



भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
पूर्वी क्षेत्रीय विद्युत समिति

Eastern Regional Power Committee

14, गोल्फ क्लब रोड, टालीगंज, कोलकाता-700033

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Azadi Ka
Amrit Mahotsav



Tel. No.: 033-24239651, 24239658 FAX No.:033-24239652, 24239653 Web: www.erpc.gov.in

NO. ERPC/EE/OPERATION/2022/259

DATE: 26.05.2022

To

As per list enclosed.

Sub: Minutes of 191st OCC Meeting held on 20.05.2022 physically at The Fern Denzong Hotel & Spa, Gangtok, Sikkim, as well as through MS Teams Platform- reg.

Sir,

Please find enclosed minutes of 191st OCC Meeting held on 20.05.2022 physically at The Fern Denzong Hotel & Spa, Gangtok, Sikkim, as well as through MS Teams Platform for your kind information and necessary action. The same is also available at ERPC website (www.erpc.gov.in).

Observations, if any, may please be forwarded to this office at the earliest.

This issues with the approval of Member Secretary.

Regards,

Yours faithfully,

(Signature)
26.5.22

(A. De)
EE(Opération)

LIST OF ADDRESSES:

1. CHIEF ENGINEER (TRANS., O&M), BSPTCL, PATNA, (FAX NO. 0612-2504557/2504937)
2. CHIEF ENGINEER (System Operation), BSPTCL, PATNA, (FAX NO. 0612-2504557/2504937)
3. CHIEF ENGINEER, TRANSMISSION (O&M), JUSNL, RANCHI (FAX NO.-0651-2490486/2490863)
4. CHIEF ENGINEER, TVNL, DORANDA, RANCHI - 834102 (FAX NO. 06544-225414)
5. CHIEF LOAD DISPATCHER, SLDC, OPTCL, BHUBANESWAR (FAX NO.0674-2748509)
6. CHIEF GENERAL MANAGER (O&M), OPTCL, BHUBANESWAR
7. SR. GENERAL MANAGER (PP), GRIDCO, JANPATH, BHUBANESWAR (0674-2547180)
8. DIRECTOR (OPERATION), IB TPS, AT/PO BANHARPALI, JHARSUGUDA, (FAX NO. 06645-222225/222230)
9. GENERAL MANAGER, TTPS, TALCHER, (FAX NO. 06760-243212)
10. SR. GENERAL MANAGER (ELECTRICAL), OHPC LTD., BHUBANESWAR, (FAX NO.0674-2542102)
11. CHIEF ENGINEER, CLD, WBSETCL, HOWRAH, (FAX NO. 033-26886232)
12. CHIEF ENGINEER, CENTRAL PLANNING WING, WBSETCL, SALT LAKE (FAX NO.: 033-23591955)
13. CHIEF ENGINEER (PTR), WBSEDCL, SALT LAKE, KOLKATA (FAX:033-23345862)
14. CHIEF GENERAL MANAGER (OS), WBPDC, KOLKATA-98 (FAX NO. 033-23393286/2335-0516)
15. GM, KOLAGHAT TPS, WBPDC, KOLAGHAT (FAX NO.03228231280)
16. DGM (OPERATION), DPL, DURGAPUR, (FAX NO. 0343-2555052)
17. GM (SYS OPERATION), CESC, CHOWRINGHEE SQUARE, KOLKATA (FAX NO.033-22253756/22129871)
18. CHIEF ENGINEER, SLDC, DVC, HOWRAH (FAX NO. 033-2688-5094)
19. ADDL.CHIEF ENGINEER, SLDC, POWER DEPT., GOVT. OF SIKKIM, GANGTOK, (FAX NO. 03592-228186/201148/202284)
20. EXECUTIVE DIRECTOR, ERLDC, POSOCO, KOLKATA, (FAX NO. 033-2423-5809)
21. GENERAL MANAGER, FSTPP, NTPC, FARAKKA, (FAX NO. 03512-224214/226085/226124)
22. GENERAL MANAGER , KhSTPP, NTPC, KAHALGAON (FAX NO.06429-226082)
23. GENERAL MANAGER, TSTPP, NTPC, TALCHER, (FAX NO. 06760-249053)
24. GENERAL MANAGER (OS), POWERGRID, ER-II, KOLKATA(Fax no: 033-23572827)
25. GENERAL MANAGER , POWERGRID, ER-I, PATNA, (FAX NO.0612-2531192)
26. GENERAL MANAGER (O&M), POWERGRID, ODISHA PROJECTS, SAHID NAGAR, BHUBANESWAR – 751 007
27. MANAGING DIRECTOR, DRUK GREEN POWER CORPORATION, P.O. BOX -1351, THIMPU, BHUTAN —(FAX NO 00975- 2336411)
28. MANAGING DIRECTOR, BHUTAN POWER CORPORATION, P.O.BOX-580, THIMPU, BHUTAN (FAX NO. 00975-2333578)
29. CHIEF ENGINEER (O&M), TALA H.E.PROJECT, BHUTAN (FAX NO. 009752/324803)
30. EXECUTIVE DIRECTOR (O&M), NHPC, FARIDABAD (FAX No.:0129-2272413)
31. GENERAL MANAGER, TEESTA –V POWER STATION, NHPC, SINGTAM, EAST SIKKIM (FAX 03592 - 247377)
32. CHIEF ENGINEER, RANGIT POWER STATION, NHPC, P.O. RANGIT NAGAR, SOUTH SIKKIM (FAX NO.03595-259268)
33. SENIOR VICE PRESIDENT, PTC LTD., NBCC TOWERS, 15-BHIKAJI KAMA PLACE, NEW DELHI- 110066 (FAX NO. 011-41659504)

34. PLANT HEAD, ADHUNIK POWER & NATUARAL RESOURCES, JHARKHAND(FAX NO.: 0657-6628440)
35. AGM (OPERATION), MAITHON POWER LTD, DHANBAD (FAX: 08860004758)
36. VICE PRESIDENT(POWER), VEDANTA LIMITED, BHUBANESWAR- 751023 (FAX NO 0674-2302920)
37. CHIEF ELECTRICAL ENGINEER, EASTERN RAILWAY, KOLKATA-700 001 (FAX NO.: 033-22300446)
38. CHIEF ELECTRICAL ENGINEER, SOUTH EASTERN RAILWAY, KOLKATA-43 (FAX: 033-24391566)
39. DEPUTY DIRECTOR, EASTERN RPSO, SALT LAKE, KOLKATA- (FAX NO:033-23217075)
40. GENERAL MANAGER (O&M), NHPC LTD, FARIDABAD, FAX: 0129-2272413
41. ASSOCIATE VICE PRESIDENT, GMR KEL, BHUBANESWAR-751007. (FAX NO: 0674-2572794)
42. GM (SO & COMML), NTPC VVNL, NEW DELHI-110033. Fax:011-24367021
43. SHRI D. P. BHAGAVA, CHIEF CONSULTANT (O&M), TEESTA URJA LIMITED, NEW DELHI-110 001 (FAX:011-46529744)
44. SHRI BRAJESH KUMAR PANDE, PLANT HEAD, JITPL. (FAX:011-26139256-65)
45. DIRECTOR (NPC), CEA, NRPC BUILDING, KATWARIA SARAI, NEW DELHI- 110016
46. DGM (OS), HALDIA ENERGY LIMITED, BARIK BHAWAN, KOKATA-700072, FAX: 033-22360955

CC:

Chief Engineer, OPM, CEA	Chief Engineer, NPC, CEA
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MINUTES OF 191st OCC MEETING

Date: 20.05.2022

The Fern Denzong Hotel & Spa,

Gangtok, Sikkim

EASTERN REGIONAL POWER COMMITTEE

MINUTES OF 191ST OCC MEETING HELD ON 20.05.2022 (FRIDAY) AT 09:30 HRS

Member Secretary, ERPC chaired the 191st OCC meeting. Welcoming all the participants to the meeting, he outlined the performance of ER Grid during April-2022 in brief. He highlighted the following points:

- In April-2022, energy consumption of ER was 15923 MU (Provisional) which was 7.8% more than that of April'2021.
- In April -2022, Peak demand of ER was 25690 MW (Provisional) which was 5.3 % more than that of April'2021.
- During April -2022, 59.24 % of time, grid frequency was in IEGC Band (49.90Hz-50.05Hz).
- As per LGBR 2022-23, total 1500 MW thermal capacity was scheduled for planned maintenance in June-2022.
- During the month of April-2022, following new transmission elements have been commissioned:
 1. 400 kV LILO of Kishanganj (PG)- Darbhanga (DMTCL) D/C Quad line at Saharsa (New)-By PGCIL
 2. 400 kV LILO of Nabinagar-II-Patna (PG) D/C at Jakkanpur (New) - By BSPTCL
 3. 220 kV Biharshariff - Asthawan (New) D/C- By BSPTCL
 4. 220 kV Saharsa – Khagaria (New) D/C- By BSPTCL
- As far as coal stock position is concerned, many of the power stations of Eastern Region are still reeling under coal shortage. He advised thermal power plants to build up their coal stock as per their normative requirement and to import at least 10% of their coal requirement for blending.

ED, ERLDC gave a brief presentation on power demand vis-a-vis availability scenario of Sikkim highlighting the aspects of portfolio management.

PART – A

ITEM NO. A.1: Confirmation of Minutes of 190th OCC Meeting held on 21st April 2022 through MS Teams online platform.

The minutes of 190th Operation Coordination sub-Committee meeting held on 21.04.2022 was circulated vide letter dated 09.05.2022.

Members may confirm the minutes of 190th OCC meeting.

Deliberation in the meeting

Members confirmed the minutes of 191st OCC meeting.

PART B: ITEMS FOR DISCUSSION

ITEM NO. B.1: Construction of 132 KV D/C Transmission line and two nos. of associated 132 KV GIS line Bay at PGCIL sub-station in Samardong.

Indian Railway is fast constructing the rail link to connect Sikkim with national rail-grid for which

construction work is under full swing. They have requested power department, Government of Sikkim for providing power connectivity at 132 KV voltage level for which they will provide the requisite fund for construction. In this regard, the power department has already initiated the preliminary survey for construction of 132 KV D/C transmission line from Samardong to

Khanikhola railway station yard at Rangpo along with two 132 GIS bay at Samardong. The connectivity will be from PGCIL 400/220/132 KV substation at Samardong near Rangpo.

Sikkim may update.

Deliberation in the meeting

Sikkim representative submitted that as per the joint meeting and preliminary inspection conducted earlier, connectivity to Khanikhola railway station yard from Rangpo S/s of Powergrid was proposed.

Powergrid representative submitted that the Rangpo S/s of PGCIL has the GIS bays placed at different levels which may pose difficulties in further accommodation of additional of 2 nos. of bays. Moreover, connectivity may be provided from the Samardong S/s of Sikkim, construction of which is under progress.

Considering the difficulty in termination of line corridor, Powergrid representative requested to forward the above proposal to monthly planning meeting of CTU for further deliberation of the technical issues.

Upon enquiring about whether the existing 132 KV D/C lines to Samardong S/s from Rangpo S/s could cater the additional load of railways, it was informed that at present the design load expected at Samardong is 20 MVA.

Regarding progress of work at Samardong S/s, it was informed that the lines were under the process of charging and the sub-station would be charged by the end of June 2022.

Sikkim representative informed that the DPR with approx. cost of Rs. 76.58 crores was submitted to IRCON considering the connectivity of Khanikhola railway yard from Rangpo S/s of Powergrid. The detailed survey of the line had been started. Since a major portion of the line comes under forest area, necessary forest clearance would be required. Further, RoW clearance would also be required for the private land. The acquisition would be started only after finalizing the path for connectivity.

OCC opined those possibilities may be explored by Powergrid in consultation with Sikkim and Railways regarding connectivity to Khanikhola railway yard.

OCC was of the view that a separate meeting may be convened in the 2nd week of June 2022 for further deliberation in the matter after getting requisite inputs from Powergrid and Sikkim.

ITEM NO. B.2: 132/66 KV Spare ICT Planning at Gangtok.

132/66 KV GANGTOK SS is having 02 No's 50 MVA ICT in service. Going by the loading profile in last winter (From Dec-21 to Feb-22) it is observed that due to huge load growth around GANGTOK, both ICT's are loaded around 90% of the installed capacity.

Further, in downstream 66KV Feeders, most of the feeders are reconductored in recent past and already enhanced power transfer capacity, but mostly restricted due to limitation of ICT capacity.

Synopsis of loading of both ICT's are given below for reference:-

Date	ICT – I; Peak Load	ICT-II ; Peak Load	Remarks
27.01.2022	44 MW	45 MW	Almost 90 % Loading during peak load
28.01.2022	43 MW	44 MW	Almost 90 % Loading during peak load
29.01.2022	44 MW	45 MW	Almost 90 % Loading during peak load
30.01.2022	42 MW	43 MW	Almost 90 % Loading during peak load
31.01.2022	44 MW	45 MW	Almost 90 % Loading during peak load

From above table it is clear that, N-1 contingency is not at all maintained in present scenario and probably, it may be estimated that in upcoming winter, Gangtok might face load shedding to keep transformer loading in safe region.

To mitigate the issue, the available immediate option is to install 3rd 50 MVA ICT at Gangtok SS. Presently 01 No spare 50 MVA ICT is available at Rangpo SS. To make it work as 3rd 50 MVA ICT, followings are proposed: -

1. Nearby area just beside the boundary of Gangtok SS required to be urgently taken over by POWERGRID. Without having extra land, bus extension and installation of ICT is not possible.
2. Regarding taking over of land, EPD/Sikkim shall extend all necessary help to POWERGRID and will also escalate the matter to Govt. of Sikkim.
3. After handing over/Taking over of land to POWERGRID, both bus extension shall be done by POWERGRID along with making foundation of 3rd ICT to be placed in operation. Both side bay extension proposed in AIS mode only.
4. After installation of 3rd ICT at Gangtok SS, as per CEA guideline spare ICT also need to be procured.
5. Considering urgency of the situation, it is proposed to implement entire package under ISTS scheme (RTM) by POWERGRID.
6. On getting, necessary approval POWERGRID shall propose the financial implications for further approval.

Considering the load restrictions faced by Sikkim and also in view of limited time for implementation, it is recommended to consider the above proposal as deemed ISTS project (RTM) and may be processed for further execution by POWERGRID. Detail drawing and location details are attached as **Annexure B.2**.

In the 190th OCC meeting, Powergrid representative submitted that in Gangtok S/s both the ICTs are of single main transfer scheme and have only TBC (Transfer Bus Coupler) in the redundant bay. Further, during the commissioning of the 3rd ICT, both sides' TBC would be engaged without

having any redundancy with the ongoing feeders.

To mitigate the above issue he submitted that the spare transformer may be located in some vacant area and both sides' TBC bay could be used as Transformer HV and LV. Additionally, some areas adjacent to the Gangtok S/s boundary may be used for the construction of another TBC bay.

Sikkim representative gave their consent to the above proposal.

OCC opined that the above proposals would be shared with CTU for further discussion and approval.

OCC further advised Sikkim to take up the matter with their government for the requirement of additional area.

Sikkim may update.

Deliberation in the meeting

Sikkim representative submitted that the additional area identified by Powergrid for construction of TBC bay belongs to private entity and advised Powergrid to initiate the land acquisition process with the assistance of Sikkim Power Department.

Powergrid representative stressed upon the fact of installation of additional ICT to cater the load of Gangtok and requested Power Department of Sikkim to explore the possibilities of acquiring the land for ICT installation. Further, a spare ICT would also be required at Gangtok S/s.

OCC advised Sikkim to expedite the land acquisition process for installation of the additional ICT.

ITEM NO. B.3: Outage of Important Transmission System.

B3.1. 132kV Sagbari–Melli.

Sikkim vide mail dated 09.06.2021 updated the following status:

- 1) In loc 82,83 & 84 we have low ground clearance which need hill cutting but if needed TL can be charged after putting temporarily barbed wire fencing.
- 2) In loc 98-99 a house had been constructed just below the line and warning had been issued to the owner for not to do vertical extension of the house till any such arrangement is made.
- 3) In loc 116 &117 land owner demanding for intermediate tower and not allowing for us to clear the jungles.
- 4) Loc 128 is in dilapidated condition due to sinking effect posing threat to lives and properties. Local public are asking to shift the tower in safe place before restoration of supply in the TL.
- 5) 80% of jungle clearance has been completed and remaining 20% is in Forest area most of it is under west district and waiting for permission from Forest department.
- 6) The delay in obtaining permission for following trees in forest land is that it cannot be ascertained whether FCA clearance during construction of TL was obtained as the record is not available either in power department or in DFO Office. Regarding this it had been told by ERPC that once obtaining environment clearance at the time of construction there need not to take permission for further clearance of ROW from Forest dept and this matter is been conveyed to the Forest department but they informed us as per Forest Act of Sikkim state

permission has to be obtained for fresh felling with payment of compensation. File for approval is being send to conservator of Forest from DFO on 10/6/2021.

In the 181st OCC meeting, Sikkim representative submitted that for the rest 20% work, they are yet to get clearance from the Forest Department. He further informed that there are also some RoW issues in that portion of the line. Further, ERLDC representative stressed over the fact that being a very important line, the restoration of the 132kV Sagbari-Melli linemay be done at the earliest.

In the 187th OCC meeting, Sikkim representative informed that clearance from the Forest Department is yet to be received.

In the 45th TCC Meeting, Sikkim representative informed that efforts have been made to restore the line at the earliest.

In the 190th OCC meeting, Sikkim representative submitted that the issues related to location 82, 83, 84 and 128 are still persisting.

ERLDC representative submitted that Melli being an important load center of Sikkim is connected to Siliguri and Rangit Power Station through Rangpo S/s. Therefore, absence of 132 KV Sagbari-Melli T/L would render shutdown of any link in Rangit-Rangpo-Melli line impossible from maintenance point of view.

Sensing the gravity of the situation, the Committee was of the view that a separate meeting with Sikkim would be convened for further deliberation on the above issue.

Sikkim may update.

Deliberation in the meeting

Sikkim representative submitted that the 132 KV Sagbari-Melli line would be charged within 6 months.

OCC advised Sikkim to submit progress report of the work on monthly basis.

B3.2. 220kV Pandiabili - Samangara D/C

220kV Pandiabili-Samangara D/C line tripped on 03-02-2019 during the event of Fani due to Tower collapse. 48 no towers got fully damaged and 12 no towers got partially damaged. Presently the line is charged from Pandiabili end up to location no 58. It is a very important line for supplying power to Puri area. The line is under outage more than 2 years.

In the 184th OCC meeting, OPTCL representative submitted that the restoration work has been undertaken by Powergrid.

He added that DA & DD type tower design has already been tested and passed by CPRI, however, the prototypes of DB & DC type tower are under testing. Once the testing of the same is successfully completed, the action plan of the restoration work would be submitted by Powergrid.

In the 186th OCC meeting, OPTCL representative informed that the type testing of DB & DC towers is under progress at CPRI. Type testing of DB & DC type tower is expected to be completed by 22nd and 28th December 2021 respectively. Further, the foundation work of towers has also started and is under progress.

In the 187th OCC meeting, OPTCL representative informed that the type-testing for all the towers had been completed at CPRI. The foundation work has been started at three places and the tower materials would be procured shortly.

In the 190th OCC meeting, OPTCL representative submitted that the work is under progress and is expected to be completed by December 2023.

OCC expressed serious concern over the issue and advised OPTCL to expedite with Powergrid for the timely completion of work.

OPTCL may update.

Deliberation in the meeting

OPTCL representative submitted that the work is under progress.

OCC advised OPTCL to strictly adhere to the timeline of December 2023 for the completion of the work.

B3.3. 440/220kV 315 MVA ICT 2 at Meramundali:

400KV/220KV 315 MVA ICT 2 at Meramundali tripped on 21-02-2021 due to fire hazard at Meramundali SS. The ICT is under outage since then. Meramundali S/S is serving the important load of the Odisha. Long outage of an ICT at such crucial S/S may hamper the reliability of the Grid.

In the 190th OCC meeting, OPTCL representative submitted that all the erection works had been completed except those of header pipes due to probable mismatch in them. The work would be completed after the new header pipes are received.

Further, two phases of nitrogen purging have been completed and the third is under progress. The commissioning work would be completed by 15th May 2022.

OPTCL may update.

Deliberation in the meeting

OPTCL representative submitted that 4 nos. of matching short pieces are yet to be received from OEM. The work would be completed after the materials are received.

B3.4. Outage of 400kV Main Bus-2 at Dikchu HEP.

400kV Main Bus-2 at Dikchu HEP has been out since 05.05.2021.

In the 185th OCC meeting, Dikchu representative was not available in the meeting.

Dikchu vide mail dated 27.11.2021 informed that, on 07.09.2021 a test had been conducted by them to pin point the fault location. Subsequently, the fault was found in the B phase Circuit Breaker Compartment of 400 KV Dikchu-Teesta 3-line bay 403.

So as suggested by the OEM, there was a need to replace the CB compartment.

In this regard, the offer for new CB compartment from OEM GE(T&D) had already been received on 15th Nov' 21. The procurement process is in progress & the works are being planned to be carried out in 3rd week of Jan' 22.

In the 186th OCC meeting, Dikchu representative informed that OEM M/s GE had given a lead time of 8 months for the supply of new CB compartment, but considering the seriousness of the issue, M/s GE has now agreed to provide the same in 3 months. The work is expected to be completed by the end of March 2022.

Considering the importance of Dikchu-Teesta-III line, OCC advised Dikchu to expedite the work at the earliest in consultation with their OEM.

In the 187th OCC meeting, Dikchu representative informed that the work would be completed by the end of June 2022.

Dikchu vide mail dated 22nd April 2022 submitted the following:

- The delivery of the new B-phase Circuit breaker compartment is being delayed due to the long Queue of pending orders with the OEM during the Covid-19 period. There is also delay in receipt of some of the specialized imported components of the Breaker causing delay in manufacturing of CB.
- OEM GE (T&D) has informed that the supply would be completed within six months. The CB accordingly is expected to be received at site in October, 2022 and the work will be completed in the same month.

Dikchu may update.

Deliberation in the meeting

Dikchu representative submitted that the breaker replacement work would be completed by October 2022.

ITEM NO. B.4: Endangering Grid connectivity, security & stability of 400 KV Sundargarh-Raigarh LILO Ckt – 3 & 4 at tapping points near Sundergarh by M/s Vedanta Ltd, Jharsuguda along with violation of Grid discipline.

As per the agreement dated 22.12.2010 between M/s Vedanta Ltd. And Powergrid, the connectivity to Vedanta Ltd sub-station was carried out from LILO of 400 KV Sundargarh-Raigarh D/C line # 3 between Tower No – 834 (DD+0) & 835 (DD+0) and 400 KV Sundargarh-Raigarh D/C line # 4 between Tower No – 299 (DD+0) & new Vedanta Tower No-VL3 (DD+0) was done during the year 2011. This activity was taken up as per direction of CERC and instruction of ERLDC/WRLDC in order to charge the Vedanta switchyard at Jharsuguda for sending and receiving of power at Vedanta end with CTU transmission system.

After direct connectivity of Vedanta 400 KV sub-station with 765/400 KV sub-station of Powergrid at Sundergarh, the tapping points of LILO portion of line # 3 & # 4 was disconnected by M/s Vedanta Pvt. Ltd. In the year 2014 & 2017 respectively, without completion of direct connectivity for Powergrid, in above-mentioned LILO lines.

M/s Vedanta has dismantled all towers of LILO portion except 2 nos. of towers near each tapping

point and left these 4 towers without any routine maintenance/watch & ward activity. At present there is no back support at tower no-VL2 and VL5 (**Annexure B.4**) As there is no watch and ward and routine maintenance work theft of tower members on these towers have become rampant, subsequently weakening the strength of towers which may lead to collapse of existing Vedanta towers as well as Powergrid towers, resulting interruption of power transfer between Eastern and Western Grid.

In this regard, the authority of M/s Vedanta has been informed many times verbally as well as in written communication for replenishment of all missing/hanging members and to provide backstay

(back support) for keeping the tower in safe condition and also to take urgent action for direct connectivity of both LILO points.

Some of the correspondences with the photographs of tower condition and record notes of discussion held on dt. 25.06.2020 and dt. 22.10.2021 have been provided at **Annexure B.4**.

Inspite of these correspondences and discussions with M/s Vedanta Ltd., since dt. 04.03.2019, neither any action has been taken nor any permanent connectivity solution has been implemented. The said LILO lines are in severe danger zone and power flow will be affected as stated.

Powergrid may update. Members may discuss.

Deliberation in the meeting

Powergrid representative requested for restoration of 400kV Sundargarh-Raigarh ckt- 3 & 4 to the configuration existed prior to LILO connectivity in order to avoid the situation of tower collapse which may lead to interruption of power transfer between Eastern and Western Grid.

Vedanta representative submitted that necessary budget approval for the aforesaid work had been taken and the work would be completed within 2 months.

ITEM NO. B.5: Agenda by Powergrid.

B.5.1. Technical Overview of AMR data center hardware and software application refreshment program.

In continuation with agenda point no - B15 of 190th OCC, POWERGRID after detail deliberation, taken fresh offer from M/S. TCS. As per latest offer, total cost of upgradation will be Rs. 1,39,49,793/- (Excluding GST). Further meeting with ERLDC and TCS also conducted on TS of H/W & S/W upgradation on 12.05.2022.

ERLDC may provide go ahead technically for the program.

In view of above, it is proposed to provide in-principal approval to POWERGRID such that LOA can be issued for above work to TCS on Single Tender (ST) basis.

The technical document and proposal are provided at **Annexure B.5.1**.

Members may discuss and approve the proposal.

Deliberation in the meeting

West Bengal representative expressed that they would inform their views to ERPC within 5 days after consulting with their higher authority.

OCC agreed with the proposal of Powergrid and gave an in-principle approval for the program and referred it to the next Commercial Committee Meeting.

B.5.2. LAN integration of DCU's installed at various SS of ER for SEM data transmission to ERLDC-Cost proposal.

In continuation with agenda B14 of 190th OCC meeting regarding cost approval for further LAN integration of various DCU's installed across various SS of Eastern Region, followings may be noted: -

1. As per original LOA- 40 Locations integrated.
2. As per amendment of LOA- 69 Locations integrated.

TCS has successfully completed all the 109 LAN integration work under scope vide LOA (Ref: ER-II/KOL/CS/I-2446/P-2420/AMEND-II/4374) dated- 05/07/2021. Now, the following 63 locations where LAN setup is present and AMR LAN integration is possible using that channel. Among these 41 locations can be integrated as regular connection through Normal CAT-6 cabling and TCS has agreed to carry out the work on prevailing rate of existing LOA and further 22 locations require additional financial implication in regard to converter and Optical cables. Further 08 locations are yet to provide any information about connectivity but included in totality. Total location count comes to 71. Location details attached separately.

Total Cost Calculation as below, based on TCS's proposal submitted.

Item	Type	Qty	Unit Price	Total Price (INR)
LAN Integration Service at Sub Station**	Services	71	15564	11,05,044.00
Additional Charges for LAN Integration at Kiosk Sites	Services	22	17830	3,92,260.00
Fiber Optical Cable with Converters and other accessories.	HW Supply	18000	94.50	17,01,000.00

Total Price: 31,98,304/- INR (without GST).

** Unit price for LAN Integration Service is same as per the existing LOA of AMR Phase-4.

In view of above, it is proposed to provide in-principal approval to POWERGRID such that LOA can be issued for LAN integration to TCS on Single Tender (ST) basis on urgent basis.

The location details and Techno Commercial proposal are provided at **Annexure B.5.2**.

Members may discuss and approve the proposal.

Deliberation in the meeting

Powergrid representative submitted that few locations in Jharkhand and Sikkim do not have fiber connectivity.

Sikkim representative submitted that fiber connectivity is available at Sagbari.

Jharkhand representative submitted that OPGW installation work is in progress in Chandil and Daltonganj S/s.

GMR representative agreed to provide the port opening details within 5 days.

West Bengal representative submitted that a separate meeting may be convened between the communication departments of WBSETCL, Powergrid, ERLDC and ERPC for further deliberation in this regard.

OCC advised all the states to provide the port opening details to Powergrid at the earliest.

OCC further advised Powergrid to give the status update of LAN integration to ERPC on weekly basis.

OCC gave in-principle approval for the cost proposal of Rs. 31,98,304/- INR (without GST) and referred it to the next Commercial Committee Meeting.

B.5.3. Proposal for upgradation of 220 KV Side bays pertaining to Durgapur (PG)-Parulia (DVC)-D/C at POWERGRID end under ADDCAP 2019-24 tariff block.

In reference to the 1st ERPCTP vide agenda no-03 (Sub-point-3.5), competent authority has approved reconductoring of 200 KV Durgapur (PG) – Parulia (DVC)-D/C reconductoring activity along with bay upgradation work at both end. As per minutes the entire work to be carried out by POWERGRID at the cost of DVC. Under subject package, apart from line upgradation (From Conventional conductor to HTLS) both side bay equipment also to be upgraded to 1600 A.

Further, on dated 28.04.2022 220kV Main Bus-I tripped due to failure of R-phase BPI which is installed in 220kV Parulia (PGCIL) - Parulia (DVC) Line-II side between CT and Line Isolator. The cause of failure of BPI was due to ageing effect. There was no sign of damage on BPI prior to tripping, but due to extreme heat wave persisting in and around subject station, the BPI may have developed snag for ageing. This event i.e., the failure of BPI due to ageing effect further stressed the requirement of complete replacement of the age-old equipment's/systems are in service at Durgapur SS. Further upgradation of line capacity without replacement of all concerned equipment's may reduce reliability.

Being asset of POWERGRID, upgradation of associated bay equipment along with hardware fittings, connectors etc. and Control & Protection Panels at POWERGRID end cannot be carried out on cost deposit basis from DVC but can be done on ADDCAP basis (under Tariff block 2019-24). The bays are commissioned back in 1987-92 period under FSTPP and as the upgradation required for enhancing capacity, it can be included in ongoing ADDCAP of FSTPP under 2019-24 block.

Therefore, to carry out the upgradation work, it is proposed to carry out the strengthening work of 220kV D/C Parulia (PGCIL) - Parulia (DVC) under ACE 2019-24 (for FSTTPS). Under subject upgradation work, following major works are proposed to be carried out at POWERGRID end:-

1. Replacement of old Isolator (05 set)
2. Replacement of CB (01 set)
3. Replacement of CT (07 set)
4. Upgradation of protection system including numerical line differential protection system.

5. Associated civil construction activity.

Tentative cost for entire upgradation work at Durgapur end will be around 2.2 Crores excluding GST.

Members may discuss and approve for taking up further tendering activity by Powergrid.

Deliberation in the meeting

DVC representative submitted that the cost of line and bay upgradation work at their end would be borne by them. Powergrid representative submitted that they would carry out the upgradation work of the asset situated at Powergrid end and file the petition with CERC (under Tariff block 2019-24).

OCC approved the proposal and referred it to the next Commercial Committee Meeting.

B.5.4. Frequent data interruption in Web Client server of RTAMC.

Web client view of ERLDC/SCADA was available with RTAMCs of Eastern region. But, it has been totally discontinued for approximately one month which causes trouble for proper & smooth grid operation & co-ordination. Earlier also, when it was available, frequent disruption of service on many grounds observed in almost all the times.

RTAMCs are very important control point for eastern regional grid. All the stations of POWERGRID are being monitored remotely & centrally as well as are controlled from RTAMCs only (Unmanned). Further many centralized activities during planned or contingency period carried out from RTAMC only. There are many critical transmission links as well as elements which belong to POWERGRID, but not situated inside POWERGRID premises. For better control of the same, co-ordination with those constituents and to take prompt action in case of any requirement, view of the live parameter along with associated network of these assets are very important. For that activity ERLDC web client view was only available solution before RTAMCs.

Again, shutdown planning, co-ordination or planning of any long outage after considering grid safety & requirement, everything also demands the single window cumulative instant view of the network.

The license for remote display was provided earlier at RTAMCs in Eastern Region (2016-2020) but the same was withdrawn by ERLDC and web clients were provided which is very much intermittent.

In view of the above, it is requested to provide the licenses for remote display at RTAMCs in Eastern Region for better availability.

Members may discuss.

Deliberation in the meeting

Powergrid representative submitted that many critical transmission links as well as elements which belong to Powergrid but are not located inside its premises for which they are completely dependent on ERLDC SCADA data. Due to non-availability of ERLDC SCADA data, a majority of operational aspects are affected on day to day basis.

Powergrid representative further requested ERLDC to provide the licenses for remote display at RTAMCs.

ERLDC representative submitted that licenses were disconnected because of cyber security issues.

Powergrid submitted that the no issue of cyber security is faced in case of licensed version as it has a dedicated network and does not run through internet.

OCC advised ERLDC and Powergrid to resolve the issue bilaterally.

ITEM NO. B.6: Drawl of power by solar power stations from the Grid during non-solar hours or during the period of shutdown or maintenance.

Hon'ble CERC has issued an order dated 25.04.2022 in Petition No. 345/MP/2018 in the matter of MPPMCL Vs. Athena Jaipur Solar Power Pvt Ltd. and Ors. In this order, the Hon'ble Commission has directed as under in the matter of drawl of power by Solar Power Stations from the grid during non-solar hours and during the period of plant shut down or maintenance:

Quote:

39.....We reiterate that as the DSM Regulations do not have any provision dealing with drawl of power by the SPDs during night hours and/or for maintenance and shut down, it should be interpreted to mean that such SPDs cannot be allowed to inter-change such drawl through DSM Regulations.

40. Therefore, the Respondent-SPDs should immediately and not later than one month from the date of this Order, enter into power purchase arrangement for such drawl of power either with the distribution licensee of the State in which they are located or with any other entity through open access. Once such an arrangement has been made, the energy drawn should be scheduled and accounted as per the provisions of the Grid Code and deviation settled as per the provisions of the DSM Regulations, 2014 or the DSM Regulations, 2022 once the same is brought to force.

Unquote:

The Solar Power Developers (SPDs)/Generators which are regional entities of Eastern Regional grid are requested to ensure compliance to the above directions of the Hon'ble CERC. As directed by the Hon'ble Commission, after 26.05.2022, ERLDC will be constrained to disallow the drawl of power by the following SPDs in ER. In absence of any such arrangement (viz. PPA/contract for scheduling power) for drawl of power during non-solar hours & periods of plant shut down.

NTPC may update.

Deliberation in the meeting

OCC advised all the solar power stations to comply with the CERC order.

ITEM NO. B.7: Ensuring N-1 reliability criteria at 400/220 KV Subhashgram (PG) S/s.

400/220 kV Subhashgram (PG) substation is feeding to the major load centers in south Bengal. At present 5 numbers of 400/220 kV ICTs (4x315 MVA+1x500 MVA) having a total transformation capacity of 1760 MVA is installed at Subhashgram. However, total loading through ICTs is crossing 1500 MW on daily basis. It is pertinent to note that N-1 security criteria for ICTs is

satisfied till the total drawl remains below 1300 MW. On exceeding the said limit, tripping of a single ICT may overload the four other ICTs which can lead to their cascade tripping, resulting in total black out of Subhashgram (PG) Substation feeding to extensive areas of South-24 parganas and Kolkata (CESC). In addition, 220 KV network connecting Rajarhat, Jeerat, Barasat, Kasba and adjoining stations can possibly trip on overload.

In this regard, a meeting was convened on 10.05.2022 by MS ERPC to discuss on the issue of violation of n-1 reliability criteria for 400/22 kV ICTs at Subhashgram (PG) S/s. In the meeting, it was agreed that an SPS will be implemented at Subhashgram (PG) considering the same load which are identified for 220 kV Subhashgram-EMSS D/C contingency.

Members may discuss.

Deliberation in the meeting

CESC representative submitted that a meeting was convened with Powergrid on 18.05.2022 to finalize the logic of the SPS scheme.

CESC representative submitted that as per the logic, SPS would operate when one of the transformers trips leading to simultaneous overloading of other transformers. The quantum required for load shedding would be decided by ERLDC on real time basis and further intimated to CESC.

ERPC representative was of the view that in case of operation of SPS the load shedding quantum should be triggered automatically instead of manual intervention.

OCC opined that a separate meeting would be convened to finalize the scheme and determine the load shedding quantum.

ITEM NO. B.8: Shutdown of Bus coupler bay.

It is observed from the shutdown requisition that entities apply for shutdown of bus coupler bay independently. In view of system reliability, it is very difficult to approve the shutdown of bus coupler bay individually. Substations with double main bus scheme or double main transfer bus scheme, any planned shutdown of bus coupler bay may be availed along with bus shutdown. To

Optimize the element outage duration and to avoid any system contingency, it is proposed to plan the shutdown of bus coupler bay with bus shutdown.

Members may discuss.

Deliberation in the meeting

ERLDC advised all the utilities to take the shutdown of bus coupler bay along with the bus shutdown.

Powergrid representative was of the view that shutdown of bus coupler along with the buses in case of GIS may pose technical difficulties and therefore the shutdown of bus and bus coupler may be allowed independently.

In case of AIS, the shutdown approval of bus and bus coupler bay may be given on coupled basis.

OCC agreed with the same.

ITEM NO. B.9: Blending of coal as per MoP number 23/13/2021- R&R (PT-1) dated 05.05.2022.

In view of the increasing trend of demand and coal shortage along with high price of imported coal Ministry of Power vide order no 23/13/2021- R&R (PT-1) dated 05.05.2022 issued direction to the generating companies under section 11 of the Electricity Act-2003. Looking at the emergency situation MOP has directed to all states and GENCOs using domestic coal to import at least 10% of its coal requirement for blending. This order shall remain valid up to 31.10.2022. All the states and generating companies are requested to ensure compliance of the same.

GENCO's may share the present status of imported coal blending in different power plants in ER.

Deliberation in the meeting

NTPC representative submitted that coal blending of around 10-15 % had already been started in Farakka and Kahalgaon units. Moreover, for NPGC and BRBCL units the coal blending would be started shortly.

DVC representative submitted that coal blending had been started in MTPS and DSTPS units.

SLDC Odisha submitted that as of now IB TPS and OPGC units are not importing coal.

GMR representative submitted that imported coal is blended with domestic coal in the ratio of 20:80.

Tenughat representative submitted that they are not importing coal.

WBPDCCL representative submitted that tender for imported coal had been floated and would be opened on 25th May 2022. Further, they have a requirement of 19 rakes per day out of which 14 rakes are met by their captive mines, 1.5 rakes on average are supplied by MCL and a shortfall of around 2-3 rakes are there on daily basis.

OCC advised all the GENCOs to comply with the MoP order and import at least 10% of their coal requirement for blending.

ITEM NO. B.10: Agenda by JITPL.

Jindal India Thermal Power Limited (JITPL) has 2X600 MW thermal power plant located in the village of Derang, Anugul, Odisha.

JITPL has an APP with TPTCL for supply of 200 MW power to Gujarat Urja Vikas Nigam Limited (GUVNL) under medium term (MTOA) for 23 months wherein the issue is regarding the methodology of calculation of impact of transmission losses. JITPL is following method which is

widely used by the industry and considered as industry practice but GUVNL is not following the same and is using different methodology due to which there is almost always a difference of approx. 1-2 paisa per unit which is a loss for JITPL. Illustrations of methodology as mentioned below.

JITPL/Industry practice method

Impact of Transmission loss in Rs. Per unit = $((A/(1-\text{Trns. Loss\%})-A)$ where A is Tariff in Rs. Per unit.

GUVNL method

Impact of Transmission loss in Rs. Per unit = $A \times \text{Transmission Loss \%}$, where A is Tariff in Rs. Per unit

JITPL had raised the issue several times with TPTCL/GUVNL but still no action has been taken in the aforesaid matter.

JITPL may update. Members may discuss.

Deliberation in the meeting

JITPL representative submitted that the methodology followed by them is as per the agreed terms mentioned in the bid document with GUVNL.

OCC advised JITPL to approach Gujarat Electricity Regulatory Commission for the resolution of the above matter.

Further, OCC advised JITPL to submit the bid document and PPA to ERPC.

ITEM NO. B.11: Status of Farakka unit # 5 under shutdown since 19.03.2022 - WBSEDCL.

As per the Minutes of the 45th ERPC Meeting Item No C-5, the emergency shutdown of Farakka U5 was allowed by the ERPC forum from 19.03.2022 & at the same time NTPC was advised to submit the then status of work as well as the timeline for restoring the unit. The minutes was drawn against the agenda placed by WBSEDCL in the said meeting. But unfortunately, till 10.05.2022, WBSEDCL is in dark regarding the status of the work & expected time of restoration. Neither any direct formal letter from NTPC nor the copy of the letter addressed to MS/ERPC in this regard has been received till 10.02.2022.

It is well aware of the fact that due to country wide coal shortage problem the DISCOMs like WBSEDCL has been reeling under huge shortfall despite having sufficient LT/MT purchase contract & trying to mitigate such shortfall by procuring power from Energy Exchange Plat form @Rs. 12.00 & more. Hence, under this prevailing situation WBSEDCL being the major stake holder of this station incurring huge financial loss due to less availability from the said station, the burden of which ultimately will be passed on to the end consumers of the State as a tariff shock.

NTPC may update.

Deliberation in the meeting

NTPC representative submitted that the Farakka unit – 5 would be synchronized by 25th May 2022.

MS, ERPC expressed serious concern regarding non sharing of status of restoration work of Farakka unit-5 by NTPC.

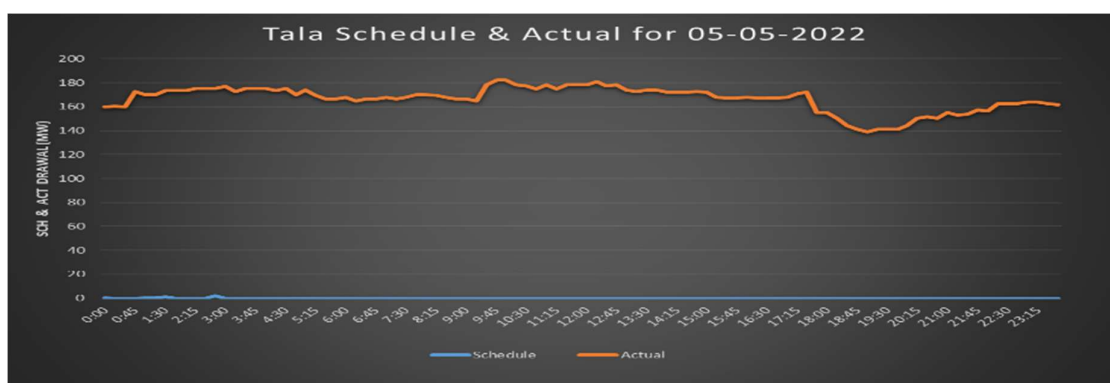
He further advised NTPC to submit the status of work and list of works carried out during the shutdown period to ERPC positively within 2 days.

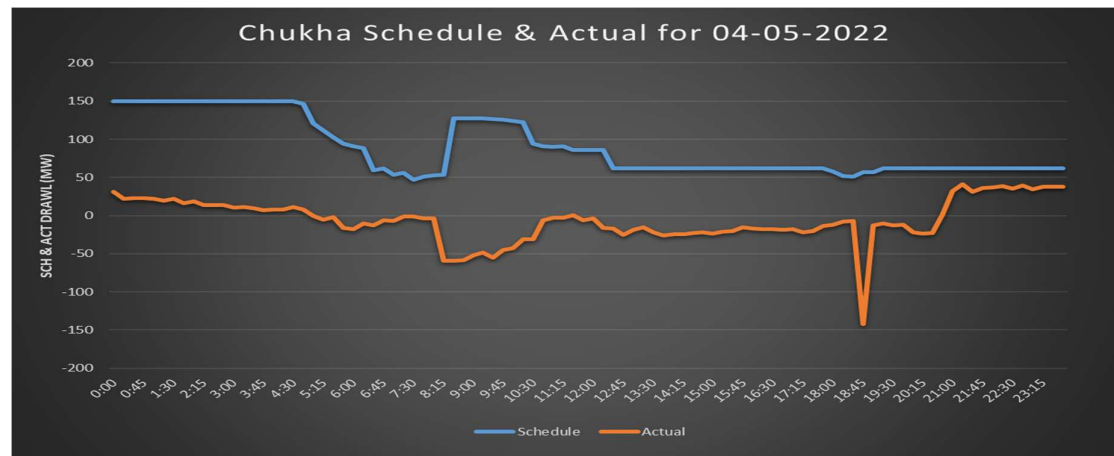
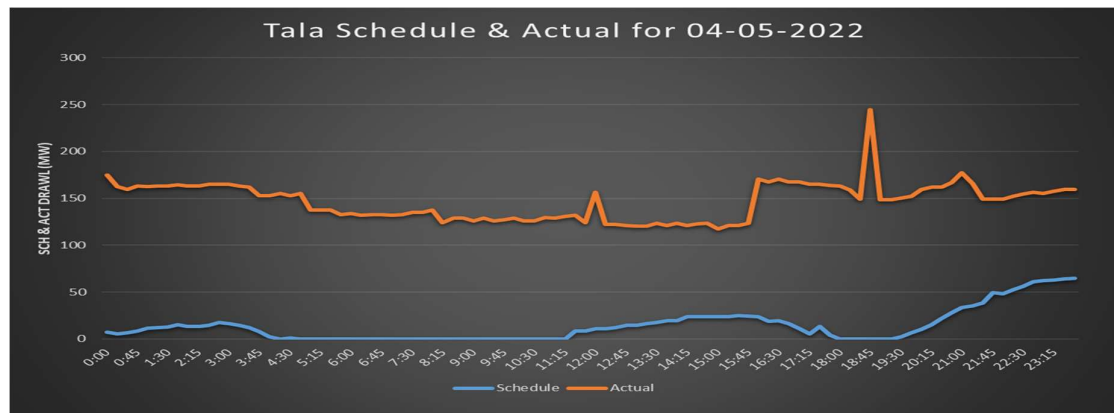
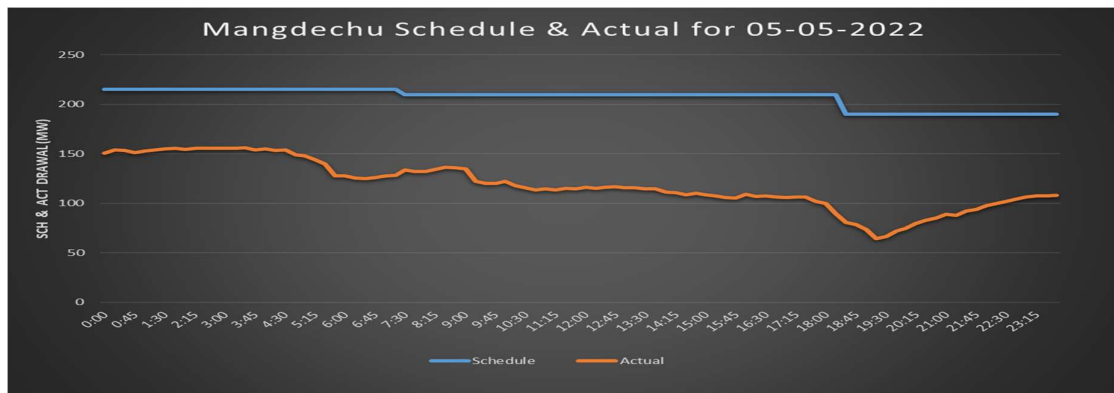
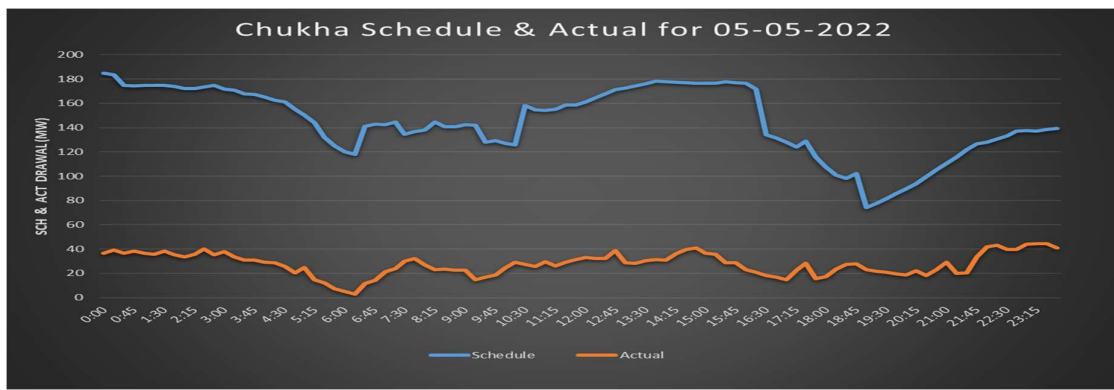
ITEM NO. B.12: Judicious and realistic declaration of DC from Bhutan HEPs - WBSEDCL.

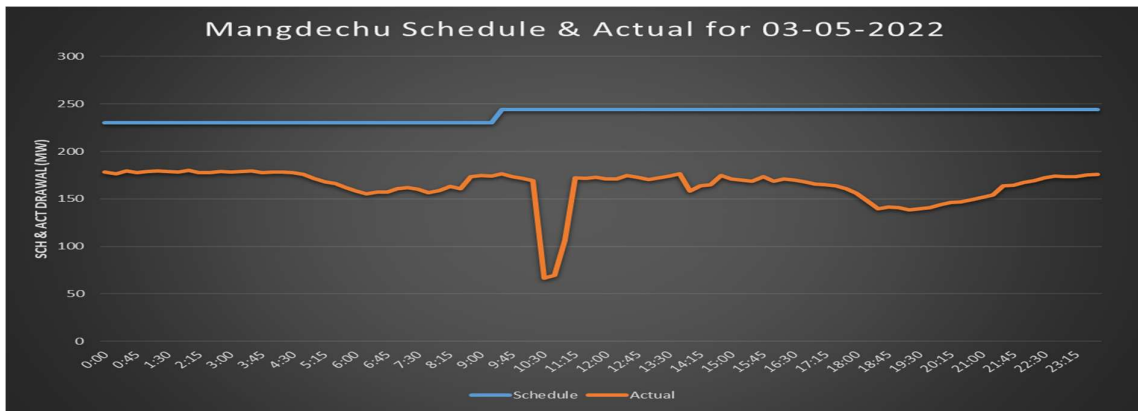
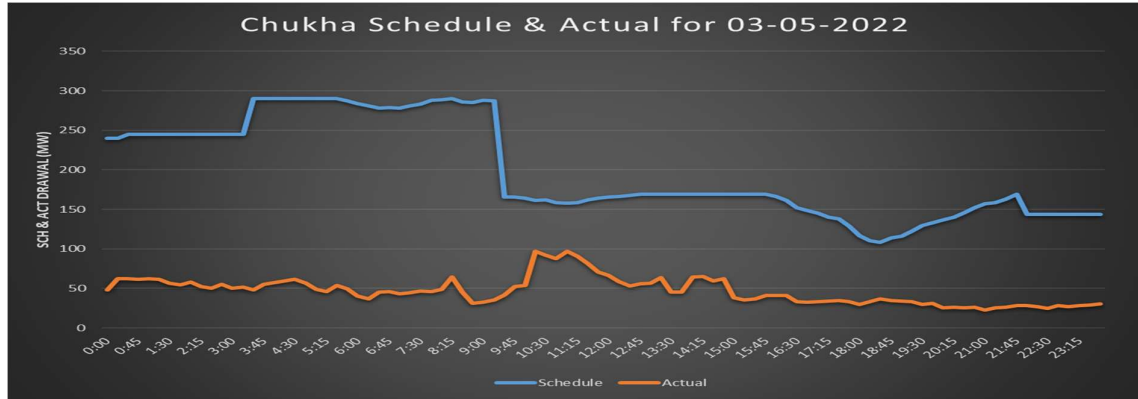
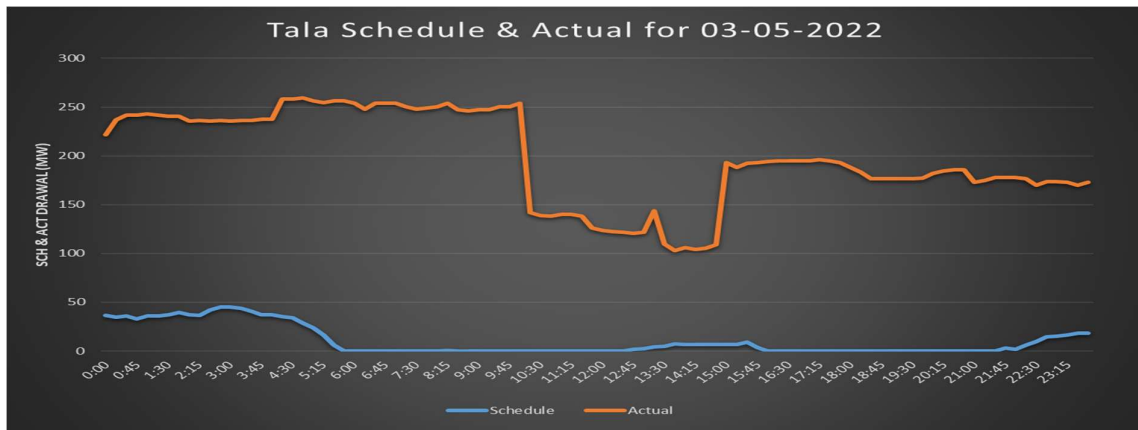
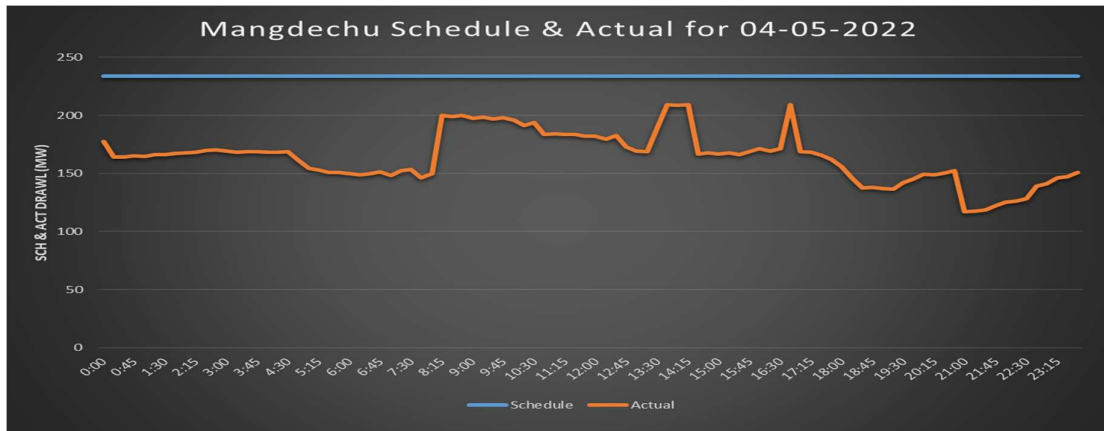
In the last few weeks, it has been observed that the DC punched by Bhutan is higher for the Mangdechhu and Chukha HEP while the same punched for Tala is very less even zero on some days. However, during the real-time operation it has been noticed that there is significant generation at Tala while generation at Mangdechhu and Chukha are on lower side than the punched DC quantum. But in accordance with the real time ongoing generation pattern, no such revision of DC was made from Bhutan end for the beneficiaries. The graphs furnished below as Annexure-I showing Schedule vs Actual for Tala, Chukha and Mangdechhu for 3rd May to 5th May 2022 from which the above fact is discernible.

It is pertinent to note that West Bengal has different share percentage from these Hydropower plants as per GOI allocation and such misdeclaration of DC is severely impacting the portfolio management of the state. Further the per unit energy cost of Mangdechhu is costlier than Tala resulting into non-economic dispatch and sorts of gaming from Bhutan side.

Thus, ERPC is hereby requested to take up the matter with appropriate authorities for a more Judicious & realistic declaration of DC of Bhutan HEPs so that beneficiaries can manage their portfolio efficiently on economic principle as per Indian Regulatory Guideline.







Deliberation in the meeting

WBSEDCL representative submitted that costly power of Bhutan was scheduled more but the actual generation was less whereas cheaper power was scheduled less but the generation was on higher side. He further requested Bhutan to declare a realistic DC.

Bhutan representative submitted that surplus power is being exported to India based on the PPA signed between Govt. of India and Royal Govt. of Bhutan. Moreover, energy accounting is done based on the energy meter data rather than the scheduled data.

Further, variation in schedule and actual figures is observed for various Bhutan generators due to the adjustments made as per the agreed terms of PPA.

ITEM NO. B.13: Preparedness in regards of flood in ER.

Monsoon season is approaching and there may be flood like situation. It is experienced from the past that some of the substations of ER such as Kishanganj, Muzaffarpur, New Purnea, Alipurduar, Darbhanga, Motihari etc were either waterlogged or about to submerged. A similar situation may arise in the coming days which may cause the complete shutdown of entire substation disrupting the power supply to downstream. In the state of Bihar, substations such as Chhapra/Amnour, DMTCL etc were severely affected due to flood. ERLDC has intimated the same to POWERGRID, DMTCL and Bihar vide mail dated 26.07.2021. In Addition to the above, from earlier data, it appears that the newly commissioned substation Sitamarhi and Saharsha are also located in the flood-prone area.

POWERGRID, Bihar, and other transmission licenses in that area may share the Preparedness plan for any flood-like situation.

Deliberation in the meeting

Powergrid representative submitted that they have constructed boundary walls and increased the heights of the walls to mitigate the problems of inundation. Further, high-capacity pumps have been installed to minimize the accumulation of water in the sub-station premises.

The newly commissioned sub-stations like Sitamarhi and Saharsha have been built on high ground to avoid flood like situations.

DMTCL representative submitted that flood protection walls have been constructed and arrangement of pumps and drain valves have been ensured to prevent accumulation of water. Further, additional towers have been provided in Gandaki river as a measure of flood prevention.

Bihar vide mail dated 18.05.2022 submitted the activities taken up for flood protection. (Annexure B.13).

ITEM NO. B.14: Ensuring healthiness of ADMS.

Automatic demand management scheme (ADMS) is already commissioned in West Bengal, DVC and Jharkhand. Logic for ADMS is as implemented in these state is as follows.

Sl No	State/Utility	Logic for ADMS operation	Implementation Date	Total Load connected in ADMS logic
1	Jharkhand	System Frequency < 49.9 Hz AND Deviation > 12 % or 25/50/75 MW. Block I, II & III feeders will be selected for load shedding depending on the O/D.	In service from 21st August 2019.	Total 90 MW
2	DVC	F <49.9 Hz AND deviation > 12 % or 150 MW	In service from 17.06.2016.	Total 281 MW
3	West Bengal	F <49.7 AND deviation > 12 % or 150 MW	In service from 25.11.16.	Total 225 MW

In the month of April 2022 frequency remained on lower side for major amount of time. Further on some occasion the above criteria for operation of ADMS was satisfied for all the three constituents. However, only West Bengal has reported a successful operation of ADMS, even in West Bengal full quantum relief is not observed on all occasions.

DVC and Jharkhand are requested to share the reason behind non operation of ADMS and action taken for rectification of same. West Bengal is requested to share the reason behind less relief on some occasions.

In the 190th OCC meeting, ERLDC representative submitted that non operation of ADMS for DVC was due to some issues in the logic. He further requested DVC not to club the feeders earmarked for ADMS with feeders for load shedding for availing any relief during requirement.

ERLDC representative requested West Bengal to implement the same logic as followed by other states to maintain a uniformity.

Jharkhand representative submitted that due to some unresponsive behavior of processor the ADMS could not operate. Necessary rectification in this regard had been done.

Automatic demand management scheme (ADMS) is already commissioned in West Bengal, DVC and Jharkhand.

In the month of April 2022 frequency remained on lower side for major amount of time. Further on some occasion the criteria for operation of ADMS was satisfied for all the three constituents.

West Bengal has reported successful operation of ADMS with inadequate relief on many occasions. As per ERLDC SCADA data analysis, ADMS criteria is satisfied for 38 number of occasions for WB, out of which on 26 no of occasions no relief was observed.

In 190th OCC meeting, Jharkhand representative submitted that necessary rectification had been done regarding the operation of ADMS. Although during 15th April 2022 to 30th April 2022 the criteria for operation of ADMS of Jharkhand were satisfied for around 390 instances but no information received regarding operation of ADMS in Jharkhand.

In the month of April 22 there are 61 times when ADMS operation logic for DVC satisfied. The

instances when deviation was more than 300 MW are listed below:

Date & Time	Frequency	Deviation
10-04-2022 22:38	49.88029861	319.1373
11-04-2022 10:54	49.85590363	346.37
11-04-2022 17:53	49.78260803	428.8279
11-04-2022 18:20	49.87540436	329.7244
11-04-2022 21:37	49.89008331	364.0398
12-04-2022 00:37	49.8949852	349.0485
12-04-2022 00:43	49.86565781	355.2567
20-04-2022 12:14	49.84611511	344.9607
21-04-2022 15:12	49.70444107	339.0992
27-04-2022 04:39	49.88031006	432.5251

However, no information was received from DVC regarding the operation of ADMS.

In 190th OCC meeting, West Bengal was requested to implement the same logic as followed by other states to maintain uniformity. ERLDC suggested to take up the matter of making ADMS logic uniform at NPC level.

Respective states may update.

Deliberation in the meeting

DVC representative submitted that for 10th & 11th April 2022, ADMS criteria was satisfied for some portion of time and most of the feeders were shed but ADMS did not operate due to some issues. Later on, simulation was carried out and ADMS was found to be operational. He further submitted that for remaining days the criteria did not satisfy as the deviation was in the over-injection mode.

OCC advised DVC to share the SCADA data and simulation report with ERPC and ERLDC.

Jharkhand representative submitted that ADMS did not operate due to unhealthy communication with some of the sub-stations.

OCC advised Jharkhand to take necessary steps in order to ensure healthy communication links.

ITEM NO. B.15: Commissioning status of ADMS.

Automatic demand management scheme (ADMS) is already commissioned in West Bengal, DVC and Jharkhand. However, for Bihar and Odisha 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	Implementation status/target
1	Bihar	F < 49.7 AND deviation > 12 % or 150 MW	1 st week of May 2022.
2	Odisha	1. System Frequency < 49.9 Hz 2. Odisha over-drawl > 150 MW 3. Discom over-drawl > 40 MW	15 th May 2022.

Bihar and Odisha may share the present status of implementation and share the reason for delay in implementation if any.

In the 190th OCC meeting, Odisha representative submitted that the ADMS would be operational by 15th May 2022.

Bihar representative submitted that ADMS would be operational by 1st week of May 2022.

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

Deliberation in the meeting

Bihar representative submitted that ADMS would be operational by last week of May 2022.

SLDC Odisha representative submitted that out of 88 stations, work has been completed in 69 stations and is expected to be operational by 24th June 2022.

ITEM NO. B.16: List of lines of Eastern Region violating N-1 security criteria.

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

Sl. No	Name of Element	Short Term Measures	Long term Measures	The target date for long term measures
Transmission Constraint in Odisha Network				
1	i. 220 kV Budhipadar-Lapanga D/C, ii. 220 kV Budhipadar Vedanta D/C iii. 220 kV Rourkela-Tarkera D/C	SPS available only for 220 kV Rourkela-Tarkera D/C. However, even with SPS N-1 criteria is not satisfied for all the conditions. Action Required:- Load trimming scheme needs to be planned	1. Reconductoring of 220 kV Rourkela-Tarkera D/C with HTLS. 2. 220 kV Rourkela-Tarkera second D/C 3. Shifting of Vedanta from 220 kV to 400 kV	OPTCL to provide a target date for Long term measures
2	i. 220 kV Lapanga-Katapalli D/C , ii. 220 kV Katapali-New Bargarh-Sadepalli (New)	No SPS Available. Action Required:- SPS/Load trimming scheme needs to be planned	Odisha to share long-term remedial action to make the system N-1 secure.	OPTCL to provide a target date for Long term measures

Sl. No	Name of Element	Short Term Measures	Long term Measures	The target date for long term measures
	Bolangir) S/C iii. 220 kV Katapali- Bolangir (PG)- S/C			
Transmission Constraint in DVC Network				
3	i. 220 kV Waria- Bidhan Nagar D/C ii. 220 kV Waria- Mejia D/C	Opening of 220 kV Waria-Bidhan Nagar D/C as and when required	400/220kV, 315MVA (3rd) ICT at Bidhannagar	Target Date 2022-23. WBSETCL may update the present Status
4	i. 220 kV Maithon- Dhanbad D/C, ii. 220 kV Maithon- Kalyanesh wari D/C	No SPS is Available. Action Required:- SOP/SPS/Load trimming scheme needs to be planned for the time being	i. 220 kV Connectivity at 400 kV Mejia-B ii. 220 kV Connectivity at 400 kV RTPS	DVC may update the target date
Transmission Constraint in Jharkhand Network				
5	220 kV Maithon Dumka D/C	No SPS Available. Action Required:- SPS/Load trimming scheme needs to be planned	i. LILO of 1st circuit of 220kV Dumka – Govindpur D/c line at Dhanbad	Target Date 2023. Jharkhand may update the target date
Transmission Constraint in West Bengal Network				
6	i. 220 kV Rajarhat- Newtown AA3 D/C, ii. 220 kV Subhasgra m-EMSS D/C	SPS is Available for both the Ckts	1. 220 kV Rajarhat- Newtown AA3 D/C line with HTLS. 2. No Strengthening planned for 220 kV Subhasgram-EMSS D/C	1. Target Date Oct, 2022 for recondutoring WBSETCL may update the present Status

Sl. No	Name of Element	Short Term Measures	Long term Measures	The target date for long term measures
7	i. 220 kV Subhasgram (PG) – Subhasgram (WB) D/C ii. 220 kV Subhasgram (WB)- Lakshmikanthpur D/C	SPS Available for 220 kV Subhasgram (PG) – Subhasgram (WB) D/C	i. 220 kV Subshagram – Baruipur D/C ii. 400/220 kV Substation at Lakshmikanthpur.	i. Line antitheft charged from Subhasgram end ii. Lakshmikanthpur target date is December 2024 WBSETCL may update the present Status

Members may update.

Deliberation in the meeting

OCC advised all the constituents to update the status.

ITEM NO. B.17: ICT Constraints violating N-1 security criteria.

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

Sl. No	Name of ICT	Short Term Measures	Long term Measures	The target date for long term measures
ICT Constraint in West Bengal Network				
1	i. 400/220 kV 2 X 315 MVA ICTs at Gokarna & ii. 400/220 kV Sagardighi 1 X 315 MVA ICTs	SPS Available for Gokerno ICTs Action Required:- Load trimming scheme needs to be planned for Sagardighi	i. 3 rd ICT at Gokerno	Target Date Dec-22 WBSETCL may update the present Status
ICT Constraint in ISTS Network				
1	i. 400/220 kV Ranchi 2 X 315 MVA ICTs	SPS Available	i. 3 rd 500 MVA ICT at Ranchi	POWERGRID may update the target date
2	i. 400/132 kV 2 X 200 MVA Motihari ICT		ii. 3 rd 315 MVA ICT at Motihari	PMTL may update the target date
ICT Constraint in DVC Network				
3	i. 400/220 kV Bokaro A 2 X 315 MVA	No SPS Available Action Required:- SPS needs to be planned	iii. Upgradation with 500 MVA ICTs	DVC may update target date

Sl. No	Name of ICT	Short Term Measures	Long term Measures	The target date for long term measures
	ICTs			

Members may update.

Deliberation in the meeting

OCC advised all the constituents to update the status.

ITEM NO. B.18: Islanding Schemes in Eastern Region.

B18.1. Implementation of Islanding Schemes in Eastern Region

In the meeting held on 28th December 2020 and chaired by the Hon'ble Minister of State (IC) it was directed that islanding schemes should be implemented for all major cities of the country considering all the strategic and essential loads. Subsequently, in line with the direction given in the meeting, the subject matter was discussed in PCC meeting of ERPC and it was finalized that new islanding scheme would be implemented for capital city of Patna & Ranchi.

I. Patna Islanding Scheme:

In the special meeting held on 06.08.2021, it was decided that Patna islanding scheme would be designed considering two unit of Nabinagar STPP (2*660 MW) of NPGCL as participating generator and loads of in and around Patna city. The provision of island formation with one unit of NPGC with corresponding load is also to be included in the island logic.

The islanding frequency & logic will be finalized based on the result of dynamic study to be carried out by SLDC Bihar/ERLDC.

The following timelines were decided:

1. Submission of requisite information by SLDC, Bihar: 2nd week of Aug' 2021.
2. Completion of Islanding simulation study by ERLDC: 4th Week of Aug' 2021
3. Review of islanding study & designing of the logic: By September'2021
4. Implementation & Operationalization of the Islanding Schemes: By March'2022

In 106th PCC meeting held on 16.09.2021 it was informed that the requisite information had already been shared by SLDC Bihar and the study is under progress by ERLDC. Further SLDC Bihar was advised to prepare the DPR by September'2021 for PSDF funding, if required.

In the 44th TCC Meeting, BSPTCL updated that preparation of DPR for PSDF funding is under process and the same would be completed within 15 days.

TCC stressed on the fact that this issue is being regularly monitored by MoP and advised BSPTCL for timely implementation of the Islanding Scheme.

OCC advised BSPTCL to expedite the matter with Siemens and prepare the DPR as per the said schedule without any further delay.

In the 189th OCC Meeting, Bihar representative submitted that the tender was cancelled due to no participation of vendors.

In the 45th TCC Meeting, following was decided:

- a) A Technical Committee comprising of the members from BSPTCL, SLDC Bihar, and participating generator, Powergrid, ERLDC and ERPC may be constituted for finalizing the Islanding Scheme.
- b) CESC may also be included in the Committee for any technical expertise.
- c) The Committee may consult OEM/Vendor as and when required for any inputs.
- d) The Committee may submit its report by 15th May'2022. TCC advised the concerned constituents to give their nominations latest by 31st March'2022.

In this regard, ERPC vide letter no. ERPC/Operation/IS/2022/97 dated 18.04.2022 (**Annexure B.18.1**) constituted a Technical Committee based on the nominations received for finalizing Patna Islanding Scheme.

In the 190th OCC meeting, Committee submitted that the first meeting was convened on 19th April 2022 and the second meeting is scheduled to be held by 1st week of May 2022. The report would be submitted by 15th May 2022.

Committee may update.

Deliberation in the meeting

OCC advised the committee to submit the report to ERPC.

II. Ranchi Islanding Scheme:

In the special meeting held on 06.08.2021, it was decided that Ranchi islanding scheme would be formed with one unit of Tenughat TPS (150-160 MW average generation) & Inland IPP (50-55 MW average generation) as participating generator & essential/critical loads of Ranchi to the tune of 180 MW. The islanding frequency & logic will be finalized based on the result of dynamic study to be carried out by SLDC Jharkhand/ERLDC.

The following timelines were decided:

- 1. Submission of requisite information by SLDC, Jharkhand: 2nd week of Aug' 2021.
- 2. Completion of Islanding simulation study by ERLDC: 4th Week of Aug' 2021
- 3. Review of islanding study & designing of the logic: By September'2021
- 4. Implementation & Operationalization of the Islanding Schemes: By February'2022

In 106th PCC meeting held on 16.09.2021 it was informed that the requisite information had already been shared by SLDC Jharkhand and the study is under progress by ERLDC. Further

SLDC Jharkhand was advised to prepare the DPR by September'2021 for PSDF funding, if required.

In the 44th TCC Meeting, JUSNL updated that preparation of DPR for PSDF funding is under process and the same would be completed within 15 days.

TCC stressed on the fact that this issue is being regularly monitored by MoP and advised JUSNL for timely implementation of the Islanding Scheme.

In the 189th OCC Meeting, Jharkhand representative submitted that the tender was cancelled as only one bidder qualified among the 3 participants.

In the 45th TCC Meeting, following was decided:

- a) A Technical Committee comprising of the members from JUSNL, SLDC Jharkhand, and participating generator, Powergrid, ERLDC and ERPC may be constituted for finalizing the Islanding Scheme.
- b) CESC may also be included in the Committee for any technical expertise.
- c) The Committee may consult OEM/Vendor as and when required for any inputs.
- d) The Committee may submit its report by 15th May'2022. TCC advised the concerned constituents to give their nominations latest by 31st March'2022.

In this regard, ERPC vide letter no. ERPC/Operation/IS/2022/97 dated 18.04.2022 (**Annexure B.18.1**) constituted a Technical Committee based on the nominations received for finalizing Ranchi Islanding Scheme.

In the 190th OCC meeting, Committee submitted that the first meeting was convened on 19th April 2022 and the second meeting is scheduled to be held by 1st week of May 2022. The report would be submitted by 15th May 2022.

Committee may update.

Deliberation in the meeting

OCC advised the committee to submit the report to ERPC.

In addition to above new islanding schemes, the following schemes have already been finalized and under different stage of implementation:

III. Chandrapura Islanding Scheme:

The scheme detail in brief is as follows:

- The CTPS-B islanding scheme is to be designed with two units of CTPS-B (2x250 MW) generating station as participating generator and connected loads at CTPS, Putki, Biada, Nimiaghata & Patherdih. The estimated off-peak and peak load in the proposed islanding system is 280 MW & 420 MW respectively.
- The islanding frequency for CTPS-B islanding system was decided as 48.4 Hz.

In special meeting held on 06.08.2021, following deliberations took place:

Representative of SPE wing of DVC updated that necessary discussion for implementation of the scheme at CTPS-B is going on with M/s GE for finalization of the scope of work & other modalities. He submitted that the tender process for implementation of islanding scheme would be initiated within two weeks.

In the 44th TCC Meeting, DVC representative informed that the work order for implementation of Chandrapura Islanding Scheme would be placed by March-2022 and the same would be implemented within 6 months.

In the 185th OCC meeting, DVC representative informed that the scope of work and scheme for the islanding of CTPS unit # 7 & 8 has been prepared and the budgetary offer from M/s Siemens & M/s GE has also been collected. The scheme would be finalized within 2-3 months and subsequently the tendering process would be initiated.

OCC advised DVC to complete the work within the stipulated time period.

In the 186th OCC meeting, DVC representative informed that the project is in the process of approval and the NIT would be floated within a month.

In the 187th OCC meeting, DVC representative informed that the order placement would be done by February 2022 and the work would be completed within 6 months.

In the 188th OCC meeting, DVC representative informed that the NIT was floated on 25th January 2022 and the bid would be opened on 25th February 2022.

In the 189th OCC Meeting, DVC representative submitted that the bid opening date has been extended to 22nd March 2022.

In the 190th OCC meeting, DVC representative submitted that 3 bids were received which were opened on 18th April 2022. He further submitted that the technical evaluation is under progress and the commercial evaluation would be completed by the end of April 2022.

DVC may update.

Deliberation in the meeting

OCC advised DVC to update the status of Chandrapura Islanding Scheme to ERPC.

IV. IB-TPS Islanding Scheme:

The scheme was finalized in the special Meeting on Islanding Scheme of IB-TPS held at ERPC, Kolkata on 12th December 2018.

In special meeting held on 06.08.2021, OPGC representative informed that work order had been placed on OEM (M/s BHEL) for implementation of the Islanding scheme at IB TPS units.

OPGC was also advised to take up the issue with their highest authority as well as with the OEM for expediting the implementation of islanding scheme.

In the 44th TCC Meeting, OPGC representative informed that IB TPS Islanding Scheme would be implemented as per the given timeline i.e., April-22.

In the 184th OCC meeting, OPGC representative informed that the erection and testing work has been completed. He further submitted that the islanding scheme would be implemented after consultation with OPTCL regarding the load details (144 MW).

OCC advised OPGC to update the status of their meeting with OPTCL regarding this to ERPC and ERLDC.

In the 185th OCC meeting, OPGC representative submitted that a meeting with OPTCL has been conducted on 11.11.2021 regarding erection and commissioning of DTPC at OPGC and Tarkera ends. The work has already been started at the Tarkera end and the whole work is scheduled to be completed by the end of December 2021.

OCC advised OPGC to complete the commissioning work of DTPC coupler at the earliest.

In the 186th OCC meeting, OPTCL representative informed that the installation and commissioning work of DTPC at both Budhipadar and IB TPS end are in progress and would be completed shortly. Further, co-ordination with M/s ABB regarding the commissioning work had also been done and the work is expected to be completed by the end of January 2022.

In the 187th OCC meeting, OPTCL representative informed that installation of DTPC and cable laying at both the ends i.e., Budhipadar and IB-TPS are completed. The commissioning and testing work would be started after the arrival of ABB engineers and the whole work is expected to be completed by the end of February 2022.

In the 188th OCC meeting, OPTCL representative informed that the ABB engineers had arrived and the pre-commissioning work had started. The commissioning and testing works are expected to be completed by 2nd week of March 2022.

In the 189th OCC Meeting, OPTCL representative submitted that the ABB engineers would arrive by 27th March 2022 and the work is expected to be completed by the end of March 2022.

In the 190th OCC meeting, OPTCL representative submitted that the installation, commissioning and testing of DTPC at both Budhipadar and OPGC end was completed.

OPGC representative submitted that end to end signal testing and wiring from switchyard to relay panel had been completed. The testing would be done during shutdown or outage of the units.

OPTCL may update.

Deliberation in the meeting

OCC advised OPTCL to provide the updated status of IB-TPS Islanding Scheme to ERPC.

ITEM NO. B.19: Reliable Power Supply to Lalmatia/Godda/Dumka areas of JUSNL

B19.1. Restoration of 220kV Farraka-Lalmatia S/C line

The 220 kV Farakka-Lalmatia S/C was out of service since April 2021 due to tower collapse. The 220/132/33 kV Lalmatia substation is relying on only 132 kV lines. At present the local load at 220 kV Dumka and Godda S/S were being radially fed from 400/220 kV Maithon S/S through 220 kV Maithon-Dumka D/C and 220 kV Dumka-Godda D/C.

In 181st OCC Meeting, JUSNL representative submitted that they had got a letter from NTPC on 19th July '21 regarding anti-theft charging of the 220kV Farraka-Lalmatia S/C line at 33kV level. Earlier the anti-theft charging of the line was done at 11kV level but incidents of thefts have been reported in some portion of the conductor.

Further, Jharkhand representative requested NTPC to submit the details of the 33kV lines passing below 220kV Farakka-Lamatia T/L. He added that as per information obtained from their JUSNL Discom part, the 33kV lines are mostly connected with 11kV feeders and due to this it would be difficult to charge the Farakka-Lamatia line at 33kV level in Pakur area.

NTPC representative informed that they had charged the line up to loc no.241 but in between loc no.76-82 only the top conductor was in charged condition and the bottom rest were not; because of this theft might have happened in that portion. He further added that they had already isolated the section from loc no.76-82, whereas up to loc no.76 the line is in charged Condition and from loc no.82-241 the line needs to be charged.

ERPC advised NTPC and Jharkhand to explore the possibility of antitheft charging at 33kV level first and if that is not feasible then charging at 11kV can be assessed.

In the meeting held on 10th August 2021 by the Hon'ble Secretary, Ministry of Power, Government of India, ECL was directed to handover the FLTS assets on "as is where is basis" to

JUSNL, the Operation and Maintenance whereof as was with the NTPC is also to be transferred to the JUSNL without any further delay and latest by 20th August 2021. Further JUSNL was directed to comply with all other directions of the CERC's order dated 21.07.2020, after the transfer of the FLTS from ECL.

In the 182nd OCC meeting, JUSNL representative submitted that the tripartite agreement for

taking over of FLTS as well as O&M of FLTS is in process and the same would be done after getting the consent from the competent authority by 4th week of August'2021.

ERLDC representative advised JUSNL for putting 220kV Lamatia-Godda line into service. JUSNL representative informed that they had tried to charge the line once but due to voltage rise at Lalmatia end, they had to open the line.

OCC advised JUSNL to re-check the possibility of charging the 220kV Lamatia-Godda line for reliable power supply to Lalmatia.

ERLDC representative opined that restoration of the 10 nos. of collapsed towers may be done first on priority basis.

JUSNL representative stated that the estimate for restoration of the lines has already been approved by their BoD and Govt. of Jharkhand has been approached for fund requisition. In the meantime, the tendering process would be finalized and after getting the necessary fund approval the work order for the same would be placed.

On query, JUSNL representative ensured that the line would be restored by June'22.

In the 188th OCC meeting, JUSNL representative informed that the BOQ has been revised due to the incident of conductor theft. The tender would be placed within 15 days and the restoration work is expected to be completed in 3 months.

In the 189th OCC Meeting, JUSNL representative submitted that the tender had been floated and the due date is 21st March 2022.

In the 45th TCC Meeting, JUSNL representative informed that re-tendering work is under process and the expected timeline for restoration of the said line is July'2022.

In 190th OCC meeting, JUSNL representative submitted that the due date of tender opening is 21st April 2022.

JUSNL may update.

Deliberation in the meeting

JUSNL representative submitted that the order would be placed by 31st May'2022.

ITEM NO. B.20: Restoration of PLCC for 220 kV Chandil-STPS S/C line
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In 101st PCC meeting held on 13.04.2021, it was come to notice that both the channels of PLCC of 220 kV Chandil-Santaldih S/C line is unhealthy at Chandil end since May-2020. PCC advised JUSNL to rectify the PLCC issue at Chandil end at the earliest.

In 108th PCC meeting held on 16.11.2021, JUSNL representative informed that the PLCC rectification work could not be carried out as they are yet to receive the financial approval for the said work from their higher authority.

220 kV Chandil-STPS being an inter-state line and connected to generating station, healthiness of PLCC/line shall be ensured for overall reliability & security of the grid.

In the 185th OCC meeting, OCC expressed serious concern over the issue and advised JUSNL to update the status at the earliest.

In the 186th OCC meeting, JUSNL representative informed that the technical part of the tender has been opened and PLCC rectification work would be carried out after finalization of the tender.

In the 187th OCC meeting, JUSNL representative informed that the work order would be placed by the end of January 2022 and the work would be completed by February 2022.

In the 188th OCC meeting, JUSNL representative informed that as the price of L1 bidder was much higher than the estimation, further negotiation with the vendor was done. The work order would be placed by 1st week of March 2022.

In the 189th OCC Meeting, JUSNL representative submitted that the work order has been awarded. The PLCC rectification work would be started during the shutdown planned in the last week of March' 2022.

In the 190th OCC meeting, JUSNL representative submitted that the PLCC work was completed on 25th March 2022. Further, Carrier healthiness was also achieved in the relay panels and control panels at both the ends.

JUSNL representative further enquired about the connection of relay with PLCC at Santaldih end.

WBPDC representative was advised to update the status of the same to Jharkhand.

JUSNL may update.

Deliberation in the meeting

OCC advised JUSNL to update the status of PLCC of 220 KV Chandil STPS S/C line.

ITEM NO. B.21: Additional Agenda

1. Charging of Tenughat – PTPS line at 400 KV and terminating at PVUNL, 400 KV GIS to provide start-up power to Patratu Super Thermal Power Station (3X800 MW) – JUSNL.

Construction work of PVUNL Phase -1 (3x800 MW) is in full swing and PVUNL has repeatedly requested JUSNL to provide start-up power by July 2022 for commissioning and testing activities of Unit # 1, scheduled to start from August 2022. Start-up power for charging PVUNL 400 kV GIS was envisaged through 400 kV Patratu (PVUNL) – Patratu (JUSNL) line of length around 7.5 km. Due to delay in award of the aforementioned line it is proposed to extend start-up power by charging TVNL – PTPS line at 400 kV and diverting it to new PVUNL 400 kV GIS as an interim measure. Any further delay in providing start up power to PVUNL may adversely impact the project timeline. It is requested to examine the proposal and provide concurrence for the extension of start-up power to PVUNL by diverting TVNL – PTPS line to PVUNL and charging it at 400 kV.

Developments since last deliberations in 189th OCC meeting:

In 189th OCC Meeting held on 16.03.2022, on JUSNL agenda, Item No. B.9.1: *“Start-up power to Patratu Vidyut Utpadan Nigam Limited (PVUNL) Phase-I, 3x800 MW units”*, it was decided that a detailed study may be carried out involving all the concerned parties and beneficiaries including ERLDC before arriving at a consensus. ERPC raised the concern that the aforementioned *“interim arrangement i.e., shifting of 220 kV TVNL – PTPS line to PVUNL 400 kV GIS to provide Start-up power may pose reliability issues in power supply to Ranchi and the Ranchi City Islanding Scheme.”* (Copy of report attached at **Annexure 1**)

Subsequent to that, M/s Power Research Development Consultants Pvt. Ltd. (PRDC) has carried out the detailed system study and submitted the report *“Technical Feasibility Study for providing start up power at PVUNL 400 kV through Tenughat Patratu line presently charged at 220 kV”* (Copy of report attached at **Annexure 2**) to JUSNL on 02.04.2022, wherein PRDC suggested termination of 220 kV Hatia-PTPS line at 400/220 kV Katia Substation, Patratu to ensure reliability of power supply to Ranchi. Same has already been approved by CEA in a meeting dated 23.02.2017 (Copy of MoM attached at **Annexure 3**).

Also, during review meeting of Jharkhand Consultancy Project (JCP) on 30.03.2022 under chairmanship of Principal Secretary, Energy Department, Government of Jharkhand, GoJh, PGCIL was instructed to divert 220 kV Hatia – PTPS line to JUSNL 400/220 kV Katia Substation, Patratu from PTPS to address the issue of reliability of power supply to Ranchi (Copy of MoM attached at **Annexure 4**).

A meeting of all stakeholders, JUSNL, JBVNL, TVNL and PVUNL under Chairmanship of Principal Secretary, Energy Department, Government of Jharkhand, GoJh was held on 12.04.2022 (Copy of MoM attached at **Annexure 5**), wherein all stakeholders agreed to the aforementioned interim measure to extend start-up power to PVUNL.

Also, Clause 7.1.5 of the Joint Venture Agreement (JVA) amongst NTPC Ltd., JBVNL, GoJh, JUVNL and JUUNL provides for the following:

*“JBVNL and the confirming parties shall arrange construction power and start-up power matching with the Project Completion and Development Schedule on terms and conditions mutually agreed in writing by and between JVC and JBVNL” (Copy of JVA attached at **Annexure 6**).*

In view of the provisions of the JVA the commercial issues related to providing start-up power to PVUNL through diversion of 400 kV Tenughat line to PVUNL switchyard may be settled on mutually agreed terms between PVUNL and JBVNL.

Members may discuss.

Deliberation in the meeting

NTPC representative submitted that in the 189th OCC meeting, few concerns were raised to the proposal of terminating Tenughat – PTPS line to PVUNL 400 kV GIS for providing Start-up power at 400 kV. These concerns included meeting of power demand of Ranchi and impact on Islanding scheme of Ranchi. Apart from this, evacuation of power from generating units of Tenughat (2X210 MW) had also to be ensured.

In this regard, a load flow study was conducted by M/s PRDC considering N-1 contingencies for Ranchi with shutdown of one no. ICT of PGCIL – Namkum (3x315 MVA).

Considering the peak demand of Ranchi to be around 500 MW for FY 2022-23, it was found that if one ICT goes out there would be shortage of around 185 MW power to Ranchi.

Further, Katia sub-station of JUSNL (400/220 KV) was commissioned recently which is getting power at 400 kV from New-Ranchi_PG. As suggested by PRDC, 220 kV Katia – PTPS line may be diverted to 220 kV Katia sub-station of JUSNL to improve the reliability of power supply to Ranchi in case one ICT of Ranchi_PG, Namkum goes out.

The Katia – PTPS line is passing through PVUNL ash mound area and PGCIL had already taken up the job of diverting the line from ash mound area under Jharkhand Consultancy Project. A joint visit was carried out by PGCIL, PVUNL and JUSNL representatives and based on the reports and consent from the involved parties, PGCIL had agreed to start the work from 30th May 2022.

Extending Start-up power to PVUNL by terminating Tenughat – PTPS line at PVUNL GIS and charging the line at 400 kV, (presently charged at 220 kV) requires erection of 3 nos. 400 kV Towers at PVUNL end and 2 nos. towers at Tenughat end. The work for these towers will start after getting consent of ERPC.

The work of diversion of 220 kV Hatia – PTPS line from PTPS to Katia substation of JUSNL and modification work of Tenughat – PVUNL line for charging at 400kV would be carried out simultaneously.

Upon enquiring on how Tenughat would evacuate power after PVUNL (3x800 MW) becomes operational, it was informed that Tenughat has 220 kV Govindpur D/C lines and one 220 kV Biharshariff line for power evacuation, which complies N-1 criteria.

JUSNL representative further submitted that price bid of 400 kV Patraru-Patraru D/C Line would be opened on 23.05.2022 and the order would be placed by the end of May 2022. The work is expected to be completed within 9 months.

OCC opined that approval would be given for diversion of Tenughat – PTPS line from PTPS to PVUNL GIS and charging the line at 400 kV after shifting of existing 220 kV Hatia – PTPS line from PTPS to Katia substation of JUSNL.

PART C: ITEMS FOR UPDATE

ITEM NO. C.1: ER Grid performance during April 2022

The average and maximum consumption of Eastern Region and Max/Min Demand (MW), Energy Export for the month April-2022 were as follows:

Average Consumption (MU)	Maximum Consumption (MU)/ Date	Maximum Demand (MW) Date/Time	Minimum Demand (MW) Date/Time	Schedule Export (MU)	Actual Export (MU)
534.4	560.1 MU 16-04-2022	25621 MW, 16-04-2022 23:15 Hrs.	17510 MW, 30-04-2022 at 07:09 Hrs.	3019	2883

ERLDC may highlight the performance of the ER grid.

Deliberation in the meeting

ERLDC highlighted the performance of the ER grid.

ITEM NO. C.2: Performance of Primary Frequency Response of ER Generating Units.

Frequency response characteristics (FRC) have been analyzed pan India for one event of sudden frequency change that occurred in the month of April 2022. The details of these events and the overall response of the Eastern region have been summarized in Table below.

Event	Frequency Change	ER FRC
Event - 1 : At 15:47 Hrs of 20.04.2022 due to loss of evacuation paths at 400kV SEIL_P2, unit-1 and 2 of 660 MW capacity each at SEIL_P2 got tripped and resulted in Generation loss of 1270MW.	49.72 Hz to 49.66 Hz.	46.4 %
Event - 2 : At 10:08 Hrs,26.04.22, due to internal flashover on C-Bus R-Ph isolator rotary of 400KV HVDC-2 Bay, bus bar protection operated on 400 KV Bus 1 and Bus 2 at Padghe(MSETCL) causing black out of 400/220 KV Padghe(MSETCL)and load loss of around 2859 MW occurred in the event in the event.	49.92 Hz to 50.07 Hz.	8.9%
Event - 3 : At 11:51 Hrs Dated 29th-April-2022, As reported, 400kV Pavagada-BPS-1 tripped on LL fault and Line-2 is already under outage on fault. Due to this all the lines at Bellary Pooling station(BPS) tripped and resulted in the loss of evacuation lines for the YTPS station as 400kV Jagalur SS also went in to black out.consequently generation loss of around 1536 MW occurred at 400kV	49.82 Hz to 49.74Hz.	25.5 %

Members may note.

Deliberation in the meeting

Members noted.

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

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

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

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

187th OCC advised all the utilities to update the status of project to the ERPC Secretariat.

In the 190th meeting, OCC advised all the utilities to update the status of PSDF projects if any to ERPC Secretariat at the earliest.

Respective utilities may update.

Deliberation in the meeting

OCC advised all the utilities to update the status of PSDF projects if any to ERPC Secretariat at the earliest.

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

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

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

AGC and they are awaiting the concurrence from SLDC.

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

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

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

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

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

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

OPGC representative was not present during the discussion.

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

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

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

OPGC representative was not present during the discussion.

In the 190th OCC meeting, DVC representative submitted that NIT would be re-floated due to some issues in the payment terms.

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

DVC and Odisha may update.

Deliberation in the meeting

OCC advised DVC and Odisha to update the status of AGC implementation to ERPC at the earliest.

ITEM NO. C.5: Primary Frequency Response Testing of ISGS Generating Units

In the 180th OCC meeting, ERLDC representative informed that as per communication received from GMR and JITPL PFR testing has been scheduled by Siemens in August'21.

MPL representative submitted that they would carry out the PFR testing in the month of July'21.

In the 181st OCC meeting, ERLDC representative informed that PFR testing of MPL got postponed due to some technical issue. He further informed that PFR testing is going on in

APNRL and that of NPGC and BRBCL is scheduled in the last week of July'21 and 1st week of August'21 respectively.

In the 182nd OCC meeting, ERLDC representative submitted that During July – August 2021, PFR testing has been conducted at the following generating units:

1. Adhunik TPS Unit 1 & 2
2. BRBCL TPS Unit 2 & 3
3. Nabinagar STPS Unit 1
4. Kahalgaon STPS Unit 1

In the 183rd OCC meeting, ERLDC representative updated that PFR testing for Unit# 1 & 2 of GMR had been completed.

In the 185th OCC meeting, ERLDC representative informed that PFR testing of Dikchu is being carried out.

In the 187th OCC Meeting, OCC advised all the members to provide the updated status of PFR testing, if any, to ERPC and ERLDC.

In the 188th OCC meeting, ERLDC representative informed that updated status of PFR testing was received from MPL.

OCC advised all the members to provide the updated status of PFR testing, if any, to ERPC and ERLDC.

The updated status is enclosed at **Annexure-C.5**.

In the 190th OCC meeting, OCC advised all the members to update the status of PFR testing to ERPC and ERLDC.

Members may update.

Deliberation in the meeting

OCC advised all the members to update the status of PFR testing to ERPC and ERLDC.

ITEM NO. C.6: Testing of Primary Frequency Response of State Generating units by third party agency.

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

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

Sl. No.	Name of the Units	Capacity (MW)
1	BTPS-A	500
2	CTPS Unit #7&8	2X250

3	DSTPS Unit#1&2	2X500
4	KTPS Unit # 1&2	2X500
5	MTPS Unit # 3 to 8	2 X 210 +2 X 250 + 2X 500
6	RTPS Unit # 1 & 2	2 X 600

In the 185th OCC meeting, OHPC representative informed that testing of Primary Frequency Response of all the units of Rengali and Indravati will be done by the end of December 2021.

WBPDC representative informed that they will place the order in the month of December 2021.

In the 186th OCC Meeting, OHPC representative informed that the testing of Primary Frequency Response of all the units of Rengali and Indravati would be done by the 2nd week of January 2022.

DVC representative informed that the bid opening had been done on 22nd December 2021.

In the 187th OCC meeting, OHPC and DVC representatives were not present during the discussion.

In the 188th OCC meeting, It was informed that PFR testing of all the 3 units of Budge-Budge are scheduled from 26th Feb 2022 to 3rd March 2022.

OHPC representative submitted that PFR testing of all the units of Rengali (5 units) and Indravati (4 units) would be carried out by M/s Solvina from 20th March 2022 onwards.

DVC representative informed that the work order for PFR testing has been placed.

In the 190th OCC meeting, OCC advised all the state generating units to update the status of PFR testing to ERPC and ERLDC at the earliest.

Generating units may update.

Deliberation in the meeting

OCC advised all the state generating units to update the status of PFR testing to ERPC and ERLDC at the earliest.

ITEM NO. C.7: PSS tuning of Generators in Eastern Region

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

In the 186th OCC Meeting, Teesta –V representative informed that the PSS tuning would be conducted in the last week of January 2022.

It was informed in the OCC that PSS tuning of Rongnichu and Chuzachen had been completed.

DVC representative informed that PSS tuning of RTPS unit-1 & 2 would be done in the month of March 2022.

BRBCL representative informed that PSS tuning of BRBCL unit-1 has also been completed.

In the 187th OCC meeting, OCC advised ERLDC to send the updated status of PSS tuning to ERPC.

The updated schedule for PSS tuning of the units is attached at **Annexure-C.7**.

In the 190th OCC meeting, OCC advised all the generators to update the status of PSS tuning to ERPC and ERLDC.

Generators may update.

Deliberation in the meeting

OCC advised all the generators to update the status of PSS tuning to ERPC and ERLDC.

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

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

Members may update.

Deliberation in the meeting

Members updated.

ITEM NO. C.9: Status of Islanding Schemes healthiness installed in Eastern Region.

As per the decision taken in the meeting held on 8th July 2021 and chaired by member (GO&D), CEA, data in prescribed formats may be submitted by concerned utilities to RPCs on monthly basis to certify the healthiness of the Islanding Schemes.

a. Format - I for RLDC/SLDCs

S.NO	Name of Islanding Scheme	Healthiness of Communication channel

b. Format - II for Generating Station

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

c. Format - III for Transmission Utility/DISCOMs

	Name of Islandin	Elements considere d for	For communication- based tripping logic	For UFR based tripping logic of feeders

S.NO	g Scheme	tripping to from Island	Of feeders		
			Healthiness of Communication channel	Healthiness of PT Fuse and status of DC supply to UFR relay*	Healthiness of Relay#

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

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

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

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

S.NO	Description	UFRs-for load relief (A)	df/dt -for load relief (B)	Relay for Island creation(C)
1	Relay location (S/s name)			
2	Relay make & model			
3	Frequency setting of the relay (at which load shedding is envisaged)			
4	Feeder name (voltage level and source-destination name) signaled by the Islanding Relay for separation /load shedding/separation from outside grid			
5	Quantum of load relief due to tripping of feeder (as per state's peak of previous year)			
6	Quantum of load (Min, Avg, Max in MW) on the feeder (as per state's peak of previous year)			

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

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

It was deliberated in the 186th OCC meeting that except West Bengal all the entities are sending the report as per the new format.

In the 187th OCC meeting, it was informed that except for West Bengal all entities are sending the report as per the new format.

Members may update.

Deliberation in the meeting

OCC advised all the entities to send the report as per the prescribed format.

ITEM NO. C.10: Latest Status of States ATC/TTC declared by States for the month of June-2022.

To harmonize the ATC/TTC calculation methodology and timeline One to one meeting and hands on training with each SLDC was conducted in the month of Sep-21 and Oct-21. As per the common agreed procedure and timeline ATC/TTC calculation in three months advance and reconciliation of the TTC/ATC figure for the upcoming month between RLDC and SLDC has started from month Dec-21. Reconciled ATC/TTC figures for **June-2022** are as follows:

Sl No	State/Utility	TTC (MW)		RM(MW)		ATC Import (MW)		Remark
		Import	Export	Import	Export	Import	Export	
1	BSPTCL	6876	--	8	--	6738	--	June-22
2	JUSNL	1711	--	53	--	1658	--	June-22
3	DVC	1898	3667	66	52	1832	3615	June-22
4	OPTCL	3258	1126	126	98	3235	1164	June-22
5	WBSETCL	5732	--	450	--	5282	--	June-22
6	Sikkim	170	--	2.18	--	167.82	--	May-22

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

State	Bihar	Jharkhand	DVC	Odisha	West Bengal	Sikkim
Month						
June-22	Submitted	Submitted	Submitted	Submitted	Submitted	Pending
July-22	Submitted	Submitted	Submitted	Submitted	Submitted	Pending
Aug-22	Pending	Pending	Pending	Pending	Submitted	Pending
Sep-22	Pending	Pending	Pending	Pending	Pending	Pending

Declaration of TTC/ATC on SLDC Website:

Sl No	SLDC	Declared on Website	Website Link	Constraint Available on Website	Type of Website Link
1	BSPTCL	Yes	http://www.bsptcl.in/ViewATCTTCWeb.aspx?GL=12&PL=10	Yes	Static Link-

					Table
2	JUSNL	Yes	http://www.jusnl.in/pdf/download/ttc_atc_nov_2020.pdf	Yes	Static link – pdf file
3	DVC	Yes	https://application.dvc.gov.in/CLD/atcttcmenu.jsp#	Yes	Static Link-Word file
4	OPTCL	Yes	https://www.sldcorissa.org.in/TTC_ATC.aspx	Yes	Static Link-pdf file
5	WBSETCL	Yes	http://www.wbslde.in/atc-ttc	No (Not updating)	Static Link-Table
6	Sikkim	No	https://power.sikkim.gov.in/atc-and-ttc	No (Not updating)	Static Link-Excel file

All the states having net export schedule should declare their export TTC. In view of the same West Bengal is once again requested to share export TTC.

It is observed that from Bihar, DVC and Sikkim submission of ATC/TTC and base case are not regular. All the states are once again requested to share ATC/TTC in timely manner.

Deliberation in the meeting

OCC advised all the states to share the ATC/TTC figures in timely manner.

ITEM NO. C.11: Mock Black start exercises in Eastern Region

Mock black start date for financial year is as follows:

Sl. No	Name of Hydro Station	Schedule	Tentative Date	Schedule	Tentative Date
		Test-I		Test-II	
1	U. Kolab	Last week of Oct 2021		Second Week of Feb 2022	
2	Balimela	Second week of Nov 2021		First Week of March 2022	
3	Rengali	Second week of Nov 2021		First 2week of March 2022	
4	Burla	Second week of Nov 2021		First Week of March 2022	
5	U. Indravati	Last week of Oct 2021		Second Week of Feb 2022	
6	Maithon	Third Week of Nov 2021		First Week of March 2022	

7	TLDP-III	Second week of Nov 2021		Second Week of Feb 2022	
8	TLDP-IV	Third Week of Nov 2021		First Week of March 2022	
9	Subarnarekha	Second week of Nov 2021		Second Week of Feb 2022	
10	Teesta-V	Third Week of Nov 2020		Third Week of March 2022	
11	Chuzachen	Done on 9 th April'21		First Week of March 2022	
12	Teesta-III	Third Week of Nov 2021		First Week of March 2022	
13	Jorethang	Third Week of Nov 2021		First Week of March 2022	
14	Tasheding	Second week of Nov 2021		First Week of March 2022	
15	Dikchu	Second week of Nov 2021		Second Week of Feb 2022	

SLDC, Odisha representative informed that they would go for Mock Black Start of Balimela in the 2nd week of August '21.

In the 182nd OCC meeting, OHPC representative submitted that Mock Black Start had been done for Rengali on 18th August'21 and they would go for Mock Black Start of Balimela in Sept'21.

OCC advised the concerned utilities to give prior intimation to ERLDC and ERPC regarding Mock Black Start.

In the 183rd OCC meeting, SLDC Odisha representative informed that mock black start for Balimela has been scheduled in Nov-21.

Teesta III HEP representative submitted that mock black would be carried out for their plant in Nov'21 as per the schedule.

In the 185th OCC meeting, SLDC Odisha representative was not present in the discussion.

JUSNL vide letter dated 25.11.2021 informed that the Mock Black Start exercise at Subarnarekha

Hydel Power, Sikidiri is scheduled on 03.12.2021 (Friday) from 11:00 hrs. to 13:00 hrs.

In the 186th OCC meeting, ERLDC representative informed that Mock Black Start of unit-7 of Burla and TLDP unit-4 were successfully completed on 15th & 16th December 2021 respectively.

Teesta-III representative informed that Mock Black Start would be done after completion of LILO work of Teesta-III Kishanganj.

Jharkhand representative informed that Mock Black Start at Subarnarekha was completed on 3rd December 2021.

Odisha representative informed that the Mock Black Start of Balimela is planned in the 2nd week

of January 2022.

In the 187th OCC meeting, ERLDC representative informed that the mock black start of Teesta-V would be conducted shortly.

In the 188th OCC meeting, SLDC Odisha representative informed that Black Start of Burla has been completed and Black Start of Balimela is scheduled in the month of March 2022.

Teesta-III representative informed that Black Start testing would be conducted after the Committee Report on Teesta-V incident.

Members may update.

Deliberation in the meeting

OCC advised all the utilities to update the status of mock black start exercises if any to ERPC and ERLDC.

ITEM NO. C.12: Status update on transmission constraint from the respective state.

In the meeting Chaired by Joint Secretary (OM & RR) dated 12.01.2022, transmission constraints for drawl of power by states were discussed.

In line with same it is required to update on approved plan, prospective schedule of the project completion and reasons for delay in commissioning if any. List of the lines is given in **Annexure-C.12**.

187th OCC advised all the concerned utilities to update the status of their approved plan and prospective schedule.

In the 188th OCC meeting, It was informed that comments are still awaited from all the constituents.

Members may update.

Deliberation in the meeting

OCC advised all the constituents to review the annexure thoroughly and update the status of their approved plan and prospective schedule.

PART D: OPERATIONAL PLANNING

ITEM NO. D.1: Anticipated power supply position during June 2022

The abstract of peak demand (MW) vis-à-vis availability and energy requirement vis-à-vis availability (MU) for the month of June 2022 provided at **Annexure D.1** were prepared by ERPC Secretariat on the basis of LGBR for 2022-23 and feedback of constituents, keeping in view that the units are available for generation and expected load growth etc.

Members may update.

Deliberation in the meeting

*The updated anticipated power supply position of June 2022 is provided at **Annexure D.1**.*

ITEM NO. D.2: Shutdown proposal of generating units for the month of June 2022

Generator unit shutdown schedule for June' 2022 is given in the table:

Proposed Maintenance Schedule of Thermal Generating Units of ER in the month of June' 2022								
System	Station	Unit No.	Capacity (MW)	Period (as per LGBR 2022-23)		No. of Days	Reason	Remarks
				From	To			
WBPDC	Kolaghat TPS	4	210	04.06.2022	13.06.2022	10	PG Test	
	Bakraeshwar TPS	5	210	18.06.2022	17.07.2022	30	COH	
	Bakraeshwar TPS	2	210	20.06.2022	29.06.2022	10	PG Test	
DVC	Mejia TPS	1	210	15.06.2022	04.08.2022	51	COH -Blr, Turb- RLA, Gen, FGD, C&I upgradation	
NTPC	New Nabinagar (NPGCL)	3	660	26.06.2022	30.06.2022	5	Boiler License Renewal	

Additional:

- **GMR Kamalanga Energy** Limited vide Letter dated 04.04.2022 has intimated that Capital Overhauling of Unit-1 (350 MW) will be conducted from **15.06.2022 to 24.07.2022 (40 Days)**. However, as per the LGBR 2022-23, the maintenance of said unit is scheduled from 01.11.2022 to 15.12.2022 (45 Days).

Members may update.

Deliberation in the meeting

*The approved shutdown schedule of generating units for the month of June 2022 is provided at **Annexure D.2**.*

ITEM NO. D.3: Major Generating Units/Transmission Element outages/shutdown in ER Grid (as on 09.05.2022)

a) Thermal Generating Stations outage report:

SL No	STATION	STATE	AGENCY	UNIT NO	CAPACITY (MW)	REASON(S)	OUTAGE DATE
1	BARAUNI TPS	BIHAR	NTPC	7	110	Excessive chemical deposits on Turbine blades and diaphragms over time	19-Feb-2022
2	FARAKKA STPP	WEST BENGAL	NTPC	5	500	Bottom Ash Buildup	17-Mar-2022
3	KAHALGAON STPP	BIHAR	NTPC	4	210	Leakage in Generator Hydrogen cooling system	12-May-2022
4	KOLAGHAT	WEST BENGAL	WBPDC L	5	210	Poor coal stock	17-Apr-2022
5	DARLIPALI	ODISHA	NTPC	1	800	Initially Furnace pressure was low. Later on vibration found in Low Pressure turbine (Damage found in LP turbine)	23-Apr-2022
6	WARIA TPS	DVC	DVC	4	210	Induced Draft (ID) Fan vibration high	30-Apr-2022
7	CHANDRAPURA TPS	DVC	DVC	8	250	Stator Earth Fault	06-May-2022

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

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

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

S.NO	STATION	STATE	AGENCY	UNIT NO	CAPACITY (MW)	REASON(S)	OUTAGE DATE
1	NIL						

b) Hydro Unit Outage Report:

S. NO	STATION	STATE	AGENCY	UNIT NO	CAPACITY (MW)	REASON(S)	OUTAGE DATE
1	BALIMELA HPS	ODISHA	OHPC	4	60	SPARKING AT PMG	04-Apr - 2022
2	RENGALI HPS	ODISHA	OHPC	3	50	Bearing problem	26-Nov-2021

It is seen that about 110 MW hydro capacities in Odisha is under forced outage / planned outage and therefore not available for providing the much-needed peaking support during evening peak.

SLDC / OHPC may please indicate restoration plan of the units.

d) Long outage report of transmission lines:

SL. NO	TRANSMISSION ELEMENT / ICT	AGENCY	OUTAGE DATE	REASONS FOR OUTAGE
1	400 KV IBEUL JHARSUGUDA D/C	IBEUL	29.04.2018	TOWER COLLAPSE AT LOC 44,45
2	220/132 KV 100 MVA ICT 2 AT LALMATIA	FSTPP/JUSNL	22.01.2019	FAILURE OF HV SIDE BREAKER
3	220 KV PANDIABILI - SAMANGARA D/C	OPTCL	03.05.2019	49 NOS OF TOWER COLLAPSED.AS REPORTED BY SLDC OPTCL, TOTAL 60 NOS OF TOWER IN BETWEEN 220KV PANDIABILI – SAMANGARA LINE IN WHICH 48 NOS TOWERS FULLY DAMAGED AND 12 NOS TOWERS PARTIALLY DAMAGED. WORK UNDER PROGRESS. PRESENTLY CHARGED FROM PANDIABILLI END (LOC 156) TO LOC 58
4	220KV BARAUNI-HAJIPUR CKT-1	BSPTCL	28.09.2019	TOWER COLLAPSE AT LOCATION 38 & 39. CKT-2 IS ON ERS SINCE 13.01.2020.
5	220/132 KV 100 MVA ICT 3 AT CHANDIL	JUSNL	30.04.2020	ICT BURST AND DAMAGED AFTER FIRE REPORTED
6	400KV/220KV 315 MVA ICT 2 AT MEERAMUNDALI	OPTCL	21.02.2021	FIRE HAZARD
7	400KV/220KV 315 MVA ICT 4 AT JEERAT	WBSETCL	09.04.2021	VERBALLY CONFIRMED BY WB THAT NEW TRANSFORMER PROCUREMENT UNDER PIPELINE AND SHALL BE REPLACED IN THE NEAR FUTURE.
8	220KV-FSTPP-LALMATIA	JUSNL	21.04.2021	THREE TOWER COLLAPSED NEAR LALMATIA
9	400KV MAIN BUS - 2 AT DIKCHU	DIKCHU	05.05.2021	Repeated spurious Busbar protection operation
10	400KV-BINAGURI-TALA-1	BHUTAN	12.11.2021	FLASHOVER IN XLPE OUTDOOR CABLE TERMINATION AT TALA.

11	400KV-BINAGURI-TALA-2	BHUTAN	17.03.2022	FIRE ON THE GIS TERMINATION OF THE B-PHASE AT TALA END.
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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)

Note: As per information received from Tala, 400KV-Binaguri-Tala-1 And 2 will be restored in mid June. In view of the onset of monsoon the non-availability of these lines will be a matter of concern hampering the evacuation of Bhutan.

Members may update.

Deliberation in the meeting

Members noted.

ITEM NO. D.4: Commissioning of new units and transmission elements in Eastern Grid in the month of April-2022

The details of new units/transmission elements commissioned in the month of April-2022 based on the inputs received from beneficiaries:

NEW ELEMENTS COMMISSIONED DURING APRIL, 2022							
GENERATING UNITS							
SL. NO.	Location	OWNER/UNIT NAME	Unit No/Source	Capacity added (MW)	Total /Inst alled Capacity (MW)	DATE	Remarks
NIL							
ICTs/ GTs / STs							
SL. NO.	Agency/ Owner	Sub-Station	ICT NO	Voltage Level (kV)	Capacity (MVA)	Date	Remarks
1	PGCIL	FARAKKA(NTPC)	2	400/220	315	21-Apr-22	First Time Charged at 18:32 hours from 400 kV Side and 220 kV side charged on 23-Apr-2022 at 13:24 hours.
2	PGCIL	MUZAFFARPUR	4	400/220	500	5-Apr-22	First Time Charged at 17:52 hours from 400 kV Side and 220 kV side charged on 06-Apr-2022 at 19:26 hours.
3	BGCL/PGCIL	JAKKANPUR	1	400/220	500	20-Apr-22	First Time Charged at 18:40 hours.

TRANSMISSION LINES						
SL. NO.	Agency/ Owner	LINE NAME	Length (KM)	Conductor Type	DATE	Remarks
1	BSPTCL	220KV-SAHARSA(PMTL)- KHAGARIA(NEW)-2	73.000	ACSR Zebr a	11-Apr- 22	First time charged at 18:15 hours
2	BGCL/P GCIL	220KV-ARRAH (PG)- NAUBATPUR(BH)-2	43.085	ACSR Zebr a	28-Apr- 22	First time charged at 15:04 hours;36.702 km is with PGCIL ownership and 6.383 km is with BGCL ownership
LILO/RE-ARRANGEMENT OF TRANSMISSION LINES						
SL. NO.	Agency /Owne r	Line Name/LILO at	Length (KM)	Con duct or Type	DATE	Remarks
1	BGCL/P GCIL	LILO of 400 KV PATNA- NABINAGAR(NPGC)-1 AT JAKKANPUR(BGCL) (400KV-JAKKANPUR(BH)-PATNA- 1)	138.145	QUA D Moo se	20-Apr- 22	129.926 km section belong to PGCIL and Loop In Section belongs to BGCL 8.219 km
2	BGCL/P GCIL	LILO of 400 KV PATNA- NABINAGAR(NPGC)-1 AT JAKKANPUR(BGCL) (400KV-NABINAGAR(NPGC)- JAKKANPUR(BH)-1)	18.548	QUA D Moo se	21-Apr- 22	10.404 km section belong to PGCIL and Loop Out Section belongs to BGCL 8.144 km
3	BGCL/P GCIL	LILO of 400 KV PATNA- NABINAGAR(NPGC)-2 AT JAKKANPUR(BGCL) (400KV-JAKKANPUR(BH)-PATNA- 2)	138.145	QUA D Moo se	21-Apr- 22	129.926 km section belong to PGCIL and Loop In Section belongs to BGCL 8.219 km
4	BGCL/P GCIL	LILO of 400 KV PATNA- NABINAGAR(NPGC)-2 AT JAKKANPUR(BGCL) (400KV-NABINAGAR(NPGC)- JAKKANPUR(BH)-2)	18.548	QUA D Moo se	21-Apr- 22	10.404 km section belong to PGCIL and Loop Out Section belongs to BGCL 8.144 km
5	ATL/ PGCIL	LILO of 400 KV KISHANGANJ- DARBHANGA(DMTCL)-1 AT SAHARSA(PMTL) (400KV-SAHARSA-DARBHANGA (DMTCL)-1)	86.684	QUA D Moo se	22-Apr- 22	Line Ownership (0-20.719km:PG), (20.719-86.684km:ATL.)
6	ATL/ PGCIL	LILO of 400 KV KISHANGANJ- DARBHANGA(DMTCL)-1 AT SAHARSA(PMTL) (400KV-SAHARSA-KISHANGANJ-3)	158.677	QUA D Moo se	26-Apr- 22	Line Ownership (0-140.473KM(ATL)), (140.473-158.677KM: PG).
7	ATL/ PGCIL	LILO of 400 KV KISHANGANJ- DARBHANGA(DMTCL)-2 AT SAHARSA(PMTL) (400KV-SAHARSA-DARBHANGA (DMTCL)-2)	86.684	QUA D Moo se	22-Apr- 22	Line Ownership (0-20.719km:PG), (20.719-86.684km:ATL.)
8	ATL/ PGCIL	LILO of 400 KV KISHANGANJ- DARBHANGA(DMTCL)-2 AT SAHARSA(PMTL) (400KV-SAHARSA-KISHANGANJ-4)	158.677	QUA D Moo se	26-Apr- 22	Line Ownership (0-140.473KM(ATL)), (140.473-158.677KM: PG).
9	PGCIL	220KV-RANGPO-NEW MELLI-2	25.800	HTLS	7-Apr- 22	First Time charged at 14:56 hours.
BUS/LINE REACTORS						

SL. NO.	Agency /Owner	Element Name	SUB-STATION	Voltage Level (kV)	DATE	Remarks
NIL						
HVDC /AC Filter bank / FACTS DEVICE associated System						
SL. NO.	Agency /Owner	Element Name	SUB-STATION	Voltage Level (kV)	DATE	Remarks
NIL						

Members may update.

Deliberation in the meeting

Members noted.

ITEM NO. D.5: UFR operation during the month of April 2022.

Frequency profile for the month as follows:

Month	Max	Min	Less IEGC Band (%)	Within IEGC Band (%)	More IEGC Band (%)
	(Date/Time)	(Date/Time)			
April, 2022	50.26 Hz on 14.04.2022 at 18:02 Hrs.	49.43 Hz on 19.04.2022 at 14:09 Hrs.	31.98	59.24	08.78

Hence, no report of operation of UFR has been received from any of the constituents. However, in view of low frequency operation and high demand scenario all the constituents are requested to keep the UFR in healthy condition.

Members may note.

Deliberation in the meeting

Members noted.



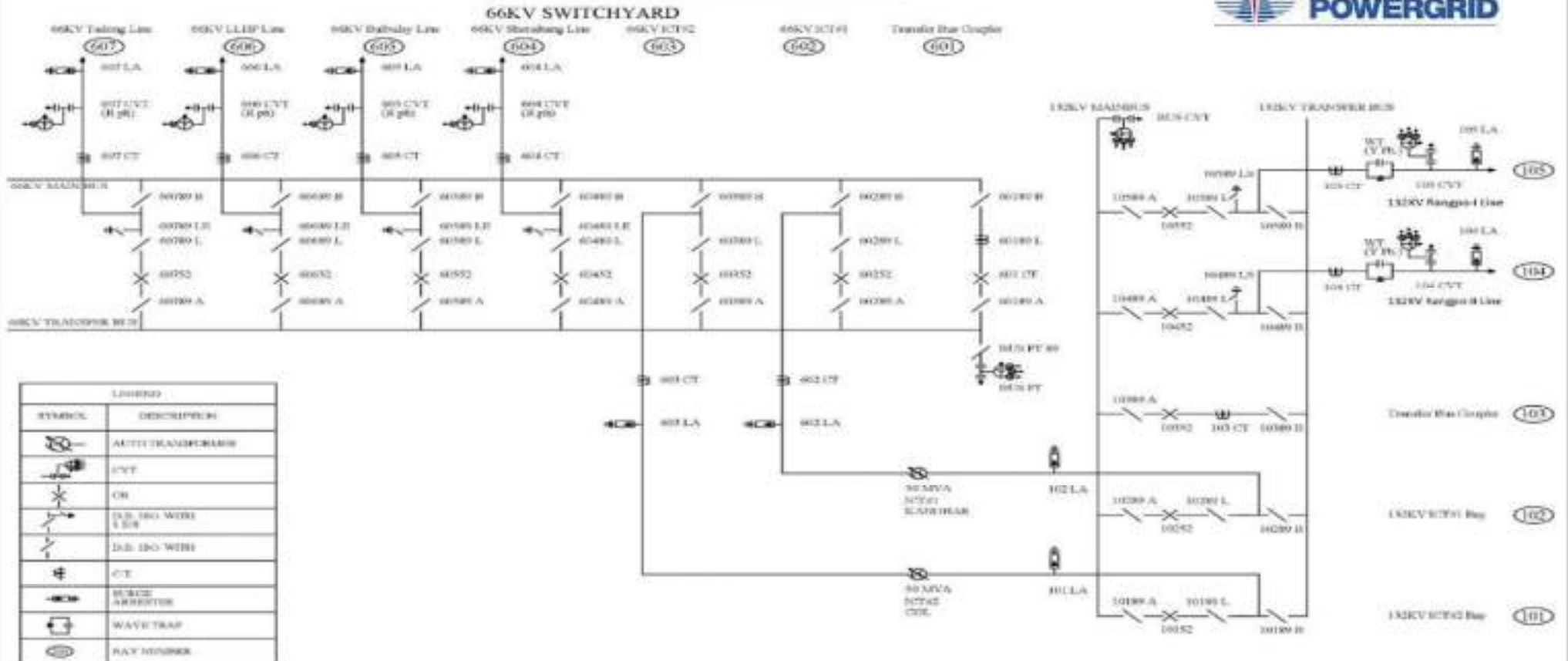
ICT Details Of Gangtok 132/66 KV SS

Equipment	Make	Voltage Rating	MVA RATING	STATUS
50 MVA ICT-I	KANOHAR	132/66 KV	50 MVA	IN SERVICE
50 MVA ICT-II	CGL	132/66 KV	50 MVA	IN SERVICE
SAPRE 50 MVA ICT	KANOHAR	132/66 KV	50 MVA	AS SPARE

Single Line Diagram of the Station

POWERGRID CORPORATION OF INDIA LTD.

132/66KV GANGTOK SUBSTATION



ICT POWER FLOW DATA SHEET DURING PEAK WINTER SEASON

Date	ICT – I ; Peak Laod	ICT-II ; Peak Load	Remarks
27.01.2022	44 MW	45 MW	Almost 90 % Loading during peak load
28.01.2022	43 MW	44 MW	Almost 90 % Loading during peak load
29.01.2022	44 MW	45 MW	Almost 90 % Loading during peak load
30.01.2022	42 MW	432 MW	Almost 90 % Loading during peak load
31.01.2022	44 MW	45 MW	Almost 90 % Loading during peak load

Observation -: For Future LOAD Catering requirements and considering the importance of Gangtok and other urban critical load centers SPARE 50 MVA Transformer needs to be charged at the earliest.

132KV TBC BAY

Adjacent vacant space

Current POSITION OF SPARE TRANSFORMER ON ITS FOUNDATION

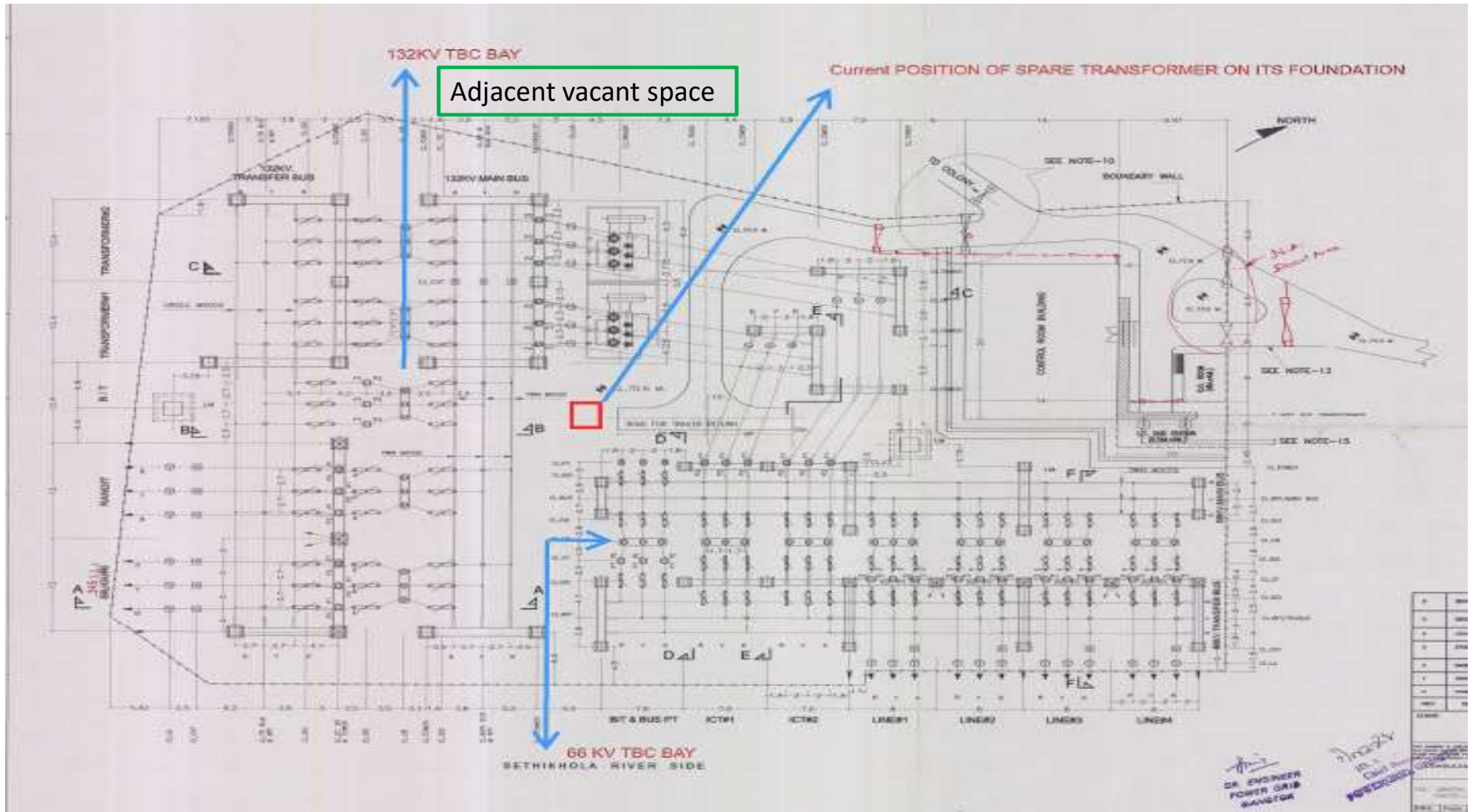
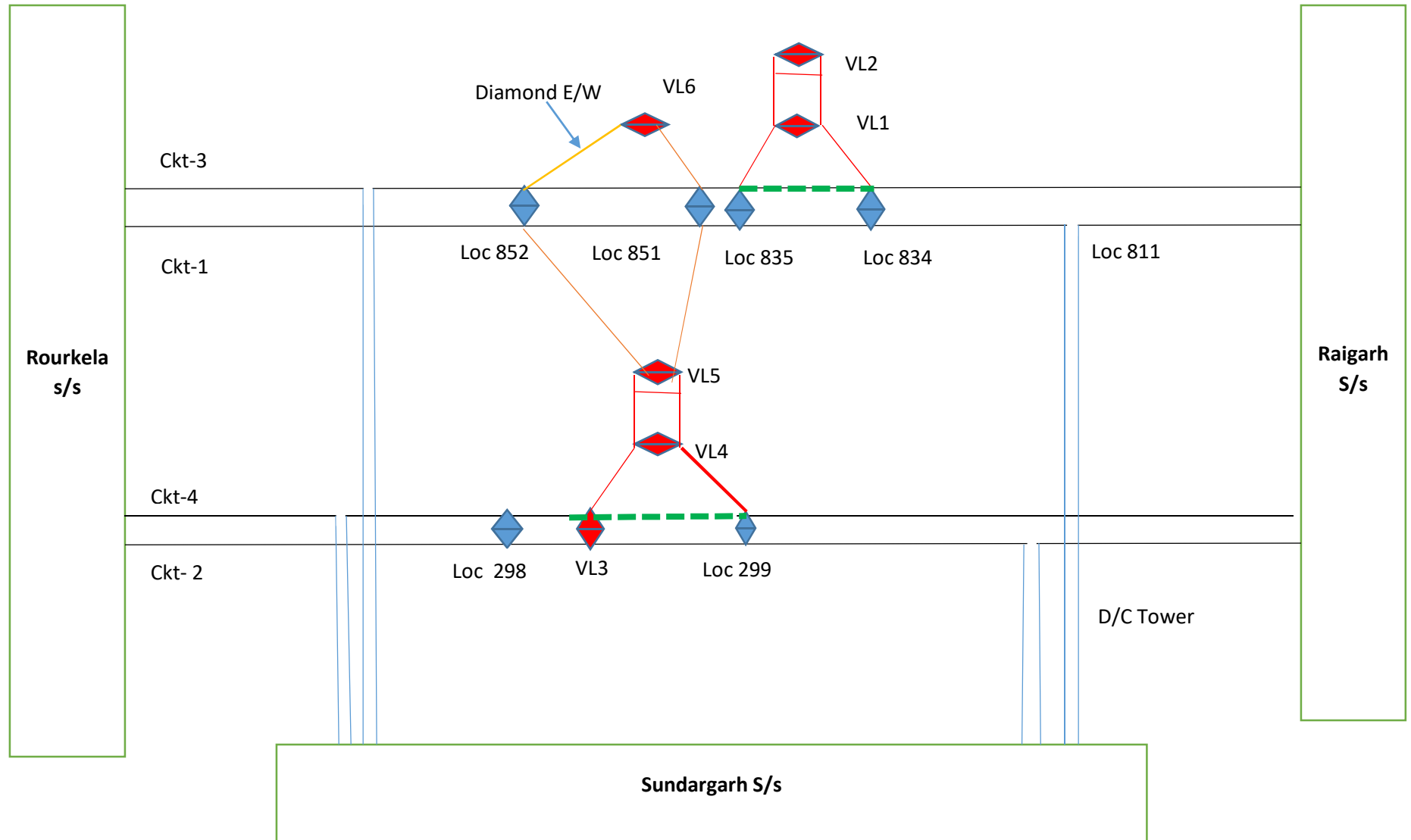


DIAGRAM FOR REMOVAL OF VEDANTA TOWER FROM RAIGARH Ckt#1 &3 and & Ckt# 2& 44 AND MAKING DIRECT LINK



Input Data

Sl.No	Description	Unit	Qty	Remarks
	400kV SnG-RGH-1&3			
1	834-835	Mtr	400	
2	834-VL1	Mtr	250	
3	835-VL1	Mtr	250	
4	VL1-VL2	Mtr	350	
	400kV SnG-RGH-1&3			
1	298-299	Mtr	390	
2	298-VL3	Mtr	220	
3	299-VL4	Mtr	110	
4	VL3-VL4	Mtr	93	
5	VL4-VL5	Mtr	94	
6	VL5-VL6	Mtr	180	
7	851-852	Mtr	400	
8	VL5-851	Mtr	250	
9	VL5-852	Mtr	250	
10	VL6-851	Mtr	250	
11	VL6-851	Mtr	250	

Type of Tower: VL1 -DD+0, VL2-DD+0, VL3-DD+0, VL4- DD+12, VL5-DD+30



पश्चिमबङ्ग पश्चिम बंगाल WEST BENGAL

G 262684

**Connection Agreement
Between
Power Grid Corporation of India Limited
&
Sterlite Energy Limited**

THIS AGREEMENT is made on the Twenty Second Day of December Two Thousand and Ten.

BETWEEN

Power Grid Corporation of India Limited, a Company incorporated under the Companies Act, 1956 having its registered office at B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi - 110016 (hereinafter called the "CTU") which expression shall unless repugnant to the context or meaning thereof be deemed to mean and include its successors or permitted assigns and for the purposes of this Connection Agreement the CTU shall act through its Executive Director, Eastern Region-II Head Quarter having address at J-1-15, Block - EP, Sector - V, Salt Lake City, Kolkata - 700091;

AND



R. P. Singh
रवि प्रकाश सिंह Ravi P. Singh
कार्यकारी निदेशक, पूर्वी क्षेत्र-II/Executive Director, ER-II
पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
POWER GRID CORPORATION OF INDIA LIMITED
J-1-15, ब्लॉक-EP, सेक्टर-V, सोल्ट लैक सिटी, कोलकाता-700 091
J-1-15, Block-EP, Sector-V, Salt Lake City, Kolkata-700 091

Sterlite Energy Limited, a Company registered under the Companies Act, 1956, having registered office at **SIPCOT Industrial Complex, Maduria Bye Pass Road, T V Puram, P.O. Tuticorin, Tamilnadu 628 002**, hereinafter called as the "Applicant" or "SEL", which expression shall unless repugnant to the context or meaning thereof be deemed to mean and include its successors or permitted assigns, through its Senior Vice President(Power)

"CTU" and the "Applicant" or "SEL" are hereinafter collectively referred to as "Parties" and individually as "Party".

WHEREAS,

The Applicant has applied to the CTU vide their letter no. SEL/PGCIL/con-4/01 dated 28.09.2010 for connection of its **Sterlite Energy Limited Thermal Power Plant** with the CTU's Transmission System and use of the CTU's Transmission System to transmit electricity to and /or from the Inter-State Transmission System.

AND WHEREAS,

The CTU has agreed to connect to the M/s Sterlite Energy Limited Thermal Power Plant at the Connection Point i.e. 400 kV switchyard located at M/s Sterlite Energy Limited, Thermal Power Plant, Jharsuguda with the

- (i) 400/220 kV Rourkela Substation and Raigarh Substation using the Transmission and Communication System of the CTU namely 400 kV D/C Rourkela (PG)- Raigarh (PG) - 210 km with LOOP-IN-LOOP-OUT Connectivity at M/s SEL Switchyard having 25 KM Transmission Line (under the scope of M/s Sterlite Energy Limited) as Interim Arrangement; and
- (ii) S/Y of M/s Sterlite Energy Limited to Jharsuguda Pool 400 kV D/C with associated line bays (under the scope of M/s Sterlite Energy Limited) and LILO of Rourkela - Raigarh 400 kV D/C Line (existing line) at Jharsuguda pool (utilizing the LILO portion of the interim arrangement) (under the scope of POWERGRID) as Final Arrangement

to transmit electricity as well as real time data to and/or from the CTU's Transmission and Communication System

AND WHEREAS,



R. P. Singh
रवि प्रकाश सिंह / Ravi P. Singh
सह-प्रबन्धक निदेशक, पूर्वी क्षेत्र-II/Executive Director, ER-II
पावर ग्रीड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
POWER GRID CORPORATION OF INDIA LIMITED
3-4-12, एडिओ-एन, सेक्टर-4, चंडीगढ़-160 002, तेलुगु-700 001
3-4-12, एडिओ-एन, सेक्टर-4, राई बेलर सिटी, कोलकाता-700 001

The Parties have therefore agreed to enter into this Connection Agreement to record the terms and conditions upon which the Parties will carry out their respective Connection Works, in addition to the estimated cost of works required to be carried out by the CTU related to the interconnection, in accordance with the Connection Agreement.

The parties shall separately take up modalities for implementation of the works on mutually agreed terms and conditions. The scope of works, time schedule for completion of works, including the timelines for the various milestones to be reached for completion of works, shall form an Appendix to this agreement, and shall form the basis for evaluating if the works by the parties are being executed in time. Similarly, for the regular O&M of the connection equipments owned by the Applicant and located in the CTU's premises/switchyard, the parties shall separately take up the O&M agreement on mutually agreed terms and conditions.

The connectivity through LILO of 400 kV D/C Rourkela (PG) - Raigarh (PG) transmission line and the associated bays at M/s Sterlite Energy Limited at their switchyard is expected to be commissioned by 15th January, 2011. The expected date of establishing connectivity through final arrangement shall be as per BPTA.

NOW, THEREFORE, THIS AGREEMENT WITNESSETH AS UNDER:

The words/expressions used in this Agreement, unless as defined below or repugnant to the context, shall have the same meaning as assigned to them by the Electricity Act, 2003 and the rules or regulations framed there under including those issued/framed by CERC (as defined hereunder), as amended or re-enacted from time to time or the General Clauses Act, failing which it shall bear its ordinary English meaning. The words/expressions when used in this Agreement shall have the respective meanings as specified below:

1. DEFINITIONS



R. Singh
रवि प्रकाश सिंह / Ravi P. Singh
कार्यवाहक निदेशक, पूर्वी क्षेत्र-II/Executive Director, E-2
शक्ति ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
POWER GRID CORPORATION OF INDIA LIMITED
2-1-15, 40th GP, सेक्टर-V, कोलकाता सिटी, कोलकाता-700 001
2-1-15, Block-GP, Sector-V, Salt Lake City, Cal-700 001

- 1.1. The "Agreement" or the "Connection Agreement" means this Connection Agreement between CTU and the Applicant.
- 1.2. CEA means Central Electricity Authority constituted u/s 70(1) of the Electricity Act, 2003
- 1.3. "CERC Connectivity Regulations" means, Central Electricity Regulatory Commission (Grant of Connectivity, Long-term Access and Medium-term Open Access in inter-state Transmission and related matters) Regulations, 2009, notified by CERC, including amendments, modification, changes made from time to time
- 1.4. Grid Standard means Central Electricity Authority (Grid Standards) Regulations, 2010 including amendments, modification, changes made from time to time
- 1.5. CTU, means Power Grid Corporation of India Limited, notified by the Central Government as Central Government Utility u/s 38 of the Electricity Act, 2003.
- 1.6. DCP means Data Collection Point for conveying the data of flow of power from Sterlite Energy Limited Thermal Power Plant to its customers i.e. Rourkela (PG) 400/220 kV S/s data collection centre.
- 1.7. Grid Code or IEGC means Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulation, 2010, notified u/s 79 (1) (h) of the Electricity Act, 2003, including amendments, modification, changes made from time to time .
- 1.8. "Meters Regulations" means Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006
- 1.9. NLDC means National Load Despatch Centre constituted u/s 26(1) of the Electricity Act, 2003.
- 1.10. RLDC means Eastern Regional Load Despatch Centre and other Regional Load dispatch centres constituted u/s 27(1) of the Electricity Act, 2003.
- 1.11. ISTS means Inter-State Transmission System.

2. General Terms and Conditions for Connectivity



Ravi P. Singh
रवि प्रकाश सिंह/Ravi P. Singh
सहसंचालक निदेशक, पूर्वी क्षेत्र-II/Executive Director, ER-II
पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
POWER GRID CORPORATION OF INDIA LIMITED
3-1-12, प्लॉट-87, सेक्टर-4, बॉम्बे हाईवे, कोलकाता-700 091
3-1-10, ब्लॉक-87, सेक्टर-4, सॉल्ट लाई सिटी, कोलकाता-700 091

- 2.1. The Parties agree to the following General Conditions:
- (a) The parties have agreed to abide by the CERC Connectivity Regulations, in respect of procedure of grant of connectivity and other matters.
 - (b) The Applicant shall be responsible for planning, design, construction, and safe and reliable operation of its own equipments in accordance with the CEA (Technical Standards for Connectivity to the Grid) Regulations, 2007, CEA (Technical Standards for Construction of electrical plants and electric lines) Regulations, Grid Standard, Grid Code and other statutory provisions.
 - (c) The Applicant shall provide necessary facilities for voice & data communication for transfer of real time operational data such as voltage, frequency, real and reactive power flow, energy, status of circuit breakers & isolators, transformer taps and other parameters from their station to DCP of CTU as per Grid Code at their own cost. CTU shall provide access to Applicant's data transfer through communication network in case spare channels are available or to be created on mutually agreed terms and conditions. The location of DCP of CTU shall be the nearest station connected electrically where wideband communication capacity of CTU is available. Additional communication system from DCP to the concerned RLDC shall be the responsibility of CTU; however its cost shall be borne by the Applicant. The responsibility of data transfer shall be that of the Applicant.
- 2.2 The following documents and their schedules which have been initialed by the parties and annexed hereto shall be deemed to form an integral part of this Agreement, in the order of precedence listed below :-
- (a) Long Term Open Access granted by the CTU vide its letter no. C/ENG/E/00/SEF/OA dated 14.05.2009.
 - (b) Application submitted vide letter no. SEL/PGCIL/con-4/01 dated 28.09.2010 seeking connection to the Inter-State transmission system.
 - (c) Acceptance conveyed by CTU for Connection vide letter no. ER-II/kol/PESM/ dated 08.12.2010.



RP Singh
रवि प्रकाश सिंह / Ravi P^s Singh
एक्जिक्यूटिव डायरेक्टर, पूर्वी क्षेत्र-II/Executive Director, E-II
पावर ग्रीड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
POWER GRID CORPORATION OF INDIA LIMITED
J-1-15, ब्लॉक-EP, सेक्टर-V, बल्लभ नगर, कोलकाता-700 095
J-1-15, Block-EP, Sector-V, Ball Lake City, Cal-700 095

2.2.1 Compliance to Statutory/Regulatory Clearances

- (i) Notwithstanding anything in the Agreement to the contrary, the CTU & Applicant shall be responsible for obtaining the statutory clearances/approvals for carrying out the works requiring connection to the ISTS. Accordingly, the provisions of the Agreement dealing with the carrying out of the Works, either by the CTU or the Applicant (unless otherwise agreed mutually) in all respects would be conditional on and subject to the CTU being satisfied that the necessary approvals/clearances are available with the Applicant.
- (ii) M/s Sterlite Energy Limited shall comply to the instructions given by WRLDC/ERLDC from time to time to ensure safe grid operation.

3. Payment of Charges and Costs

3.1. Monthly Transmission Tariff

The Applicant hereby declares and agrees that it shall pay the Monthly Transmission Tariff for above referred transmission lines and for use of Inter-State Transmission System including ULDC/NLDC charges, as and when Long term access, Medium-term open access or Short-term open access is availed by the Applicant, in accordance with the relevant regulations of CERC in this regard.

3.2. Additional costs

The Applicant declares and hereby agrees that it shall pay the cost towards modification/alterations to the infrastructure of CTU for accommodating the proposed connection as specified by CTU furnished in the connection details.

3.3. Payment for damages

The Applicant declares and hereby agrees that it shall pay/make good damages, if any, caused by the Applicant to the property of the CTU or inter-state transmission licensee other than the CTU, as the case may be,



Ravi P. Singh
रवि प्रकाश सिंह Ravi P. Singh
अध्यक्ष निदेशक, पूर्ण वे-1/Executive Director, EN-1
पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
POWER GRID CORPORATION OF INDIA LIMITED
2-1-12, ब्लॉक-EP, सेक्टर-4, सोलारि सिटी, नई दिल्ली-110001
2-1-12, ब्लॉक-EP, सेक्टर-4, सोलारि सिटी, नई दिल्ली-110001

which has been notified by the CTU, as the case may be, within reasonable time of its occurrence, during the course of control, operation and maintenance of the equipment.

3.4. O&M Charges:

The O&M of Equipment of the CTU and Applicant shall be undertaken by the respective parties on their own. Where Applicant requisitions the services and support of CTU for O&M of its equipments, these O&M charges shall be payable in accordance with mutually agreed terms and conditions.

4. Conditions Precedent to the implementation of the Commissioning Instructions

The Applicant shall have to get appropriate "Commissioning Instruction" prior to actually first charging of the equipment with the grid. The charging instruction shall be issued only when the CTU is satisfied (by acting reasonably) that:

- (a) The Connection Works have been completed;
- (b) The Applicant has complied with its all obligations as set out in the Offer Letter;
- (c) The Applicant has established and demonstrated the voice & data communication facilities to concerned RLDC;
- (d) The Applicant has obtained necessary approvals like Electrical Inspectorate of CEA etc. or from other competent authority as applicable;
- (e) The Applicant has complied with its obligations under the CERC Connectivity Regulations.

5. Metering

The Applicant shall install and maintain the Metering equipments, in accordance with the Meters Regulations and Grid Code. The parties shall be responsible for timely and periodic calibration of the meters and metering equipments on mutually agreed period. It shall be the responsibility of SEL to ensure collection of SEM (Special Energy meter) Data and transmission



Ravi P. Singh
रवि प्रकाश सिंह Ravi P. Singh
वरिष्ठ निदेशक, पूर्वी क्षेत्र-III/Executive Director, EN-III
पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
POWER GRID CORPORATION OF INDIA LIMITED
J-1-12, ब्लॉक-29, फेज-IV, लॉन्गवुड हिल, नोएडा-200 091
J-1-18, ब्लॉक-29, फेज-IV, नई लखनऊ, को-700 091

of the same to WRLDC/ERLDC every Monday as per the provision of IEGC.

The measurands, status indications to be telemetered and transmitted to WRLDC/ERLDC would be specified by WRLDC/ERLDC and the responsibility for ensuring the same lies with SEL. SEL shall ensure configurations and generation of SOE (Sequence of events) and transmission of the SOE file to WRLDC/ ERLDC. In case of substation Automation, provision of gateway, configuration of data points at gateway level to be ensured by SEL in coordination with CTU/ERLDC/WRLDC Modalities of reconfiguration of data points if any shall have to be done with prior intimation to ERLDC/WRLDC.

6. Communication Equipments

The Applicant shall arrange.

- a) 2 number Data channels (600 Bauds) & 1 number Speech Channels, DCP;
- b) PLCC links – SEL, Jharsuguda TPS to Rourkela (PG) S/s – 2 numbers of 4 kHz links;
- c) 400 kV SEL S/Y to 400 kV Raigarh S/s (PG) – 2 numbers of 4 kHz link;
- d) Total number of PLCC Panels required – 8 numbers, The PLCC equipment can be provided subject to availability of frequencies. Alternatively Applicant shall arrange alternative communication link between M/s Sterlite Energy Ltd. TPS and 400/220 kV S/s at Rourkela and Raigarh.

The Applicant shall also bear the cost of additional communication equipments / cards if any required for integration of M/s Sterlite Energy TPS generation data at DCP.



RPS-gh
रवि प्रकाश सिंह/Ravi B Singh
प्रबंधपालक निदेशक, पूर्वी क्षेत्र-III/Executive Director, ER-II
पावर ग्रीड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
POWER GRID CORPORATION OF INDIA LIMITED
24-12, गडक-47, पुणे-41, महाराष्ट्र, भारत-411 004
24-12, Ghatkoti-47, Pune-41, Maharashtra, India. Tel: 720 001

7.1 Site Access

Similarly the Applicant may also allow, on prior permission, site access to the CTU's employees and/or agents and/or contractors/subcontractors and/or invitees to carry out preliminary site investigation works, inspections and works etc in the connection site of the Applicant, provided that a written request has been made giving reasonable advance intimation.

7.2 Accessibility to the Applicant's premises

[illegible]

carry out the functions in respect of which the access is granted. Being a restricted area, any individual of one party to whom access is given under the Agreement shall comply with all reasonable directions given by the other party and its duly authorized employees and agents to safe guard the interest of safety and security requirements of personnel and equipment. All such access shall be exercisable without payment of any kind.

8. Transfer Assignment and Pledge

The Applicant shall not transfer, assign or pledge its rights and obligations under this connection agreement to any other person.

9. Notice

All correspondence/notices required or referred to under this Agreement shall be in writing and signed by the respective authorized signatories of the parties mentioned herein, unless otherwise notified. Each such notice shall be deemed to have been duly given if delivered or served by registered mail/courier service/speed post with an acknowledgment due to other party (ies) as per authorization by parties.

The authorities of the parties who shall be responsible for the correspondence notices etc. in connection with this agreement shall be informed in advance.

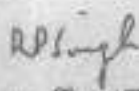
10. Settlement of Disputes and Arbitration

All differences and/or disputes between the parties arising out of or in connection with these presents shall at first instance be settled through amicable settlement at the level of CEO/CMD.

In the event of unresolved disputes or differences as covered under the statutory arbitration provided under The Electricity Act, 2003, the same shall be resolved accordingly.

Notwithstanding the existence of any disputes and differences referred to arbitration, the parties herein shall continue to perform their respective obligations under this Agreement.




रवि प्रकाश सिंह / Ravi P. Singh
कार्यपालक निदेशक, यूई सेल-II/Executive Director, EN-II
पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
POWER GRID CORPORATION OF INDIA LIMITED
3-4-1E, फ्लोअर-EP, सेक्टर-V, इंदिराजीव नदी, गुरुग्राम-700 091
3-1-1B, ब्लॉक-EP, सेक्टर-V, गुरु लोका सिटी, कल-700 051

11. **Coordination between the parties**

Executive Director (ED) of the Eastern Region - II of CTU and Head (O&M) of Sterlite Energy Limited shall be nodal authorities for coordination to the implementation of the Connection Agreement from time to time. However for day to day coordination the concerned engineering in charge of the control rooms set up in premises of the respective parties shall maintain coordination of the Connection Agreement. ED and Head (O&M), with due intimations to each other, may delegate certain matters for study, improvement, investigations, deliberations, trouble shooting to their respective officers.

12. **Force Majeure**

Force Majeure herein is defined as any cause which is beyond the control of the CTU or the Applicant as the case may be, which could not be foreseen or with a reasonable amount of diligence could not have been foreseen and which substantially affects the performance of the agreement. Force Majeure events would include:

- Natural phenomenon including but not limited to floods, droughts, earthquake and epidemics;
- War (whether declared or undeclared), invasion, armed conflict or act of foreign enemy in each case involving or directly affecting India, revolution, riot, insurrection or other civil commotion, act of terrorism or sabotage in each case within India;
- Nuclear explosion, radio active or chemical contamination or ionizing radiation directly affecting the generation station, captive generating plant or bulk consumer, inter-state transmission system of the CTU or inter-state



RPSingh
रवि प्रकाश सिंह/Ravi R Singh
सहसंचालक निदेशक, पूर्वी क्षेत्र-II/Executive Director, ER-II
पावर ग्रिड कॉरपोरेशन ऑफ इंडिया लिमिटेड
POWER GRID CORPORATION OF INDIA LIMITED
3-1-10, बॉम्बे-एफ, सेक्टर-V, इंदौर-462 001, मध्यप्रदेश-462 001
3-1-15, डिप्टी-सी, सेक्टर-V, बॉम्बे लाइन चय, बॉम्बे-400 001

transmission licensee other than CTU, or any facility or system that is integral to and substantial for the performance of this agreement.

- Any event or circumstances of a nature analogous to any events set forth as above within India.

Provided either party shall within fifteen (15) days from the occurrence of such a Force Majeure event, notify the other in writing of such cause(s).

Neither of the parties shall be liable for delays in performing obligations on account of any force majeure causes as referred to and/or defined above.

13. Confidentiality

The parties shall keep in confidence any information obtained under this Connection Agreement and shall not divulge the same to any third party without the prior written consent of the other party, unless such information is

- a) in the public domain,
- b) already in the possession of the receiving party,
- c) required by the Govt. Ministries/Agencies/Court of competent jurisdiction.

The information exchanged herein between the parties shall be used only for the purpose of, and in accordance with, this Agreement and for the purpose stated herein. This clause shall remain in force even after termination of Connection Agreement.

14. Governing Laws and Jurisdiction

The shall agreement be governed by Indian Laws and Rules made there under.

15. Jurisdiction



R. P. Singh
रवि प्रकाश सिंह / Ravi P. Singh
एग्जीक्यूटिव निदेशक, यूटी सेल-१/Executive Director, EIL-१
पावर ग्रीड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
POWER GRID CORPORATION OF INDIA LIMITED
J-1-15, ब्लॉक-EP, सेक्टर-V, खिखरीवाड़ा, दिल्ली-११००२१
J-1-15, Block-EP, Sector-V, Saket, New Delhi-110021

The courts at Delhi shall have exclusive jurisdiction over the matters and issues arising out of this agreement.

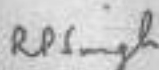
16. Amendment to the Connection Agreement

In case of Modification to point of connection like re-allocation of bays, upgradation of voltage level etc. by either of the parties, if mutually agreed, an amendment to the Connection Agreement shall be executed between the parties within 30 days of implementing such modification.

IN WITNESS WHEREOF the CTU and the Applicant have caused this Agreement to be executed by duly authorized representative on date above first herein written.

Signed for and on behalf of:-

Powergrid Corporation of India Limited,
Eastern Region Transmission System II,
J-1-15, Block EP, Sector V, Salt Lake
Kolkata - 700091

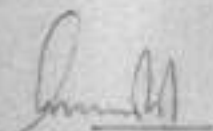

Authorised Signatory
रवि प्रकाश सिंह/Ravi P. Singh
कार्यपालक निदेशक, पूर्वी क्षेत्र-II/Executive Director, ER-II
वायव्य विद्युत प्रसारण कॉर्पोरेशन ऑफ इंडिया लिमिटेड
POWER GRID CORPORATION OF INDIA LIMITED
J-1-15, ब्लॉक-EP, सेक्टर-V, सोलार्क लुई, कोलकाता-700 091
J-1-15, Block-EP, Sector-V, Salt Lake City, Cal-700 091

Witness



Signed for and on behalf of:-

Sterlite Energy Limited
Bhubaneswar Office
1st Floor, City Mart Commercial Complex
Baramunda, Bhubaneswar- 751 003


Authorised Signatory

Witness



1. Name of the Link

: Interim Arrangement

LILO of one circuit of Rourkela - Raigarh 400 kV D/C (existing line) at M/s Sterlite switchyard (under the scope of M/s Sterlite Energy Limited.

Final Arrangement

- Sterlite S/Y to Jharsuguda Pool 400 kV D/C with associated line bays (under the scope of M/s Sterlite Energy Limited)
- LILO of Rourkela – Raigarh 400 kV D/C Line (existing line) at Jharsuguda pool (utilizing the LILO portion of the interim arrangement) (under the scope of POWERGRID)

2. Voltage level

: 400 KV

3. Type of Link

: Double Circuit – Twin Moose

4. Reactive compensation to be provided: N/A

5. Maximum Import Capacity through the link : 64 MVA

6. Maximum Export Capacity through the link : 400 MW

7. Date of commissioning

: Interim arrangement expected by 15 th Jan, 2011.



RP Singh

रवि प्रकाश सिंह / Ravi P. Singh
 कार्यवाहक निदेशक, पूर्वी क्षेत्र-II/Executive Director, ER-II
 पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
 POWER GRID CORPORATION OF INDIA LIMITED
 J-145, ब्लॉक-CP, सेक्टर-V, झारखण्ड सिटी, पोस्टकोड-730 001
 3-1-15, Block-CP, Sector-V, Salt Lake City, Cal-700 001

8. Bay Allocated in the Switchyard of Connectivity

a) For Interim Arrangement

Name of the Substation : Rourkela (PG) & Raigarh (PG)

Name of the Bays : Sterlite Bay 1 both at Rourkela & Raigarh

Sl.No.	Bay Nos. at which connectivity is to be established
a)	400 KV Bay No.20 at Rourkela (Sterlite Bay # 1)
b)	400 KV Bay No. 04 at Raigarh(Sterlite Bay # 1')

b) For Final Arrangement

Name of Substation : Jharsuguda Pooling Point

Bay No (s) shall be intimated later.



RPS-gh
 रवि प्रकाश सिंह / Ravi P. Singh
 कार्यवाहक निदेशक, पूर्वी क्षेत्र-II/Executive Director, ERI-II
 पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
 POWER GRID CORPORATION OF INDIA LIMITED
 3-4-12, ब्लॉक-EP, सेक्टर-V, सोनभद्रा रोड, बल्लभपुर-700 001
 3-4-12, Block-EP, Sector-V, Salt Lake City, Cal-700 001

Annexure – II

9. a) For Providing Interim Connectivity under Short Term Open Access , equipment provided by CTU in the allocated bay meeting the requirement of Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007 which is compatible with the equipment installed at other end.

Name of the Substation : Rourkela (PG) & Raigarh (PG)

Name of the Bays : Sterlite bay # 1 each at Rourkela & Raigarh

Sl.No.	Name of Equipments	Nos.	Ratings.
1.	Circuit Breaker	02	420 KV, 2000A, 40KA – 1 sec.
2.	Isolators	04	420 KV, 2000A, 40KA – 1 sec.
3.	Earth Switches	04	420 KV, 40KA – 1 sec.
4.	CT	12	420 KV, 2000A, 120% extended current rating, 40KA – 1 sec.
5.	CVT	06	420 KV, 4400pF
6.	Wave Trap	02	420 KV, 2000A, 1.0mH, 40KA – 1 sec.
		02	420 KV, 2000A, 0.5mH, 40KA – 1 sec.
7.	390 KV Surge Arrestor	06	390 KV,

- b) For Final Arrangement at Jharsuguda Pooling station : Number of the Switchyard equipments will be finalized later on and the cost for the same will be realized through tariff realization as per CERC Guidelines under BPTA Agreement



R. P. Singh
रवि प्रकाश सिंह/Ravi P. Singh
 कार्यपालक निदेशक, पूर्वी क्षेत्र-III/Executive Director, ER-III
 पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
POWER GRID CORPORATION OF INDIA LIMITED
 2-4-15, ब्लॉक-EP, सेक्टर-V, सोनभद्रा (बिहार)-801 005
 2-4-15, Block-EP, Sector-V, Sonbhadra City, Bihar-801 005

10. a) For Providing Interim Connectivity under Short Term Open Access .Protection Equipment provided by CTU which is meeting the technical standards as per Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations 2007 and is compatible & matching with the equipment installed at other end.

For Sterlite bays at ROURKELA/ RAIGARH Substation :

- a. Distance Protection Relays : Main-I & Main-II
- b. Auto – Reclose.
- c. Over Voltage protection.
- d. LBB protection.

10. b) For Final Arrangement at Jharsuguda Pooling station : Number of the Switchyard equipments as well as protection equipment will be finalized later on and the cost for the same will be realized through tariff realization as per CERC Guidelines under BPTA Agreement.



Ravi P. Singh
रवि प्रकाश सिंह / Ravi P. Singh
खान्दोला निदेशक, पूर्वी क्षेत्र-II/Executive Director, ER-II
पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
POWER GRID CORPORATION OF INDIA LIMITED
J-1-15, ब्लॉक-EP, सेक्टर-V, झारखण्ड हाई, कोलकाता-700 091
J-1-15, ब्लॉक-EP, सेक्टर-V, सॉल लैक सिटी, कोलकाता-700 091

Annexure – III (a)

11. a) For Providing Interim Connectivity under Short Term Open Access . System recording Equipments is meeting the technical standards as per Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007 which shall be compatible with the equipment installed at other end.

Name of the Substation : Rourkela/ Raigarh

Name of the Bays : Sterlite Bay#1 each at Rourkela and Raigarh .

SLNo.	Name of Equipments	Nos.	Ratings.
1.	Event Logger	-	Existing
2.	Disturbance Recorder	2	In-built in main distance protection relay.
3.	Fault locator	2	In-built in main distance protection relay.

- b) For Final Arrangement at Jharsuguda Pooling station : Number of the recording instrument will be finalized later on and the cost for the same will be realized through tariff realization as per CERC Guidelines under BPTA Agreement.

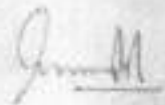


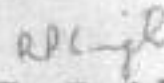
Ravi P. Singh
 रवि प्रकाश सिंह / Ravi P. Singh
 कार्यवाहक निदेशक, पूर्वी क्षेत्र-II/Executive Director, EP-II
 पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
 POWER GRID CORPORATION OF INDIA LIMITED
 J-1-15, ब्लॉक-EP, सेक्टर-V, सारलखा चौराहा, बिलासपुर-768 001
 J-1-15, Block-EP, Sector-V, Saralaha Chy, Bilaspur 826 001

Annexure – III (b)

11. SCADA Equipments shall be meeting the Technical standards as per Central Electricity Authority (Technical standards for Connectivity to the Grid) Regulations, 2007 and shall be compatible to facilitate exchange of data with the existing system installed in the ISTS network.

Sl.No.	Name of Equipments	Nos.	Ratings.
1.	Data Acquisition System - RTU/SAS	-	Initially ERLDC shall accept data on IEC870-5-101 protocol & in future on IEC870-5-104 protocol.
2.	Communication equipment -PLCC	As required	4 KHz PLCC
3.	Any other equipment - Mux/Data & Voice – card required if any at Data Collection Point.	As required	





रवि प्रकाश सिंह / Ravi P. Singh
 कार्यवाहक निदेशक, पूर्वी क्षेत्र-II/Executive Director, EIS-II
 पावर ग्रीड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
 POWER GRID CORPORATION OF INDIA LIMITED
 3-4-15, बंगला-एफ, टाउन-IV, मिंटोरोड, नए दिल्ली-110 001
 2-1-15, ब्लॉक-एफ, सेक्टर-IV, साई लैक सिटी, नए दिल्ली-110 001

12. Details of the modification/alteration to existing facilities for accommodating proposed connection and its estimated cost for the interim arrangement

A. Modification/alteration to existing facilities in terminal substation for accommodating proposed connection :

a) Required ☒

Not Required ☐

b) If required, details of modification(s) /alteration(s) are as under :

1. Terminal Bay N/A
2. Protection N/A
3. Metering N/A
4. PLCC/Communication APPLICABLE
5. Others.. N/A

B. Modification/alteration to existing transmission line for accommodating proposed connection

b) Required ☒

Not Required ☐

b) If required, details of modification(s) /alteration(s) are as under :

1. _____
2. _____
3. _____
4. _____

Total estimated Cost of above works (A+B) : Rs ____ (Total Cost will be borne by M/s SEL).

[Signature]

[Signature]
रवि प्रकाश सिंह / Ravi P. Singh
 कार्यवाहक निदेशक, पूर्वी क्षेत्र-III/Executive Director, ER-II
 प्रसार विद्युत निगम लिमिटेड/ POWER GRID CORPORATION OF INDIA LIMITED
 3-1-13, ब्लॉक-CP, सेक्टर-V, नई दिल्ली, पिनकोड-110 001
 3-1-13, ब्लॉक-CP, सेक्टर-V, नई दिल्ली, पिनकोड-110 001

13. Name of Communication Link for Data and Voice Communication : From
Raigarh(PG)- Sterlite
Sterlite- Rourkela(PG)

14. Communication equipment details up to POWERGRID Data Collection Point

Details are as under:

Requirement of Channels: 2 Nos Data Channel (600Baud) & 1 no. Speech Channel.

Data Collection Point (DCP): 400kV Rourkela S/s (PG) for interim arrangement and final arrangement.

1. PLCC link details as below (To be implemented by M/s Sterlite Energy Limited):

A. Interim Arrangement :

Sterlite Energy Ltd. Generating Station-400 KV S/S (PG)-2Nos. of 4KHz. Link

Total nos. of PLCC Panels required – 4 Nos. under interim arrangement & 4 Nos. under final arrangement.

The PLCC equipment can be provided subject to availability of frequencies alternatively M/s Sterlite Energy Limited shall arrange alternative communication link between M/s Sterlite Energy Limited Generating S/s & 400kV Rourkela S/s of POWERGRID

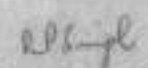
2. Wideband links (POWERGRID Portion):

400 kV Rourkela S/s (PG) – ERLDC, Kolkata.

Note:-

1. M/s Sterlite Energy Ltd. shall bear the cost of additional communication equipments/cards if any required for integration of M/s Sterlite Energy Limited Generating station data at & 400 KV Rourkela S/s (PG) .
2. 765kV Jharsuguda Pooling station (PG) has been proposed to be a wide band node. Under phase-I generation project in Orissa, 765kV Jharsuguda pooling station(PG) shall be the new data collection point for M/S Sterlite Energy Limited generating station.
3. In future, if PMU (Phasor Measurement Unit) planned to be installed at M/S Sterlite Energy Limited, generating station, then due to requirement of higher band width, wide band link (fibre optic based) need to be established by M/S Sterlite Energy Limited between M/S Sterlite Energy Limited generating S/S & 765kV Jharsuguda pooling station (PG).



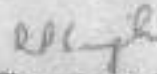

रवि प्रकाश सिंह / Ravi P. Singh
भारतीय विद्युत निदेशक, पूर्ण क्षेत्र-II/Executive Director, ERI-II
पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
POWER GRID CORPORATION OF INDIA LIMITED
J-1-15, बल्लभ-मार्ग, बिल्डिंग V, कोलकाता-700 091
J-1-15, Block-BII, Section-V, Salt Lake City, Cal-700 091

Annexure – VI

15. Site responsibility schedule

A. Principle & Procedure:

The responsibility of control, operation, maintenance & all matters pertaining to safety of equipments and apparatus at the connection point shall lie with the owner .



रवि प्रकाश सिंह / Ravi P. Singh
प्रबन्धनात्मक निदेशक, पूर्ण वेत-II/Executive Director, ER-II
पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
POWER GRID CORPORATION OF INDIA LIMITED
J-1-15, ब्लॉक-EP, सेक्टर-V, रोडकॉल सिटी, नोएडा-201 001
J-1-15, Block-EP, Sector-V, Road Col City, Noida-201 001



पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

Ref: ODP/SNG/TLM/GEN/2022/

Date:05.01.2022

To
General Manager (Elect)
M/s Vedanta Limited
Jharsuguda

(Kind Attention- Sh Mangu Srinivas, GM)

Sub: Replenishment of missing /hanging tower members at Tower No-V1 and V3 near Kundukela LILO-3 and LILO-4 tapping points.

Dear Sir,

Please refer our earlier letter and discussion held at your conference hall on Dt.22.10.2021 regarding the cited matter and early action for direct connectivity of our 400KV Sundargarh-Raigarh D/C line # 3 and #4. You had assured us to take immediate action for replacement of missing and hanging members at both the towers to keep the tower in safe condition and also parallel action would be taken for direct connectivity of both tapings.

But during joint site visit on 05.01.2022 to finalize the direct connectivity working plan, it is found that nearly 40pes tower member missing at 1st section of tower No-V-3 near LILO-4 tapping point due to which the main bracing tends to buckle inwards at mid-point. Similar case found at tower No-V-1 LILO-3 tapping point near Kundukela where more than 50pes tower member missing and hanging at body-II to Top cross arm. It seems no such serious action is being taken for rectification of missing tower members in order to maintain the tower in safe condition.

You are well aware of that these lines are interstate connected lines and random theft/missing of tower members may lead to collapse of towers as well as interruption of power between Eastern and Western Grid.

Some of photographs taken during site visit is attached herewith for your reference.

You are once again requested to take immediate action on following points:

- 1) Fixing up all missing members including tack welding of B&Ns at these 02nos of towers to keep the tower /line in safe and healthy condition latest by 10th Jan'22.
- 2) Intense increase of watch & ward activities near the vicinity of said towers.
- 3) Please intimate us your work plan for direct connectivity of both tapping arrangements.
- 4) An emergence meeting may be arranged tomorrow 2nd half for detail discussion on cited matter.

Thanking You

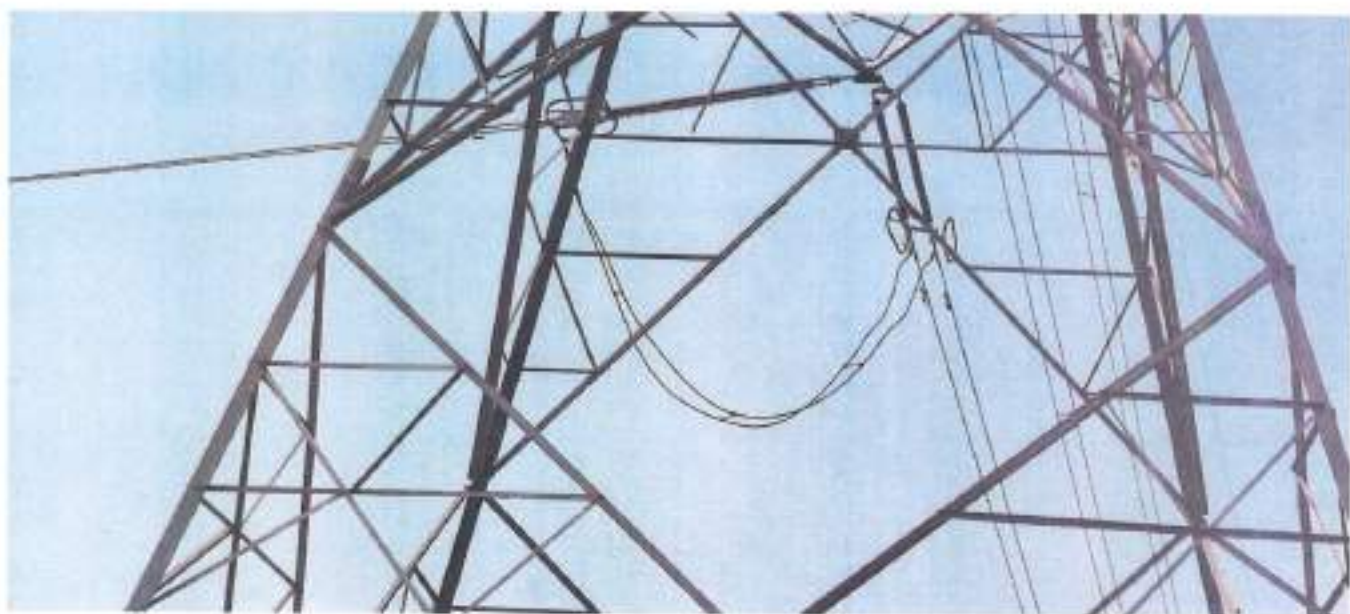
Your's faithfully


(J. Mohanty)
05.01.2022

Sr. GM/ Sundargarh









पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)

Ref: ODP/SNG/TLM/GEN/2022-2023/

Date: 22.04.2022

To
General Manager (Elect.),
M/s Vedanta Ltd.,
Jharsuguda, Odisha.

(Kind Attention-Sh Mangu Srinivas, GM)

Sub: Endangering Grid connectivity, security & stability of 400KV Sundargarh - Raigarh LILO Ckt 3 & 4 at tapping points near Sundargarh by M/s Vedanta Ltd., Jharsuguda (Earlier name Sterilite Energy Ltd.) along with violation of Grid discipline.

Dear Sir,

As per the Agreement dated 22.12.2010 between M/s Vedanta Ltd. (Earlier name Sterilite Energy Ltd.) and POWERGRID, the connectivity to M/s Vedanta Ltd.'s Sub-station was carried out from LILO of 400KV Sundargarh-Raigarh D/C line #3 between Tower No-834(DD+0) & 835 (DD+0) and 400KV Sundargarh-Raigarh D/C line #4 between tower No-299(DD+0) & new Vedanta Tower No-VL3 (DD+0) was done during the year 2011. This activity was taken up as per direction of CERC and instruction of ERLDC/WRLDC in order to charge the Vedanta switchyard at Jharsuguda for sending and receiving of power at Vedanta end with CTU transmission system.

After direct connectivity of Vedanta 400 KV Sub-station with 765/400 KV Sub-station of POWERGRID at Sundargarh, the tapping points of LILO portion of line #3 & #4 was disconnected by M/s Vedanta Pvt. Ltd. in the year 2014 & 2017 respectively, without completion of direct connectivity for POWERGRID, in above-mentioned LILO lines.

As you know, M/s Vedanta has dismantled all towers of LILO portion except 02 nos. of towers near each tapping point and left these 04 towers without any routine maintenance/watch & ward activity. At present, there is no back support at tower no-VL2 and VL5 (as shown in the sketch). As there is no watch & ward and routine maintenance work, theft of tower members on these towers have become rampant, subsequently weakening the strength of towers which may lead to collapse of existing Vedanta towers as well as

POWERGRID towers, resulting interruption of power transfer between Eastern and Western Grid.

In this regard, the authority of M/s Vedanta has been informed many times verbally as well as in written communication for replenishment of all missing/hanging members and to provide backstay (back support) for keeping the tower in safe condition and also to take urgent action for direct connectivity of both LILO points.

Some of the correspondences with the photographs of tower condition and record notes of discussion held on dt.25.06.2020 and dt.22.10.2021 have been attached for kind perusal.

In spite of these correspondences & discussion with M/s Vedanta Ltd, since dt.04.03.2019, neither any action has been taken nor any permanent connectivity solution has been implemented. The said LILO lines are in severe danger zone and power flow will be affected as stated.

It is therefore requested to take immediate necessary action for safe guarding of the existing towers and implementation of direct connectivity of 400KV Sundargarh-Raigarh D/C line # 3&4 in order to avoid any future incidents and to maintain Grid discipline for security & stability point of view.

One single line diagram is attached herewith for reference and better visuality of LILO portion.

Thanking You

Your's faithfully


22.04.2022
(J. Mohanty)

Sr. GM/ Sundargarh

- Copy to:-1. The Member Secretary, ERPC, Kolkata.-For Kind information pl.
2. The CGM(AM), Odisha Project, Bhubaneswar.
3. The Sr.GM(AM), Odisha Project, Bhubaneswar.

Odisha project, Plot No-4, Unit-41, Niladrivihar, Chandrasekharapur, Bhubaneswar-751021(Odisha)

Record Notes of Discussion held on 25/06/2020, Time 11:00 Hrs with M/s Vedanta Ltd (Earlier Sterlite Energy Limited) at POWERGRID, Sundargarh

Participants List

POWERGRID	M/s Vedanta Ltd
Though VC 1. Sh. Sunil K Thomas (AM) 2. Sh. S K Sahu, DGM(AM)	1) Sh.Mangu Srinivas, GM 2) Sh.Dinesh Patra, Mgr
Sundargarh S/S 3. A.K.Naik, Sr.GM	

CGM(AM), Bhubaneswar welcomed the participants & expressed the concern for the delay in restoration for direct connectivity of 400kV Sundargarh-Raigarh Ckt#3(Earlier name was Ckt#2) and Ckt#4. Following points were deliberated & agreed for moving forward.

- 1) 02 Nos of LILO was constructed in line with Agreement Dt 22/12/2010 between M/s Vedanta Ltd (Earlier name Sterlite Energy Ltd) and M/s POWERGRID. 01(One) LILO was opened in 2014 and 2nd one in Oct 2017 after establishing direct connectivity of 400kV Lines from Meramandli and POWERGRID Sundargarh. However, our Sundargarh-Raigarh ckt 3 & 4 lines are now passing through 05 towers of M/s Vedanta and its immediate removal is required for smooth maintenance, minimizing outage and as per direction of ERLDC. Sketch is attached for reference.
- 2) For removal of LILO in Sundargarh-Raigarh Ckt#3(Earlier Rourkela-Raigarh Ckt#2), LILO materials will be removed and direct connectivity will be done from Loc 834-835.
- 3) For removal of LILO in Sundargarh-Raigarh Ckt#4(Earlier Rourkela-Raigarh Ckt#4): Vedanta Tower VL3 is on the line corridor and its removal will require all conductors & hardware to be provided new. Hence 02 options were deliberated:
 - a. Option -I: Removal of Towers & all conductors & Hardwires/accessories and providing new conductors with stringing materials.
 - b. Option-II: Handing over the tower to POWERGRID with modifications for box cross arm and an equivalent spare tower dismantled from existing tower in good condition with stub and N&Bs. Drawings of Tower, template, foundations & BOM to be provided by M/s Vedanta Ltd

M/s Vedanta will decide an option & intimate by 10/07/2020.

- 4) Earthwire diamonding to be removed between loc 851 to 852 and conductor between VL-5-VL6 of 400kV Sundargarh- Raigarh D/C Ckt#1&3.
- 5) All ROW during Dismantling/ erection and shutdown shall be to the account of M/s Vedanta Ltd. M/s Vedanta will apply at least 02 months in advance for shutdown in OCC meeting through SLDC for each Ckt. However, Vedanta requested PGCIL to facilitate the approval for shutdown.
- 6) Vedanta will supply insulators (Powergrid approved make) from their store & provide documents for concurrence of POWERGRID before use.
- 7) All new materials are to be used from POWERGRID approved source.
- 8) For SI -2 and 3, Vedanta opined to provide the available material (PGCIL approved makes) with them like Insulators or use any of the existing materials of the lines to make good the modifications and requested PGCIL to provide balance materials like conductor, accessories, earthwire etc as required to expeditiously execute the job. POWERGRID will make effort for supplying conductor, hardware fittings/accessories from their store in the best interest of early completion of the job.
- 9) Erection Contractor will be engaged by M/s Vedanta Ltd and then a workplan to be finalized.
- 10) Supervision cost @15% will be paid on the value of the works and a formal agreement to be made between both parties.
- 11) Timelines:

Sl.No.	Description	Date	Action by
1	Confirmations of Option at SI-3	10/07/2020	Vedanta
2	Submission of CLR insulator details	10/07/2020	Vedanta
3	Materials like conductor, Hardware, earthwire available with POWERGRID to be explored.	10/07/2020	POWERGRID
4	Balance Materials to be reused in good condition to be examined & finalized.	15/07/2020	POWERGRID

A.K. Naik

(A.K. Naik)
Sr. GM, POWERGRID
Sundargarh

M. Srinivas
(Mangu Srinivas)
GM (Power Systems)
Vedanta Limited, Tharuguda

Record Notes of Discussion held with M/s VEDANTA Ltd (Direct connectivity of LILO #3 and #4)
Name of Work: Direct connectivity of 400KV Sundargarh-Raigarh D/C Line #3 (earlier #2) and 400KV Sundargarh-Raigarh D/C line #4

Date: 22/10/2021; Time: 04.30 PM; Location: M/s Vedanta Ltd, Conference Hall, Jharsuguda.

POWERGRID		VEDANTA	
Sh J Mohanty, Sr. GM (I/c), Sundargarh		Sh. Mangu Srinivas, GM	
Sh. A.K.Naik, Sr.GM		Sh Niranjan Das, Associate GM	
Sh. B.K.Sahoo, CM (TLM)		Sh Piyus Lenka, Dy Manager (TL)	
S.No	Description	Action by	Proposed Date
1	Representatives from, POWERGRID & M/s Vedanta Ltd were present in the meeting. The brief discussion on fixing of missing tower members with watch & ward at Vedanta Towers and action to be taken for direct connectivity of 400KV SNG-RGH Line #3 & #4 is as follows:		
2.	FIXING OF MISSING TOWER MEMBERS WITH WATCH & WARD ACTIVITY: There are number of tower members are missing in Vedanta towers at both LILO points which was detected by POWERGRID staff during routine line patrolling. M/s Vedanta is requested to take immediate action for fixing of missing members on priority with watch & ward to keep the tower in safe and line in healthy condition till final direct connectivity completed. M/s Vedanta agreed to do so on emergency basis. DIRECT CONNECTIVITY OF SNG-RGH LINE #3: M/s Vedanta Ltd is requested to take immediate action for direct connectivity of 400KV Sundargarh-Raigarh D/C Line #3 (earlier #2) and 400KV Sundargarh-Raigarh D/C line #4 as decided during earlier MOM Dtd. 25.06.2020. It is decided to take action for direct connectivity of 400KV Sundargarh-Raigarh line #3 i.e. tapping point between tower No-834 to 835. As such there is no litigation at this section the restringing can be done immediately. So, it is decided that M/s Vedanta Ltd will supply 2500mtr ACSR Moose conductor, Insulators and all other hardware fittings (Only POWERGRID approved manufacturer) required for restringing work of 834 to 835 (400mtr span) section in presence of POWERGRID officials with a payment of 15% supervision cost in advance. The Erection/ stringing gangs shall be arranged by M/s Vedanta Ltd.	M/s Vedanta Ltd. M/s Vedanta Ltd. M/s Vedanta Ltd.	24.10.2021 10.11.2021 01.12.2021

S.No	Description	Action by	Proposed Date
	It is also discussed & decided that if dismantled conductor is of ACSR Moose and hardware fittings is of POWERGRID approved manufacturer supplied and are in good conditions then that may be used in restringing work for LILO #3 direct connectivity work after prior approval of POWERGRID Competent Authority.	M/s Vedanta Ltd.	01.12.2021
	So, to carry out the restringing work for #3 Lilo point Shut Down of said line (400KV Sundargarh-Raigarh Line #3 with auto mode of Sundargarh-Raigarh #1) shall be applied by M/s Vedanta Ltd during Nov'2021..	M/s Vedanta Ltd.	01.12.2021
	DIRECT CONNECTIVITY OF SNG-RGH LINE #4: It is discussed and decided that the DD+0 tower inserted between existing tower no-298 and 299 to be kept as usual with proper modification of all 03 cross arm of ckt#4 to be maintained with adequate electrical clearance from the tower body, including dismantle of existing cross arm. The modification work should be done by M/s Vedanta Ltd. Secondly, one same type of tower (either new or good condition dismantled one)to be supplied by M/s Vedanta Ltd as spare tower for future use by POWERGRID. Besides this all-other hardware fittings, Insulators and ACSR Moose conductor required for restringing work shall be supplied by M/s Vedanta Ltd either from dismantled materials in good conditions or supply of new materials but should be POWERGRID approved manufacturer supply material.	M/s Vedanta Ltd.	15.11.2021
	In case, if M/s Vedanta will not agree on above points then the existing tower inserted between tower no.298 & 299 shall be dismantled by M/s Vedanta ltd. and all materials i.e. conductor, hardware fittings and insulators etc required for restringing work from existing tower no-296 (DB+0) to 299 (DD+0) for a total route length of 1056 mts shall be supplied by Vedanta Ltd along with erection and supervision cost.	M/s Vedanta Ltd.	15.11.2021
	M/s Vedanta Ltd said they have sent above mentioned 02 proposal for approval of their competent authority and as soon as they got the approval (within 15days) they will take up the work accordingly on priority basis.		

Note: For Direct Connectivity of above mentioned 02 lines -M/s Vedanta Ltd stated to complete the entire work within DEC'2021. However, as per POWERGRID request, best effort will be made to complete work as early as possible.

(B.K. Sahoo)

(J. Mohanty)

Hardware, Software & Application refreshment at Data Center, for PGCIL AMR System

Technical Document, Apr 2022

**for Power Grid Corporation of India Ltd. – Eastern
Region (PGCIL - ER)**

April 28, 2022

Reference No.: TCS/PGCIL-AMR/TS/01/0422 DT 28.04.2022

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1. Reference

Referring to PGCIL AMR system installation at Data Centre, which had been done in Mar-2013 period. All the hardware and its corresponding software have crossed the technical life span. Referring CERC/CEA regulations, refreshment required for IT hardware and software.

Referring to the technical presentation given on 12-Oct-21 to PGCIL and PGCIL mail request dated. 26-Oct-21 and 12-Apr-2022, submitting the Technical Document for “AMR Hardware, Software and Application Refreshment at Data Centre.”

2. Business Background and Requirements

Automatic Meter Reading (AMR) system has been implemented in Eastern Region of PGCIL circuit. This covers total 05 states i.e., West Bengal, Sikkim, Odisha, Bihar, and Jharkhand. The implementation of AMR system has been started from Mar-2013. Gradually the number of Sub Station and Meters have been gradually integrated with AMR system.

The Data Centre Setup for AMR system was initially done in Mar-2013 time. All the Hardware, software and AMR application being installed and put into production that time. Since then, the same AMR Hardware and application is running in AMR system till now. As per CERC/CEA guidelines for IT equipment (both hardware and Software) depreciation rate, refreshment of all Hardware and Software required. This Technical Document is for the total overview of new Hardware and Software replacement plan.

There will be no change in the basic architecture of AMR system. The way and methodology being used for Data retrieval from SEMs by DCU and the data transmission to ERLDC (via GPRS or LAN) will remain same. This Technical document is only the detailed overview of new Hardware and Software those will be installed at ERLDC as a part of “AMR Hardware, Software and Application Refreshment at Data Centre” plan.

3. New Hardware and Software of AMR

Details of New Hardware and the corresponding software being given in below sections. The hardware will be installed as a replacement of existing Hardware. All hardware and software will have 05 years comprehensive OEM support from the date of material delivery to PGCIL. The qty of new Hardware will be same as the existing system. No additional hardware being considered here.

3.1 Hardware for Networking Part

In the networking, the existing architecture have one Firewall, one Router and one Switch. Following are the details of new hardware, which will be installed as replacement of the existing one. All the new Networking Devices will be CISCO make with latest upgradations.

1. AMR Firewall – CISCO MAKE

#	Part Number	Part Description	Service Duration	Quantity
1.0	FPR1140-NGFW-K9	Cisco Firepower 1140 NGFW Appliance, 1U	-	1
1.0.1	CON-SSSNT-FR11P40N	SOLN SUPP 8X5XNBD Cisco Firepower 1140 NGFW Appliance, 1U	60	1
1.1	FPR1140T-TMC	Cisco FPR1140 Threat Defense Threat, Malware and URL License	-	1
1.1.1	L-FPR1140T-TMC-5Y	Cisco FPR1140 Threat Defense Threat, Malware and URL 5Y Subs	60	1
1.2	CAB-IND-10A	10A Power cable for India	-	1
1.3	FPR1K-RM-SSD200-	Cisco Firepower 1K Series 200GB for FPR-1120/1140	-	1
1.4	FPR1K-RM-ACY-KIT	Cisco Firepower 1K Series Accessory Kit for FPR-1120/1140	-	1
1.5	FPR1000-ASA	Cisco Firepower 1000 Standard ASA License	-	1
1.6	GLC-SX-MMD	1000BASE-SX SFP transceiver module, MMF, 850nm, DOM	-	1
1.7	FPR-LTP-QR-LBL	Cisco Firepower QR Label - Internal Use Only	-	1
1.8	SF-F1K-TD7.0.1-K9	Cisco Firepower Threat Defense software v7.0.1 for FPR1000	-	1

2. AMR Router – CISCO Make

#	Part Number	Part Description	Service Duration	Quantity
2.0	ISR4221-SEC/K9	Cisco ISR 4221 SEC Bundle with SEC lic	-	1
2.0.1	CON-SNT-ISR4221S	SNTC-8X5XNBD Cisco ISR 4221 SEC B	60	1
2.1	SL-4220-SEC-K9	Security License for Cisco ISR 4220 Series	-	1
2.2	SL-4220-IPB-K9	IP Base License for Cisco ISR 4220 Series	-	1
2.3	PWR-4220-AC	AC Power Supply for Cisco ISR 4220	-	1
2.4	CAB-C13-C14-IN	Power Cord Jumper, C13-C14 Connectors, 1.4 Meter Length India	-	1
2.5	NIM-BLANK	Blank faceplate for NIM slot on Cisco ISR 4400	-	2
2.6	SISR4200UK9-173	Cisco ISR 4200 Series IOS XE Universal	-	1

3. AMR Manageable Switch 24 Ports – CISCO Make

#	Part Number	Part Description	Service Duration	Quantity
3.0	C9200L-24T-4G-E	Catalyst 9200L 24-port data, 4 x 1G, Network Essentials	-	1
3.0.1	CON-SSSNT-C920L24T	SOLN SUPP 8X5XNBD Catalyst 9200L 24-port data, 4 x 1G, Net	60	1
3.1	C9200L-NW-E-24	C9200L Network Essentials, 24-port license	-	1
3.2	CAB-C15-CBN-IN	AC Power Cord, Type C15 Cable, India	-	1
3.3	PWR-C5-BLANK	Config 5 Power Supply Blank	-	1
3.4	C9200-STACK-BLANK	Catalyst 9200 Blank Stack Module	-	2
3.5	C9200L-DNA-E-24	C9200L Cisco DNA Essentials, 24-port Term license	-	1
3.5.0.1	CON-SSTCM-C92LE24	SOLN SUPP SW SUBC9200L Cisco DNA Ess	60	1
3.5.1	C9200L-DNA-E-24-5Y	C9200L Cisco DNA Essentials, 24-port, 5 Year Term license	60	1
3.6	NETWORK-PNP-LIC	Network Plug-n-Play Connect for zero-touch device deployment	-	1

The required Operating System for above three hardware will be pre-installed. Required Configuration as per AMR architecture will be done post procurement and installation of the same.

3.2 Hardware for AMR Application Server

For the Application Server, which have the AMR application and Database installed within it. At present there are two application Servers present and working as Primary and Backup of AMR Application and Database Server. Also, to connect to those Servers from outside (via VPN), one Workstation system is present. All this three hardware will be replaced, and new Hardware will be installed. All hardware will be HP make and will have 05 years Comprehensive Support from the date of material delivery.

1. AMR Application and Database Server (Qty: 2) – HP make

Qty	Product Description
1	HPE ProLiant DL160 Gen10 8SFF Configure-to-Order Server
1	HPE DL160 Gen10 8SFF CTO Server
1	Intel Xeon-Silver 4208 (2.1GHz/8-core/85W) FIO Processor Kit for HPE ProLiant DL160 Gen10
1	Intel Xeon-Silver 4208 (2.1GHz/8-core/85W) Processor Kit for HPE ProLiant DL160 Gen10
2	HPE 32GB (1x32GB) Dual Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart Memory Kit
4	HPE 2TB SAS 12G Business Critical 7.2K SFF SC 1-year Warranty 512e HDD
1	HPE Smart Array E208i-a SR Gen10 (8 Internal Lanes/No Cache) 12G SAS Modular LH Controller
2	HPE 500W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit
1	HPE iLO Advanced 1-server License with 3yr Support on iLO Licensed Features
1	HPE DL160/180 Gen10 Redundant Power Supply Enablement Kit
1	HPE 1U Gen10 8SFF Smart Array SAS Cable Kit
1	HPE 1U Small Form Factor Easy Install Rail Kit
1	HPE 5 Year Tech Care Basic DL160 Gen10 Service
1	HPE Installation ProLiant DL160/DL360e Service

2. AMR Workstation System– HP Make

Qty	Product Description
1	HPE ProLiant ML350 Gen10 Hot Plug SFF with RPS Enablement Kit Configure-to-order Server
1	Intel Xeon-Silver 4208 (2.1GHz/8-core/85W) FIO Processor Kit for HPE ProLiant ML350 Gen10
1	Intel Xeon-Silver 4208 (2.1GHz/8-core/85W) Processor Kit for HPE ProLiant ML350 Gen10
2	HPE 16GB (1x16GB) Dual Rank x8 DDR4-2933 CAS-21-21-21 Registered Smart Memory Kit
2	HPE 2TB SAS 12G Business Critical 7.2K SFF SC 1-year Warranty 512e HDD
1	HPE Smart Array E208i-a SR Gen10 (8 Internal Lanes/No Cache) 12G SAS Modular Controller
2	HPE 800W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit
1	HPE ML350 Gen10 AROC Mini-SAS Cable Kit for SFF Configuration
1	HPE ML350 Gen10 Redundant Fan Cage Kit with 4 Fan Modules
1	HPE 5 Year Tech Care Basic ML350 Gen10 Service

3.3 Software for AMR Application Servers

In AMR application Servers, Windows Operating System will be installed, and MS SQL Server will be installed as RDBMS. (Database Management). Details of those license version software are given below. This OEM license will be valid for 05 years from the date of material delivery and will have comprehensive support for the period.

Item Name	Description	OEM	Qty	Remarks
MS OS License 2019.	MS WS19 (16-Core) Std ROK en SW	Microsoft	3	03 Windows license for three Servers. (02 application Servers, 01 Workstation)
MS Office License 2021	MS Office LTSC Standard 2021	Microsoft	3	03 MS Office license for three Servers. (02 application Servers, 01 Workstation)
MS SQL Server License 2019	SQL Server 2019 Standard Core - 2 Core License Pack - Commercial	Microsoft	2	02 Database will be installed in 02 AMR Application Servers.

All comprehensive 05 supports will be from respective OEM. SLA will be maintained for issue rectifications. All required documents from OEM, will be submitted to PGCIL during material delivery time.

4. New AMR Application Development

The AMR application has been developed and installed in AMR System in Mar-2013. Since then, the same application is running in AMR system. Application replacement is needed for smooth execution of AMR system and to follow all the Security Compliance policies, as per Cyber Security Guideline policy by CERC. New AMR application will be developed. The detailed overview of new AMR Application development is mentioned in below sections. This new Application will have 05 years Comprehensive Support, from the date of delivery to PGCIL.

4.1 Scope and Objective of AMR Application

The following are the major scope and Objectives of AMR Application. New AMR application will have all the existing functionalities with some new features.

- Dumping of Raw data file of Energy Meter.

- Processing raw data file and store data in Database.
- Handling and processing of large number of data files at a time.
- Provide User Interface.
- Viewing Live Dashboard for AMR communication status.
- Generating various Reports. (Like NPC, Energy Flow, Load Duration, Time deviation etc.)

4.2 Design Approach and Pre-Requisites

- This new application will be developed in Latest Version of JAVA. (JRE 17)
- Web designing will be done using HTML/CSS, Angular JS (version 1.8).
- A web application resource file (.war) will be deployed in Apache Tomcat Server. This Deployment will be done in AMR Application Servers.
- Required JRE and JDL will be installed at AMR Servers.
- The application will be hosted in ERLDC LAN Network.
- User will be able to access the AMR application using any Web Browser. (Platform independent).
- Application will be running at both AMR Primary and Backup Server, for better Redundancy.
- Application will go through software patch update regularly.

4.3 Application: Security Aspects

- Application will go through all Security testing. SSA (Software Security Assurance) review and Audit will be done.
- SSA review will be done against each unit/section wise development.
- Comprehensive SSA Certificate will be provided before going into Live Environment.
- Any change in Application will go-through SSA review.

4.4 AMR Application: Overview with Snapshots

In this section, the new AMR Application over and functionalities are being described in a high-level.

4.4.1 AMR Login Page:

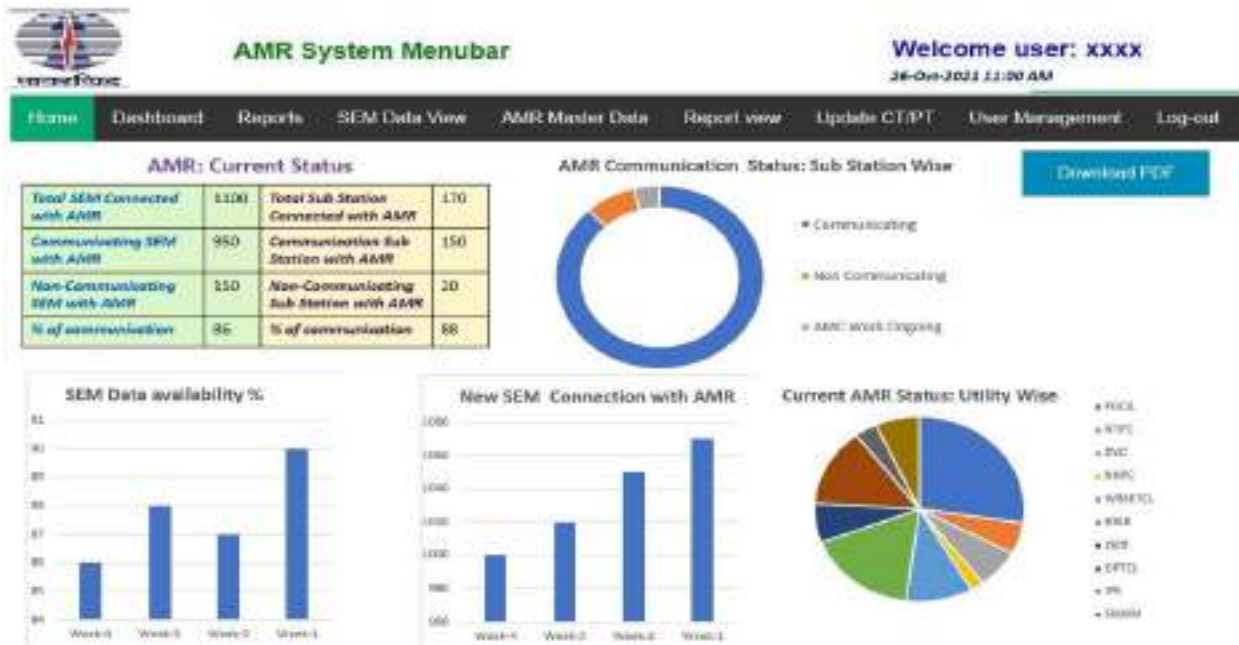
The new AMR Login page will have two level of Security authentication, password, and OTP.



- User will provide Username and password. If valid then system will ask for OTP.
- OTP will be sent to registered Mobile number. After successful OPT Verification, user will log in to system.
- Password policy to be followed.
- Periodic change of password.
- Password Reset/ Update/ Forget Password function.
- Auto Logout during Ideal time.

4.4.2 AMR Home Page:

Once User successfully logged into AMR system, the following Home Page will be displayed.



- Representation of AMR communication status.
- Representation of new AMR connection.
- Representation of AMR installation status- Utility Wise.
- Both Graphical and Tabular Representation will be there (as per above screen shot).
- This will give the status of AMR system on the given date.
- This can be downloaded in PDF/Word format.

4.4.3 AMR Dashboard:

AMR Live Dashboard will be like this. This Dashboard will give the live communication Status of Each Sub Station.

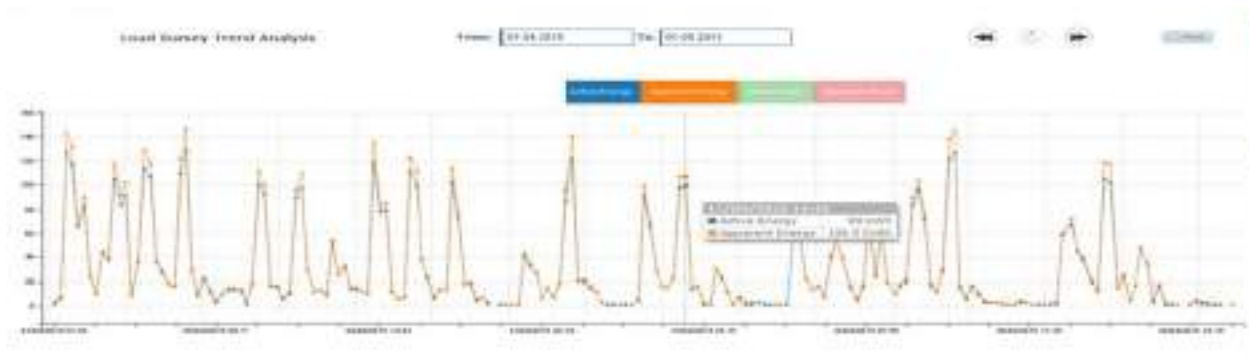
Sub Station Search							
Sl No.	Sub Station	Utility	DCU Hostname	Total Meter	Communicating Meter	Non Communicating Meter	View Details
1	Subhasgram	PGCIL	100	10	10	0	View
2	Maithon	PGCIL	200	10	9	1	View
3	Durgam	PGCIL	300	10	0	10	View

- Sub Station Wise Search/ Filter.
- Click on View Button, for SEM Details and Data Pooling time.
- Auto Refresh of Dashboard.
- Scroll in both horizontal and Vertical.

4.4.4 AMR Reports:

AMR Application will have the following Reports.

- **NPC Reports**
 - **Diagnostic Report (Dashboard)**
 - **Frequency with Load Curve**
 - **Max Min (MW) Flow Report**
 - **Reactive Energy Flow**
 - **Time Deviation Report**
 - **Daily Export Import Report**
 - **Load Duration Curve**
 - **Net Injection Report**
 - **Trend Analysis of Energy (Meter/Feeder wise)**
- Generating Reports as per given date. (same as existing process).
 - Report will be sent to Users Mail.
 - All Report stored at specific folder.
 - NPC report can be downloaded SEM Wise, Sub Station Wise, Utility Wise, All Sub Station.
 - Trend Analysis report is the new one. Snapshot given below.



- Graphical Representation of block wise data.
- Active and Reactive power flow for a given SEM in given period.

- Mouse Pointer hovering will show the Parameter Value.
- Report Can be downloaded in PDF/Word format.

4.4.5 AMR SEM Data View:

- Data View of selected SEM. (General Info, LS Data, MIDN Data)
- **General Info:** SEM info like Feeder, Sub Station, CT PT, Location ID etc. with Last LS & MIDN data timestamp.
- **Load Survey:** 15 mins block-wise data for given period (Wh_Net, Frequency).
- **Midnight Data:** 00:00 hrs. data (Active and Reactive Energy) view for given period.
- Data view with/without MF of Meter.
- Data download option in required format. (word, excel, pdf)

4.4.6 AMR Master Data View:

Sub Station

Search

Sub Station	Utility	Total SEM	GENUS	I&T	Total DCU	Connectivity	ISP	SIM Code	SIM No.	Contact
Subhasgram	PGCIL	20	15	5	1	LAN	NA	NA	NA	sem@powergrid.in 9876543210

- Details of all Sub Stations.
- Search, Filter and download options.

4.4.7 AMR Report View:

- Show all downloaded reports.
- Separate Folders based on Reports.
- Folders/ Files with Date-Time Stamp.
- Options to download files/folders in User's system.

4.4.8 Update CT/PT Ratio:

Sub Station	Utility	SEM Sl No.	Feeder	CT Primary	CT Secondary	PT Primary	PT Secondary	Last CT/PT updated	Action
Subhasgram	PGCIL	ER-1183-A	Feeder-1	1000	1	220	110	20-Oct-21	Edit
Subhasgram	PGCIL	ER-1183-A	Feeder-2	1000	1	220	110	20-Oct-21	Edit
Subhasgram	PGCIL	ER-1183-A	Feeder-3	1000	1	220	110	20-Oct-21	Edit

- Only Admin User have the privilege.
- CT/PT can be searched and Updated SEM/ Sub Station Wise.
- CT/PT report can be downloaded in Excel/PDF.

4.4.9 User Profile Management:

User specific privilege will be given for accessing AMR system and the Features. Admin User have the full access of entire AMR Application. Normal user will have role specific access.

- o Normal User: Check and update user info details of individuals.
- o Admin User:
 - o Create new User with specific role.
 - o Set Role base access to features.
 - o Check all user info and download in report format.
 - o Make users active/ inactive.
 - o Check User Log for respective end users.

4.5 AMR Application: Dumping and Data File Processing

AMR application will do the dumping and processing of raw data file of SEM. Data files will be dumped and processed with greater speed. Data insertion into Database will be done simultaneously. Background scripts will be running to speed up the data handling and processing, with ~ zero loss of any raw data file. Dumping script will be deployed in both primary and backup Servers of AMR. Dumping will work in redundancy mode.

Multithreading will be used to control and handle the multiple scripts and programs, that will run for data dumping. This will reduce the time of data dumping significantly. Once any SEM raw data file comes into M2M Server, the same file will be taken and processed immediately and respective data values will be stored into database. At the same time, AMR live dashboard will be updated with the latest time of data retrieval and dumping into AMR. The number of scripts will be increased with proportion to the number of SEM increases in AMR system.

4.6 AMR Application: Load Balancing and Mirroring

AMR application will do the dumping and processing of raw data file of SEM. And using the application, End Users will be able to generate and download various reports. For smooth running of system and do proper load balancing and consumption of database, there will be specific rule setup. Bulk report generation (like NPC report of all Sub Stations, many utilities etc.) will be restricted to max 02 users at a time. Once the reports are generated, then next user will be able to generate bulk reports. Proper pop-up message will be displayed if user is on queue to generate Bulk size reports.

AMR application and AMR Database will be installed at both Primary and Backup application Servers. In ideal scenario, AMR Primary Server will be working in Live environment (both AMR

Application and Database). Raw SEM Data processing and dumping will be done, along with the required UI for AMR system access and report generation. There will be Database mirroring between the Primary AMR Server and Secondary AMR Server database. All required SEM data will be stored in Secondary Server database (along with Primary Server DB). If there is any issue with the Primary Server, then the Secondary Server AMR application will be put in Live Environment. Both SEM data file dumping and UI access will be achieved through the Secondary Server. This will ensure the ~ zero data loss and AMR system availability will be kept as ~ 99%. (except any exceptional scenarios).

4.7 Exclusions

This TS document is for “AMR Hardware, Software and Application Refreshment at Data Centre.”. The scope is to refresh the existing AMR system Hardware, software and Applications which are old (almost 9 years). There is no change in the basic Architecture of existing AMR system. The methodology which are currently being used for SEM data retrieval through DCU and data transmission to ERLDC (via GPRS or LAN) will remain same. Any change in the existing Network setup (Like Public IP address, Current LAN IP, internal IP for AMR access etc.) have not being considered in this scope.

Providing required DC Infra is part of PGCIL scope. PGCIL has to provide the required AMR Rack space and Power Supply needed for all the Hardware. And, maintaining the DC Infra is not in our scope. (As per the existing and ongoing architecture of AMR)

This is for the AMR Data Centre part only. No DR (Disaster Recovery) site been considered here.

Hardware, Software & Application refreshment at Data Center, for PGCIL AMR System

Techno Commercial Proposal, Apr 2022

**for Power Grid Corporation of India Ltd. – Eastern
Region (PGCIL - ER)**

April 28, 2022

TCS Offer No. TCS/PGCIL/AMR-HWSW/TECH-COM/01/0422 DT 28.04.2022

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1. Reference

Refereeing to PGCIL AMR system installation at Data Centre, which had been done in Mar-2013 period. All the hardware and its corresponding software have crossed the End of life. Referring CERC/CEA regulations, refreshment required of IT hardware and software.

Referring to the technical presentation given on 26-Oct-21 to PGCIL, subsequent mail request from PGCIL dated. 26-Oct-21, PGCIL mail dated 12-04-2022 for resubmitting the revised offer and Technical Specification document submitted to PGCIL (Ref#: TCS/PGCIL-AMR/TS/01/0422 DT 28.04.2022), we hereby submitting the Techno Commercial proposal for “AMR Hardware, Software and Application Refreshment at Data Centre.”

2. Scope of Work (SoW), Exclusions & Timelines

2.1.1 Scope of Work

1. Supply and installation of AMR DC Hardware, as per the existing system architecture. Hardware details and Spec are in below table.

SL No.	Item	Make	Model	OEM Support
1	Firewall	CISCO	Cisco Firepower 1140	05 years
2	Router	CISCO	Cisco ISR 4221 SEC	05 years
3	L3 Switch	CISCO	Catalyst 9200L 24-port data	05 years
4	Application Server	HP	HPE ProLiant DL160 Gen10, with 64 GB RAM, 4TB HDD (RAID-1), Intel Xeon-Silver 4208 Processor	05 Years
5	Tower Server	HP	HPE ProLiant ML350 Gen1, with 32 GB RAM, 2TB HDD (RAID-1), Intel Xeon-Silver 4208 Processor	05 Years

- 05 years OEM Support starting from Delivery of Hardware to PGCIL.
2. Supply and installation of required software. Details as below.

SL No	Item	OEM	Remarks
1	Windows Operating System 2019, MS Office 2021	Microsoft	With SA, and patch update.
2	SQL Server 2019 standard Version, for RDBMS	Microsoft	With SA, and patch update.

3. All the Hardware will have 05 years back-to-back OEM Support. Support period will start from the date of Delivery of hardware materials to PGCIL.
4. Standard SLA will be followed, as per OEM, for any issue rectification.
5. Hardware installation and Rack fitting (at Data Centre, ERLDC) will be done.
6. Hardware configuration will be done as per the existing required AMR architecture.
7. All Server hardening will be done as per standard practice.
8. Firewall rule reconciliation will be done periodically.
9. New AMR application will be developed, with required features. New application will be developed in latest JAVA version.
10. Existing and new features will be developed. (As per Technical Document submitted)
11. Application development, installation, testing and deployment in production will be done unit wise.
12. Application will be hosted in LAN network of Data Center.
13. Feasible Security aspects will be taken care, during the development phase.
14. New AMR application software will have support and will go-through periodic SSA Audit/review by TCS internal team.
15. New application will go through required patch updates periodically.
16. 05 years support will be provided, support will start from the date of delivery to PGCIL.

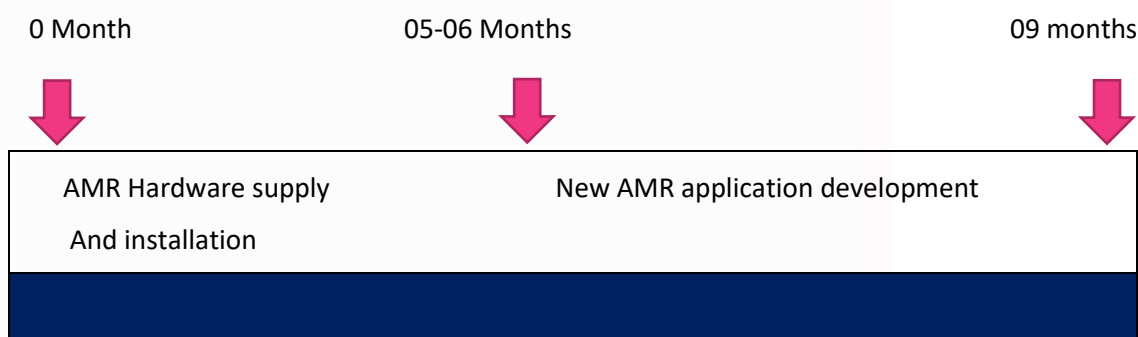
2.1.2 Exclusions

1. New Rack installation at Data Center is not considered. Rack and required Power Supply, Network Ips etc. to be given by ERLDC. (This is as per the existing setup).
2. No change in the existing network Architecture of AMR. (Like Public IP, internal IP addresses etc.)
3. Any DR site setup is not considered here.
4. Maintenance of Data Centre Infra is not in our scope.
5. Hardware setup will be done as per the existing architecture, no new architecture (like public IP change, 05 mins scheduling SEM etc.) will be considered in this scope.
6. Application development will be as per the existing system with new features (as demonstrated in technical presentation). Any new change will be part of separate change request.

7. Hosting of new AMR application software will be same as per the existing architecture. (In ERLDC LAN network). Hosting into another LAN zone, or WAN zone or open internet is out of our scope.
8. Public IP Network monitoring and Security control will not be in scope of us. Inclusion of direct ISP link to AMR network is not feasible in this scope.
9. This proposal is only for the HW and SW of ERLDC Data Center. Any Sub Station related hardware/software change (in DCU) are not considered.
10. Conducting VAPT of AMR hardware is not in our scope.

2.1.3 Hardware software and application refreshment timeline.

Indicative timeline for the execution of the project is given below



3. Commercials

3.1 Items

The Cost for new Hardware, software and the Development of new AMR application are mentioned briefly in below sections and tables.

3.1.1 COST of Component of Hardware and OS Supply Items. (A)

SL No	Item Description	Unit	Qty	Unit- Ex Work Cost (INR)	Unit- Ex Work Cost (INR)
1	Networking Devices- CISCO make (1 Firewall, 1 Router, 1 Switch) with 05 Years Comprehensive OEM Support (from the date of Delivery)	No	1	28,77,406.00	28,77,406.00
2	AMR Servers- HP make (2 Rack Servers, 01 Tower Server) along with required Operating system (Windows Server 2019) and MS Office 2021 license, with 05 Years Comprehensive OEM Support (from the date of Delivery)	No	1	18,00,537.00	18,00,537.00
Total Cost					46,77,943.00.00

3.1.2 COST of Component of Software Supply Items. (B)

SL No	Item Description	Unit	Qty	Unit- Ex Work Cost (INR)	Unit- Ex Work Cost (INR)
1	SQL Server 2019 license, for RDBMS with 05 Years Comprehensive OEM Support (from the date of Delivery)	No	2	3,51,308.50	7,02,617.00
Total Cost					7,02,617.00

3.1.3 COST of Component of AMR Application Development (C)

SL No	Item Description	Unit	Qty	Unit- Ex Work Cost (INR)	Unit- Ex Work Cost (INR)
1	New AMR application development with all features	Item	1	8569233	85,69,233.00
Total Cost					85,69,233.00

3.1.4 TOTAL COST OF OWNERSHIP (TCO)

TOTAL COST OF HW SUPPLY (w/o taxes) (A)	TOTAL COST OF SW SUPPLY (w/o taxes) (B)	TOTAL COST OF Application Development (w/o taxes) (C)	TOTAL COST OF OWNERSHIP (w/o taxes) A+B+C = T
46,77,943.00	7,02,617.00	85,69,233.00	1,39,49,793.00

Total Cost of Ownership in figures without taxes: 1,39,49,793.00 /-

Total Cost of Ownership in words without taxes: One Crore Thirty Nine Lakhs Forty Nine Thousand Seven Hundred Ninety-Three Rupees only.

Note:

- 1) *These prices are exclusive of all applicable taxes, duties, freight, and insurance. Taxes, duties, freight, and insurance will be extra, as applicable at the time of invoicing pursuant to the relevant 'Taxes and Duties' clause as detailed in this document.
- 2) Any change in the existing tax rates or introduction of any new taxes (applicable for this contract) will be on customer's account and will be charged at the rate applicable at the time of invoicing.

3.1.5 PAYMENT TERMS

The following payment terms are applicable for the project.

SL No	Payment Milestone
HW and SW SUPPLY	
1	100% billing after Delivery of Hardware and Software
New AMR Application Development	
2	- MS-1: 40% billing at the end of month-3 after completion of framework development in existing Servers. - MS-2: 40% billing at the end of month-6, after development completed in new Setup. - MS-3: Remaining 20% billing after completion of 2 months of deployment of the new application in new setup.

NOTE:

1. Applicable Road Permit / C-Form has to be provided by PGCIL.
2. All payment shall be released within 30 days from the date of invoice submission. Delayed payments may attract penalty @2% per month or part thereof.

4. Technical and Operational Terms and Conditions

1. All the new hardware will be delivered to Data Centre directly.
2. Hardware installation and configuration will be done at Data Centre, immediately after the Hardware delivered to PGCIL.
3. Hardware installation will be done in the existing AMR system rack.
4. Required documents like Warranty Certificate, test certificate will be provided accordingly.
5. The existing network architecture (like public IP used, network accesses and controls etc.) should remain same as it is currently working. Any network related changes will not be considered in this scope.
6. Application development will be done by remote VPN connection or physically sitting at Data Centre during the development lifecycle period.
7. After hardware installation and application development is completed, the ownership will be transferred to Customer.

8. VAPT is not part of this scope. Customer should conduct it separately. VAPT open points closure will be our scope (which are related to AMR).
9. No additional requirement will be considered.
10. Accessing of AMR system via Intranet (at ERLDC) will be same which is existing. There will be no additional access provided either any other LAN zone in ERLDC or outside ERLDC.
11. Public IP Network monitoring and Security control will not be in scope of us. Inclusion of direct ISP link to AMR network is not feasible in this scope.
12. Hosting of new AMR application software will be same as per the existing architecture. (In ERLDC LAN network). Hosting into another LAN zone, or WAN zone or open internet is out of our scope.
13. End to end security monitoring of AMR is not feasible in this scope. However, the new HW and Application software will go through TCS internal security audit process and resolution actions will be taken.

5. Commercial Terms and Conditions

The assignment will be governed by the following commercial terms and conditions.

5.1 Offer Validity

This offer is valid till May 28, 2022. Acceptance from PGCIL is expected within this period. Acceptance can be in the form of Firm Order/Contract/Letter of Award. Revalidation of offer is mandatory if acceptance is not received within the timeframe stated here.

5.2 Contract Duration

This contract will be valid for a time period as detailed in the above [Section 2.3](#) of this proposal and subject to finalization between PGCIL and TCS. This Commercial is valid with the assumption that start date of this project will be effective from 01-Jun-22.

5.3 Language of Communication

The official language of communication for the proposed assignment will be English. Further, all deliverable documents will be in the English language.

5.4 Work Order

As the first step for the assignment, post finalization of the job, PGCIL will issue TCS a Work Order with reference to TCS' proposal and acceptance of the terms and conditions.

5.5 Customer Location

This project will be done at current Data Center (ERLDC, Kolkata) premises. Required documents and signing will be done from PGCIL-ER2 RGQ office, Kolkata.

5.6 Acceptance

Keeping the project duration in mind, each deliverable delivered by TCS, which is subject to acceptance, shall be reviewed and accepted by Customer within a period of two (2) days from the date of delivery. All deliverables will be deemed accepted by Customer on successful closure of review comments, whereupon Customer shall provide sign-off letter to TCS. However, if Customer does not provide any review comments within the above mentioned period of two (2) days from delivery or written acceptance on deliverables is not received within two (2) days of its delivery, then notwithstanding anything contained herein, the deliverables shall be deemed to be unconditionally and absolutely accepted by the Customer at the end of the two (2) day period allotted for provision of such review comments.

The cost of correction of the deliverables shall be to the account of the Customer if the failure is for reasons not solely and entirely attributable to the TCS. This clause will be applicable for acceptance related to all types of deliverables, including the acceptance of such deliverables which ensures Go Live of the corresponding component as well.

5.7 Mode of Delivery

The mode of delivery for different components shall be as follows:

- a. All documentation including specifications, manuals etc. shall be delivered in softcopy format only via electronic mail.
- b. The hardware items, spares, etc. will be delivered in physical form at ERLDC, Kolkata office.
- c. All third-party licenses, if applicable, shall be delivered in softcopy/electronic format.
- d. Links to download sites, for licensed software downloads, as provided by OEM, shall be shared with Customer. All such downloads will be carried out by Customer.

5.8 Third Party Licenses/ Agreements

Customer shall be responsible for signing of all Third Party Licenses/Agreements as required for timely execution of the project. All terms and conditions will be as detailed in the corresponding End User License Agreements.

5.9 TAXES

Prices quoted are exclusive of all applicable taxes, duties, freight, and insurance. Taxes, duties, freight, and insurance will be extra, as applicable at the time of invoicing pursuant to the relevant '**Taxes and Duties**' clause as detailed in this document. Building CESS is not part of this job.

5.10 Assistance

PGCIL will ensure, through its Project Co-ordinator, transfer of information, specification of mutually agreed change-requirements (Change Requests), availability of materials such as documents and equipment, meetings with relevant users and other personnel among other requisites for TCS to understand and document the same for the purpose of time-bound formal approval by the PGCIL, before the service is undertaken by TCS.

Necessary and sufficient time will have to be spent by PGCIL personnel with TCS personnel during this stage of the assignment.

5.11 Methodology and Techniques

TCS standards, methodology, tools, and techniques will be used for maintaining the software, in the absence of PGCIL standards. However, in the event of any PGCIL specific standards, the same can be used for maintaining the software application.

5.12 Delegation

Neither PGCIL nor TCS will have the right to delegate any rights or obligations concerning the proposal without the written consent of the other party.

5.13 Additional Support and Services

In case the PGCIL requires any additional support in execution of its tasks in respect of the assignment, it shall be provided to them by TCS on availability-basis at then current market rate of TCS.

5.14 Travel and Related Expenses

In case, the assignment requires any travel by TCS experts outside the customer location mentioned above, PGCIL will bear all expenses for such travel after mutually discussed with all stakeholders.

5.15 Taxes and Duties

TCS shall be reimbursed its liability for payment of any statutory duty/tax/levy including interest and/or new or an increase in the rates of existing taxes or any other sum, if any payable in respect of any sales tax and/or any other state or central levy, including GST. This will apply retrospectively, if so applicable upon TCS.

5.16 Warranty

Except as set forth in the Agreement to be finalized, TCS makes no warranties to PGCIL, express or implied, with respect to any services or deliverables provided hereunder, including, without limitation, any implied warranties of merchantability or fitness for a particular purpose. All such other warranties are hereby disclaimed by TCS.

5.17 Non-Employment

PGCIL will neither offer to employ nor employ, directly or otherwise, any TCS employee associated for the purpose of or with the proposed assignment during the period between the date of this proposal and two years from the completion of the assignment arising from it.

5.18 Confidentiality

Both parties and their respective employees may, in the course of their business relationship with the other, acquire or be exposed to information that is proprietary or confidential to the other party, its affiliates or its or their respective Purchasers.

Both parties undertake to hold all such information in strictest confidence and further undertakes not to (i) disclose such information either in whole or in part to any person other than those of its officers, employees and agents who need to know the confidential information for the purpose authorized hereunder provided that each such officer, employee or agent has agreed in writing to maintain the confidentiality of the confidential information in accordance with the terms hereof or (ii) use such

information for any purpose whatsoever save as may be strictly necessary for the performance of the obligations of that party under this Agreement.

The receiving party shall indemnify and hold harmless the other party and their directors, officers, employees, agents, and representatives from and against all or any claims, damages, losses, liabilities, or expenses (including, but not limited to, reasonable attorneys' fee and disbursements), [however incurred], arising out of a breach of this undertaking by either party or their officers.

The parties agree that money damages would not be a sufficient remedy for any breach of this undertaking by the receiving party, and that in addition to the remedies provided in this Agreement and any other remedies, the aggrieved party shall be entitled to specific performance and injunctive or other equitable relief as a remedy for any such breach.

However, nothing in this clause shall prevent the receiving party from treating confidential information as non-confidential, if such information is:

- i) in the possession of, or was known to receiving party prior to its receipt, without an obligation to maintain its confidentiality.
- ii) becomes generally known to the public without violation of this agreement by the receiving party.
- iii) obtained by receiving party from a third party (i) who the receiving party does not know to have violated, or to have obtained such information in violation of any obligation to the disclosing party with respect to such information, (ii) who does not require the receiving party to refrain from disclosing such information and (iii) who has the right to disclose it, without the obligation to keep such information confidential.
- iv) independently developed by receiving party without the use of confidential information and without the participation of individuals who have had access to confidential information.
- v) is required to be disclosed by the receiving party under the compulsion of law, or by order of any court or government or regulatory body to whose supervisory authority the receiving party is subject; provided that, in any such event, the receiving party shall give the disclosing party notice in writing as soon as practicable (which shall, subject to the applicable law, be prior notice where possible and not later than 30 days after the disclosure) of any disclosure, and the receiving party shall use its best effort to obtain assurance that the disclosed information will be accorded confidential treatment.

This clause shall survive the expiry or earlier termination of this Agreement and for a period of two years thereafter.

5.19 Risk Purchase

During the period of contract, if the contractor fails to rectify any defect pointed out to him, the same shall be got done by POWERGRID at the risk and cost of contractor, which shall not exceed 5% of the value of the undelivered goods/services and recovered from any other amount payable to the contractor.

5.20 Sub-Contracting

TCS shall be free to sub-contract any portion of the work. Details of sub-contractors will be shared with Customer for reference purposes. Responsibility for the sub-contractors performance and compliance to contract terms and conditions shall be with the TCS.

5.21 General Indemnity

Customer will, during the period of the coverage of this Contract defend, indemnify and hold TCS harmless from any costs, expenses, loss, injury, claim or damage resulting from (i) any death or injury to any person or property of TCS arising out of the use or possession of the equipment or location of Customer by TCS or its personnel (ii) any action or claim that may be made or initiated against the TCS by any third parties alleging infringement of their rights arising out of any materials provided by Customer to the TCS and the limitation or liability provided herein shall not apply to such loss, injury, claim or damages.

5.22 Patent Indemnity

Customer shall indemnify and hold harmless TCS and its employees, officers and subcontractors from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, which TCS may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Agreement arising out of or in connection with any design, data, drawing, specification, or other documents or materials provided by Customer.

5.23 Patent Infringement

TCS shall have no liability for any claim of infringement based on: (i) use of a superseded or altered release of some or all of the deliverables including, but not limited to, Customer's failure to use corrections, fixes, or enhancements made available by TCS ; (ii) the combination, operation, or use of some or all of the deliverables or any modification thereof furnished under this Agreement with information, software, specifications, instructions, data, or materials not furnished by TCS if the infringement would have been avoided by not combining, operating, or using the deliverables or the modification thereof; (iii) some or all of the deliverables or the modification thereof, which is based on Customer's material, data or design; (iv) any change, not made by TCS, to some or all of the deliverables or any modification thereof or (v) use of the deliverables otherwise than for the purposes authorized hereunder.

If any of the deliverables is held or is believed by TCS to infringe, TCS shall have the option, at its expense, to (i) modify the deliverables so as to make it non-infringing, (ii) obtain for Customer a license to continue using the deliverables, or (iii) terminate the license for the infringing part of the deliverables and refund a pro rata portion of the fees paid for that portion of deliverables. This clause provides for TCS's entire liability and Customer's exclusive remedy for claims of infringement of intellectual property rights related to the deliverables.

Each of the parties shall separately defend, indemnify, and hold each other harmless from and against any liability, loss, costs, or expenses (including reasonable Attorney's fees) arising out of or resulting from breach of the provisions herein.

5.24 Notices

All notices, requests, demands and other communications under this proposal or in connection herewith shall be given to or made upon the respective parties as follows –

- TCS – Anando Bhattacharya, Tata Consultancy Services, Delta Park Eden, Plot B1, Salt Lake Electronics Complex, Sector V, Salt Lake, Kolkata 700091, West Bengal, Phone # 9874162233
- OR**
- TCS – Sourav Bera, Tata Consultancy Services, Delta Park Eden, Plot B1, Salt Lake Electronics Complex, Sector V, Salt Lake, Kolkata 700091, West Bengal, Phone # 03366369242,
 - PGCIL – as informed to TCS from time to time

Or to such other person or addresses as any of the parties shall have notified to the others.

All notices, requests, demands, and other communications given or made in accordance with the provisions of this proposal shall be in writing by letter, fax, or email.

5.25 Force Majeure

If the performance specified in the proposal is prevented, restricted, delayed, or interfered with by reason of:

- Fire, explosion, cyclone, floods.
- War, revolution, acts of public enemies, blockage of embargo.
- Any law, order proclamation, ordinance, demand, or requirements of any Government or authority or representative of any such Government, including restrictive trade practices or regulations.
- Strikes, shutdowns or labour disputes which are not instigated for the purpose of avoiding obligations herein; or
- Any other circumstances beyond the control of the party affected.

then notwithstanding anything here before contained, if such an event lasts for a continuous period of thirty (30) days then either party may at any time thereafter while such performance continues to be excused, terminate this assignment without liability, by notice in writing to the other party. However, TCS shall be entitled to receive payments for all services rendered by it under this assignment.

5.26 Waiver

No forbearance, indulgence, or relaxation by any party at any time to require performance of any provision of this proposal shall in any way affect, diminish or prejudice the right of such party to require performance of that provision and any waiver by any party or any breach of any provisions of this proposal shall not be construed as a waiver or an amendment of the provisions itself or a waiver of any right under or arising out of this proposal.

5.27 Severability

If any term, clause, or provision of this proposal shall be judged to be invalid for any reason whatsoever, such invalidity shall not affect the validity or operation of any other term, clause or provision of this proposal and such invalid term clause or provision shall be deemed to have been deleted from this proposal.

5.28 Assignment

Neither party shall be entitled to assign or transfer all or any of its rights, benefits, and obligations under this proposal without the prior written consent of the other party.

5.29 Non-exclusivity

TCS shall be free to do similar business either for itself or for any other party or offer similar services to any third parties but without in any way affecting the services agreed to be offered by TCS under this proposal.

5.30 Independent Relationship

This proposal is not intended to create a relationship such as a partnership, joint venture, agency, or employment relationship. Neither party may act in a manner which expresses or implies a relationship other than that of independent party nor bind the other party.

5.31 Modification

This proposal may be modified only by an amendment executed in writing by a duly authorized representative for each party.

5.32 Publicity

Neither party shall publicize any information pertaining to this assignment or the other party without seeking the prior written consent of the other party.

5.33 Entire Understanding

This proposal together with the Schedules, Annexure, and Exhibits hereto and executed by the Parties hereto constitutes the entire understanding between the Parties hereto with respect to the subject matter hereto and supersedes and cancels all previous negotiations thereof.

5.34 Survival

The clauses of this proposal which by their nature are intended to survive shall so survive the termination / expiry of this proposal.

5.35 Liability

TCS shall not be held liable for any delay or failure in its obligations, if and to the extent such delay or failure has resulted from a delay or failure by or on behalf of Customer to perform any of Customer's obligations. In such event, TCS shall be (a) allowed additional time as may be required to perform its obligations, and (b) entitled to charge Customer for additional costs incurred, if any, as may be mutually agreed upon between the parties.

Neither party shall be liable to the other for any special, indirect, incidental, consequential (including loss of profit or revenue), exemplary or punitive damages or loss of data whether in contract, tort, or other theories of law, even if such party has been advised of the possibility of such damages.

The total cumulative liability of either party arising from or relating to this Contract shall not exceed the total amount paid to TCS by Customer under that applicable work in the last twelve (12) months for the services that gives rise to such liability (as of the date the liability arose).

5.36 Intellectual Property Rights

- i. Subject to provisions of the Scope of Agreement including the Scope of Work and Financials as finalized between both organizations, all deliverables created and developed by TCS specifically and exclusively for Customer, together with any associated copyright and other intellectual property rights, shall be the sole and exclusive property of Customer, provided all payments due to TCS for the deliverables rendered under the Agreement, have already been paid by Customer to TCS.
- ii. All Intellectual Property Rights of TCS in its software, tools, processes, utilities, methodology, proprietary products and/or components including any development, customization, enhancement etc. carried out by TCS thereto of and on its own software, tools, processes, utilities, methodology, proprietary products and/or components in the course of providing services hereunder, shall remain the exclusive property of TCS ("TCS Pre-Existing IP") and Customer shall not acquire any right title or interest of any nature on TCS Pre-Existing IP except to the extent provided herein.
- iii. Similarly, all Intellectual Property Rights (IPR) in any Third-Party Software used in providing services including those forming part of or incorporated into the deliverables shall remain with the respective Third-Party owners / vendors licensor and Customer shall have user rights in accordance with End User License Agreement (EULA) as applicable to use of such software.

- iv. Each party shall be entitled to use in the normal course of its business and in providing same or similar services or development of similar deliverables for its other clients, the general knowledge and experience gained and retained in the unaided human memory of its personnel, in the performance of the Agreement. For the purpose of clarity, TCS shall be free to provide any services or design any deliverable (s) that perform functions same or similar to the deliverables being provided hereunder for Customer, for any other client or customer of TCS (including without any limitation any affiliate, competitor, or potential competitor of Customer).

5.37 Statutory and Regulatory Requirements

All the required details with respect to statutory and regulatory requirements relevant to the realization of the product/service will be made available to TCS by Customer. Where such requirements will not/cannot be provided to TCS, the onus shall be on Customer to make it explicitly known to TCS at the very outset.

5.38 Relief Events

TCS shall not be liable or responsible for any delay or failure to perform Support Services and/or Development Services or other services under this Proposal to the extent that such delay or failure to perform has arisen as a result of any delay or failure by Customer or its employees or agents to perform any of its duties and obligations as set out in this Proposal and the applicable Work Package/Statement of Work. In the event that TCS is delayed or prevented from performing its obligations due to such failure or delay on the part of Customer, TCS shall be allowed an additional period of time to perform its obligations and unless otherwise agreed the additional period shall be equal to the amount of time for which TCS is delayed or prevented from performing its obligations due to such failure or delay on the part of Customer. TCS shall be entitled to invoice Customer for the TCS's incremental costs (over and above the Charges) as a result of such failure or delay on the part of Customer.

5.39 Termination

Either party can terminate the agreement with **Two (2) months'** notice in writing for non-performance of any of the articles of this agreement by the other party or for any other reasons.

Termination shall be without prejudice to any other rights or remedies a party may be entitled to hereunder or at law and shall not affect any accrued rights or liabilities of either party nor the coming into force or continuation in force of any provision hereof which is expressly intended to come into force or continue in force on or after the termination.

In the event of this assignment being terminated, PGCIL shall be liable to make payments of the entire amount due under this assignment for which services have been rendered by TCS' consultants. Forthwith on the expiry or earlier termination of this agreement, each party shall, return to the other party all documents and materials, belonging to the other party with regard to this assignment or shall at the option of the disclosing party destroy all documents or materials in connection with this assignment

5.40 Tata Code of Conduct

We, in our dealings, are self-regulated by the "Tata Code of Conduct. We request your support in helping us adhere to the Code in letter and spirit. We request that any violation or potential violation of the Code by any person be promptly brought to the notice of the Ethics Counsellor (corporate.ethics@tcs.com) or the CEO of TCS. All communication received in this regard will be treated and kept as confidential.

Contact

For more information contact,

Anando Bhattacharya

Client Partner

Energy, Resources, Utilities, & Infrastructure (ERUI),

Tata Consultancy Services

Eden Building, Plot – B1, Block EP & GP

Sector V, Salt Lake, Kolkata 700091

India

Cell: +91 9874162233

Mailto: anando.bhattacharya@tcs.com

About Tata Consultancy Services (TCS)

Tata Consultancy Services is an IT services, consulting and business solutions organization that delivers real results to global business, ensuring a level of certainty no other firm can match. TCS offers a consulting-led, integrated portfolio of IT and IT-enabled infrastructure, engineering, and assurance services. This is delivered through its unique Global Network Delivery Model™, recognized as the benchmark of excellence in software development. A part of the Tata Group, India's largest industrial conglomerate, TCS has a global footprint and is listed on the National Stock Exchange and Bombay Stock Exchange in India.

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IT Services

Business Solutions

Consulting

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SET-I

DIRECT LAN CONNECTIVITY POSSIBLE BY PORT OPENING: -

S/NO	Utility Name	Substation Name
1	BIHAR	ARAH(ARB)
2	POWERGRID	BINAGURI(BIN)
3	JHARKHAND	CHANDIL(CHN)
4	IPPR	CHUZACHEN(CZN)
5	JHARKHAND	DALTONGANJ
6	DMTCL	DARBHANGA
7	DMTCL	DARBHANGA
8	NTPC	DARLIPALLI
9	POWERGRID	DURGAPUR(DGP)
10	CESC	EMSS(EMS)
11	GRIDCO	GMR(GMR)
12	CESC	HALDIA(HAL)
13	GRIDCO	INDRAVATI(IND)
14	SIKKIM	JORTHANG
15	BIHAR	KAHALGAON(KAH)
16	WEST BENGAL	KALIMPONG(KLM)
17	BIHAR	KARMANASHA NEW
18	BSPTCL	KHIZIRSARAI
19	BIHAR	KUDRA(KUD)
20	WEST BENGAL	KURSEONG(KSG)
21	BIHAR	LAUKAHI
22	IPPR	MAITHON POWER LTD (MRB)
23	IPPR	MAITHON POWER LTD (MRB)
24	DMTCL	MOTIHARI
25	DMTCL	MOTIHARI
26	BSPTCL	MOTIPUR
27	NTPC	NABINAGAR
28	BIHAR	NEW PUSAULI(NPS)
29	GENERATOR	OPGC 400KV
30	JHARKHAND	PATRATU(PTJ)
31	BIHAR	PURNEA(PUR)
32	WBSETCL	RAMMAM(RMM)
33	BIHAR	RAXAUL
34	GRIDCO	RENGALI(REG)
35	GRIDCO	SADEIPALI
36	WEST BENGAL	SAGARDIGHI(SAG)
37	WEST BENGAL	SANTALDIH(SNT)
38	IPPR	STERLITE(SEL)
39	IPPR	STERLITE(SEL)
40	IPPR	STERLITE(SEL)
41	POWERGRID	LAKHISARAI(PG)

SET-II

KIOSK LOCATION WHERE ADDITIONAL CONVERTER AND FIBER
OPTICAL CONNECTIVITY REQUIRED: -

S/NO	Utility Name	Substation Name
1	IPPR	ADHUNIK(APNRL)
2	IPPR	ADHUNIK(APNRL)
3	POWERGRID	ALIPURDUAR
4	POWERGRID	ALIPURDUAR
5	POWERGRID	ALIPURDUAR
6	POWERGRID	ANGUL
7	POWERGRID	ANGUL(AGL)
8	POWERGRID	BERHAMPORE(BMP)
9	POWERGRID	CHANDAUTI
10	JHARKHAND	DUMKA(DUM)
11	POWERGRID	GAYA(GYA)
12	WEST BENGAL	JEERAT(JRT)
13	POWERGRID	KEONJHAR(KJR)
14	POWERGRID	MEDINIPUR
15	SIKKIM	MELLI(MEL)
16	POWERGRID	PATNA(PAT)
17	POWERGRID	PURNEA(PRN)
18	POWERGRID	PUSAUL
19	POWERGRID	RANCHI NEW
20	POWERGRID	RANCHI NEW
21	POWERGRID	GAYA(GYA)
22	POWERGRID	NEW JEERAT

SET-III

LAN CONNECTIVITY PROVISIONALLY POSSIBLE IN DUE COURSE: -

S/NO	Utility Name	Substation Name
1	JHARKHAND	DEOGARH(DEO)
2	JHARKHAND	GARWA(GAR)
3	JHARKHAND	JAMTARA(JMT)
4	JHARKHAND	JAPLA(JAP)
5	JHARKHAND	KENDOPOS(KEN)
6	JHARKHAND	NAGARUNTARI
7	SIKKIM	RAVANGLA(RAV)
8	SIKKIM	DIKCHU

Integration of PGCIL LAN with existing DCU in AMR

Techno Commercial Proposal, Apr 2022

**for Power Grid Corporation of India Ltd. – Eastern
Region (PGCIL - ER)**

Apr 30, 2022

TCS Offer No. TCS/PGCIL/AMR-LAN/TECH-COM/01/0422 DT 30.04.2022

Proprietary Notice

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TATA Code of Conduct

We, in our dealings, are self-regulated by a code of conduct as enshrined in the “TATA Code of Conduct”. We request your support in helping us adhere to the code in letter and spirit. We request that any violation or potential violation of the code by any person be promptly brought to the notice of the Local Ethics Counsellor or the Principal Ethics Counsellor or the CEO of TCS. All communication received in this regard will be treated and kept as confidential.

Confidentiality Notice

Both parties undertake to hold information shared in the course of this business relationship in strictest confidence and undertakes not to disclose such information, either in whole or in part, to any person other than those of its officers, employees, and agents who need to know the confidential information for the purpose explicitly authorized for.

Confidential Information shall mean any information disclosed by one party (hereinafter the “Disclosing Party”) to the other (hereinafter the “Receiving Party”), either directly or indirectly, in writing, by inspection of tangible objects (including, without limitation, documents, prototypes, samples, media, documentation, discs and code). Confidential Information shall include, without limitation, documents, any materials, trade secrets, know-how, formulae, processes, algorithms, ideas strategies, inventions, data, network configurations, system architecture, designs, flow charts, drawings, proprietary information, business and marketing plans, financial and operational information, and all other non-public information, material or data relating to the current and /or future business and operations of the Disclosing Party and any analysis, compilations, studies, summaries, extracts or other documentation prepared by the Receiving Party based on information disclosed by the Disclosing Party. Confidential Information may also include information disclosed to the Receiving Party by third parties on behalf of the Disclosing Party.

REVISION LIST

Revision No.	Revision Date	Revision Description	Page No.	Rationale for Change	Change Type (Add / modify / delete)
1.					
2.					
3.					
4.					
5.					
6.					

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1. Reference

With the References of AMR Phase-4 LOA, Ref#: ER-II/KOL/CS/I-2446/P-2420/1929 Dated. 20/07/2020, Amendment Ref#: ER-II/KOL/CS/I-2446/P-2420/Amend-II/4374 Dated. 05/07/2021 and PGCIL OCC meeting dated 21-Apr-22, we are submitting the proposal for LAN integration with existing DCU of AMR system at 71 locations in PGCIL ER. Power Grid Corporation of India Ltd. (PGCIL) hereinafter referred to as customer in this proposal.

2. Scope of Work (SoW), Exclusions & Timelines

2.1.1 Scope of Work

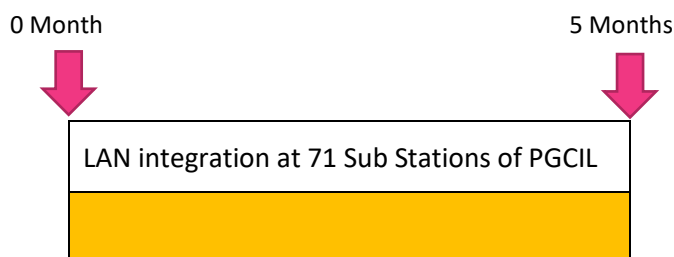
1. Integrating DCU with PGCIL LAN connection at 71 Sub Stations in Eastern Region of PGCIL.
2. Out of 71 locations, 50 are normal Sub Station type and 21 are Kisok type locations.
3. Fiber optical cable and media converters will be used for Kisok type locations to establish communication in long distance between DCU and LAN Switch of PGCIL.
4. Required Cabling work to be done to connect the DCU with the Switch port of LAN connectivity Set-Up, which is already present at Sub Stations.

2.1.2 Exclusions

1. Any civil work that is required at substations.
2. Opening Port in LAN Switch of PGCIL is not in our scope. PGCIL has to provide the required port.
3. Connectivity from respective Sub Stations to ERLDC data center should be direct path. No IP nating/hop in between.
4. MICC/CIP are not applicable against the HW items, as these are running items and will be directly installed at Respective Sub Stations.

2.1.3 LAN Integration Period

Indicative time line for the execution of the project is given below



3. Commercials

3.1 Items

The Costs for LAN integration work at 69 locations is mentioned in the below table.

3.1.1 COST of Component of Hardware Supply Items. (A)

SL No	Item Description	Unit	Qty	Unit- Ex Work Cost (INR)	Unit- Ex Work Cost (INR)
1	Fibre Optical Cable with Converters and other accessories	Mtr.	18000	94.50	17,01,000.00
Total Cost					17,01,000.00

3.1.2 COST of Component of Services. (B)

SL No	Item Description	Unit	Qty	Unit- Ex Work Cost (INR)	Unit- Ex Work Cost (INR)
1	Integration of PGCIL LAN with existing DCU	No	71	15564	11,05,044.00
2	Additional Charges for LAN Integration at Kiosk Sites	No	21	17830	3,74,430.00
Total Cost					14,79,474.00

3.1.3 TOTAL COST OF OWNERSHIP (TCO)

TOTAL COST OF HW SUPPLY (w/o taxes) (A)	TOTAL COST OF Services (w/o taxes) (B)	TOTAL COST OF OWNERSHIP (w/o taxes) A+B+C = T
17,01,000.00	14,79,474.00	31,80,474.00

Total Cost of Ownership in figures without taxes: 31,80,474.00 /-

Total Cost of Ownership in words without taxes: Thirty-One Lakhs Eighty Thousand Four Hundred Seventy-Four Rupees Only.

Note:

- 1) *These prices are exclusive of all applicable taxes, duties, freight, and insurance. Taxes, duties, freight, and insurance will be extra, as applicable at the time of invoicing pursuant to the relevant 'Taxes and Duties' clause as detailed in this document.
- 2) Any change in the existing tax rates or introduction of any new taxes (applicable for this contract) will be on customer's account and will be charged at the rate applicable at the time of invoicing.

3.1.4 PAYMENT TERMS

The following payment terms are applicable for the project.

SL No	Payment Milestone
HW SUPPLY	
1	Item will be billed quarterly with equivalent amount of qty Supplied
Services	
2	Item will be billed quarterly with equivalent amount of qty completed

NOTE:

1. Applicable Road Permit / C-Form has to be provided by PGCIL.
2. All payment shall be released within 30 days from the date of invoice submission. Delayed payments may attract penalty @2% per month or part thereof.

4. Technical and Operational Terms and Conditions

1. Opening Port in LAN Switch of PGCIL is not in our scope. PGCIL has to provide the required port.
2. Connectivity from respective Sub Stations to ERLDC data center should be direct path. No IP nating/hop in between.
3. PGCIL should provide a good Bandwidth Network (3-5 MBPS minimum) for this LAN connectivity.
4. No Civil work to be done in this Scope.
5. MICC/CIP are not applicable against the HW items, as these are running items and will be directly installed at Respective Sub Stations.

5. Commercial Terms and Conditions

The assignment will be governed by the following commercial terms and conditions.

5.1 Offer Validity

This offer is valid till May 30, 2022. Acceptance from PGCIL is expected within this period. Acceptance can be in the form of Firm Order/Contract/Letter of Award. Revalidation of offer is mandatory if acceptance is not received within the timeframe stated here.

5.2 Contract Duration

This contract will be valid for a time period as detailed in the above [Section 2.3](#) of this proposal and subject to finalization between PGCIL and TCS. This Commercial is valid with the assumption that start date of this project will be effective from 01-Jun-22.

5.3 Language of Communication

The official language of communication for the proposed assignment will be English. Further, all deliverable documents will be in the English language.

5.4 Work Order

As the first step for the assignment, post finalization of the job, PGCIL will issue TCS a Work Order with reference to TCS' proposal and acceptance of the terms and conditions.

5.5 Customer Location

This project will be done at current Data Center (ERLDC, Kolkata) premises. Required documents and signing will be done from PGCIL-ER2 RGQ office, Kolkata.

5.6 Acceptance

Keeping the project duration in mind, each deliverable delivered by TCS, which is subject to acceptance, shall be reviewed and accepted by Customer within a period of two (2) days from the date of delivery. All deliverables will be deemed accepted by Customer on successful closure of review comments, whereupon Customer shall provide sign-off letter to TCS. However, if Customer does not provide any review comments within the above mentioned period of two (2) days from delivery or written acceptance on deliverables is not received within two (2) days of its delivery, then notwithstanding anything contained herein, the deliverables shall be deemed to be unconditionally

and absolutely accepted by the Customer at the end of the two (2) day period allotted for provision of such review comments.

The cost of correction of the deliverables shall be to the account of the Customer if the failure is for reasons not solely and entirely attributable to the TCS. This clause will be applicable for acceptance related to all types of deliverables, including the acceptance of such deliverables which ensures Go Live of the corresponding component as well.

5.7 Mode of Delivery

The mode of delivery for different components shall be as follows:

- a. All documentation including specifications, manuals etc. shall be delivered in softcopy format only via electronic mail.
- b. The hardware items, spares, etc. will be delivered and installed at Sub Stations.
- c. All third-party licenses, if applicable, shall be delivered in softcopy/electronic format.
- d. Links to download sites, for licensed software downloads, as provided by OEM, shall be shared with Customer. All such downloads will be carried out by Customer.

5.8 Third Party Licenses/ Agreements

Customer shall be responsible for signing of all Third Party Licenses/Agreements as required for timely execution of the project. All terms and conditions will be as detailed in the corresponding End User License Agreements.

5.9 TAXES

Prices quoted are exclusive of all applicable taxes, duties, freight, and insurance. Taxes, duties, freight, and insurance will be extra, as applicable at the time of invoicing pursuant to the relevant '**Taxes and Duties**' clause as detailed in this document. Building CESS is not part of this job.

5.10 Assistance

PGCIL will ensure, through its Project Co-ordinator, transfer of information, specification of mutually agreed change-requirements (Change Requests), availability of materials such as documents and equipment, meetings with relevant users and other personnel among other requisites for TCS to understand and document the same for the purpose of time-bound formal approval by the PGCIL, before the service is undertaken by TCS.

Necessary and sufficient time will have to be spent by PGCIL personnel with TCS personnel during this stage of the assignment.

5.11 Methodology and Techniques

TCS standards, methodology, tools, and techniques will be used for maintaining the software, in the absence of PGCIL standards. However, in the event of any PGCIL specific standards, the same can be used for maintaining the software application.

5.12 Delegation

Neither PGCIL nor TCS will have the right to delegate any rights or obligations concerning the proposal without the written consent of the other party.

5.13 Additional Support and Services

In case the PGCIL requires any additional support in execution of its tasks in respect of the assignment, it shall be provided to them by TCS on availability-basis at then current market rate of TCS.

5.14 Travel and Related Expenses

In case, the assignment requires any travel by TCS experts outside the customer location mentioned above, PGCIL will bear all expenses for such travel.

5.15 Taxes and Duties

TCS shall be reimbursed its liability for payment of any statutory duty/tax/levy including interest and/or new or an increase in the rates of existing taxes or any other sum, if any payable in respect of any sales tax and/or any other state or central levy, including GST. This will apply retrospectively, if so applicable upon TCS.

5.16 Warranty

Except as set forth in the Agreement to be finalized, TCS makes no warranties to PGCIL, express or implied, with respect to any services or deliverables provided hereunder, including, without limitation, any implied warranties of merchantability or fitness for a particular purpose. All such other warranties are hereby disclaimed by TCS.

5.17 Non-Employment

PGCIL will neither offer to employ nor employ, directly or otherwise, any TCS employee associated for the purpose of or with the proposed assignment during the period between the date of this proposal and two years from the completion of the assignment arising from it.

5.18 Confidentiality

Both parties and their respective employees may, in the course of their business relationship with the other, acquire or be exposed to information that is proprietary or confidential to the other party, its affiliates or its or their respective Purchasers.

Both parties undertake to hold all such information in strictest confidence and further undertakes not to (i) disclose such information either in whole or in part to any person other than those of its officers, employees and agents who need to know the confidential information for the purpose authorized hereunder provided that each such officer, employee or agent has agreed in writing to maintain the confidentiality of the confidential information in accordance with the terms hereof or (ii) use such information for any purpose whatsoever save as may be strictly necessary for the performance of the obligations of that party under this Agreement.

The receiving party shall indemnify and hold harmless the other party and their directors, officers, employees, agents, and representatives from and against all or any claims, damages, losses, liabilities, or expenses (including, but not limited to, reasonable attorneys' fee and disbursements), [however incurred], arising out of a breach of this undertaking by either party or their officers.

The parties agree that money damages would not be a sufficient remedy for any breach of this undertaking by the receiving party, and that in addition to the remedies provided in this Agreement and any other remedies, the aggrieved party shall be entitled to specific performance and injunctive or other equitable relief as a remedy for any such breach.

However, nothing in this clause shall prevent the receiving party from treating confidential information as non-confidential, if such information is:

- i) in the possession of, or was known to receiving party prior to its receipt, without an obligation to maintain its confidentiality.
- ii) becomes generally known to the public without violation of this agreement by the receiving party.
- iii) obtained by receiving party from a third party (i) who the receiving party does not know to have violated, or to have obtained such information in violation of any obligation to the disclosing party with respect to such information, (ii) who does not require the receiving party to refrain from disclosing such information and (iii) who has the right to disclose it, without the obligation to keep such information confidential.
- iv) independently developed by receiving party without the use of confidential Information and without the participation of individuals who have had access to confidential information.
- v) is required to be disclosed by the receiving party under the compulsion of law, or by order of any court or government or regulatory body to whose supervisory authority the receiving party is subject; provided that, in any such event, the receiving party shall give the disclosing party notice in writing as soon as practicable (which shall, subject to the applicable law, be prior notice where possible and not later than 30 days after the disclosure) of any disclosure, and the receiving party shall use its best effort to obtain assurance that the disclosed information will be accorded confidential treatment.

This clause shall survive the expiry or earlier termination of this Agreement and for a period of two years thereafter.

5.19 Risk Purchase

During the period of contract, if the contractor fails to rectify any defect pointed out to him, the same shall be got done by POWERGRID at the risk and cost of contractor, which shall not exceed 5% of the value of the undelivered goods/services and recovered from any other amount payable to the contractor.

5.20 Sub-Contracting

TCS shall be free to sub-contract any portion of the work. Details of sub-contractors will be shared with Customer for reference purposes. Responsibility for the sub-contractors performance and compliance to contract terms and conditions shall be with the TCS.

5.21 General Indemnity

Customer will, during the period of the coverage of this Contract defend, indemnify and hold TCS harmless from any costs, expenses, loss, injury, claim or damage resulting from (i) any death or injury to any person or property of TCS arising out of the use or possession of the equipment or location of Customer by TCS or its personnel (ii) any action or claim that may be made or initiated against the TCS by any third parties alleging infringement of their rights arising out of any materials provided by Customer to the TCS and the limitation or liability provided herein shall not apply to such loss, injury, claim or damages.

5.22 Patent Indemnity

Customer shall indemnify and hold harmless TCS and its employees, officers and subcontractors from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, which TCS may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Agreement arising out of or in connection with any design, data, drawing, specification, or other documents or materials provided by Customer.

5.23 Patent Infringement

TCS shall have no liability for any claim of infringement based on: (i) use of a superseded or altered release of some or all of the deliverables including, but not limited to, Customer's failure to use corrections, fixes, or enhancements made available by TCS ; (ii) the combination, operation, or use of some or all of the deliverables or any modification thereof furnished under this Agreement with information, software, specifications, instructions, data, or materials not furnished by TCS if the infringement would have been avoided by not combining, operating, or using the deliverables or the modification thereof; (iii) some or all of the deliverables or the modification thereof, which is based on Customer's material, data or design; (iv) any change, not made by TCS, to some or all of the deliverables or any modification thereof or (v) use of the deliverables otherwise than for the purposes authorized hereunder.

If any of the deliverables is held or is believed by TCS to infringe, TCS shall have the option, at its expense, to (i) modify the deliverables so as to make it non-infringing, (ii) obtain for Customer a license to continue using the deliverables, or (iii) terminate the license for the infringing part of the deliverables and refund a pro rata portion of the fees paid for that portion of deliverables. This clause provides for TCS's entire liability and Customer's exclusive remedy for claims of infringement of intellectual property rights related to the deliverables.

Each of the parties shall separately defend, indemnify, and hold each other harmless from and against any liability, loss, costs, or expenses (including reasonable Attorney's fees) arising out of or resulting from breach of the provisions herein.

5.24 Notices

All notices, requests, demands and other communications under this proposal or in connection herewith shall be given to or made upon the respective parties as follows –

- TCS – Anando Bhattacharya, Tata Consultancy Services, Delta Park Eden, Plot B1, Salt Lake Electronics Complex, Sector V, Salt Lake, Kolkata 700091, West Bengal, Phone # 9874162233
OR
- TCS – Sourav Bera, Tata Consultancy Services, Delta Park Eden, Plot B1, Salt Lake Electronics Complex, Sector V, Salt Lake, Kolkata 700091, West Bengal, Phone # 03366369242,

- PGCIL – as informed to TCS from time to time

Or to such other person or addresses as any of the parties shall have notified to the others.

All notices, requests, demands, and other communications given or made in accordance with the provisions of this proposal shall be in writing by letter, fax, or email.

5.25 Force Majeure

If the performance specified in the proposal is prevented, restricted, delayed, or interfered with by reason of:

- Fire, explosion, cyclone, floods.
- War, revolution, acts of public enemies, blockage of embargo.
- Any law, order proclamation, ordinance, demand, or requirements of any Government or authority or representative of any such Government, including restrictive trade practices or regulations.
- Strikes, shutdowns or labour disputes which are not instigated for the purpose of avoiding obligations herein; or
- Any other circumstances beyond the control of the party affected.

then notwithstanding anything here before contained, if such an event lasts for a continuous period of thirty (30) days then either party may at any time thereafter while such performance continues to be excused, terminate this assignment without liability, by notice in writing to the other party. However, TCS shall be entitled to receive payments for all services rendered by it under this assignment.

5.26 Waiver

No forbearance, indulgence, or relaxation by any party at any time to require performance of any provision of this proposal shall in any way affect, diminish or prejudice the right of such party to require performance of that provision and any waiver by any party or any breach of any provisions of this proposal shall not be construed as a waiver or an amendment of the provisions itself or a waiver of any right under or arising out of this proposal.

5.27 Severability

If any term, clause, or provision of this proposal shall be judged to be invalid for any reason whatsoever, such invalidity shall not affect the validity or operation of any other term, clause or provision of this proposal and such invalid term clause or provision shall be deemed to have been deleted from this proposal.

5.28 Assignment

Neither party shall be entitled to assign or transfer all or any of its rights, benefits, and obligations under this proposal without the prior written consent of the other party.

5.29 Non-exclusivity

TCS shall be free to do similar business either for itself or for any other party or offer similar services to any third parties but without in any way affecting the services agreed to be offered by TCS under this proposal.

5.30 Independent Relationship

This proposal is not intended to create a relationship such as a partnership, joint venture, agency, or employment relationship. Neither party may act in a manner which expresses or implies a relationship other than that of independent party nor bind the other party.

5.31 Modification

This proposal may be modified only by an amendment executed in writing by a duly authorized representative for each party.

5.32 Publicity

Neither party shall publicize any information pertaining to this assignment or the other party without seeking the prior written consent of the other party.

5.33 Entire Understanding

This proposal together with the Schedules, Annexure, and Exhibits hereto and executed by the Parties hereto constitutes the entire understanding between the Parties hereto with respect to the subject matter hereto and supersedes and cancels all previous negotiations thereof.

5.34 Survival

The clauses of this proposal which by their nature are intended to survive shall so survive the termination / expiry of this proposal.

5.35 Liability

TCS shall not be held liable for any delay or failure in its obligations, if and to the extent such delay or failure has resulted from a delay or failure by or on behalf of Customer to perform any of Customer's obligations. In such event, TCS shall be (a) allowed additional time as may be required to perform its obligations, and (b) entitled to charge Customer for additional costs incurred, if any, as may be mutually agreed upon between the parties.

Neither party shall be liable to the other for any special, indirect, incidental, consequential (including loss of profit or revenue), exemplary or punitive damages or loss of data whether in contract, tort, or other theories of law, even if such party has been advised of the possibility of such damages.

The total cumulative liability of either party arising from or relating to this Contract shall not exceed the total amount paid to TCS by Customer under that applicable work in the last twelve (12) months for the services that gives rise to such liability (as of the date the liability arose).

5.36 Intellectual Property Rights

- i. Subject to provisions of the Scope of Agreement including the Scope of Work and Financials as finalized between both organizations, all deliverables created and developed by TCS specifically and exclusively for Customer, together with any associated copyright and other intellectual property rights, shall be the sole and exclusive property of Customer, provided all payments due to TCS for the deliverables rendered under the Agreement, have already been paid by Customer to TCS.
- ii. All Intellectual Property Rights of TCS in its software, tools, processes, utilities, methodology, proprietary products and/or components including any development, customization, enhancement etc. carried out by TCS thereto of and on its own software, tools, processes, utilities, methodology, proprietary products and/or components in the course of providing services hereunder, shall remain the exclusive property of TCS ("TCS Pre-Existing IP") and Customer shall not acquire any right title or interest of any nature on TCS Pre-Existing IP except to the extent provided herein.

- iii. Similarly, all Intellectual Property Rights (IPR) in any Third-Party Software used in providing services including those forming part of or incorporated into the deliverables shall remain with the respective Third-Party owners / vendors licensor and Customer shall have user rights in accordance with End User License Agreement (EULA) as applicable to use of such software.
- iv. Each party shall be entitled to use in the normal course of its business and in providing same or similar services or development of similar deliverables for its other clients, the general knowledge and experience gained and retained in the unaided human memory of its personnel, in the performance of the Agreement. For the purpose of clarity, TCS shall be free to provide any services or design any deliverable (s) that perform functions same or similar to the deliverables being provided hereunder for Customer, for any other client or customer of TCS (including without any limitation any affiliate, competitor, or potential competitor of Customer).

5.37 Statutory and Regulatory Requirements

All the required details with respect to statutory and regulatory requirements relevant to the realization of the product/service will be made available to TCS by Customer. Where such requirements will not/cannot be provided to TCS, the onus shall be on Customer to make it explicitly known to TCS at the very outset.

5.38 Relief Events

TCS shall not be liable or responsible for any delay or failure to perform Support Services and/or Development Services or other services under this Proposal to the extent that such delay or failure to perform has arisen as a result of any delay or failure by Customer or its employees or agents to perform any of its duties and obligations as set out in this Proposal and the applicable Work Package/Statement of Work. In the event that TCS is delayed or prevented from performing its obligations due to such failure or delay on the part of Customer, TCS shall be allowed an additional period of time to perform its obligations and unless otherwise agreed the additional period shall be equal to the amount of time for which TCS is delayed or prevented from performing its obligations due to such failure or delay on the part of Customer. TCS shall be entitled to invoice Customer for the TCS's incremental costs (over and above the Charges) as a result of such failure or delay on the part of Customer.

5.39 Termination

Either party can terminate the agreement with **Two (2) months'** notice in writing for non-performance of any of the articles of this agreement by the other party or for any other reasons.

Termination shall be without prejudice to any other rights or remedies a party may be entitled to hereunder or at law and shall not affect any accrued rights or liabilities of either party nor the coming into force or continuation in force of any provision hereof which is expressly intended to come into force or continue in force on or after the termination.

In the event of this assignment being terminated, PGCIL shall be liable to make payments of the entire amount due under this assignment for which services have been rendered by TCS' consultants. Forthwith on the expiry or earlier termination of this agreement, each party shall, return to the other party all documents and materials, belonging to the other party with regard to this assignment or shall at the option of the disclosing party destroy all documents or materials in connection with this assignment

5.40 Tata Code of Conduct

We, in our dealings, are self-regulated by the "Tata Code of Conduct. We request your support in helping us adhere to the Code in letter and spirit. We request that any violation or potential violation of the Code by any person be promptly brought to the notice of the Ethics Counsellor (corporate.ethics@tcs.com) or the CEO of TCS. All communication received in this regard will be treated and kept as confidential.

Contact

For more information contact,

Anando Bhattacharya

Client Partner

Energy, Resources, Utilities, & Infrastructure (ERUI),

Tata Consultancy Services

Eden Building, Plot – B1, Block EP & GP

Sector V, Salt Lake, Kolkata 700091

India

Cell: +91 9874162233

Mailto: anando.bhattacharya@tcs.com

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Tata Consultancy Services is an IT services, consulting and business solutions organization that delivers real results to global business, ensuring a level of certainty no other firm can match. TCS offers a consulting-led, integrated portfolio of IT and IT-enabled infrastructure, engineering, and assurance services. This is delivered through its unique Global Network Delivery Model™, recognized as the benchmark of excellence in software development. A part of the Tata Group, India's largest industrial conglomerate, TCS has a global footprint and is listed on the National Stock Exchange and Bombay Stock Exchange in India.

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IT Services

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Consulting

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Status of Stock of Critical Items

Annexure B.13

S.no	Material	Quantity	Remarks
1	Circuit Breaker	88	(220KV- 28 nos., 132KV-36 nos., 33KV-24 nos.)
2	Current Transformers	635	(220KV-75 nos., 132KV- 304 nos., 33KV-256 nos.)
3	Lightening Arresters	1131	(220KV-72 nos., 132KV-339 nos., 33KV-720 nos.)
4	Potential transformer	94	(220KV-11 nos., 132KV- 77 nos., 33KV-6 nos.)
5	CVT	23	(220KV- 17 nos, 132KV-6 nos.)
6	Sparable Transformers		
a.	20MVA	16	
b.	50MVA	27	
c.	80MVA	3	
7	Conductor		
a.	Moose	0.877	
b.	Zebra	26.16	
c.	Panther	193.2	
8	ERS	29-Enganged 09-Available	

Activities taken up for Flood Protection

- RCC Boundary wall constructed at GSS Supaul, Amnour, Goradih and Darbhanga (DMTCL) for the protection from flooding.
- Executing agency for the emergency works have been tied up at circle level and their contact person with mobile numbers are available with concerned ESEs.
- All transmission line and GSS equipments have been covered during winter maintenance for upcoming Monsoon.
- Flood protection of towers have been done under following Transmission Lines:
 1. 132KV Mottihari-Dhaka T/L
 2. 220KV Kishanganj(New)-Barsoi T/L
 3. 132KV Kishanganj(New)-Kishanganj(Old) T/L
 4. 132KV Ramnagar-valmikinagar-Surajpura T/L

- **Patna Flood Protection**

At Jakkanpur GSS (Patna), Panels have been raised, drainage system renovated for proper discharge of water, spare pumps for disposal of water have been kept at GSS premises.



Eastern Regional Power Committee

14, गोल्फ क्लब रोड, टालीगंज, कोलकाता-700033

Tel. No.: 033-24239651, 24239659 FAX No.: 033-24239652, 24239653 Web: www.erpc.gov.in

ERPC/Operation/IS/2022/ 97

Date: 18.04.2022

To

As per Distribution List

Sub: Constitution of "Technical Committee for finalizing Patna & Ranchi Islanding Scheme"-reg

Sir,

In the 45th TCC/ERPC meeting held on 25.03.2022 & 26.03.2022 respectively, it was decided that technical committees are to be formed for finalizing Patna & Ranchi Islanding Scheme. For Patna Islanding scheme, the committee members will be from BSPTCL, SLDC Bihar, NPGCL(NTPC), Powergrid, ERLDC and ERPC whereas for Ranchi Islanding Scheme the members will be from JUSNL, SLDC Jharkhand, TVNL, Powergrid, ERLDC and ERPC. Based on the receipt of nominations from the concerned utilities, the composition of the technical committees are as follows:

Organization	Name	Member
ERPC	S Kejriwal, SE	Member (For Both Patna & Ranchi Islanding Scheme)
	P. P. Jena, EE—Convenor	
ERLDC	A.P. Singh, Manager	
Bihar	A K Choudhury, CE(SO)	Member (For Patna Islanding Scheme)
	S. N. Kumar, CE (O &M)	
NTPC	B K Pandey, AGM(EM)	
	Bipin Kumar, Manager(EM)	Member (For Ranchi Islanding Scheme)
Powergrid	H C Gupta, Chief Manager, Patna S/s	
Powergrid	R K Srivastava, Chief Manager, N. Ranchi S/s	
Jharkhand	Ajeet Kumar, DGM(STU)	Member (For Ranchi Islanding Scheme)
	Rimil Topno, Sr Manager(SLDC)	
TVNL	Sarvesh Prasad, HOD (Electrical)	
	Bhaskar Kumar, HOD(C&I)	
	Ashish Kr. sharma, ESE(Electrical)	
	Imroz Alam, ESE(Turbine division)	

(Cont.)

The committee may co-opt/associate any other expert in the field as they feel necessary. The Committee may also consult OEM/Vendor as and when required for any inputs.

The committee may submit the report by 15th May'2022.

This issues with approval of Member Secretary, ERPC.

Yours faithfully,

P.P. Jena
15.04.2022

(P. P. Jena)

Executive Engineer(PS)

Distribution List:

- All Members of the Technical Committee for Patna & Ranchi Islanding Scheme
- Member Secretary, ERPC-for kind information

ITEM NO. B.8: Restoration of PLCC for 220 kV Chandil-STPS S/C line

In 101st PCC meeting held on 13.04.2021, it was come to notice that both the channels of PLCC of 220 kV Chandil-Santalidih S/C line is unhealthy at Chandil end since May-2020. PCC advised JUSNL to rectify the PLCC issue at Chandil end at the earliest.

In 108th PCC meeting held on 16.11.2021, JUSNL representative informed that the PLCC rectification work could not be carried out as they are yet to receive the financial approval for the said work from their higher authority.

220 kV Chandil-STPS being an inter-state line and connected to generating station, healthiness of PLCC/line shall be ensured for overall reliability & security of the grid.

In the 185th OCC meeting, OCC expressed serious concern over the issue and advised JUSNL to update the status at the earliest.

In the 186th OCC meeting, JUSNL representative informed that the technical part of the tender has been opened and PLCC rectification work would be carried out after finalization of the tender.

In the 187th OCC meeting, JUSNL representative informed that the work order would be placed by the end of January 2022 and the work would be completed by February 2022.

In the 188th OCC meeting, JUSNL representative informed that as the price of L1 bidder was much higher than the estimation, further negotiation with the vendor was done. The work order would be placed by 1st week of March 2022.

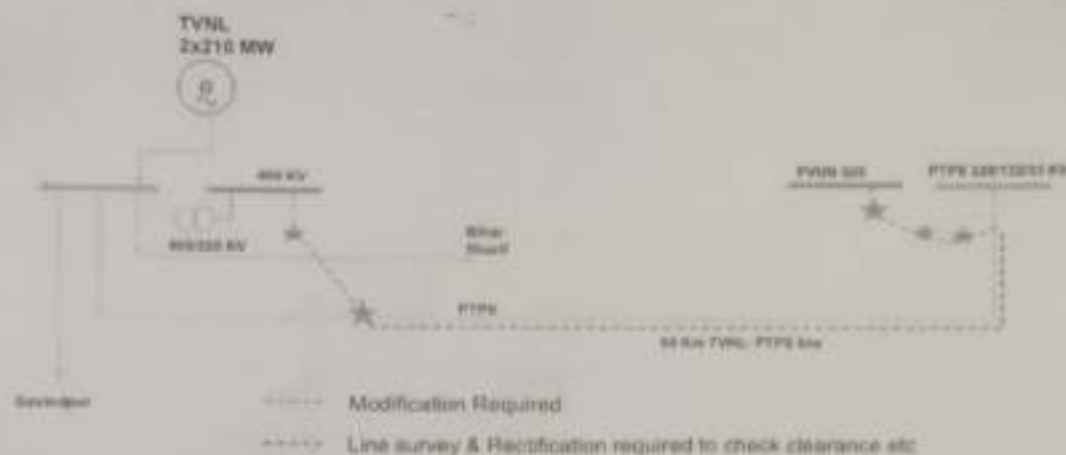
JUSNL may update.

Deliberation in the meeting

JUSNL representative submitted that the work order has been awarded. The PLCC rectification work would be started during the shutdown planned in the last week of March' 2022.

ITEM NO. B.9: Agenda by JUSNL.**B9.1. Start-up power to Patratu Vidyut Utpadan Nigam Limited (PVUNL) Phase-I, 3x800 MW units.**

Construction of PVUN Phase -1 units is in full swing and first unit is expected to be synchronized by Dec 23. Startup power is to be extended from newly charged 400 KV Patratu Grid through Patratu- Patratu 400 KV line of length around 7.5 KM. Due to delay in award of Patratu -Patratu 400 KV D/C Moose line, it is proposed to extend start up power by charging TVNL - PTPS line at 400 KV and diverting it to new PVUNL 400 KV GIS as an interim measure as per attached scheme. PVUN has requested to make startup power available by May 22 as commissioning activities are required to commence from Aug 22. Since delay in extending Start up power will impact project timeline adversely, it is requested to examine the proposal and provide concurrence for the extension of startup power to PVUNL from TVNL - PTPS line.



Deliberation in the meeting

PVNL representative submitted that the associated transmission lines in the Patratu-Patratu Transmission system are Patratu-Patratu (7.5 Km), Patratu-Koderma (150 Km) and Patratu-Chandel (140 Km). The NIT for Patratu-Patratu line which was floated in the year 2021 was delayed on grounds of high cost and further requirement of necessary administrative approval from state government and eventually led to the expiry of the bid. The NIT for Patratu-Patratu, Patratu-Koderma and Patratu-Chandel were again floated on 5th March 2022.

Since the commissioning activities would commence from August-2022 onwards for which there would be a requirement of startup power which could be met through an extension from 400KV Patratu Grid by charging TVNL - PTPS line at 400 KV and diverting it to new PVUNL 400 KV GIS as an interim measure as the Patratu- Patratu 400 KV line is expected to be charged not before April 2023.

He further deliberated that the Patratu-Patratu 400KV line is a Quad Moose D/C line through which around 1600 MW power could be evacuated. Since all the 3 units of PVUNL would be synchronized subsequently within a short time span and Patratu-Koderma and Patratu-Chandel are not expected to be charged before another 2-3 years, it would not be possible to evacuate the whole power through Patratu-Patratu 400KV line alone. Therefore, if the Patratu-PVUNL line is available, some power could be evacuated through this line also.

ERLDC representative submitted that the above interim arrangement i.e. shifting of 220 KV TVNL-PTPS line on may pose reliability issues in power supply to Ranchi city as well as to the Islanding scheme.

OCC was of the view that a detailed study may be carried out involving all the concerned parties and beneficiaries including ERLDC before arriving at a consensus.

B9.2. Charging of 400/220/132 KV GSS Latehar on temporary basis by using LILO arrangement of circuit-2 of 220 KV D/C Daltonganj-Chatra transmission line.

Proposed arrangement related to charging of 400/220/132 kV GSS, Latehar through 220 kV Daltonganj (PG) – Latehar (JUSNL) line with certain consideration for the time being, so as to avail the power at the new 400/220/132 kV GSS, Latehar (JUSNL) and further to extend the power to our 132/33 kV Latehar GSS through link line between the aforesaid two GSS's. One no. tower location of this link line falling under the present 220 kV corridor would also be required to be completed, post the above proposed arrangement. Further, it is to mention that the above

Technical Feasibility Study for supply of power to
Banhardi Coal Mines from under construction
Chetar (Chandwa) GSS of JUSNL and providing
start up power at PVUNL 400kV through Tenughat
Patratu line presently charged at 220kV

JHARKHAND URJA SANCHARAN NIGAM LIMITED
&
PUVNL LIMITED

March 2022



Power Research and Development Consultants
Private Limited

5, 11th cross, 2nd stage, west of chord road,

Bangalore - 560 086, Karnataka

Tel: +91- 80-23192159 / 23192168

E-mail – prdc@vsnl.com

Web site: www.prdcinfotech.com

Document reference details:

Work order No: 27 GM,C&M(NWBP)/JUSNL Dated 24-03-2022

Document reference No: PRDC /2021-2022/JUSNL/750

Internal Approval

Prepared by	Mr. Subhasish Roy	25-03-2022 to 28-03-2022
	Mr. Indrajit Chakraborty	
Approved by	Mrs. Debarati Basu	28-03-2022

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SCOPE of WORK

JUSNL has entrusted an exercise to M/s. PRDC for carrying feasibility study for providing start up power to PVUNL from TTPS generation by stepping up TTPS 220kV to 400kV and divert the the existing PTPS-TTPS 220kV S/c (which is a 400kV line charged at 220kV) to PVUNL-TTPS 400kV S/c . With the present system study, JUSNL also wants a technical feasibility study for giving supply of power to Barhandi Coal mines from the upcoming Chandwa 132/33kV substation .In this regard, work order is awarded to M/s. PRDC via Work order no.27 G.M., C&MM (NWBP)/ JUSNL dated 24.03.2022.

SYSTEM MODELLING

This study has been done for a steady state operating condition considering a maximum of 25 MW load at PUVNL before commission of the generating plant.

To analyze the steady state system behavior and identify the system constraints, JUSNL transmission network is modelled for FY 2023-24. Case studies performed are:

Case 1: Feasibility study to provide startup power to PVUNL from TTPS.

Condition I: The studies have been carried out for the horizon year of 2022/23 peak load and transmission network conditions with following network changes:

- Diverting the existing single circuit line (400 kV grade, twin moose) between TVNL (220 kV) and Patratu (old) 200/132/33 kV substation to PUVNL 400 kV GIS to provide start up power of 25 MW in PUVNL and addition of 50MVar switchable line reactor at Tenughat 400kV.

Condition II: The studies have been carried out for the horizon year of 2022/23 peak load and transmission network conditions with following network changes:

- Diverting the existing single circuit line (400 kV grade, twin moose) between TVNL (220 kV) and Patratu (old) 200/132/33 kV substation to PUVNL 400 kV GIS to provide start up power of 25 MW in PUVNL
- Connecting existing Hatia New 220 kV D/C to Katia 220 kV for a second power source to Hatia 220 kV from Bero 765/400 kV substation

Case 2: Feasibility study for giving supply of power to Barhandi Coal mines with a load demand of 40MW from the upcoming Chandwa 132/33kV substation

Present system study report covers the steady state power flow and voltage profile for both cases with FY 2022-23 network conditions and also proposal of network augmentation required in the region. System study has also been performed to evaluate network constraints in case of outage of any crucial element at nearby vicinity.

LOAD FLOW STUDY:

Load flow analysis is a computer aided fundamental study of power system. The planning, design and operation of power systems require load flow studies to analyze the steady state performance of power system under various operating conditions and to study the effects of changes in network configuration. The study determines the active & reactive power flows of each line and transformers, and also the voltage profile at each bus in the system. The study also determines the total power loss in the system.

Analyzing the solution of load flow analysis for numerous conditions helps to ensure that the power system is designed to satisfy its performance criteria. Some examples of the uses of load flow studies are to determine:

- ✓ Component or circuit loading.
- ✓ Steady state bus voltages.
- ✓ Active and Reactive power flows.
- ✓ Transformers tap settings.
- ✓ System losses.
- ✓ Performance under emergency conditions

Modern systems are complex and have many paths or branches over which power can flow. Such systems form networks of series and parallel paths. Electric power flow in these networks divides among the branches until a balance is reached in accordance with established circuit theory. The load flow model is the basis for several other studies such as short circuit, transient stability study, relay co-ordination, harmonic analysis etc. The load flow model provides initial steady state condition for these studies.

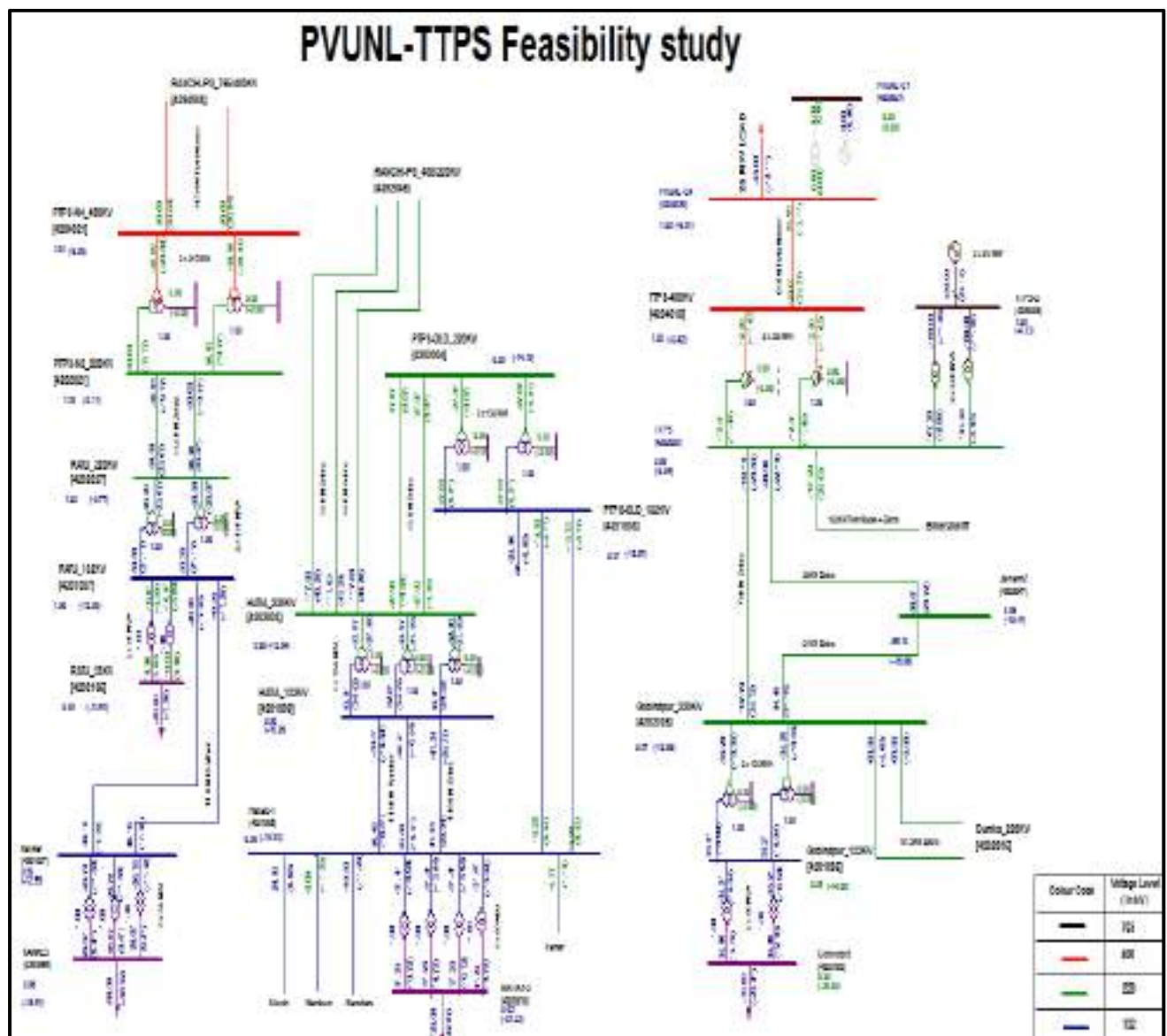
Three cases have been simulated to check the power flow for different network condition

Case1:

Condition I: The studies have been carried out for the horizon year of 2022/23 peak load and transmission network conditions with following network changes:

- Diverting the existing single circuit line (400 kV grade, twin moose) between TVNL (220 kV) and Patratu (old) 200/132/33 kV substation to PUVNL 400 kV GIS to provide start up power of 25 MW in PUVNL

Figure 1: Load flow condition of Ranchi region with TTPS-PTPS 220kV upgraded to TTPS-PVUNL 400kV S/c



Note 1 : SLD given on page no. 17

Table 1: Power flow & % loading of TTPS substation and adjacent buses with TTPS-PTPS 220kV upgraded to TTPS-PVUNL 400kV S/c

Element Name	Voltage Level	Conductor type	No. of Circuits	Power Flow (per ckt. MW)	% Loading
TVNL - PUVNL 400 kV S/C	400	Twin Moose	2	25	4
Bero 400 kV - Katia 400 kV D/C	400	Twin Moose	2	50.6	7.5
Ranchi PG_ Hatia 220 kV T/C	220	Zebra	3	117.8	59
Katia - Ratu 220 kV D/C	220	Zebra	2	50.5	26
Hatia New - Patratu Old 220 kV D/C	220	Zebra	2	28	14
TVNL - Biharsharif 220 kV S/C	220	Twin Moose + Zebra	1	101	24
TVNL - Govindpur 220 kV single circuit	220	Zebra	1	108	53
TVNL - Jainamore 220 kV single circuit	220	Zebra	1	98	48
Jainamore - Govindpur 220 kV single circuit	220	Zebra	1	85	42
Ratu - Kanke 132 kV D/C	132	Panther	2	40	53
Hatia New - Hatia Old 132 kV T/C	132	Panther	2	50	67
	132	Zebra	1	47	45
Hatia Old - Patratu Old 132 kV D/C	132	Panther	2	15	21

N-1 Contingency Condition

Table 2: N-1 contingency condition of the main power source lines in Ranchi region

Outage Element Nme	Parallel Corridor	% Loading
Outage of one circuit of Ranchi PG-Hatia 220 kV t/c	Ranchi PG - Hatia 220 kV other two circuits	83.6
Outage of TTPS - Govindpur 220 kV s/c	TTPS - Jainamore 220 kV S/C	86
	Jainamore - Govindpur 220 kV S/C	79
	TTPS - Biharsharif 220 kV D/C	30
Outage of TTPS - Jainamore 220 kV S/C	TTPS - Govindpur 220 kV S/C	89
	Jainamore - Govindpur 220 kV S/C	7
	TTPS - Biharsharif 220 kV S/C	29

Outage of Jainamore - Govindpur 220 kV S/C	TTPS - Govindpur 220 kV S/C	84
	TTPS - Jainamore 220 kV S/C	7
	TTPS - Biharsharif 220 kV D/C	28
Outage of one circuit of Hatia New - Hatia old 132 kV t/c	Hatia New - Hatia old 132 kV other two circuits	100
Outage of one transformer of Ranchi PG - 2x315 MVA transformer	Ranchi PG - 1x315 MVA second transformer	138

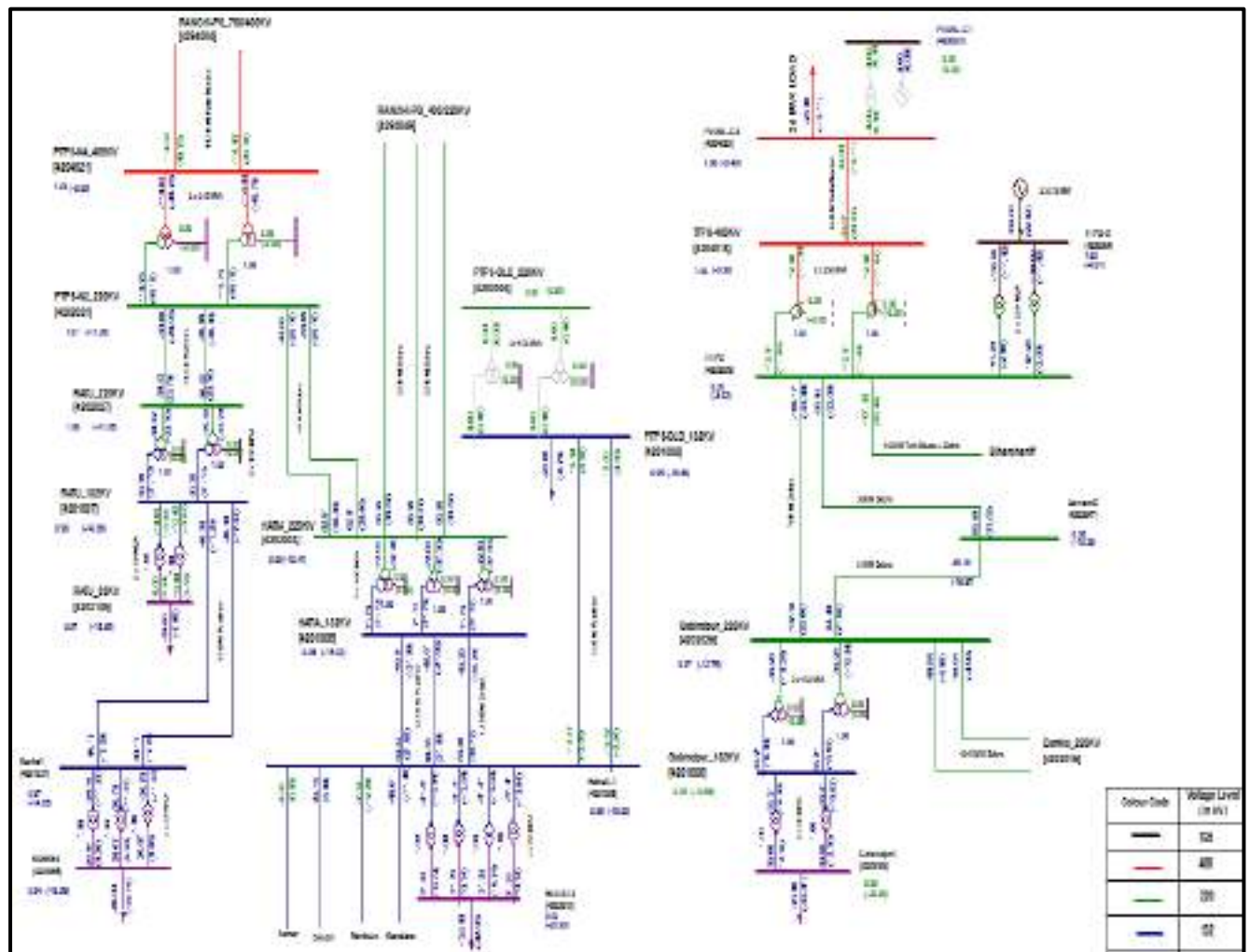
Observations/ Recommendations:

- The major load of Hatia supplying power to the state capital will be on Ranchi-PG 400/220 kV as the main power source. However with the estimated peak load conditions it is observed that the plant and equipment are loaded within capacity in normal operating condition
- Overloading in N-1 outage conditions are also not very critical considering the a short term scenario from July to December 2022 keeping in view the full commissioning of Katia 400/220/132/33 kV system by December 2022 with a strong connectivity with Bero 765/400 kV system.
- Further the 400 kV link between PUVNL 400 kV and Katia 400 kV will be established by January 2023 and hence a stronger corridor will be available.
- The load in 3nos 132 kV circuits between Hatia-New and Hatia old is not complying to N-1 contingency condition in any cases. Upgrade of these lines to HTLS conductors are proposed.

Condition II: The studies have been carried out for the horizon year of 2022/23 peak load and transmission network conditions with following network changes:

- Diverting the existing single circuit line (400 kV grade, twin moose) between TVNL (220 kV) and Patratu (old) 200/132/33 kV substation to PUVNL 400 kV GIS to provide start up power of 25 MW in PUVNL.
- Connecting existing Hatia New 220 kV D/C to Katia 220 kV for a second power source to Hatia 220 kV from Bero 765/400 kV substation

Figure 2: load flow condition of Ranchi region with TTPS-PTPS 220kV upgraded to TTPS-PVUNL 400kV S/c & Hatia 220kV D/c shifted from PTPS old grid to PTPS-New (Katia) 220KV grid



Note 2: PDF of the drawing given on page no. 18

Table 3: Power flow & % loading of the adjacent connected lines of TTPS 220kV substation with Hatia 220kV shifted to Katia 220kV

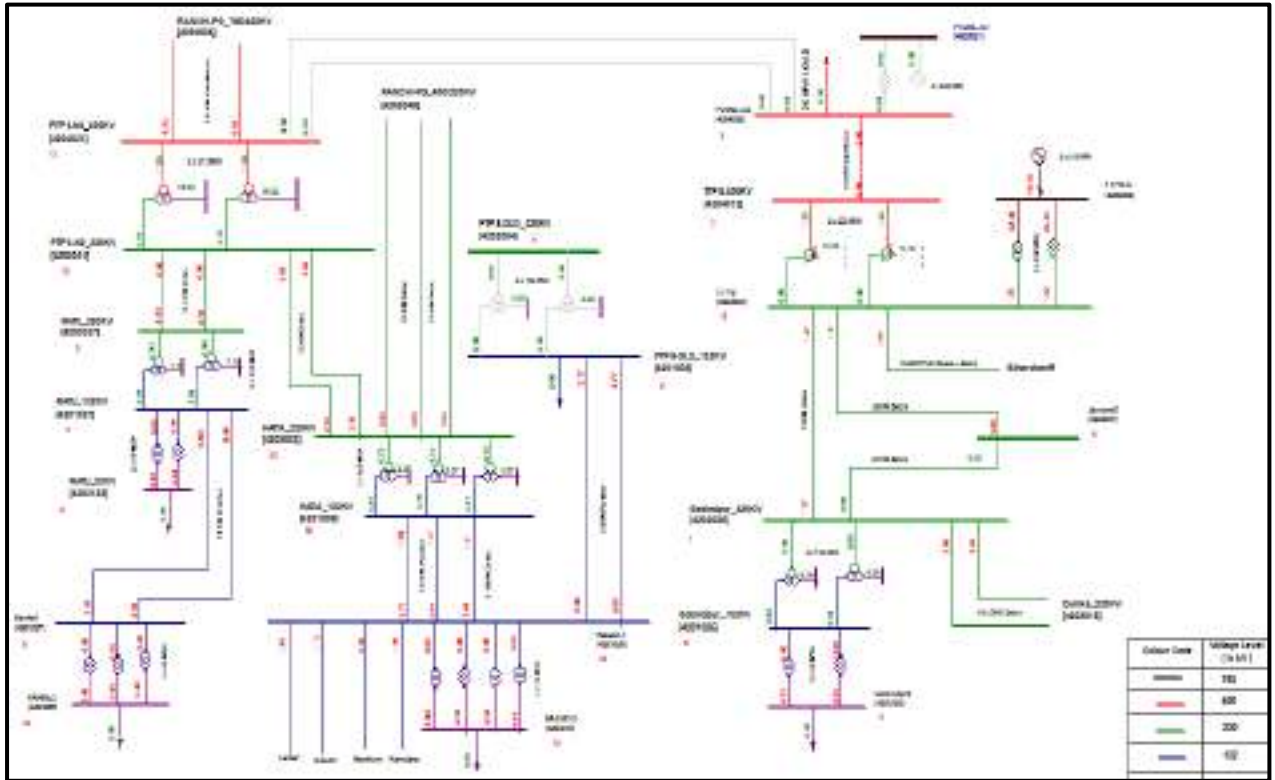
Element Name	Voltage Level	Conductor type	No. of Circuits	Power Flow (per ckt. MW)	% Loading
TTPS - PUVNL 400 kV S/C	400	Twin Moose	2	25	4
Bero 400 kV - Katia 400 kV D/C	400	Twin Moose	2	114	14
Ranchi PG - Hatia 220 kV T/C	220	Zebra	3	87	44
Katia - Ratu 220 kV D/C	220	Zebra	2	50.5	26
Hatia New - Katia 220 kV D/C	220	Zebra	2	63.2	33
TTPS - Biharsharif 220 kV S/C	220	Twin Moose + Zebra	1	101	24
TTPS - Govindpur 220 kV single circuit	220	Zebra	1	109	53
TTPS - Jainamore 220 kV single circuit	220	Zebra	1	99	48
Jainamore - Govindpur 220 kV single circuit	220	Zebra	1	85	42
Ratu - Kanke 132 kV D/C	132	Panther	2	40	54
Hatia New - Hatia Old 132 kV T/C	132	Panther	2	69	91
	132	Zebra	1	65	61
Hatia Old - Patratu Old 132 kV D/C	132	Panther	2	12.5	17

N-1 Contingency Condition

Table 4: N-1 contingency condition of the main power source lines in Ranchi region

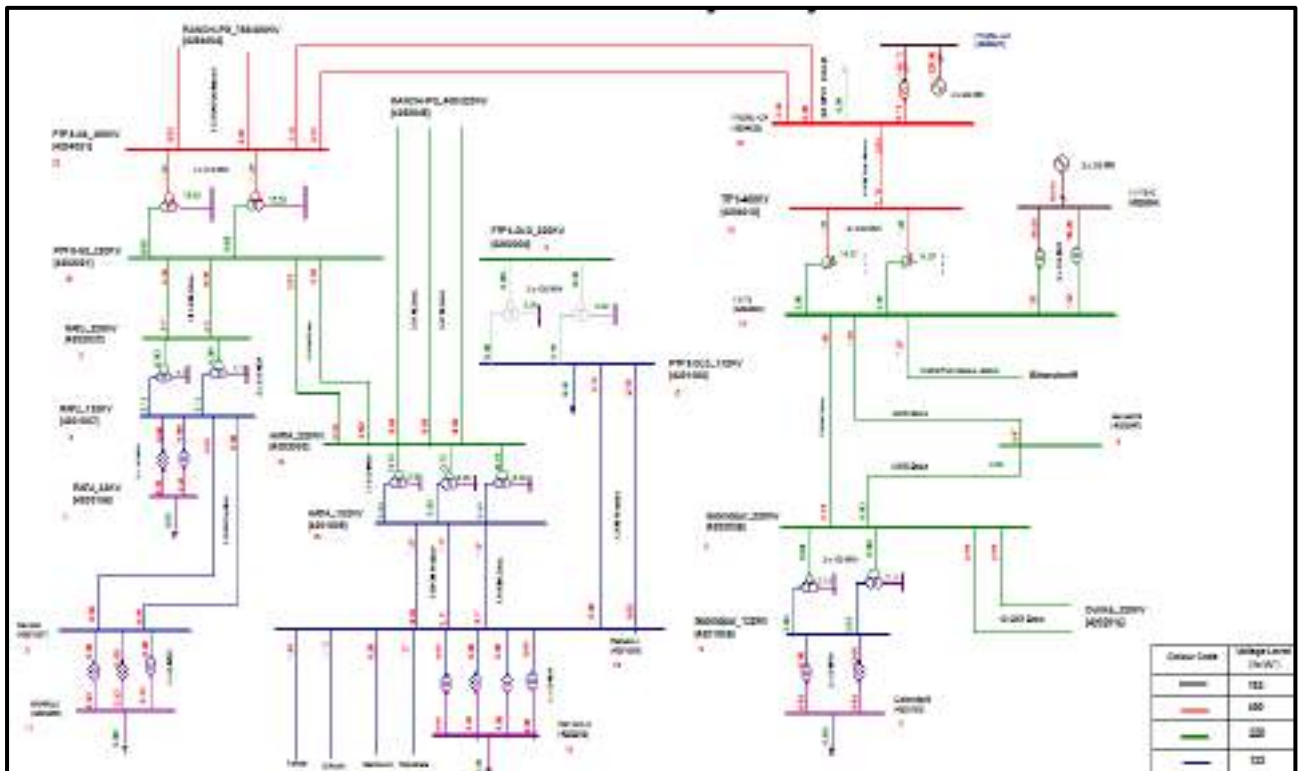
Outage Element Nme	Parallel Corridor	% Loading
Outage of one circuit of Ranchi PG-Hatia 220 kV t/c	Ranchi PG - Hatia 200 kV other two circuits	59
	Katia220kV - Hatia 220kV D/c	36
Outage of one circuit of Katia220kV - Hatia 220kV D/C	Katia220kV - Hatia 220kV second ckt	51
	Ranchi PG - Hatia 200 kV T/C	48
Outage of one circuit of Hatia Old - Patratu Old 132 kV D/C	Hatia Old - Patratu Old 132 kV second ckt	34
Outage of one circuit of Hatia New - Hatia old 132 kV t/c	Hatia New - Hatia old 132 kV other two circuits	136
Outage of one transformer of Ranchi PG - 2x315 MVA transformer	Ranchi PG - 1x315 MVA second transformer	108

Figure 3: 3phase to ground Short circuit study results without PVUNL generation



Note 3: SLD given on page no. 19

Figure 4: 3phase to ground Short circuit study results with full PVUNL generation



Note 4 : SLD given on page no. 20

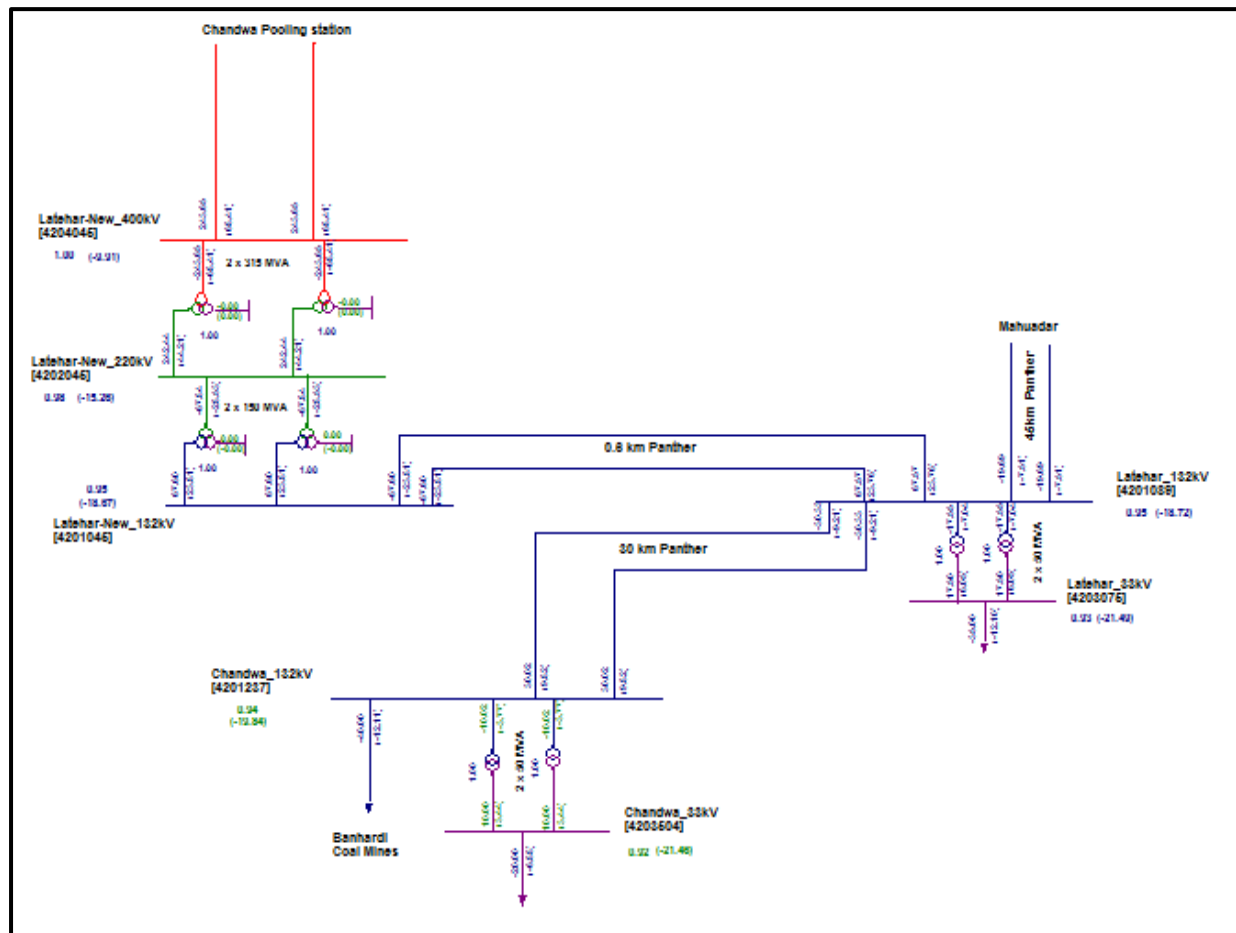
Observations/ Recommendations:

- Hatia 220/132 substation will get a second source of supply from Bero 765/400 kV system. This will provide a high level redundancy to supply source at Hatia serving the state capital
- Strong 220 kV power corridor will be established between Bero (765/400) –Katia (400/220/132/33) -Hatia (220/132) -Ranchi-PG (400/200) providing a redundancy in the power source for the state capital.
- The 400 kV connectivity from PUVNL–Katia will be considered as a major power evacuation corridor for 3x800 MW generation from PUVNL once it is commissioned.

Case 2: The studies have been carried out for the horizon year of 2022/23 peak load and transmission network conditions with following network changes:

- Latehar New 400/220/132kv substation has been considered with connectivities from:
 - ❖ D/c from Chandwa pool at 400kV level
 - ❖ D/c from Daltonganj PG and D/c from Lohardaga 220kV at 220kV level
 - ❖ D/c from Latehar-old 132/33kV at 132kV level
- Load considered at the following substations are :
 - ❖ Latehar 33kV :- 35MW
 - ❖ Chandwa 33kV :- 20MW
 - ❖ Mahuadar 33kV :- 15MW
 - ❖ Barhandi coal mines :- 40MW

Figure 5: Load flow condition of Chandwa 132/33 kV substation with adjacent buses



Note 5 : SLD given on page no. 21

Table 5: Power flow & % loading of the main source lines at Chandwa

Element Name	Voltage Level	Conductor type	No. of Circuits	Power Flow	% Loading
Latehar_new - Latehar_old 132 kV D/C	132	Panther	2	51	66.7
Latehar_old - Chandwa 132 kV D/C	132	Panther	2	30	40
Latehar_old - Mahuadar 132 kV D/C	132	Panther	2	7.5	10

N-1 Contingency Condition

Table 6: N-1 contingency condition of the main power source lines in Latehar region

Outage Element Nme	Parallel Corridor	% Loading
Latehar_new - Latehar_old 132 kV s/c outage	Latehar_new - Latehar_old 132 kV second circuit	133.5
Latehar_old - Chandwa 132 kV s/c outage	Latehar_old - Chandwa 132 kV second circuit	81.5

Observations/Recommendations:

- Chandwa 132/33kV substation is radially fed from Latehar-old 132/33kV substation which in turn is fed from Latehar-New 400/220/132kV substation.
- With the increase in load demand in Chandwa substation due to supply of power to Banhardi coal mines , the extra quantum of power (40MW) will also be fed from Latehar 400/220/132kV substation via Latehar new_ Latehar old 132kV D/c making it major connectivity in the region.
- Due to increase in load demand in Chandwa & adjacent substations,the Latehar-New_Latehar-Old 132kV D/c fails to satisfy N-1 condition, therefore upgradation of this D/c line with panther equivalent HTLS conductor is proposed, to meet the future load demand in the region.

CONCLUSION:

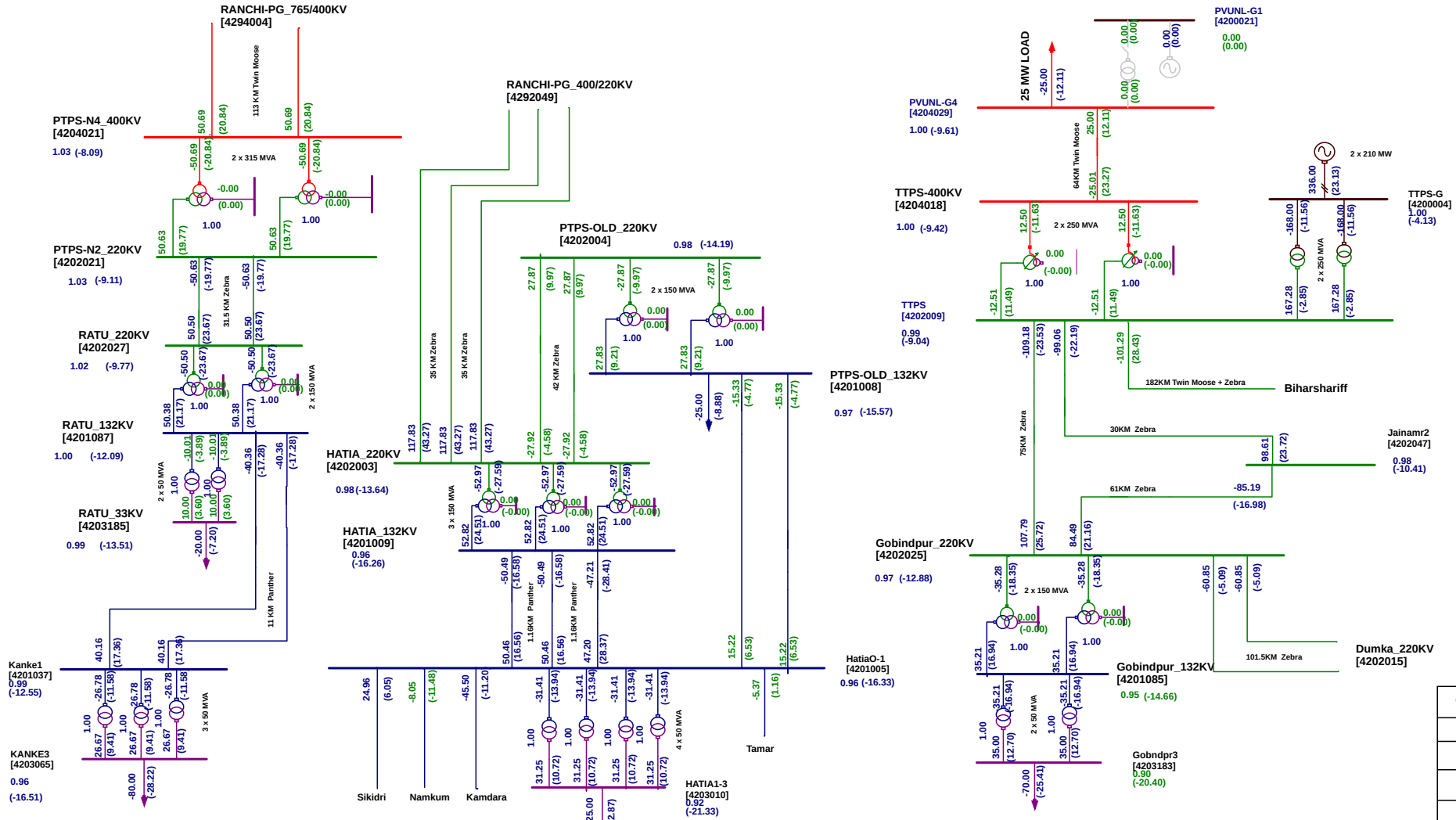
The major load of Hatia supplying power to the state capital is currently fed from Ranchi-PG 400/220 kV as the main power source and from TTPS generation as a second source via PTPS-TTPS 220kV single circuit & PTPS-Hatia new 220kV D/c. Upgrading and diverting TTPS-PTPS 220KV s/c to PVUNL-TTPS 400kV s/c for startup power at PVUNL will eliminate an alternate source option at Hatia-New 220/132kV substation making it solely dependant on 3 circuits from Ranchi-PG 400/220kV.

Hence to provide an alternate/secondary source to Hatia it is very important to prepone or reschedule the shifting of Hatia 220KV D/c from PTPS old grid to PTPS-New(Katia) grid by October 2022 so that to provide secure cutoff of Hatia from TTPS generation as the upgradation of PVUNL-TTPS line is also proposed during the time frame Aug2022- Dec 2022 . This would provide a strong connectivity corridor to Hatia as PTPS-new(Katia) is connected from Bero 765/400kV substation. Later on with the commissioning of PVUNL_PTPS-new(Katia) 400kV D/c, it would provide as an major power evacuation path to PVUNL generation.

Additionally this could also be considered for providing a major source to Ranchi-islanding scheme with 1unit of PVUNL generation and essential load of Hatia through the Katia-Hatia 220kV corridor. However detail study needs to be done with respect to the stability of the system.

For the supply of power at Banhardi coal mines from Chandwa 132/33kV substation, it is seen that upcoming load at Chandwa is about 20 MW, Latehar 33kV is about 35MW and Mahuadar about 15 MW. All these load will be fed from the Latehar-new 132V-Latehar-old 132kV panther D/c corridor which increases its loading making it vulnerable to N-1 contingency. Hence it is recommended to upgrade the Latehar-New_Latehar-old 132kV D/c corridor with panther equivalent HTLS conductor to cater the extra quantum of power to meet the increasing load demand of the region.

PVUNL-TTPS Feasibility study



Colour Code	Voltage Level (in kV)
—	765
—	400
—	220
—	132
—	33

Display Notation
Injection into the bus : +ve
Drawl away from the bus : -ve
Voltage Mag/(Ang) in Pu /degree
Flows in MW and (Mvar)

LOAD FLOW STUDY RESULTS CASE 1 : Condition 1

28.3.2022

REVIEWED CHECKED DRAWN DESCRIPTION REV DATE



**Jharkhand Urja Sancharan
Nigam Limited**

Regd. office - engineering building,
H.E.C., Dhurwa, Ranchi - 834004



Power Research and Development Consultants Pvt. Ltd.

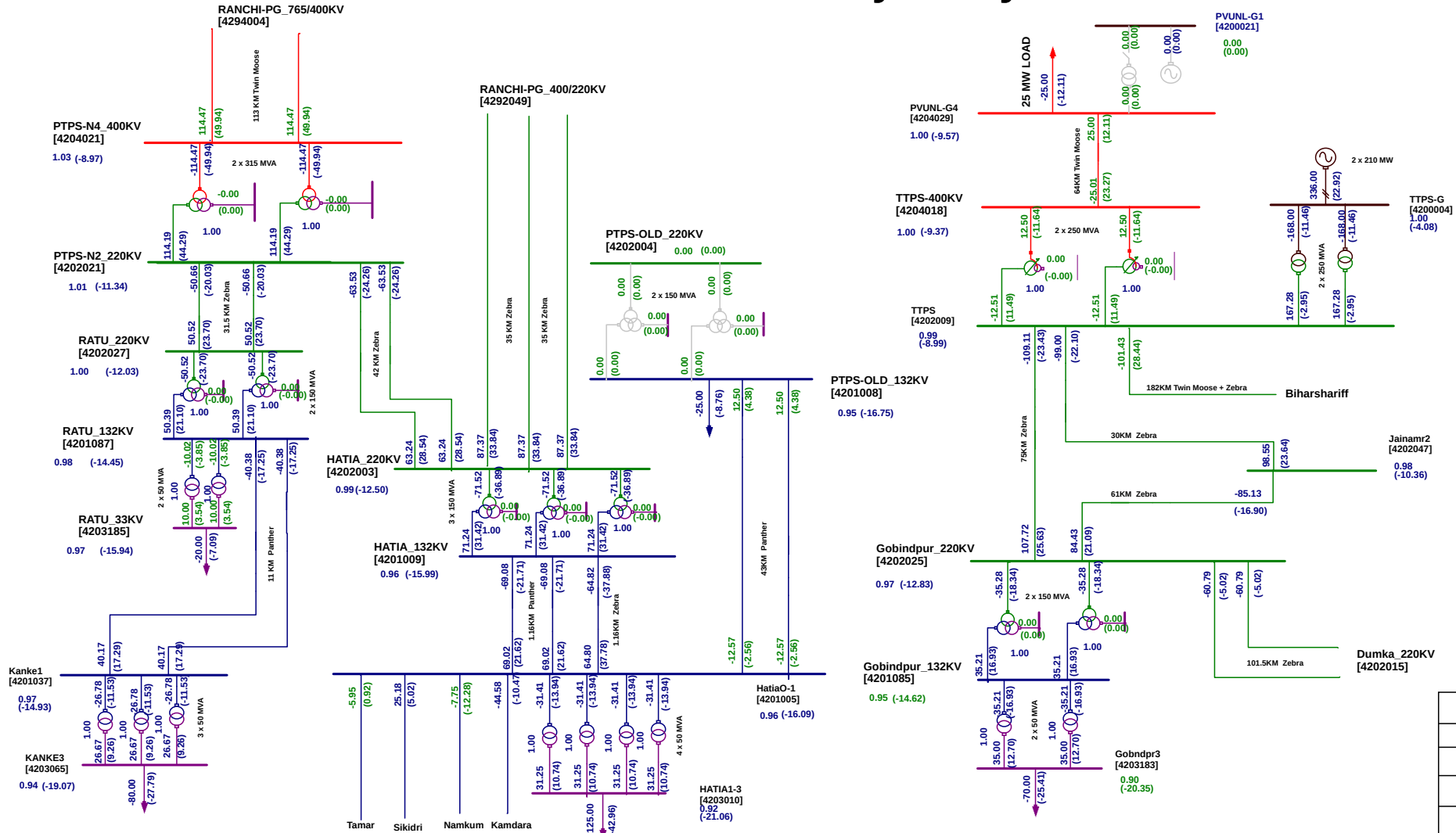
#5, 11th Cross, 2nd Stage, WOC Road,
Bangalore-560 086, INDIA.
Tel : +91-080-23192159, 23192168,
E-mail : prdc@vsnl.com



Drawn using: MiP-PSCT™

DWG. NO : LFA\ 2022-23\case 1

PVUNL-TTPS Feasibility study



Colour Code	Voltage Level (in kV)
—	765
—	400
—	220
—	132
—	33

Display Notation
Injection into the bus : +ve
Drawl away from the bus : -ve
Voltage Mag/(Ang) in Pu /degree
Flows in MW and (Mvar)

LOAD FLOW STUDY RESULTS CASE 1 : Condition 2

28.3.2022

REVIEWED CHECKED DRAWN DESCRIPTION REV DATE



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Nigam Limited**

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Power Research and Development Consultants Pvt. Ltd.

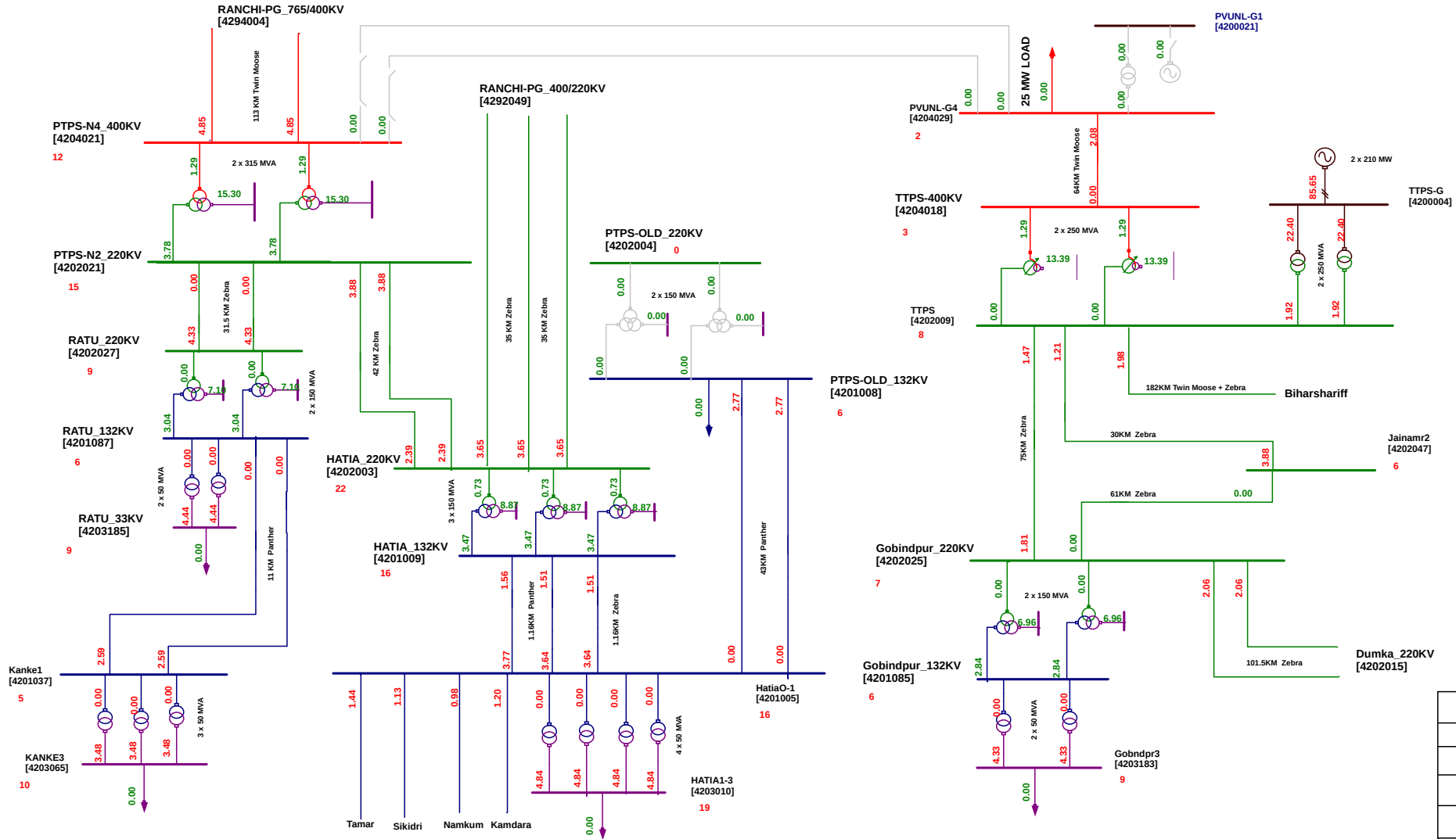
#5, 11th Cross, 2nd Stage, WOC Road,
Bangalore-560 086, INDIA.
Tel : +91-080-23192159, 23192168,
E-mail : prdc@vsnl.com



Drawn using: MiP-PSCT™

DWG. NO : LFA\ 2022-23\ case 2

PVUNL-TTPS Feasibility study



Colour Code	Voltage Level (in kV)
—	765
—	400
—	220
—	132
—	33

Display Notation
Injection into the bus : +ve
Drawl away from the bus : -ve
Voltage Mag/(Ang) in Pu /degree
Flows in MW and (Mvar)

SHORT CIRCUIT STUDY RESULTS WITHOUT PVUNL GENERATION



**Jharkhand Urja Sancharan
Nigam Limited**

Regd. office - engineering building,
H.E.C., Dhurwa, Ranchi - 834004



Power Research and Development Consultants Pvt. Ltd.

#5, 11th Cross, 2nd Stage, WOC Road,
Bangalore-560 086, INDIA.
Tel : +91-080-23192159, 23192168,
E-mail : prdc@vsnl.com

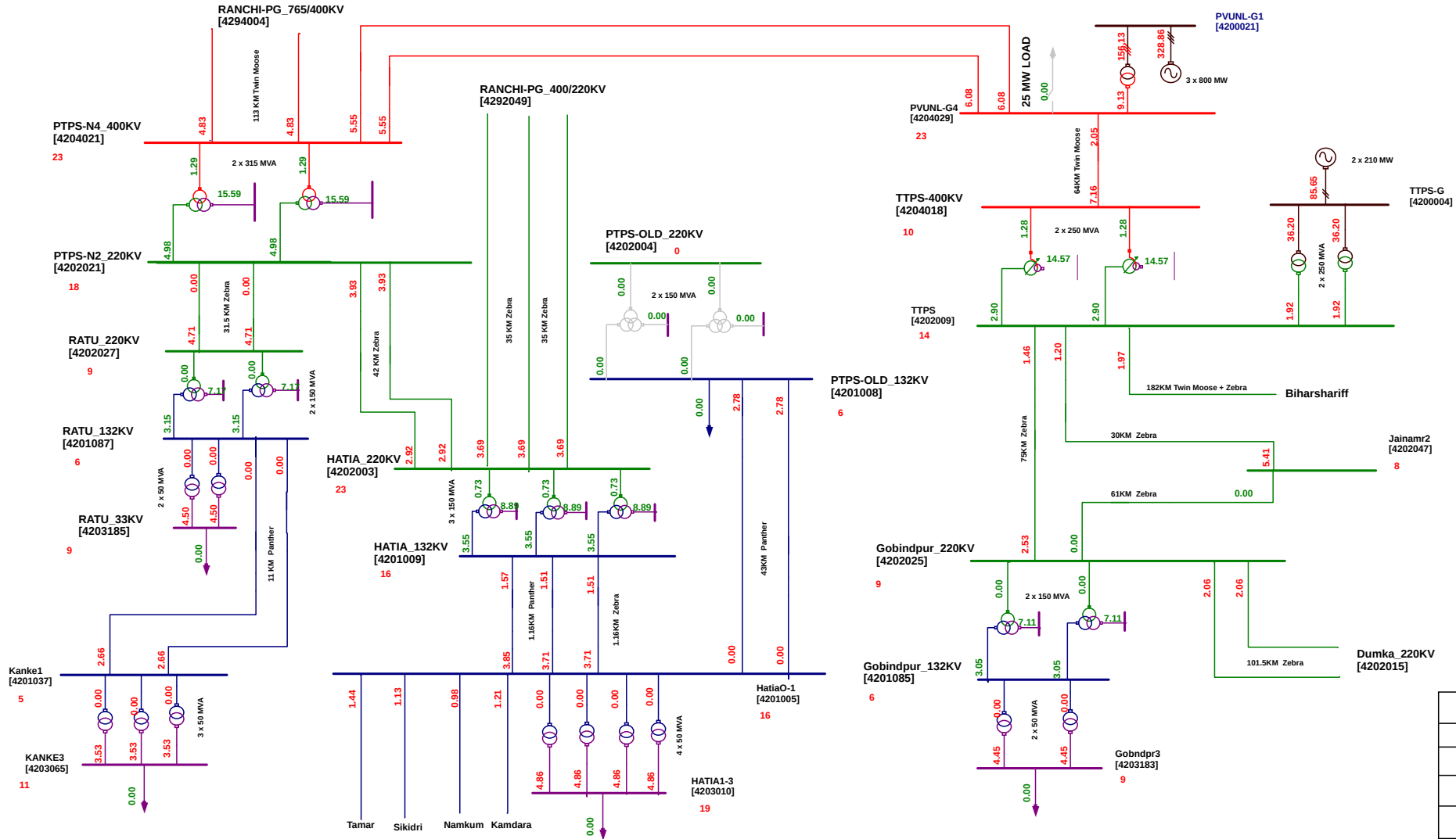


REVIEWED	CHECKED	DRAWN	DESCRIPTION	REV	DATE
					28.3.2022

Drawn using: MiP-PSCT™

DWG. NO : SCS\ 2022-23\case 2

PVUNL-TTPS Feasibility study



Colour Code	Voltage Level (in kV)
—	765
—	400
—	220
—	132
—	33

Display Notation
Injection into the bus : +ve
Drawl away from the bus : -ve
Voltage Mag/(Ang) in Pu /degree
Flows in MW and (Mvar)

SHORT CIRCUIT STUDY RESULTS WITH FULL PVUNL GENERATION



**Jharkhand Urja Sancharan
Nigam Limited**

Regd. office - engineering building,
H.E.C., Dhurwa, Ranchi - 834004



Power Research and Development Consultants Pvt. Ltd.

#5, 11th Cross, 2nd Stage, WOC Road,
Bangalore-560 086, INDIA.
Tel : +91-080-23192159, 23192168,
E-mail : prdc@vsnl.com

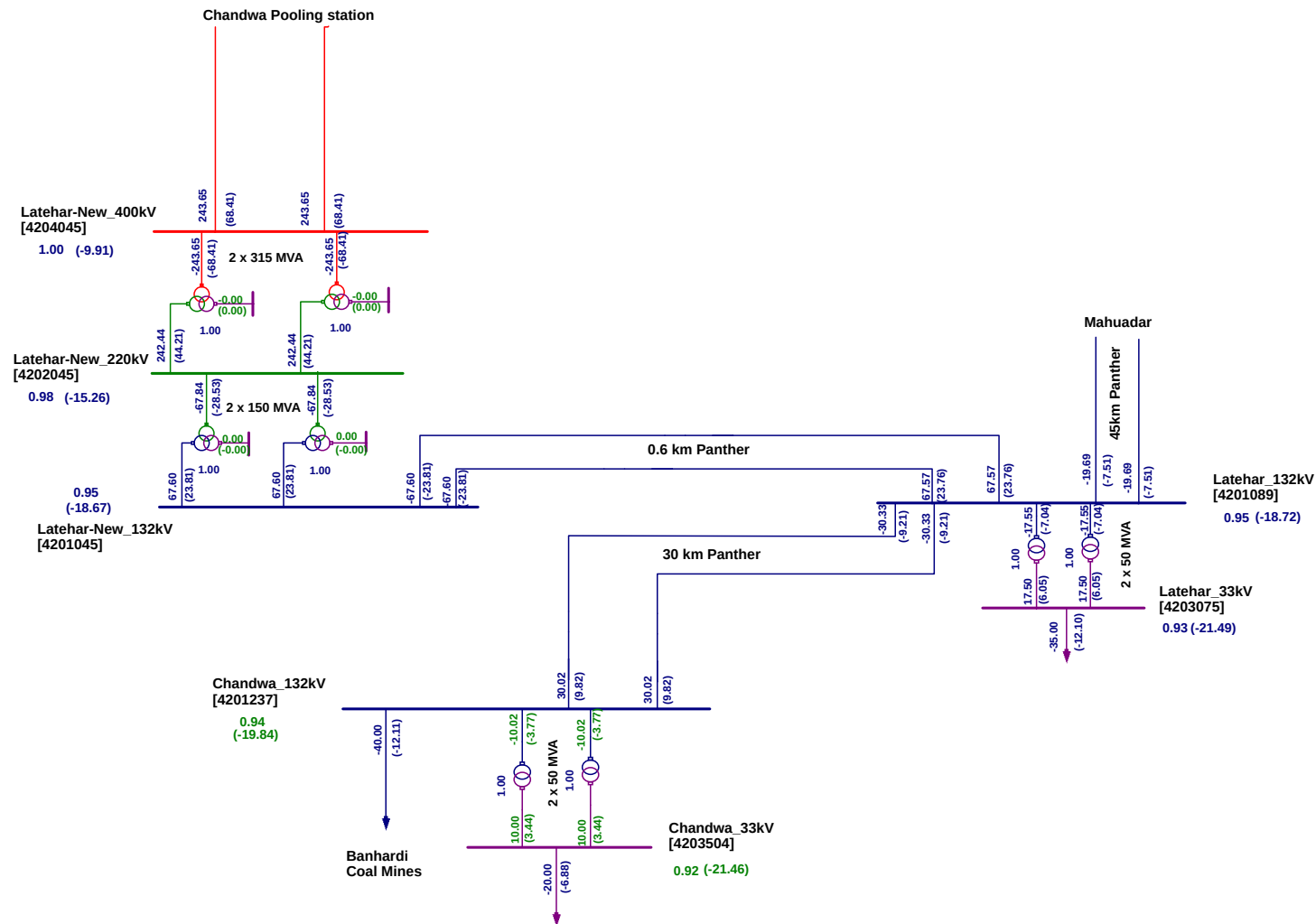


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					28.3.2022

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DWG. NO : SCS\ 2022-23\case 2

Feasibility study for supply of power to Banhardi Coal mines from Chandwa



LOAD FLOW STUDY RESULTS CASE 2



**Jharkhand Urja Sancharan
Nigam Limited**

Regd. office - engineering building,
H.E.C., Dhurwa, Ranchi - 834004



Power Research and Development Consultants Pvt. Ltd.

#5, 11th Cross, 2nd Stage, WOC Road,
Bangalore-560 086, INDIA.
Tel : +91-080-23192159, 23192168,
E-mail : prdc@vsnl.com



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DWG. NO : LFA\ 2022-23\case 2

28.3.2022

REVIEWED	CHECKED	DRAWN	DESCRIPTION	REV	DATE

ANNEXURE-3



भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केंद्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत प्रणाली योजना एवं मूल्यांकन प्रभाग-2



[ISO: 9001:2008]

Power System Planning & Appraisal Division-II
सेवा भवन, रा. क. पुरम, नयी दिल्ली -110066
Sewa Bhawan, R. K. Puram, New Delhi-110066

No. 75/1/PSPA-II/2017/154-157

Dated 23-02-2017

To

- | | | |
|--|---|---|
| 1. Managing Director,
Jharkhand Urja
Sancharan Nigam
Limited (JUSNL),
Engineering Building,
H.E.C., Dhurwa,
Ranchi-834004.
Fax-0651-2400799 | 2. COO(CTU-Pig),
Power Grid Corp. of
India Ltd. (PGCIL),
"Saudamini", Plot No.2,
Sector-29,
Gurgaon-122001,
Haryana.
FAX : 95124-2571932 | 3. Shri Subhash Thakur,
Asst. General Manager,
Project Engineer(Electrical),
NTPC Ltd,
Engineering Office Complex,
A-8A, Sector-24,
Noida-201301(UP) |
|--|---|---|

Subject: Minutes of meeting regarding draft report of JUSNL perspective transmission plan (2021-22) and Evacuation of power from Patrattu TPS (3x800MW) held on 20.01.2017 at CEA

Sir,

The minutes of the meeting held on 20.01.2017 at CEA, Sewa Bhawan, R K Puram, New Delhi regarding above subject is enclosed.

Yours faithfully,

Rishika Sharan
23/02/2017

(Rishika Sharan)
Director (PSPA-II)

Copy to:

PPS to Member(PS), CEA

I. Lathar 400kV substation (Loads in this area are also supplied by Dalganga PGCL 400kV substation)							
Sr. No.	Name of substation	District	Voltage level (kV)	Proposed substation details No. of units	Capacity of each unit (MVA)	Total capacity (MVA)	Commissioning year
1	Lathar	Lathar	400/220	2	115	230	2015-16
			220/132	2	130	260	
2	Chakra	Chakra	220/132	2	100	200	2015-16
			132/75	2	05	10	
3	Lathagga	Lathagga	220/132	2	150	300	2015-16
			132/75	2	05	10	
4	Geneta	Geneta	220/132	2	150	300	2015-16
			132/75	2	05	10	
5	Chakra (Pattadak)	Chakra	132/75	1	05	05	2017-18
			132/75	2	05	10	
6	Mahadhar	Lathar	132/75	2	05	10	2015-16
			132/75	2	05	10	
7	Chandera	Lathar	132/75	2	05	10	2015-16
			132/75	2	05	10	
8	Chandpur	Geneta	132/75	2	05	10	2020-21
			132/75	2	05	10	
9	Smara	Chakra	132/75	2	05	10	2021-22
			132/75	2	05	10	
10	Nagpurwadi	Geneta	132/75	2	05	10	2015-16
			132/75	2	05	10	
11	Mara	Geneta	132/75	2	05	10	2015-16
			132/75	2	05	10	
12	Ramsarai	Geneta	132/75	2	05	10	2015-16
			132/75	2	05	10	
13	Pana	Pattadak	132/75	2	05	10	2015-16
			132/75	2	05	10	
14	Chandpur	Pattadak	132/75	2	05	10	2015-16
			132/75	2	05	10	
Additional transmission lines for network strengthening							
1	132kV DC line from 132/220V Geneta substation to Lathar 132/220V substation						2018-17
2	132kV DC line from Dalganga PGCL 400/220/132V substation to Chandera 132/220V substation						2017-16
3	132kV DC line from Geneta substation to Dalganga 132/220V substation						2017-18

E. Patrauli 400kV substation								
Sr. No.	Name of substation	District	Voltage level (kV)	Proposed substation details			Connectivity	Commissioning year
				No. of units	Capacity of each unit (MVA)	Total capacity (MVA)		
1	Patrauli	Hazaribagh	400/220	2	115	230	400kV DC line from Patrauli 400/220/132kV substation to Lathar 400/220/132kV substation. Charging of 400kV DC line with charging at 132kV line from PTTS & TTTS at 80kV and sending the line from PTTS to Patrauli 400/220/132kV substation.	2015-16
			220/132 (proposed line is drafted from PTTS to Patrauli)	2	130	260	Linking of 220kV DC line from PTTS to make 220-132kV substation at Patrauli 400/220/132kV substation. 220kV line from Patrauli 400/220/132kV substation to HCLM (ATTS). 220kV DC line from Patrauli 400/220/132kV substation to PTTS.	



Record notes of discussions held on 30th March 2022 in review meeting at Board Head Quarter, Dhurwa, Ranchi under the Chairmanship of CMD, JUVNL.

Member present :-

1. Sri Avinash Kumar IAS, Chairman-cum-Managing Director, JUVNL
2. Sri K. K. Verma, Managing Director, JUSNL
3. Shri. Manoj Kumar Karmali, Executive Director (Projects), JUSNL
4. Shri. Amar Nayak, General Manager C&M (NWBP), JUSNL
5. Shri. Hari Ram Swarnakar, DGM (Engg), JUSNL
6. Shri. S. Samanta, Sr. General Manager, PGCIL
7. Shri. S.K. Shashi, Chief Manager, PGCIL
8. Shri. S. Kundu, Chief Manager, KEC Ltd.

AGENDA OF THE MEETING - Progress review of the projects being executed by PGCIL und JCP project.

Points discussed during Meeting are as follows:

1. CMD reviewed the progress of 400/220/132 kV GSS at Latehar, 220/132 kV GSS at Lohardagga, 400 kV Chandwa - Latehar and 400 kV Patrattu - Latehar Transmission Lines & link lines and shown very much displeasure regarding progress of the work.
2. Matter related with progress of 400/220/132 kV GSS at Latehar was discussed and it was directed to complete GSS Latehar, in all respect within 45 days i.e. latest by 15th May 2022.
3. Matter related with progress of 220/132 kV GSS at Lohardagga was discussed and it was directed to complete GSS Latehar, in all respect, latest by 30th May 2022.
4. Matter related with progress of 400 kV QM Chandwa - Latehar was discussed and it was directed to complete this Transmission Line in all respect by 15th May 2022.
5. Matter related with progress of 400 kV QM Patrattu - Latehar was discussed and it was directed to complete this Transmission Line in all respect within 3 months after getting Forest clearance/ approval.
- ➔ 6. Matter related with connectivity of 220 kV Hatia - Patrattu Transmission Line at 400/220 kV Patrattu GSS (Katia) was discussed and directed to complete this line latest by end of June 2022.
7. PGCIL will submit day to day progress of work to JUSNL
8. Further progress of aforesaid projects will be reviewed on 12.04.2022 at 01:00 PM, in the office chamber of MD, JUSNL.

Sd/-
General Manager C&M (NWBP)

P.T.O.

ANNEXURE-5

Date- 12.04.2022

Sub: Minutes of Meeting between JUSNL, JBVNL, TVNL & PVUNL regarding charging of Tenughat-Patratu Line at 400 kV and terminating at PSTPP Stage-I (3x800 MW) GIS

Member's Present:

JUSNL (Shri.)	JBVNL (Shri.)	TVNL (Shri.)	PVUNL (Shri.)
KK Verma, MD (JUSNL)	Rishi Nandan GM (Commercial)	Nurul Hoda ESE (TVNL)	S K Panda GM (Projects)
M K Karmali, Director (Projects)			Tushar Kumar AGM (EED)
Amit Banerjee Director (Finance)			Ajit Pratap Singh AGM (EED)
Amar Nayak, GM (JUSNL)			
Shailesh Prasad, DGM - Operation (SLDC)			

A meeting was held in the office chamber of CMD, JUVNL Ranchi in presence of MD (JUSNL), regarding charging of Tenughat-Patratu Line at 400 kV and terminating it at PVUNL Phase-I (3x800 MW) GIS. Discussions held and decision taken during the meeting are as below:

- PVUNL emphasised the requirement of 400 kV input at PVUNL Phase-I (3x800 MW) by July, 2022 for charging of GIS and carrying out the commissioning activities of the project as per plan. JUSNL confirmed that as an interim measure Tenughat-Patratu Line shall be charged at 400 kV level and terminated at PVUNL Phase-I GIS by July 2022.
- For Charging the TVNL -PTPS line at 400 KV, Load flow study have been carried out by M/S PRDC and with commissioning of TVNL-Govindpur 220 KV D/c line, power generated from TVNL will be distributed without any restriction. TVNL agreed to the JUSNL proposal to charge TVNL- PTPS line at 400 KV (presently charged at 220 KV) and terminating it to PVUNL GIS for enabling extension of Startup power to PVUN.
- TVNL has confirmed that one no. 400 kV line bay and two nos. ICTs (2x250 MVA) are available at TVNL end to provide 400 kV start-up power to PVUNL along-with power evacuation at 400 kV level and remaining three nos. 220 kV lines will remain available for evacuation of power generated at TVNL after modification.

24/04/22

[Signature]

[Signature]
12/04/2022

12

1/2

[Signature]

[Signature]

d) 400 KV Patratu-Patratu D/C quad moose conductor (7.5 Km) line is presently under tendering and likely completion of work will be Sept. 22.

e) PVUNL informed that estimate for modification work required in TVNL-PTPS line has been received. The same will be put up to PVUN Board for necessary approvals.


(JUSNL) (SLDC)


(JEVNL)


(TVNL)


(PVUNL) 12/04/2020

7/2

case the transfer of block is not allowed by the Ministry of Coal, the allocated mine block shall be developed by JUUNL co-terminus with the Project Development Schedule and appropriate link sufficient to meet the coal requirement of the Project shall be provided on terms and conditions mutually agreed in writing by and between the JVC and JUUNL;

- 7.1.5. JBVNL and the Confirming Parties, shall arrange construction power and start-up power matching with the Project Completion and Development Schedule on terms and conditions mutually agreed in writing by and between JVC and JBVNL;
- 7.1.6. JBVNL shall purchase 100% (one hundred percent) of the power from the Existing Units and 85% (eighty five percent) of the power generated from the New Units for the State of Jharkhand, subject to the prior written approval of the MoP and JBVNL shall first purchase the allocated power from the JVC before exploring the option of purchasing power from any third party. The sale of power from the JVC to JBVNL shall be as per tariff determined by CERC. In case of default by JBVNL in payment of its dues for purchase of electricity to JVC, JVC shall have the right to sell the power to other customers. However, this shall not absolve JBVNL of its liability to pay full fixed charges for the entire capacity allocated to it till such time an alternate arrangement is made by the JVC. The Government of Jharkhand shall provide reasonable and appropriate guarantee to secure the payments towards the purchase of electricity from the JVC. The form and content of the guarantee shall be attached to the supplementary power purchase agreement(s);
- 7.1.7. As per the terms of Clause 4.1.7, JUUNL shall assign the Existing PPA to the JVC. JBVNL shall enter into a supplementary power purchase agreement(s) to incorporate the suitable payment security mechanisms and to give effect to the provisions pertaining to sale of power from the Existing Units and the New Units. Further, JBVNL shall ensure reasonable and appropriate guarantee from the Government of Jharkhand to secure the payments towards purchase of electricity from the JVC;
- 7.1.8. Sale of power by JVC shall be at the bus bar of generating station. Evacuation of power shall be the responsibility of JBVNL. JBVNL shall ensure availability of adequate transmission system for evacuation of power generated from the existing station;
- 7.1.9. JBVNL, through the Government of Jharkhand, shall extend full support by way of maintaining law and order and facilitating all Approvals for water linkage, coal block/coal link etc.;
- 7.1.10. JBVNL/JUUNL shall provide suitable space/building for office, accommodation, transit camp facility etc., as available with them to the seconded employees of NTPC on a chargeable basis and on terms mutually agreed between the JV Partners, until such time alternate arrangements are made in this regard by the JVC. The cost of refurbishment, restoration, furniture etc. shall be to the account of the JVC;

Annexure-C.3

POWER SYSTEM DEVELOPMENT FUND												
Status of the Projects in Eastern Region												
Sl No	State	Entity	Name of the scheme	Grant Approved	Grant sanctioned on	1st Installment grant released on	Completion Schedule	Completion schedule w.r.t date of 1st instalment	Grant aviled so far	Under process of release	Total awards amount of placed of till date	Latest status
1	Bihar	BSPTCL	Renovation and Upgradation of protection system of substations. (18)	64.22	42135	42506	24	43236	56.04		69.195	90% grant availed on award cost.
2			Installation of Capacitor bank in 20 Nos of Grid Sub Station. (74)	18.882	42618	43550	24	44281	16.99		21.55	
			Total	83.10					73.03		90.745	
5	Jharkhand	JUSNL	Renovation & Upgradation of protection system of Jharkhnad. (161)	138.13	15-Nov-17	28-Mar-19	16	28-Jul-20	114.68	1.01	145.674	90% grant availed on award cost. Project closure is expected by Q-2 of 2021-22.
6			Reliable Communication & data acquisition system upto 132kV Substations ER. (177)	22.36	24-May-19		24					Price bid has been opened. Tender on awarding stage.
			Total	160.49					114.68		145.674	
7	Odisha	OPTCL	Renovation and Upgradation of protection system of substaions. (08)	162.50	11-May-15	22-Mar-16	24	22-Mar-18	46.04		63.31	Project Completed on Dec-20. Request for release of final 10 % fund has been placed.
8			Implementation of OPGW based reliable communication at 132 kv and above substations. (128)	25.61	15-Nov-17	29-Mar-19	36	29-Mar-22	23.04		51.22	90% grant availed on award cost. Work In Progress
9			Installation of 125 MVAR Bus Reactor along with construction of associated by each at 400kV Grid S/S of Mendhasal, Meramundali & New Duburi for VAR control & stabilisation of system voltage. (179)	27.23	27-Jul-18	1-Apr-19	18	1-Oct-20	8.17		24.5	90% grant availed . Rest work in progress
10			Implementation of Automatic Demand Management System (ADMS) in SLDC, Odisha. (196)	2.93	24-May-19	19-Feb-20	10	19-Dec-20	0.29		0.29	10% grant availed
11			Protection Upgradation and installation os Substation Automatic System (SAS) for seven nos of 220/132/33kV Substations (Balasore, Bidanasi, Budhipadar, Katapali, Narendrapur, New-Bolangir & Paradeep). (209)	29.56	24-May-19	13-Feb-20	18	13-Aug-21	8.87		32.85	30% grant availed. Work in Progress.
12		OHPCL	Renovation and Upgradation of protection and control system of OHPC. (109)	22.35	22-May-17	25-May-18	24	25-May-20	14.94		21.25	90% grant availed on award cost.
			Total	270.18					101.35		193.42	
14	West Bengal	WBSETCL	Installation of switchable reactor & shunt capacitor for voltage improvement. (88)	43.37	22-May-17	22-Jun-18	19	22-Jan-20	33.07		40.83	90% grant availed on award cost. Will get completed by Oct'21
15			Renovation & Modernisation of Transmission System. (87)	70.13	22-May-17	25-Jun-18	25	25-Jul-20	63.12		96.44	90% grant availed on award cost. Will get completed by Mar'22
16			Installation of Bus Reactors at different 400kV Substation within the state of West Bengal for reactive power management of the Grid. (210)	71.74	24-May-19	23-Oct-19	19	23-May-21	39.3		45.62	30% grant availed on award cost. 04 Nos. of Reactors will be commissioned by December 2021. LoA of the 5th Reactor is yet to be placed.
17			Project for establishment of reliable communication and data acquisition at different substation at WBSWTCL. (222)	31.19	24-May-19	23-Oct-19	25	23-Nov-21	3.12			The tender has been been cancelled for OPGW. Re-tendering has to be done.
18			Implementation of Integrated system for Scheduling, Accounting, Metering and Settlement of Transactions (SAMAST) system in West Bengal. (197)	10.08	43910		12					10% grant not yet requested
19		WBPDCCL	Renovation and Modernization of 220/ 132 kV STPS switch yard and implementation of Substaion Automation System. (72)	23.48	5-Sep-16	18-May-17	18	18-Nov-18	21.13		32.09	Target date for completion of project is Sept.'21 subject to availability of S/D & Covid scenario. Request for release for final 10% grant has been placed.
21			Renovation and Modernization of switchyard and related protection system of different power stations (BTPS, BKTPS and KTPS) of WBPDCCL (155)	45.16	27-Jul-18	27-Mar-19	12	27-Mar-20	34.52		41.68	Target date for completion of project is Oct'21, subject to availability of S/D & Covid scenario. 90% grant availed on award cost.
			Total	295.15					194.26		256.661	

POWER SYSTEM DEVELOPMENT FUND												
Status of the Projects in Eastern Region												
Sl No	State	Entity	Name of the scheme	Grant Approved	Grant sanctioned on	1st Installment grant released on	Completion Schedule	Completion schedule w.r.t date of 1st instalment	Grant aviled so far	Under process of release	Total awards amount of placed of till date	Latest status
22	DVC	DVC	Renovation and Upgradatn of the protection and control system of Ramgarh Sub Station. (81)	25.96	2-Jan-17	31-May-17	24	31-May-19	22.95	2.57	28.603	90% grant availed on award cost.
23			Renovation and Modernization of control and protection system and replcement of equipment at Parulia, Durgapur, Kalyanewari, Giridhi Jamsedpur, Barjora, Burnpur, Dhanbad and Bundwan substation. (106)	140.50	16-May-17	14-Dec-17	24	14-Dec-19	102.43	0.98	127.684	
			Total	166.46					125.38		156.287	
24	Sikkim	ENPD, Sikkim	Drawing of optical ground wire (OPGW) cables on existing 132kV & 66kV transmission lines and integration of leftover substations with State Load Despatch Centre, Sikkim. (173)	10.00	24-May-19		18		3.00		20	30% grant availed on award cost
				10.00					3.00		20.00	
26	ERPC	ERPC	Creation and Maintenance of web based protection database management. (67)	20.00	17-Mar-16	28-Jun-16	18	28-Dec-17	14.83		16.48	Project Completed
27			Study Programme on power trading at NORD POOL Academy for Power System Engineers of Eastern Region. (122)	5.46	27-Jul-18	27-Mar-19	13	27-Apr-20	4.61		5.37	
28			Traning Program for Power system Engineers of various constituents of Eastern Region. (117)	0.61	27-Jul-18	11-Apr-19	24	11-Apr-21	0.54		0.60888	90% grant availed on award cost.
			Total	26.07					19.98		22.45888	
			GrandTotal	1,011.46					631.68		885.25	

Annexure-C.5

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

Sr. No	Station	Generating Unit	Test schedule	Remarks
1	TALCHER STAGE 2	3	Unit 3 - 5: 23-11-2020 to 28-11-2020	Testing for unit 6 yet to be conducted
2		4		
3		5		
4		6		
5	Farakka	2	01-02-2021 to 10-01-2021	Testing completed
6		3		
7		4		
8		5		
9		6		
10	Kahalgaon	1	August'21	Testing completed for Unit 1
11		5		
12		6		
13		7		
14	Barh	4	18-02-2021 to 21-02-2021	Scheduled
15		5		
16	Teesta V	1	07-01-2021 - 08-01-2021	Testing completed
17	Teesta III	1	30-01-2021 - 10-02-2021	Testing completed
18		2		
19		3		
20		4		
21		5		
22		6		
23	Dikchu	1	Unit#1: 6th & 7th April' 21 Unit#2: 8th & 9th April' 21	Scheduled
24		2		
25	MPL	1	-	Postponed due to some technical issue
26		2		
27	GMR	1	August'21	Testing Completed
28		2		
29		3		
30	JITPL	1	August'21	Scheduled
31		2		
32		3		
33	NPGCL	1	August'21	Testing Completed

34	BRBCL		1 st Week of August'21	Testing Completed
35	APNRL	1&2	July'21-August-21	Testing Completed
36	BBGS	1,2&3	26th Feb 22 - 3rd Mar 22	Scheduled

Annexure C.7

Power Plant	Unit No	PSS tuned (Yes/No)	PSS in Service (Yes/No)	Last PSS Tuning Date	Whether Done in Last 3 Years	Whether Next to be planned	Planned Next PSS Tuning
West Bengal							
Kolaghat-WBPDCL	3	No	Yes	Long Back	No	Yes	To be done within Jan./Feb. 2022 after DAVR replacement.
Bakreshwar-WBPDCL	2	Yes	Yes	2019	Yes	Yes	PSS tuning to be done during Unit O/H in the month of November-December, 2021
Bakreshwar-WBPDCL	4	Yes	Yes	2019	Yes	Yes	BHEL offer received. PSS tuning to be done within Nov. , 2021
Bakreshwar-WBPDCL	5	Yes	Yes	2019	Yes	Yes	BHEL offer received. PSS tuning to be done within Nov. , 2021
PPSP	1	No	Yes	2009	No	Yes	Dec-21
PPSP	2	No	Yes	2009	No	Yes	Dec-21
PPSP	3	No	Yes	2009	No	Yes	Dec-21
PPSP	4	No	Yes	2009	No	Yes	Dec-21
TLDP III	4 x 33			No Detail	No Detail	Yes	To be updated by WBSEDCL
TLDP IV	4 X 44			No Detail	No Detail	Yes	To be updated by WBSEDCL
DVC							
Raghunathpur-DVC	1	No	No		No Detail	Yes	Will be done after AOH
Raghunathpur-DVC	2	No	No		No Detail	Yes	Jun-21
Waria	4	Yes	Yes	2008	No	Yes	Unit Is out of Service
ISGS							
Kahalgaon NTPC	1	Yes	Yes	2017	Yes	Yes	Apr-21
Kahalgaon NTPC	3	Yes	Yes	2016	Yes	Yes	Jul-21
Kahalgaon NTPC	4	Yes	Yes	2015	No	Yes	Mar-21
Kahalgaon NTPC	6	Yes	Yes	2009	No	Yes	Mar-21
Talcher Stage 2	3	Yes	Yes	2016	Yes	Yes	Nov-21
Talcher Stage 2	4	Yes	Yes	No Details	No Details	Yes	Nov-21
Talcher Stage 2	5	Yes	Yes	No Details	No Details	Yes	Nov-21
Talcher Stage 2	6	Yes	Yes	2016	Yes	Yes	Nov-21
Barh NTPC	1						
Barh NTPC	4			2015		Yes	In Next AOH
Barh NTPC	5			During Unit commissioning		Yes	June 2021 (AOH)
Teesta V	1	Yes	Yes	2008	No	Yes	Nov-21
Teesta V	2	Yes	Yes	2008	No	Yes	Nov-21
Teesta V	3	Yes	Yes	2008	No	Yes	Nov-21
BRBCL	2	Yes	Yes	2019	Yes	Yes	Jun-21

BRBCL	3	No	Yes	Vendor to Do	No	Yes	Jun-21
BRBCL	4	No	Yes	Vendor to Do	No	Yes	To be updated
KBUNL	1	Yes	Yes	2014	No	Yes	2021-22
KBUNL	2	Yes	Yes	2014	No	Yes	2021-22
Rangit	3 x 20			Not Available	No	Yes	To be updated by NHPC
IPP							
ADHUNIK	1	Yes	YES	2013	No	Yes	Mar-21
ADHUNIK	2	Yes	YES	2013	No	Yes	Mar-21
JITPL	1	Yes	Yes	2016	Yes	Yes	Jul-21
JITPL	2	Yes	Yes	2016	Yes	Yes	Jul-21
GMR	1	Yes	Yes	2013	No	Yes	Dec-21
GMR	2	Yes	Yes	2013	No	Yes	Dec-21
GMR	3	Yes	Yes	2013	No	Yes	Dec-21
Orissa							
IB TPS	1	Yes	Yes	2011	No	Yes	Mar'2021
IB TPS	2	Yes	Yes	2012	No	Yes	Mar'2021
Upper Indravati	1	Yes	No	2015	No	Yes	To be updated by OHPC
Upper Indravati	2	Yes	No	2015	No	Yes	To be updated by OHPC
Upper Indravati	3	Yes	No	2000	No	Yes	To be updated by OHPC
Upper Indravati	4	Yes	No	2001	No	Yes	To be updated by OHPC
Balimela	1 (60 MW)			No detail		Yes	To be updated by OHPC
Balimela	2 (60 MW)			No detail		Yes	To be updated by OHPC
Balimela	3 (60 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Balimela	4 (60 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Balimela	5 (60 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Balimela	6 (60 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Balimela	7 (75 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Balimela	8 (75 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Upper Kolab	1	Yes	Yes	2007	No	Yes	To be updated by OHPC
Upper Kolab	2	Yes	Yes	2007	No	Yes	To be updated by OHPC
Upper Kolab	3	Yes	Yes	2007	No	Yes	To be updated by OHPC
Upper Kolab	4	Yes	Yes	2007	No	Yes	To be updated by OHPC
Sterlite	4 X 600			No detail		Yes	To be updated by SLDC
Jharkhand							
Tenughat	1	Yes	Yes	2017	Yes	Yes	Dec-21
Tenughat	2	Yes	Yes	2017	Yes	Yes	Dec-21
Subarnrekha	2 X 65					Yes	To be updated
Bihar							
BTPS	6 (110)					Yes	To be updated by BSPGCL

BTPS	7 (110)					Yes	To be updated by BSPGCL
BTPS	8					Yes	To be updated by BSPGCL
BTPS	9					Yes	To be updated by BSPGCL
Bhutan							
Tala	1	No	Yes			Yes	To be updated by BPC
Tala	2	No	Yes			Yes	To be updated by BPC
Tala	3	No	Yes			Yes	To be updated by BPC
Tala	4	No	Yes			Yes	To be updated by BPC
Tala	5	No	Yes			Yes	To be updated by BPC
Tala	6	No	Yes			Yes	To be updated by BPC
Chukha	1	No	Yes	2005	No	Yes	To be updated by BPC
Chukha	2	No	Yes	2005	No	Yes	To be updated by BPC
Chukha	3	No	Yes	2005	No	Yes	To be updated by BPC
Chukha	4	No	Yes	2005	No	Yes	To be updated by BPC
Mangdechu	1	No	Yes			Yes	Sep-21
Mangdechu	2	No	Yes			Yes	Sep-21

Annexure C.12

Statewise transmission adequacy												
Sl.NO.	Name of the state	Antecedent condition	Likely constraints	Future element to relieve constraints		Executing agency	Details of SCM/plan /forum	Date of approval	Expected date of commissioning	if delayed from SCOD, Reason	Revised expected date of commissioning	Other reason
1	Bihar	High drawal at Sipara (to meet the demand of City of Patna) by Bihar	N-1 non-compliant of 220kV Patna-Sipara T/c line	Intra State	Creation of 400/220 kV Jakkanpur Substation by LILO of NPGC-Patna D/C Line at Jakkanpur	BSPTCL/B GCL	18th SCEM	13-Jun-16	Mar-22			
				Intra State	220 kV Down stream of Jakkanpur	BSPTCL/B GCL	2nd ERPCTP	30-Sep-20	NA			To be taken after commissioning of Jakkanpur Substation
				Intra State	LILO of 400 kV Patna-Balia DC at Naubatpur		2nd ERPCTP	30-Sep-20	NA			
				Intra State	220 kV Down stream of Naubatpur		2nd ERPCTP	30-Sep-20	NA			
				Intra State	Reconductoring of Patna-Sipara with HTLS Conductor		2nd ERPCTP	30-Sep-20	NA			
2	Bihar	During Peak demands of Bihar and Nepal	N-1 non-compliant of 2x200 MVA 400/132kV ICTs at Motihari	ISTS	1x 315 MVA ICT at Motihari	PMTL	18th SCEM	13-Jun-16	Apr-22			Third 315 MVA ICT was being charged through 132 kV GIS Bus at Motihari on 21-04-2021. Just after charging of new ICT, 132kV Main bus-1 at Motihari tripped due to problem at Bus extension module. After this ICT could not be charged yet
3	Jharkhand	During Peak demand of Jharkhand	N-1 non-compliant of 2x315 MVA 400/220 kV ICTs at Ranchi	ISTS	3rd 500 MVA ICT at Ranchi	Not yet allocated	3rd ERPCTP	09-Feb-21	Not available			
4	Jharkhand	During Peak demand of Jharkhand	N-1 non-compliant of 220 kV Maithon(PG)-Dumka D/C	Intra State	LILO of 220kV Tenughat - Govindpur D/c line at Jainamore and Dhanbad	JUSNL	1 st Consultation Meeting	27-Dec-21	Dec-23			Dec 2023(for 02 bays at Dhanbad) Under administrative approval of State Government Level
5	DVC	1. Less generation at CTPS 2. Less generation at Koderma	N-1 non-compliant of 220 kV Maithon(PG)-Kalyaneswari D/C and Maithon(PG)-Dhanbad D/C	Intra State	1. Construction of 400/220 kV Substation at RaghunatpurTPS	DVC	4th ERPCTP	09-Sep-21	Mar-23			
					2. LILO of 220 kV Kalyaneswari-CTPS D/C at RaghunatpurTPS			09-Sep-21	Mar-23			
					3.Construction of 400/220 kV Substation at Mejia-B TPS			09-Sep-21	Mar-23			
					4. LILO of 220 kV Mejia-A TPS-Barjora D/C at Mejia-B TPS			09-Sep-21	Mar-23			
6	DVC	Decommissioning of generators at Bokaro B	N-1 non-compliant of 2x315 MVA 400/220 kV ICTs at Bokaro	Intra State	1. Construction of 400/220 kV Substation at RaghunatpurTPS 2. LILO of 220 kV Kalyaneswari-CTPS D/C at RaghunatpurTPS	DVC	4th ERPCTP	09-Sep-21	Mar-23			
7	DVC and WB	High Demand of WB and less generation at DPL	N-1 non-compliant of 220 kV Waria(DVC)-Bidhannagar(WB) D/C	Intra State	3rd 315 MVA ICT at Bidhannagar (WB)	WBSETCL	8th SSCM/4th ERPCTP	NA	Jun-22			

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Annexure D.1

Anticipated Peak Demand (in MW) of ER & its constituents for the month of Jun 2022

1	BIHAR	Demand (MW)	Energy Requirement (MU)
	NET MAX DEMAND	6450	3623
	NET POWER AVAILABILITY- Own Sources	500	207
	Central Sector+Bi-Lateral	5850	3757
	SURPLUS(+)/DEFICIT(-)	-100	341
2	JHARKHAND		
	NET MAXIMUM DEMAND	1760	955
	NET POWER AVAILABILITY- Own Source	515	175
	Central Sector+Bi-Lateral+IPP	975	798
	SURPLUS(+)/DEFICIT(-)	-270	18
3	DVC		
	NET MAXIMUM DEMAND	3200	2010
	NET POWER AVAILABILITY- Own Source	5500	3197
	Central Sector+MPL	305	299
	Bi- lateral export by DVC	2500	1575
	SURPLUS(+)/DEFICIT(-) AFTER EXPORT	105	-89
4	ODISHA		
	NET MAXIMUM DEMAND (OWN)	4850	2844
	NET MAXIMUM DEMAND (In Case of CPP Drawal)	2880	3200
	NET POWER AVAILABILITY- Own Source	2895	2098
	Central Sector	1750	1361
	SURPLUS(+)/DEFICIT(-) (OWN)	-205	615
	SURPLUS(+)/DEFICIT(-) (In Case, 600 MW CPP Drawal)	1765	259
5	WEST BENGAL		
5.1	WBSEDCL		
	NET MAXIMUM DEMAND	7645	4645
	NET MAXIMUM DEMAND (Incl. Sikkim)	7640	4652
	NET POWER AVAILABILITY- Own Source (Incl. DPL)	5161	2568
	Central Sector+Bi-lateral+IPP&CPP+TLDP	2628	1643
	EXPORT (To SIKKIM)	5	7
	SURPLUS(+)/DEFICIT(-) AFTER EXPORT	138	-441
5.2	CESC		
	NET MAXIMUM DEMAND	2380	1080
	NET POWER AVAILABILITY- Own Source	830	460
	IMPORT FROM HEL	540	373
	TOTAL AVAILABILITY OF CESC	1010	833
	DEFICIT(-) for Import	-1370	-247
	WEST BENGAL (WBSEDCL+CESC+IPCL)		
	(excluding DVC's supply to WBSEDCL's command area)		
	NET MAXIMUM DEMAND	10025	5725
	NET POWER AVAILABILITY- Own Source	5991	3028
	CS SHARE+BILATERAL+IPP/CPP+TLDP+HEL	3168	2016
	SURPLUS(+)/DEFICIT(-) BEFORE WBSEDCL'S EXPORT	-866	-681
	SURPLUS(+)/DEFICIT(-) AFTER WBSEDCL'S EXPORT	-871	-688
6	SIKKIM		
	NET MAXIMUM DEMAND	104	48
	NET POWER AVAILABILITY- Own Source	18	1
	Central Sector	124	134
	SURPLUS(+)/DEFICIT(-)	38	87
	EASTERN REGION		
	NET MAXIMUM DEMAND	25872	15204
	NET MAXIMUM DEMAND (In Case of CPP Drawal of Odisha)	23940	15560
	BILATERAL EXPORT BY DVC (Incl. Bangladesh)	2187	1575
	EXPORT BY WBSEDCL TO SIKKIM	5	7
	EXPORT TO B'DESH & NEPAL OTHER THAN DVC	642	462
	NET TOTAL POWER AVAILABILITY OF ER	25091	15496
	(INCLUDING CS ALLOCATION +BILATERAL+IPP/CPP+HEL)		
	SURPLUS(+)/DEFICIT(-)	-786	285
	SURPLUS(+)/DEFICIT(-) (In Case, 600 MW CPP Drawal of Odisha)	1146	-71

ANNEXURE D2

Approved Maintenance Schedule of Thermal Generating Units of ER during 2022-23 in the month of June'2022												
System	Station	Unit No.	Capacity(MW)	Period (as per LGBR 2022-23)		No. of Days	Approved Period		No. of Days	Reason	Whether as per LGBR or not	Remarks
				From	To		From	To				
WBPCL	Kolaghat TPS	4	210	04.06.2022	13.06.2022	10	04.06.2022	13.06.2022	10	PG Test	YES	
	Bakreshwar TPS	5	210	18.06.2022	17.07.2022	30	18.06.2022	17.07.2022	30	COH, BOH, TOH	YES	
	Bakreshwar TPS	2	210	20.06.2022	29.06.2022	10				PG Test	NO	Not Required
DVC	Mejia TPS	1	210	15.06.2022	04.08.2022	51	15.06.2022	04.08.2022	51	COH - Blr, Turb-RLA, Gen, FGD, C&I upgradation	YES	
NTPC	New Nabinagar (NPGCL)	3	660	26.06.2022	30.06.2022	5				Boiler License Renewal	NO	

ERPC::KOLKATA

ATTENDANCE SHEET

191st Operation Coordination sub-Committee (OCC) Meeting

VENUE: GANGTOK, SIKKIM

TIME: 09:30 HRS

DATE: 20.05.2022 (FRIDAY)

Sl. No.	Name	Designation & Organisation	Contact Number	E-mail Id	Signature
1	N.S.Mondal	Member Secretary, ERPC			
2	R. Sutradhar	Executive Director, ERLDC			
3	S. Ray, At	Adtl. CE, SIKKIM			
4	S. Konar	GM, ERLDC	9436335370	konar_sc@powergrid.in	S. Konar
5	D.K.JAVERI	CGM-AM-ER2 POWERGRID	9425409535	javeri@powergrid.in	D.K. Javeri
6	PARTHA GHOSH	Ch. Mgr-AM/ER-2	9434748263	partha.ghosh@powergrid.in	P. Ghosh
7	B. Devendhakumar	E.D. Teesta-III	7719379087	devendha.b@teesta.org	B. Devendhakumar
8	Niladri Mandal	Plant Head Teesta Teesta Urja Ltd	9800048898	niladri.mandal@andritz.com	Niladri Mandal
9	ARUNAVA SENGUPTA	GM (System Operation) ESC Ltd	9831802682	arunava.gupta@npsg.in	Arunava Sengupta
10	DEBARSHI DE	Mgr. (Sys/Em) ESC	9163312742	debarshi.de@npsg.in	Debarshi De
11	Shailendra Kumar	DGM (O&M), Shuza	9016097775	Shailendra.kumar@shuza.in	Shailendra Kumar
12	PRASHANT KUMAR DAS	CGM (Elect.) GRIDCO, ODISHA	9438907408	sgm.pp@gridco.co.in	P. K. Das
13	MANOJ KUMAR DAS	Sr. GM (Elect.) GRIDCO, Odisha	9437188969	manojkumardas@gridco.co.in	Manoj Kumar Das
14	Sarej Kumar Panda	CGM (Elect.), OHPC, WB	7328840016	skpanda@gmail.com	Sarej Kumar Panda
15	Amiya Kumar Mohanty	GM (EL), OHPC, BBSR	7328840019	akm_678@yahoo.co.in	Amiya Kumar Mohanty
16	Amrit Kumar Gupta	DM, Dikchu, NEP	9002242962	amitkumar.g@greenenergyproject.com	Amrit Kumar Gupta
17	Ravinder Kumar	AM Dikchu NEP	9083560917	Ravinder.kumar@greenenergyproject.com	Ravinder Kumar
18	Shweta Thapa	Adtl. Chief Engg SLDC Sikkim	9434701129	shwetha.thapa@gmail.com	Shweta Thapa
19	Krishna Pradhan	S.E (T&E)	9593385398	krishna.pradhan43@gmail.com	Krishna Pradhan
20	Nangyal Tashi	EE (SLDC)	7797672743	nangyal.tashi26@gmail.com	Nangyal Tashi
21	AJIT PRATAP SINGH	AGM (EE), NTPC, PVUNL	9650992791	ajitpratapsingh@ntpc.co.in	Ajit Pratap Singh
22	Nibit Kr. Gupta	A.E.G, SLDC, BIHAR	7033095872	nk Gupta.b@ntel@gmail.com	Nibit Kr. Gupta
23	SWETA	ESE, SLDC, Bihar	7763817716	SwetaSBP@2013@gmail.com	Sweta

Sl. No.	Name	Designation & Organisation	Contact Number	E-mail Id	Signature
24 ⁵³	DIKSHA KUMARI	A.M. (ERLDC)	9608578757	dikshakumari@posoco.in	Diksha Kumari
25 ⁵⁴	TAPOBRATA PAUL	Manager (ERLDC)	708502850	paul.tapobrata@posoco.in	T Paul
26 ⁵⁵	BILASH ACHARI	DGM(SO)	7003472016	bilash.achari@posoco.in	Bilash Achari
27 ⁵⁶	Saswat Ranjan Swain	Asst. Director (ERPC)	9337791451	saswat.ranjan@gov.in	Saswat
27 ⁵⁷	S. K. pradhan	AD, ERPC	8249244719	SK.pradhan15@gov.in	Sprad
28 ⁵⁸	A. De	EE, ERPC	9681932906	alix.erpc@gov.in	A De
29 ⁵⁹	SANJAY MITTAL	Director Power Sales	9811314080	Sanjay_mittal@indatgroup.com	Sanjay Mittal
30 ⁶⁰	K. Chakraborty	Asst Vice President	814584	kchakraborty@mbpelion	K Chakraborty
31 ⁶¹					
32 ⁶²					
33 ⁶³					
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