STPP St-II (NTPC)	CENTRAL	Chhattisgarh	U-2	800	Jun-28
				Sub-Total (FY 2028-29)	**800**	
Grand Total					**12720**	

Details of Central Sector Candidate Thermal Power Plants expected to be commissioned by 2030					
Sl.	**Name Of Project**	**Sector**	**Developer**	**Capacity in MW**	**State**
1	Singrauli STPP-III	Central	NTPC	2x800=1600	Uttar Pradesh
2	Darlipalli-II			1x800=800	Odisha
3	Sipat-III			1x800=800	Chhattisgarh
4	TPS-II 2nd Expansion	Central	NLCIL	2x660=1320	Tamil Nadu
5	NLC Talabira STPS			3x800=2400	Odisha
6	Raghunathpur TPS, PH-II	Central	DVC	2x660=1320	West Bengal
7	Durgapaur TPS			1x800=800	West Bengal
8	Koderma TPS			2x800=1600	Jharkhand
9	Chandrapura Extn TPS			1x800=800	Jharkhand
10	Meja-II	Central	U.P. - NTPC-JV	3x800=2400	Uttar Pradesh
11	Obra Extn			2x800=1600	Uttar Pradesh
12	Buxar TPP-II	Central	SJVN	1x660=660	Bihar
TOTAL				**31010**	

Details of Central Sector Additional Identified Candidate Thermal Power Plants					
Sl.	**Name Of Project**	**Sector**	**Developer**	**Capacity in MW**	**State**
1	Telangana Stage II	Central	NTPC	2400	Telangana
2	New Nabi Nagar	Central	NTPC	2400	Bihar
3	Patratu Stage II	Central	NTPC	1600	Jharkhand
4	Gadarwara Stage II	Central	NTPC	1600	Madhya Pradesh
5	Anpara E	Central	NTPC-UP-JV	1600	Uttar Pradesh
6	NLC Talabira STPS	Central	NLCIL	800	Tamil Nadu
7	Mahanadi Basin Power	Central	MCL	1600	Odisha
TOTAL				**12000**	

Total Central Sector Thermal Capacity Addition Target	55730 MW

Details of Central Sector Under Construction Hydro Capacity Addition Target (Financial Year Wise)						
S.No	**Project Name/ Impl. Agency**	**Sector**	**State**	**Unit No.**	**Capacity (MW)**	**Anticipated Trial Run Date**
F Y. 2023-24						
1	SUBANSIRI LOWER /NHPC	Central	Arunachal Pradesh	U-1 to 2	500	June'2024
2	Naitwar Mori /SJVN	Central	Uttarakhand	U-1 to 2	60	Oct'2023
				Sub-Total (FY 2023-24)	**560**	
F Y. 2024-25						
1	Rangit-IV/NHPC	Central	Sikkim	U-1 to 3	120	Aug'2024
2	SUBANSIRI LOWER /NHPC	Central	Arunachal Pradesh	U-3 to 6	1000	Mar'2025
3	Parbati-II /NHPC	Central	Himachal Pradesh	U-1 to 4	800	Jun'2024
4	Tehri PSS/THDC	Central	Uttarakhand	U-1 to 4	1000	Sept'2024
				Sub-Total (FY 2024-25)	**2920**	
F Y. 2025-26						
1	Kiru /CVPPL	Central	Jammu & Kashmir	U-1 to 4	624	Mar'2026
2	SUBANSIRI LOWER /NHPC	Central	Arunachal Pradesh	U-7 to 8	500	May'2025
3	Luhri-I /SJVN	Central	Himachal Pradesh	U-1 to 4	210	Jan'2026
4	Dhaulasidh /SJVN	Central	Himachal Pradesh	U-1 to 2	66	Nov'2025
5	Tapovan Vishnugad /NTPC	Central	Uttarakhand	U-1 to 4	520	Dec'2025
6	Polavaram / Polavaram Project Authority	State	Andhra Pradesh	U-5 to 12	640	Mar'2026
7	Shahpurkandi /PSPCL	State	Punjab	U-1 to 7	206	Oct'2025
8	Lower Sileru Extension /APGENCO)	State	Andhra Pradesh	U-1 to 2	230	Mar'2026
9	Kutehr/JSW	Private	Himachal Pradesh	U-1 to 3	240	Nov'2025
				Sub-Total (FY 2025-26)	**3236**	
F Y. 2026-27						
1	Kwar/CVPPL	Central	Jammu & Kashmir	U-1 to U-4	540	Nov'2026
2	Ratle / NHPC	Central	Jammu & Kashmir	U-1 to U-5	850	May'2026
3	Rammam - III / NTPC Ltd.	Central	West Bengal	U-1 to U-3	120	Sept'2026
4	Teesta- VI /NHPC	Central	Sikkim	U-1 to U-4	500	Aug'2026
5	Pakal Dul /CVPPL	Central	Jammu & Kashmir	U-1 to U-4	1000	Sept'2026
6	Vishnugad Pipalkoti /THDC	Central	Uttarakhand	U-1 to U-4	444	Jun'2026
				Sub-Total (FY 2026-27)	**3454**	
F Y. 2027-28						
1	Sunni Dam /SJVNL	Central	Himachal Pradesh	U-1 to U-6	382	Mar'2028
				Sub-Total (FY 2027-28)	**382**	
Grand Total					**10552**	

Details of Central Sector Under Planning Hydro Power Plants expected to be commissioned by 2030					
Sl.	**Name Of Project**	**Sector**	**Developer**	**Capacity in MW**	**State**
1	Uri-I Stage-II	Central	NHPC	240	J & K
2	Nafra	Central	NEEPCO	120	Arunachal Pradesh
3	Tato-I	Central	NEEPCO	186	Arunachal Pradesh
4	Heo	Central	NEEPCO	240	Arunachal Pradesh
5	Wah Umiam Stage-III (Mawphu stage-II)	Central	NEEPCO	85	Meghalaya
6	Kirthai-II	Central	CVPPL	930	J & K
7	Dugar	Central	NHPC	500	Himachal Pradesh
8	Dulhasti Stage-II	Central	NHPC	260	J & K
Total				**2561**	

Total Central Sector Hydro Capacity Addition Target	13113 MW

Total Capacity (thermal + Hydro) likely to be added by 2029-2030 under Central Sector	**68843 MW**

Annexure B.3.1

सत्यमेव जयते

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. CEA/TPRM/R&M/2023/1377–1408 **Dated** 03.11.2023

विषय:- Draft phasing plan of R&M/LE for identified coal based thermal units to be implemented– reg.

CEA has prepared a R&M guideline, 2023 and the same has been circulated by MoP to power utilities in the month of August,2023. Thereafter, CEA prepared a draft phasing plan ***of identified thermal units for R&M/LE*** till 2030 and the phasing plan was discussed in region wise meeting on 12.06.2023, 13.06.2023, 14.06.2023, 15.06.2023 and 16.06.2023 at CEA, Sewa Bhawan, New Delhi.

After incorporating suggestions/inputs received from all stakeholders, the phasing plan of R&M/LE for identified coal based thermal units has been suitably revised. The revised phasing plan is given in **Annexure-I**. It is therefore requested to provide inputs/comments on revised draft phasing plan of R&M/LE for identified coal based thermal units up to 2030, by 15.11.2023 positively.

03/11/2023

Pravir Kumar/(प्रवीर कुमार)
Director (TPRM)/निदेशक (टीपीआरएम)

To,

As per list.

Copy to:

1. Secretary (Power), MoP
2. Chairperson, CEA
3. Member (GO&D), CEA
4. Member (Thermal), CEA

To:

1. CMD, Grid Controller of India Limited
2. Member Secretary (ERPC/NRPC/WRPC/SERPC), CEA
3. CMD, NTPC Limited, NTPC Bhawan, SCOPE Complex, Institutional Area, Lodhi Road, New Delhi – 110003, (FAX NO.: 011 24361018), Email : cmd@ntpc.co.in
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5. The Chairman & Managing Director, PSPCL, The Mall,Patiala-147001 (FAX – 0175-2213199, Email: cmd.pspcl@gmail.com
6. Managing Director, UPRVUNL, UP Rajya Vidyut Utpadan Nigam, Shakti Bhawan, Ashok Marg, Lucknow. (Fax No. 0522-2237922), Email: md@uprvunl.org
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9. MD, Gujrat State Electricity Corpon. Ltd. (GSECL), Vidyut Bhavan, Race Course, Vadodara-390007 (Fax No. 0265-2337918/2338164), Email: md.gsecl@gebmail.com
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13. CMD, TSGENCO, Vidyut Saudha, Khaitrabad, Hyderabad-500082 (Fax-040-23499361), Email: cmd@tsgenco.co.in
14. CMD, TANGEDCO, NPKRR Maaligai, 144, Anna Salai, Chennai-60002 (Fax: 044-28521300), Email: chairman@tnebnet.org
15. Chief Engineer(Planning), HPGCL, Urja Bhawan, C-7, Sector-6, Panchkula, Haryana-134109 (Fax No. 0172-5022432)
16. CMD, Rajasthan Rajya Vidyut Utpadan Nigam Limited, Vidyut Bhawan , Jyoti Nagar, Janpath , Jaipur -302005 (Fax No. 0141 - 2740633), Email: cmd@rrvun.com
17. Managing Director, Orissa Power Generating Corp. Ltd., Zone A,7111 Floor,Fortune T.owers, Chandrashekharpur, Bhubaneshwar- 751 023 Fax.No. 0674-2303 755, Email : opgc2.leadership@opgc.co.in
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19. Managing Director, MSPGCL, Prakashgad , Plot No-G-9 ,Bandra(east), Mumbai-400051 Fax:02226581400, Email: md@mahagenco.in
20. Managing Director, Tenughat Vidyut Nigam Ltd .Hinoo, Doranda, Ranchi - 834002, Jharkhand, Fax 0651 -2507460, Email: info@tvnl.in
21. MD/CMD, JSW Centre, Bandra Kurla Complex, Near MMRDA Grounds, Bandra East,Mumbai 400 051 Fax: +91 22 4286 3000, Email: contact@jsw.in
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24. 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
25. CMD, CESC Limited , CESC House, Chowringhee Square, Kolkata - 70000 I, Phone:

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26. Director, Adani Power Limited, Achalraj, Opp Mayor Bungalow, Law Garden, Ahmedabad-380006 ,Gujarat, lndia.,Tel:+91 79 2555 7555,Fax:+91 79 25557177 Email: deepak.pandya@adani.com
27. CMD/MD, Taqa Neyveli Power Company Pvt Ltd, Uthangal, Tamil Nadu 607804, Email: raghu.nathan@taqaglobal.com
28. MD/CMD, Jindal Power Limited, Jindal Centre, 12, Bhikaiji Cama Place, New Delhi 110 066, India, Email: info@jindalpower.com

Annexure B.3.2

Annexure I

Phase I

Region	State	Sector	Developer	Organisation	Name of Project	Unit No	Capacity	Date of Commissioning
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	SINGRAULI STPS	1	200.00	2/14/1982
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	SINGRAULI STPS	2	200.00	11/25/1982
WR	Chhattisgarh	Central Sector	NTPC LIMITED	NTPC	KORBA STPS	1	200.00	2/28/1983
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	SINGRAULI STPS	3	200.00	3/28/1983
SR	Telangana	Central Sector	NTPC LIMITED	NTPC	RAMAGUNDEM STPS	1	200.00	10/27/1983
WR	Chhattisgarh	Central Sector	NTPC LIMITED	NTPC	KORBA STPS	2	200.00	10/31/1983
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	SINGRAULI STPS	4	200.00	11/2/1983
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	SINGRAULI STPS	5	200.00	2/26/1984
WR	Chhattisgarh	Central Sector	NTPC LIMITED	NTPC	KORBA STPS	3	200.00	3/17/1984
SR	Telangana	Central Sector	NTPC LIMITED	NTPC	RAMAGUNDEM STPS	2	200.00	5/29/1984
SR	Telangana	Central Sector	NTPC LIMITED	NTPC	RAMAGUNDEM STPS	3	200.00	12/13/1984
ER	West Bengal	Central Sector	NTPC LIMITED	NTPC	FARAKKA STPS	1	200.00	1/1/1986
					Sub Total	**12**	**2400.00**	
WR	Maharashtra	Private Sector	TATA POWER COMPANY LTD.	TATA PCL	TROMBAY TPS	**5**	**500.00**	1/25/1984
					Sub Total	**1**	**500.00**	
WR	Gujarat	State Sector	GUJARAT STATE ELECTRICITY CORPORATION LIMITED	GSECL	UKAI TPS	3	200.00	1/21/1979
WR	Maharashtra	State Sector	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	MAHAGENCO	NASIK TPS	3	210.00	4/26/1979
WR	Madhya Pradesh	State Sector	M. P. POWER GENERATING CORPORATION LIMITED	MPPGCL	SATPURA TPS	6	200.00	6/27/1979
SR	Tamil Nadu	State Sector	TAMIL NADU GENERATION & DISTRIBUTION CORP. LTD.	TANGEDCO	TUTICORIN TPS	1	210.00	7/9/1979
WR	Maharashtra	State Sector	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	MAHAGENCO	NASIK TPS	4	210.00	7/10/1980
WR	Madhya Pradesh	State Sector	M. P. POWER GENERATING CORPORATION LIMITED	MPPGCL	SATPURA TPS	7	210.00	9/20/1980
SR	Tamil Nadu	State Sector	TAMIL NADU GENERATION & DISTRIBUTION CORP. LTD.	TANGEDCO	TUTICORIN TPS	2	210.00	12/17/1980
WR	Gujarat	State Sector	GUJARAT STATE ELECTRICITY CORPORATION LIMITED	GSECL	WANAKBORI TPS	1	210.00	3/23/1982
SR	Tamil Nadu	State Sector	TAMIL NADU GENERATION & DISTRIBUTION CORP. LTD.	TANGEDCO	TUTICORIN TPS	3	210.00	4/16/1982
NR	Uttar Pradesh	State Sector	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	UPRVUNL	OBRA TPS	13	200.00	7/21/1982
ER	West Bengal	State Sector	WEST BENGAL POWER DEVELOPMENT CORP. LIMITED	WBPDC	BANDEL TPS	5	210.00	10/8/1982
WR	Gujarat	State Sector	GUJARAT STATE ELECTRICITY CORPORATION LIMITED	GSECL	WANAKBORI TPS	2	210.00	1/15/1983
WR	Madhya Pradesh	State Sector	M. P. POWER GENERATING CORPORATION LIMITED	MPPGCL	SATPURA TPS	8	210.00	1/25/1983
WR	Chhattisgarh	State Sector	CHHATTISGARH STATE POWER GENERATION CO. LTD.	CSPGCL	KORBA-WEST TPS	2	210.00	6/21/1983
WR	Madhya Pradesh	State Sector	M. P. POWER GENERATING CORPORATION LIMITED	MPPGCL	SATPURA TPS	9	210.00	2/27/1984
WR	Chhattisgarh	State Sector	CHHATTISGARH STATE POWER GENERATION CO. LTD.	CSPGCL	KORBA-WEST TPS	1	210.00	3/30/1984
ER	West Bengal	State Sector	WEST BENGAL POWER DEVELOPMENT CORP. LIMITED	WBPDC	KOLAGHAT TPS	3	210.00	10/12/1984
WR	Gujarat	State Sector	GUJARAT STATE ELECTRICITY CORPORATION LIMITED	GSECL	UKAI TPS	5	210.00	1/30/1985
WR	Chhattisgarh	State Sector	CHHATTISGARH STATE POWER GENERATION CO. LTD.	CSPGCL	KORBA-WEST TPS	3	210.00	3/26/1985
SR	Karnataka	State Sector	KARNATAKA POWER CORPORATION LIMITED	KPCL	RAICHUR TPS	1	210.00	3/29/1985
WR	Maharashtra	State Sector	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	MAHAGENCO	CHANDRAPUR(MAHARASHTRA) STPS	3	210.00	5/3/1985
SR	Karnataka	State Sector	KARNATAKA POWER CORPORATION LIMITED	KPCL	RAICHUR TPS	2	210.00	3/2/1986
					Sub Total	**22**	**4590.00**	
					Total	**35**	**7490.00**	

	Jan-24	Feb-24	Mar-24	Apr-24	#####	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	#####	Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26	Mar-26	Apr-26	#####	Jun-26
No. of Units																			12				24		35		12			
Capacity (MW)																			2760				5220		7490		2460			

Legend

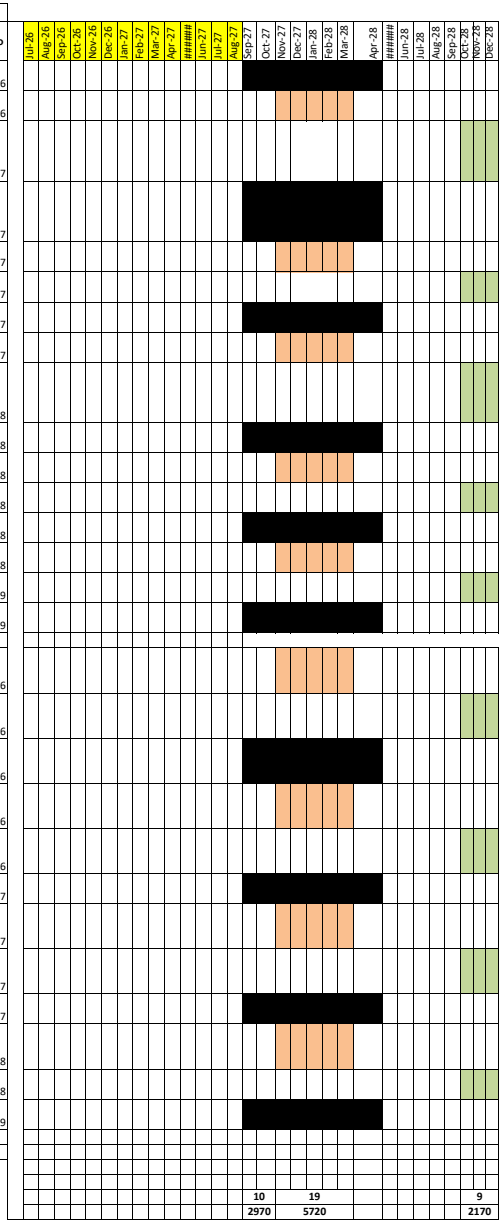
- S/d period of 8 months
- S/d period of 5 months
- S/d period of 3 months
- Time Schedue Placement of order, Engineering, Manufacturing and Supply

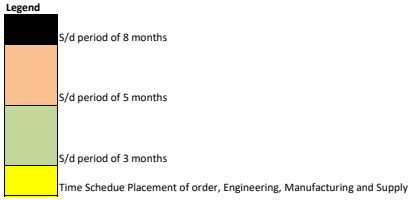
subtotal	37	10390

b	12	2760
o	12	2460
g	11	2270

Phase II

Region	State	Sector	Developer	Organisation	Name of Project	Unit No	Capacity	Date of Commissioning
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	SINGRAULI STPS	6	500.00	12/23/1986
ER	West Bengal	Central Sector	NTPC LIMITED	NTPC	FARAKKA STPS	2	200.00	12/24/1986
SR	Tamil Nadu	Central Sector	NLC	NEYVELI LIGNITE	NEYVELI TPS-II	2	210.00	2/6/1987
SR	Tamil Nadu	Central Sector	NLC	NEYVELI LIGNITE	NEYVELI TPS-II	3	210.00	3/29/1987
WR	Chhattisgarh	Central Sector	NTPC LIMITED	NTPC	KORBA STPS	4	500.00	5/31/1987
ER	West Bengal	Central Sector	NTPC LIMITED	NTPC	FARAKKA STPS	3	200.00	8/6/1987
WR	Madhya Pradesh	Central Sector	NTPC LIMITED	NTPC	VINDHYACHAL STPS	1	210.00	10/10/1987
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	SINGRAULI STPS	7	500.00	11/24/1987
SR	Tamil Nadu	Central Sector	NLC	NEYVELI LIGNITE	NEYVELI TPS-II	1	210.00	1/17/1988
WR	Chhattisgarh	Central Sector	NTPC LIMITED	NTPC	KORBA STPS	5	500.00	3/25/1988
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	RIHAND STPS	1	500.00	3/31/1988
SR	Telangana	Central Sector	NTPC LIMITED	NTPC	RAMAGUNDEM STPS	4	500.00	6/26/1988
WR	Madhya Pradesh	Central Sector	NTPC LIMITED	NTPC	VINDHYACHAL STPS	2	210.00	7/23/1988
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	UNCHAHAR TPS	1	210.00	11/21/1988
WR	Madhya Pradesh	Central Sector	NTPC LIMITED	NTPC	VINDHYACHAL STPS	3	210.00	2/3/1989
WR	Chhattisgarh	Central Sector	NTPC LIMITED	NTPC	KORBA STPS	6	500.00	2/26/1989
					Sub Total	**16**	**5370.00**	
WR	Maharashtra	State Sector	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	MAHAGENCO	CHANDRAPUR(MAHARASHTRA) STPS	4	210.00	3/8/1986
WR	Gujarat	State Sector	GUJARAT STATE ELECTRICITY CORPORATION LIMITED	GSECL	WANAKBORI TPS	4	210.00	3/9/1986
WR	Chhattisgarh	State Sector	CHHATTISGARH STATE POWER GENERATION CO. LTD.	CSPGCL	KORBA-WEST TPS	4	210.00	3/13/1986
NR	Uttar Pradesh	State Sector	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	UPRVUNL	ANPARA TPS	1	210.00	3/24/1986
WR	Gujarat	State Sector	GUJARAT STATE ELECTRICITY CORPORATION LIMITED	GSECL	WANAKBORI TPS	5	210.00	9/23/1986
SR	Tamil Nadu	State Sector	TAMIL NADU GENERATION & DISTRIBUTION CORP. LTD.	TANGEDCO	METTUR TPS	1	210.00	1/4/1987
NR	Uttar Pradesh	State Sector	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	UPRVUNL	ANPARA TPS	2	210.00	2/28/1987
WR	Gujarat	State Sector	GUJARAT STATE ELECTRICITY CORPORATION LIMITED	GSECL	WANAKBORI TPS	6	210.00	11/18/1987
SR	Tamil Nadu	State Sector	TAMIL NADU GENERATION & DISTRIBUTION CORP. LTD.	TANGEDCO	METTUR TPS	2	210.00	12/1/1987
NR	Uttar Pradesh	State Sector	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	UPRVUNL	ANPARA TPS	3	210.00	3/12/1988
NR	Punjab	State Sector	PUNJAB STATE POWER CORP. LTD.	PSPCL	ROPAR TPS	3	210.00	3/31/1988
NR	Punjab	State Sector	PUNJAB STATE POWER CORP. LTD.	PSPCL	ROPAR TPS	4	210.00	1/29/1989
					Sub Total	**12**	**2520.00**	
					Total	**28**	**7890**	





	29	13260
b	10	2970
o	9	2750
g	9	2170

Phase III

Region	State	Sector	Developer	Organisation	Name of Project	Unit No	Capacity	Date of Commissioning
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	UNCHAHAR TPS	2	210.00	3/22/1989
SR	Telangana	Central Sector	NTPC LIMITED	NTPC	RAMAGUNDEM STPS	5	500.00	3/26/1989
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	RIHAND STPS	2	500.00	7/5/1989
SR	Telangana	Central Sector	NTPC LIMITED	NTPC	RAMAGUNDEM STPS	6	500.00	10/16/1989
WR	Madhya Pradesh	Central Sector	NTPC LIMITED	NTPC	VINDHYACHAL STPS	4	210.00	12/26/1989
WR	Madhya Pradesh	Central Sector	NTPC LIMITED	NTPC	VINDHYACHAL STPS	5	210.00	3/31/1990
WR	Madhya Pradesh	Central Sector	NTPC LIMITED	NTPC	VINDHYACHAL STPS	6	210.00	2/1/1991
SR	Tamil Nadu	Central Sector	NLC	NEYVELI LIGNITE	NEYVELI TPS-II	4	210.00	3/30/1991
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	DADRI (NCTPP)	1	210.00	12/21/1991
SR	Tamil Nadu	Central Sector	NLC	NEYVELI LIGNITE	NEYVELI TPS-II	5	210.00	12/31/1991
ER	Bihar	Central Sector	NTPC LIMITED	NTPC	KAHALGAON TPS	1	210.00	3/31/1992
ER	West Bengal	Central Sector	NTPC LIMITED	NTPC	FARAKKA STPS	4	500.00	9/25/1992
SR	Tamil Nadu	Central Sector	NLC	NEYVELI LIGNITE	NEYVELI TPS-II	6	210.00	10/30/1992
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	DADRI (NCTPP)	2	210.00	12/18/1992
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	DADRI (NCTPP)	3	210.00	3/23/1993
					Sub Total	**15**	**4310.00**	
SR	Tamil Nadu	State Sector	TAMIL NADU GENERATION & DISTRIBUTION CORP. LTD.	TANGEDCO	METTUR TPS	3	210.00	3/22/1989
WR	Maharashtra	State Sector	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	MAHAGENCO	KHAPARKHEDA TPS	1	210.00	3/26/1989
WR	Maharashtra	State Sector	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	MAHAGENCO	KHAPARKHEDA TPS	2	210.00	1/8/1990
WR	Gujarat	State Sector	GUJARAT STATE ELECTRICITY CORPORATION LIMITED	GSECL	GANDHI NAGAR TPS	3	210.00	3/20/1990
SR	Tamil Nadu	State Sector	TAMIL NADU GENERATION & DISTRIBUTION CORP. LTD.	TANGEDCO	METTUR TPS	4	210.00	3/27/1990
WR	Maharashtra	State Sector	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	MAHAGENCO	CHANDRAPUR(MAHARASHTRA) STPS	5	500.00	3/22/1991
SR	Karnataka	State Sector	KARNATAKA POWER CORPORATION LIMITED	KPCL	RAICHUR TPS	3	210.00	3/30/1991
SR	Tamil Nadu	State Sector	TAMIL NADU GENERATION & DISTRIBUTION CORP. LTD.	TANGEDCO	TUTICORIN TPS	5	210.00	3/31/1991
ER	West Bengal	State Sector	WEST BENGAL POWER DEVELOPMENT CORP. LIMITED	WBPDC	KOLAGHAT TPS	5	210.00	5/14/1991
WR	Gujarat	State Sector	GUJARAT STATE ELECTRICITY CORPORATION LIMITED	GSECL	GANDHI NAGAR TPS	4	210.00	7/20/1991
SR	Tamil Nadu	State Sector	TAMIL NADU GENERATION & DISTRIBUTION CORP. LTD.	TANGEDCO	TUTICORIN TPS	4	210.00	2/11/1992
WR	Maharashtra	State Sector	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	MAHAGENCO	CHANDRAPUR(MAHARASHTRA) STPS	6	500.00	3/11/1992
NR	Punjab	State Sector	PUNJAB STATE POWER CORP. LTD.	PSPCL	ROPAR TPS	5	210.00	3/29/1992
					Sub Total	**13**	**3310.00**	
					Total	**28**	**7620**	

No. of Units	**10**	**19**	**28**	**9**
Capacity (MW)	**2390**	**4570**	**7620**	**2180**

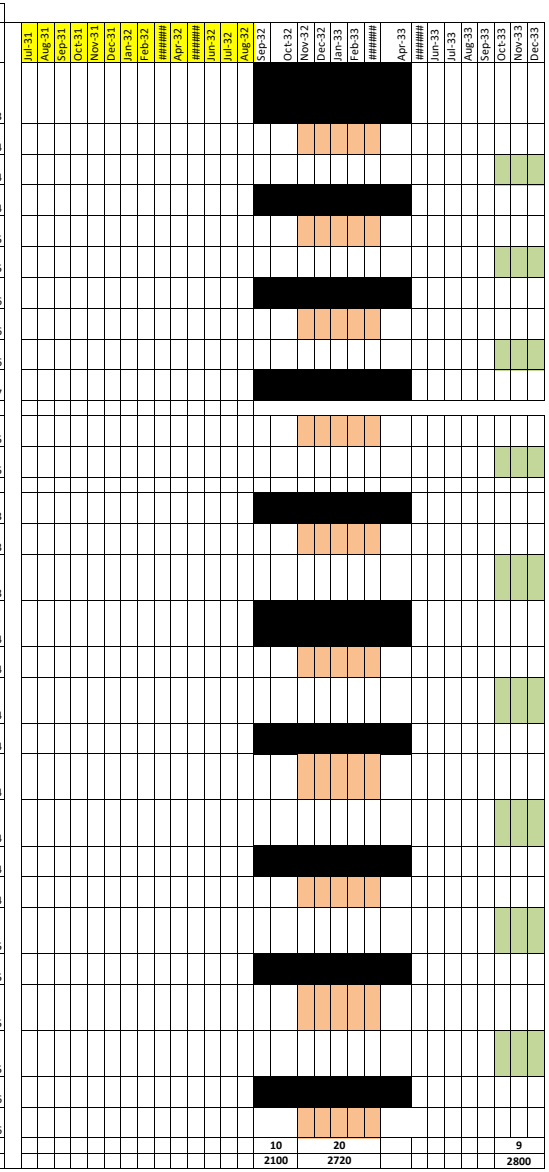
Legend

- S/d period of 8 months
- S/d period of 5 months
- S/d period of 3 months
- Time Schedule Placement of order, Engineering, Manufacturing and Supply

	29	11930
b	10	2390
o	9	2180
g	9	3050

Phase IV

Region	State	Sector	Developer	Organisation	Name of Project	Unit No	Capacity	Date of Commissioning
SR	Tamil Nadu	Central Sector	NLC	NEYVELI LIGNITE	NEYVELI TPS-II	7	210.00	6/19/1993
ER	West Bengal	Central Sector	NTPC LIMITED	NTPC	FARAKKA STPS	5	500.00	2/16/1994
ER	Bihar	Central Sector	NTPC LIMITED	NTPC	KAHALGAON TPS	2	210.00	3/17/1994
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	DADRI (NCTPP)	4	210.00	3/24/1994
ER	Odisha	Central Sector	NTPC LIMITED	NTPC	TALCHER STPS	1	500.00	2/19/1995
ER	Bihar	Central Sector	NTPC LIMITED	NTPC	KAHALGAON TPS	3	210.00	3/24/1995
ER	West Bengal	Central Sector	DAMODAR VALLEY CORPORATION	DVC	MEJIA TPS	1	210.00	3/1/1996
ER	Bihar	Central Sector	NTPC LIMITED	NTPC	KAHALGAON TPS	4	210.00	3/18/1996
ER	Odisha	Central Sector	NTPC LIMITED	NTPC	TALCHER STPS	2	500.00	3/27/1996
ER	West Bengal	Central Sector	DAMODAR VALLEY CORPORATION	DVC	MEJIA TPS	2	210.00	3/24/1997
					Sub Total	**10**	**2970.00**	
WR	Maharashtra	Private Sector	ADANI ELECTRICITY MUMBAI LIMITED	AEML	DAHANU TPS	1	250.00	1/6/1995
WR	Maharashtra	Private Sector	ADANI ELECTRICITY MUMBAI LIMITED	AEML	DAHANU TPS	2	250.00	3/29/1995
					Sub Total	**2**	**500.00**	
WR	Madhya Pradesh	State Sector	M. P. POWER GENERATING CORPORATION LIMITED	MPPGCL	SANJAY GANDHI TPS	1	210.00	3/26/1993
NR	Punjab	State Sector	PUNJAB STATE POWER CORP. LTD.	PSPCL	ROPAR TPS	6	210.00	3/30/1993
NR	Uttar Pradesh	State Sector	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	UPRVUNL	ANPARA TPS	4	500.00	7/19/1993
ER	West Bengal	State Sector	WEST BENGAL POWER DEVELOPMENT CORP. LIMITED	WBPDC	KOLAGHAT TPS	6	210.00	1/1/1994
WR	Madhya Pradesh	State Sector	M. P. POWER GENERATING CORPORATION LIMITED	MPPGCL	SANJAY GANDHI TPS	2	210.00	3/27/1994
SR	Andhra Pradesh	State Sector	ANDHRA PRADESH POWER GENERATION CORP. LIMITED	APGENCO	RAYALASEEMA TPS	1	210.00	3/31/1994
ER	Jharkhand	State Sector	TENUGHAT VIDYUT NIGAM LIMITED	TVNL	TENUGHAT TPS	1	210.00	4/14/1994
ER	Odisha	State Sector	ORISSA POWER GENERATION CORPORATION LIMITED	OPGC	IB VALLEY TPS	1	210.00	6/2/1994
NR	Uttar Pradesh	State Sector	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	UPRVUNL	ANPARA TPS	5	500.00	7/4/1994
SR	Karnataka	State Sector	KARNATAKA POWER CORPORATION LIMITED	KPCL	RAICHUR TPS	4	210.00	9/29/1994
SR	Tamil Nadu	State Sector	TAMIL NADU GENERATION & DISTRIBUTION CORP. LTD.	TANGEDCO	NORTH CHENNAI TPS	1	210.00	10/25/1994
SR	Andhra Pradesh	State Sector	ANDHRA PRADESH POWER GENERATION CORP. LIMITED	APGENCO	RAYALASEEMA TPS	2	210.00	2/25/1995
SR	Tamil Nadu	State Sector	TAMIL NADU GENERATION & DISTRIBUTION CORP. LTD.	TANGEDCO	NORTH CHENNAI TPS	2	210.00	3/27/1995
ER	West Bengal	State Sector	WEST BENGAL POWER DEVELOPMENT CORP. LIMITED	WBPDC	KOLAGHAT TPS	4	210.00	4/1/1995
ER	Odisha	State Sector	ORISSA POWER GENERATION CORPORATION LIMITED	OPGC	IB VALLEY TPS	2	210.00	10/22/1995
SR	Tamil Nadu	State Sector	TAMIL NADU GENERATION & DISTRIBUTION CORP. LTD.	TANGEDCO	NORTH CHENNAI TPS	3	210.00	2/24/1996
ER	Jharkhand	State Sector	TENUGHAT VIDYUT NIGAM LIMITED	TVNL	TENUGHAT TPS	2	210.00	10/10/1996
					Sub Total	**17**	**4150.00**	
					Total	**29**	**7620**	



Legend

- S/d period of 8 months
- S/d period of 5 months
- S/d period of 3 months
- Time Schedue Placement of order, Engineering, Manufacturing and Supply

	31	11090
b	10	2100
o	10	2720
g	9	2800

	10	**2100**
	20	**2720**
	9	**2800**

Phase V

Region	State	Sector	Developer	Organisation	Name of Project	Unit No	Capacity	Date of Commissioning
ER	West Bengal	Central Sector	DAMODAR VALLEY CORPORATION	DVC	MEJIA TPS	3	210.00	3/25/1998
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	UNCHAHAR TPS	3	210.00	1/27/1999
WR	Madhya Pradesh	Central Sector	NTPC LIMITED	NTPC	VINDHYACHAL STPS	7	500.00	3/3/1999
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	UNCHAHAR TPS	4	210.00	10/22/1999
WR	Madhya Pradesh	Central Sector	NTPC LIMITED	NTPC	VINDHYACHAL STPS	8	500.00	2/26/2000
SR	Andhra Pradesh	Central Sector	NTPC LIMITED	NTPC	SIMHADRI	1	500.00	2/22/2002
SR	Andhra Pradesh	Central Sector	NTPC LIMITED	NTPC	SIMHADRI	2	500.00	8/24/2002
SR	Tamil Nadu	Central Sector	NLC	NEYVELI LIGNITE	NEYVELI (EXT) TPS	1	210.00	10/21/2002
					Sub Total	**8**	**2840.00**	
ER	West Bengal	Private Sector	CALCUTTA ELECTRIC SUPPLY CO. LTD.	CESC	BUDGE BUDGE TPS	1	250.00	9/16/1997
ER	West Bengal	Private Sector	CALCUTTA ELECTRIC SUPPLY CO. LTD.	CESC	BUDGE BUDGE TPS	2	250.00	3/6/1999
SR	Tamil Nadu	Private Sector	TAQA	TAQA	NEYVELI TPS(Z)	1	250.00	10/21/2002
					Sub Total	**3**	**750.00**	
SR	Telangana	State Sector	TELANGANA STATE GENCO	TSGENCO	KOTHAGUDEM TPS (NEW)	9	250.00	3/27/1997
WR	Maharashtra	State Sector	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	MAHAGENCO	CHANDRAPUR(MAHARASHTRA) STPS	7	500.00	10/1/1997
NR	Punjab	State Sector	PUNJAB STATE POWER CORP. LTD.	PSPCL	GH TPS (LEH.MOH.)	1	210.00	12/29/1997
SR	Telangana	State Sector	TELANGANA STATE GENCO	TSGENCO	KOTHAGUDEM TPS (NEW)	10	250.00	2/28/1998
WR	Gujarat	State Sector	GUJARAT STATE ELECTRICITY CORPORATION LIMITED	GSECL	GANDHI NAGAR TPS	5	210.00	3/17/1998
NR	Punjab	State Sector	PUNJAB STATE POWER CORP. LTD.	PSPCL	GH TPS (LEH.MOH.)	2	210.00	10/16/1998
WR	Gujarat	State Sector	GUJARAT STATE ELECTRICITY CORPORATION LIMITED	GSECL	WANAKBORI TPS	7	210.00	12/31/1998
SR	Karnataka	State Sector	KARNATAKA POWER CORPORATION LIMITED	KPCL	RAICHUR TPS	5	210.00	1/31/1999
WR	Madhya Pradesh	State Sector	M. P. POWER GENERATING CORPORATION LIMITED	MPPGCL	SANJAY GANDHI TPS	3	210.00	2/28/1999
SR	Karnataka	State Sector	KARNATAKA POWER CORPORATION LIMITED	KPCL	RAICHUR TPS	6	210.00	7/22/1999
WR	Madhya Pradesh	State Sector	M. P. POWER GENERATING CORPORATION LIMITED	MPPGCL	SANJAY GANDHI TPS	4	210.00	11/23/1999
WR	Maharashtra	State Sector	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	MAHAGENCO	KHAPARKHEDA TPS	3	210.00	5/31/2000
WR	Maharashtra	State Sector	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	MAHAGENCO	KHAPARKHEDA TPS	4	210.00	1/7/2001
NR	Haryana	State Sector	HARYANA POWER GENERATION CORPORATION LIMITED	HPGCL	PANIPAT TPS	6	210.00	3/31/2001
ER	West Bengal	State Sector	WEST BENGAL POWER DEVELOPMENT CORP. LIMITED	WBPDC	BAKRESWAR TPS	2	210.00	4/1/2001
ER	West Bengal	State Sector	WEST BENGAL POWER DEVELOPMENT CORP. LIMITED	WBPDC	BAKRESWAR TPS	3	210.00	10/11/2001
SR	Karnataka	State Sector	KARNATAKA POWER CORPORATION LIMITED	KPCL	RAICHUR TPS	7	210.00	12/11/2002
					Sub Total	**17**	**3940.00**	
					Total	**28**	**7530**	
								No. of Units
								Capacity (MW)

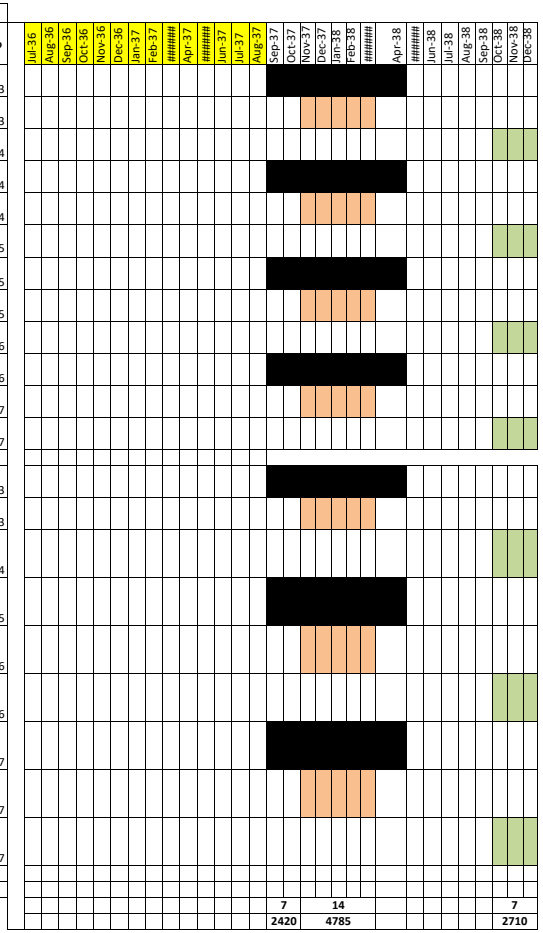
		30	11120
b		9	2220
o		10	2510
g		9	2800

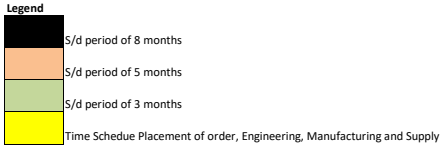
Legend

- S/d period of 8 months
- S/d period of 5 months
- S/d period of 3 months
- Time Schedue Placement of order, Engineering, Manufacturing and Supply

Phase VI

Region	State	Sector	Developer	Organisation	Name of Project	Unit No	Capacity	Date of Commissioning
ER	Odisha	Central Sector	NTPC LIMITED	NTPC	TALCHER STPS	3	500.00	2/21/2003
ER	Odisha	Central Sector	NTPC LIMITED	NTPC	TALCHER STPS	4	500.00	10/25/2003
ER	Odisha	Central Sector	NTPC LIMITED	NTPC	TALCHER STPS	5	500.00	5/13/2004
SR	Telangana	Central Sector	NTPC LIMITED	NTPC	RAMAGUNDEM STPS	7	500.00	9/26/2004
ER	West Bengal	Central Sector	DAMODAR VALLEY CORPORATION	DVC	MEJIA TPS	4	210.00	10/12/2004
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	RIHAND STPS	3	500.00	1/31/2005
ER	Odisha	Central Sector	NTPC LIMITED	NTPC	TALCHER STPS	6	500.00	2/6/2005
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	RIHAND STPS	4	500.00	9/24/2005
WR	Madhya Pradesh	Central Sector	NTPC LIMITED	NTPC	VINDHYACHAL STPS	9	500.00	7/27/2006
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	UNCHAHAR TPS	5	210.00	9/28/2006
WR	Madhya Pradesh	Central Sector	NTPC LIMITED	NTPC	VINDHYACHAL STPS	10	500.00	3/8/2007
ER	Bihar	Central Sector	NTPC LIMITED	NTPC	KAHALGAON TPS	5	500.00	3/31/2007
					Sub Total	**12**	**5420.00**	
NR	Rajasthan	State Sector	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	RRVUNL	SURATGARH TPS	5	250.00	6/30/2003
NR	Rajasthan	State Sector	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	RRVUNL	KOTA TPS	6	195.00	7/30/2003
NR	Haryana	State Sector	HARYANA POWER GENERATION CORPORATION LIMITED	HPGCL	PANIPAT TPS	7	250.00	9/28/2004
NR	Haryana	State Sector	HARYANA POWER GENERATION CORPORATION LIMITED	HPGCL	PANIPAT TPS	8	250.00	1/28/2005
NR	Uttar Pradesh	State Sector	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	UPRVUNL	PARICHHA TPS	3	210.00	3/29/2006
NR	Uttar Pradesh	State Sector	UTTAR PRADESH RAJYA VIDYUT UTPADAN NIGAM LIMITED	UPRVUNL	PARICHHA TPS	4	210.00	12/28/2006
SR	Andhra Pradesh	State Sector	ANDHRA PRADESH POWER GENERATION CORP. LIMITED	APGENCO	RAYALASEEMA TPS	3	210.00	1/25/2007
WR	Maharashtra	State Sector	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	MAHAGENCO	PARLI TPS	6	250.00	2/16/2007
WR	Chhattisgarh	State Sector	CHHATTISGARH STATE POWER GENERATION CO. LTD.	CSPGCL	DSPM TPS	1	250.00	3/30/2007
					Sub Total	**9**	**2075.00**	
					Total	**21**	**7495**	





	22	12915
b	7	2420
o	7	2365
g	7	2710

Phase VII

Region	State	Sector	Developer	Organisation	Name of Project	Unit No	Capacity	Date of Commissioning
WR	Chhattisgarh	Central Sector	NTPC LIMITED	NTPC	SIPAT STPS	4	500.00	5/27/2007
ER	West Bengal	Central Sector	DAMODAR VALLEY CORPORATION	DVC	MEJIA TPS	5	250.00	10/1/2007
ER	Bihar	Central Sector	NTPC LIMITED	NTPC	KAHALGAON TPS	6	500.00	3/16/2008
WR	Chhattisgarh	Central Sector	NTPC-SAIL POWER COMPANY LIMITED	NSPCL	BHILAI TPS	1	250.00	4/20/2008
WR	Chhattisgarh	Central Sector	NTPC LIMITED	NTPC	SIPAT STPS	5	500.00	8/13/2008
					Sub Total	**5**	**2000.00**	
WR	Chhattisgarh	Private Sector	JINDAL POWER LTD.	JPL	OP JINDAL TPS	1	250.00	9/2/2007
WR	Chhattisgarh	Private Sector	JINDAL POWER LTD.	JPL	OP JINDAL TPS	2	250.00	2/10/2008
WR	Chhattisgarh	Private Sector	JINDAL POWER LTD.	JPL	OP JINDAL TPS	3	250.00	3/6/2008
WR	Chhattisgarh	Private Sector	JINDAL POWER LTD.	JPL	OP JINDAL TPS	4	250.00	6/17/2008
					Sub Total	**4**	**1000.00**	
WR	Maharashtra	State Sector	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	MAHAGENCO	PARAS TPS	1	250.00	5/31/2007
WR	Madhya Pradesh	State Sector	M. P. POWER GENERATING CORPORATION LIMITED	MPPGCL	SANJAY GANDHI TPS	5	500.00	6/18/2007
NR	Haryana	State Sector	HARYANA POWER GENERATION CORPORATION LIMITED	HPGCL	YAMUNA NAGAR TPS	1	300.00	11/1/2007
ER	West Bengal	State Sector	WEST BENGAL POWER DEVELOPMENT CORP. LIMITED	WBPDC	SANTALDIH TPS	5	250.00	11/7/2007
SR	Andhra Pradesh	State Sector	ANDHRA PRADESH POWER GENERATION CORP. LIMITED	APGENCO	RAYALASEEMA TPS	4	210.00	11/20/2007
ER	West Bengal	State Sector	DURGAPUR PROJECTS LIMITED	DPL	D.P.L. TPS	7	300.00	11/24/2007
SR	Karnataka	State Sector	KARNATAKA POWER CORPORATION LIMITED	KPCL	BELLARY TPS	1	500.00	12/3/2007
WR	Chhattisgarh	State Sector	CHHATTISGARH STATE POWER GENERATION CO. LTD.	CSPGCL	DSPM TPS	2	250.00	12/11/2007
ER	West Bengal	State Sector	WEST BENGAL POWER DEVELOPMENT CORP. LIMITED	WBPDC	SAGARDIGHI TPS	2	300.00	12/21/2007
ER	West Bengal	State Sector	WEST BENGAL POWER DEVELOPMENT CORP. LIMITED	WBPDC	BAKRESWAR TPS	5	210.00	12/24/2007
NR	Punjab	State Sector	PUNJAB STATE POWER CORP. LTD.	PSPCL	GH TPS (LEH.MOH.)	3	250.00	1/3/2008
NR	Haryana	State Sector	HARYANA POWER GENERATION CORPORATION LIMITED	HPGCL	YAMUNA NAGAR TPS	2	300.00	3/29/2008
WR	Madhya Pradesh	State Sector	M. P. POWER GENERATING CORPORATION LIMITED	MPPGCL	AMARKANTAK EXT TPS	3	210.00	6/15/2008
ER	West Bengal	State Sector	WEST BENGAL POWER DEVELOPMENT CORP. LIMITED	WBPDC	SAGARDIGHI TPS	1	300.00	7/20/2008
NR	Punjab	State Sector	PUNJAB STATE POWER CORP. LTD.	PSPCL	GH TPS (LEH.MOH.)	4	250.00	7/31/2008
ER	West Bengal	State Sector	WEST BENGAL POWER DEVELOPMENT CORP. LIMITED	WBPDC	BAKRESWAR TPS	4	210.00	3/8/2009
					Sub Total	**16**	**4590.00**	
					Total	**25**	**7590**	

	27	10590
b	9	2630
o	8	2510
g	8	2450

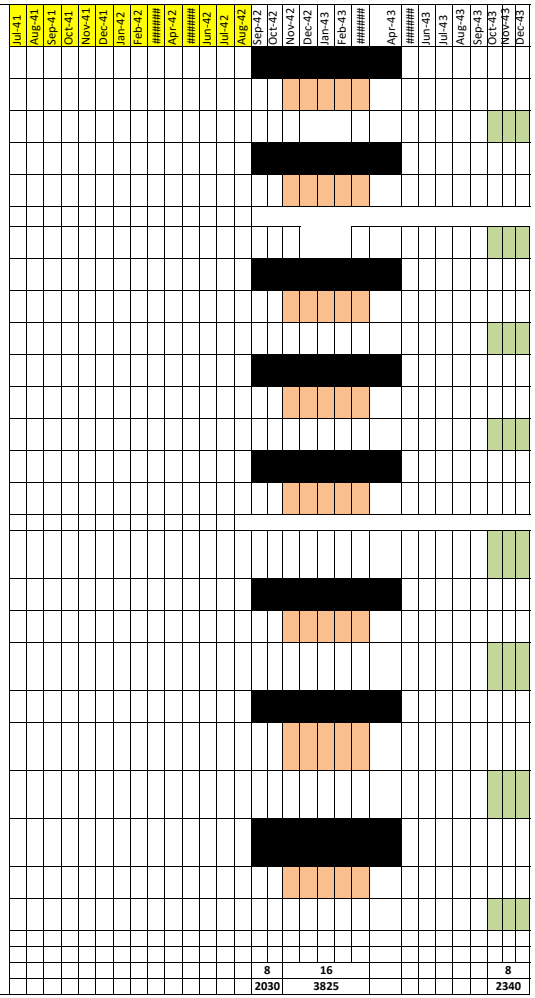
	Jan-39	Feb-39	######	Apr-39	######	Jun-39	Jul-39	Aug-39	Sep-39	Oct-39	Nov-39	Dec-39	Jan-40	Feb-40	######	Apr-40	######	Jun-40	Jul-40	Aug-40	Sep-40	Oct-40	Nov-40	Dec-40	Jan-41	Feb-41	######	Apr-41	######	Jun-41
No. of Units																							9	17	25	8				
Capacity (MW)																							2630	5140	7590	2510				

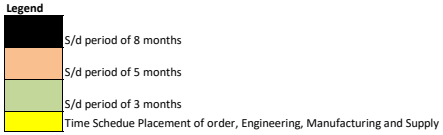
Legend

- S/d period of 8 months
- S/d period of 5 months
- S/d period of 3 months
- Time Schedule Placement of order, Engineering, Manufacturing and Supply

Phase VIII

Region	State	Sector	Developer	Organisation	Name of Project	Unit No	Capacity	Date of Commissioning
WR	Chhattisgarh	Central Sector	NTPC-SAIL POWER COMPANY LIMITED	NSPCL	BHILAI TPS	2	250.00	7/12/2009
ER	Bihar	Central Sector	NTPC LIMITED	NTPC	KAHALGAON TPS	7	500.00	7/31/2009
ER	Jharkhand	Central Sector	DAMODAR VALLEY CORPORATION	DVC	CHANDRAPURA(DVC) TPS	7	250.00	11/4/2009
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	DADRI (NCTPP)	5	490.00	1/25/2010
ER	Jharkhand	Central Sector	DAMODAR VALLEY CORPORATION	DVC	CHANDRAPURA(DVC) TPS	8	250.00	3/31/2010
					Sub Total	**5**	**1740.00**	
WR	Maharashtra	Private Sector	TATA POWER COMPANY LTD.	TATA PCL	TROMBAY TPS	8	250.00	3/26/2009
SR	Karnataka	Private Sector	JSW ENERGY LTD.	JSWEL	TORANGALLU TPS(SBU-II)	1	300.00	4/23/2009
WR	Chhattisgarh	Private Sector	LANCO AMARKANTAK POWER PVT. LTD.	LANCO	PATHADI TPP	1	300.00	6/4/2009
WR	Gujarat	Private Sector	ADANI POWER LTD.	APL	MUNDRA TPS-I & II	1	330.00	8/4/2009
SR	Karnataka	Private Sector	JSW ENERGY LTD.	JSWEL	TORANGALLU TPS(SBU-II)	2	300.00	8/24/2009
ER	West Bengal	Private Sector	CALCUTTA ELECTRIC SUPPLY CO. LTD.	CESC	BUDGE BUDGE TPS	3	250.00	9/29/2009
NR	Uttar Pradesh	Private Sector	ROSA POWER SUPPLY CO. LTD.	RPSCL	ROSA TPP Ph-I	1	300.00	2/10/2010
WR	Gujarat	Private Sector	ADANI POWER LTD.	APL	MUNDRA TPS-I & II	2	330.00	3/17/2010
WR	Chhattisgarh	Private Sector	LANCO AMARKANTAK POWER PVT. LTD.	LANCO	PATHADI TPP	2	300.00	3/25/2010
					Sub Total	**9**	**2660.00**	
ER	West Bengal	State Sector	WEST BENGAL POWER DEVELOPMENT CORP. LIMITED	WBPDC	BAKRESWAR TPS	1	210.00	6/7/2009
NR	Rajasthan	State Sector	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	RRVUNL	SURATGARH TPS	6	250.00	8/29/2009
NR	Rajasthan	State Sector	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	RRVUNL	KOTA TPS	7	195.00	8/31/2009
SR	Andhra Pradesh	State Sector	ANDHRA PRADESH POWER GENERATION CORP. LIMITED	APGENCO	Dr. N.TATA RAO TPS	7	500.00	10/8/2009
NR	Rajasthan	State Sector	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	RRVUNL	CHHABRA-I PH-1 TPP	1	250.00	10/30/2009
WR	Maharashtra	State Sector	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	MAHAGENCO	PARLI TPS	7	250.00	2/10/2010
WR	Maharashtra	State Sector	MAHARASHTRA STATE POWER GENERATION COMPANY LIMITED	MAHAGENCO	PARAS TPS	2	250.00	3/27/2010
NR	Haryana	State Sector	HARYANA POWER GENERATION CORPORATION LIMITED	HPGCL	RAJIV GANDHI TPS	1	600.00	3/31/2010
NR	Rajasthan	State Sector	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED	RRVUNL	CHHABRA-I PH-1 TPP	2	250.00	5/4/2010
SR	Telangana	State Sector	TELANGANA STATE GENCO	TSGENCO	KAKATIYA TPS	1	500.00	5/27/2010
					Sub Total	**10**	**3255.00**	
					Total	**24**	**7655**	





	26	21475
b	8	2030
o	8	1795
g	8	2340

Phase IX

Region	State	Sector	Developer	Organisation	Name of Project	Unit No	Capacity	Date of Commissioning
NR	Uttar Pradesh	Central Sector	NTPC LIMITED	NTPC	DADRI (NCTPP)	6	490.00	7/16/2010
ER	West Bengal	Central Sector	DAMODAR VALLEY CORPORATION	DVC	MEJIA TPS	7	500.00	9/30/2010
ER	West Bengal	Central Sector	DAMODAR VALLEY CORPORATION	DVC	MEJIA TPS	8	500.00	9/30/2010
NR	Haryana	Central Sector	ARAVALI POWER COMPANY PRIVATE LIMITED	APCPL	INDIRA GANDHI STPP	1	500.00	10/31/2010
WR	Chhattisgarh	Central Sector	NTPC LIMITED	NTPC	KORBA STPS	7	500.00	11/25/2010
					Sub Total	**5**	**2490.00**	
NR	Uttar Pradesh	Private Sector	ROSA POWER SUPPLY CO. LTD.	RPSCL	ROSA TPP Ph-I	2	300.00	6/26/2010
SR	Karnataka	Private Sector	UDUPI POWER CORP. LTD.	UPCL	UDUPI TPP	1	600.00	7/23/2010
WR	Gujarat	Private Sector	ADANI POWER LTD.	APL	MUNDRA TPS-I & II	3	330.00	8/2/2010
WR	Maharashtra	Private Sector	JSW ENERGY LTD.	JSWEL	JSW RATNAGIRI TPP	1	300.00	8/24/2010
WR	Gujarat	Private Sector	ADANI POWER LTD.	APL	MUNDRA TPS-I & II	4	330.00	12/20/2010
WR	Gujarat	Private Sector	ADANI POWER LTD.	APL	MUNDRA TPS-I & II	5	660.00	12/26/2010
ER	Odisha	Private Sector	VEDANTA LIMITED	VEDANTA	VEDANTA TPP	2	600.00	12/29/2010
					Sub Total	**7**	**3120.00**	
SR	Karnataka	State Sector	KARNATAKA POWER CORPORATION LIMITED	KPCL	RAICHUR TPS	8	250.00	6/26/2010
NR	Haryana	State Sector	HARYANA POWER GENERATION CORPORATION LIMITED	HPGCL	RAJIV GANDHI TPS	2	600.00	10/1/2010
SR	Andhra Pradesh	State Sector	ANDHRA PRADESH POWER GENERATION CORP. LIMITED	APGENCO	RAYALASEEMA TPS	5	210.00	12/31/2010
					Sub Total	**3**	**1060.00**	
					Total	**15**	**6670**	

	17	12280
b	5	2170
o	5	2590
g	5	1910

	Jan-43	Feb-43	Mar-43	Apr-43	#####	Jun-43	Jul-43	Aug-43	Sep-43	Oct-43	Nov-43	Dec-43	Jan-44	Feb-44	Mar-44	Apr-44	#####	Jun-44	Aug-44	Sep-44	Oct-44	Nov-44	Dec-44	Jan-45	Feb-45	Mar-45	Apr-45	#####	Jun-45
No. of Units																			5			10		15		5			
Capacity (MW)																			2170			##		6670		2590			

Legend

- S/d period of 8 months
- S/d period of 5 months
- S/d period of 3 months
- Time Schedule Placement of order, Engineering, Manufacturing and Supply

Annexure B.5.1

STUDY ON VOLTAGE RISE AT DIFFERENT 400 KV BUSES OF DVC

400 KV Transmission system of DVC was commissioned gradually during 2010 onwards with the construction and commissioning of 500 MW generators at MTPS, DSTPS, KTPS, RTPS and BTPS. Connectivity of the 400 KV bus of these power stations with the national grid were done mostly through LILO arrangement from existing CTU Lines or new lines constructed by the CTU. However, DVC has also constructed two double circuit 400 KV lines i.e. one from DSTPS to RTPS (Twin Moose D/C) and the other from RTPS to Ranchi (PG) (Quad Moose, D/C).

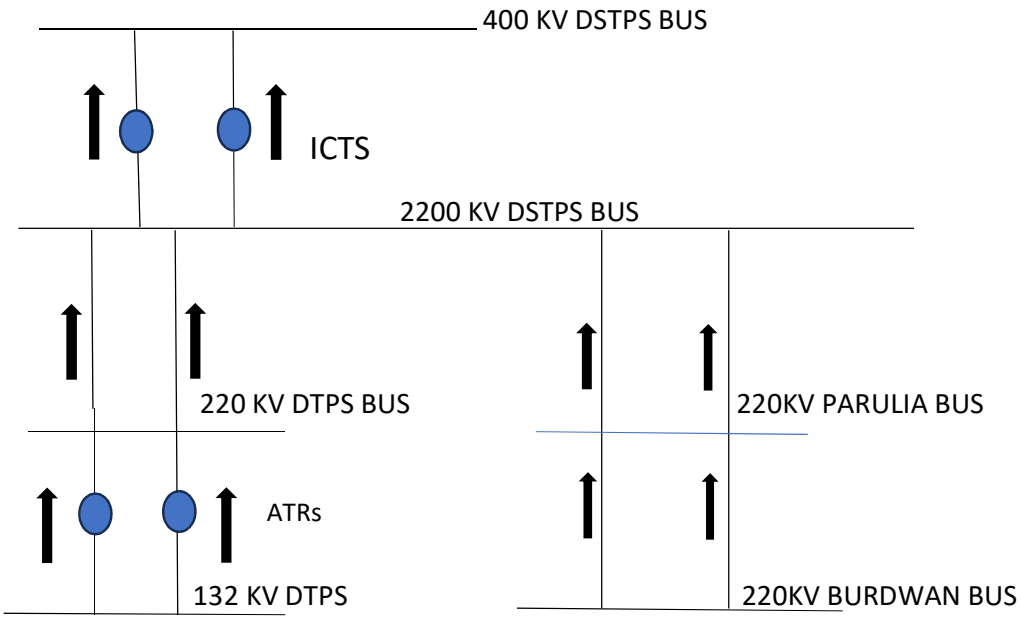
At DSTPS, KTPS & RTPS it has been observed for last few years that the 400 KV bus voltage occasionally crosses the higher operational voltage limit of 103% i.e. 412 KV. In order to find out the exact reason and source of VAR injection in DVC 400 KV buses data from different power stations were sought. Thereafter data scrutiny and analysis was carried out for each power stations. Based on the available data and further load flow study requirement of reactor (either bus reactor or line reactor) has been proposed. Detailed Plant wise study is furnished hereunder :

1. DSTPS

The data including voltage, MVAR for DSTPS for different seasons of two months span each and considering double as well as single unit in service, wherever observed, has been studied and following are the observations:

- The bus voltage remains within the range of 406KV to 412 KV but during low demand condition the same increased to 419 KV.
- In general, the direction of MVAR flow through all the 400 KV lines are towards 400 KV Bus i.e. import direction (although occasionally it reverses to the export direction) during healthy voltage range conditions.
- During High Voltage conditions the reactive power import to Bus through all 400 KV lines further decreased to some extent.
- From the available data it has been found that during normal voltage range (400-412 KV) as well as high voltage condition (412-419 KV) the variation of VAR absorption by both the Generators (Including GTs) varied in the range 150 -200 MVAR (in total).
- It has also been observed that during normal voltage range conditions as well as in high voltage condition, the reactive power imports towards 400 KV bus through ICTs and this phenomenon increased after commissioning of 220KV Parulia Burdwan double circuit lines on 25.09.2022.

- VAR flow of 220 KV system also studied and found that beside VAR flow from 220 KV Parulia lines (from 220 KV Parulia bus to 220 KV DSTPS bus) there are VAR flow observed from 132 KV system of DTPS through 220 KV DTPS lines (from 220 KV DTPS bus to 220 KV DSTPS bus)



ATRS

Conclusion:

- **Hence, to mitigate the condition of high voltage at DSTPS 400 KV Bus it is proposed to install 2 x 80 MVAR reactors connected directly with the 400 KV Bus**

Note:

In case, the proposed 2 x 80 MVAR reactors could not be commissioned at DSTPS due to nonavailability of space at DSTPS 400 KV Switch-yard and associated areas the commissioning of 2 Nos. 50 MVAR reactors at DSTPS 220KV Bus may be explored.

2. RTPS

Observations:

At RTPS two Nos of Line Reactors of 50 MVAR each is already connected in Ranchi PGCIL Line #2 & 3 and also two nos. of Bus reactors of 50 MVAR each are already connected in 400 KV Buses. Hence bus voltage at DVC RTPS end seldom exceeds 412 KV but due to VAR flow from DVC, RTPS to PGCIL Ranchi end through 400 KV RTPS-

Ranchi double circuit lines the voltage at PGCIL, Ranchi ends exceed the limit time to time.

However, there are two numbers of 400 KV Bus Reactors at Ranchi PGCIL end. Rating of the same are 80 MVAR and 125 MVAR respectively. Both the reactors are presently kept out of circuit since 1st week of June'23. In case these Bus Reactors are put into service the high voltage issue at Ranchi PGCIL end may get resolved.

Conclusions:

Considering above no such Voltage issue is presently noticed at RTPS but at Ranchi PGCIL end Bus Reactors need to be put into service.

3. KTPS

Observations:

The data including voltage, MVAR for KTPS for different seasons of two months span each and considering double as well as single unit in service, wherever observed, has been studied and following are the observations:

- The bus voltage remains within the range of 407KV to 412 KV but during low demand condition the same increased to 415 KV.
- In general, the direction of MVAR flow through all the 400 KV lines are towards 400 KV Bus i.e. import direction (although occasionally it reverses to the export direction).
- From the available data it has been found that during normal voltage range (407-412 KV) as well as high voltage condition (412-415 KV) the variation of VAR absorption by both the Generators (Including GTs) varied in the range 160 -270 MVAR (in total).

At KTPS two nos. of Bus reactors of 50 MVAR each is already connected in 400 KV Buses. One of the two reactors has been out of service presently.

Conclusions:

Once the 50 MVAR damaged reactor will be put back into service still there will be demand for more VAR absorption to maintain the Voltage rising issue at KTPS, hence it would be worthy to procure and install 2 nos. 125 MVAR Reactors at 400 KV Bus replacing existing 2 nos. 50 MVAR Reactors.

4. MTPS

The data including voltage, MVAR for MTPS for different seasons of two months span each and considering different numbers of available units, has been studied and following are the observations:

- The bus voltage remains within the range of 404KV to 412 KV but occasionally the same increased to 413 KV.
- In general, the direction of MVAR flow through all the 400 KV lines are towards 400 KV Bus i.e. import direction.
- From the available data it has been found that maximum VAR absorption by the Generators (Including GTs) is in the tune of 120 MVAR each, which is well below the max MVAR absorbing capacity of the Units (approx. 150-160 MVAR each)

Conclusion:

- Hence, at present there is not any need of installing Reactors at MTPS, however after complete functioning of both the ICTs at MTPS, scenarios may get changed. In that case 2 Nos. of 50 MVAR reactors which are presently connected at 400 KV bus at KTPS may be shifted to MTPS 400 KV Bus.

Annex B.5.2

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)

संदर्भ/Ref: CTU/E/00/21th CMETS-ER

दिनांक/Date: 20-07-2023

वितरण सूची के अनुसार/ As per distribution list

विषय/Subject: पूर्वी क्षेत्र में पारेषण योजनाओं के विकास के लिए 21वीं परामर्श बैठक की कार्यावली (सीएमईटीएस-ईआर) / Agenda for 21th Consultation Meeting for Evolving Transmission Schemes in Eastern Region (CMETS-ER)

महोदय /महोदया /Sir /Ma'am,

आईएसटीएस योजना और ओपन एक्सेस आवेदन प्रसंस्करण के लिए पूर्वी क्षेत्र में पारेषण योजनाओं के विकास के लिए 21वीं परामर्श बैठक (सीएमईटीएस-ईआर) **28th जुलाई, 2023** (शुक्रवार) को वीडियो कॉन्फ्रेंसिंग के माध्यम से नीचे दिए गए विवरण के अनुसार आयोजित होने वाली है:

The **21th** Consultation Meeting for Evolving Transmission Schemes in Eastern Region (CMETS-ER) for ISTS planning and open access applications processing is scheduled to be held on **28th July, 2023 (Friday)** through video conferencing as per details below:

विषय/Topic	: 21th CMETS-ER
दिनांक/Date & समय/Time	: **28th July 2023** at **11:00AM**
बैठक लिंक/ Meeting Link	: MS-Teams (in email)

इस संबंध में बैठक की कार्यावली अलग से प्रसारित की जाएगी, जो सीटीयू वेबसाइट (*www.ctuil.in >> ISTS Planning and Coordination >> Consultation Meetings for ISTS >> ER*) पर भी उपलब्ध होगी। कृपया उपरोक्त लिंक के माध्यम से बैठक में शामिल होने और रिटर्न मेल के माध्यम से इस संबंध में भागीदार होने की पुष्टि करें।

In this regard, the agenda of the meeting shall be circulated separately and the same will also be available on CTU website (*www.ctuil.in >> ISTS Planning and Coordination >> Consultation Meetings for ISTS >> ER*). It is requested to join the meeting through the above link and send confirmation of participation in this regard through return mail.

धन्यवाद/Thanking you,

भवदीय / Yours faithfully,

राजेश कुमार
20/07/2023

(राजेश कुमार) / (Rajesh Kumar)
वरिष्ठ महाप्रबंधक/ Sr. General Manager

A. ितरण सूची के अनुसार/ **Distribution List:**

1. Chief Engineer (PSP&A-II) Central Electricity Authority Sewa Bhawan, R.K.Puram New Delhi-110066	**2. Member Secretary** Eastern Regional Power Committee 14, Golf Club Road, Tollygunge Kolkata-700033
3. Director (SO) Grid Controller of India Limited 9th Floor, IFCI Towers, 61, Nehru Place, New Delhi-110016	**4. Executive Director** Eastern Regional Load Despatch Centre 14, Golf Club Road, Jubilee Park, Golf Gardens, Tollygunge, Kolkata, West Bengal - 700095
5. CMD Damodar Valley Corporation DVC Towers, VIP Road Kolkata-700054	**6. CMD** Odisha Power Transmission Corporation Ltd. (OPTCL) Bhoinagar Post Office, Jan path Bhubaneshwar-751022
7. CMD Bihar State Power Transmission Company Ltd. (BSPTCL) Vidyut Bhavan, 4th floor, Bailey Road Patna-800021	**8. CMD** Jharkhand Urja Sancharan Nigam Limited (JUSNL) Engineering Building, HEC, Dhurwa Ranchi -834004
9. Principal Chief Engineer cum Secretary Power Department Government of Sikkim Gangtok, Sikkim	**10. Managing Director** West Bengal State Electricity Transmission Company Ltd. (WBSETCL) Vidyut Bhavan, 8th Floor, A-Block Salt Lake City, Kolkata-700091

B. िवशेष आमिऊत /**Special invitee:**

1. Director (Projects) Power Grid Corporation of India Ltd. "Saudamini", Plot No. 2, Sec-29, Gurugram, Haryana-122001

C. आवेदक/**Applicant:**

1. Sh. Amit Girwan DGM Adhunik Power & Natural Resources Ltd. (APNRL) Lansdowne Towers, 5th Floor, 2/1A, Sarat Bose Road, Kolkata West Bengal – 700020 Ph. No.: 9818555993 Email: powertrading@adhunikpower.co.in; bhaveshsahu@adhunikpower.co.in

Agenda for 21st Consultation Meeting for Evolving Transmission Schemes in Eastern Region (CMETS-ER)

1. Confirmation of minutes of the previous meeting

1.1. The minutes of the 20th CMETS-ER held on 28-06-2023 were issued vide letter dated 21-07-2023.

1.2. WBSETCL vide email dated 21-07-2023 has requested for rephrasing of certain portion of para 4.3 as detailed below:

- **Existing:** *"…WBSETCL informed that due to fund shortage they would be initially implementing LILO of only one circuit of the Jeerat (New) – Subhasgram (Quad) D/c line at New Laxmikantpur…"*
- **Proposed:** *"…WBSETCL informed that as proposed New Laxmikantapur 400/132/33kV GIS would be required to cater an estimated load of approx. 300MW to 400MW and also for avoiding unnecessary blockage of CAPEX (in case of D/C LILO instead of S/C LILO) they would be initially implementing LILO of only one circuit of the Jeerat (New) – Subhasgram (Quad) D/c line at New Laxmikantpur…"*

1.3. With the above proposed modification by WBSETCL, the minutes of 20th CMETS-ER are proposed to be considered as confirmed.

A. Connectivity and GNA related matters

2. Transition of "Connectivity/LTA/MTOA granted and applications received under Connectivity Regulations, 2009" to GNA Regulations, 2022 in line with provisions under Regulation 37 of GNA Regulations, 2022

2.1. **Transition under Regulations 37.6 (1)** viz. Only Connectivity exists (including part quantum not having LTA/MTOA) and the same is effective.

Sl. No.	Applicant	Installed Capacity (MW)	Location	Nature of entity	Connectivity already granted quantum	Quantum for transition under Reg. 37.6(1) (MW)	New start date of Connectivity under GNA Regulations (requested)	Proposed Transmission system for Connectivity under GNA Regulations, 2022
1	Adhunik Power & Natural Resources Ltd. (APNRL)	540	Jharkhand	Generation (Thermal)	450	250	01-07-2023	Existing transmission system
	• M/s APNRL is connected to ISTS at Jamshedpur (POWERGRID) S/s through its 400kV D/c DTL.							

Sl. No.	Applicant	Installed Capacity (MW)	Location	Nature of entity	Connectivity already granted quantum	Quantum for transition under Reg. 37.6(1) (MW)	New start date of Connectivity under GNA Regulations (requested)	Proposed Transmission system for Connectivity under GNA Regulations, 2022
	• Present LTAs from M/s APNRL is 200MW, which is already operational. Accordingly, 250MW (Connectivity-Deemed GNA) is available for transition under Regulation 37.6 (1), which has been requested by M/s APNRL vide its letter dated 20-06-2023. • It has been observed that the available ISTS including the immediate evacuation system has margin for evacuation of this additional 250MW. • New start date of Connectivity has been requested as 01-07-2023, which has already passed. **Applicant may provide revised start date.** • In view of the above, it is proposed that this request of transition may be agreed with Start date of Connectivity as agreed in meeting with existing transmission system. • The Regulation 37.6 (1) (a) of the GNA Regulations states that *"(a) In case additional GNA as applied for under Regulation 17.2 can be granted on existing transmission system, the Nodal Agency shall grant such additional GNA on furnishing Conn-BG3 @ Rs.2 lakh/MW. Conn-BG3 shall be returned in five equal parts over the next five years starting from the year when such GNA becomes effective or in accordance with Regulation 16.2 of these regulations, whichever is later."* • In the instant case, transition under GNA Regulations is proposed through "existing transmission system". Thus, in terms of Regulation 37.6 (1) (a), applicant may note that they shall be liable to furnish Conn-BG3 @ Rs.2 lakh/MW, if grant is agreed as proposed.							

B. ISTS expansion schemes in Eastern Region

3. Augmentation of transformation capacity at Subhasgram (POWERGRID), Rajarhat (POWERGRID), and Jeerat-New (PMJTL) substations

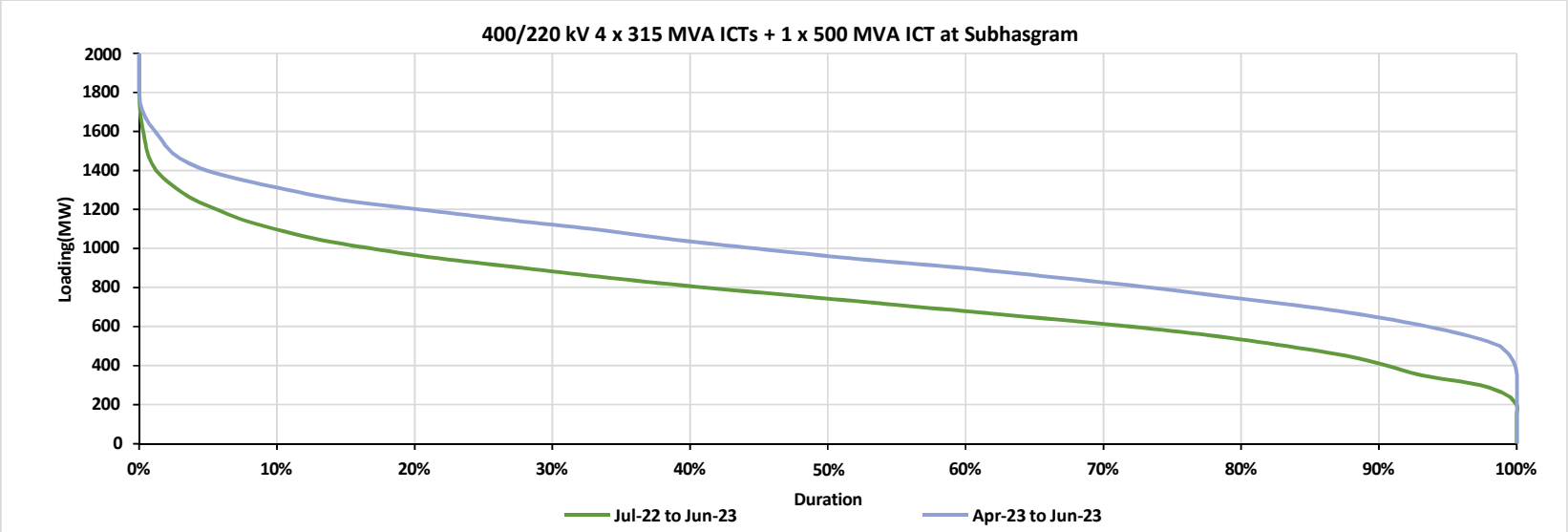
3.1. In the 20th CMETS-ER held on 28-06-2023, the ERLDC input on "Reliability enhancement of south West Bengal transmission system in view significant demand growth" was deliberated, wherein following was agreed:

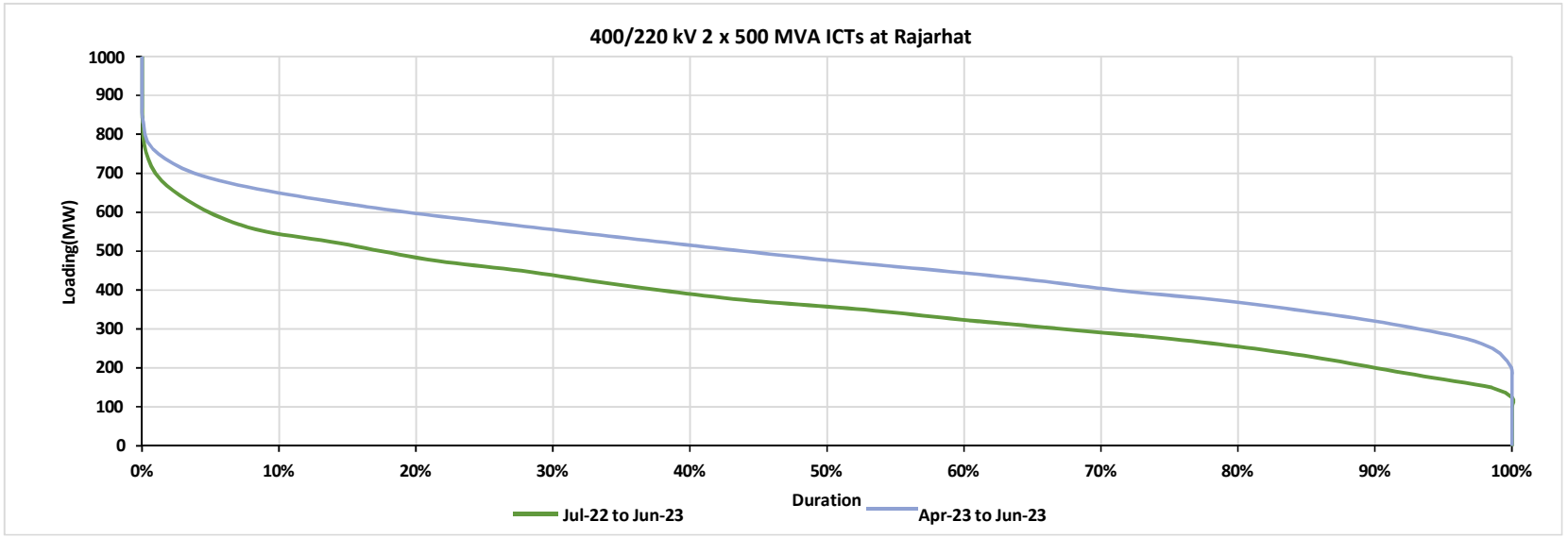
(a) Critical loading of ICTs at Subhasgram (POWERGRID), Rajarhat (POWERGRID) and Jeerat-New (PMJTL) substations was deliberated, and it was decided that after analysis the proposal regarding augmentation of transformation capacity at said ISTS substations may be deliberated in the next CMETS-ER.

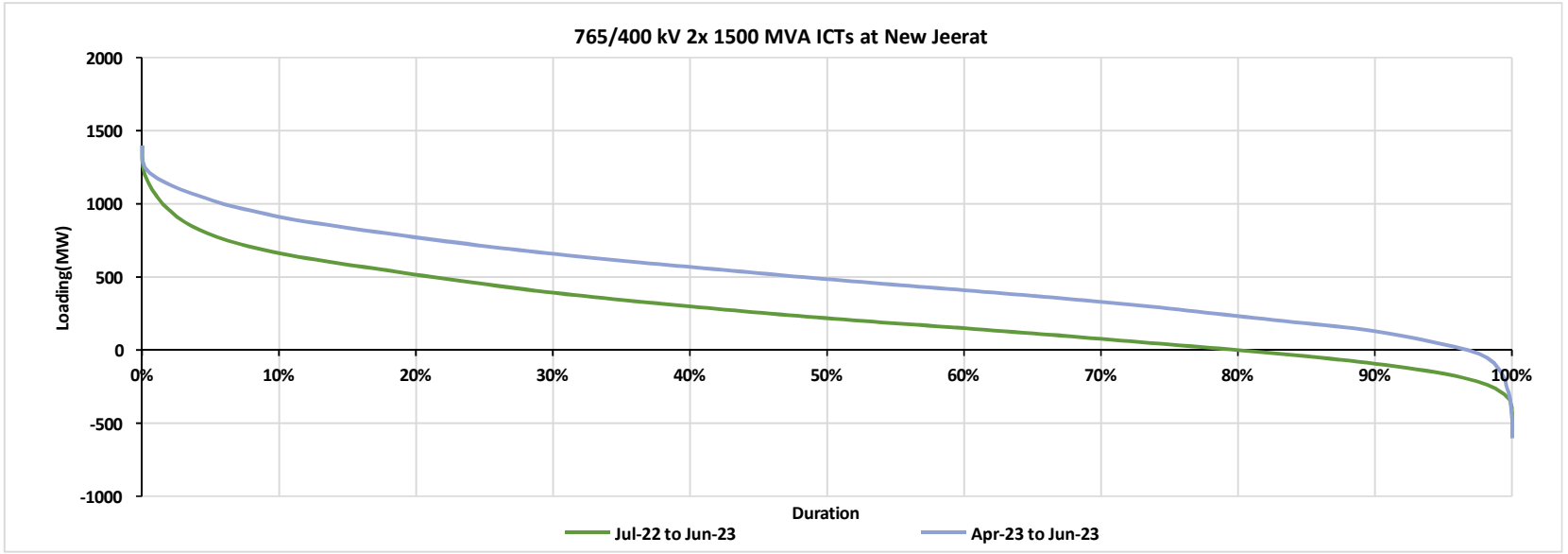
(b) WBSETCL was requested to coordinate with all state utilities including all distribution licensees and provide their action plan in regard to the issues highlighted by ERLDC in their submission and share the details of planned transmission infrastructure along with their expected timelines at the earliest.

3.2. The loading details of the ICTs at Subhasgram (POWERGRID), Rajarhat (POWERGRID) and Jeerat-New (PMJTL) substations and ICT load distribution curve was obtained from ERLDC. The data provided by ERLDC is as follows:

	Subhasgram (POWERGRID) S/s			Rajarhat (POWERGRID) S/s	Jeerat-New (PMJTL) S/s	
Month	400/220kV 4x315MVA + 1x500MVA ICTs Loading (MW)	WB drawal (MW)	CESC drawal (MW)	400/220kV 2x500MVA ICTs Loading (MW)	765/400kV 2x1500MVA ICTs Loading (MW)	
	400kV to 220kV			400kV to 220kV	765kV to 400kV	400kV to 765kV
Jul-22	1270.8	680.0	657.7	617.1	885.7	128.5
Aug-22	1300.7	648.8	688.8	612.3	888.0	301.1
Sep-22	1412.4	758.1	725.5	618.1	981.8	335.3
Oct-22	1168.9	533.2	690.3	574.9	627.7	317.7
Nov-22	1051.3	474.8	694.4	468.8	386.4	373.2
Dec-22	1019.5	538.9	575.1	403.9	398.6	405.2
Jan-23	851.4	529.0	398.4	383.6	382.1	428.0
Feb-23	927.6	472.4	516.9	448.8	365.3	374.9
Mar-23	983.3	564.8	555.2	510.7	517.0	343.7
Apr-23	1804.7	944.4	854.4	736.7	993.2	503.2
May-23	1607.9	753.5	862.8	720.1	1224.4	160.6
Jun-23	1780.8	921.3	888.7	850.3	1335.7	167.5




400/220 kV 2 x 500 MVA ICTs at Rajarhat
Loading(MW)
1000
900
800
700
600
500
400
300
200
100
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Duration
Jul-22 to Jun-23
Apr-23 to Jun-23


765/400 kV 2x 1500 MVA ICTs at New Jeerat
Loading(MW)
2000
1500
1000
500
0
-500
-1000
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Duration
Jul-22 to Jun-23
Apr-23 to Jun-23

3.3. From the above, following is observed:

A. Subhasgram (POWERGRID) 400/220kV S/s: 2x315MVA + 1x500MVA ICTs under ISTS & 2x315MVA ICTs are of CESC

- Maximum combined drawl by WBSETCL and CESC has been about 1805MW. Maximum drawl by WBSETCL and CESC has been about 944MW and 889MW respectively.
- The present loading (1805MW) has already crossed the available transformation capacity of 1760MVA.
- It can be observed that maximum drawl by WBSETCL and CESC are of similar order.
- 400/220kV, 500MVA 6th ICT is under installation by CESC. After installation of 6th ICT, there would be 2x315MVA + 1x500MVA ICTs under ISTS and 2x315MVA + 1x500MVA ICTs of CESC. The cumulative transformation capacity would be 2260MVA. With installation of 6th ICT also, N-1 would not be fulfilled.
- During installation of 6th ICT also it was observed that there is similar maximum drawl at Subhasgram by WBSETCL and CESC. Now also the situation is same. With installation of 6th ICT, there would be same transformation capacity under ISTS and by CESC. However, assuming that ICT drawl would remain same or rather more in coming years, it observed that 7th ICT is required to meet N-1.
- In the clause 5.2.2 of the Manual on Transmission Planning Criteria (Jan 2023), it has been mentioned that the capacity of any single substation (load serving) at 400kV voltage level shall not normally exceed 2500MVA. With installation of 7th ICT, either 315MVA or 500MVA (500MVA is preferred), the cumulative transformation capacity would cross 2500MVA. As installation of 7th ICT is critical to meet N-1, **CEA may provide their views on the matter of transformation capacity becoming 2760MVA** at 400kV level (against recommended level of 2500MVA).
- POWERGRID vide email dated 21-07-2023 has provided following inputs with regard to installation of the 7th 400/220kV, 500MVA ICT (SLD at **Annexure-IV**):
  - Dismantling of existing 420kV, 125MVAr bus reactor installed in bay 418 and shifting/re-installation of the same to new bay no. 419 including construction of bay no. 419 and new foundation for bus reactor.
  - Installation of 7th 400/220kV, 1x500MVA ICT in bay no. 418 (vacated upon shifting of bus reactor) at 400kV level with adaptation of foundation and in bay no. 213 at 220kV level including cable 220kV, 2500sqmm Cu XLPE (single run) / 1-phase GIS bus duct of 500m.

- ERLDC vide letter dated 13-06-2023 (copy enclosed at **Annexure-X**) has also raised issue regarding critical loading of ICTs at Subhasgram and requirement of augmentation of transformation capacity.
- As the 7th ICT is required for meeting N-1 criteria for both ISTS and CESC ICTs on priority, implementation modality may be deliberated. In the interest of National Grid, it is proposed that ICT may be installed in ISTS, and WBSETCL & CESC may settle commercial matters bilaterally.

B. Rajarhat (POWERGRID) 400/220kV S/s: 2x500MVA

- Maximum drawl of about 850MW has been observed at Rajarhat S/s in last one year with N-1 being violated during most of the months (8/12 months), with about 18% time the loading being beyond 500MW.
- It is proposed that 3rd 400/220kV, 1x500MVA ICT along with associated bays in GIS may be installed under ISTS at Rajarhat (POWERGRID) S/s in 21 months (in view of GIS) from date of allocation.
- POWERGRID has confirmed space for installation of 3rd 400/220kV, 1x500MVA ICT along with associated bays in GIS (SLD at **Annexure-V**).

C. Jeerat-New (PMJTL) 765/400kV S/s: 2x1500MVA

- Maximum drawl of about 1335MW has been observed in last one year.
- Looking into the increasing trend of power requirement by West Bengal, it is expected that drawl at Jeerat-New may cross 1500MW in coming months or by next year. Thus, as a proactive measure it is proposed that 3rd 765/400kV, 1x1500MVA (3x500MVA single phase units) may be installed under ISTS in 18 months from date of allocation.
- PMJTL/POWERGRID has confirmed space for installation of 3rd 765/400kV, 1x1500MVA (3x500MVA single phase units) ICT along with associated bays (SLD at **Annexure-VI**). POWERGRID Medinipur Jeerat Transmission Limited (PMJTL) is a subsidiary of POWERGRID.

3.4. May be deliberated.

4. Talcher-III (2x660MW) Connectivity reg. – Agenda by NTPC Ltd.

4.1. In the 19th CMETS-ER, following transmission system for providing ISTS and Intra-state Connectivity was finalised:

- 660MW ISTS Connectivity: Talcher-III – Pandiabili 400kV D/c line
- 660MW intra-state Connectivity (OPTCL): Talcher-III – Meramundali-B 400kV D/c (Quad) line

4.2. Now, NTPC Ltd. vide email dated 13-07-2023 has proposed to include following in the agenda of CMETS-ER:

(a) Installation of 420kV, 1x125MVAr bus reactor at Talcher-III switchyard

(b) Implementation of Talcher-III – Meramundali-B 400kV D/c (Quad) line by OPTCL

4.3. In view of the above, it is proposed to note installation of 420kV, 1x125MVAr bus reactor along with associated bay at Talcher-III switchyard by NTPC Ltd.

4.4. With regard to implementation of Talcher-III – Meramundali-B 400kV D/c (Quad) line by OPTCL, **OPTCL may confirm**.

4.5. Further, as decided in the 19th CMETS-ER, **NTPC Ltd. is requested to confirm** the per circuit rating of DTL so as to take up implementation of ISTS end bays of commensurate rating. In the 19th CMETS-ER, applicant had informed that they shall confirm the same in due course of time. In order to take up implementation of ISTS end line bays in timely manner, NTPC Ltd. may provide the per circuit rating of DTL.

5. Scheduling of 96MW power from Dickhu HEP in Sikkim under GNA Regulations, 2022

5.1. M/s Sneha Kinetic Power Projects Private Limited (SKPPPL) vide letter dated 06-06-2023 has requested the formalities to be fulfilled for scheduling of 96MW power from its Dikchu HEP in Sikkim under GNA Regulations, 2022.

5.2. In this regard a meeting was held on 26-06-2023 (minutes enclosed at **Annexure-VII**), wherein following has been decided:

- 96MW of power can be scheduled from Dikchu HEP (in Sikkim) of M/s SKPPPL under T-GNA in line with various provisions of the GNA Regulations, 2022. This arrangement shall strictly continue only till completion/commissioning of final intra-state connectivity system of Dikchu HEP by Govt. of Sikkim i.e. LILO of one circuit of Dikchu Pool – Singhik 220kV D/c line (operated at 132kV) at Dikchu HEP. Further, the ISTS transmission charges and deviation calculation for Dikchu HEP for T-GNA in ISTS shall be as per applicable Regulations of CERC.

5.3. Power Dept., Govt. of Sikkim may confirm the expected completion schedule of LILO of one circuit of Dikchu Pool – Singhik 220kV D/c line (operated at 132kV) at Dikchu HEP.

5.4. May be noted.

6. Evacuation system for additional generations in Odisha and intra-state 765kV strengthening – Agenda by OPTCL

6.1. During the joint study meeting of ER held on 11-07-2023, intra-state evacuation system for additional generations in Odisha viz. OPGC-Unit 5&6 (1320MW) and floating solar at Hirakud Dam (1200MW) along with 765kV strengthening with connection to ISTS was deliberated. Highlights of the joint study meeting are given below:

- In the 2028-29 time-frame, OPGC Unit 5&6 (1320MW) and floating solar at Hirakud Dam (1200MW) are expected in Odisha which are to be evacuated in the intra-state system. OPGC Unit-5&6 shall not be connected to existing OPGC Units-1 to 4 by any means (line/bus extension/bus-sectionaliser etc.) and the Unit-5&6 shall be connected directly and dedicatedly through its own switchyard to new substation in OPTCL network. The power from these generations is to be mainly transferred to new load centres on the eastern part of Odisha grid viz. Duburi, Paradeep, Mendhasal areas.
- In order to evacuate power from said upcoming generation projects and transfer power to western part of Odisha network, OPTCL proposed establishment of Kolabira 765/400kV substation with 765kV interconnections to Sundargarh S/s and planned Duburi 765/400kV S/s.
- Split bus arrangement has been implemented at Sundargarh (POWERGRID) S/s at 765kV level (SLD at **Annexure-VIII**) and the same shall be operationalised in next few years (before subject new generations of Odisha) as the fault level is found to be increasing the design limits. Further, at Sundargarh S/s only 2 no. 765kV GIS bays are available, which are in bus section-B.
- With connection of Kolabira to Sundargarh-B and also to Duburi through 765kV link, two separate 765kV corridors including inter-regional link (viz. Dharamjaygarh-A – Sundargarh-B – Duburi – Paradeep and Dharamjaygarh-B – Sundargarh-A – NLC-Talabira – Angul – Duburi – Paradeep) shall be created for meeting the power exchange requirement in Odisha with reliability. The Sundargarh-B section also has Darlipalli (2x800MW) generation at 765kV level.
- In view of the above, studies were carried out and following system was identified in intra-state (to be implemented by OPTCL):

  (a) Establishment of 765/400kV, 3x1500MVA Kolabira S/s along with 765kV, 2x330MVAr + 420kV, 2x125MVAr bus reactors

  (b) Sundargarh-B – Kolabira 765kV D/c line

(c) Kolabira – Duburi 765kV D/c line

(d) 400kV D/c DTL from OPGC Unit-5&6 to Kolabira (shall be connected directly and dedicatedly to Kolabira without any connection to existing units)

(e) Injection from 1200MW Floating solar (500MW + 700MW) at 400kV at Kolabira

(f) Shyam Steel (300MW) bulk consumer at Kolabira at 400kV

- It was agreed that the identified intra-state system may be taken up for ratification/approval in the CMETS-ER.

6.2. As per confirmation from POWERGRID vide email dated 13-07-2023, 2 no. 765kV GIS bays are available at Sundargarh-B section viz. bay no. 727 and 730. It is proposed that 765kV GIS ISTS bays no. 727 & 730 may be allocated to OPTCL for connection of their 765kV D/c line from Kolabira (OPTCL) S/s. Other necessary items like GIS duct, bushing (SF_6 to Air), line terminal equipment (CVT/LA/BPI/Line Trap etc.) for line termination may be installed by OPTCL.

6.3. Further, following intra-state strengthening in Odisha to be implemented by OPTCL under intra-state scheme may be noted:

(a) Establishment of 765/400kV, 3x1500MVA Kolabira S/s along with 765kV, 2x330MVAr + 420kV, 2x125MVAr bus reactors ***(space provision for future expansion may informed by OPTCL in the meeting)***

(b) Sundargarh-B (POWERGRID) – Kolabira (OPTCL) 765kV D/c line

(c) Kolabira (OPTCL) – #Duburi (OPTCL) 765kV D/c line

(d) OPGC (unit-5&6) – Kolabira 400kV D/c (Quad) line

(e) Hirakud floating Solar – Kolabira 400kV D/c line

Note: *#Duburi 765/400kV S/s to be established through LILO of Angul (POWERGRID) – Paradeep (ISTS) 765kV D/c ISTS line (under implementation in ISTS) was agreed to be implemented by OPTCL under intra-state scheme in the 18th CMETS-ER held on 29-03-2023. However, as per direction from National Committee on Transmission (NCT) the scheme has been referred to ERPC for their views/observations. With the views of ERPC, the scheme would be referred to NCT.*

6.4. OPTCL may confirm regarding establishment of Kolabira 765/400kV substation in AIS / GIS considering both initial and future space requirements.

7. Intra state strengthening in DVC area for upcoming thermal and solar generations and strengthening of intra state infrastructure – Agenda by DVC

7.1. CTU vide email dated 20-04-2023 had requested all the STUs of ER regarding submission of data for studies for the upcoming interim Rolling Plan to be issued by Sep 2023.

7.2. In response to above referred email, DVC vide email dated 29-05-2023 submitted a Study Report inter alia including evacuation plan for new units at DTPS: 1x800MW, KTPS: 2x800MW, RTPS: 2x660 & Solar power of 1950MW, and system strengthening of DVC. In the said report, it is mentioned that the existing generation capacity of DVC is about 6897MW and present load demand (including Railway & JBVNL load) within valley area is to the tune of 4633MVA. By 2027-28, the expected load growth is about 6278MVA. Further, three units of Mejia-A viz. 1, 2 & 3 of 210MW each are about to retire by this timeframe. In the report, preliminary proposals for evacuation of power from new thermal / solar plants, reconductoring of existing intra-state transmission lines, augmentation of existing substations & new transmission lines are also mentioned.

7.3. In this regard, a joint study meeting between DVC and CTU was held on 13-06-2023 & 14-06-2023 at CTU office, Gurugram. The minutes of the meeting are enclosed at **Annexure-IX.** Major outcomes are given below:

A. The transmission system having immediate connection with ISTS are given below:

A1. Evacuation from upcoming thermal generations:

(a) Power from the upcoming 2x800MW generations at Koderma can be evacuated through the existing 400kV network & additional 3rd ICT 400/220kV, 500MVA at Koderma.

(b) Power from the upcoming 1x800MW generations at DTPS-Waria can be evacuated through the DTPS – Durgapur (POWERGRID) (Twin Moose) 400kV D/c along with new 400/220kV, 2x500MVA ICTs within the existing 220/132kV DTPS switchyard

(c) Power from the upcoming 2x660MW generations at Raghunathpur can be evacuated through the existing 400kV network & additional 3rd ICT 400/220kV, 315MVA at Raghunathpur.

Note: The above transmission system is based on preliminary studies and the same would be finalised as and when DVC applies for ISTS Connectivity of above generations as per GNA Regulations 2022.

A2. Gola-B and Ramkanali 400kV substations

In the 6th CMETS-ER held on 29-04-2022, two new 400/220/132kV substations of DVC viz. Ramkanali (LILO of both circuits of RTPS – DSTPS 400kV D/c line) and Gola-B (LILO of both circuits of Ranchi – RTPS 400kV D/c line) through LILO of existing 400kV ISTS line was agreed to be implemented by DVC. The transformation capacity of Gola-B was planned as 400/220kV, 2x500MVA + 220/132kV, 2x200MVA and of Ramkanali was 400/220kV, 2x315MVA (shifted from DSTPS) + 220/132kV, 3x200MVA (3rd 220/132kV ICT may be installed progressively with load growth).

During the study of 2027-28 timeframe, it was observed that loading on 220/132kV ICTs is expected to be violating the N-1 criteria due to increased new load demand at Chandil and Jamshedpur areas. Accordingly, it was decided that Gola-B substation may be implemented with 220/132kV, 3x200MVA ICTs instead of 2x200MVA ICTs. Thus, Gola-B shall be established as 400/220kV, 2x500MVA + 220/132kV, 3x200MVA.

Further, 2x315MVA ICTs released from DSTPS were identified to be shifted to Ramkanali-B for establishment of new substation. As DVC has decided to implement Ramkanali-B and Gola-B substations through intra-state TBCB, it would not be prudent to use old ICTs in the TBCB scheme. Accordingly, the transformation capacity of Ramkanali-B may be modified as 400/220kV, 2x500MVA ICTs (to be sourced under intra state TBCB scheme). Thus, Ramkanali-B shall be established as 400/220kV, 2x500MVA + 220/132kV, 3x200MVA. The DSTPS ICTs shall be used elsewhere as detailed below.

A3. ICTs at all DVC generations at 400kV level (ISGS)

Replacement existing 2x315MVA, 400/220kV ICTs with 2x500MVA, 400/220kV ICTs at BTPS switchyard was agreed in 6th CMETS-ER. The ICTs released from Bokaro TPS were proposed to be shifted to Mejia (2nd) and RTPS/Ramkanali (3rd) ICT. However, N-1 constraint is observed at Bokaro TPS 400/220kV ICTs even with the 2x500MVA ICTs in future timeframe with load growth and additional generations in DVC area. Accordingly, it was decided that to augment the transformation capacity at BTPS, 3rd 400/220kV, 1x500MVA ICT may be installed at Bokaro TPS in place of earlier agreed replacement of 2x315MVA ICTs. Thus, BTPS will have 2x315MVA + 1x500MVA.

Further, the ICTs released from DSTPS would be utilized for Mejia TPS (2nd) and RTPS (3rd) ICT.

With the above rearrangement, the ICTs at various 400kV DVC generation switchyards and substations shall be as below:

Sl. No.	Location	Existing/Planned Capacity	Final Capacity	Remarks
1	DSTPS	2x315	2x500	Replaced ICT to be shifted to MTPS (2nd) & RTPS (3rd)
2	MTPS	1x315	2x315	Replaced ICT from DSTPS to be installed as ICT(2nd)
3	RTPS	2x315	3x315	Replaced ICT from DSTPS to be installed as ICT(3rd)
4	KTPS	2x315	2x315+1x500	Additional 500MVA ICT (3rd) linked with KTPS (2x800MW)
5	BTPS	2x315	2x315+1x500	Additional 500MVA ICT (3rd)
6	Gola-B	2x500+2x200	2x500+3x200	-
7	Ramkanali-B	2x315+3x200	2x500+3x200	-
8	DTPS	-	2x500	New ICT linked with DTPS (1x800MW)

B. Strengthening of intra-state system of DVC: for noting only

B1. Augmentation of transformation capacity at various intra-state substations of DVC was required to meet the growing demand.

B2. Power from about 1950MW upcoming solar generation may be evacuated through intra-state system. Reconductoring of intra-state lines to meet the growing demand as well as establishment of 2 nos. 220/33kV S/s to meet the additional load was noted.

B3. For the evacuation of solar power from Maithon Solar Block 1 (234MW) & 2 (300MW), DVC is planning LILO of both circuits of Dhanbad-Maithon PG 220kV D/c at Maithon Solar Block. From the studies, it was observed that major portion of power rushes towards Maithon (POWERGRID) S/s, which in turn leads to overloading of under implementation Maithon – Asansol 220kV D/c HTLS line (1200A) of WBSETCL. As per information available on WBPDCL website, new 800MW generating unit in under planning at Santaldih. With new units at Santaldih the loading on Maithon – Asansol

line was observed to be reduced. **WBSETCL may share their observations on this matter including status of new units of Santaldih.**

7.4. Matter may be deliberated.

8. Status of downstream 220kV or 132kV network by STUs from the various commissioned and under-construction ISTS substations in ER

8.1. Numbers of ISTS sub-stations have been commissioned and some are under construction for which the downstream system is being implemented by the STUs. Based on the information provided by the states, updated information on planned/under-construction downstream system is given at **Annexure-I**.

8.2. STUs may update the status of downstream system given at **Annexure-I** prior to the meeting for further deliberations in the meeting, if any.

9. Status of 400kV substations being implemented by STUs/entities in ER to be connected through ISTS

9.1. Various 400kV substations have been approved in the intra-state strengthening schemes in ER having interconnection with ISTS grid involving LILO of ISTS lines or direct connection to ISTS substations. Status of such intra-sate substations as per available information is given at **Annexure-II**.

9.2. STUs may update the status of the transmission system given at **Annexure-II** prior to the meeting for further deliberations in the meeting, if any.

10. Status of space allocated at various ISTS substations to STUs for implementation of line bays under intra state system) for their intra state lines

10.1. Space at various ISTS substations have been allocated to STUs for creation of line bays for termination of their new intra-state. List of such ISTS substations as per available information is given at **Annexure-III**.

10.2. STUs may update the status of the bays given at **Annexure-III** prior to the meeting for further deliberations in the meeting, if any.

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Annexure-I

Status of Downstream Transmission Network in ER

Sl. No.	ISTS S/s	State	Voltage ratio, Trans. Cap	Downstream Voltage level (kV)	Unuti-lised bays	Status of ISTS	STU lines for unutilised bays	Status of Lines	
								Date of Award	Completion schedule
1.	Chaibasa	Jharkhand	400/220kV, 2x315MVA	220	2	Existing bay	Chaibasa (POWERGRID) – Jadugoda (JUSNL) 220kV D/c	Administrative approval taken	May 2025
2.	Daltonganj	Jharkhand	400/220/132kV, 2x315MVA+ 2x160MVA	132	2	Existing bay	Daltonganj (POWERGRID) – Chatarpur 132kV D/c	22-10-2019	Expected by May 2024.
3.	Dhanbad	Jharkhand	400/220kV, 2x500MVA	220	4	Existing bay	LILO of 1st circuit of 220kV Dumka – Govindpur D/c line at Dhanbad (23km)	Price part open on 18th April 23	16-05-2024
							Dhanbad - Baliyapur 220kV D/c line.	DPR prepared and send to government for administrative approval.	
4.	Keonjhar	Odisha	400/220kV, 2x315MVA	220	2	Existing bay	Keonjhar (POWERGRID) – Turumunga (OPTCL) 220kV D/c		Expected by Dec 2023.
5.	Rourkela	Odisha	400/220kV, 4x315MVA	220	-	-	Reconductoring of Rourkela – Tarkera 220kV D/c line with HTLS conductor	Tender will be awared in first week of May.	Expected by Sep 2023.
6.	Subashgram	West Bengal	400/220kV, 2x315MVA+ 1x500MVA	220	2	Existing bay	Subashgram (POWERGRID) – Baraipur 220kV D/c line		220kV Baruipur substation charged. 132kV downstream viz. Baruipur-Serakol 132kV D/c delayed due to RoW. Line completed except stringing of 1 no. span due to pending court case.
7.	Rajarhat	West Bengal	400/220kV, 2x500MVA	220	2	Existing bay	Rajarhat (POWERGRID) – New Town AA IIC 220kV D/c		Line charged on 26-09-2022 from Rajarhat S/s. New Town AA IIC S/s is getting delayed due to some issues in

Sl. No.	ISTS S/s	State	Voltage ratio, Trans. Cap	Downstream Voltage level (kV)	Unuti-lised bays	Status of ISTS	STU lines for unutilised bays	Status of Lines	
								Date of Award	Completion schedule
									132kV GIS bus ducts & 220kV GIS.
8.	Sitamarhi (New)	Bihar	400/220/132kV, 2x500MVA + 2x200MVA	132	2	Existing bay	LILO of Benipatti - Pupri 132kV S/c at Sitamarhi (New)		Expected by October 2023.
9.	Saharsa (New)	Bihar	400/220/132kV, 2x500MVA + 2x200MVA	132	2-ISTS (addln.4 by state)	Existing bay	Saharsa (New) - Saharsa 132kV D/c line formed by LILO of Saharsa - Banmankhi and Saharsa - Uda Kishanganj 132kV S/c line	Line portion ready	04 nos. of bays are under construction by BSPTCL at Saharsa (New). These bays are expected in June 2023.
10.	Banka	Bihar	400/220/132kV, 2x500MVA + 2x200 & 1x315MVA	220	2	Oct 2024	Banka (POWERGRID) – Goradih (Sabour New) 220kV D/c line (around 45km) along with 2 nos. 220kV GIS line bays at Goradih (Sabour New) S/s	**Line:** Awarded on 03-03-2023. **Bays:** Tender has been floated.	**Line**: Expected to be completed within 18 months from award i.e. by 02-09-2024. **Bays**: 12 months from the date of issuance of Notification of Award.
11.	Durgapur	DVC	400/220kV, 3x315MVA	220	-	-	Reconductoring of Durgapur – Parulia (DVC) 220kV D/c line with HTLS conductor. (1000A)	Awarded in Feb 2022.	Expected by Aug 2023.

Annexure-II

Status of 400kV & 220kV substations being implemented by STUs/entities in ER to be connected to ISTS

Sl. No.	Substation/Location	Transformation Capacity/ Element	Date of Award	Completion Schedule
A	**Bihar (to be implemented by BSPTCL)**			
I	**Bakhtiyarpur GIS**	400/220/132kV, 2x500MVA + 2x160MVA	26-11-2019	1st 500MVA: Aug 2023 2nd 500MVA: Oct 2023 1st 160MVA: Sept 2023 2nd 160MVA: Dec 2023
a)	LILO of both circuits of Barh – Patna (PG) 400kV D/c (Quad) line-1 at Bakhtiyarpur 400 kV 2xD/c line	400kV 2xD/c	26-11-2019	Line ready to be charged matching with Bakhtiyarpur S/s.
II	**Chappra (New)**	400/220/132kV, 2x500MVA + 2x200MVA	Approved by Cabinet. Tender process being initiated.	Dec 2025
a)	LILO of 400 kV Barh (NTPC) – Motihari (DMTCL) D/C (Quad) transmission line at Chappra	400kV 2xD/c	Approved by Cabinet. Tender process being initiated.	Dec 2025
B	**Odisha (to be implemented by OPTCL)**			
I	**Gopalpur**	400/220kV, 2x500MVA	Tendering activity to be taken up shortly.	Mar 2026
a)	Pandiabili (POWERGRID) – Gopalpur 400kV D/c (AAAC Twin Moose) line	400kV D/c	Tendering activity to be taken up shortly.	Mar 2026
II	**Therubali**	400kV switching station along with 420kV, 1x125MVAr bus reactor	Survey completed. Land schedule is under preparation	2026-27
a)	Gopalpur – Therubali – Jeypore (POWERGRID) 400kV D/c line	400kV D/c	To be taken after tendering of Gopalpur S/s.	2026-27
III	**Bhadrak**	400/220kV, 2x500MVA	Tender was cancelled due to high cost. Exploring Self-funding.	2025-26
a)	LILO of Baripada – Duburi and Baripada – Pandiabili 400kV line sections at Bhadrak	400kV D/c	Tender was cancelled due to high cost. Exploring Self-funding.	2025-26
IV	**Paradeep**	400/220kV, 2x500MVA	Awarded in Dec 2022	Dec 2024
a)	Paradeep – Duburi 400kV D/c line	400kV D/c	Line work started.	Dec 2024
VI	**Joda New**	400/220kV, 3x500MVA	To be taken up under intra state TBCB. Assigned to PFC. Site	2025

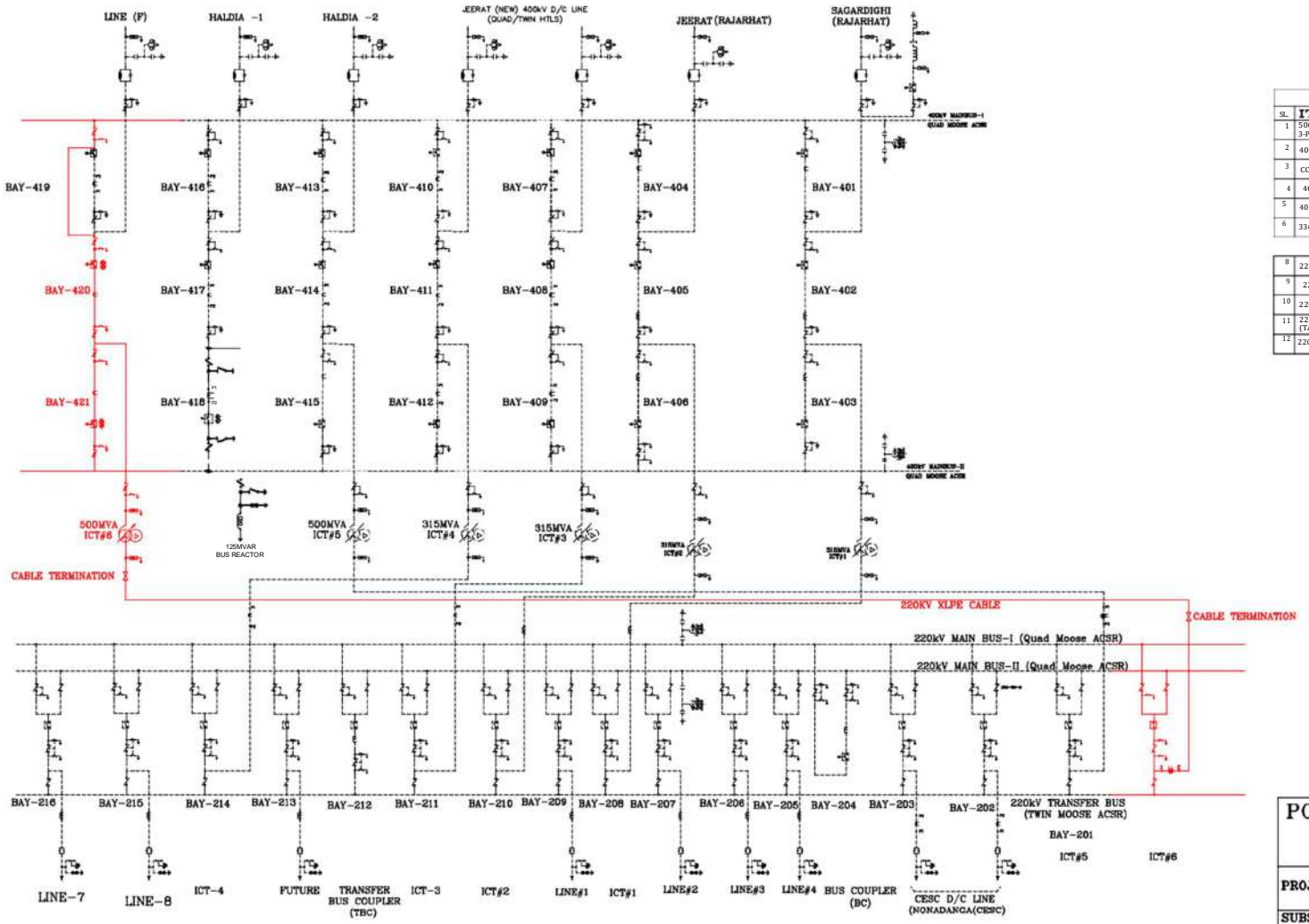
Sl. No.	Substation/Location	Transformation Capacity/ Element	Date of Award	Completion Schedule
			selection under progress	
a)	LILO of Rourkela (POWERGRID) – Talcher (NTPC) 400kV D/c line at Joda New	400kV D/c	To be taken up under intra state TBCB. Assigned to PFC.	2025
C	**Jharkhand (to be implemented by JUSNL)**			
I	**Chandil (New)**	400/220kV, 2x500MVA	Price part opened. Sent to state government for approval.	24 months
a)	PVUNL – Chandil 400kV D/c (Quad) line	400kV D/c (Quad)		
b)	Chandil – Chaibasa (POWERGRID) 400kV D/c (Quad) line	400kV D/c (Quad)		
c)	Chandil – Dhanbad (ISTS) 400kV D/c (Quad) line	400kV D/c (Quad)		
II	**Koderma**	400/220/132/33kV, 2x500MVA + 2x200MVA + 2x80MVA		
a)	PVUNL – Koderma 400kV D/c (Quad) line	400kV D/c (Quad)		
III	**Latehar**			
a)	Patratu – Latehar 400kV D/c line	400kV D/c	Forest Stage-I clearance is awaited.	Mar 2024
b)	Latehar – Chandwa (POWERGRID) 400kV D/c line	400kV D/c	Work in Progress. However, progress is slow. This work is being executed by POWERGRID under Jharkhand Consultancy Project (JCP).	Dec 2023
D	**West Bengal**			
(to be implemented by WBSETCL)				
I	**New Laxmikantpur GIS**	400/132kV, 2x315MVA	Land identified. In process of acquisition.	
a)	LILO of one circuit of Jeerat (New) – Subhasgram 400kV D/c (Quad) line at New Laxmikantpur *(Interim arrangement: LILO of Haldia – Subhasgram 400kV D/c line at Laxmikantpur)*	400kV D/c	**Interim arrangement:** M/s HEL is yet to receive the clearance from OEM of their generating units for LILOing of 400KV Haldia-Subhasgram line.	

Sl. No.	Substation/Location	Transformation Capacity/ Element	Date of Award	Completion Schedule
II	**Falakata**	220/132kV, 2x160MVA	Initial civil works have been started.	Dec 2023
a)	LILO of Birpara – Alipurduar 220kV D/c line at Falakata substation (LILO portion length around 9km)	220kV 2xD/c		Dec 2023 (may get delayed due to poor progress of work by Vendor)
(being implemented by CESC – status may be updated by WBSETCL)				
III	**Subhasgram (POWERGRID)**	-	-	-
	Installation of new 400/220kV, 500MVA (6th) ICT at Subhasgram (POWERGRID) S/s along with associated ICT bays and OLTC by CESC at its own cost	400/220kV, 1x500MVA (6th ICT)	Go ahead clearance from CESC given to POWERGRID for tendering process. Agreement between POWERGRID & CESC executed on 26-05-2023.	-

Annexure-III

Space allocated at various ISTS substations to STUs for implementation of line bays under intra state system for their intra state lines

Sl. No.	Substation/ Location	Space for	Date of award of line and bays	Completion Schedule	Agreed in CMETS-ER
1.	Rourkela (POWERGRID)	2 No. 220kV lines bays for termination of Rourkela (POWERGRID) – Tikrapara 220kV D/c (HTLS) line	No clarity from beneficiary	On hold	1st & 7th
2.	Keonjhar (POWERGRID)	2 No. 220kV lines bays for termination of Keonjhar (POWERGRID) – Tikarpada 220kV D/c line	No clarity from beneficiary	On hold	1st
3.	Maithon (POWERGRID)	2 No. 220kV lines bays for implementation of Maithon (POWERGRID) – Asansol 220kV D/c line	Line bays to be constructed by PGCIL as a deposit work of WBSETCL on consultancy basis, draft agreement is being vetted by concerned wings of WBSETCL & PGCIL and is expected to be executed shortly. Line survey completed and engineering & cost estimation are in progress.	Tender for line & WBSETCL end bay works will be floated within July 2023.	7th



400KV EQUIPMENT

LEGENDS

SL.	ITEM DESCRIPTION	SYM.
1	500 MVA AUTO TRANSFORMER 3-PH., 400/220/33 KV	
2	400KV CIRCUIT BREAKER WITHOUT PIR	
3	CONTROLLED SWITCHING DEVICE (CSD)	
4	400KV ISOLATOR WITH ONE EARTH SWITCH	
5	400KV CURRENT TRANSFORMER	
6	336KV SURGE ARRESTER	

220KV EQUIPMENT

8	220KV CIRCUIT BREAKER WITHOUT PIR	
9	220KV ISOLATOR WITH ONE EARTH SWITCH	
10	220KV ISOLATOR WITH TWO EARTH SWITCH	
11	220KV ISOLATOR WITHOUT EARTH SWITCH (TANDEM)	
12	220KV CURRENT TRANSFORMER	

LEGENDS :-

PRESENT SCOPE:-

FUTURE/EXISTING:-

FOR TENDER PURPOSE ONLY

POWER GRID CORPORATION OF INDIA LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)

PROJECT: Consultancy to CESC

SUBSTATION:
Extension of 400/220kV Subhashgram Substation

TITLE: SINGLE LINE DIAGRAM

DRG.NO. C/ENGG/CONS/CESC/SUBHASHGRAM/SLD

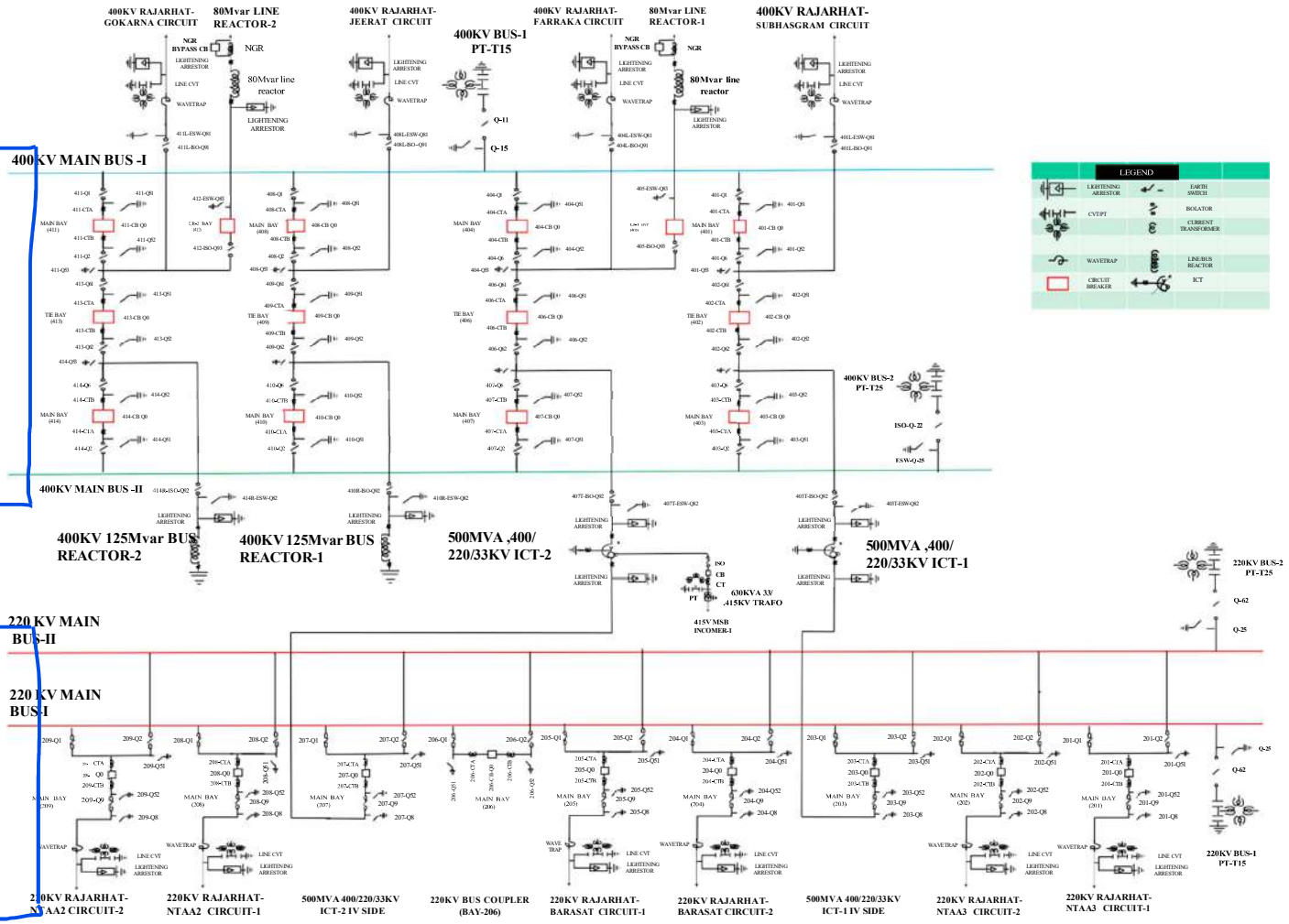
REV. 00

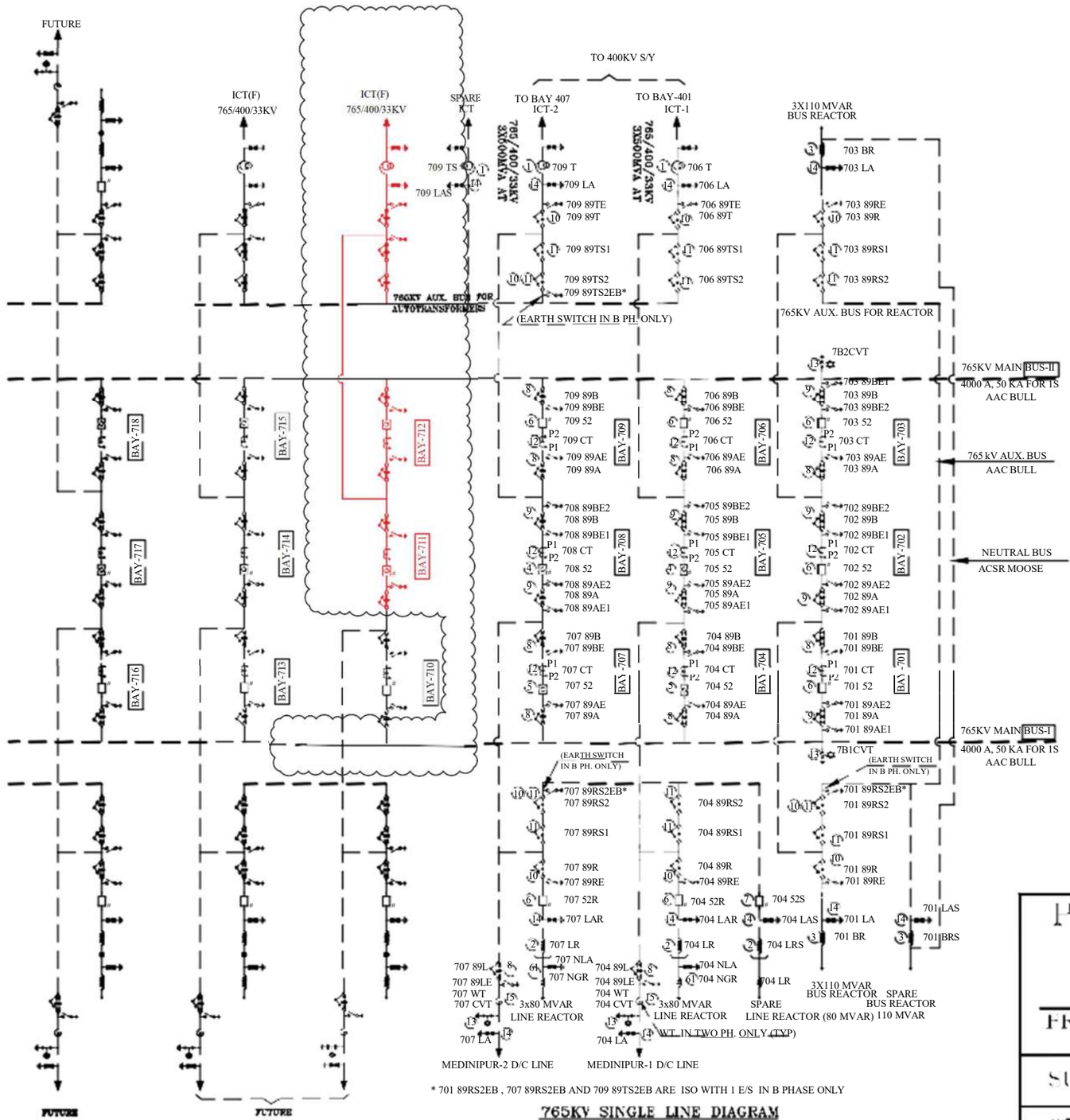
Annexure-V

POWERGRID CORPORATION OF INDIA LIMITED

SINGLE LINE DIAGRAM 400/220KV GIS SUBSTATION

ER-2 RAJARHAT KOLKATA





* 701 89RS2EB , 707 89RS2EB AND 709 89TS2EB ARE ISO WITH 1 E/S IN B PHASE ONLY

765KV SINGLE LINE DIAGRAM

POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

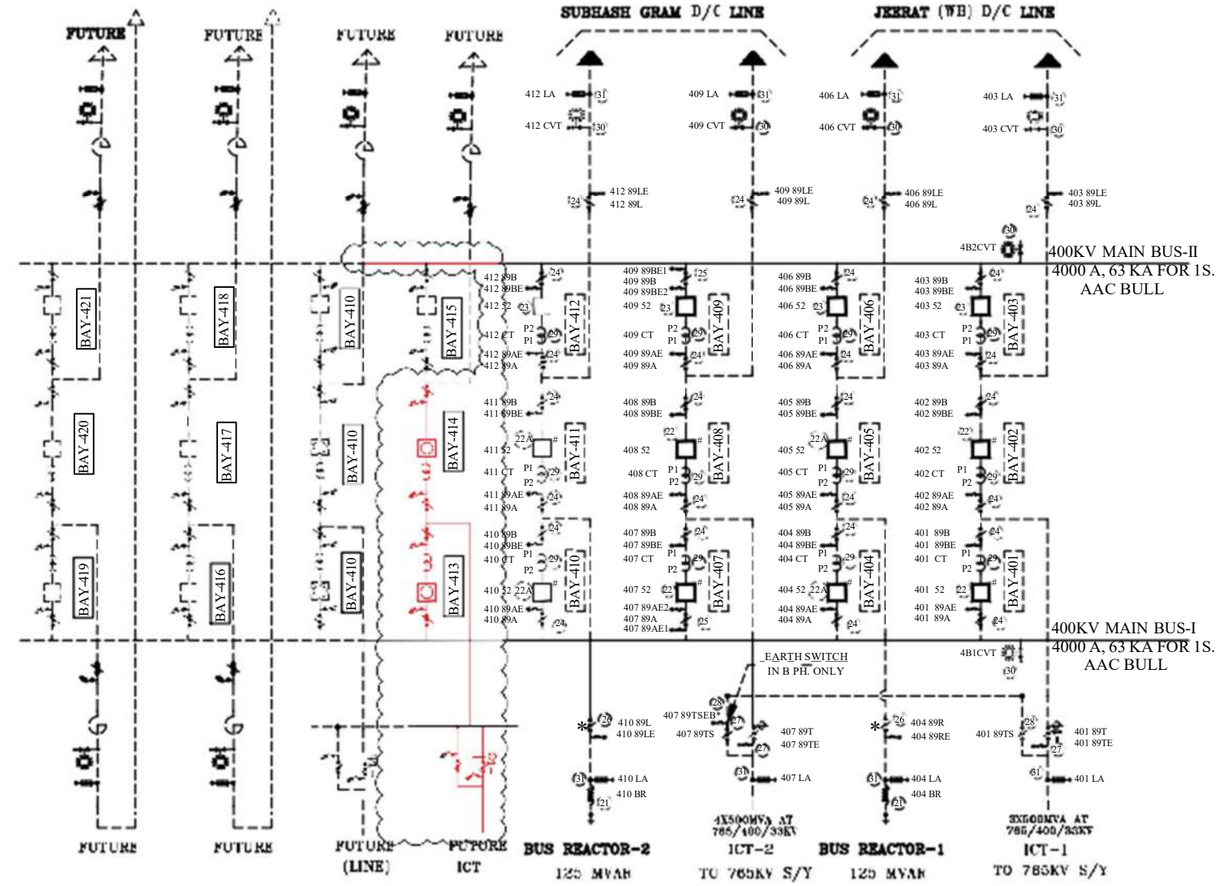
PROJECT : Space for installation of new 765/400kV, 1500MVA ICT (3rd) along with associated ICT bays.

SUBSTATION : 765/400KV JEERAT S/S (EXTN)

TITLE : BAY ALLOCATION AT 765/400kV JEERAT S/S FOR 765/400KV, 1500MVA 3rd ICT

DRAWN	DATE	DRAWING NO.	REV.
		C/ENGG/TBCB/JEERAT/765KV/EXTN/	C

TB-3-395-510-001



400KV SINGLE LINE DIAGRAM

POWER GRID CORPORATION
OF INDIA LIMITED
(A Government of India Enterprise)

PROJECT : Space for installation of new 765/400kV 1500MVA ICT (3rd) along with associated ICT bays.

SUBSTATION : 765/400KV JEERAT S/S (EXTN)

TITLE : BAY ALLOCATION AT 765/400kV JEERAT S/S FOR 765/400kV, 1500MVA 3rd ICT- 400kV Side

DRAWING NO.

C/ENGG/TBCB/JEERAT/765KV/EXTN/

DRAWN

DATE

REV.

0

Annexure-VII

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/01/Dikchu

Date: 18-07-2023

To: As per Distribution List

Subject: Minutes of Meeting regarding scheduling of power from Dikchu HEP in Sikkim under GNA Regulations, 2022

Dear Sir/Ma'am,

A meeting to discuss the scheduling of 96MW power from Dikchu HEP in Sikkim under GNA Regulations, 2022 was held on **26th June, 2023** through video conferencing. In this regard, please find enclosed minutes of the meeting.

धन्यवाद/ Thanking you,

भवदीय / Yours faithfully,

राजेश कुमार
18/07/2023

(राजेश कुमार) / (Rajesh Kumar)
वरिष्ठ महाप्रबंधक/ Sr. General Manager

Distribution List:

1. Chief Engineer (PSP&A-II) Central Electricity Authority Sewa Bhawan, R.K.Puram New Delhi-110066	**2. Member Secretary** Eastern Regional Power Committee 14, Golf Club Road, Tollygunge Kolkata-700033
3. Director (SO) Grid Controller of India Limited 9th Floor, IFCI Towers, 61, Nehru Place, New Delhi-110016	**4. Executive Director** Eastern Regional Load Despatch Centre 14, Golf Club Road, Jubilee Park, Golf Gardens, Tollygunge, Kolkata, West Bengal - 700095
5. Authorised Signatory Sneha Kinetic Power Projects Pvt. Ltd. C-35, Lane-1, Sector-2, New Shimla Shimla, Himachal Pradesh-171009	

Minutes of Meeting held on 26-06-2023 regarding scheduling of 96MW power from Dickhu HEP in Sikkim under GNA Regulations, 2022

1.0 Dy. COO (CTUIL) welcomed the participants to the meeting. The list of participants is enclosed at **Annexure-I.**

2.0 CTU informed that the present meeting has been convened based on the letter received from M/s Sneha Kinetic Power Projects Private Limited (SKPPPL) dated 06-06-2023 (enclosed at **Annexure-II**) wherein M/s SKPPPL has requested the formalities to be fulfilled for scheduling of 96MW power from its Dikchu HEP in Sikkim under GNA Regulations, 2022.

3.0 CTU mentioned the following about the matter:

- An interim ISTS connectivity of 96MW was granted to M/s SKPPPL as per CERC order dated 03-12-2014 in Petition No. 157/MP/2014 wherein CERC allowed LILO of one circuit of Teesta III HEP – Kishanganj 400kV D/c (Quad) line (subsequently LILOed at Rangpo S/s) at Dikchu HEP as an interim arrangement connectivity of Dikchu HEP. In the said order, it is also mentioned that the interim arrangement is to be removed upon completion of originally planned 220kV Dikchu – Rangpo line (to be initially operated at 132kV) by Govt. of Sikkim.
- The intra-state connectivity system (under the scope of Sikkim) was revised from original plan in the 1st meeting of ERPC-TP held on 14-02-2020, wherein following was decided in regard to Connectivity system of Dikchu HEP:

  "the following scope of works in regard to connectivity system of Dikchu HEP was agreed:

  (i) LILO of one circuit of Dikchu Pool-Singhik 220kV D/c (Twin Moose) line (to be initially operated at 132kV) – by Govt. of Sikkim

  (ii) *LILO of one circuit of Teesta-III – Rangpo/Kishanganj 400kV D/c (Quad) line at Dikchu HEP would be disconnected from Dikchu HEP switchyard and original Teesta-III – Rangpo – Kishanganj 400kV D/c (Quad) line would be restored by generation developer upon commissioning of above LILO."*
- LILO of one circuit of Dikchu Pool – Singhik 220kV D/c line (operated at 132kV) at Dikchu HEP is being implemented under Comprehensive Scheme (being implemented by POWERGRID under Consultancy). POWERGRID vide email dated 23-06-2023 has informed that the above scheme is expected by Dec 2023.
- Presently, no LTA exists from Dikchu HEP, and ERLDC confirmed that power is being evacuated from Dikchu HEP under STOA only.
- Now M/s SKPPPL vide said letter has requested for the formalities required to schedule 96MW power under the GNA Regulations, 2022 without affecting

the operation of the plant. In this regard, it is to mention that the most suitable provision under GNA Regulations, 2022 was observed is ***2nd proviso of Regulation 22.4 (a)***, which is quoted below:

> *"For Connectivity grantees covered under Regulation 4.1 of these regulations, the effective date of GNA of such Connectivity grantees shall be the start date of Connectivity or COD of ATS, whichever is later.*
>
> *Provided that where only some of the transmission elements of the ATS have achieved COD before the COD of the ATS and the Connectivity grantee seeks part effectiveness of its Connectivity, the Nodal Agency shall make such part Connectivity and corresponding GNA effective, subject to availability of transmission system.*
>
> ***Provided also that where such GNA is yet to become effective, such entity shall be eligible to get its power scheduled partly or fully of the quantum of Connectivity sought for, subject to availability of transmission system by treating such access as deemed T-GNA, and shall not be required to pay T-GNA charges."***

4.0 In view of the above, it was proposed that once the scheduling of power under GNA Regulations, 2022 starts, the scheduling of power from Dikchu HEP may be done under T-GNA till commissioning of final intra-state connectivity system.

5.0 ERLDC mentioned that as per Regulation 26.1 of the GNA Regulations 2022, M/s SKPPPL for its Dikchu generation would not fulfill the eligibility requirements for grant of T-GNA as they are injecting entity. CTU mentioned that T-GNA may be allowed by Grid-India from Dikchu HEP to eligible entities under Regulation 26.1 till commissioning of final intra-state connectivity system.

6.0 ERLDC further mentioned that as per the present interim arrangements viz. LILO of one circuit of Teesta III HEP – Kishanganj 400kV D/c (Quad) line (subsequently LILOed at Rangpo S/s) at Dikchu HEP, under the outage of Dikchu – Rangpo 400kV line section, there is an operational constraint in evacuation of power (considering overload capacity) of both Teesta-III & Dikchu HEPs simultaneously during the high hydro condition due to the limiting constraints in 400kV cable installed at Teesta-III switchyard (2000A rated cable section in Quad Moose line). Accordingly, curtailment of power of Dikchu HEP would be required under T-GNA. ERPC also supported the operational constraints raised by ERLDC.

7.0 CTU clarified that Teesta-III HEP has been granted deemed GNA of 536MW. Further, they the generation developer has already opted for transition of balance quantum i.e. 664MW (1200-536), under Regulation 37.6 (1), which has already been agreed for grant on existing ISTS in the 19th CMETS-ER with start date as "Date from which scheduling under GNA starts as per CERC notification/communication". As per Regulation 37.6 (1) (a), grant shall be made after submission of requisite Conn-BG by generation developer of Teesta-III HEP. Further, the Regulation 29.2 states that "The GNA grantees shall have priority over the T-GNA grantees for use of the ISTS.". Thus, curtailment of power under T-GNA, if any, would be as per the provisions in the GNA Regulations, 2022.

8.0 It was also noted in the meeting that, the ISTS transmission charges and deviation calculation for Dikchu HEP for T-GNA shall be as per applicable Regulations of CERC.

9.0 Dikchu HEP developer noted that power scheduled with present ISTS interim arrangement under T-GNA is liable to curtailed as per provisions of GNA Regulations, 2022.

10.0 After detailed deliberations, it was agreed that 96MW of power can be scheduled from Dikchu HEP (in Sikkim) of M/s SKPPPL under T-GNA in line with various provisions of the GNA Regulations, 2022. This arrangement shall strictly continue only till completion/commissioning of final intra-state connectivity system of Dikchu HEP by Govt. of Sikkim i.e. LILO of one circuit of Dikchu Pool – Singhik 220kV D/c line (operated at 132kV) at Dikchu HEP. Further, the ISTS transmission charges and deviation calculation for Dikchu HEP for T-GNA in ISTS shall be as per applicable Regulations of CERC.

– x – x – x -

Annexure-I

List of participants

Sl. No.	Name	Designation	Organization	Email id
1.	Sh. Ashok Pal	Dy. COO	CTU	ashok@powergrid.in
2.	Sh. Rajesh Kumar	Sr. GM	CTU	rajeshkumar@powergrid.in
3.	Sh. Manish Ranjan Keshari	Ch. Manager	CTU	manish.keshari@powergrid.in
4.	Sh. Anupam Kumar	Manager	CTU	i.anupamk@powergrid.in
5.	Sh. Abhilash Thakur	Engineer	CTU	abhilash.28@powergrid.in
6.	Sh. Amit Kumar	Engineer	CTU	emailamit0014@powergrid.in
7.	Sh. P.P. Jena	EE	ERPC	ppjena.erpc@gov.in
8.	Sh. Manish Maurya	Deputy Director	CEA	
9.	Sh. Amaresh Mallick	CGM	ERLDC, GRID-INDIA	amareshmallick@grid-india.in
10.	Sh. Saugato Mondal	Sr. DGM	ERLDC, GRID-INDIA	saugato@grid-india.in
11.	Sh. Manas Das	DGM	ERLDC, GRID-INDIA	manasdas@grid-india.in
12.	Sh. Saurav Kr Sahay	Chief Manager	ERLDC, GRID-INDIA	saurav.sahay@grid-india.in

Sneha Kinetic Power Projects Private Limited
CIN: U40108HP2004PTC030554

Ref: SNEHA/2023-24/20230606 **Date:** 6th June 2023

To,

The Chief Operating Officer (COO)
Central Transmission Utility (CTU)
Saudamini, Plot No. 2, Sector 29,
Gurgaon 122001, Haryana

Subject: Scheduling of DIKCHU HEP Power under CERC GNA Regulation 2022-reg.

Ref:

1. **Grid Connectivity Intimation letter bearing reference no. C/CTU-Plg/E/Dikchu HEP/Connectivity dated 26th Feb 2016**

Dear Sir,

This has reference to subject matter; we would like to bring in your kind notice that DIKCHU HEP have obtained 96 MW Grid connectivity from CTU vide intimation referred under reference (1) and said project is currently connected with CTU network at 400 kV voltage level (Interim Arrangement). DIKCHU HEP has been granted connectivity with ISTS network under interim arrangement till work related to 132 kV Intra State transmission network required for grid connectivity gets complete.

DIKCHU HEP has been in operation since March 2017 and power is being scheduled as per previous regulation i.e CERC Connectivity and LTA Regulation 2009. It is requested that the power from DIKCHU HEP may also continue to be scheduled under the new regime of CERC GNA Regulation 2022, without affecting the smooth operation of the plant.

Accordingly, we request you to kindly advise us to fulfil the formalities required to schedule power from DIKCHU HEP without affecting its operation.

Looking forward to your kind support.

For **M/s Sneha Kinetic Power Projects Pvt. Ltd.**

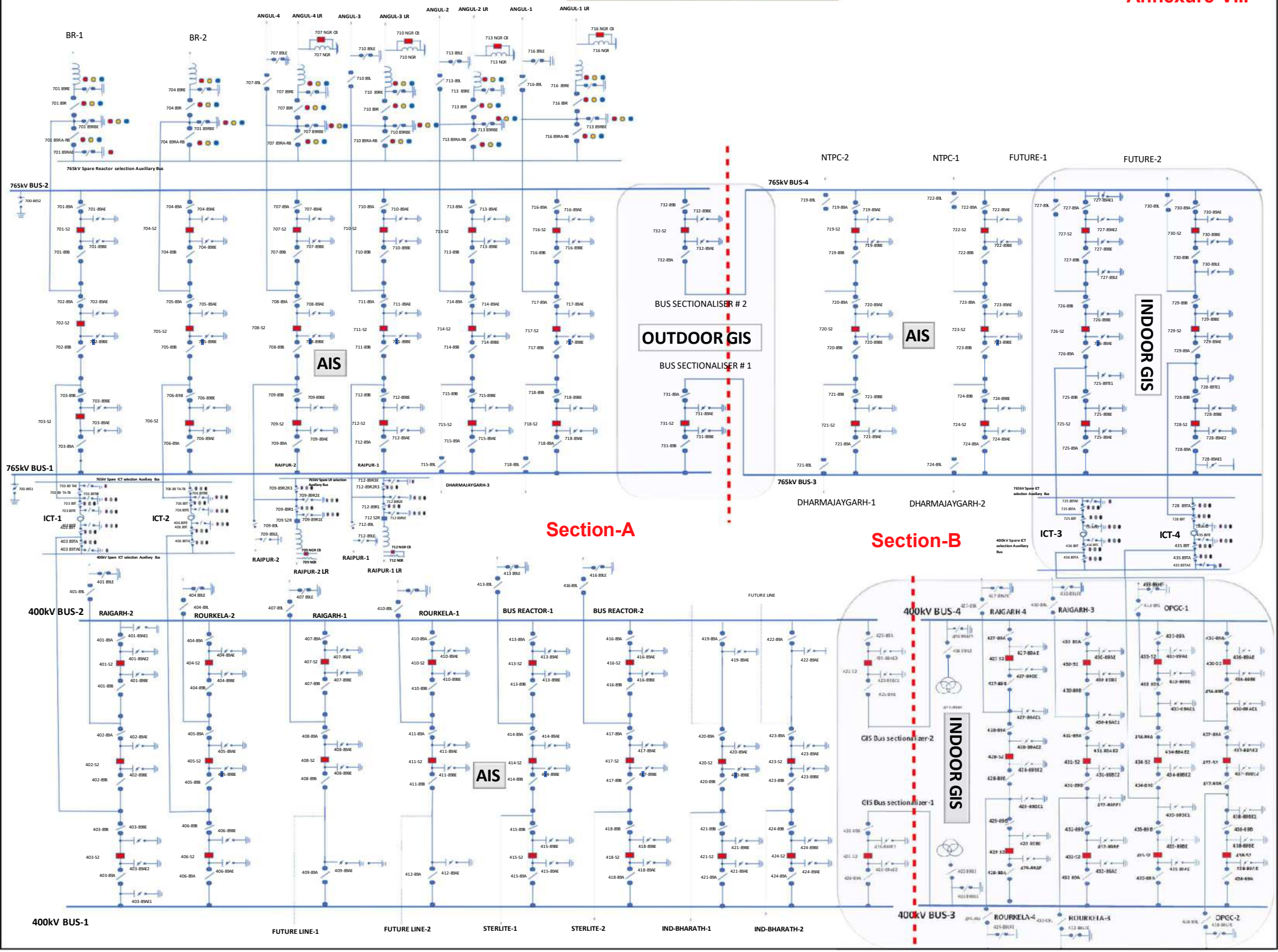
yugal

Authorized Signatory

Regd. Office: C-35, Lane-1, Sector-2, New Shimla, Shimla, Himachal Pradesh-171009.
Corp. Office: Plot No. 13, Sy.No.64 Part, Block-D, First Floor, Hitech City Layout, Madhapur Village, Hyderabad - 500081.
Ph: 040-40301000, Fax: 040-40301101, Email: info@greenkogroup.com

765/400 kV SUNDARGARH SS SLD

Annexure-VIII



Annexure-IX

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/DVC

Date: 26-06-2023

Subject: Minutes of Joint Study Meeting between DVC & CTU held on 13-06-2023 & 14-06-2023 at CTU office, Gurugram

Sir/Ma'am,

A joint study meeting to discuss the future DVC transmission system strengthening was held on 13-06-2023 & 14-06-2023 at CTU office, Gurugram. In this regard, please find enclosed minutes of the meeting.

Thanking you,

भवदीय / Yours faithfully,

राजेश कुमार
26/06/2023

(राजेश कुमार) / (Rajesh Kumar)

वरिष्ठ महाप्रबंधक/ Sr. General Manager

Record Note of Discussion (RNOD)
Joint Study Meeting between DVC & CTU held on 13-06-2023 & 14-06-2023
at CTU office, Gurugram

1.0 CTU vide email dated 20-04-2023 had requested STUs in Eastern Region to submit the data for studies for the upcoming interim rolling plan to be issued by Sep 2023. In this regard, DVC vide email dated 29-05-2023 had submitted a Report inter alia including evacuation plan for new units at DTPS: 1x800MW, KTPS: 2x800MW, RTPS 2x660 & Solar power of 1950MW, and T&D system strengthening of DVC. In the said report, it is mentioned that the existing generation capacity of DVC is about 6897MW and present load demand (including Railway & JBVNL load) within valley area is to the tune of 4633MVA. By 2027-28, the expected load growth is about 6278MVA. Further, three units of Mejia-A viz. 1, 2 & 3 of 210MW each are about to retire by this timeframe. In the report, preliminary proposals for evacuation of power from new thermal / solar plants, reconductoring of existing intra-state transmission lines, augmentation of existing substations & new transmission lines are also mentioned.

2.0 In view of the above, a joint study meeting between DVC and CTU was held on 13-06-2023 & 14-06-2023 at CTU office, Gurugram. List of Participants is at **Annexure-I**.

3.0 The Report prepared by DVC is enclosed at **Annexure-II**.

4.0 The brief highlights of the discussions are mentioned below:

a) DVC informed that they have segregated their network into 5 clusters/regions as shown in the SLD (enclosed at **Annexure-III**)

b) Preliminary studies have been done for 2 cases viz. (i) Non-Solar hours with peak thermal dispatch of DVC and Peak Demand (6090MW) and (ii) High Solar with reduced thermal dispatch of DVC and reduced Demand (4740MW)

c) Element wise deliberation on proposed transmission systems is given below:

Sl. No.	New Infrastructure details	Transmission System Deliberated	Remarks
A. New Infrastructure associated with new thermal generations			
1.	DTPS: 400/220KV DTPS switchyard with new 1x800MW unit	Alternative-1: (a) 400kV D/c (Twin Moose) DTPS-Parulia PG (b) 2 Nos. 400/220kV, 500MVA ICT with Existing 220/132kV DTPS Switchyard	

Sl. No.	New Infrastructure details	Transmission System Deliberated	Remarks
		Alternative-2: (a) 3 Nos. 400/220kV, 500MVA ICT and additional 220/132kV, 1x160MVA (5th ICT) at existing 220/132kV DTPS Switchyard	
Discussion was held on the above two alternatives. In alternative-1, about 50% power is evacuated through 400kV D/c (Twin Moose) DTPS-Parulia PG line and balance is absorbed by DVC through 400/220kV, 2x500MVA ICTs at DTPS. In alternative-2 i.e. evacuation at 220kV through 3x500MVA ICT, there would requirement of additional 1x160MVA, 220/132kV ICT (5th) at DTPS S/s. However, during the unavailability of 1x800MW generation (due to planned/unplanned shutdown) at DTPS in alternative-2, high loading is observed in the DSTPS-DTPS 220kV D/c line and DSTPS ICTs. Therefore, alternative-1 was found to be more desirable option, and accordingly was in principally decided for power evacuation from new 800MW unit at DTPS. It was noted that transmission system would be finalised when DVC applies for ISTS Connectivity as per GNA Regulations 2022.			
2.	KTPS: New 2x800 MW units in existing 2x500MW complex	Existing infrastructure & additional 3rd ICT 400/220kV, 500MVA at KTPS	
Presently, Koderma is connected to ISTS through Koderma-Gaya 400kV D/c (Quad), Koderma – Biharshariff 400kV D/c (Quad) & Koderma- Bokaro 400kV D/c lines. Further, there are 2x315MVA ICTs at KTPS. With additional 2x800MW units at KTPS, N-1 constraint was observed with these existing 2x315MVA ICTs at KTPS. Accordingly, additional 1x500MVA would be required to mitigate this constraint. With this additional 3rd 400/220kV, 500MVA ICT, new generation units at KTPS can be evacuated using existing ISTS and ICTs. It was noted that transmission system would be finalised when DVC applies for ISTS Connectivity as per GNA Regulations 2022.			
3.	RTPS: New 2x660MW units in existing 2x600MW complex	3rd 1x315MVA, 400/220kV ICT (to be released from DSTPS after installation of 2x500MVA ICTs)	
DVC informed that 400/220kV, 2x315MVA ICTs are under installation at RTPS. With the installation of new units at Raghunathpur (2x660MW), 2x315MVA ICTs at RTPS were not found to be N-1 compliant. Accordingly, additional 1x315MVA ICT (released after replacement of 2x315MVA ICTs at DSTPS with 2x500MVA ICTs) would be required to mitigate this constraint. With this additional 3rd 400/220kV, 315MVA ICT, new generation units at RTPS can be			

Sl. No.	New Infrastructure details	Transmission System Deliberated	Remarks
evacuated using existing ISTS and ICTs. It was noted that transmission system would be finalised when DVC applies for ISTS Connectivity as per GNA Regulations 2022.			
4.	220kV substation for new consumer at (DTPS-MTPS S/c LILO)	Establishment of new 220kV S/s through LILO of one circuit of 220kV D/c DTPS-MTPS Line alongwith suitable 220/132kV and /or 220/33kV ICTs	
DVC informed that to meet the new additional expected load, the above system is required. Accordingly, the proposed system was found to be in order.			
5.	220kV substation for new consumer at Kalyaneswari through LILO of Mejia-Kalyaneswari line	Establishment of new 220kV S/s at Kalyaneshwari-2 through LILO of one circuit of 220kV D/c Mejia - Kalyaneswari line alongwith suitable 220/132kV and/or 220/33kV ICTs	
DVC informed that to meet the new additional expected load, the above system is required. Accordingly, the proposed system was found to be in order.			
6.	Increase in load at Burnpur	S/C LILO of 220KV Mejia-Kalyaneswari (79KM) at Burnpur	
DVC informed that to meet the new additional expected load, the above system is required. Accordingly, the proposed system was found to be in order.			
B. Augmentation of ATR (220/132kV) & ICTs (400/220kV) to Avoid Overloading/ To Suffice N-1 Contingency [studies done on case-(i)]			
7.	400/220/132kV DTPS Switchyard	400/220kV, 2x500 MVA ICT	
The matter has already been discussed at Sl. No. 1 above.			
8.	400/220/132kV KTPS switchyard (2x315MVA ICT, 2x150MVA ATR)	400/220kV, 1x500MVA ICT & 220/132kV, 1x200MVA (already approved in ERPC meeting)	
The matter regarding 400/220kV ICTs has already been discussed at Sl. No. 2 above. DVC further informed that additional (3rd) 220/132kV, 1x200MVA ICT at KTPS has already been approved in ERPC meeting held on 01-06-2022.			
9.	220/132kV Jamshedpur S/s (2x150MVA)	1x200MVA ATR	
N-1 constraint has been observed with existing 2x150MVA ICTs at Jamshedpur (DVC). Therefore, an additional (3rd) 1x200MVA, 220/132kV ICT at Jamshedpur (DVC) was found to be in order.			
10.	400/220/132kV Gola-B S/s (2x200MVA ATR)	1x200MVA ATR	
From the studies, it was observed that loading on already agreed Gola-B – Gola 132kV D/c line is beyond the approved capacity due to increased new load demand at Chandil and Jamshedpur areas. Further, N-1 constraint was observed with planned 2x200MVA ICTs at Gola-			

Sl. No.	New Infrastructure details	Transmission System Deliberated	Remarks
B. Accordingly, it was decided that Gola-B substation may be implemented with 220/132kV, 3x200MVA ATRs instead of 2x200MVA ATRs. Further, to mitigate the loading on the Gola-B – Gola 132kV D/c line, following was decided: • **Phase-I:** Reconductoring of Gola-B - Gola line with HTLS. Ampacity to be informed by DVC. • **Phase-II:** Gola-B – Gola (2nd) 132kV D/c line with similar rating of the 1st D/c line with increased demand in future.			
11.	400/220kV MTPS Switchyard (1x315MVA)	2nd 1x315MVA, 400/220kV ICT (to be released form DSTPS after installation of 2x500MVA)	
In order to improve reliability of drawl arrangement at MTPS, it was found in order to install 2nd 400/220kV, 315MVA ICT (released from DSTPS after replacement of 2x315MVA ICTs with 2x500MVA ICTs at DSTPS).			
12.	400/220/132kV BTPS (2x315MVA, 400/220kV ICT)	1x500MVA, 400/220kV ICT (3rd)	
DVC informed that replacement of existing 2x315MVA, 400/220kV ICTs with 2x500MVA, 400/220kV ICTs at BTPS switchyard was agreed in 6th CMETS-ER. However, N-1 constraint is observed at Bokaro TPS 400/220kV ICTs even with the 2x500MVA ICTs in future timeframe with load growth and additional generations in DVC area. The ICTs released from Bokaro TPS were proposed to be shifted to as Mejia (2nd) and RTPS/Ramkanali (3rd) ICT. Further, 2x315MVA ICTs released from DSTPS were identified to be shifted to Ramkanali-B for establishment of new substation. DVC informed that it has now been decided to implement Ramkanali-B and Gola-B substations through TBCB mode. Therefore, it would not be prudent to use old ICTs in the TBCB scheme. Accordingly, it was decided that to augment the transformation capacity at BTPS, (3rd) 400/220kV, 1x500MVA ICT may be installed at Bokaro TPS in place of earlier agreed replacement of 2x315MVA ICTs. Further, the ICTs released from DSTPS would be utilized for Mejia TPS (2nd) and RTPS (3rd) ICT as mentioned at Sl. No. 11 and 3 respectively.			
C. New Lines For Connection of the Proposed Solar/Thermal Plants			
13.	Evacuation of power from DTPS 800MW	New D/c DTPS-Parulia PG (400kV)	
The matter has already been discussed at Sl. No. 1 above.			
14.	Evacuation of solar power from Maithon Solar Block 1 (234MW) & 2 (300 MW)	LILO of 220kV D/c Dhanbad-Maithon PG at Maithon Solar Block	
With the proposed system, it was observed that major portion of power rushes towards Maithon (POWERGRID) S/s, which in turn leads to overloading of under implementation Maithon – Asansol 220kV D/c HTLS line (1200A) of WBSETCL. Further, DVC informed that as per information available on WBPDCL website new unit at expected at Santaldih. With new units at Santaldih the loading on Maithon – Asansol line was observed to be redueced. Accordingly, it was decided that the matter may be deliberated in a joint study meeting among CTU, DVC and WBSETCL.			

Sl. No.	New Infrastructure details	Transmission System Deliberated	Remarks
15.	Evacuation of solar power from Tilaya Block 1 (150MW)	LILO of D/c 132kV Barhi-Koderma TPS at Tilaya S1	
16.	Evacuation of solar power from Tilaya Block 2 (285MW)	S/c 220kV Tilaya S2-Koderma TPS Line	
17.	Evacuation of solar power from Tilaya Block 3 (150MW)	S/c 220kV Tilaya S3-Koderma TPS Line	
The above system was found to be in order for evacuation of power from the Tilaya Solar block-2 & 3. For block-1, LILO of both circuits of Barhi – Koderma TPS 132kV D/c line may be implemented with HTLS (of rating commensurate with rating of HTLS of main line). Ampacity to be informed by DVC.			
18.	Evacuation of solar power from Panchet Block 1 (75MW)	S/c LILO of 132kV D/c Ramkanali - Panchet at Panchet Solar Block-1	
19.	Evacuation of solar power from Panchet Block 2 (80MW)	S/c LILO of 132kV proposed D/c Panchet - Kumardubi at Panchet Solar Block-2	Panchet – Kumardubi 132kV D/c line would established through LILO of Panchet Hydro – Maithon Hydro at Kumardubi
For block-1 & 2, LILOs may be implemented with HTLS (of rating commensurate with rating of HTLS of main line). Ampacity to be informed by DVC			
20.	Evacuation of solar power from Panchet Solar Block 1 (225MW) & 2 (225 MW)	S/c 400kV PHS-RTPS Line	
For evacuation of power from Panchet Solar Block 1& 2 (2x225MW) to Raghunathpur at 400kV, ISTS connectivity may be required. As the power from these solar is expected to be absorbed by DVC, it was suggested that generation plant may be connected to DVC system. Accordingly, proposal of LILO of RTPS – CTPS 220kV D/c line at Panchet Solar Block was discussed and it was observed that power can be evacuated through the said LILO. Accordingly, the final evacuation system for Panchet Solar block (2x225MW) was decided as LILO of both circuits of RTPS – CTPS 220kV D/c line at Panchet Solar Block.			
21.	Evacuation of solar power from Konar Solar Block 1 (225MW)	S/c LILO of 220kV D/c Jamshedpur-BTPS at Konar Solar	
The above system was found to be in order.			
D. Reconductoring of Transmission Lines for load growth			
22.	-	Reconductoring of 220kV D/c DSTPS-Parulia (DVC)	

Sl. No.	New Infrastructure details	Transmission System Deliberated	Remarks
It was observed that the loading on DSTPS-Parulia (DVC) 220kV D/c line violates the N-1 criteria during the unavailability of DTPS (1x800MW) generation, even in the decided alternative-1 at Sl. No. 1 above. Accordingly, it was agreed to reconductor the above line with HTLS. Ampacity to be informed by DVC.			
23.	-	Reconductoring of 132kV D/c Gola-Chandil line	
It was observed that loading on Gola – Chandil 132kV D/c line is beyond its existing rating under N-1 contingency due to increased and new load at Chandil area. Accordingly, it was decided to reconductor the above line with HTLS. Ampacity to be informed by DVC.			
24.	-	Reconductoring of 132kV D/c NK-Patratu Radial line	
It was observed that loading on NK-Patratu 132kV D/c line is beyond its existing rating under N-1 contingency due to increased load in North Karanpura area. Accordingly, it was agreed to reconductor the above line with HTLS. Ampacity to be informed by DVC.			

5.0 The above transmission system which would be directly impacting ISTS would be discussed in the forthcoming CMETS-ER meeting.

6.0 Requirement of reactive compensation at 400kV level in DVC area: Generations in DVC area were observed to be running in leading mode (absorbing reactive power) in both peak and off-peak cases. DVC informed that the generation units of 500MW / 600MW are expected to absorb reactive power up to 25-30% of rated capacity as per their capability curve, however, due to some overheating/design issues the machines are capable of absorbing reactive power only about 10-12% of its rated capacity. Further, as majority of times the generations are running below rated capacity, the 400kV evacuating lines are observed to be loaded below SIL in normal operation. These conditions are resulting in surplus reactive power in the system and leading to over voltage scenarios. It was decided that DVC would take up the matter regarding lower setting for operating in leading power factor mode with their OEM. Nevertheless, it was decided that suitable number of bus reactors of 125MVAr may be installed at various generation switchyard (at least one at each) to control the voltage excursions.

*****

Annexure-I

Attendance list of Joint Study Meeting between DVC & CTU held on 13-06-2023 & 14-06-2023

Sl. No.	Name of Officials	Designation & Organization	Email
1.	Sh. Jasbir Singh	CGM, CTUIL	jasbir@powergrid.in
2.	Sh. Rajesh Kumar	Sr. GM, CTUIL	rajeshkumar@powergrid.in
3.	Sh. Manish Ranjan Keshari	Chief Manager, CTUIL	manish.keshari@powergrid.in
4.	Sh. Anupam Kumar	Manager, CTUIL	i.anupamk@powergrid.in
5.	Sh. Abhilash Thakur	Engineer, CTUIL	abhilash.28@powergrid.in
6.	Sh. Amit Kumar	Engineer, CTUIL	emailamit0014@powergrid.in
7.	Sh. Jayanta Dutta	GM (DVC)	jayanta.dutta@dvc.gov.in
8.	Sh. Swarup Kumar Pal	Sr.Manager, DVC	swarup.pal@dvc.gov.in

Annexure-X

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)]
पूर्वी क्षेत्रीय भार प्रेषण केन्द्र / Eastern Regional Load Despatch Centre
कार्यालय : 14, गोल्फ क्लब रोड, टालिगंज, कोलकाता - 700033
Office : 14, Golf Club Road, Tollygunge, Kolkata - 700033
CIN : U40105DL2009GOI188682, Website : www.erldc.in, Tel.: 033 23890060/0061

संदर्भ: पू.क्षे.भा.प्रे.के./ एस. ओ. /ERLDC/ SO/ 2023-24/317 13-06-2023

To
Chief Operating Officer,
Central Transmission Utility of India Ltd.,
Saudamini, 1st Floor,
Gurugram-122001

Sub: Transformation Capacity Augmentation at 400/220 kV Subhashgram S/s-reg.

Sir,

This is to draw your kind attention to recent loading of 400/220 kV ICTs at Subhashgram S/s. This summer, total loading of these ICTs crossed more than its transformation capacity i.e., 1760 MVA for a considerable period and the system was not even N compliant. To this effect, CESC as well as WB had to shed some load in some pockets of metropolitan area of Kolkata and around. Loading pattern for last one week is attached at Annexure-1 for your ready reference.

As you are aware, majority of the load of metropolitan city of Kolkata and South 24 Parganas district of West Bengal are catered through five nos. of 400/220 kV ICTs (1760 MVA) at Subhashgram. While five ICTs at Subhashgram have been commissioned progressively, demand growth in these pockets have grown at a faster rate.

It is gathered from POWERGRID that, procurement of 6th ICT (500 MVA) is still in tendering stage, and it is unlikely to be available by next summer season which may create acute transmission constraint in meeting Kolkata's demand.

Further, discussion has been going on for commissioning of 400/220 kV Laxmikantapur S/s for last two years, but no concrete outcome has come so far. A committee was formed by ERPC with members from ERLDC, WBSETCL, CESC and CTU to expedite it, but a definite timeline for this Sub-Station is not yet available.

With no option left otherwise in such a short duration, commissioning of 7th ICT (500 MVA) at Subhashgram may be considered to meet the demand and satisfy N-1 criteria. Although commissioning of seven ICTs (4*315 + 500*1 MVA) with total transformation capacity i.e. 2760 MVA will be more than maximum transformation capacity of 2500 MVA mentioned in CEA manual on transmission planning criteria, 2023, same may be feasible through a bus splitting arrangement. Also, considering the reasonable fault level and immediate necessity of augmentation of transformation

capacity at Subhashgram S/s, possibility of an exemption to this criterion may be explored to enable commissioning of the 7th. ICT.

You are requested for needful action at your end.

Thanking you.

Yours faithfully

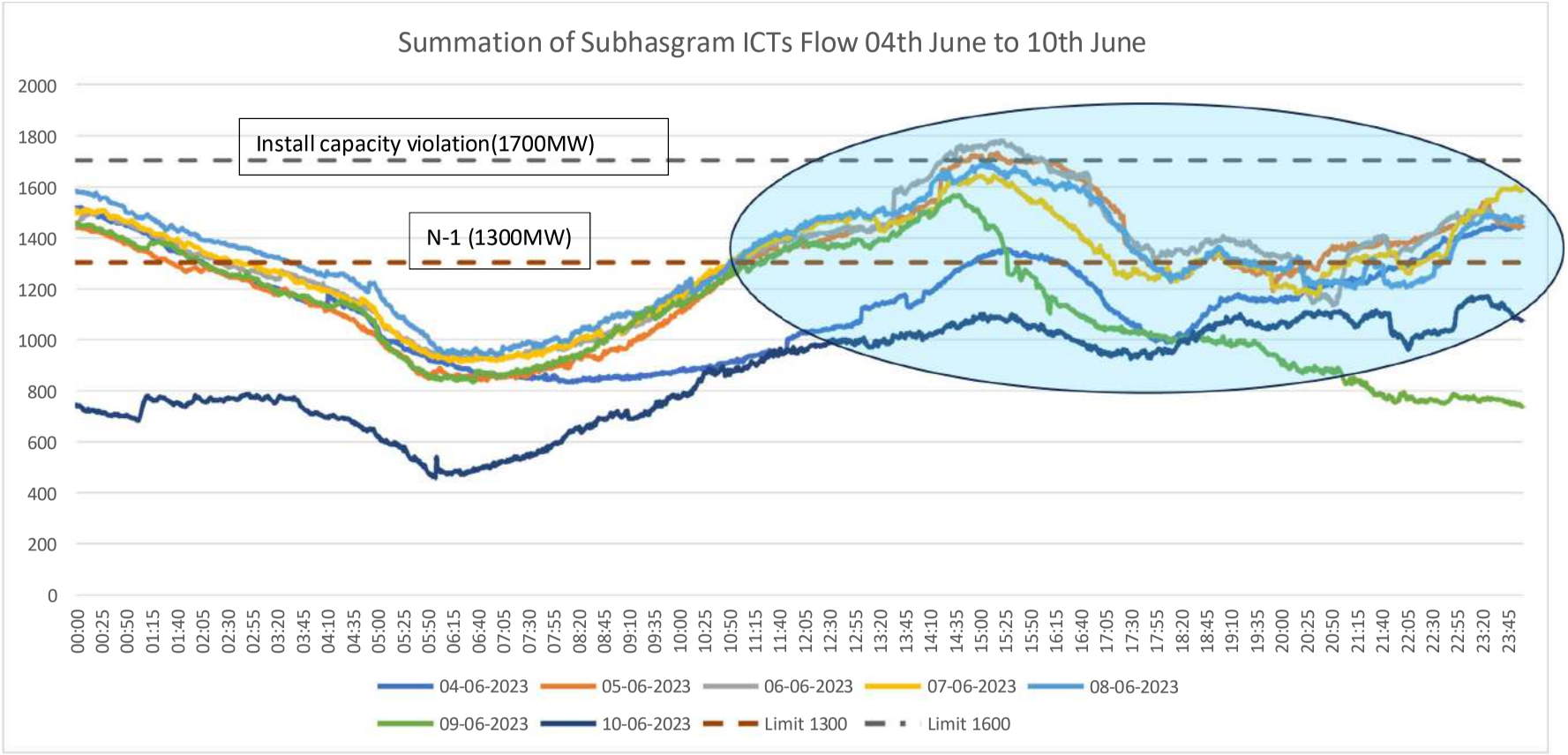
13/6/2023

Rajib Sutradhar
Executive Director

Copy to:

1. Member (GO&D), CEA. Sewa Bhawan, R.K.Puram, Sector-1,New Delhi-110 066
2. Member Secretary, ERPC, 14, Golf Club Road, Tollygunge, Kolkata-700033
3. Executive Director, NLDC, New Delhi-110016

Annexure-1


Summation of Subhasgram ICTs Flow 04th June to 10th June
Install capacity violation(1700MW)
N-1 (1300MW)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
00:00
00:25
00:50
01:15
01:40
02:05
02:30
02:55
03:20
03:45
04:10
04:35
05:00
05:25
05:50
06:15
06:40
07:05
07:30
07:55
08:20
08:45
09:10
09:35
10:00
10:25
10:50
11:15
11:40
12:05
12:30
12:55
13:20
13:45
14:10
14:35
15:00
15:25
15:50
16:15
16:40
17:05
17:30
17:55
18:20
18:45
19:10
19:35
20:00
20:25
20:50
21:15
21:40
22:05
22:30
22:55
23:20
23:45
04-06-2023
05-06-2023
06-06-2023
07-06-2023
08-06-2023
09-06-2023
10-06-2023
Limit 1300
Limit 1600

s

Annexure B.7.1

Chem.	
Elec.	
Mech.	

NSIC TECHNICAL SERVICES CENTRE

TESTING LABORATORY

TEST REPORT

एन एस आई सी
N S I C

राष्ट्रीय लघु उद्योग निगम लिमिटेड

THE NATIONAL SMALL INDUSTRIES CORPORATION LTD.

(A GOVERNMENT OF INDIA ENTERPRISE)

BALITIKURI, HOWRAH - 711 113

एन एस आई सी
N S I C

TESTING LABORATORY
THE NATIONAL SMALL INDUSTRIES CORPORATION LIMITED
(A Govt. of India Enterprise)
TECHNICAL SERVICES CENTRE
Japanigate, Balitikuri, Howrah – 711113, West Bengal.
Phone: 033-2653 8607, Email: ntschowrahtest@nsic.co.in

TEST REPORT

REPORT NO. & DATE	TL-19322 11.12.2023	SHEET NO. 1 OF 5
JOB ORDER NO.	7/01/14717 dt. 05.12.2023 & 7/06/06268 dt. 05.12.2023	
SAMPLE CODE NO.	14717 for Mechanical Testing 6268 for Electrical Testing	
CUSTOMER'S NAME AND ADDRESS	M/s. POWERGRID CORPORATION OF INDIA LIMITED EASTERN REGION TRANSMISSION SYSTEM-II (REGIONAL HEAD QUARTER): CF-17, ACTION AREA-1C, NEW TOWN, KOLKATA-700156 (W. B.) INDIA	
CUSTOMER'S REF. NO.	Request Form dt. 01.12.2023	
DESCRIPTION OF SAMPLE / EQUIPMENT TESTED (As stated by customer)	ACSR Zebra Conductor (Size: Al-54/3.18 + Steel-7/3.18 mm)	
DRAWING NO.	Nil	
QUANTITY	01 No. (Appox. Length 08 meters)	
IDENTIFICATION	Nil	
NATURE OF TEST & RELEVANT SPECIFICATION	a) Freedom from Defects b) Surface Condition c) Ultimate Breaking Load Test on Complete Conductor d) Breaking Load Test of Al & Steel Strands e) Wrapping Test of Al & Steel Strands f) Elongation Test on Steel Strands g) Torsion Test on Steel Strands	IS: 398 (Part-2)/1996
	h) Resistance Test of Complete Conductor	As per customer's requirement
DATE OF SAMPLE RECEIVED	05.12.2023	
DATE OF TEST	08.12.2023 & 11.12.2023	
MAJOR EQUIPMENTS USED	1) Vernier Calliper 2) Measuring Tape 3) Universal Tensile Testing Machine 4) Horizontal Tensile Testing Machine 5) Wrapping & Torsion Testing set up 6) Digital Micro Ohmmeter	
DEVIATIONS, IF ANY	Nil	
ENCLOSURE	Nil	
TEST WITNESSED BY	---	

Prepared by
SUMAN BANDYOPADHYAY
DEPUTY MANAGER (TECH.)
11/12/23

Issued by
AJIT KUMAR
Dy. Manager (Tech.)
11.12.23

Note:-
- *This report relates to the particular sample(s) tested under stated conditions.*
- *This report cannot be reproduced in part or full without the written permission of Laboratory In Charge, NTSC, Howrah.*
- *Any anomaly/discrepancy in this report should be brought to notice within 45 days from the date of issue*

TEST REPORT

REPORT NO. & DATE	TL-19322 11.12.2023	SHEET NO. 2 OF 5

ACSR Zebra Conductor (Size: Al-54/3.18 + Steel-7/3.18 mm)

a) **Freedom from defects** (Cl. No. : 7.1) : Above Conductor found blackened & Surface was not smooth

b) **Surface Condition Test** (Cl. 13.9) : Applied 50% of UTS Load 65.25 kN and marked the conductor on circumferences and observed after one minute. The diameter of the conductor measured at 4 different places and found 28.58 mm, 28.55 mm, 28.58 mm & 28.55 mm.

: No relative movement of the strand found. The Diameter measured at 4 places are more than the sum of minimum specified diameter of the individual aluminum & steel strands.

c) **Ultimate Breaking Load** (Cl. No. 13.10)

Specified Value	Observed Value	Observations
130.32 kN	**114.25 kN**	Conductor fractured

On individual Al Strands		
Sl. No.	d) **Breaking Load (kN)** (Cl. No. 13.3.1)	e) **Wrapping Test** (Cl. No. 13.5)
Specified		
	1.23 (Min)	8 turns wrap, 6 turns unwrap & wrap as earlier in same direction.
Observed		
1	**1.20**	No crack observed
2	1.25	No crack observed
3	**1.20**	No crack observed
4	1.25	No crack observed
5	**1.20**	No crack observed
6	1.25	No crack observed
7	**1.15**	No crack observed
8	**1.20**	No crack observed
9	1.30	No crack observed
10	**1.05**	No crack observed
11	**1.20**	No crack observed
12	**1.10**	No crack observed
13	**1.05**	No crack observed

Prepared by
11/12/23
SUMAN BANDYOPADHYAY
DEPUTY MANAGER (TECH.)

Issued by
11.12.23
AJIT KUMAR
Dy. Manager (Tech.)

TEST REPORT

REPORT NO. & DATE	TL-19322 11.12.2023	SHEET NO. 3 OF 5

On individual Al Strands		
Sl. No.	d) **Breaking Load (kN)** (Cl. No. 13.3.1)	e) **Wrapping Test** (Cl. No. 13.5)
Specified		
	1.23 (Min)	8 turns wrap, 6 turns unwrap & wrap as earlier in same direction.
Observed		
14	**1.15**	No crack observed
15	1.25	No crack observed
16	**1.05**	No crack observed
17	**1.10**	No crack observed
18	**1.15**	No crack observed
19	**1.20**	No crack observed
20	**1.05**	No crack observed
21	**1.10**	No crack observed
22	**1.15**	No crack observed
23	**1.05**	No crack observed
24	**1.15**	No crack observed
25	**1.10**	No crack observed
26	**1.15**	No crack observed
27	**1.00**	No crack observed
28	**1.10**	No crack observed
29	**1.20**	No crack observed
30	**1.15**	No crack observed
31	**1.10**	No crack observed
32	**1.05**	No crack observed
33	**1.00**	No crack observed
34	**1.05**	No crack observed
35	**1.00**	No crack observed
36	**1.05**	No crack observed
37	**0.95**	No crack observed
38	**0.90**	No crack observed
39	**1.05**	No crack observed
40	**1.05**	No crack observed
41	**0.90**	No crack observed
42	**1.15**	No crack observed
43	**0.90**	No crack observed
44	**1.00**	No crack observed
44	**0.85**	No crack observed
45	**0.95**	No crack observed

Prepared by
11/12/23
SUMAN BANDYOPADHYAY
DEPUTY MANAGER (TECH.)

Issued by
11.12.23
AJIT KUMAR
Dy. Manager (Tech.)

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N S I C

TESTING LABORATORY
NSIC TECHNICAL SERVICES CENTRE
Japanigate, Balitikuri, Howrah – 711113, West Bengal.

TEST REPORT

REPORT NO. & DATE	TL-19322 11.12.2023	SHEET NO. 4 OF 5

On individual Al Strands		
Sl. No.	d) **Breaking Load (kN)** (Cl. No. 13.3.1)	e) **Wrapping Test** (Cl. No. 13.5)
Specified		
	1.23 (Min)	8 turns wrap, 6 turns unwrap & wrap as earlier in same direction.
Observed		
46	**1.10**	No crack observed
47	1.30	No crack observed
48	**0.05**	No crack observed
49	**0.85**	No crack observed
50	**0.80**	No crack observed
51	**0.95**	No crack observed
52	**1.05**	No crack observed
53	**0.90**	No crack observed
54	**1.05**	No crack observed

	On individual Steel Strands			
Sl. No.	d) **Breaking Load (kN)** (Cl. No. 13.3.1)	e) **Wrapping Test** (Cl. No. 13.5)	f) **Elongation (%)** (Cl. No. 13.4)	g) **Torsion** (Cl. No. 13.4)
	Specified			
	9.91 (Min)	8 turns wrap, 6 turns unwrap & wrap as earlier in same direction.	3.5 (Min)	No. of turns. 16 (Min)
	Observed			
1	10.85	No crack observed	5.5	**15**
2	11.50	No crack observed	6.5	**13**
3	11.05	No crack observed	6.0	**14**
4	10.90	No crack observed	5.5	**14**
5	11.00	No crack observed	4.5	**13**
6	10.95	No crack observed	6.5	**15**
7	11.15	No crack observed	6.0	**14**

Remarks : Observation reported.

Prepared by
11/12/23
SUMAN BANDYOPADHYAY
DEPUTY MANAGER (TECH.)

11.12.23
Issued by
AJIT KUMAR
Dy. Manager (Tech.)

TESTING LABORATORY

NSIC TECHNICAL SERVICES CENTRE

Japanigate, Balitikuri, Howrah – 711113, West Bengal.

TEST REPORT

REPORT NO. & DATE	TL-19322 11.12.2023	SHEET NO. 5 OF 5

RESISTANCE TEST ON COMPLETE CONDUCTOR (Sample code No. 6268):-

OBSERVED VALUES OF RESISTANCE			AVERAGE VALUE OF RESISTANCE
R_1	:	0.1147 mΩ /mtr. at 25.9°C	**0.12846 Ω /KM at 20°C**
R_2	:	0.1297 mΩ /mtr. at 25.9°C	
R_3	:	0.1139 mΩ /mtr. at 25.9°C	
R_4	:	0.1535 mΩ /mtr. at 25.9°C	
R_5	:	0.1348 mΩ /mtr. at 25.9°C	

Note:- Resistance measurement done after reasonably cleaning of the burnt out/blackened Conductor, particularly at the point of current clamp/ potential clamp fitting.

Remarks : Observation reported.

--- End of the Report ---

11.12.2023

Prepared by

NITIN RAJ
DY. MANAGER (TECH.)

11/12/2023

Issued by

RAJIB CHANDA
CH. MANAGER

Annexure-B1

Standard Technical Particulars for ACSR Conductors

Sl. No.	Description	Unit	Standard Technical Particulars					
			ACSR LAPWING	ACSR BERSIMIS	ACSR SNOWBIRD	ACSR MOOSE	ACSR ZEBRA	ACSR PANTHER
1.0	**Construction**							
1.1	**Stranding and wire diameter**							
a)	Aluminium wire		45/4.78 mm	42/4.57 mm	42/3.99 mm	54/3.53 mm	54/3.18 mm	30/3.00 mm
b)	Steel wire		7/3.18 mm	7/2.54 mm	7/2.21 mm	7/3.53 mm	7/3.18 mm	7/3.00 mm
1.2	**Layer & no. of wire**							
a)	Steel core		1	1	1	1	1	1
b)	1st steel layer		6	6	6	6	6	6
c)	1st Aluminium alloy layer		9	8	8	12	12	12
d)	2nd Aluminium alloy layer		15	14	14	18	18	18
e)	3rd Aluminum alloy layer		21	20	20	24	24	NA
2.0	**Raw Materials**							
2.1	**Aluminium**							
a)	Minimum purity of Aluminium	%	99.50					
b)	Maximum copper content	%	0.04					
2.2	**Steel wires/ rods**							
a)	Carbon	%	0.50 to 0.85					

Sl. No.	Description	Unit	Standard Technical Particulars					
			ACSR LAPWING	ACSR BERSIMIS	ACSR SNOWBIRD	ACSR MOOSE	ACSR ZEBRA	ACSR PANTHER
b)	Manganese	%	0.50 to 1.10					
c)	Phosphorous	%	Not more than 0.035					
d)	Sulphur	%	Not more than 0.045					
e)	Silicon	%	0.10 to 0.35 (Max.)					
2.3	**Zinc**							
a)	Minimum purity of Zinc	%	99.95					
3.0	**Aluminum strands after stranding**							
3.1	Diameter							
a)	Nominal	mm	4.78	4.57	3.99	3.53	3.18	3.00
b)	Maximum	mm	4.81	4.60	4.02	3.55	3.20	3.02
c)	Minimum	mm	4.75	4.54	3.96	3.51	3.16	2.98
3.2	Minimum breaking load of strand							
a)	Before stranding	KN	2.87	2.64	2.12	1.57	1.29	1.17
b)	After stranding	KN	2.73	2.51	2.02	1.49	1.23	1.11
3.3	Max. resistance of 1 m length of strand at 20^0C	Ohm	0.001595	0.001746	0.002295	0.002921	0.003604	0.004053
4.0	**Steel strand after stranding**							
4.1	Diameter							
a)	Nominal	mm	3.18	2.54	2.21	3.53	3.18	3.00

Sl. No.	Description	Unit	Standard Technical Particulars					
			ACSR LAPWING	ACSR BERSIMIS	ACSR SNOWBIRD	ACSR MOOSE	ACSR ZEBRA	ACSR PANTHER
b)	Maximum	mm	3.24	2.59	2.25	3.59	3.24	3.06
c)	Minimum	mm	3.12	2.49	2.17	3.47	3.12	2.94
4.2	Minimum breaking load of strand							
a)	Before stranding	KN	10.43	6.87	4.74	12.86	10.43	9.29
b)	After stranding	KN	9.91	6.53	4.49	12.22	9.91	8.83
4.3	**Galvanising**							
a)	Minimum weight of zinc coating per sqm	gm	250	230	230	250	250	240
b)	Minimum number of dips that the galvanised strand can with stand in the standard preece test	Nos.	2 of one minute & 1 of half minute	2 of one minute	2 of one minute & 1 of half minute			
c)	Min. No. of twists in gauge length equal 100 times the dia. of wire which the strand can withstand in the torsion test (after stranding)	Nos	16	16	16	16	16	16
d)	Min. elongation of the steel strand (after stranding) for a gauge length of 250 mm (after break)	%	3.5	3.5	3.5	3.5	3.5	3.5
5.0	**Stranded Conductor**							
5.1	Overall diameter	mm	38.22	35.04	30.57	31.77	28.62	21.00
5.2	Sectional area of Aluminium	sq. mm	807.5	688.9	525.2	528.5	428.9	212.1

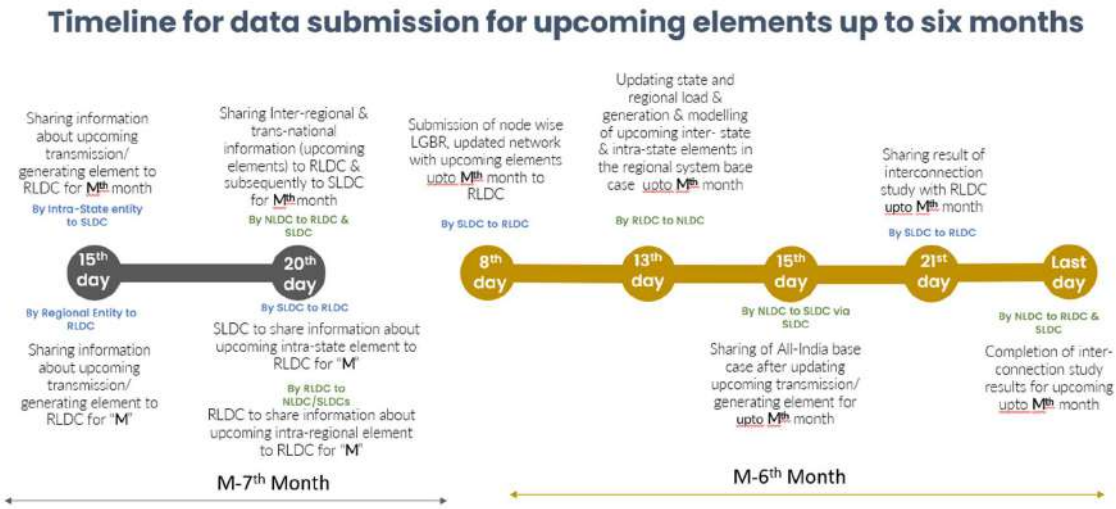
Sl. No.	Description	Unit	Standard Technical Particulars											
			ACSR LAPWING		ACSR BERSIMIS		ACSR SNOWBIRD		ACSR MOOSE		ACSR ZEBRA		ACSR PANTHER	
5.3	Total sectional area	sq. mm	863.1		724.4		552.1		597.0		484.5		261.5	
5.4	Minimum UTS of the conductor	kN	188.0		154.0		118.0		161.20		130.32		89.67	
5.5	Lay ratio of outer steel & Aluminium layer		**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**
a)	1st steel layer	mm	30	18	24	16	24	16	18	16	18	13	28	16
b)	1st Aluminium layer	mm	17	10	16	10	16	10	14	12	17	10	16	10
c)	2nd Aluminium layer	mm	16	10	16	10	16	10	13	11	16	10	14	10
d)	3rd Aluminum layer	mm	13	10	13	10	14	10	12	10	14	10	NA	NA
5.6	Maximum DC resistance of the conductor at 20°C	ohm/km	0.0358		0.04242		0.05516		0.05552		0.06868		0.1390	
5.7	Standard length of the conductor	m	1800		2100		2100		2100		2200		2300	
5.8	Tolerance on Standard length	%	± 5											
5.9	Direction of lay of outer layer		Right Hand											
5.10	Linear mass of the conductor													
a)	Standard	kg/km	2667		2181		1657		2004		1621		974	
b)	Minimum	kg/km	2628		2142		1632		1969		1589		954	
	Maximum	kg/km	2707		2221		1682		2040		1653		993	

Annexure B.12.1

Planning Horizon	Responsibility of Data Submission	Timeline for Data Submission	Responsibility of Study	Timeline for Study
Real time and Intra-day	SCADA data	Real time	RLDC Real time System operators	Real time
Day-ahead	SLDC, STU, Users & Transmission licensee	By 13 :00 hrs of "D-1"	RLDC	16:00 hrs of D-1
Weekly	SLDC, STU, Users & Transmission licensee	By 1st Day of Previous week(W-1)	RLDC	By 3rd Day of Previous week(W-1)
Monthly	SLDC, STU, Users & Transmission licensee	05th day of Previous month	RLDC	By 11th of Previous month
Yearly	SLDC, STU, Users & Transmission licensee	30th September of the previous year	RLDC	16th October of Previous Year

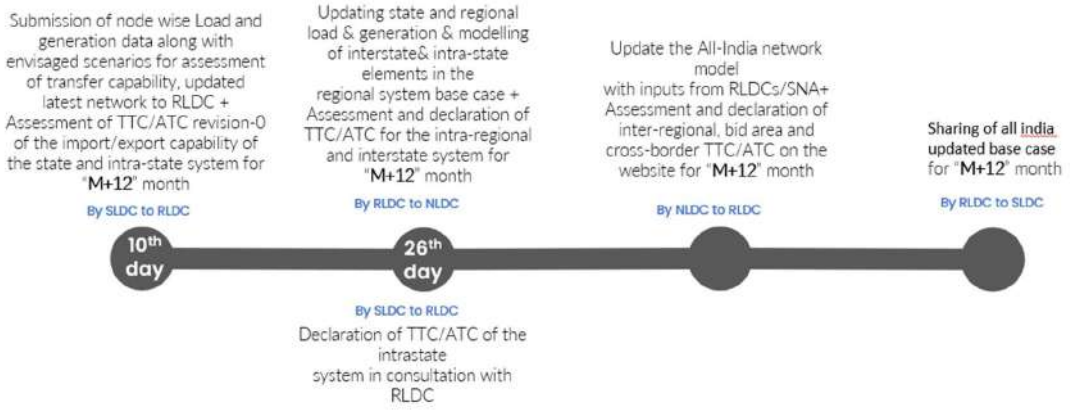
'D' and 'W' being the date and week of operation respectively

Annexure B.12.2



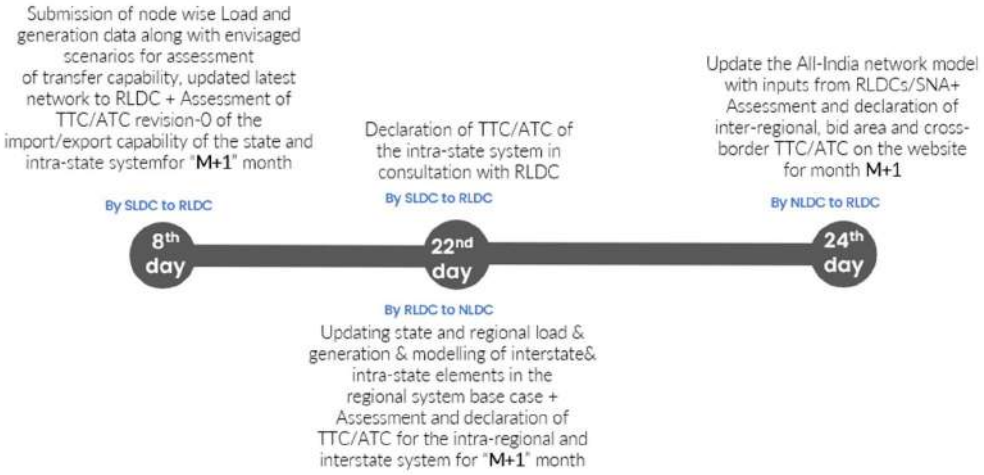
Annexure B.12.3

Timeline for submission of TTC/ATC Data twelve month ahead



Annexure B.12.4

Timeline for submission of TTC/ATC Data One month ahead



Annexure D.1

Anticipated Peak Demand (in MW) of ER & its constituents for January 2024

1	**BIHAR**	**Demand (MW)**	**Energy Requirement (MU)**
	NET MAX DEMAND	6267	3212
	NET POWER AVAILABILITY- Own Sources	613	378
	Central Sector+Bi-Lateral	6323	4022
	SURPLUS(+)/DEFICIT(-)	669	1188
2	**JHARKHAND**		
	NET MAXIMUM DEMAND	2020	1164
	NET POWER AVAILABILITY- Own Source	430	183
	Central Sector+Bi-Lateral+IPP	846	576
	SURPLUS(+)/DEFICIT(-)	-744	-405
3	**DVC**		
	NET MAXIMUM DEMAND	3474	2022
	NET POWER AVAILABILITY- Own Source	5541	3295
	Central Sector+MPL	298	146
	Bi- lateral export by DVC	1860	1211
	SURPLUS(+)/DEFICIT(-) AFTER EXPORT	505	207
4	**ODISHA**		
	NET MAXIMUM DEMAND (OWN)	5200	2950
	NET MAXIMUM DEMAND (In Case of CPP Drawal)	5511	2906
	NET POWER AVAILABILITY- Own Source	3085	2062
	Central Sector	1722	1115
	SURPLUS(+)/DEFICIT(-) (OWN)	-393	227
	SURPLUS(+)/DEFICIT(-) (In Case, 600 MW CPP Drawal)	-704	271
5	**WEST BENGAL**		
	WBSEDCL		
5.1	NET MAXIMUM DEMAND	6226	3661
	NET MAXIMUM DEMAND (Incl. Sikkim)	6231	3665
	NET POWER AVAILABILITY- Own Source (Incl. DPL)	5224	2659
	Central Sector+Bi-lateral+IPP&CPP+TLDP	2475	1202
	EXPORT (To SIKKIM)	5	4
	SURPLUS(+)/DEFICIT(-) AFTER EXPORT	1468	197
5.2	**CESC**		
	NET MAXIMUM DEMAND	1370	684
	NET POWER AVAILABILITY- Own Source	700	419
	IMPORT FROM HEL	270	179
	TOTAL AVAILABILITY OF CESC	970	598
	DEFICIT(-) for Import	-400	-86
			-86
	WEST BENGAL (WBSEDCL+CESC+IPCL)		
	(excluding DVC's supply to WBSEDCL's command area)		
	NET MAXIMUM DEMAND	7596	4345
	NET POWER AVAILABILITY- Own Source	5924	3078
	CS SHARE+BILATERAL+IPP/CPP+TLDP+HEL	2745	1381
	SURPLUS(+)/DEFICIT(-) BEFORE WBSEDCL'S EXPORT	1073	115
	SURPLUS(+)/DEFICIT(-) AFTER WBSEDCL'S EXPORT	1068	111
6	**SIKKIM**		
	NET MAXIMUM DEMAND	135	65
	NET POWER AVAILABILITY- Own Source	2	1
	Central Sector	56	15
	SURPLUS(+)/DEFICIT(-)	-76	-49
	EASTERN REGION		
	NET MAXIMUM DEMAND	24207	13758
	NET MAXIMUM DEMAND (In Case of CPP Drawal of Odisha)	24512	13714
	BILATERAL EXPORT BY DVC (Incl. Bangladesh)	1860	1211
	EXPORT BY WBSEDCL TO SIKKIM	5	4
	EXPORT TO B'DESH & NEPAL OTHER THAN DVC	642	478
	NET TOTAL POWER AVAILABILITY OF ER	25726	15040
	(INCLUDING CS ALLOCATION +BILATERAL+IPP/CPP+HEL)		
	SURPLUS(+)/DEFICIT(-)	1513	1279
	SURPLUS(+)/DEFICIT(-) (In Case, 600 MW CPP Drawal of Odisha)	1208	1323