सत्यमेव जयते

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

No. CEA-GO-15-14/1/2021-NPC Division 83 - 104 Date: 27.02.2024

To
(As per distribution list)

विषय: 03.02.2024 को बैंगलोर में आयोजित एनपीसी की 14वीं बैठक के कार्यवृत्त के संबंध में।
Subject: Minutes of the 14th Meeting of NPC held on 03.02.2024 at Bangalore-reg.

कृपया 03.02.2024 को बैंगलोर में आयोजित एनपीसी की 14वीं बैठक का कार्यवृत्त आपकी जानकारी और आवश्यक कार्रवाई के लिए संलग्न है। यह सीईए वेबसाइट पर भी उपलब्ध है।

The Minutes of the 14th meeting of NPC held on 03.02.2024 at Bangalore is enclosed herewith for your kind information and necessary action, please. The same is also available on CEA website.

भवदीय/Yours faithfully

Encl: As above

27/02/24

(ऋषिका शरण/Rishika Sharan)
मुख्य अभियन्ता एवं सदस्य सचिव,रा.वि.स /
Chief Engineer & Member Secretary, NPC

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15. Shri K B Jagtap, Member Secretary, NERPC, NERPC Complex, Dong Parmaw, Lapalang, Shillong-793006. [Email: ms-nerpc@gov.in]

Special Invitees:

1. CMD, GRID-INDIA, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi -110016.

2. CMD, NTPC, NTPC Bhawan, SCOPE Complex, Institutional Area, Lodhi Road, New Delhi-110003.
3. CMD, PowerGrid, Saudamini, Plot No.2, Sector-29, Gurugram-122001.
4. COO, CTU, Saudamini, Plot No.2, Sector-29, Gurugram-122001
5. Chief Engineer, GM Division, Sewa Bhawan, CEA, New Delhi.

Copy for kind information to:-

1. SA to Chairperson, CEA, New Delhi
2. SA to Member(Go&D),CEA, New Delhi

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केंद्रीय विद्युत प्राधिकरण
Central Electricity Authority

राष्ट्रीय विद्युत समिति
National Power Committee

Minutes of 14th Meeting of
National Power Committee (NPC)
held on 03.02.2024
At Bangalore.

Minutes of 14th Meeting of National Power Committee (NPC) chaired by Chairperson, CEA held on 03.02.2024 at Bangalore.

1. Introduction

a. The 14th meeting of National Power Committee (NPC) was held on 03.02.2024 (Saturday) at Bangalore. The meeting was hosted by SRPC. The list of participants is at **Annexure-A.**

b. **Member Secretary, SRPC** extended warm and hearty welcome to Shri Ghanshyam Prasad, Chairperson CEA, Shri K Vijayanand, Chairperson SRPC, Chairperson TCC of WRPC, NRPC & SRPC, COO CTUIL, Director (SO), Grid-India, Director (SLDC), OPTCL, ED, PGCIL, Member Secretaries of NPC & RPCs, Members of NPC, Special Invitees and delegates to this 14th NPC meeting being hosted by SRPC at the Garden City, Bengaluru. He expressed heartfelt thanks Chairperson NPC for providing inspiring leadership to the NPC forum. He also thanked Chairperson SRPC for providing his guidance to conduct this meeting. He informed that SR demand has touched around 64 GW of maximum demand while SR may reach 100 GW by 2031-32 as per NEP. Out of SR Installed capacity of 290 GW, RE may be 219 GW by 2031-32. Till now Solar peak of 18.5 GW out of 22 GW, Wind peak of 16 GW out of 20 GW and simultaneous peak of 28 GW out of 42 GW has been achieved in Southern Region. Demand wise SR has achieved 61 % while energy wise in a day 32% of RE integration. He pose the challenges of increasing RE capacity in southern region and that it would be a big challenge which needs support of stake holders like SLDCs, RLDCs, Grid India, and CEA.

c. **Chairperson NPC in his opening remarks emphasized that** there is a need to take power sector to the next level amid the changing scenario like integration of renewable energy, cyber security issues in power system which throws main challenges in the today's time. He stated that a few years ago, the conventional generators were major part of the installed capacity, but in present years there are transition in the power sector and it is also the need of the hour in order to align our system with global level. He also stated that with the increase in the RE integration, the challenge become more when we don't have other capacity to balance during the non-solar hours or non-wind season. In order to address such issue which are having implications at national level, the role of National Power Committee become more prominent. Historically, we integrated the generators and transmission lines within a state and formed multiple intra-state system. Next was the formation of the regional grids by making inter-state system there and eventually the concept of one nation one grid was become a reality. This brought flexibility in the system and the benefits from a region can be taken by any other part of the country. He further stated that there is a regional diversity of demands and generation in the different regions of the country. There is a need to develop a mechanism to utilise this diversity of demands and generation. A uniform mechanism can be formed to use the surplus generation of a region to the deficit region. He opined that gradually we are moving towards the flexible tie-ups regime. It may be helpful in the cost optimization of the power for the consumers. The depth of the power market may likely to increase in the upcoming times. He informed that in the 13th meeting of

NPC, the focus was on the need for harmonization and uniformity of the different procedures, philosophies and modalities which were being followed by various RPCs and RLDCs in fields of energy accounting, protection aspect, operational aspects and communication system of the grid. He further informed that the inter-regional exchange of energy has been increasing and there is need to enhance inter-regional capacity and subsequently preparing National Energy Account i.e. NEA, which is also one of the agenda items to be discussed during the meeting. He requested MS NPC to take up the agenda of the meeting.

d. **MS NPC also welcomed Chairperson, CEA & NPC, all the members, special invitees and participants to the 14th meeting of National Power.** She thanked Chairperson, CEA for his able guidance for conducting the 14th NPC meeting. She thanked MS SRPC for arranging the meeting and for their warm hospitality at Bengaluru.

2. Confirmation of Minutes of 13th Meeting of NPC

a. The Minutes of 13th Meeting of NPC held on 05.07.2023 at Kolkata was circulated vide letter No. CEA-GO-15-14/1/2021-NPC division/237 dated 31.07.2023.

b. **MS NERPC** informed that in MoM of 13th NPC at item no. *"**9. Review of Status of Islanding scheme***, it is mentioned that, *"MS NERPC informed that DPR of Assam-II was sent to NLDC and DPR of Tripura IS under preparation stage. MS NPC informed that the DPR of Assam-II IS has not been received by NPC Division for PSDF funding"*.

c. **MS NERPC** suggested to modify the above para/information as below:

MS NERPC informed that the DPR of Guwahati Islanding scheme (approximate estimate of Rs 84 Cr) was placed at 23rd RPC meeting for approval. However, the same has been referred back to subcommittee of NERPC by 23rd NERPC to review the estimate as the cost was exorbitant. The subcommittee is re-examining the islanding scheme of Guwahati and the DPR with revised estimate will be finalized at the earliest and after taking of approval of RPC, it will be sent to PSDF by Assam State. Further he informed that Tripura islanding Scheme is also under review.

d. **The Committee confirmed the Minutes of 13th NPC with the following modification:**

Item no. "9. Review of Status of Islanding scheme" as per approved MoM of 13th NPC	**Modified part of Item no. "9. Review of Status of Islanding scheme as per comments of MS NERPC**

MS NERPC informed that DPR of Assam-II was sent to NLDC and DPR of Tripura IS under preparation stage. MS NPC informed that the DPR of Assam-II IS has not been received by NPC Division for PSDF funding.	**MS NERPC informed that the DPR of Guwahati Islanding scheme (approximate estimate of Rs 84 Cr) was placed at 23rd RPC meeting for approval. However, the same has been referred back to subcommittee of NERPC by 23rd NERPC to review the estimate as the cost was exorbitant. The subcommittee is re-examining the islanding scheme of Guwahati and the DPR with revised estimate will be finalized at the earliest and after taking of approval of RPC, it will be sent to PSDF by Assam State. Further he informed that Tripura islanding Scheme is also under review.**

3. Best practices/procedures being followed by RPC

a. **MS NPC** briefed the agenda to the Committee. She informed that the Subgroups of Operation, Protection, Communication and Commercial was constituted by the NPC to discuss best practices/procedures being followed by RPC as per the direction of Chairperson, CEA. It was decided in the 13th NPC meeting that draft S.O.P for Protection System Audit, Grid disturbance analysis, Communication outage, and Communication audit for S/s may be prepared by the concerned Subgroups. Accordingly, after due deliberations in the various meetings and based on inputs from RPCs, the following SOPs are finalised:

i. **SOP for Protection System Audit:** SOP (Attached at **Annexure-I**) was approved and circulated to all RPCs to implement. All RPCs have adopted the SOP and started to form the annual calendar for the same.

ii. **SOP for Grid Disturbances/Grid Incidents/Tripping's:** Subgroup finalized the SOP (Attached at **Annexure-II**) in the meeting held on 10.10.2023 and circulated to RPCs on 10.10.2023.

iii. **S.O.P for Communication Audit for Substations:** Subgroup finalized the SOP (Attached at **Annexure-III**) in the meeting held on 11.10.2023 and circulated to RPCs on 11.10.2023.

iv. **SOP for Communication System Outage Planning**: Subgroup finalized the SOP (Attached at **Annexure-IV**) in the meeting held on 03.11.2023 and circulated to RPCs on 03.11.2023.

b. She further informed that in the pre-meeting among MS, RPCs and MS, NPC held on 29.01.2024, MS SRPC was of view that some of utilities wanted to conduct Third Party Protection Audit by external agencies in line with IEGC 2023 and they may be permitted to engage Third Party Auditors.

c. **Chairperson NPC** queried whether the external agencies are certified or having expertise in conducting protection audit. MS SRPC informed that the external agencies are not certified however, they are having experience of conducting third party protection audit.

d. **Chairperson NPC** opined that the utilities may conduct the third party protection audit as per the SOP finalised by the subgroup since the audit team will be formed excluding the member for the utility whose protection system is to be audited and therefore it may be considered as third party audit. He further opined that a list of external agencies for conducting third party protection audit may be prepared by protection sub-group of NPC for reference. He also suggested that exception report of prolonged non-compliance of the recommendations of the protection audit may be monitored by NPC on the basis of reports submitted by RPCs.

e. **Chairperson NPC** suggested that Protection System Analysis Group (PSAG) may be constituted at RPC level consisting of the members from RPC, NPC, NLDC, RLDC, PGCIL, and a Protection Expert from the region along with the Entity under whose jurisdiction GD/GI occurred to analyse Grid Disturbances/Grid Incidents occurred at major/critical substations or at substations that affected critical/essential/strategic loads. The PSAG may exist always to analyse such GD/GI in a region.

f. Further, GRID-India vide email dated 19.02.2024 submitted suggestions on SOP for protection system audit, Grid Disturbances/Grid incidents/Tripping's, Communication audit for substations, and communication system outage planning. The copy of suggestions is attached at **Annexure-B.** GRID-India suggestions may be discussed in the respective subgroup of NPC and if agreed by the subgroup, suggestions of GRID-India may be incorporated suitably.

g. **Decisions of the Committee:**

i. SOPs finalised by the respective subgroups were approved by the Committee, if any changes suggested by members of the subgroup, will be incorporated suitably and circulated to RPCs for implementation/adoption. The same may be ratified in the next meeting of NPC.

(Action: Respective subgroups of NPC / NPC)

ii. The list of external agencies for conducting Third Party Protection Audit may be prepared by Protection sub-group of NPC for reference.

(Action: Protection Subgroup of NPC)

iii. Protection System Analysis Group (PSAG) may be constituted at RPC level consisting of the members from RPC, NPC, NLDC, RLDC, PGCIL, a Protection Expert from the region along with the Entity under whose jurisdiction GD/GI occurred to analyse Grid Disturbances/Grid Incidents occurred at major/critical substations or at substations that affected critical/essential/strategic loads. The PSAG may exist always to analyse such GD/GI in a region.

(Action: RPCs Secretariat)

iv. **The exception report of prolonged non-compliance of the recommendations of the protection audit may be monitored by NPC on the basis of reports submitted by RPCs on half yearly basis.**

(Action: NPC/RPCs)

4. Unified Accounting Software (UAS) for RPCs

a. **MS NPC** informed that in the 13th meeting of NPC held on 05th July 2023, it was decided that the commercial subgroup of NPC would recommend on the standardization of the formats and software of the commercial accounts. The standard formats and software finalised by the commercial sub-group would be placed in next NPC meeting.

b. She further informed that two meetings of commercial sub-group was held on 8.8.23 and 30.10.23. Based on the inputs/comments of ERPC and SRPC, the standardised output formats was discussed and the Final standard output formats (attached as **Annexure-V**) were circulated to all RPCs. The **Standard Output formats contains** the formats of the **Weekly account** (i.e. DSM Settlement Account, Ancillary Service Account (SRAS, TRAS) and Reactive Energy Account), **Monthly Account (i.e.** Regional Energy Account, RTA/RTDA, Ramping Account Format, SCED Account, Delayed payment accounts) and Additional formats of some commercial account. Further, a meeting to discuss the implementation of the Unified Accounting Software for RPCs under the chairmanship of Member (GO&D), CEA was held on 20.11.2023 at Sewa Bhawan, New Delhi in hybrid mode. (MoM is attached at **Annexure-VI).** In this meeting, the implementation of the Unified Accounting Software for RPCs were discussed in detail and the following decisions were taken:

i. ERPC shall be the Nodal RPC for implementation of Unified Accounting Software for RPCs.

ii. A Joint Committee shall be formed with representatives (Director/Superintending Engineer/ Deputy Director Level) from all RPCs, GM Division, CEA and NPC Secretariat. Superintending Engineer, ERPC would be the Member Convener of Joint Committee with following Term of Reference (TOR):

- Hiring of consultant for preparation of DPR
- Identifying the possible source of funding i.e. through PSDF or RPC funds.
- Preparation of NIT and other documents related to tendering.
- Selection of vendor for commercial account software.
- Execution of work order and certification of completion of work.
- Recommend on O&M/AMC/Ownership of project.
- Any other matter related to Unified Accounting Software.

c. She further informed that in the pre-meeting among MS, RPCs and MS, NPC held on 29.01.2024, MS SRPC suggested that the development of Unified Accounting Software may be carried out in two phases. In Phase –I, Technical specifications and scope of work for commercial accounts may be finalised and in the Phase –II, Additional formats for information or analysis of operational data, report formations may be carried out.

MS SRPC also suggested the working level officers may be involved in the finalisation of technical specifications. In pre-meeting, NRPC representative suggested that the parallel efforts may also be carried out for identifying non uniformity in Commercial accounts wrt different RPCs so that same may be accommodated simultaneously in process finalisation. Further, a dedicated team/committee may also be formed at RPC for carrying out changes required after implementation of the UAS.

d. The standard output formats of commercial accounts and constitution of the Committee along with its ToR was proposed for approval of the Committee.

e. **Chairperson SRPC** raised the issue of funding for the Uniform Accounting Software and suggested that the PSDF funding may be provided for the smoother implementation of the project considering the importance of Accounts. It was suggested to plan the implementation of the UAS in the comprehensive manner considering the interoperability and uniformity among all the regions of the country.

f. **Chairperson NPC queried regarding the cost estimates for implementation of the Unified Accounting Software for all RPCs. MS NRPC** informed that RPCs may share the cost for hiring of consultant and preparation of DPR, however, the project cost may be funded through PSDF.

g. **Director (System Operation) Grid-India** informed that the cost of implementation for Uniform WBES software was around Rs. 20 crore including the cost of AMC. Accordingly, UAS may cost around Rs. 20-30 crore and the provision of migrating to 5 min scheduling was made in their WBES and other applications. It was opined that similar provision need to be made in Unified Accounting Software (UAS) of RPCs.

h. **Chairperson NPC** suggested to prepare a proposal for UAS and thereafter, the PSDF funding may be sought. The project may be considered as critical project under PSDF guidelines for bringing interoperability uniformity in the system and importance of timely and accuracy of Regional accounts. ERPC will be nodal RPC for implementation of the UAS and the ToR of the Joint Committee may be revised considering the NEA and for carrying out changes required post implementation of the UAS. He also suggested to include the NTPC and some states as member of the Joint Committee.

i. **Decisions of the Committee:**

i. The standard output formats of commercial accounts were approved.

ii. ERPC will be nodal RPC for implementation of the UAS and the ToR of the Joint Committee may be revised considering the NEA, provisions of migrating to 5 min scheduling and for carrying out changes required post implementation of the UAS. NTPC and some states may be included as member of the Joint Committee.

(Action: ERPC/JC/NPC)

iii. A proposal for UAS may be prepared and thereafter, the DPR may be submitted to nodal agency i.e. NLDC for PSDF funding. The project may be considered as critical item under PSDF guidelines for bringing interoperability and uniformity in the system and importance of timely and accuracy of

Regional accounts. The cost for hiring of consultant and preparation of DPR will be shared equally by all RPCs.

(Action: ERPC/JC/RPCs)

iv. The following timeline was decided in the meeting:

- **Hiring of consultant- 45 days**
- **Preparation of DPR- 60 days**
- **Further timelines may be depending upon scope of work as per DPR.**

(Action: ERPC/JC)

5. National Energy Account (NEA)

a. **MS NPC** briefed the agenda to the Committee. She informed that MoP vide letter dated 30.11.2016 (**attached as Annexure-VII**) observed that considering the changing scenarios, the functions of NPC may also be broadened including the functions to maintain the National Energy Account (NEA) involving the trans-national and inter-regional transmission transactions. The issue of National Energy Account was deliberated in various meetings (8^{th}, 9^{th}, 10^{th}, 11^{th}, 12^{th} and 13^{th}) of NPC and in the 11th meeting of NPC held on 28.02.2022, NPC and RPCs agreed that in future, if NEA would be mandated by CERC, the directions may be followed accordingly. It was also informed that the mock exercise of NEA was conducted by NLDC.

b. **MS NPC** opined that since the Uniform Accounting Software (UAS) is being under discussion and in order to make the system futuristic, the provision of NEA may also be incorporated in the UAS. The proposed statement of account to be covered under NEA are as follows:

i. DSM account statement of inter-regional and cross border entities.

ii. Reactive Energy account statement of cross border entities.

iii. National SCED account statement which is currently issued by NLDC.

iv. SRAS and TRAS account statement.

The output formats of these statement of account are attached at **Annexure-VIII.** It was noted in pre-meeting among MS, RPCs and MS, NPC held on 29.01.2024 that Schedule of Inter Country transactions may be included in NEA.

c. **Decisions of the Committee:**

i. **It was decided that the Joint Committee constituted for implementation of the UAS may also consider the NEA in the UAS software to make the system futuristic.**

(Action: ERPC/JC)

ii. **The Schedule of Inter Country transactions may also be included in NEA.**

(Action: ERPC/JC)

6. Protection Setting Protocol (WRPC Agenda)

a. **MS WRPC** informed that in 48th WRPC meeting it was suggested that the protection setting protocol for WR shall be drafted by WRPC within a month and the same shall be forwarded to NPC. The objective of protection setting protocol is to provide and maintain effective protection system having reliability, selectivity, speed and sensitivity to isolate faulty section and protect element(s). MS WRPC requested to prepare a uniform protection setting protocol for all regions, in consultation with all RPCs. The draft protection setting protocol prepared by WRPC is attached at **Annexure-IX.**

b. **MS NPC** proposed to form a sub-committee with representations from all RPCs, NPC and RLDCs to finalise a uniform protection setting protocol for all regions.

c. **MS SRPC** informed that Protection Protocol in compliance to IEGC 2023 has been prepared for southern region in consultation with stake holders and has been implemented in SR from 01.10.2023 and same has been informed to Commission. In IEGC it is mentioned that the Protection Protocol in particular system may vary based on operational experience. A sub group to analyse the proposed settings and recommend the settings to the respective entity has been constituted. The recommended settings are vetted in the monthly PCSC meetings.

d. **Chairperson NPC** opined that the Protection Setting Protocol of WR and SR may be referred and a Uniform Protection Protocol and Uniform Protection Setting Procedure may be prepared for all the regions.

e. It was decided that the protection subgroup of NPC may finalise a Uniform Protection Protocol and Uniform Protection Setting Procedure for all regions in consultation with RLDCs/GRID-India. The subgroup may submit its report within 5 months.

f. **Decision of the Committee:**

The protection subgroup of NPC may finalise a Uniform Protection Protocol and Uniform Protection Setting Procedure for all regions in consultation with RLDCs/GRID-India. The subgroup may submit its report within 5 months.

(Action: Protection subgroup of NPC /RLDCs/GRID-India)

7. SOP for Voice over Internet Protocol (VOIP) connectivity to utilities from RLDC (NRPC Agenda)

a. **MS NRPC** informed that a meeting was held under the chairmanship of Member Secretary (NRPC) on 06.07.2023 regarding provision of VOIP connectivity to the control centre / coordination centre of Indigrid & Sterlite with NRLDC. In this meeting, CTU was advised to prepare a draft SOP for providing the VOIP connectivity to control centres of TSPs/ Gencos etc. The draft SOP was deliberated in 23rd TeST meeting of NRPC held on 21.09.2023 wherein it was decided that SOP needs to be finalized for all regions as TSPs in other regions may also come up with such requirements. Hence,

issue may be taken up for deliberation in upcoming NPC meeting. (Draft SOP enclosed at **Annexure-X**).

b. **CTU representative** informed that inputs related to cyber security has been incorporated as per CEA guidelines and it shall be further looked into for requisite compliance.

c. **MS NPC** proposed to form a sub-committee with representations from all RPCs, CEA, RLDCs/Grid India, CTU, POWERGRID and concerned private entities to finalise a draft SOP for providing the VOIP connectivity to control centres of TSPs/ Gencos etc. She also informed that in the pre-meeting among MS, RPCs and MS, NPC held on 29.01.2024, it was suggested that representative from PCD Division, CEA may also be included as a member of sub-committee.

d. **Director (System Operation), Grid-India** opined that there is need for expansion/up-gradation of exiting system since it was conceptualized way long back in year 2012. CTU stated that they are already planning a new VOIP system to replace the existing one as being deliberated in the RPCs.

e. **Chairperson NPC/CEA** suggested that assessment of the system requirements needs to be ascertained considering the existing and the future requirements. CTU shall take up the same during planning of VOIP system.

f. After detailed deliberations, it was decided that a sub-committee may be constituted under chairmanship of MS NRPC with representations from all RPCs, PCD Division, CEA, NPC, RLDCs/Grid India, CTU, POWERGRID and concerned private entities to finalise SOP at national level for providing the VOIP connectivity to control centres of TSPs/ Gencos etc. The sub-committee may submit its report within 4 months.

g. **Decision of the Committee:**

i. A sub-committee may be constituted under chairmanship of MS NRPC with representations from all RPCs, PCD Division, CEA, NPC, RLDCs/Grid India, CTU, POWERGRID and concerned private entities to finalise SOP at national level for providing the VOIP connectivity to control centres of TSPs/ Gencos etc. The sub-committee may submit its report within 4 months.

(Action: NPC Secretariat/NRPC)

ii. The assessment of the system requirements needs to be ascertained considering the existing and the future requirements by CTU. CTU shall take up the same during planning of VOIP system.

(Action: CTU)

8. Report on Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme

A. Report on AUFLS and df/dt scheme

a. **MS NPC** briefed the agenda to the committee. She informed that in the 13th NPC meeting, it was decided that a task force under chairmanship of MS, SRPC with

members from Grid India, RPCs/NPC may be formed to review the report in order to address following suggestions of CMD, GRID-INDIA and MS,SRPC.

i. The first stage will be set at 49.4 Hz.

ii. Total 25% relief will be planned in 4 stages-49.4 Hz, 49.2 Hz, 49.0 Hz & 48.8 Hz.

iii. Pumping load will be tripped before first stage (> 49.4 Hz). Battery energy system in charging mode will go in discharging mode (> 49.4 Hz), no storage will be in storage/charging mode at frequency < 49.4 Hz.

b. She further informed that NPC Secretariat constituted task force on Automatic under Frequency Load Shedding (AUFLS) and df/dt scheme with the representatives from RPCs, NPC and GRID-INDIA. Accordingly, the meeting of the taskforce was held on 11.09.2023 under the chairmanship of MS, SRPC and based on the deliberations in the meeting and further comments received from members, the final Report of the Task Force (Attached **at <u>Annexure-XI</u>**) was prepared/ circulated among the Members and submitted to NPC by SRPC.

c. Total 25% relief would be planned in four stages: Stage as shown in the table below:

S.No.	**Stage of UFR Operation**	**Frequency (Hz)**	**% of Quantum Relief**
1	***Stage-1***	**49.40**	**5%**
2	***Stage-2***	**49.20**	**6%**
3	***Stage-3***	**49.00**	**7%**
4	***Stage-4***	**48.80**	**7%**
Total			**25%**

d. **She summarised the recommendation of the report as below:**

i. NPC Secretariat will communicate region wise relief quantum (based on Regional Peak Demand Met during the previous FY) by 31st of May to RPCs for implementation in the next Financial Year (FY).

ii. Distribution of relief among State/UT to be carried out based on Regional relief and demand contribution in the average of Peak demand met ratio and demand met (consumption) ratio of State/UT in the previous FY by RPCs.

iii. Guidelines for identification of AUFLS feeders: Stage-1 & Stage-2 for downstream network at 11/22/33 kV level and Stage-3 & Satge-4 for upstream network at EHV (66/110/132 kV) level.

iv. Prioritization of the loads under the AUFLS and df/dt scheme: Feeders catering to critical loads are to be avoided. VIP areas, Airport, Metro, Railways, Defence etc. has been prioritized.

v. Quantum Identification for AUFLS by States/UT and monthly vetting: Each SLDC shall carry out month-wise Stage-wise analysis and furnish to RPC/RLDC. Actual Relief for the month and recommended Relief for the month for each Stage. The

data would be vetted by RLDC and discussed in OCC Meetings of RPC. As a general Guideline Actual Relief for the month should be 10% more than the recommended Relief for the month considering the Relay/breaker issues and a resilient safety net.

vi. Analysis of AUFLS Event and discussion in OCC Meetings of RPC.

vii. Mapping of AUFLS feeder at SLDC and RLDC level.

viii. SLDCs shall download the data and store it for two years. The Data should be made available to RPCs/RLDCs/CEA/CERC for further studies or analysis.

ix. Settings of UFR for Pumping load/Energy Storage Systems: All Energy Storage Systems would change from charging mode to discharging mode at 49.50 Hz. If it is not possible then they would be tripped at 49.50 Hz. If ESS is injecting active power at 49.50 Hz not to be tripped. Pumping load will be tripped before AUFLS first stage. Irrigation Pumps would be tripped at 49.50 Hz.

x. All the relays procured in future to have a sampling period ranging from three (03) cycles to five (05) Cycles. No additional time delay to be incorporated in the relay other than the inherent measuring time.

xi. Testing/Inspection of UFR: SLDCs responsible for testing and chalk out a plan of relays testing schedule before 1st of December and submit the same to RPC/RLDC. The periodicity of testing of relays shall be twice in a year at 110 / 132 kV level and above Substations and once in a year at 66 kV level and below Substations.

xii. RPC would carry UFR inspection randomly on sample basis by the RPC Secretariat or through RLDC.

xiii. df/dt Scheme: It is specific to regions and therefore, the quantum of load shedding may be discussed at regional levels in the RPCs in consultation with the stakeholders.

e. **Director SLDC (Odisha)** opined that the starting frequency/first stage of AUFLS may be considered at 49.5 Hz instead of 49.4 Hz keeping in view the operation of automatic demand side management at 49.9 Hz. MS SRPC clarified that the issue was discussed in detail in the UFR report under Chairmanship of MS, WRPC and the resilience of single grid needs to be harnessed before going for AUFLS load relief.

f. **Chairperson NPC** queried whether the feeders under AUFLS are being monitored. MS NPC informed that the feeders are being monitored and RPCs shares the status update on the feeder monitoring to the NPC Secretariat. Chairperson NPC emphasised upon the monitoring of feeders under AUFLS and suggested that it may be made part of regular agenda in the appropriate RPC forum.

g. **Chairperson NPC** queried if a feeder under AUFLS is under outage, then how the desired load shedding can be obtained. MS SRPC informed that in the report, it has been recommended that the actual load relief should be 10% more than the desired relief considering the Relay/breaker issues and a resilient safety net. He also informed that the load flow of feeders under AUFLS being monitored regularly by the SLDCs.

h. **Chairperson SRPC** stated that the utilities generally kept agriculture feeders under AUFLS and feeders connected to city load are not covered under AUFLS.

i. **MS NPC** informed that the reports recommended that the guidelines for identification of AUFLS feeders and prioritization of the loads under the AUFLS and df/dt scheme.

j. Further, GRID-India vide email dated 19.02.2024 submitted following suggestions on implementation of AUFLS:

i. The Distribution connected RE (DRE) rich areas shall not be included as loads for shedding under AUFLS.

ii. AUFLS relay operation may also be standardized such as measurement, delay and operation time.

iii. The mapping of feeders need to be carried out at all RLDCs also.

k. **Decisions of the Committee:**

i. The report of Task Force on Automatic under Frequency Load Shedding (AUFLS) and df/dt scheme was approved by the Committee. The same needed to be taken up for implementation by RPCs. In order to address the views of Director SLDC (Odisha) and suggestions of GRID-India, a meeting may be convened by NPC Secretariat with stakeholders and if any further changes are suggested it shall be brought to next meeting of NPC.

(Action: NPC Secretariat)

ii. The monitoring of feeders under AUFLS may be prioritised by SLDC/RLDC/NLDC and it may be made part of regular agenda in the appropriate RPC forum to assess the performance.

(Action: RPC Secretariat)

B. Settings of AUFLS schemes:

a. **MS NPC** informed that in line with the recommendations of the sub-committee and further revision suggested by the Taskforce, the quantum of load shedding in different stages of AUFLS has been calculated based on the peak demand met of the region in the financial year (2022-23). The region wise peak demand met is as follows:

Region	NR	SR	WR	ER	NER
Peak Demand Met (MW)	76561	64337	71677	27218	3603

b. The quantum of load shedding in different stages of AUFLS has been calculated based on the peak demand met of the region in the financial year (2022-23) as follows:

S. No.	**Stage**	**Frequency (Hz)**	**Demand Disconnection (%)**	**Quantum of Load shed in MW**					
AUFLS Set Points and Percentage Quantum of Relief				**NR**	**SR**	**WR**	**ER**	**NER**	**All India Load shed**

1	Stage 1	49.4	5.00%	3828.05	3216.85	3583.85	1360.9	180.15	12169.8
2	Stage 2	49.2	6.00%	4593.66	3860.22	4300.62	1633.08	216.18	14603.76
3	Stage 3	49.0	7.00%	5359.27	4503.59	5017.39	1905.26	252.21	17037.72
4	Stage 4	48.8	7.00%	5359.27	4503.59	5017.39	1905.26	252.21	17037.72
	Total (in MW)			**19140.3**	**16084.25**	**17919.25**	**6804.5**	**900.75**	**60849**

c. **Decisions of the Committee:**

If any change is recommended in the meeting by NPC secretariat to look into the suggestion of Director SLDC (Odisha), for new stage of AUFLS at 49.5 Hz with 1-2% of Load relief, the same will be put upto to NPC and after approval of NPC the same would be communicated to RPCs for implementation.

(Action: NPC Secretariat)

9. Unified Real Time Dynamic State Measurement (URTDSM) project phase-II (PowerGrid Agenda)

a. **MS NPC** informed that in the 13th NPC meeting, the report of subcommittee on uniform philosophy of PMU locations, new analytics and requirement of up gradation of Control Center under "Unified Real Time Dynamic State Measurement" (URTDSM) project phase-II under the chairmanship of MS, WRPC was approved by NPC. It was also decided that the PowerGrid may prepare the DPR of URTDSM project phase-II in accordance with the recommendation of the committee within three months. PSDF funding for URTDSM project phase-II may also be sought subsequently. RPCs were requested to provide full cooperation in preparation of DPR.

b. **PowerGrid representative** informed that based on the recommendation of the report and the inputs received from entities, around 4000 PMUs will be installed in phase-II. The scope of work also includes the development of new analytics, up-gradation of existing analytics and integration of existing PMUs of phase-I etc. He further informed that the budgetary quotations were sought from 3 prospective bidders. All the bidders have informed about constraints in design & providing estimated cost because of large number of PMUs, large size of PDC & historian and new analytic applications in the Project. Till now, two budgetary quotations were received and based on that, cost estimates for phase-II have been worked out and it came around Rs. 3700 crore which includes Rs. 2300 crore for project implementation and rest amount for 7 years AMC.

c. **MS ERPC** informed that the in ER, the state of Jharkhand is having majority of transmission lines at 132 kV level, however, the report of URTDSM phase-II recommends to install PMUs on 220 kV and above lines. He requested to considered 132kv lines of state of Jharkhand for PMU installation under phase-II. Chairperson NPC suggested to send their inputs with proper justification.

d. **Chairperson NPC stated for** optimising number of PMUs to be installed under Phase II based on importance of PMUs location required for grid operations in consultation with the users like RLDC, SLDC.

e. **Director (System Operation) GRID-India** informed that as per Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022, the PMUs need to be installed in all the new substation and therefore all such new substation may be excluded from the scope for URTDSM phase-II.

f. **ED (AM) PGCIL** informed that the IT components of phase –I will serve their useful life by 2026 (URTDSM phase I was commissioned in year 2018), therefore, these components may also include in the phase-II. Chairperson NPC stated to exclude such components from the scope of phase-II.

g. **MS NPC** opined that the software analytics/reports under Phase-II may be finalised in consultation with the RLDCs/RPCs. The new technology options like AI, ML and big data analytics may be explored by RLDCs/RPCs/CTUIL while designing analytics software. **CTU representatives** appreciated the views of MS NPC and further added that URTDSM systems is critical for the increased complexity of power system network in light of large amount of renewable integration in the vast integrated Indian grid. The grid behaviours captured by PMUs and analysed by the applications may be empowered with Machine learning & Artificial Intelligence for adaptive solutions. The applications may generate meaningful reports periodically for separate zones depending upon its uniqueness. And the system database & intelligence may be periodically (every quarter or configurable for applicable administrative responsibility areas) revalidated for more realistic results and report generation.

h. **CTU representative** suggested to reduce the storage time period of the data under URTDSM phase-II to optimise the cost estimates and in this context the input from Grid India may be taken for assessing the phase I storage requirements and historical data usage.

i. **Chairperson TCC (SR)** stated that the analytics under phase-I are not of much use. He suggested that capacity building programs related to PMUs and its software analytics may be organised for the SLDCs**. Chairperson NPC** stated that a course may be designed on PMUs and its software analytics by NPTI.

j. **ED (AM) PGCIL** informed that the AMC contract for software URTDSM phase-I needs to extend with IIT Mumbai for further years. **MS ERPC** informed that extension of contract has already been approved for ER**. MS SRPC** informed that SRPC forum is not satisfied with analytics and support of the IIT Mumbai and therefore, they may not be ready to extend the AMC contract further. **Chairperson NPC** opined that GRID-India may coordinate among RLDCs to have a consensus on whether to extend the AMC contract with IIT Mumbai for the software analytics for URTDSM phase-I.

k. **Director SLDC (Odisha)** informed that the state of Odisha is implementing a separate WAMS projects. He requested the analytics which has been provided to them under URTDSM phase-I may be allowed to use for their separate WAMS project. The cost of customisation of analytics under URTDSM phase-I to make them for the use of WAMS of Odisha may be borne by the Odisha. PowerGrid informed that they will examine

whether it is possible as per their agreement with IIT Mumbai and coordinate with Odisha.

l. **Decision of the Committee:**

i. **PGCIL may revise the scope of DPR in line with above suggestions ((d) to (h)) and submit the DPR by March 2024.**

(Action: PGCIL)

ii. **PowerGrid will inform whether the customisation of analytics under URTDSM phase-I to make them for the use of WAMS of Odisha is possible as per their agreement with IIT Mumbai.**

(Action: PGCIL)

iii. **A course may be designed on PMUs and its software analytics for the SLDCs by NPTI.**

(Action: HRD Division, CEA/NPTI)

iv. **GRID-India may coordinate among RLDCs to have a consensus on whether to extend the AMC contract with IIT Mumbai for the software analytics for URTDSM phase-I.**

(Action: GRID-India)

10. Introduction of MPLS Technology in ISTS Communication (Agenda from CTU):

a. **MS NPC** informed that in line with decision of the 13th NPC meeting, NPC Secretariat constituted the committee on 24.08.2023 with representative from RPCs, PCD Division CEA, GRID-INDIA, RLDCs, POWERGRID, CTU and some prominent states Kerala, Chhattisgarh, West Bengal .As of now the Joint Committee has held four (4) numbers of meetings on 19.09.2023, 17.10.2023, 05.12.2023 and 23.01.2024.

b. **CTU representative** informed that the vendors of MPLS technology state that they are not able to meet the Make In India requirements completely and therefore, they are reluctant to go for PoC. However, CTU is consistently trying for the same.

c. **Chairperson SRPC** opined that the MPLS technology may be implemented for the new and upcoming system and in the old and exiting system SDH technology may be used. He suggested to use hybrid approach with interoperability to slowly integrate the new technology.

d. **Chairperson NPC** emphasised that the importance of trusted vendor for the communication system. He opined that whether the migration from SDH technology to MPLS technology is required need to be deliberated further. He suggested to develop a comprehensive plan for the future, considering the existing/available technology.

e. **Decision of the Committee:**

CTU may submit the report on Introduction of MPLS Technology in ISTS system by July 2024.

(Action: CTU)

11. PUShP portal (For Flexibilisation of PPA for Optimal Utilization of Resources & Reduction in Cost of Power for Consumers):

a. **MS NPC** informed that the PUShP portal was launched on 09th March, 2023 by Hon'ble Minister of Power and NRE. The transaction on the portal has been started w.e.f. 03.04.2023. Twenty (20) Nos of States & UTs have started using the portal for declaration and requisition of surplus power. She informed that as on 03.02.2024, 94 number of request completed for allocation on portal. The status of successful transactions on the PUShP portal is attached at **Annexure-XII.** She further informed that the following new Provision/Feature were added on the PUShP portal**:**

i. Updating power requirement by the Buyers: As of now, some of the states-Bihar, Rajasthan, Andhra Pradesh, Jharkhand, Maharashtra, Odisha, Tamil Nadu, Uttar Pradesh, Haryana and Assam have updated their power requirement on the portal as and when required by them.

ii. Provision of Banking of Power feature under the PUShP Portal: In the PUShP Portal, a facility/provision has been provided to the States through which the States may intimate/declare the surplus power quantum which they are willing to bank for a certain period of duration. Any other state who wants to acquire this surplus power in deficit scenario and willing to undergo for banking with the surplus state, may give requisition for this surplus power for a same duration in the PUShP Portal as per their mutual agreement. **PUShP Portal shall be acting as match-making platform for banking of power.**

b. She further informed that in a meeting held on 7.12.2023 with the nodal officers, Punjab representative informed that NTPC is insisting for separate PPA for transactions on the PUShP portal. In this meeting, NTPC informed that beneficiaries are required to enter into a generic PPA for the power allocated to them through PUShP portal and to comply the scheduling requirements as per the provisions of act and regulations. NTPC has submitted the draft PPA format. In the minutes of the meeting held on 07.12.2023, it was concluded that the allocation of power through PUShP portal is of temporary nature and the original allocation of power gets reinstated once the temporary allocation cease to exist. Further, the PUShP portal facilitates the temporary allocation of power for a certain period which was earlier done by MoP/RPCs. In case of temporary re-allocation of power being done by MoP/RPCs, separate/another PPAs with the states/buyers was not required. In line with this, the separate PPA for the power allocated through PUShP portal may not be necessary for creation of contracts and scheduling of power.

c. She further informed that a buyer having adequate LC/PSM/advance payment with a CGS/Gencos, the existing adequate LC/PSM/advance payment may be considered as valid PSM by CGS/Gencos for both short term and long term temporary power allocation through PUShP portal. However, in absence of adequate LC/PSM/advance

payment, CGS/Gencos may review the existing LC/PSM on regular interval and request buyer to enhance LC/PSM/advance payment or ask for additional LC/PSM/advance payment for the short term and long term temporary power allocated through PUShP portal. ED (commercial), NTPC agreed for the same.

d. **Chairperson NPC** opined that there are terms and condition which an entity has to agree before login to the PUShP portal. NTPC may add any specific points in these terms and condition and there is no need to enter into separate PPA with the states for the PUShP portal.

e. **Chairperson TCC (SR)** informed that the APERC has not approved the payments for the power taken by the state from the unallocated share of CGS from whom the state is not having firm share.

f. **Decision of the Committee:**

i. There are terms and condition which an entity has to agree before login to the PUShP portal. NTPC may add any specific points in these terms and condition and there is no need to enter into separate PPA with the states for the PUShP portal.

(Action: NTPC)

ii. A buyer having adequate LC/PSM/advance payment with a CGS/Gencos, the existing adequate LC/PSM/advance payment may be considered as valid PSM by CGS/Gencos for both short term and long term temporary power allocation through PUShP portal. However, in absence of adequate LC/PSM/advance payment, CGS/Gencos may review the existing LC/PSM on regular interval and request buyer to enhance LC/PSM/advance payment or ask for additional LC/PSM/advance payment for the short term and long term temporary power allocated through PUShP portal.

12. Establishment of State-of- the-Art National Unified Network Management System (N-UNMS) in main & backup configuration integrating all the regional UNMSs. (CTUIL Agenda)

a. **CTU representative** briefed the agenda to the Committee. She informed that in line with CERC, CEA Regulations and RPC's deliberation, establishment of State-of Art U-NMS for ISTS and State Utility Communication System for all the Regions have been envisaged for five Regional systems and one National system integrating all the regional ones; in main & backup configuration. This will facilitate centralized reporting/collection of PAN India communication Network of ISTS as well as State level system including cross border links at National Level. She informed the status of UNMS for each region as below:

Region	Vendor	Date of award	Control Center Location	Status
NR	Sterlite	09.08.2021	**Main:** Delhi, **Backup:** Lucknow	Commissioned

NER	Sterlite	09.08.2021	**Main:** Guwahati, **Backup:** Shillong	Commissioned
ER	NMS works	29.06.2022	**Main:** Kolkata, **Backup:** Patna	Commissioning in Feb'24/March' 24
SR	NMS works	17.01.2024	**Main:** Bangalore, **Backup:** Hyderabad	Awarded
WR	NA	NA	**Main:** Mumbai, **Backup:** Vadodara	Tender opened in Jan'24
National	NA	NA	**Main:** NLDC, Delhi, **Backup:** RLDC, Kolkata	Approval for NPC

b. **Chairperson SRPC** opined that the regional UNMS system will monitor the inter-state and intra-state communication system, the objective of implementing the national UNMS is also similar.

c. **Chairperson NPC** informed that national UNMS will be helpful in the monitoring of PAN India communication Network of ISTS as well as State level system including cross border links at National Level. A data repository will be created at national level which will be helpful in the communication system planning.

d. It was suggested that the tariff of UNMS project at national level may be included as national component.

e. RPCs opined that the agenda for implementation of national UNMS needs deliberations at RPC level.

f. **Decision of the Committee:**

The agenda for implementation of national UNMS needs deliberations at RPC level for taking the views of RPCs. CTU may take up agenda for implementation of national UNMS in the upcoming meeting of RPCs. The cost booking under National Component may be included in proposal.

(Action: CTU/RPCs)

13. Membership of RE Generators in RPC (ERPC- Agenda)

a. **MS NPC** informed that it was decided in the 13th meeting of NPC that the associations of solar and wind generators both on rotational basis may become the members of the RPCs. The participation of associations would be limited to technical and operational issues. GM Division, CEA would nominate the associations to RPCs in similar line of Traders/Private Transmission Licensees.

b. **Deputy Director GM Division (CEA)** informed that the regulations and resolution on basis of which the membership of RPCs is being considered are applicable for conventional generators only.

c. **Chairperson NPC suggested that GM Division may take up the matter in CEA.**

14. Any Other Agenda Items with the permission of Chairperson, NPC

14.1 Five (5) min Interface Energy Meters along with AMR system for PAN India (for all Five regions) (CTU Agenda)

a. **CTU representative** informed that the proposal of the scheme "5 min Interface Energy Meter along with AMR system" for Southern Region was put up to 17th NCT meeting held on 31st Jan'2024. After deliberation, it was decided that the same scheme shall be worked out for complete PAN India National level. He **further** informed that the SRPC has proposed for the PSDF funding for "5 min Interface Energy Meter along with AMR system" for Southern Region.

b. **Grid-India** informed that the provision of migrating to 5 min scheduling was made in their WBES and other applications. It was opined that similar provision need to be made in Unified Accounting Software (UAS) of RPCs.

c. **Chairperson NPC** was of the view that 5 min IEM with AMR system may be implemented for pan India for smoother transition from 15 min to 5 min regime. **He further** opined that the proposal/DPR for 5 min IEM with AMR system for pan India may be prepared by PGCIL based on the input provided by CTUIL regarding the ISTS metering points in consultation with Grid India. CTU may prepare the roadmap and activities to be done for transition from 15 min to 5 min regime based on the previous studies/ reports in present context. He emphasized that the timeline of the activities may also be prepared and it may be in sync and coordination with each activities for smoother implementation of the project. The PSDF funding may not be possible because limited funds in PSDF. The funding of the project may be decided in the NCT meeting.

d. **Decision of the Committee:**

i. **The agenda for 5 min Interface Energy Meters along with AMR system for PAN India (for all five regions) needs deliberations in all RPC. Agenda may be taken up in the upcoming meetings of all RPCs.**

(Action: CTU/RPCs/POWERGRID)

ii. **The proposal/DPR for 5 min IEM with AMR system for pan India may be prepared by PGCIL based on the input provided by CTUIL regarding the ISTS metering points in consultation with Grid India.**

(Action: POWERGRID/CTU/GRID-India)

iii. **CTU may prepare the roadmap and activities to be done for transition from 15 min to 5 min regime based on the previous studies/ reports in present context. The timeline of the activities may also be prepared and it may be in sync and coordination with each activities for smoother implementation of the project.**

(Action: CTU)

14.2 Mismatch between RTU-SCADA real time data and IEM data

a. **Director SLDC (Odisha)** informed that in the special meeting of NPC held on 24.06.2022 it was decided that the pilot project of Integration of Interface Energy Meters (IEMs) into SCADA/EMS system for telemetry of meter data to MP SLDC was agreed to be implemented for the standby meters at MP side at the ISTS interface points. It was also agreed that the similar projects may be implemented at the two ISTS substations (one at new system and other at old system) in each region. He informed that such pilot project has not implemented in the ER due to various issues raised by PGCIL.

b. **PGCIL representative** informed that the pilot project has the cyber security issues. Further, it will also add burden to the IEM, it may affect the commercial accounting.

c. **Grid –India representative** stated that the difference in SEM and SCADA was less than 1%. The SCADA issues needs to be addressed by the entities rather than taking one more input from existing IEMs.

d. **MS NPC** informed that the provision of telemetry of 1 min instantaneous MW power flow data from IEMs to SLDC for efficient drawl management has been made in the Technical Specification of 5 Min IEM, AMR and MDP system.

e. **Chairperson NPC** suggested to form a sub-committee under chairmanship of MS WRPC with the representation from PGCIL, states, RPCs, RLDCs, CTUIL, NPC to look into the issue **SCADA vs SEM mismatch**, reason thereof and also study the pilot project being done by MP. The sub-committee may submit its report within 4 months.

f. **Decision of the Committee:**

A sub-committee may be constituted under chairmanship of MS WRPC with the representation from PGCIL, RPCs, RLDCs, CTUIL, NPC and states to look into the issue SCADA vs SEM mismatch, reason thereof and also study the pilot project being done by MP. The sub-committee may submit its report within 4 months.

(Action: NPC Secretariat)

14.3 Agenda of operational Issues of DISCOMs at RPC level

a. **Chairperson SRPC** opined that the RPC forum are being used mainly for addressing the issues of Generators, Transmission Licensee, PGCIL, CTU etc. however, the issues of the DISCOMs are not being deliberated at RPC level. He suggested to earmark some time and forum to discuss the issues of DISCOMs**.**

b. **MS ERPC** informed that generally DISCOMs are not raising their issues in the RPC meetings because generally states are being represented in the RPCs by their transmission wing.

c. **Chairperson TCC (WR)** stated that guidelines at Enterprise Level (Discom Level) needs to be brought out for number of operational/planning aspects of DISCOMs by central agencies like CEA.

d. **Chairperson NPC** informed that Electricity Distribution Network Planning Criteria 2023 and Draft Distribution Perspective Plan 2030 has been published on CEA website and focus is there on Distribution aspects. He opined that DISCOMs have forums to

raise their infrastructural issues, however, there is no appropriate forum to discuss the operational issues of the DISCOMs. He suggested to earmark time and forum of RPC to take up the agenda related to operational issues of DISCOMs.

e. **Decision of the Committee:**

DP&T Divisions, CEA in coordination with the NPC to take lead in this aspect and Region-wise meeting may be held. RPCs may facilitate these meetings at regional level.

(Action: DP&T Divisions, CEA)

15. Status Update of the following Agenda items: The Status update on the following agenda items as received from RPCs is given below:

Agenda items	Decision/Deliberations in the 13th NPC Meeting	Status Update
Preparation of an annual calendar for conducting the protection system audits.	RPCs are requested to update the preparation of an annual calendar for conducting the protection system audits	The status provided by RPCs are as follows:- • **SRPC**- SRPC has completed the Regional Protection Audit of 30 Substations for the FY 2023-24 during the Months of December 2023 & January 2024. As per IEGC Regulations, entities are required to furnish the third party audit plan for the next financial year to RPC by 31st October. Third Party Audit calendar for Southern Region would be prepared for FY 2024-25 after receipt of the audit plans from all SR entities. • **WRPC**- Tentative Annual calendar (will be firmed up shortly) enclosed at **Annexure –XIII** • **NERPC**- An annual calendar for protection audits of 132kV level & above substations has been prepared by NERPC. The same is being reviewed in monthly Protection sub-committee meetings. • **NRPC**- Utilities were sensitized for provision of IEGC 2023 that Annual audit plan for the next financial year shall be submitted by the users to their respective RPC by 31st October. NRPC Secretariat has received annual audit plan from 6 utilities till the date.

		Input is still awaited from ERPC.
Development of communication outage portal in RPCs	The communication outage portal developed by SRLDC shall be discussed with RPCs/NPC at Communication subgroup of NPC and RLDCs for implementation in other regions.	The status provided by RPCs are as follows:- • **SRPC-** Communication outage portal developed by SRLDC. • **ERPC-**Communication outage portal development is in process with ERLDC in consultation with SRLDC. • **NERPC-** NERPC requested NERLDC to develop communication outage portal similar in line with SRPC portal. NERLDC is in the process of development of the communication outage portal. • **NRPC &WRPC**-initiated discussion with RLDC for the development of the portal.
	Deliberation/Decisions in 14th NPC Meeting: All RLDC/RPC may develop the common communication outage portal in line with SRLDC portal.	
Conducting Cyber Security Audits	It was also decided in the 13th NPC meeting that periodicity of conducting Cyber Security Audits - 6 months for IT audit and 1 year for OT audit may be followed by RPCs.	The status provided by RPCs are as follows:- • **WRPC**- A Regional Sub-Committee and Central Cyber Security Coordination Forum for CERT-GO as per provision of Regulation 53 of Indian Electricity Grid Code has been formed and nominations provided by WRPC. • **SRPC**- SR entities are insisted to carry out the cyber security audits for their IT as well as OT systems at least once in every 6 (six) months as per CEA (Cyber Security Guidelines) 2021. • **NERPC-** Cyber Security Audits for OT system is being done annual basis. However Cyber Security Audits for IT system is being planned by constituents. Matter will be taken up in the next NETeST Meeting. • **NRPC**- In accordance with Regulations 53 of IEGC, 2023, Northern Regional Cyber Security Co-

		ordination forum is formed by NRLDC. 1st meeting of committee is scheduled to be held on 8th Feb, 2024. **Input is still awaited from ERPC**.
Review of Status of Islanding schemes	a. RPCs may handhold the states for timely implementation of the islanding scheme and the timeline may be given by RPC to each states for DPR preparation and implementation of Islanding Scheme. b. RPCs are requested to update the progress of each Islanding Scheme in the MIS report.	The detailed MIS report (as per information available in NPC Secretariat is attached at **Annexure-XIV**). The updated MIS report has been received from WRPC, NERPC, NRPC and SRPC Input is still awaited from ERPC.
Mapping of Feeders under AUFLS schemes on SCADA system	It was again requested to expedite the work by WRPC, NRPC and NERPC to conduct meetings with their DISCOMs to find solutions for feeder mapping and expedite it in their regions.	The status available with NPC Secretariat is attached at **Annexure-XV.** **Summary of status of mapping of feeders:-** • **In SR**- As on 31.12.2023 mapping was 95% in SR. Andhra Paradesh-92 %, Telangana-87%, Karnataka-96%, Kerala-100%, Tamil Nadu-97%, Puducheery-100%. • **In WR**- Madhya Pradesh: 100 %, Gujarat: NIL, Maharashtra: NIL, Goa: NIL, Chhattisgarh: NIL, DDDNH-NIL. • **In NER**- Assam-100 %, Meghalaya-100%, Nagaland-100%, Arunachal Pradesh – Nil Manipur – Nil, Mizoram – Nil (to be completed by Dec'23),Tripura – 20%. However, NERPC informed that States are being regularly sensitized in OCC forum for ensuring complete mapping of UFR feeders. Lack of RTUs at 33kV substations is a major hurdle. Shifting of feeders are underway.

		• **In NR-** UP-77.35 %, Punjab-90%, Haryana-99%, Delhi-100%, HP-86.9%, Rajasthan-0%. Input is still awaited from ERPC.
Ensuring Proper Functioning of Under Frequency Relays (UFR) & df/dt Relays	a. The annual calendar and SOP for periodic inspection of AUFLS and df/dt relays to be prepared by RPCs. b. RPCs may also ensure to conduct the periodic inspections of AUFLS and df/dt relays as per the annual calendar.	• **SRPC** had prepared Annual Calendar for periodic inspection of AUFLS and df/dt for the year 2023-24. Total 26 S/Ss were identified for Inspection in five States and UT. Inspection was carried out in 16 number of Sub Stations. Details are attached at **Annexure-XVI.** The SLDCs/S/Ss are advised on the actions to be taken based on the observations by SRPC. Action taken report also were sought. • **WRPC** had prepared Annual Calendar for periodic inspection of AUFLS and df/dt for the year 2023-24. Inspection was carried out in 8 number of Sub Stations. Details are attached at **Annexure-XVI.** • **NERPC** has prepared annual audit calendar for inspection of UFRs in the region. Inspection of UFR at 132kV Azara substation was conducted on 24.08.2023. Other sites of Assam have been identified for inspection, to be carried along with the protection audit in January'24. • Utilities submit report of mock exercises for healthiness of UFRs on quarterly basis to NRPC Secretariat. The compliance is monitored in monthly OCC meetings. NRPC has also conducted UFR inspection of 220 kV Rishikesh S/s of PTCUL recently. IEGC, 2023 requires RPC to carry out random inspection of the under-frequency relays. In view of this calendar for periodic inspection has not been prepared in NRPC. Further, a pre-prepared periodic inspection calendar would rule out the possibility of surprise inspection.

		Input is still awaited from ERPC.
Report on Power System Stabilizers (PSS) tuning	The report of the sub-committee was accepted by the NPC. The reports may be circulated for the stakeholders' consultation before implementation of recommendations of the report.	**WRPC updated that the PSS tuning report was circulated with concerned stakeholders via email dated 18.08.2023. However, no update has been received regarding comments from stakeholder on the report. The report may adopted by RPCs.**
	Deliberation in 14th NPC Meeting: **The Report may be adopted by RPCs.**	

16. Meeting ended with vote of thanks to Chair.

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Annexure A 14th NPC

List of Participants for the 14th Meeting of National Power Committee Scheduled on 03.02.2024 at Bangalore-reg.

Central Electricity Authority (CEA)

1. Sh.Ghanshyam Prasad, Chairperson……..(in Chair)
2. Smt. Rishika Sharan, Chief Engineer, NPC
3. Sh.Satyendra Kr. Dotan, Director, NPC
4. Sh. S. Prakash, Dy. Director, GM
5. Sh.Himanshu Lal, Dy. Director, NPC
6. Sh.Ravi Shankar Singh, Dy. Director, NPC

Eastern Regional Power Committee (ERPC)

1. Sh.B B Mehta, Director SLDC Odisha
2. Sh.N.S. Mondal, Member Secretary
3. Sh.P. P. Jena, Executive Engineer

Western Regional Power Committee (WRPC)

1. Sh. Raghuraj Rajendran, Chairperson TCC (WR)
2. Sh. Deepak Kumar, Member Secretary
3. Sh. P. D. Lone ,Superintending Engineer
4. Sh. D.N.Gavani ,Superintending Engineer

Southern Regional Power Committee (SRPC)

1. Sh.K Vijayanand, Chairperson, SRPC
2. Sh.A K V Bhaskar, Chairperson, TCC (SR)
3. Sh.Asit Singh, Member Secretary
4. Sh. J. B Len., Superintending Engineer
5. Sh.Meka Ramakrishna, Superintending Engineer
6. Sh. Anusha Das, Executive Engineer
7. Smt. NS Malini, Executive Engineer
8. Sh. A Kesavam, Executive Engineer
9. Smt. Betsy Sebastian, Executive Engineer

North Eastern Regional Power Committee (NERPC)

1. Sh. KB Jagtap, Member Secretary
2. Sh. S. M Aimol, Superintending Engineer

North Regional Power Committee (NRPC)

1. Sh.Manmohan Matta, Director(Projects), Chairman TCC, NRPC
2. Sh. V. K. Singh, Member Secretary
3. Sh.Neeraj Hooda, Executive Engineer

Power Grid

1. Sh.Vibhay Kumar, Executive Director

2. Sh.Arun Kumar Singh, Senior General Manager

Grid-India

1. Sh.Rajiv Porwal, Director (System Operations)
2. Sh.S.C.Saxena, Executive Director,NLDC
3. Sh.S. P. Kumar, Executive Director,SRLDC
4. Sh.T. Srinivas, Chief General Manager, SRLDC
5. Sh.T. R. Ganesh, Chief General Manager
6. Sh. A. Raj Kumar Chief Manager
7. Sh. M. Dileep kumar, Deputy Manager

Central Transmission Utility of India Limited (CTUIL)

1. Sh. P.C. Garg, Chief Operating Officer
2. Smt. Nutan Mishra, Senior General Manager

National Thermal Power Corporation (NTPC)

1. Sh. Ajay Dua, Executive Director

Annexure-I 14th NPC

सत्यमेव जयते

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

No.4/MTGS/SG/NPC/CEA/2023/ 353 Date: 18.09.2023

Subject: Standard Operating Procedure for Protection System Audit- reg.

Standard Operating Procedure (S.O.P) for Protection System Audit is enclosed herewith for your kind information and necessary action.

Enclosure: As above

Yours faithfully,

सत्येंद्र 18.09.23

(सत्येंद्र कु. दोतान / Satyendra Kr. Dotan)
Director, NPC & Member Convener (Sub-group)

Standard Operating Procedure for Protection System Audit

A protection system audit is a review and evaluation of the protection systems of a substation with an objective to verify whether required protection systems have been put in place at station by the concerned utility, and to recommend suitable measures to provide for the same.

Ministry of Power, had constituted a Committee under the Chairmanship of Chairperson CEA to examine the grid disturbances on the 30th and the 31st July 2012. One of important recommendation of the committee was conducting of extensive audit of protection system. List of sub-stations where protection audit is to be undertaken on priority basis was prepared and audited across the country. This was the beginning of protection audit across the country and large number of important 400 and 220kV substations were audited.

Keeping in view the importance of Protection System Audit, Standard Operating Procedure has been prepared for the reference purpose. It will provides a step-by-step guide for RPCs to follow during the audit process.

1. All users shall conduct third party protection audit of each sub-station at 220 kV and above (132 kV and above in NER) once in five years or earlier as advised by the respective RPC.
2. After analysis of any event, each RPC shall identify a list of substations / and generating stations where third-party protection audit is required to be carried out and accordingly advise the respective users to complete third party audit within three months.
3. The third-party protection audit report shall contain information sought in the format as per IEGC 2023 and its further amendments.
4. Annual audit plan for the next financial year shall be submitted by the users to their respective RPC by 31st October. The users shall adhere to the annual audit plan and report compliance of the same to their respective RPC.

5. Criteria for choosing substations for third party protection audit:

The following criteria are generally applied during choosing a substation for protection audit.

i. Substations/ Generating (SS/ GS) stations with frequent grid incidences or frequent maloperations or any grid occurrence in any substation which affected supply to large number of substations and caused significant load loss. In this case, third-party protection audit may be carried out within three months or as decided in the Protection sub-Committee Meeting of the RPC.

ii. Based on request received from utilities for arranging protection audit in certain stations (e.g. for availing PSDF funding for Renovation and Upgradation of Protection system). In this case, preferably third-party protection audit may be carried out within three months.

iii. Important 400kV and 765kV substations (SS) / Generating stations (GS) including newly commissioned SS/ GS. In this case, third-party protection audit may be carried out at a frequency decided in the Protection sub-Committee Meetings of respective RPCs.

6. Protection audit Procedure:

i. After identification of stations for protection audit, the same is communicated to the owner utility seeking nomination of one nodal officer for each Station.
ii. The nodal officer shall provide the details of substation for preparation of protection audit format (in line with IEGC and subsequent amendments).
iii. Meanwhile nominations shall be sought from all utilities to form regional teams for audit. Regional teams comprising of engineers from various utilities /utility (other than the team of host State) of the region shall be formed based on the no. of SS to be audited. (Each team may consists of 3 or 4 engineers from utilities other than the host utility and at the maximum a team will be able to audit 3 to 4 stations in 7-9 days or so)
iv. Once the team details and list of stations to be audited is finalised the details of nodal officers, team members , list of stations to be audited by each team is shared to all for further coordination regarding planning and conduction of audit.
v. Based on the inputs received from nodal officer regarding the list of elements in the substation to be audited, protection audit formats shall be prepared by RPC (in line with IEGC) and circulated to nodal officer. The nodal officer along-with the substation engineers shall fill the audit format and furnish the same along-with various attachments sought as part of the audit format within a week or so. List of attachments shall be given in the covering page of audit format.
vi. The filled in audit format along-with the received annexures shall then forwarded to the audit team by the nodal officer and any further clarification regarding the format or attachments shall be taken up by the audit team with the nodal officer under intimation to RPC.
vii. The SS/ GS shall be audited based on the data filled in audit format checking for compliance of Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022, Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007 & CEA (Measures relating to Safety and Electric Supply) Regulations, 2010, CERC regulations and amendments to the same, approved guidelines of RPC, best practices in industry, report of the Task Force on Power System Analysis Under Contingencies and as per the "Model Setting Calculations For Typical IEDs Line Protection Setting Guide Lines Protection System Audit Check List Recommendations For Protection Management Sub-Committee on Relay/Protection Under Task Force For Power System Analysis Under Contingencies" etc.
viii. After conduct of audit, the shortcomings observed in the audit shall be discussed in detail with the nodal officer and substation engineers and recommendations are finalised.
ix. The filled in audit format along-with the recommendations and attachments shall be finalised and final protection audit report RPC (in line with IEGC) shall be compiled.
x. Final protection audit report shall be discussed in Protection Coordination Committee and recommendations may be accepted/deleted/modified as per the scope of audit and compliance of various regulations/guidelines etc.
xi. The recommendations of all SS audited shall be inserted into audit recommendations database and update regarding recommendations shall be sought from respective utilities.
xii. Action plan for rectification of deficiencies detected, if any, shall be submitted to the respective RPC and RLDC and monthly progress will be submitted.

xiii. The travel expense from place of duty to Substation/Generating Station to be audited shall be borne by respective Auditor (Parent Organisation). The expense for boarding, lodging any travel of the team during the audit period shall be borne by the organisation owning the Substation/Generating Station.

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Annexure-II 14th NPC

Final Standard Operating Procedure (SOP) to address the Grid Disturbances (GDs)/Grid Incidents (GIs)/any other Protection Trippings

1. Immediately following an event (grid disturbance/incidence as defined in the CEA (Grid Standards) Regulations 2010 and subsequent amendment in the system, the concerned user/entity or SLDC shall inform to the RLDC through voice message.
2. Written flash report shall be submitted to RLDC and SLDC by the concerned user/entity within the time line specified in **Table 8** below, as per the IEGC, 2023.
3. In compliance of IEGC, 2023, All the Users, STU/SLDC are required to furnish the following information in respect of Grid Occurrences(GD/GI) within the time line specified in **Table 8** below, to RLDC/ RPC:
   (i) First Information Report (FIR)
   (ii) Event Logger (EL) output
   (iii)Disturbance Recorder (DR) output
   (iv)Trip event analysis report-TR (with pre and post fault system conditions)
   (v) Data Acquisition System (DAS)
4. RLDC shall report the event (grid disturbance or grid incidence) to CEA, RPC and all regional entities within twenty-four (24) hours of receipt of the flash report.
5. After a complete analysis of the event, the user/entity shall submit a detailed report in the case of grid disturbance or grid incidence within one (1) week of the occurrence of event to RLDC and RPC.
6. Based on the above detailed report submitted to RLDC by the entities, RLDC shall Categorize Grid Occurrences into grid incidents (GIs) and grid disturbance (GDs) based on criteria as per the CEA (Grid Standards) Regulations 2010 and subsequent amendment. RLDC shall also submit the Auto Reclosure (A/R) failure events, PLCC related events, any other protection related events to RPCs on monthly basis.
7. RLDCs and NLDC (for events involving more than one region) shall prepare a draft report of each grid disturbance or grid incidence including simulation results and analysis along with associated PMU plots of appropriate resolution, which shall be discussed and finalized at the Protection sub-committee/sub-group of RPC as per the timeline specified in **Table-8** below.

TABLE 8 : REPORT SUBMISSION TIMELINE

Sr. No.	Grid Event^ (Classification)	Flash report submission deadline (users/ SLDC)	Disturbance record and station event log submission deadline (users/ SLDC)	Detailed report and data submission deadline (users/ SLDC)	Draft report submission deadline (RLDC/ NLDC)	Discussion in protection committee meeting and final report submission deadline (RPC)
1	GI-1/GI-2	8 hours	24 hours	+7 days	+7 days	+60 days
2	Near miss **event**	8 hours	24 hours	+7 days	+7 days	+60 days
3	GD-1	8 hours	24 hours	+7 days	+7 days	+60 days
4	GD-2/GD-3	8 hours	24 hours	+7 days	+21 days	+60 days
5	GD-4/GD-5	8 hours	24 hours	+7 days	+30 days	+60 days

^*The classification of Grid Disturbance (GD)/Grid Incident (GI) shall be as per the* CEA Grid Standards.

(**The above table is as per the IEGC 2023**)

8. RPCs shall circulate all the GDs, GIs, near miss events, A/R events, PLCC mal-operation events, any other protection related event etc. along with the Agenda for Protection Co-Ordination Sub-Committee (PCSC) of RPCs. PCSC meetings are to be held in every month.
9. The implementation of the recommendations of the final report shall be monitored by the protection sub-committee of the RPC. Tripping portals deployed for reporting of the GDs & GIs on RLDCs portal, shall also have compliances reporting of PCSC recommendations on this portal. NLDC shall disseminate the lessons learnt from each event to all the RPCs for necessary action in the respective regions.
10. Constituents/entities shall furnish the following details to RPCs/RLDCs in respect of all the grid occurrences for analysis:

    a) Detailed analysis of the events
    b) SLD or equivalent pictorial representation clearly showing:
        i. Location of fault with distance
        ii. Fault details with type & relay indications
        iii. CT/PT/CVT rating details with location
        iv. Bus-bar arrangement/ Configuration of feeders and other information related to the ratings of the information required for analysis of the disturbance.
        v. CB positions (OPEN/ CLOSE) before and after fault
        vi. Isolator & Earth-switch positions (OPEN/CLOSE)
        vii. Voltage, frequency & power flows with direction at the time of fault
    c) Output of Event logger & Disturbance recorder
    d) Remedial Action(s) taken
    e) Relay setting details

HVDC Station Disturbance : Any additional data such as HVDC transient fault

record, switchyard equipment and any other relevant station data required for carrying out analysis of an event by RPC, NLDC, RLDC and SLDC shall be furnished by the users including RLDC and SLDC, as the case may be, within forty- eight (48) hours of the request. All users shall also furnish high-resolution analog data from various instruments including power electronic devices like HVDC, FACTS, renewable generation (inverter level or WTG level) on the request of RPCs, NLDC, RLDCs or SLDCs.

Generating Station Disturbance: Generating Station shall furnish high-resolution analog data from various instruments including AVR response, PSS response required for analysis of disturbance.

11. The respective entities (for which the Grid occurrence is placed in the PCSC agenda) shall present the Grid Occurrence which shall cover all related aspects such as:

    a) Antecedent conditions,
    b) Bus-configuration,
    c) Reasons of GD/ GI occurrence,
    d) Relevant Diagrams showing location of the fault,
    e) Bus bar arrangement/configuration of feeders and other connected equipment with proper CB positions (OPEN/ CLOSE) at the time of occurrence of the fault,
    f) Type of protections operated,
    g) Substantiation of the protections operated by relevant DRs & ELs,
    h) Reasons for protection systems mal-operation/non-operation,
    i) Remedial measures taken/ proposed, etc.

12. In respect of failure or Non-operation of A/R events, PLCC mal-operation events, any other protection related event as given in the PCSC agenda the concerned entities, shall furnish the reasons along with remedial action taken to RPCs/RLDCs. The same would be analyzed by the PCSC.
13. In the PCSC meetings, all the GDs, GIs, near miss events, A/R non-operation/mal-operation, PLCC mal-operations, other protection related trippings/events as circulated in the agenda shall be analyzed in detail by the PCSC forum and conclude the suitable recommendations to avoid the recurrence of such incidents in the future.
14. The action plan by the entities shall be furnished to RPC for implementation of the PCSC recommendations along with the timelines.
15. The implementation of the PCSC recommendations shall be followed up in the monthly PCSC meetings of RPC.
16. When grid disturbances or grid incidents occurred at major/critical substations and at substations that affected critical/essential/strategic loads, a Protection System Analysis Group (PSAG) shall be constituted consisting of the members from RPC, NLDC, RLDC, PGCIL, a Protection Expert from the region along with the Entity under whose jurisdiction GD/GI occurred to analyze the GD/GI in detail by visiting the respective substation/substations physically and conducting the meetings. PSAG would finalize the remedial actions and recommendations after deliberations and detailed analysis. The progress of implementation of the PSAG shall be followed up in the monthly PCSC Meetings.
17. In case any user/entity fails to undertake remedial action identified by the RPC within the specified timelines as decided by PCSC of RPC, the concerned RPC may approach the Commission with all relevant details for suitable directions.

18. A date depository of the event as maintained by the RLDC shall be accessible to every entity and the entity shall upload all the relevant documents on the RLDC portal of trippings.

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Annexure-III 14th NPC

Final Standard Operating Procedure (SOP) for Communication audit of Substations

1. This procedure has been prepared in compliance to Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017. As per clause 10 of the Regulation, RPC shall conduct annual audit of the communication system annually as per the procedure finalized in the forum of the concerned RPC. However, this SOP for communication audit of substations is finalized to maintain uniformity at the national level. It also mandates that RPC Secretariat shall issue necessary instructions to all stakeholders to comply with the audit requirements within the time stipulated by the RPC Secretariat based on the audit report. An Annual Report on the audit carried out by respective RPC is to be submitted to the Commission within one month of closing of the financial year.
2. The Audit would be conducted in two phases. In first phase scrutiny of the reports, documents etc. In the second phase physical verification shall be carried out.
3. Each User/entity, using inter-state transmission or the intra-state transmission incidental to inter-state, shall submit the detailed report to RPC Secretariat and RLDC, as per prescribed format on yearly basis. The detailed report shall be submitted by the April end of the respective year. This report shall be considered as self-certificate regarding availability and healthiness of the Communication system of respective user/entity.
4. In respect of intra-state users/entities, SLDC shall submit detailed reports yearly by the April end of the respective year, to RPC Secretariat and RLDC.
5. Outage report of all the channels (including Network Management System, PLCC etc) report for a month shall be submitted by the Users/entities to RLDC and respective SLDCs, on monthly basis, by 7th day of the next month. RLDC and SLDCs after verifying the NMS data shall submit report to RPC Secretariat by 15th day.
6. All users/entities and Control Centers shall get the third-party cyber security audits done from a Cert-in certified vendor in compliance of CEA (Cyber Security in Power Sector) Guidelines,2021. The detailed report of the Cyber Security Audit shall be submitted by 15th April for the previous financial Year.
7. RPC Secretariat may ask any other information required for Audit of the communication system in addition to these periodic reports.

Phase-I Audit: Scrutiny of the Information

8. A Communication System Audit Sub-Group comprising one member each from RPC, RLDC, PowerGrid and One of the respective Region SLDCs shall be constituted by RPC Secretariat with the approval of Member Secretary, RPC. The sub-group may co-opt any other member from any organization for facilitating the activities of the sub-group. Further, consultation from CEA may be taken, if required. The Audit team shall be formed excluding the member forthe Organization/Utility whose system is to be audited.
9. The Communication System Audit Sub-group shall scrutinize the information received in RPC Secretariat. The Sub-group may also ask any additional information necessary for its activities. All the users/entities, RLDC, SLDCs shall provide the information to the sub-group on priority within the stipulated time period.
10. The sub-group shall also identify the nodes for physical inspection based on the criticality of the node in view of performance of the communication network or based on the deficiencies observed in the communication system.
11. The Audit would include but not limited to following aspects:
    a. Availability of communication channels. The outage reason needs to be clearly specified whether it is on account of the concerned entity or on account of any other entity, force majeure etc. The list of communication channels would be finalized by Communication System Sub Group in consultation with other stakeholders.
    b. Availability of terminal equipment. The outage reason needs to be clearlyspecified whether it is on account of the concerned entity or on account of any other entity, force majeure etc. The list of terminal equipment would be finalized by Communication System Sub Group. Part outage like failure of specific cards etc. would also be furnished along-with reasons.
    c. Availability of Auxiliary System e.g. Battery Charger, Battery bank, sufficient cooling equipment etc.
    d. Compliance of CERC and CEA Regulations and the procedures under these Regulations.
    e. Completion of periodic testing of the communication system in accordance with procedure for maintenance and testing prepared by CTU.
    f. Audit of all newly commissioned communication equipment within six months of its commissioning.
    g. Completion of 3rd party Cyber Security Audits.
    h. Network traffic w.r.t capacity.
    i. Spare availability, replenishment etc.
    j. Any other parameters as agreed by the Communication Sub Group.

Phase-II Audit: Physical Verification

12. Based on the Recommendations of the Communication System Audit Sub-group, Audit team shall be constituted and the physical inspection Audit plan shall be prepared by RPC Secretariat.
13. Audit team shall be formed on regional basis.
14. Audit shall be carried out in a planned manner as included in this document by a team of three members. The audit team shall comprise of one representative from the RPC Secretariat, one representative from RLDC and one representative from any of the Utilities or SLDCs of respective Region. The Audit team shall be formed excluding the member for the Organization/Utility whose system is to be Audited. The Audit team may co-opt any other member from any organization for facilitating the activities of the committee.
15. Once the plan is finalized, minimum 3 days advance notice shall be served to the concerned Auditee entity intimating the detailed plan so that availability of required testing equipment and the required documents is ensured by Auditee entity and is made available to the Audit team during the site visit.
16. Member Secretary, RPC in consultation with the Communication System Audit Sub-Group may decide on any additional nodes/locations for physical inspection if a location is very critical in view of performance of the communication network at any time of the year.
17. The Scope of the physical verification shall include but not limited to thefollowing:
    a. Available communication Network for its redundancy
    b. Availability of channel redundancy for all the functions for which it is configured.
    c. Communication equipment (hardware and software configuration) of all thenodes including repeater stations for its recommended performance.
    d. Documentation of the configuration of the respective site and its updation.
    e. Fibre layout / usage of fibre / Availability of dark fibre and its healthiness.
    f. Cable Schedule and identification / tagging.
    g. Healthiness of Auxiliary supply including the healthiness of Battery backup.
    h. Healthiness of Earthing / Earth protection for communication system.
    i. Availability of sufficient cooling equipment at the User's premises to maintain the stipulated temperature for the communication equipment.
    j. Optical power level
    k. Alternate modes of communication for speech

18. The format for collecting the details of Communication channels/links and Equipment is at **Annexure-I** and the same shall be furnished by the Auditee entity.

19. Communication Audit Checklist points are given in **Annexure-II** and the same are to be thoroughly verified by the Audit team.
20. Expenses towards Lodging, Boarding & Transportation (Excluding Air/Train Fair) between various places within the jurisdiction of Auditee entity shall be borne by respective Auditee entity. The Coordinating Officer(s) from the Auditee Utilities identified for each Team is (are) responsible for facilitating them to all the Members of respective Team.
21. Audit team shall submit report including recommendations for action on deficiencies, if any, found during the inspection, within 15 days from the date of inspection to Member Secretary, RPC. After approval of MS, RPC, the report would be communicated to the Auditee entity for compliance.

Audit Compliance Monitoring

22. Communication System Audit Sub-group would monitor the compliance of audit observations as applicable. Non-compliance of Audit Recommendations, if any, shall be put up to TCC and RPC.
23. The Annual Audit Report would be reviewed by a Communication System Sub Group at RPCs level. After considering the observations of Sub Group, RPC Secretariat shall issue necessary instructions to all stakeholders to comply with the audit requirements within the time stipulated by the RPC Secretariat based on the audit report. An Annual Report on the audit carried out by RPC would be submitted to the Commission within one month of closing of the financial year.

***

REGIONAL COMMUNICATION AUDIT REPORT			
General Information:			
1	**Substation Name**		
2	**SS Voltage level**		
3	**Date of commissioning of the substation**	**XX.XX.XXXX**	
4	**Region & State / Auditee**	**/**	
5	**Audit Date**		
6	**Name of the Utility which owns the SS**		
Details of Audit Team Members :			
SL	**Name**	**Designation**	**Organization**
1			
2			
3			
4			
Attached Documents, if any			
SL	**Name of the document**		**Original / Signed / Copy**
1			
2			
3			
4			
5			
6			
7			

8		
9		
10		
11		
12		
13		
14		
15		
16		
17		

Communication Channels and Equipments Audit Format

(A) List of channels in usage for data (64 kbps, 104, PMU, VC, 101) / Voice / Protection circuits / others:

Sl	Description (64 kbps, 104, PMU, VC, 101) / Voice / Protection circuits / Others)	Source	Destination	Channel Routing	Ownership details of terminal equipment / Links
1					
2					
3					
4					
5					
6					
7					
8					

(B) List of terminal communication equipments:

Sl	Name of Station	Equipment Type (SDH / PDH / Radio / VSAT / EPABX)	Make / Model	Ownership
1				
2				
3				
4				
5				
6				
7				
8				

(C) Communication System Details:

I. SDH Equipment

(1) Card Details:

Slot No	IP Address & Path / Direction Name	Card Details	Place a ✓mark if on usage, else Write as "Spare"	Whether Card is healthy / Faulty ? (H / F)	Cards Redundancy available (Yes / No)	Power Supply Card / Optical Card (Yes / No)	MSP configured? (Yes / No)	Action Plan for faulty cards	Other Information, if any
1									
2									
3									
And so on									

(2) Whether equipment is time synchronized : Yes / No

If Yes, how is it being done?

(3) Failures during last Fin. year / since last Audit :

Particulars	Number of failures of Card / Power Supply	Reason for failures	Measures taken for rectification
Card		**(i)** **(ii)** **(iii)**	**(i)** **(ii)** **(iii)**
Power Supply		**(i)** **(ii)** **(iii)**	**(i)** **(ii)** **(iii)**

(4) Configuration of the Node:

Name of Equipment	Number of Nodes	Number of directions	Name of Directions	Number of links down, with details	Details of corrective action, if any, taken

(5) Preventive maintenance schedule and its compliance:

Date of Last Preventive maintenance	Maintenance carried out as per schedule? (Yes / No)	Whether all the defects have been attended? (Yes / No) Give details

II. PDH Equipment

(1) Card Details :

Slot No	IP Address	Card Details	Place a ✓mark if on usage, else Write as "Spare"	Whether Card is healthy / Faulty ? (H / F)	Cards Redundancy available (Yes / No)	Power Supply Card / Optical Card (Yes / No)	MSP configured? (Yes / No)	Action Plan for faulty cards	Other Information, if any
1									
2									
3									
And so on									

(2) Whether equipment is time synchronized : Yes / No

If Yes, how is it being done?

(3) Failures during last Fin. year / since last Audit :

Particulars	Number of failures of Card / Power Supply	Reason for failures	Measures taken for rectification
Card		**(i)** **(ii)**	**(i)** **(ii)**

		(iii)	**(iii)**
Power Supply		**(i)** **(ii)** **(iii)**	**(i)** **(ii)** **(iii)**

(4) Configuration of the Node:

Name of Equipment	Number of Nodes	Number of directions	Name of Directions	Number of links down, with details	Details of corrective action, if any, taken

(5) Preventive maintenance schedule and its compliance:

Date of Last Preventive maintenance	Maintenance carried out as per schedule? (Yes / No)	Whether all the defects have been attended? (Yes / No) Give details

III. OPGW / Optical Fibre Details

Number of Directions	**Name of Direction**	**No. of Pairs**	**No. of Fibers used**	**No. of spare & healthy Fibers**	**Unarmoured cable laid within PVC/Hume duct pipe?**	**Fibre Count in OPGW? Whether matching with Approach cable to FODP?**	**Overall Optical Fibre Path Attenuation (dB/km)**	**Power Received**	**Conformation to Compliance of CEA Standards**

IV. Healthiness of Auxiliary System:

(1) Details of 2 independent Power Sources :

Source	Commissioning Date	Battery Back up (Hour)	Battery capacity (AH)	Supply Voltage (V)	Healthiness of Battery (Yes / No)	Make of Charger	Charger Capacity (A)	Periodicity of Maintenance Schedule	Date of Last 2 Actual Maintenance carried out	Remarks
1										
2										

(2) Conformation to Compliance of CEA Standards :

V. Healthiness of Earthing of each equipment:

Sl	Equipment	Status on Healthiness of Earthing

VI. Details of Voice communication available between Sub-station and Control Centre:

Sl	Voice communication (Sub-station - Control Centre)	Status on Healthiness of Voice communication	Healthiness of air-conditioning of communication room as per OEM recommendation

VII. PLCC Details:

Number of Panels	Make and Model	Direction	Frequency (Tx & Rx) KHz	Status on Healthiness	Last preventive maintenance		Details of defects, if any, attended	Status of Availability of Spares	Conformation to Compliance of CEA Standards
					Schedule	Actual			

VIII. Radio Communication Details:

Number of Equipments	Make and Model	Status on Healthiness	Last preventive maintenance		Details of defects, if any, attended	Status of Availability of Spares	Conformation to Compliance of CEA Standards
			Schedule	Actual			

IX. Data Retention :

(i) Earliest Date of availability of data: _____

(ii) Historical data availability : ____ days.

X. Control Command Delay :

(i) Time delay in seconds from Control Centre for SCADA : ____ Seconds

(ii) Time delay in seconds from Control Centre for WAMS : ____ Seconds

XI. Wide Band Network :

(i) Absolute channel delay in protection applications : _____ ms

(ii) Channel delay asymmetry in protection applications : _____ ms

(iii) Switching Time delay to alternate path/route during failure of one path : _____ ms

XII. Any other information :

Audit Team Member	Audit Team Member	Audit Team Member	Audit Team Member
SRPC	Co-Ordinator	PGCIL (Internal / External)	State (Internal / External)

Communication Audit Checklist (Annexure-II)

S.No	Check list points	Expected	Actual	Reference
1	Whether OPGW is terminated properly. Down lead shall be fixed property in sufficient locations. Metallic part shall be connected to earth mat riser.	Yes		
2	Distinct approach cable shall be laid 1 Protection & Communication 2 Fibers for commercial applications Item no 1 cable shall be terminated in communication room FODP One number FODP panel shall be available in communication room			
3	Fiber Identification shall be done in FODP properly			
4	Whether End to end tests were carried out during installation and records are available (both Optical Power Source/receiver testand OTDR Test results			
5	Whether patch chords 1 Cross labelled (source/ receive) 2 Tx – Rx Marking 3 Mechanical protection is provided for pach chords laid between panels			
6	Whether separate room for communication is available with following:- 1 Air conditioning with standby A/C Unit 2 AC Distribution board with ELCB 3 Single point earthing bar which shall be connected to substation Earth mat			
7	Two sets of 48 V (Positive Earthed) DC Systemshall be available with 1 Common DC Distribution board/ Panels with incoming MCB, coupler MCB , out doing MCBsetc 2. Minimum 200 Ah (2 sets of battery) VRLA batteries are preferred to keep chargers and battery in communication room. 3. Battery Charger shall be Thryristorised/SMPS			
8	Battery Charger alarms /measurements shallbe made available to SAS (if available) It can be achieved through MOD bus or connecting analogue/ digital signals to Common BCU of SAS. If such system is not available major			

	alarms shall b alarmed in common substation annunciator			
9	2 nos of substation Data (From RTU or SAS Gateway)shall route in different roots to Main and Standby Load Dispatch centres			
10	Kindly assure proper protection is available for AC Distribution (ELCB, MCB, Backup fuse),			
11	Aux Transformer neutral Earthing shall be connected to Stations earth mat (Aux Transformers shall be installed in yard earth mat area only)			
12	Whether DG sets with AMF panels are provided for Aux AC Supply			
13	Whether 2 nos 11 kV (or 33kV) supplies are available for Each station aux Transformer			

Annexure-IV 14th NPC

Final Standard Operating Procedure (SoP) for Communication System Outage Planning

1. As per the following CEA and CERC Regulations, the Communication Outage for the Region shall be carried out by RPC Secretariat:
   a) Regulation 7.3 of Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017 stipulates as below:

   Quote:

   7.3 Role of National Power Committee (NPC) and Regional Power Committee (RPC):

   ……

   (iv) The RPC Secretariat shall be responsible for outage planning for communication system in its region. RPC Secretariat shall process outage planning such that uninterrupted communication system is ensured.

   ……

   Unquote

   b) Regulation 10 Central Electricity Authority (Technical Standards for Communication System in Power System Operations) Regulations, 2020 notified on 27.02.2020 envisages as below:

   Quote:

   10. Outage Planning: Monthly outage shall be planned and got approved by the owner of communication equipment in the concerned regional power committee, as per detailed procedure finalized by the respective regional power committee.

   Unquote

2. A Communication System Outage Planning Sub-Group/ TeST Sub Committee shall be formed in each region constituting the members from all the entities connected to ISTS including all CGS, ISGS, REGs/SPPDs/SPDs, STUs, SLDCs etc., of the respective Region, RLDC/Grid-India, PGCIL, CTUIL, Private Transmission licensees in respective region & RPC secretariat. The sub-group/ Sub Committee may co-opt any other member from any organization for facilitating the activities of the sub-group/ Sub Committee.

3. Communication System Outage Planning will be limited to the following systems:
   (i) ISTS Communication System including ISGS
   (ii) Intra-state Communication System being utilized for ISTS Communication
   (iii) ICCP links between Main & Backup RLDCs, Main & Backup SLDCs & Main & Backup NLDCs.
   (iv) Inter-regional AGC links.

(v) Any other system agreed by the sub-group.

4. Communication Equipment/link within the scope of the Procedure would include :

   (i) Optic Fibre links
   (ii) Any other link being used for ISTS communication
   (iii) ICCP links between Main & Backup RLDCs, Main & Backup SLDCs & Main & Backup NLDC
   (iv) VC links between LDCs
   (v) Inter-regional AGC links
   (vi) SPS Links
   (vii) Tele-Protection
   (viii) AMR
   (ix) PMU
   (x) SDH & PDH
   (xi) DCPC
   (xii) RTU & its CMU cards
   (xiii) DTPCs
   (xiv) Battery Banks and Charging Equipment
   (xv) EPABX
   (xvi) Any other equipment/link agreed by the sub-group

5. A Web Portal named as "Communication System Outage Planning Portal" shall be developed by respective RLDCs. Log-in credentials shall be provided to all the ISTS connected entities/concerned entities.

6. Entities/Users/Owners shall add their communication links and the equipment to the Web Portal as soon as they are commissioned. The same has to be furnished to RPC Secretariat /RLDCs.

7. Entities/Users/Owners of the communication equipment shall upload the outage proposals of communication links and the equipment (in the prescribed format only) to be availed during subsequent month by 7th/8th of every month in the Web Portal.

8. RPC Secretariat consolidates the list of outage proposals received from various Entities/Users/Owners of the communication links and equipment by downloading from the Web portal and circulate the same among all the respective region entities by 15th of every month. Communication outages affecting other regions would be coordinated by respective RLDC through NLDC.

9. Communication System Outage Planning (CSOP) meeting shall be conducted during the third week of every month normally (preferably through VC) to discuss and approve the proposed outages of communication links and equipment.

10. The approved outages of Communication links and equipment in the CSOP meeting shall be published in the RPC website and respective RPCs Communication Outage Portal within 3 days from the date of CSOP meeting.

11. Outage of the approved communication links and equipment shall be availed by the respective owner /entities after confirming the same with RLDC on D-3 basis.
12. In case of any emergency outage requirement of communication links and equipment, Entities/Users/Owners may directly apply to respective RLDC with intimation to respective RPCs on D-2 basis. Confirmation of approval/rejection will be provided on D-1 basis by RLDCs in consultation with respective RPCs considering 24hrs processing window.
13. Entities/Users/Owners shall take the code from the respective RLDC before availing the planned outage of the communication links & equipment and before restoration of the same.
14. Entities/Users/Owners of the communication links and equipment shall submit the deviation report for the approved outages (approved dates & approved period) availed during the previous month and the report on planned / forced / other outage of communication links / equipment by 10th of the month to RPC Secretariat as per the format at **Annexure-I** .
15. In the monthly CSOP meetings, communication links and equipment whose outage duration (Planned / Forced / Others) more than 48 hours for the last 12 months of rolling period shall be deliberated for the measures to be taken in future for the better outage management. The date deviations and non-availing the outages that were approved in the previous CSOP meetings shall also be deliberated in the CSOP meetings.

Note: The manual for implementation of Communication System Outage Planning through web portal received from SRPC is attached at **Annexure-II** for ready reference.

***

Annexure: DCOA-I

Outage Deviation Report : List of outages of Communication Links, availed / deviated during the month of June, 2021

Dated :

A Details of Communication Links (Point to Point) availed :

SL	Name of Requesting Agency	Description of Link	Source	Destination	Channel Routing	Ownership	Reason for availing outage with the details of equipment attended	Approved Start Date : Time [dd-mm-yy<>hh:mm]	Approved End Date : Time [dd-mm-yy<>hh:mm]	Approved Outage Hours	Outage availed Start Date : Time [dd-mm-yy<>hh:mm]	Outage availed End Date : Time [dd-mm-yy<>hh:mm]	Total hours of outage availed now	Deviation ? (Y/N)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	**Example**	Back up Control Center (BCC) : Data	KAYATHAR 230 kV SS	MADURAI LDC	Data will be availble throu	TANTRANSCO	Shifting of FODB panel at Kayathar 230 KV SS	10-Mar-2021 09:00	10-Mar-2021 18:00	**09:00**	10-Mar-2021 14:07	10-Mar-2021 17:30	**03:23**	**N**

Annexure: DCOA-II

Outage Deviation Report : List of outages of Communication Equipment availed / deviated during the month of June, 2021

Dated : **00:00**

B Details of Communication Equipment availed :

SL	Name of Requesting Agency	Name of the communication equipment	Location of the Equipment / Name of Station	Name of the Link/Channel/Path / directions affected	Alternate Channel/Path available ? (Furnish details)	Ownership	Reason for availing outage with the details of faults	Approved Start Date : Time [dd-mm-yy<><>hh:mm]	Approved End Date : Time [dd-mm-yy<><>hh:mm]	Approved Outage Hours	Outage availed Start Date : Time [dd-mm-yy<><>hh:mm]	Outage availed End Date : Time[dd-mm-yy<><>hh:mm]	Total hours of outage availed now	Deviation ? (Y/N)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	**Example**	DC Charger -2, Amararaja, 48v	Edamon	Nil	Nil	KSEBL	Monthly maintenance. No interruption as alternate chargers available	16-Mar-21, 11:00	16-Mar-21, 16:00	**05:00**	16-Mar-21, 10:30	16-Mar-21, 16:00	**05:30**	**Y**

COMSR

MANUAL-2023

ग्रिड-इंडिया
GRID-INDIA

PREPARED BY

SRLDC, GRID-INDIA

Table of Contents

1. Need for Communication Outage Portal?

In line with the requirements for outage planning of communication equipment as per CERC Communication System for Inter State Transmission of Electricity Regulations 2017, SRPC has devised a procedure for Outage planning for Communication system in Southern Region available at the website of Southern Regional Power Committee (SRPC) (https://www.srpc.kar.nic.in/website/2020/communication/com_outg_proc.pdf) and attached as **Annex-I**. As per the "Procedure on Outage Planning for Communication System -SR", monthly meetings are being conducted with participation of Nodal Officers from users, SLDCs, SRLDC, SRPC & CTU. These meetings are conducted to discuss and approve/reschedule / dispose of the proposed list of outages pertaining to communication links / equipment scheduled for the next month. In order to provide a seamless experience for applying and availing communication outages and monitoring availed outage timelines, SRLDC has developed a web portal which is used to register communication equipment/links, configure outage proposals for already registered equipment/links, view deviations between approved outage timelines and actual outage timelines .The web portal facilitates entering observations/remarks by RLDC/RPC on any outage proposal with the facility to concur/deny the proposal by SRPC.

2. COMSR (Communication Equipment Outage Coordination Meeting - SR) Outage Portal:

The web portal is accessible through the following URL: https://srcom.srldc.in/login

2.1. Login Page:

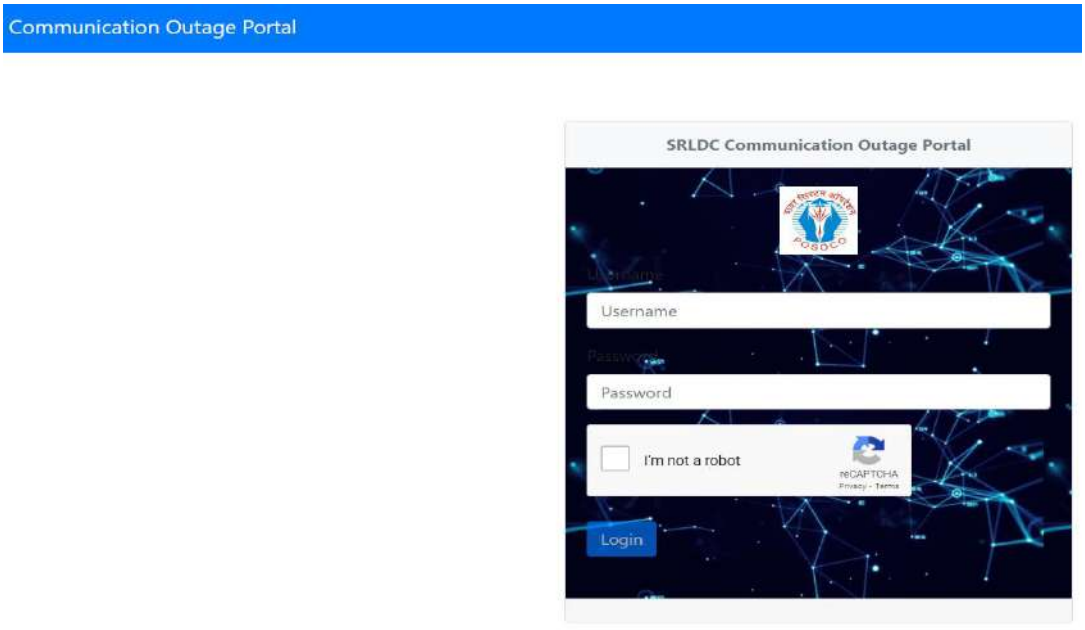


Figure 1 COMSR Portal Login Page

- User name & initial password are created and shared by web admin (SRLDC).
- Note: Password Change can be enforced after first time login.

2.2. Roles defined in the Communication outage portal

1. **Administrator (RPC)**
2. **Supervisor (RLDC)**
3. **User**
4. **Operator**

The administrator role is assigned to the respective RPC. Supervisor Role is assigned to the respective RLDC. User Role is assigned to each entity/utility, who can apply for outages. Operator Role is assigned to real time shift operators at RLDC.

- Only Administrator can approve/deny the proposed outages. Supervisor can provide remarks against each proposed outage and do necessary configuration and maintenance of web-portal front end and Db for smooth functioning of the entire process.
- Operator can view the portal for list of approved outages and issue codes for availing outages
- User can apply for the outages proposed for the next month and once the outage is approved, the respective user can view the approval details under their account login . User can also apply for emergency outages. User can also update the actual time duration (Start time, End time) of each outage availed.

2.3. Main Tabs in COMSR Portal:

- **Meetings**
- **Links**
- **Equipment**
- **COA1(Link) -** Communication Outage Approval for Communication Links
- **COD1(Link) -** Communication Outage Deviation for Communication Links
- **COA2(Equipment)-** Communication Outage Approval for Communication Equipment
- **COD2(Equipment) -** Communication Outage Deviation for Communication Equipment
- **Rolling Report- 12 Months Outage Time > 48hours**
    - **COD3- Communication Outage Rolling 12 Months Deviation – Links**
    - **COD4-Communication Outage Rolling 12 Months Deviation - Equipment**

Note:
1. Formats for COA1, COA2, COD1, COD2, COD3 & COD4 have been finalized by SRPC.
2. All Reports can be downloaded from the web portal in Excel Format

2.4. Meetings Tab

Figure 2 below shows the Meeting summary Page, where details for upcoming monthly meeting can be configured with a unique meeting number for each meeting. The details configured include opening and closing dates for receipt of applications for

communication links/equipment outages proposed for next month (M+1month outages proposed in timelines defined in Mth month).

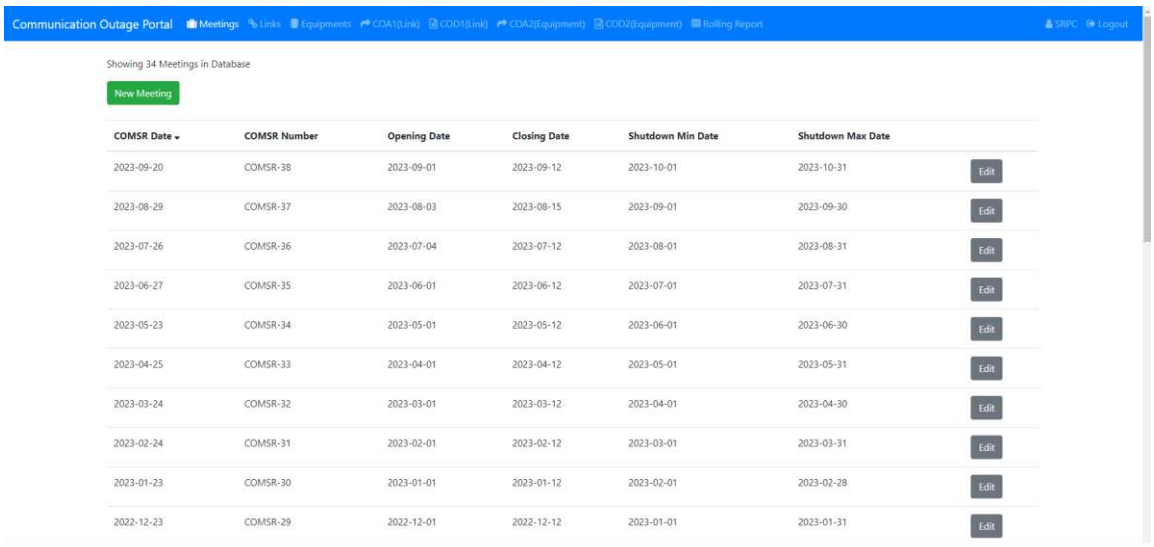


Figure 2 Meeting summary Page

A sample meeting creation page screen in shown in Figure 3 below:

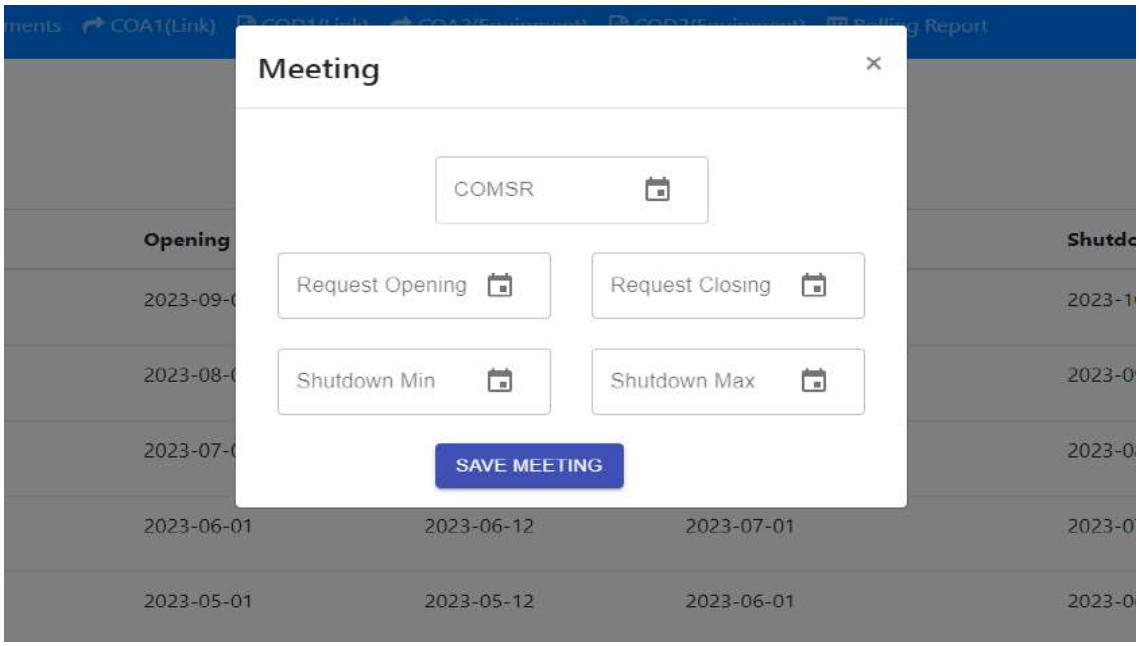


Figure 3 New Meeting Creation Page

All options available on this webpage are customisable and presently the meeting creation option is automated with default Opening and Closing dates for proposed outages as 1st and 12th of the current month.

2.5. Work Flow for availing communication outages:

RPC (Administrator Login) configures the upcoming COMSR Meeting details in the web portal through manual/automated mode and intimation for the next meeting is sent to all stakeholders through e-mail.

2.5.1. Planned Outages:

- User can apply planned outages for the M+1 month by furnishing various details during current month (M) window (planned outages to be submitted between defined timelines---*opening and closing date* as shown in Figure 3 above) and the applied outage details intimation are sent automatically through mail to RLDC and RPC by the portal itself.
- User can edit their applied outages till end of c*losing date* of requests for M+1 Month.
- RLDC can provide observations for the proposed outages.
- RPC consolidates the list of outage proposals received from various Users/Owners and releases the list around mid of the M^{th} month for outages proposed for M +1 month.
- On the meeting date, the proposed outages are deliberated, and RPC approves, revises or rejects the applied outages as per the outcome of discussions.
- Facility has been provided in the portal for RPC to change/defer (approval/rejection) of approved requests till D-1 day (D being the day of availing outage).
- User need to intimate RLDC about availing approved outages(confirmation) before D-3 through email (D being the date of availing outage).
- A consolidated view of day-wise approved outages is available under Operator Login. The facility has been made available to enable Grid Operators to issue unique codes to the concerned user seeking equipment/link outage on the day of outage.

Detailed flowcharts covering activities involved in creating a meeting instance on web portal, entering of planned outages by Users, provision for entering review/observations by RLDC/RPCs, discussions on proposed outages in monthly meeting, approval/denial of proposed outages, availing of outages on the proposed dates, computing deviations between actual outage timeline with proposed timeline and preparation of Rolling Window for outages for last 12 months are depicted in figures 4 and 5 below.

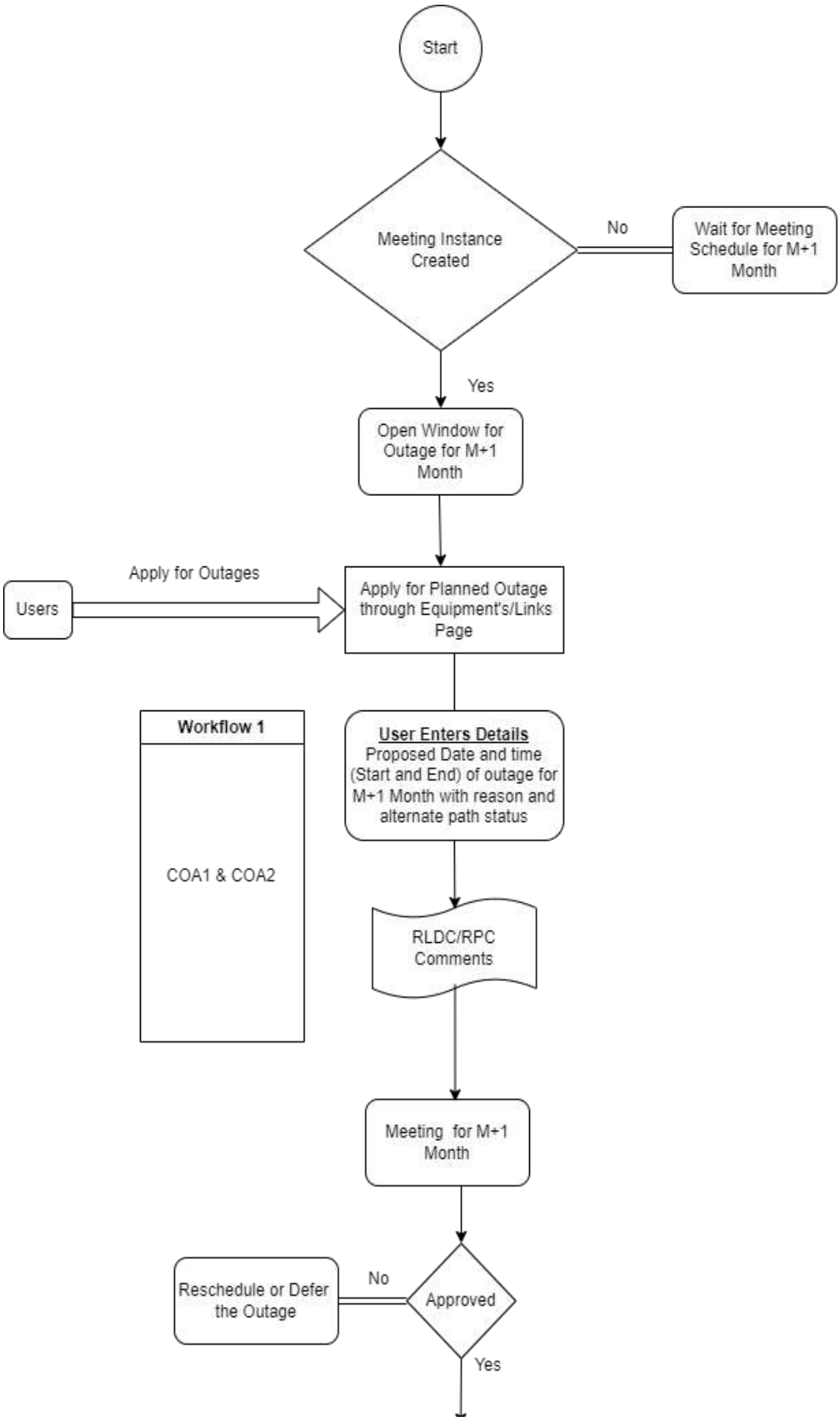


Figure 4 Flowchart for Planned Outage processing through web portal

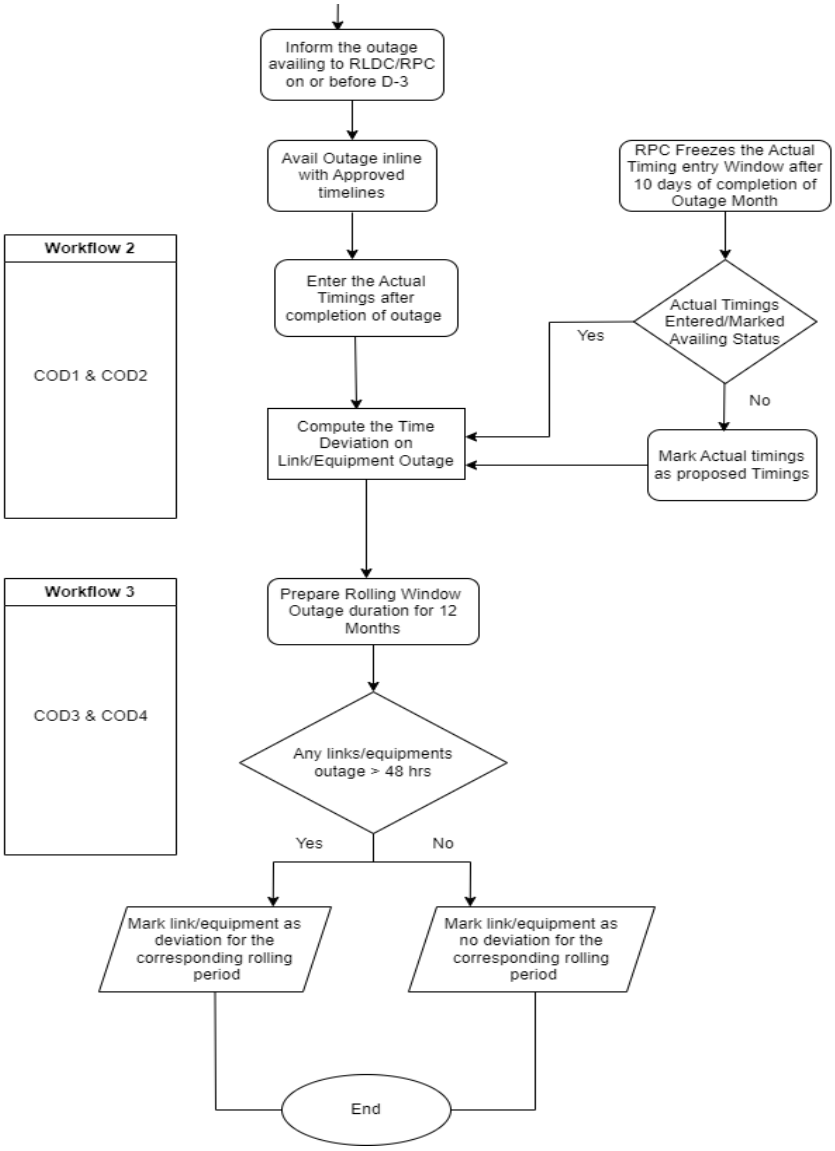


Figure 5 Flowchart for availing approved outages and entering deviations between approved/actual outage timelines through web portal

2.5.2. Emergency & Forced Outages:

- User can apply Emergency outages for D Day on D-1 Day i.e1 Day before the proposed outage. The details of applied Emergency Outage will be sent to registered email ids of RLDC and RPC for concurrence.
- User can submit details for Forced outages availed for links/equipment in previous Month (M-1) till 12th of the current Month(M). The details of reported Forced Outages will be sent to registered email ids of RLDC and RPC.

Flowchart covering various activities involved in application and approval of emergency outages is depicted in Figure 6 below.

Flowchart covering various activities involved in reporting of forced outages and its inclusion in 12 months rolling report is depicted in Figure 7 below.

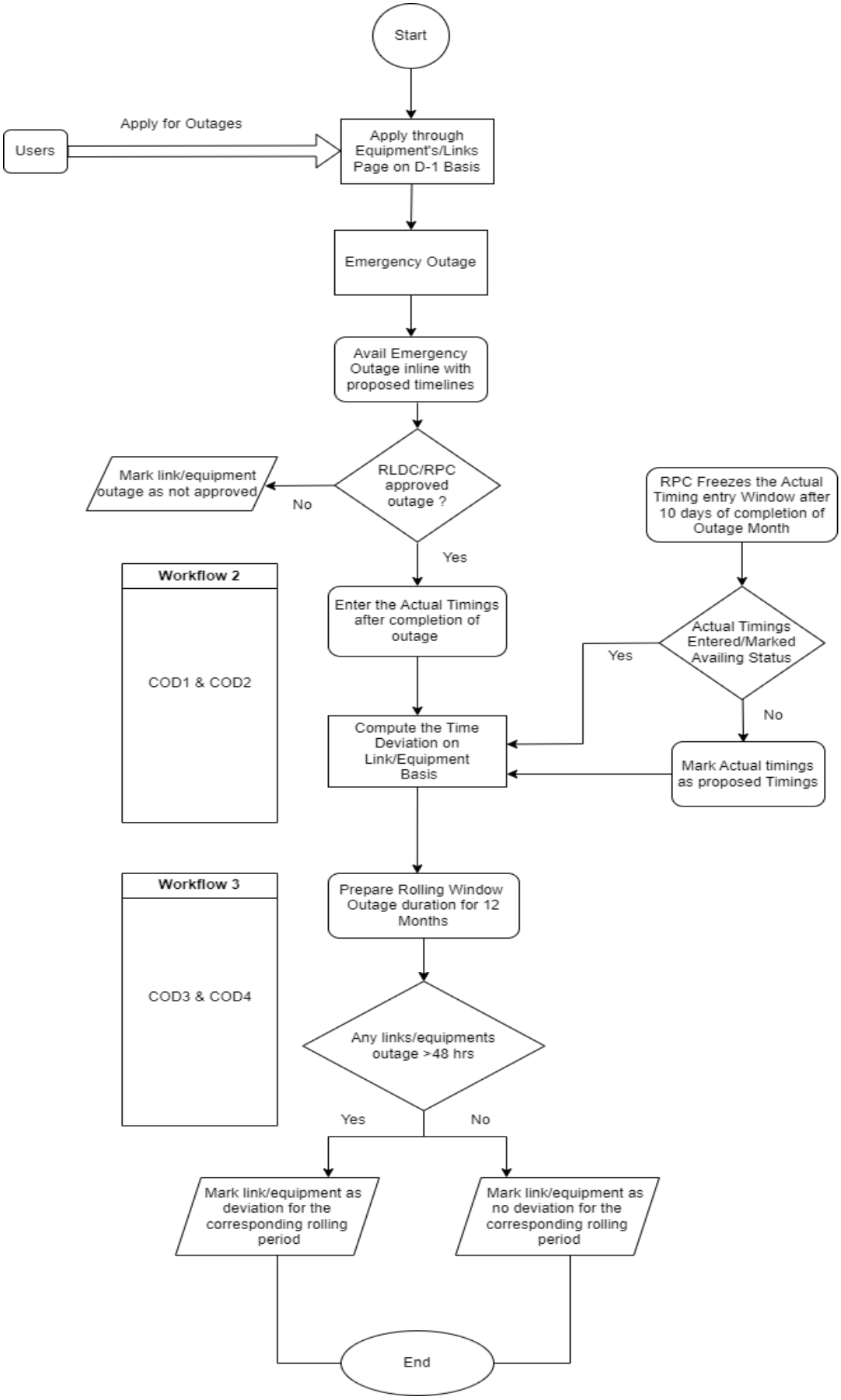


Figure 6 Emergency Outage Workflow

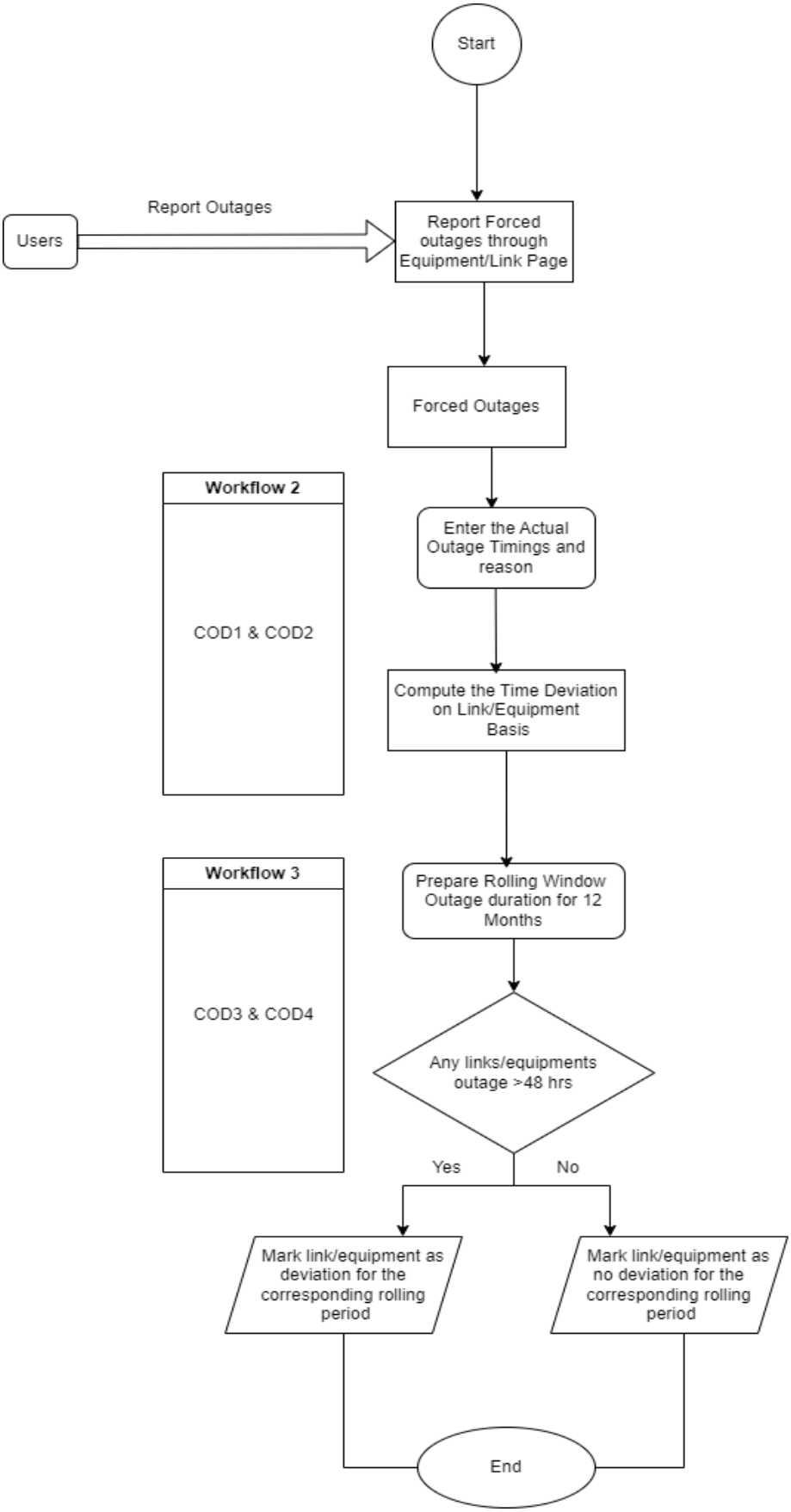


Figure 7 Forced Outage Workflow

2.6. Adding new/modified Equipment/Link to the portal database:

- Under the **Equipment** Tab, provision is there for User to add new/modified equipment details and request RPC/RLDC for addition/updating of the equipment in COMSR Database through "Request to Add new Equipment to Database option". Screenshot of the "Create New Equipment" widget is shown in Figure 8 below.

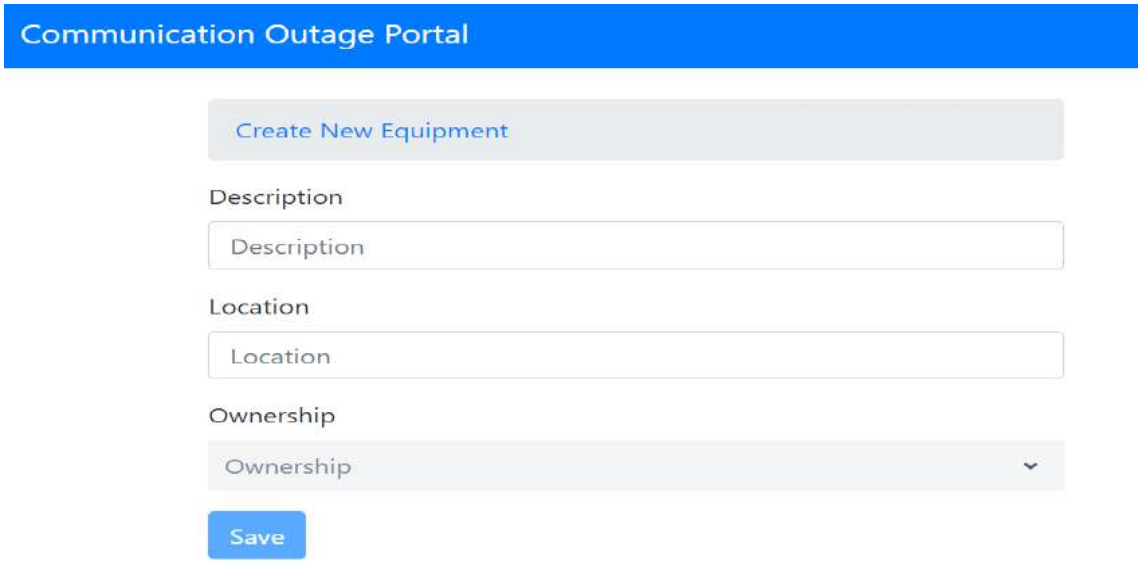


Figure 8 Create new Equipment Request screen

Similarly, any new/modified Communication Channel (links) can be added through the **Links** Tab by User and User can further request RPC/RLDC for approval of addition of the same in Communication outage portal database, Screenshot of the "Create New Link" widget is shown in Figure 9 below.

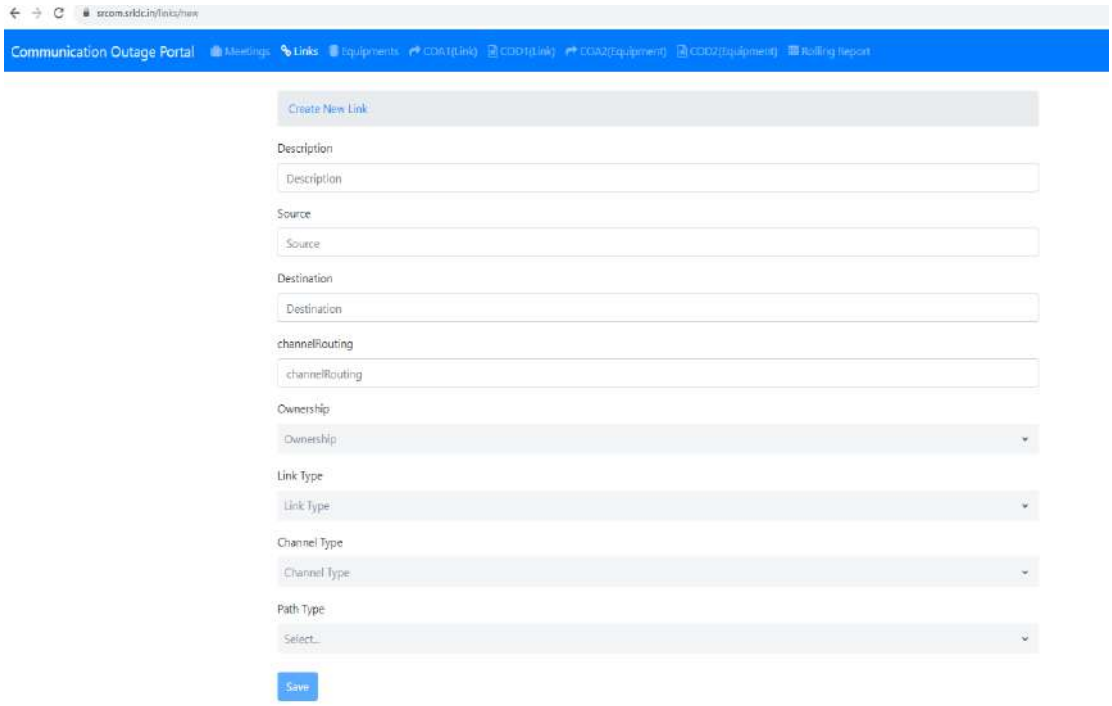


Figure 9 Create the communication Channel screen

Workflow depicting activities involved in adding new/modified Equipment/Link to the portal database is depicted below (Figure 10).

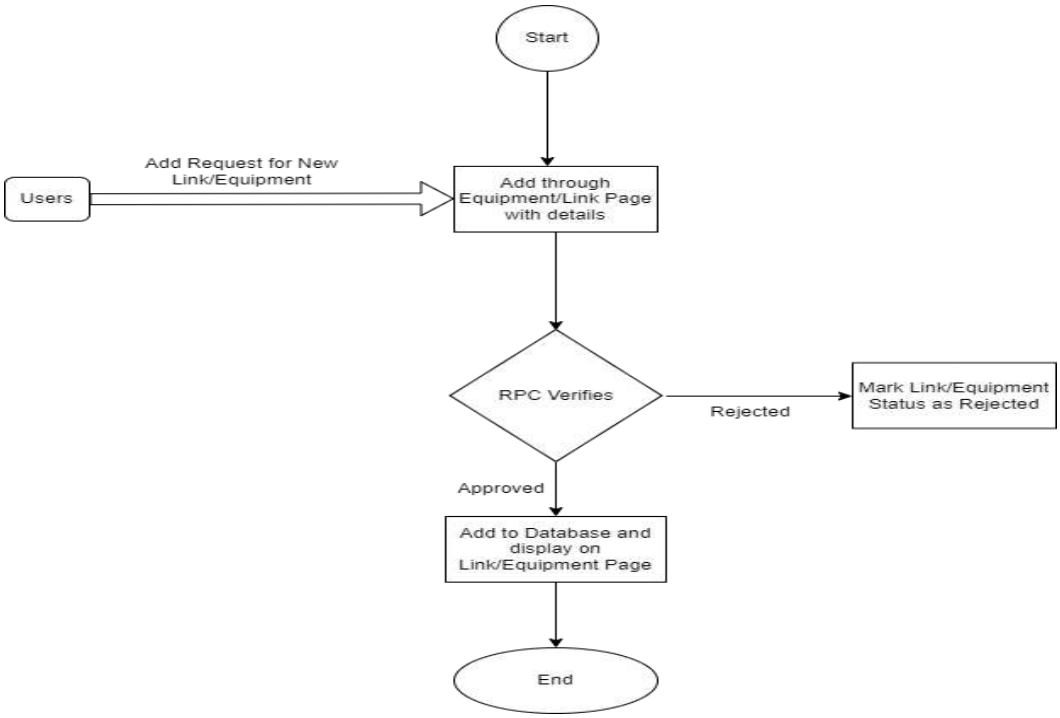


Figure 10 Adding New Links/Equipment's Workflow

Once a user requests for the addition/modification of the communication equipment or links, the request is forwarded to RPC for approval. Screenshot of widget showing the pending equipment/link approval of respective RPC/RLDC sample view is shown in Figure 11 below.

Figure 11 Pending Approval Widget for equipment's

- RPC/RLDC can add/update the Communication outage portal database with equipment/links proposed by users through **Equipment** tab on the web portal which contains a widget for **Pending Equipment to be added to Database** or through **Links** tab on the web portal with a widget for **Pending Links to be added to Database.**

2.7. Links Tab

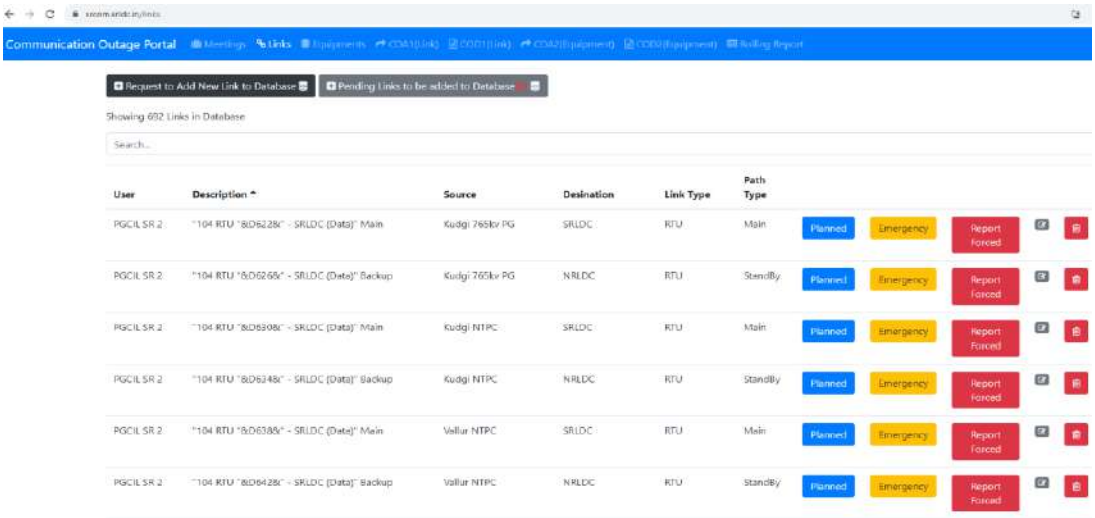


Figure 12 Links Tab sample screen

From **Links** tab, user can apply for proposed outages in communication links in either planned or emergency category and can also report the forced outages availed.

Sample View page screens for entering planned, emergency or forced outage details for communication equipment by the User are shown below in Figures 13,14 and 15 respectively.

2.7.1. Planned Outage Application for Links:

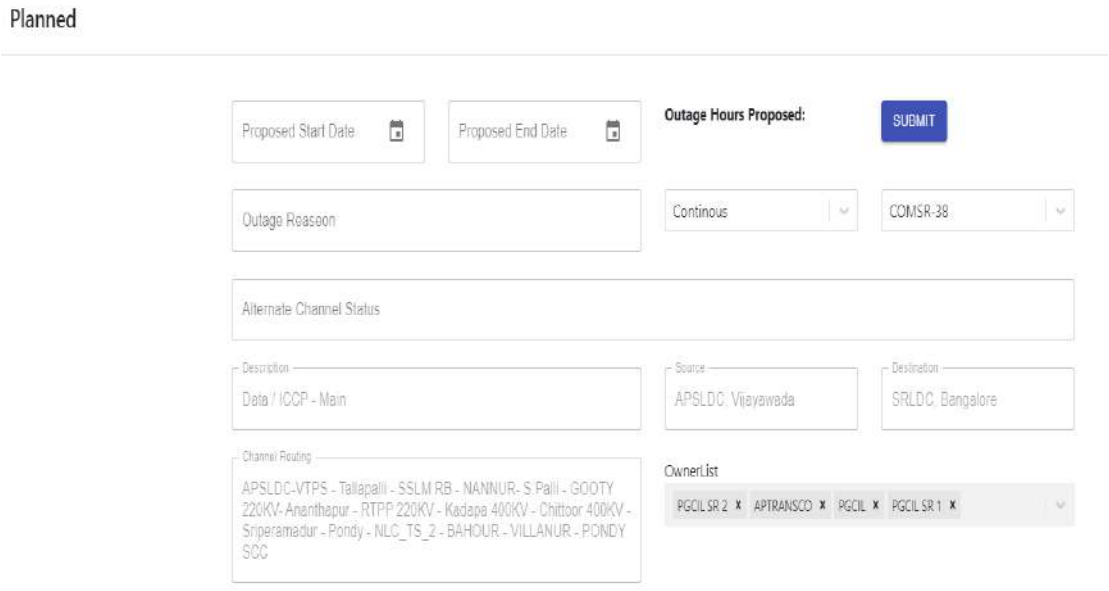


Figure 13 Planned Outage Application Screen for Links

2.7.2. Emergency Outage Application for Links:

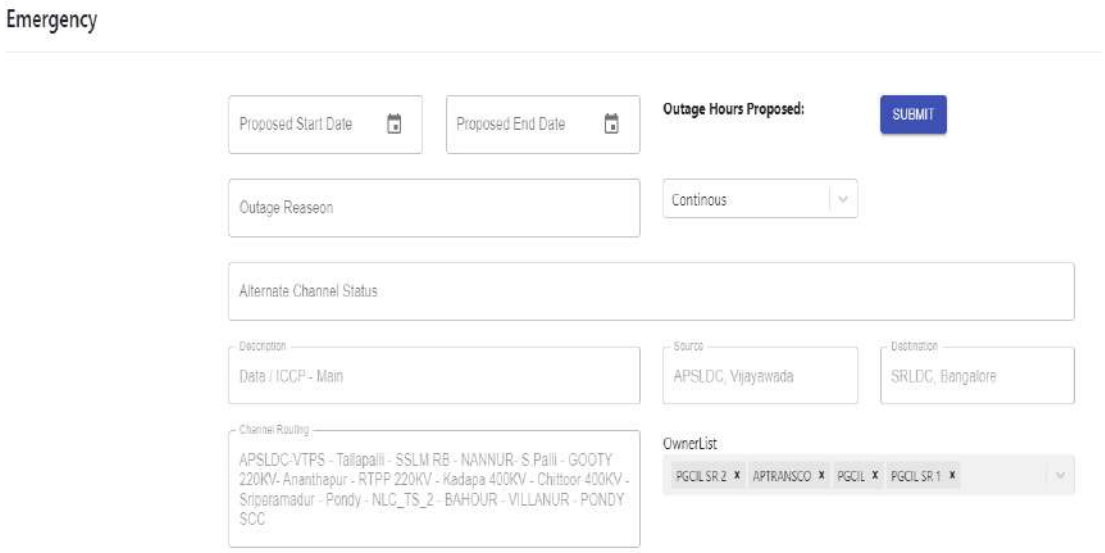


Figure 14 Emergency Outage Application Screen for Links

2.7.3. Forced Outage Reporting for Links:

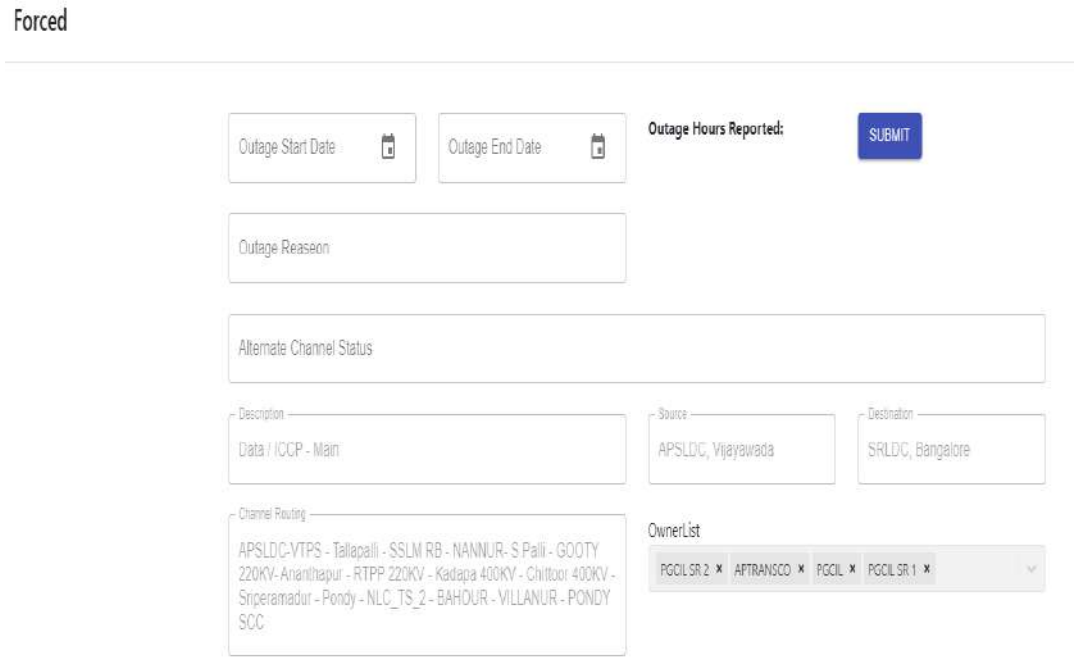


Figure 15 *Forced Outage Reporting Screen for Links*

2.8. Equipment Tab

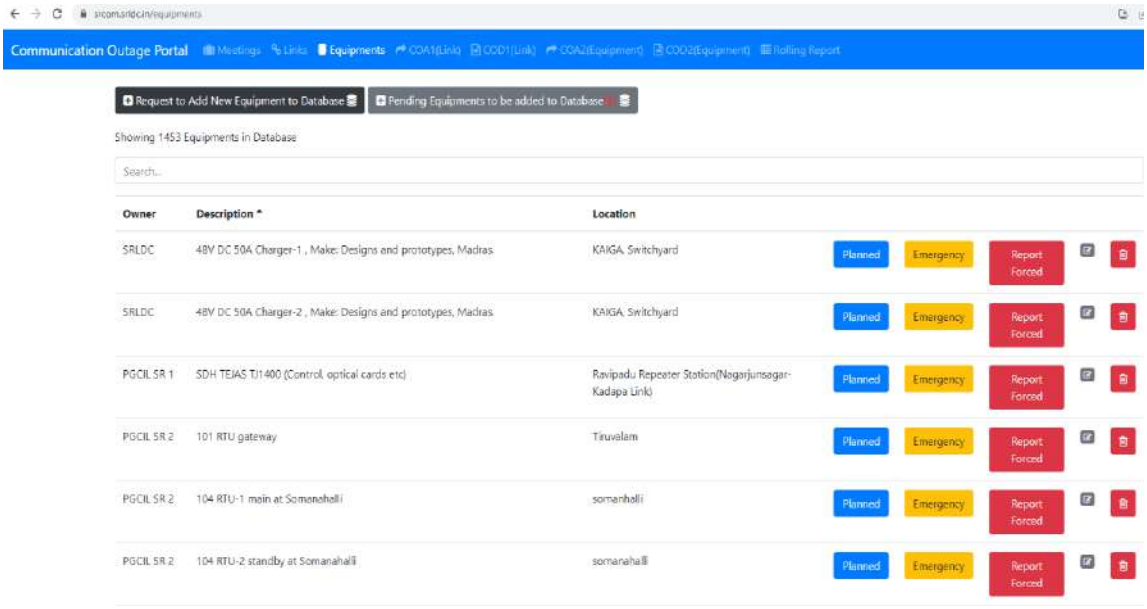


Figure 16 Equipment Tab sample screen

From **Equipment** tab (Figure 16 above), user can apply for proposed outages in communication equipment in either planned or emergency category and can report the forced outage availed. Sample View page screens for entering planned, emergency or forced outage details for communication equipment by the User are shown below in Figures 17,18 and 19 respectively.

2.8.1. Planned Outage Application for Equipment:

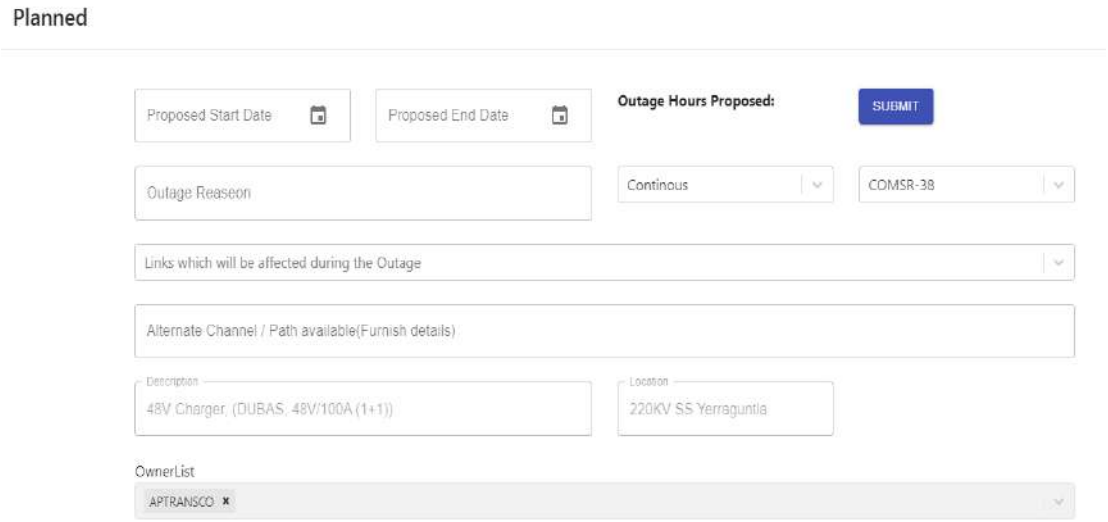


Figure 17 Planned Outage Application Screen for Equipment

2.8.2. Emergency Outage Application for Equipment:

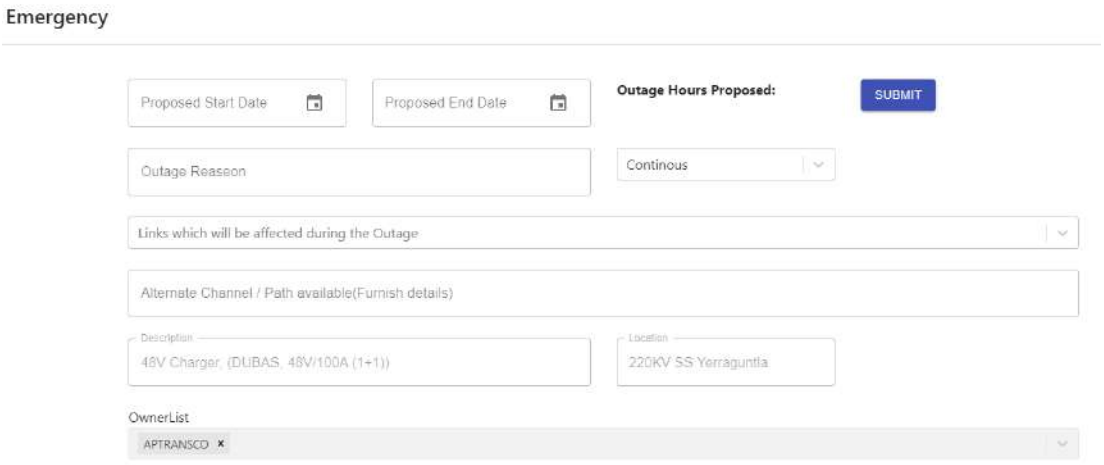


Figure 18 Emergency Outage Application Screen for Equipment

2.8.3. Forced Outage Reporting for Equipment:

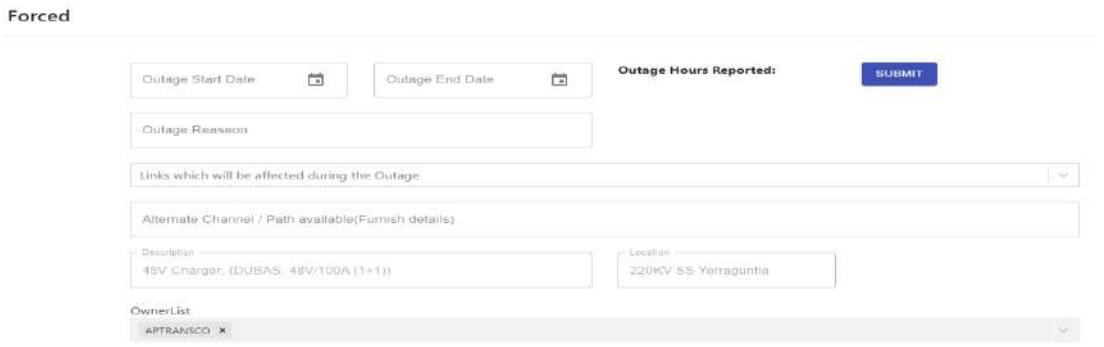


Figure 19 Forced Outage Reporting screen for Equipment

2.9. COA1(Link) - Communication Outage Approval Links

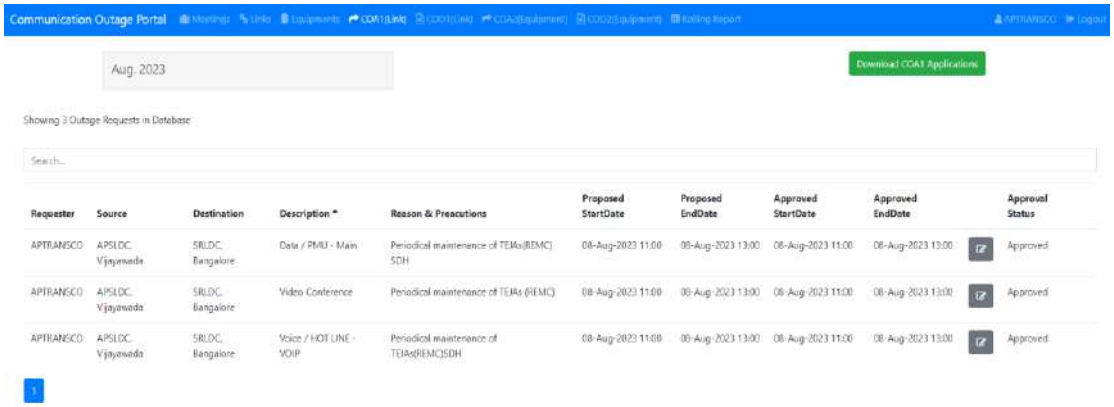


Figure 20 Communication Outage Application links (COA1) details for selected month

Through COA1 tab (Figure 20 above), Users can view the consolidated list of outage requests (for communication channels) submitted by them along with the current status of each outage request i.e., whether approved/rejected/revised (along with approved

timelines). Through this tab, users can edit their outage requests within the scheduled timeline window for submission of proposed outages.

Under Admin/Supervisor logins (RPC/RLDC) COA1 tab provides a consolidated list of all outage requests (for communication channels) from all users with proposed start and end date / time along with approved start and end date/ time for each outage.

2.10. COD1(Link) - Communication Outage Deviation - Links

Once communication link outage is approved in COMSR meeting, the final approved list for outage of communication links is communicated by RPC to all stakeholders and also updated on COMSR web portal. After availing the approved outage, concerned users have to enter the actual outage times (including start and end date, time) through COD1(Links) Tab (Figure 21 below) for communication channels

Note: In case of Emergency outage, approved start and end date times shall be null.

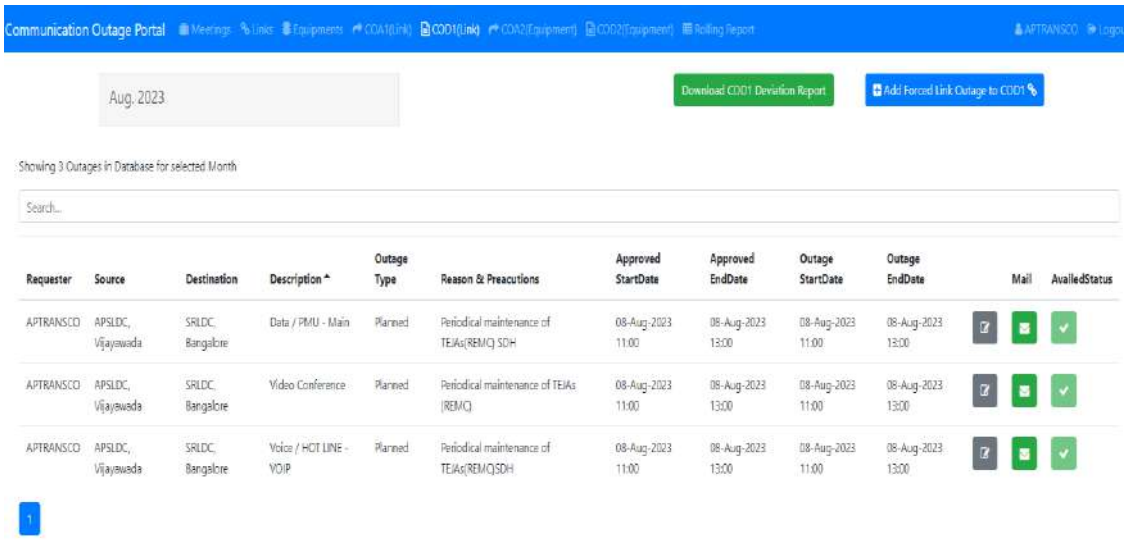


Figure 21 Communication Outage Deviation entry page for communication links (COD1)

Once the User enters the timings for actual outage duration for each approved outage, any deviation between the actual outage timing from the approved outage timing is computed and displayed in the COD1 tab. Sample screen for entry options available for Users against each approved outage under COD1 tab is shown in Figure 22 below. In case the user didn't avail the approved outage, user can select the "*Not availed*" option and submit the same in Communication Outage web portal. Similar Procedure is to be followed by Users for entering details of Emergency Category outages also.

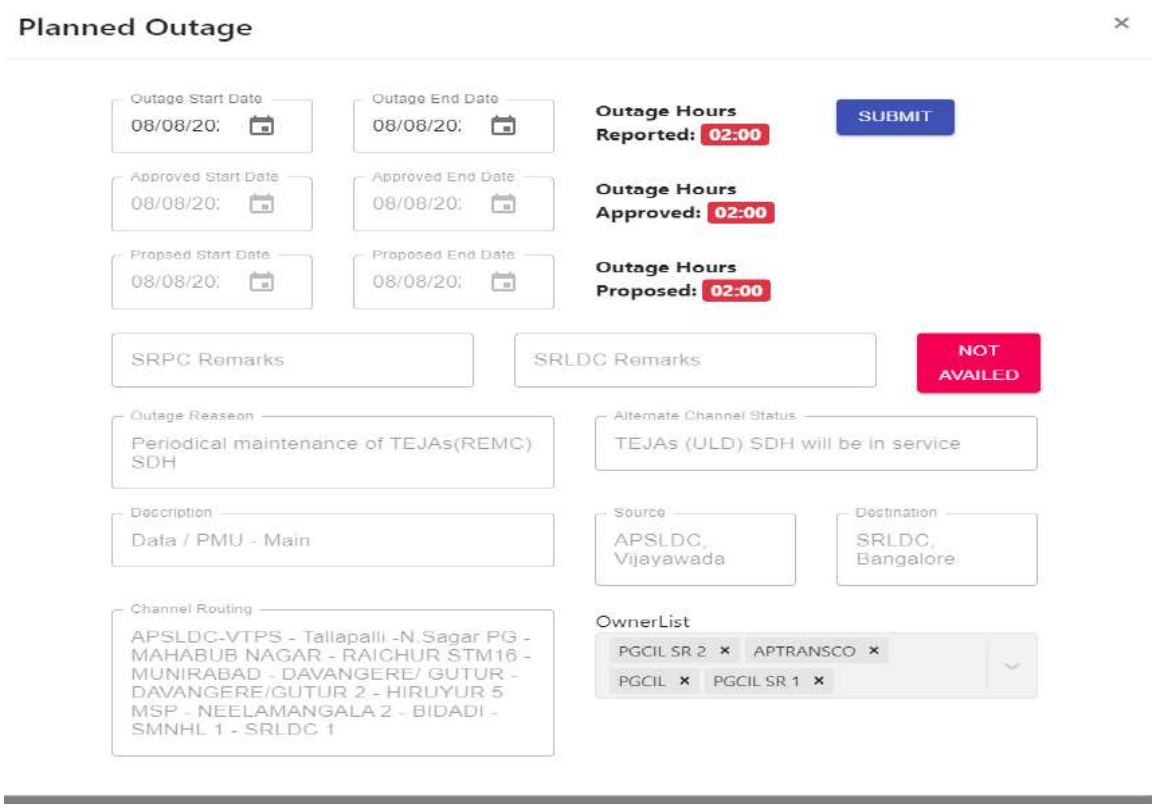


Figure 22 Planned Outage - actual time reporting entry screen

For reporting forced outages of communication links, user can use the "Add Forced Link Outage to COD1" Button which is located in the right corner of COD1(Links) Page (Fig. 22 above). On clicking this button, it shall navigate to Links Page where user can submit the details for the outage by selecting the respective links Sample screen for Forced Outage reporting widget is shown in Figure 23.

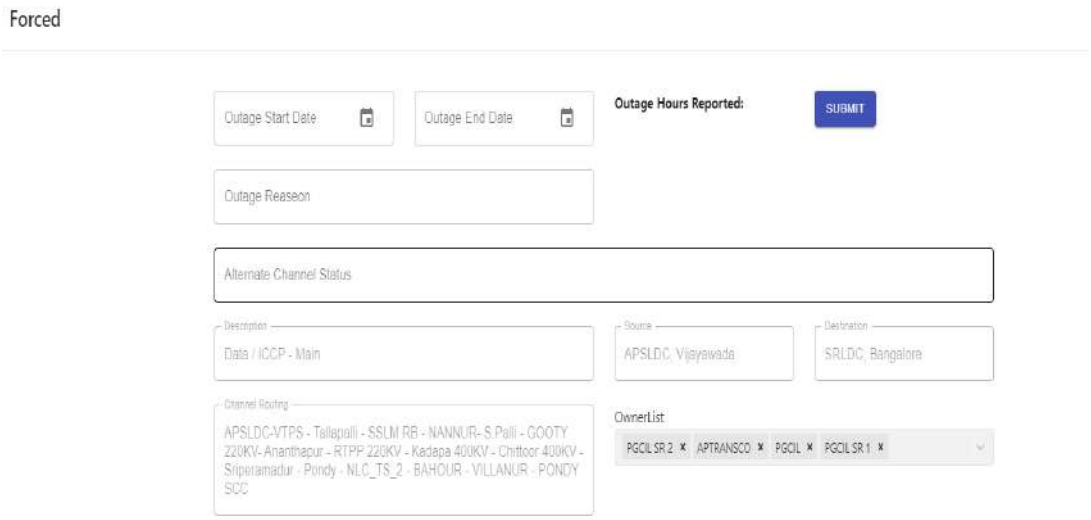


Figure 23 Forced Outage Reporting with actual outage times screen

2.11. COA2 (Equipment)- Communication Outage Approval for Equipment

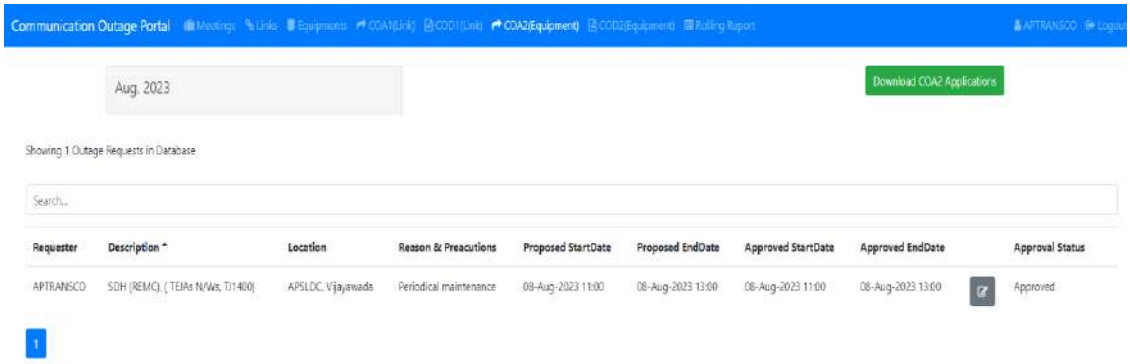


Figure 24 Communication Outage Application links (COA2) details for selected month

Through COA2 tab (Figure 24 above), Users can view the consolidated list of outage requests (for communication equipment) submitted by them along with the current status of each outage request i.e., whether approved/rejected/revised (along with approved durations). Through this tab, users can edit their outage requests within the scheduled timeline window for submission of proposed outages.

Through COA2 tab, RPC/RLDC can view consolidated list of all outage requests (for communication equipment) from all users with proposed start and end date / time along with approved start and end date/ time for each outage.

2.12. COD2(Equipment) - Communication Outage Deviation for Equipment

Once communication equipment outage is approved in COMSR meeting, the final approved list for outage of communication equipment is communicated by RPC to all stakeholders and also updated on COMSR web portal. After availing the approved outage, concerned users have to enter the actual outage times (including start and end date, time) through COD2(Equipment) Tab (Figure 25 below) for communication equipment.

Note: In case of Emergency outage, approved start and end date times shall be null.

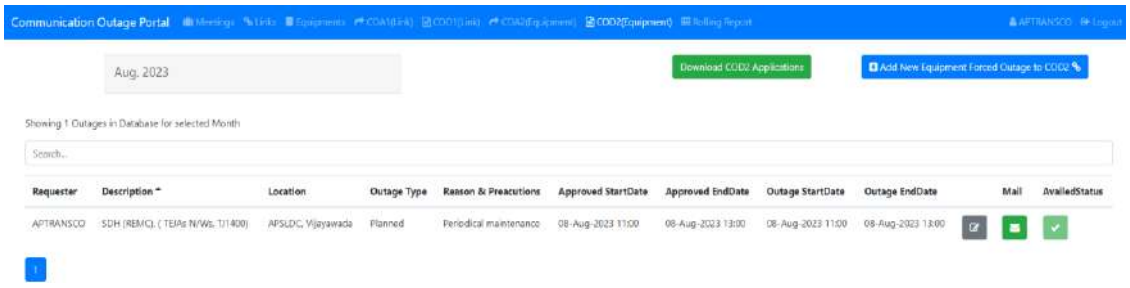


Figure 25 Communication Outage Deviation entry page for communication Equipment (COD2)

Once the User enters the timings for actual outage duration for each approved outage, any deviation between the actual outage timing from the approved outage timing is computed and displayed in the COD2 tab. The sample screen for entry options available for Users against each approved outage under COD2 tab is shown in Figure 26 below.

In case the user didn't avail the approved outage, the user can select the "Not Availed option" and submit the same in COMSR web portal. Similar Procedure is to be followed by Users for entering details of Emergency Category outages also.

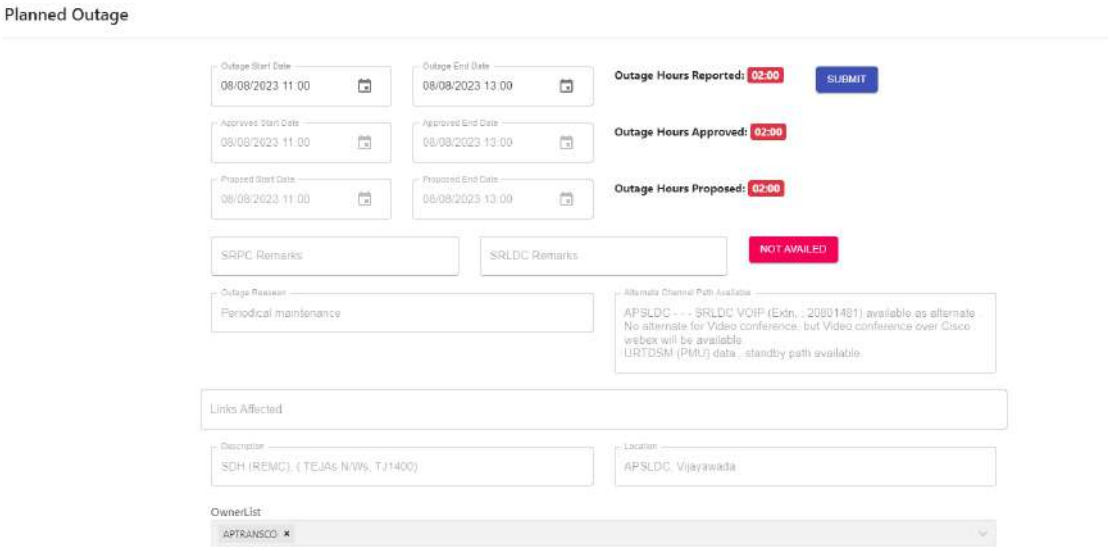


Figure 26 Planned Outage (Equipment) - actual time reporting entry screen

For reporting forced outages of communication equipment, user can use the "Add Forced Link Outage to COD2" Button located in the right corner of COD2(Equipment's) Page (Fig. 27 below). On clicking this button, it shall navigate to Equipment Page where user can submit the details for the respective Forced Outage.

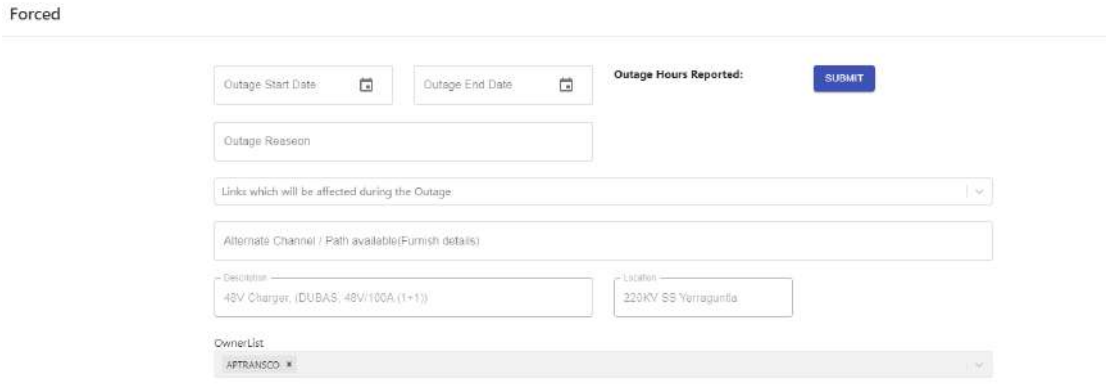


Figure 27 Forced Outage (Equipment's) Reporting with actual outage times screen

As per the approved Outage Procedure, all users/owners of communication equipment's/links need to submit the deviation report for outages availed by them in the M-1 month (considering M as current month) by 10th of the Mth Month. This requirement has been facilitated through the COD1(Links) & COD2(Equipment) tabs in the Communication Outage web portal.

Once this COD1 (links) & COD2 (equipment) is filled by respective Users/owners, RPC freezes the COD1& COD 2-page entry option after 10th of Mth month for outages availed in M-1 Month using "Freeze COD Application button" (Figure 28 and 29 below), available under Admin role login. In cases wherein the user has not entered the actual outage

timelines of approved outages, the portal automatically takes the approved outage timelines as actual outage timelines for planned outages. In case of emergency outages, if the user doesn't enter the actual outage timelines for the outage availed, the portal automatically takes proposed outage timings as actual outage timings. In all such cases, wherein User doesn't enter the actual outage timelines, the outage is deemed to be availed by respective entity.

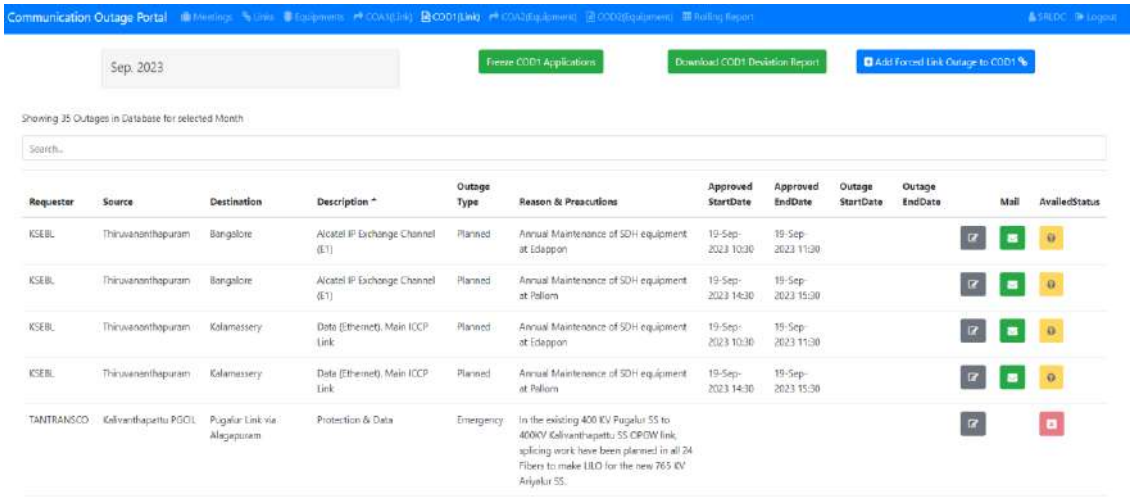


Figure 28 RPC view for Freezing COD1 Application.

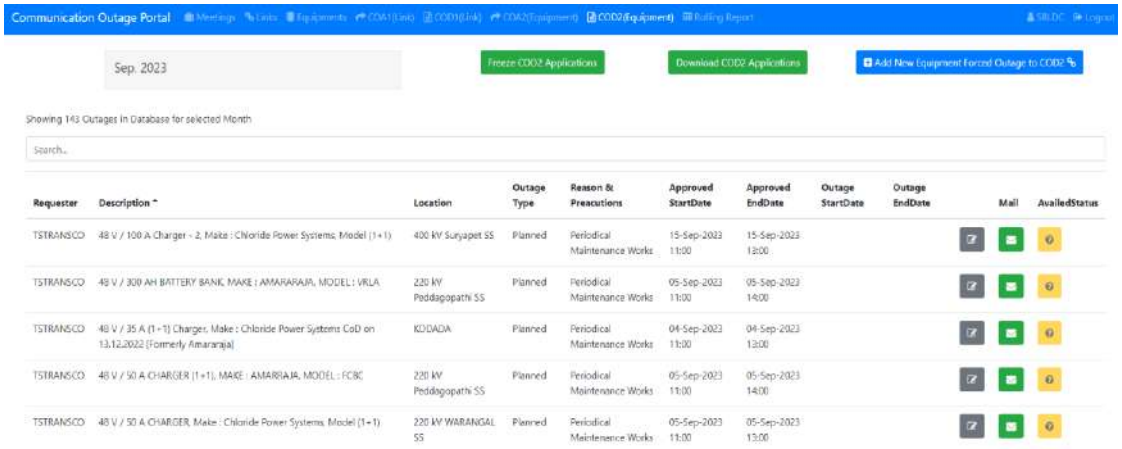


Figure 29 RPC view for Freezing COD2 Application

2.13. Rolling Report-- 12 Months Outage Time > 48hours

In order to monitor and highlight excessive outages of any of the communication link/equipment registered in the COMSR Db, Rolling Outage Reports for last twelve (12) months are provided which cumulatively adds the outage duration of communication links/equipment as per COD1/COD2 reports of last 12 months and summarizes the same in COD3 report (for communication links) and COD4 report (for Equipment). COD3 and COD4 reports are available for downloading in excel from the web portal. Sample screen showing download option is shown in Figure 30 and sample report format for COD3 (links) and COD4 (equipment) are shown in Figure 31 and Figure 32 below.

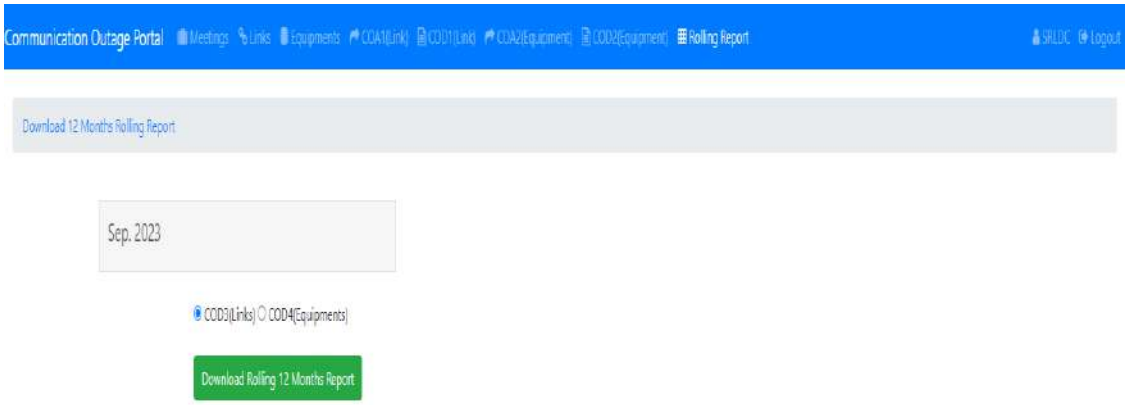
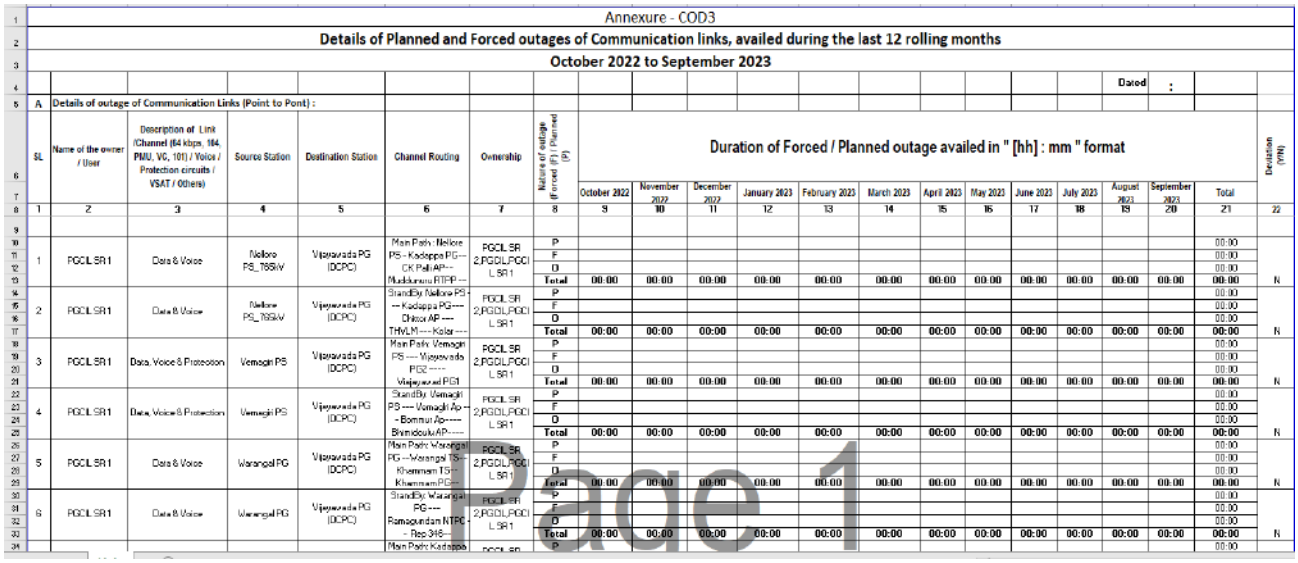


Figure 30 Rolling Report - 12 Months Outage Time download option



Annexure - COD3

Details of Planned and Forced outages of Communication links, availed during the last 12 rolling months

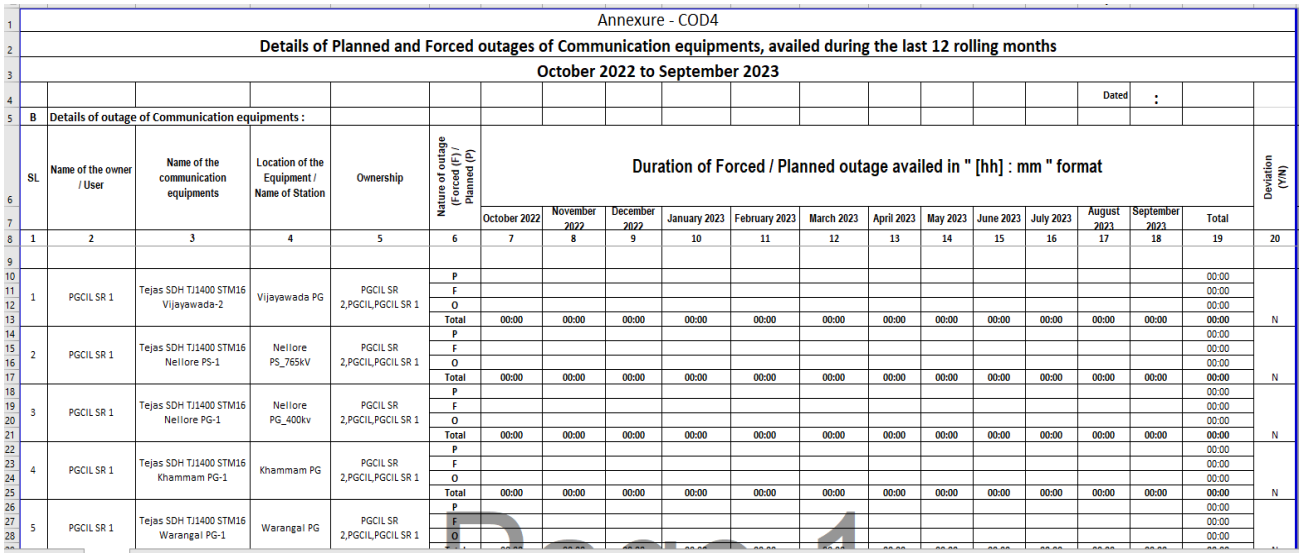
October 2022 to September 2023

Dated :

A Details of outage of Communication Links (Point to Pont) :

SL	Name of the owner / User	Description of Link /Channel (64 kbps, 164, PMU, VC, 101) / Voice / Protection circuits / VSAT / Others)	Source Station	Destination Station	Channel Routing	Ownership	Nature of outage (Forced (F) / Planned (P))	Duration of Forced / Planned outage availed in " [hh] : mm " format												Deviation (Y/N)
								October 2022	November 2022	December 2022	January 2023	February 2023	March 2023	April 2023	May 2023	June 2023	July 2023	August 2023	September 2023	Total	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	PGCIL SR1	Data & Voice	Nellore PS_765kV	Vijayawada PG (DCPC)	Main Path: Nellore PS - Kadappa PG--- CK Palli AP--- Muddunuru PGP ---	PGCIL SR 2,PGCIL,PGCI L SR1	P													00:00	
							F													00:00	
							O													00:00	
							Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
2	PGCIL SR1	Data & Voice	Nellore PS_765kV	Vijayawada PG (DCPC)	StandBy Nellore PS --- Kadappa PG---- Chittor AP ---- THVLM ---- Kolar ----	PGCIL SR 2,PGCIL,PGCI L SR1	P													00:00	
							F													00:00	
							O													00:00	
							Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
3	PGCIL SR1	Data, Voice & Protection	Vemagiri PS	Vijayawada PG (DCPC)	Main Path: Vemagiri PS ---- Vijayawada PG2 ---- Vijayawada PG1	PGCIL SR 2,PGCIL,PGCI L SR1	P													00:00	
							F													00:00	
							O													00:00	
							Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
4	PGCIL SR1	Data, Voice & Protection	Vemagiri PS	Vijayawada PG (DCPC)	StandBy Vemagiri PS --- Vemagiri Ap --- Bommur Ap----- Bhimavaram AP ----	PGCIL SR 2,PGCIL,PGCI L SR1	P													00:00	
							F													00:00	
							O													00:00	
							Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
5	PGCIL SR1	Data & Voice	Warangal PG	Vijayawada PG (DCPC)	Main Path: Warangal PG --Warangal TS-- Khammam TS-- Khammam PG---	PGCIL SR 2,PGCIL,PGCI L SR1	P													00:00	
							F													00:00	
							O													00:00	
							Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
6	PGCIL SR1	Data & Voice	Warangal PG	Vijayawada PG (DCPC)	StandBy Warangal PG --- Ramagundam NTPC - Rec 346---	PGCIL SR 2,PGCIL,PGCI L SR1	P													00:00	
							F													00:00	
							O													00:00	
							Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
					Main Path: Kadappa	PGCIL SR	P													00:00	

Figure 31 Sample COD3 Links Generated Report



Annexure - COD4

Details of Planned and Forced outages of Communication equipments, availed during the last 12 rolling months

October 2022 to September 2023

Dated :

B Details of outage of Communication equipments :

SL	Name of the owner / User	Name of the communication equipments	Location of the Equipment / Name of Station	Ownership	Nature of outage (Forced (F) / Planned (P))	Duration of Forced / Planned outage availed in " [hh] : mm " format												Deviation (Y/N)
						October 2022	November 2022	December 2022	January 2023	February 2023	March 2023	April 2023	May 2023	June 2023	July 2023	August 2023	September 2023	Total	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	PGCIL SR 1	Tejas SDH TJ1400 STM16 Vijayawada-2	Vijayawada PG	PGCIL SR 2,PGCIL,PGCIL SR 1	P													00:00	
					F													00:00	
					O													00:00	
					Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
2	PGCIL SR 1	Tejas SDH TJ1400 STM16 Nellore PS-1	Nellore PS_765kV	PGCIL SR 2,PGCIL,PGCIL SR 1	P													00:00	
					F													00:00	
					O													00:00	
					Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
3	PGCIL SR 1	Tejas SDH TJ1400 STM16 Nellore PG-1	Nellore PG_400kv	PGCIL SR 2,PGCIL,PGCIL SR 1	P													00:00	
					F													00:00	
					O													00:00	
					Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
4	PGCIL SR 1	Tejas SDH TJ1400 STM16 Khammam PG-1	Khammam PG	PGCIL SR 2,PGCIL,PGCIL SR 1	P													00:00	
					F													00:00	
					O													00:00	
					Total	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	N
5	PGCIL SR 1	Tejas SDH TJ1400 STM16 Warangal PG-1	Warangal PG	PGCIL SR 2,PGCIL,PGCIL SR 1	P													00:00	
					F													00:00	
					O													00:00	

Figure 32 Sample COD4 Links Generated Report

GRID-INDIA Comments on Draft MOM of 14th NPC Meeting

Annexure-B 14th NPC

Para no.	Para heading	GRID-INDIA Comments	Rationale
2.(i)	**SOP for Protection System Audit:**	i. IEGC 2023 mandates third party protection audit and same may be added in the background for reference.	IEGC 2023 contains detailed provisions for carrying out protection audit and therefore may be added as reference.
		ii. Self audit alongwith third party audit need to be carried out by the stations . This is missing in agenda and therefore may be added.	Annual self audit has to be carried out by entities, the findings of self-audit may help in third party protection audit.
		iii. The audit shall also review the Site Responsibility Schedule in the stations where multiple agencies are involved.	In the projects based on TBCB scheme, it is possible that line owner is different from substation owning entity. CEA standards specify a Site Responsibility schedule containing allocation of responsibilities among different entities. Protection audit may review the SRS for bringing out clarity in implemetation.
		iv. CBIP manual on power system protection may be referred.	CBIP manual on protection audit is also standard document and several custom clauses of this manual may be useful in Indian power system.
		v. The audit shall also review the withstand capability of physical structures for possible cyclones, wind speeds, humidity, earthquake etc.	Protection audit may contain the resiliency aspects such that station can withstand extreme weather and envioronmental conditions.
		vi. The reliability indices shall also be considered as one of the factors for carrying out audit.	As per IEGC reliability indices have to be computed and this parameter may be considered for carrying out protection audit.
		vii. IEGC 2023 recommends detailed requirement as ANNEXURE – 1 THIRD PARTY PROTECTION SYSTEM CHECKING & VALIDATION TEMPLATE FOR A SUBSTATION .This may be added in the SoP.	This template may be added for tabulating the results and data obtained in protection audit.
		viii. The protection details of nearby stations, lines and generators may also be required alongwith subject station for coordination purposes.	A template may be prepared for obtaining the details from nearby sttaions for coordination purposes.
		ix. The station shall share the readable files of DR/EL during any previous disturbance.	DR/EL records for previous disturbance may be one of the prerequisites to be submitted alongwith protection settings.
		x. In the SoP of protection audit, the audit of inter-regional line/HVDC is missed. The HVDC where tripping of all poles takes place shall be considered a candidate for audit. FACTS devices shall also be included for separate audit.	HVDC stations are missing in the SOP and since most of the HVDC links are inter-regional and high power carrying links, it is important that focussed audit shall be carried out for them.
		xi. The protection audit of IR lines may be conducted jointly by involved RPCs.	IR lines involve two regions and therefore, a joint audit by respective RPCs may be required.
		xii. The RE pooling stations need to be audited at higher frequency since addition/modification of elements within or nearby station take place at regular intervals. The philosophy adopted for auditing RE station may be added	RE pooling stations witness frequent addition of generation as well as transmission and this may involve the necessity to review the protection settings more frequently.
		xiii. The audit shall also contain review of practice being followed for activation/archival of DR (FOR committee report can be referred).	Forum of Regulators has released detailed report on standardisation of DR/Eland same may be refrred during feedback to entity owner.
		xiv. All RE plants, together with their external compensating equipment (if any) should be audited	RE generation stations shall be audited alongwith external compensation equipment e.g STATCOM, Capacitor banks etc. .
		xv.Power and control Cable testing results, Frequency of DC earth fault to be included in periodic protection audit.	The cable testing, DC earth fault detection are rarely tested in site which may cause multiple tripping.
		xvi.Highest Flood levels Measurement and random inspection of tower strength assessment may be conducted in protection audit checklist.	Due to road construction/repairing there is possibility of mismatch between substation level and road level which may create flooding of substations in high rainy seasons.The strength of tower assessment is needed to detect any chance of tower collapse condition.

2.(ii)	**SOP for Grid Disturbances/Grid Incidents/Tripping's:**	i.RE plants shall also share the high resolution data for validation of plant performance after a grid disturbance. The details shall be shared for any event involving change in generation of the plant by more than 10 percent.	RE plant being inverter based resource may be observed vide high resolution data. RE plants shall submit details for events where change in generation during a step is more than 10%.
		ii. After a major grid disturbance, the feedback to transmission planners shall be shared and planners shall also submit the necessary remedial measures in the form of transmission addition etc.	In case during GD it emerges that any network related inadequacy contributed to the GD, the feedback shall be shared with planners as well.
		iii.In Sl. No. 9 , it is mentioned that NLDC shall disseminate the lessons learned, it is suggested to modify " RLDC alongwith NLDC shall disseminate the lessons learned".	It seems that role of RLDCs got missed, therefore RLDCs have been added.
		iv.The event involving more than one region shall be discussed in both RPCs .	The GD/GI/Near-miss involving more than one region may require deliberation in respective RPCs.
		v. Few cascade tripping have been observed due to failure of auto changeover of auxiliary supply from one source to the other (refer Rajasthan – RAPS case). During event reporting, reliability of auxiliary scheme shall be checked.	The event analysis shall provide details of auxillary supply and in case of blackout , reliable operation of auxillary supply may be reviewed.
		vi. Grid disturbance analysis shall also review any loss of data at respective RLDC during event.	It is observed during events that there is partial/complete loss of telemetry at RLDC/NLDC. The analysis may also factor the continuity of telemetry.
2.(iii)	**S.O.P for Communication Audit for Substations:**	i.Audit shall validate the Performance requirement. - Communication system shall be able to conform the data interval time as specified in Schedule-I of CEA Technical standards for communication 2020.	These are added in line with CEA Technical Standards for Communication System in Power System Operations) Regulations, 2020 and IEGC 2023.
		ii. A site responsibility schedule for every interface point shall be prepared by the owner of the communication interface equipment at the interfacing location.	
		iii. Audit shall check whether the retention of historical data for ninety days has been kept or not.	
		iv.In Audit format status of integration with U-NMS may be kept.	
		v. Audit shall also check compliance to Cyber Security guidelines.	
2.(iv)	**SOP for Communication System Outage Planning:**	i. There is an annexure to the format for communication outage portal, as per process mentioned in portal , there is only option of self-declaration by requester i.e. there is no mechanism for checking the accuracy of details.	It is important that there is some mechanism for validation of data entered in portal.
		ii) In Sl No 5 of SOP it is mentioned that a Web Portal named as "Communication System Outage Planning Portal" shall be developed by respective RLDCs. It is requested that this point may be deleted from SOP	Such clause can be deleted from SOP . Also as per Communication Regulations 2017 Outage planning is the responsibility of RPC.
		ii.In Sl. No. 13 of SoP , it is mentioned that user has to obtain code from RLDC. Outages can be approved by Communication Outage planning committee. However, a fomat may be included where owner can submit information after availing outages. iii. Central Electricity Authority (Technical Standards for Communication System in Power System Operations) Regulations, 2020 has identified RPC as nodal agency for the purpose. "Monthly outage shall be planned and got approved by the owner of communication equipment in the concerned regional power committee, as per detailed procedure finalised by the respective regional power committee" .	It may be difficult for RLDC to monitor and handle so many codes for communication.
		The below points may be inserted suitably in the NPC SOP regarding AGC. iv. All the AGC communications links between NLDC and the power plants (2 links each between NLDC and the respective power plant) may be added to the outage monitoring list. In the SOP only "inter-regional AGC links" are mentioned.	AGC links are typically point to point connections between NLDC and the power plant. Hence, instead of focusing on inter-regional AGC links, links between NLDC and the power plant may be monitored.
		v. In case of a planned outage of an intermediate part of a communication link/channel/path, an alternate link may be planned to be configured to the extent possible, to avoid disruption of communication.	AGC links are supposed to operate with 99.99% availability. Alternate links to the extent posible may be created in advance, in case of planned outages.

		vi. NLDC Detailed Procedure for Secondary Reserve Ancillary Services (SRAS) prepared in line with the CERC (Ancillary Services) Regulations, 2022, provides roles and a standard operating procedure for AGC communication failure identification and rectification. The same is available at https://grid-india.in/en/download/detailed-procedure-for-secondary-reserve-ancillary-services-sras-2022/?wpdmdl=49193 and shall be adhered to in the real-time AGC system operation.	There is an operational SOP created by NLDC inline with CERC (Ancillary Services) Regulations, 2022. The same may be mentioed in the planning SOP to make the document holistic.
		vii.NLDC may submit the monthly communication availability report of the AGC communication links, as measured from the NLDC router to the plant router. However, this metric would also include the communication failure caused due to power plant side issues, apart from the CTUIL/POWERGRID (ULDC)/NLDC side issues. Wherever necessary, NLDC-submitted statistics may be analysed together with the power plant-submitted statistics (plant router to plant RTU, plant router to NLDC router), and POWERGRID-submitted statistics (NLDC MUX to plant MUX), to find the root cause and solutions.	This is inline with the NLDC SOP for SRAS/AGC. This ensures that NLDC, POWERGRID and the Power plants claim responsibility for their portion of communication availability for AGC.

STANDARDIZATION OF OUTPUT REPORTS OF COMMERCIAL ACCOUNTS ISSUED BY RPCs

As per the decision in the 13th meeting of NPC held on 05th July 2023 and mandate given in Annexure-7: Accounting & Pool Settlement system under CERC IEGC Regulation 2023 and subsequent decision taken in the Sub group meeting held on 08th August 2023, ERPC secretariat has entrusted for preparing a draft standardization of Output format of all commercial accounts published by RPCs for accounting and settlement.

In this regard, ERPC vide email dated 20.09.2023 has provided draft standardization of Output format of all commercial accounts published by RPCs and the same was circulated for the comments. SRPC vide email dated 04 Oct 2023 has given their observation for standardization of output format.

A meeting of the commercial sub-group of NPC was held on 30.10.2023 through video conference to discuss Standardization of output formats of Commercial Accounts issued by RPCs. The standardised output formats of the commercial accounts have been modified based on deliberations in the meeting and circulated to all RPCs for comments. The comments/inputs dated 8.11.2023 was received from SRPC and the same has been suitably incorporated.

After consideration of comments of SRPC and visiting the accounts published by RPCs, the standardization of Output format of all commercial accounts published by RPCs has been prepared by NPC Division for uniformity in all commercial account. The same has been given below with the final suggestions:

Basis of Standardization of Output Formats:

1. Regulations of CERC and existing formats of commercial accounts issued by RPCs.
2. Unit of energy, power, INR and Constituent name should be unique and will be applicable for all RPCs output report format uniformly.
3. Final modifications of output format may be done during the development of Unified Accounting Software for all RPCs.

Note:

1. Proper mentioning of Amount (this shall be indicated along with sign (+/-) & Nature of Amount (this shall be indicated a Payable to Pool/ Receivable from Pool).
2. All Amounts shall be shown in Rupee terms.
3. Resolution of Power (in MW) & Energy (in MWH) figures shall be restricted to THREE Decimals in the Main Reports

A. Weekly Accounts

Standard Format of Commercial Accounts

1. DSM Account Format:

1.1 Final Weekly DSM Account

DSM Settlement Account for the week
From DD-MM-YYYY to DD-MM-YYYY

Entity	Total Deviation (MWHr)	Under Drawl Charges/ Over Injection Charges (Rs)	Over Drawl Charges/ Under Injection Charges (Rs)	Post-facto Charges/ Charges for Drawl without Schedule (Rs)	Final Charges (Rs)	Payable To Pool ("-")/ Receivable From Pool ("+")
States/UT/Drawee Entities						
Ent-1						
Ent-2						
....						
CGS						
CGS-1						
CGS-2						
...						
General Sellers						
GS-1						
GS-2						
...						
WS-Seller						
Solar Entity						
SE-1						
SE-2						
...						
Wind Entity						
WE-1						
WE-2						
...						
Inter- regional						

Inter- National						
Infirm generators						

(All Figs. in Rs.)

Payable To The Pool (A) :	
Receivable From The Pool (B) :	
__ Deviation (A-B) :	

1.2 Day-wise Report Format:

(All Figs. in Rs.)

Date	Total Scheduled (MWH)	Total Actual (MWH)	Deviation (MWH)	Final Charges (Rs)	Payable To Pool ("-")/ Receivable From Pool ("+")
States/UT/Drawee Entities					
Day-1					
Day-2					
Day-3					
Day-4					
Day-5					
Day-6					
Day-7					
Weekly Total					
CGS					
Day-1					
Day-2					
Day-3					

Day-4					
Day-5					
Day-6					
Day-7					
Weekly Total					
General Sellers					
Day-1					
Day-2					
Day-3					
Day-4					
Day-5					
Day-6					
Day-7					
Weekly Total					
WS-Seller					
Solar Entity					
Day-1					
Day-2					
Day-3					
Day-4					
Day-5					
Day-6					
Day-7					
Weekly Total					
Wind Entity					
Day-1					
Day-2					
Day-3					
Day-4					
Day-5					
Day-6					
Day-7					
Weekly Total					
Inter- regional					
Day-1					
Day-2					

Day-3					
Day-4					
Day-5					
Day-6					
Day-7					
Weekly Total					
Inter National					
Day-1					
Day-2					
Day-3					
Day-4					
Day-5					
Day-6					
Day-7					
Weekly Total					
Infirm Generator					
Day-1					
Day-2					
Day-3					
Day-4					
Day-5					
Day-6					
Day-7					
Weekly Total					

Note: Energy unit in MWH and upto 3 decimal.

2. Ancillary Service Account:

2.1 SRAS Settlement Account for the week from dd-mm-yyyy to dd-mm-yyyy

Payments to the SRAS Provider(s) from the DSM pool

Sr. No.	SRAS Provider	UP Regulation due to SRAS (MWh)	Down Regulation due to SRAS (MWh)	Net Energy (MWh)	Energy Charges/ Compensation Charges (Rs.)	Incentive Charges (Rs.)	Total Charges (Rs.)	Payable to the pool/Receivable from the pool

Total								

Notes :

1. Energy unit in MWH and upto 3 decimal.
2. Energy Charges/Compensation Charges for SRAS provider has been calculated as per the rate furnished by the respective SRAS providers in Format AS and the same published in RPC website.
3. The Incentive has been calculated based on actual performance of SRAS providers.

2.2 SRAS Actual Performance Statement by __RPC
from dd-mm-yyyy to dd-mm-yyyy

Sr. No.	SRAS Provider	dd-mm-yyyy	dd-mm-yyyy	dd-mm-yyyy	…	dd-mm-yyyy	dd-mm-yyyy	Remarks (Disqualification period)
		Actual Performance(%)	Actual Performance(%)	Actual Performance(%)	…	Actual Performance(%)	Actual Performance(%)	
					…			
					…			
					…			

2.3 TRAS Account:

TRAS Settlement Account for the week from dd-mm-yyyy to dd-mm-yyyy
(Short Fall/Emergency)

Net Charges Payable/Receivable by the TRAS Provider(s) to/from the Regional Deviation and Ancillary Service Pool Account in Shortfall/Emergency Condition

SL No.	TRAS Provider	Energy scheduled under shortfall/ Emergency TRAS-Up (MWH) (A)	Total Charges /Compensation Charges for Shortfall/Emergency TRAS-Up (Rs) (B)	Energy scheduled under Shortfall/Emergency TRAS-Down (MWh) (C)	Total Charges / Compensation Charges for Shortfall/Emergency TRAS-Down to be paid back to Pool (Rs) (D)	Net Charges (Rs) (E)=(B)-(D)	Payable from Pool to TRAS Provider/ Receivable by Pool from TRAS Provider

Notes:

A) TRAS settlement account for the week dd-mm-yyyy to dd-mm-yyyy has been prepared as per the detailed procedure for Tertiary Reserve Ancillary Services (TRAS) approved by CERC.

B) Total Charges for TRAS providers have been calculated as per the rates furnished by the respective TRAS providers and the same published in ___RPC website.

2.4 TRAS Settlement Account by RPC (Day Ahead and Real Time Market)

TRAS Account for Week from dd-mm-yyyy to dd-mm-yyyy.

Net Charges Payable/Receivable by the TRAS Provider(s) to/from the Regional Deviation and Ancillary Service Pool Account

S. No	**TRAS Provider Name**	**TRAS-Up in Day Ahead AS Market**				**TRAS-Up Energy in Real Time AS Market**				**Total Charges/ compensation charge for TRAS Up (Rs) (I)=(C)+(D)+ (G)+(H) (11)**
(1)	**(2)**	TRAS Up Cleared (MWh) (A) **(3)**	TRAS-Up Energy Scheduled (MWh) (B) **(4)**	TRAS Up Energy Charges (Rs.) (C) **(5)**	TRAS-Up Commitment Charges (Rs.) (D) **(6)**	TRAS Up Cleared (MWh) (E) **(7)**	TRAS-Up Energy Scheduled (MWh) (F) **(8)**	TRASUp Energy Charges (Rs) (G) **(9)**	TRAS-Up Commitment Charges (Rs) (H) **(10)**	
1										
2										
3										

TRAS-Down in Day Ahead AS Market		TRAS-Down in Real Time AS Market		Net Charges (Rs) (N)=(I)-(K)- (M) **(15)**	Payable from Pool to TRAS Provider/Receivable by Pool from TRAS Provider
TRASDown Energy Scheduled (MWh) (J) **(12)**	TRASDown Charges to be paid back to Pool (Rs) (K) **(13)**	TRASDown Energy Scheduled (MWh) (L) **(14)**	TRASDown Charges to be paid back to Pool (Rs) (M) **(15)**		
1					
2					

3. Reactive Energy Account Format:

3.1 Weekly Reactive Energy Account format after final Adjustment:

Regional Entity Name	MVArh_H	MVArh_L	Net Amount (Rs.)	Payable to Pool (-)/ Receivable from Pool (+)
States/UTs/ Drawee Utilities				
CGS				
General Sellers				
WS Seller (Solar Entity)				
WS Seller (Wind Entity)				
WS Seller (Others)				

(All Figs. in Rs.)

Payable To The Pool :	
Receivable From The Pool :	

3.2 Meter-wise Reactive Energy Details

Regional Entity Name	Station Name	Element Name	Meter No	MVArh_H	MVArh_L
Ent-1					
Ent-2					
…					

3.3 Day wise Format:

Reactive Energy export (-) / import (+) under high & low voltage condition
And Reactive Energy Charges thereof
(Reactive Energy Exchange in MVARH & Charges in Rs.)

Regional Entity Name	ISTS/BBMB/DVC etc.	Drawl Point	Day1 (HV, LV)...	……	Day7(HV, LV)	Total HV	Total LV	Charges HV	Charges LV

B. Monthly Accounts

1. REA Accounts Formats:

_____Regional Power Committee

Regional Energy Account for the Month of _____

1.1 Details of Plant Availability Factor (PAF) for CS Stations

High Demand Season for FY 20__-__

Peak Hours ( )

ISGS	IC (MW)	Auxiliary Consumption	NPAF (%)	PAFM (%)	PAFC (%)	High Demand Season				Low Demand Season			
						Peak Hour		Off-Peak Hour		Peak Hour		Off-Peak Hour	
						PAFM (%)	PAFC (%)	PAFM (%)	PAFC (%)	PAFM (%)	PAFC (%)	PAFM (%)	PAFC (%)
ISGS-1													
ISGS-2													
……													
…….													

1.2 Details of Plant Load Factor (PLF) for CS Stations

High Demand Season for FY 20__-__

Peak Hours ( )

ISGS	IC (MW)	Auxiliary Consumption	NPLF (%)	PLFM (%)	PLFC (%)	High Demand Season				Low Demand Season			
						Peak Hour		Off-Peak Hour		Peak Hour		Off-Peak Hour	
						PLFM (%)	PLFC (%)	PLFM (%)	PLFC (%)	PLFM (%)	PLFC (%)	PLFM (%)	PLFC (%)
ISGS-1													
ISGS-1													
……													
…….													

1.3 Details of Misdeclaration of Declared Capability by CS Stations

Entity	Mis Declaration Date	Incident No	No. of days for which FC Deductible

1.4 Weighted Average Percentage Allocation - Peak & Off – Peak Hours combined from ISGS for the FY 20__-__ Month- 20___

ISGS	Ben-1	Ben-2	…	…	…	…	…	Total
ISGS-1 (August-2023)								
ISGS-1 Cumulative2023-24)								
ISGS-2 (August-2023)								
ISGS-2 (Cumulative 2023-24								
…								
…								
ISGS-13 (August-2023)								
ISGS-13 (Cumulative 2023-24								

1.5 Details of Scheduled Energy to the Beneficiaries for Month, Year

1.5.a Energy Scheduled from ISGS to the Beneficiaries for Month, Year

All units in MWH

Entity		Ben-1	Ben-2	…	…	…	…	…	Total
ISGS-1									
ISGS-2									
…									
Hydro Stations	Name of Hydro stations								
	Free Energy of Hydro Stations								
Nuclear Stations									
Solar									
Wind									

Shared Projects								
STOA Export by Goa								

Note: Energy unit in MWH and upto 3 decimal.

1.5.b Energy Scheduled from Renewable ISGS for the Month, Year

All units in MWH

Entity	Total Energy Schedule (MWH)	Total Actual Energy (MWH)	Net Deviation for the purpose of REC (MWH)
SOLAR ENTITY			
S1			
S2			
…			
NON SOLAR ENTITY			
NS1			
NS2			
…			
Total Solar Deviation for the purpose of REC			
Total Non-Solar Deviation for the purpose of REC			

Note: Energy unit in MWH and upto 3 decimal.

1.6 Energy Scheduled above Normative PLF from Inter State Generating Stations for the FY 2023-24

(Incentive Energy)

1.6.a. High Demand Season

Details of Incentive Energy (in MWH) Beyond Target PLF								
		Incentive Energy Peak Period				**Incentive Energy Off Peak Period**		
Station Name	**State Name**	**Incentive Energy upto Last Month (A)**	**Incentive Energy upto Current Month (B)**	**Incentive Energy for the Month (C)=(B)-(A)**		**Incentive Energy upto Last Month (D)**	**Incentive Energy upto Current Month (E)**	**Incentive Energy for the Month (F)=(E)-(D)**
Station-1								

	Total							
Station-2								
	Total							
Station-N								
	Total							

1.6. b. Low Demand Season

Details of Incentive Energy (in MWH) Beyond Target PLF								
		Incentive Energy Peak Period				**Incentive Energy Off Peak Period**		
Station Name	**State Name**	**Incentive Energy upto Last Month (A)**	**Incentive Energy upto Current Month (B)**	**Incentive Energy for the Month (C)=(B)-(A)**		**Incentive Energy upto Last Month (D)**	**Incentive Energy upto Current Month (E)**	**Incentive Energy for the Month (F)=(E)-(D)**
Station-1								
	Total							
Station-2								
	Total							
Station-N								
	Total							

1.7. Compensation for Degradation of Heat Rate (SHR) and Auxiliary Energy Consumption (AEC)

As per Detailed Operating Procedure on Reserve Shutdown and Compensation Mechanism issued on 05-05-2017 by Hon'ble CERC.

From Date: dd-mm-yyyy, To Date: dd-mm-yyyy

1.7 a Information used for ECR calculation

Entity (SR-ISGS)	Installed capacity MCR (MW)	Normative SHR or Net SHR (kCal/kWh)	Normative SFC (ml/kWh)	CVSF (kCal/ml)	LPPF (Rs./MT)	LPSFi (Rs./KL)	Normative LC (kg/kWh)	LPL (Rs./kg)	Normative Aux. Cons (%)	CVPF (kCal/kg)	Actual GHR / SHR (kCal/kWh)	Actual SFC (ml/kWh)	Actual LC (kg/kWh)	Actual Aux. Cons (%)
ISGS-1														
ISGS-2														
...														
ISGS-13														

1.7 b Outage Data details for Stations for the Month, Year

Entity	Unit No.	Installed Capacity	Start-Date time	End Date time	Type of Outage
ISGS-X					
ISGS-X					
...					
Note: Outage Duration has been calculated from 01-04-2023 at 00:00 hrs.					

1.7 c Compensation Calculated for each ISGS Stations up to Month , Year

Energy charge rate (ECR) in Rupees per kWh on ex-power plant basis is determined to three decimal places.

ENTITY (SR-ISGS)	Average Unit Loading (%)	Total schedule (MWH)	ECR (Norm) (Rs/kWh)	ECR (Actual) (Rs/kWh)	ECR (SE) (Rs/kWh)	ECR (DC) (Rs/kWh)	EC (Norm) (Rs)	EC (Actual) (Rs)	EC (SE) (Rs)	EC (DC) (Rs)	EC (A)- EC (N) (Rs)	Comp (P) (Rs)	**Comp (F) (Rs)**
ISGS-1													
ISGS-2													
...													
ISGS-13													
TOTAL													

1.7 d Details of Entitlement and Schedule of Beneficiaries and SCED from ISGS

SR-ISGS	Ben-1		Ben-2		...		Ben-15		SCED	
	Ent (MW)	Sch (MW)	Ent (MW)	Sch (MW)	Ent (MW)	Sch (MW)	Ent (MW)	Sch (MW)	Ent (MW)	Sch (MW)
ISGS-1										
ISGS-2										

…										
ISGS-13										

1.7 e Proportion of (Un-requisitioned Energy of beneficiaries when Schedule is below 85% of its entitlement from ISGS) and (SCED)

Rounded off values are shown in the table below; however, actual values are considered for computation of compensation payable by beneficiary.

SR-ISGS (NTPC)	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	…	Ben15	SECD	Total
ISGS-1																	
ISGS-2																	
…																	
ISGS-13																	

1.7 f Compensation Amount payable by Beneficiary

SR-ISGS (NTPC)	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	…	Ben15	SECD	Total
ISGS-1																	
ISGS-2																	
…																	
ISGS-13																	
Total for each Beneficiary																	

1.7 g Statement of Compensation due to Part Load Operation on Account of SCED

Month, Year

SCED Generator	Decrement due to SCED up to the month (MWhr)	Compensation Amount Payable on account of SCED from National Pool Account (SCED) to SCED Generator **upto the month (Rs)**	Compensation Amount Payable on account of SCED from National Pool Account (SCED) to SCED Generator **for the month (Rs)**	Payable/ Receivable **for the month (Rs)**
ISGS-1				
ISGS-2				
…				
ISTS-13				
Total				

1.8 Details of Intra/ Inter Regional Exchanges through Power Exchanges (COLLECTIVE TRANSCATION DETAILS)

FROM DD/MM/YYYY TO DD/MM/YYYY

(In MWH)

	Indian Energy Exchange				Power Exchange of India				Hindustan Power Exchange Limited			
	Import (Region Peri)	Import(State Peri)	Export(Region Peri)	Export(State Peri)	Import(Region Peri)	Import(State Peri)	Export(Region Peri)	Export(State Peri)	Import(Region Peri)	Import(State Peri)	Export (Region Peri)	Export(State Peri)
DAM												
Total _____ Region												
Through _____ Region												
Inter national												
RTM												
Total _____ Region												
Through _____ Region												
Inter national												
GDAM												
Total _____ Region												
Through _____ Region												
Inter national												
HPDAM												
Total _____ Region												
Through __Region												
Inter national												

1.9 Bilateral Open Access Transactions (GNA/T-GNA/REMC Details) for the month …….

SL No.	Access	Applicant	From State	From Utility	To State	To Utility	IR Link	Approval No.	Schedule (MWh)
1	GNA								
2	GNA								
3									
4	TGNA								
	TGNA								
	…								
	…								
	REMC								
	REMC								

1.10 Certification of DC and Computation of Plant Availability Factor (PAF) and Plant Load Factor (PLF) for IPPs

Up to Month, Year

STATION NAME	State	Contracted Capacity (MW)	Availability up to the Month(kWh)	Plant Availability Factor (PAF)	Plant Load Factor (PLF)
IPP-1					
IPP-2					
…					

For Month, Year

STATION NAME	State	Contracted Capacity (MW)	Availability up to the Month(kWh)	Plant Availability Factor (PAF)	Plant Load Factor (PLF)
IPP-1					
IPP-2					
…					

1.11 Statement of Scheduled Energy for exported electricity by Generation Plants (using fuel except nuclear, gas, domestic linkage coal, mix fuel) for claiming Input Tax Credit

I. Generating Station Name

1. Month in which electricity was exported :
2. Name of Generating Station and Location :
3. Name of Company :
4. GSTIN of Company :
5. Installed Capacity of Generating Station (in MW) :
6. Connection point state and Region :
7. **Details of Scheduled Energy during the month** :

Domestic	
Name of Domestic Entity	**Scheduled Energy in (MU)**
…..	
……	
Power Exchange	
Subtotal Domestic Sale (A)	
Cross Border	
Name of Cross Border Country with Exporting entity	**Scheduled Energy in (MU)**
Subtotal Export (B)	
Total Scheduled Energy of Generating Station (C=A+B)	

Note: As per decision taken in the special meeting held on 01st May'2023 under the chairmanship of Member (Power System), CEA.

11. Availability, Schedule and Un-requisition Surplus Data of CGS (For Information) up to Month, Year

All values in MU. This is only for information. It has no commercial implications.				
STATION NAME (SR-ISGS)	AVAILABILTY	SCHEDULE	SURRENDERAT EX-BUS	SURRENDER AT GENERATOR TERMINAL (SURRENDER AT EX-BUS/(1-NAux))
ISGS-1 (NAux= XX%)				
ISGS-2 (NAux= XX%)				
…				
ISGS-13 (NAux= XX%)				

12. _____ Region High Demand & Low Demand Seasons and the hours of Peak and Off-Peak periods during a day declared by ___RLDC

YEAR (F.Y)	High demand Season	Low Demand Season

Period	Hours of Peak Period (4 Hours) during a day

2. RTA Format:

…….REGIONAL POWER COMMITTEE

2.1 RTA for the billing month ……..

S.No.	Name of DIC	GNA (MW)	GNA waiver (MW)	Net GNA (MW)	Usage based AC system charges (Rs.)	Balance AC system charges (Rs.)	National Component (Rs.)		Regional Component (Rs.)	Transformers component (Rs.)	Total Transmission Charges payable in Rs.
					AC-UBC	AC-BC	NC-RE	NC-HVDC	RC	TC	

2.2 Details of entity-wise bilateral billing

S.No.	DIC	Name of the Assets	Bilateral charges (Rs)	Remarks
	DIC1			
	DIC2			

3. RTDA Format:

…….REGIONAL POWER COMMITTEE

3.1 RTDA for the billing month ……..

SL No.	Gen/State/DIC	Located in State	Deviation due to Over drawl (MW)	Deviation due to Over injection (MW)	Total Deviation (MW)	Transmission Deviation Rate (Rs/MW)	Deviation Charges (in Rs.)
Beneficiaries of Region							
Inter State Generating Stations							
SELLER							
Inter-National							
Generating Station Under INFIRM Stage							
Inter-National							

3.2 Day wise RTDA format

…….REGIONAL POWER COMMITTEE

Day wise RTDA report for the Month …..

SL No.	Gen/State/DIC	Located in State	Deviation due to Over drawl (MW)	Deviation due to Over injection (MW)	Total Deviation (MW)	Transmission Deviation Rate (Rs/MW)	Deviation Charges (in Rs.)
Beneficiaries of Region							
Inter State Generating Stations							

SELLER							
Inter-National							
Generating Station Under INFIRM Stage							
Inter-National							

4. Ramping Accounting Format.

_____REGIONAL POWER COMMITTEE

Ramp Performance of Thermal Power Stations for Month										Month
Number of months in computation (M):										
Station	Total no. of Time Blocks (Tm)	No. of Time Blocks Where Declared Ramp Up & Down rate ≥ 1%(Td)	Td /Tm	No. of time blocks where scheduled ramp ≥ 1%/min (D)	Out of (D), no. of time blocks where actual ramp ≥ scheduled ramp (E)	Out of (D), no. of time blocks where actual ramp ≥ 1%/min (F)	Average actual ramp rate during blocks when scheduled ramp ≥ 1%/min (%/min) (AARR)	E/D	F/D	Recommended change in RoE (%)
Generator 1										
Generator 2										
Generator 3										
Generator 4										

5. SCED Account:

_____REGIONAL POWER COMMITTEE

SCED Settlement Account for the Month _____

SL No.	SCED Generator	Increment due to SCED scheduled to VSCED (MWHr) (A)	Decrement due to SCED scheduled to VSCED (MWHr) (B)	Charges to be paid to SCED Generators from National Pool (SCED) (in Rs) (C)= (A) x V.C.	Charges to be Refunded by SCED Generators to National Pool (SCED) (in Rs) (D)= (B) x V.C.	Net Charges (in Rs)	Payable (+) /Receivable (-)
1							
2							
3							
	Total						

6. Details of Delayed Payments to DSM, Reactive Energy, Congestion & Ancillary Services Pool and Interest Payable for Delayed Payments

SN	Constituent	Week No	Week	Amount Payable (Rs.)	Amount Paid (Rs.)	Difference(Rs.)	Due Date for Payment (7 Days)	Date of Payment	Interest to be paid for Delayed Payments
1									
2									
...									

*****

Regional Energy Account Statement

(Additional formats)

1. Details of Weighted Average Allocation from ISGS for 2023-24

1.1 Weighted Average Allocation - Peak & Off–Peak Hours combined from ISGS for the FY 2023-24 (August-2023)

(In MW terms)

ISGS	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	Total
ISGS-1 (August-2023)														
ISGS-1 Cumulative 2023-24)														
ISGS-2 (August-2023)														
ISGS-2 (Cumulative 2023-24)														
…														
…														

1.2 Weighted Average Allocation High Demand Season- Peak Hours from ISGS for the FY 2023-24 (April, 2023)

(In Percentage Terms)

ISGS	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	Total
ISGS-1 (April-2023)														
ISGS-1 (Cumulative 2023-24)														
ISGS-2 (April-2023)														
ISGS-2 (Cumulative 2023-24)														
…														
…														

(In MW Terms)

ISGS	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	Total
ISGS-1 (April-2023)														
ISGS-1 (Cumulative 2023-24)														
ISGS-2 (April-2023)														
ISGS-2 (Cumulative 2023-24)														
…														
…														

1.3 Weighted Average Allocation High Demand Season- Off Peak Hours from ISGS for the FY 2023-24 (April, 2023)

(In Percentage Terms)

ISGS	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	Total
ISGS-1 (April-2023)														
ISGS-1 (Cumulative 2023-24)														
ISGS-2 (April-2023)														
ISGS-2 (Cumulative 2023-24)														
…														
…														

(In MW Terms)

ISGS	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	Total
ISGS-1 (April-2023)														
ISGS-1 (Cumulative 2023-24)														
ISGS-2 (April-2023)														
ISGS-2 (Cumulative 2023-24)														
…														
…														

1.4 Weighted Average Allocation Low Demand Season- Peak Hours from ISGS for the FY 2023-24 (August, 2023)

(In Percentage Terms)

ISGS	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	Total
ISGS-1 (August-2023)														
ISGS-1 (Cumulative 2023-24)														
ISGS-2 (August-2023)														
ISGS-2 (Cumulative 2023-24)														
…														
…														

(In MW Terms)

ISGS	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	Total
ISGS-1 (August-2023)														
ISGS-1 (Cumulative 2023-24)														
ISGS-2 (August-2023)														
ISGS-2														

(Cumulative 2023-24)														
…														
…														

1.5 Weighted Average Allocation Low Demand Season- Off Peak Hours from ISGS for the FY 2023-24 (August, 2023)

(In Percentage Terms)

ISGS	**Ben-1**	**Ben-2**	**…**	**…**	**…**	**…**	**…**	**…**	**…**	**…**		**…**	**…**	**…**	**Total**
ISGS-1 (August-2023)															
ISGS-1 (Cumulative 2023-24)															
ISGS-2 (August-2023)															
ISGS-2 (Cumulative 2023-24)															
…															
…															

(In MW Terms)

ISGS	**Ben-1**	**Ben-2**	**…**	**…**	**…**	**…**	**…**	**…**	**…**	**…**		**…**	**…**	**…**	**Total**
ISGS-1 (August-2023)															
ISGS-1 (Cumulative 2023-24)															
ISGS-2 (August-2023)															
ISGS-2 (Cumulative 2023-24)															
…															
…															

2. Details of Incentive Energy for Inter State Generating Stations for the FY 2023-24

2.1 Details of Energy Scheduled above Normative PLF from ISGS – Up to April-2023 during Peak Hours

ISGS	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	Total
ISGS-1 (April-2023)														
ISGS-1 (Cumulative 2023-24)														
ISGS-2 (April-2023)														
ISGS-2 (Cumulative 2023-24)														
…														
…														

2.2 Details of Incentive Energy from ISGS – Up to April-2023 during Peak Hours

ISGS	Normative Schedule Energy in KWhr	Schedule Energy in KWhr	Incentive Energy in KWhr
ISGS-1			
ISGS-2			
…			

2.3 Details of Energy Scheduled above Normative PLF from ISGS – Up to April-2023 during Off-Peak Hours

SR-ISGS	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	Total
ISGS-1 (April-2023)														
ISGS-1 (Cumulative 2023-24)														
ISGS-2 (April-2023)														
ISGS-2 (Cumulative 2023-24)														
…														
…														
…														

2.4 Details of Incentive Energy from ISGS – Up to April-2023 during Off-Peak Hours

SR-ISGS	Nor.Schedule Energy in KWhr	Schedule Energy in KWhr	Incentive Energy in KWhr
ISGS-1			
ISGS-2			
…			

Additional formats of Output Data Files related to various Accounts:

SN	Output Data File Name (Name is indicative only)	Output Data File Description	Related Account (s)
1	Commercial_actual	Day-wise, Block-wise Actuals of all DSM Entities	DSM
2	commercial_actual_ananthapuramu_inj	Day-wise, Block-wise Actuals of Ananthapuram Entities	DSM
3	commercial_actual_pavagada_inj	Day-wise, Block-wise Actuals of Pavagada Entities	DSM
4	commercial_dev2022_ENTITY	Day-wise, Block-wise DSM Details of ENTITY;	DSM
5	commercial_dev2022_interregional	Day-wise, Block-wise DSM Details of (SR, WR) & (SR , ER)	DSM
6	commercial_postfacto_ENTITY	Postfacto Details of ENTITY from Eligible Sources	DSM
7	commercial_sch_sras_15minute	Day-wise, Block-wise Schedules of SRAS Providers	AS
8	commercial_sch_rras	Day-wise, Block-wise Schedules of TRAS Generators of SR	AS
9	commercial_reactive_states	Entity-wise, Station-wise, Element-wise, Meter-wise Weekly Reactive Energy Details	Reactive Energy Account
10	commercial_dev2022_ENTITY	Day-wise, Block-wise RTA & RTDA Details of ENTITY	RTA & RTDA
11	commercial_transmission_charges	Day-wise Details of Transmission Charges of all SR DICs	RTA & RTDA
12	commercial_ecr_data	ECR & Compensation Parameters of ISGS Stations	REA
13	commercial_ent_ENTITY	Day-wise, Block-wise Entitlement of ENTITY from all ISGSs	REA
14	commercial_entonbar_ENTITY	Day-wise, Block-wise On-Bar & Off-Bar Entitlement of ENTITY from all ISGSs	REA
15	commercial_gdam_px_iex	Details of G-DAM Transactions done in IEX	REA
16	commercial_gdam_px_pxi	Details of G-DAM Transactions done in PXI	REA
17	commercial_isgs	Day-wise, Block-wise Details of DC & Schedule of all ISGS	REA
18	commercial_modify_dc_sch_isgs	Modiefied Day-wise, Block-wise Details of DC & Schedule of all ISGS	REA
19	commercial_on_off_dc_isgs	Day-wise, Block-wise On-Bar	REA

		& Off-Bar DC of ENTITY from all ISGSs	
20	commercial_outage_data	Outage Details of all ISGSs	REA
21	commercial_pushp_beneficiary	Day-wise, Block-wise Details of allocation inclusive of PUShP Transactions of SR Beneficiaries	REA
22	commercial_px_ENTITY	Day-wise, Block-wise Details of DAM, GDAM, RTM, HPDAM Transactions in Power Exchanges	REA
23	commercial_remc_schedule	Day-wise, Block-wise Details of REMC Schedules involving SR RE Generators/ SR Entities	REA
24	commercial_rnw_schedule	Day-wise, Block-wise Details of RENEWABLE bilateral Schedules involving SR RE Generators/ SR Entities	REA
25	commercial_rtm_px_iex	Day-wise, Block-wise Details of RTM Transactions of SR Entities in IEX	REA
26	commercial_rtm_px_pxi	Day-wise, Block-wise Details of RTM Transactions of SR Entities in PXI	REA
27	commercial_sch_ENTITY	Day-wise, Block-wise Schedules of ENTITY from all Sources	REA
28	commercial_urs_ENTITY	Day-wise, Block-wise Details of URS Power scheduled to ENTITY from ISGSs	REA
29	Commercial_Gen_Parameters	Details of various Parameters of Generators present in the region	REA
30	commercial_sch_sced	Day-wise, Block-wise Schedules of SCED Generators of SR	SCED
31	commercial_sch_sced_acount	Day-wise, Block-wise Amounts from SCED Generators of SR	SCED

*****

Annexure-VI 14th NPC

सत्यमेव जयते

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

विषय: सदस्य (जीओएंडडी) की अध्यक्षता में आरपीसी के लिए एकीकृत लेखा सॉफ्टवेयर के कार्यान्वयन पर चर्चा करने के लिए 20.11.2023 को आयोजित बैठक का कार्यवृत्त के संबंध में।

Subject: Minutes of the Meeting held on 20.11.2023 to discuss the implementation of the Unified Accounting Software for RPCs under the chairmanship of Member (GO&D)-reg.

Minutes of the Meeting held on 20.11.2023 to discuss the implementation of the Unified Accounting Software for RPCs under the chairmanship of Member (GO&D) is enclosed herewith for your kind information and necessary action, please.

भवदीय/Yours faithfully

Encl: As above

01/12/2023

(ऋषिका शरण/Rishika Sharan)
मुख्य अभियन्ता एवं सदस्य सचिव,रा.वि.स /
Chief Engineer & Member Secretary, NPC

MS (ERPC/WRPC/NRPC/SRPC/NERPC), CE (GM), CE (OPM)

No. CEA-GO-15-14/1/2021-NPC Division 435 Date: 01.12.2023

Copy for kind information to:

1. SA to Chairperson, CEA, New Delhi
2. SA to Member (G&OD), CEA, New Delhi

*****

Minutes of the Meeting held on 20.11.2023 to discuss the implementation of the Unified Accounting Software for RPCs under the chairmanship of Member (GO&D)

The List of Participants is attached at **Annexure-I.**

1. A meeting to discuss the implementation of the Unified Accounting Software for RPCs under the chairmanship of Member (GO&D), CEA was held on 20.11.2023 at Samvad, 6th floor, CEA, Sewa Bhawan in hybrid (Offline and Online) Mode. Member (GO&D) welcomed the Member Secretaries of RPCs. After expressing gratitude to everyone, he requested Member Secretary/Chief Engineer (NPC) to proceed with the meeting.

2. Chief Engineer (NPC) gave a brief presentation attached as **Annexure-II.** She informed that in the 13th meeting of NPC held on 05th July 2023, it was decided that the commercial subgroup of NPC would recommend on the standardization of the formats and software of the commercial accounts. The standard formats and software finalized by the commercial sub-group would be placed in next NPC meeting. Subsequently, a meeting of commercial sub-group of NPC was held on 8 Aug 2023. In this meeting, Commercial accounts to be standardized were identified and it was decided that ERPC would submit draft standard output formats of commercial accounts. Another meeting of the commercial sub-group of NPC was held on 30.10.2023 through video conference wherein the draft standard output formats of commercial accounts prepared by NPC Division, based on the inputs/comments of ERPC and SRPC, was discussed and the Final standard output formats (attached as **Annexure-III**) were circulated to all RPCs.

3. In the meeting, the implementation of the Unified Accounting Software for RPCs were discussed in detail and the following decisions were taken:

   a) ERPC shall be the Nodal RPC for implementation of Unified Accounting Software for RPCs.

   b) A Joint Committee shall be formed by NPC with representatives (Director/Superintending Engineer/ Deputy Director Level) from all RPCs, GM Division, CEA and NPC Division, CEA. Superintending Engineer, ERPC would be the Member Convener of Joint Committee with following Term of Reference:
      i. Hiring of consultant for preparation of DPR
      ii. Identifying the possible source of funding i.e. through PSDF or RPC funds.
      iii. Preparation of NIT and other documents related to tendering.
      iv. Selection of vendor for commercial account software.
      v. Execution of work order and certification of completion of work.
      vi. Recommend on O&M/AMC/Ownership of project.

4. The meeting ended with vote of thanks to the Chair.

*****

Annexure-I

List of Participants:

Central Electricity Authority (CEA)

1. Sh. B. K. Arya, Member (GO&D)
2. Smt. Rishika Sharan, Chief Engineer, NPC
3. Sh. B. Lyngkhoi, Chief Engineer, OPM
4. Sh. Chandra Prakash, Chief Engineer, GM
5. Sh. Satyendra Kr. Dotan, Director, NPC
6. Sh. Himanshu Lal, Dy. Director, NPC
7. Sh. Nikul Rohin, Asstt. Director, NPC
8. Sh. Dhruv Kawat, Asstt Director, GM
9. Sh. Sakil Ahmad, Asstt. Director, GM

Eastern Regional Power Committee (ERPC)

10. Sh. N.S. Mondal, Member Secretary
11. Sh. S. K. Pradhan. EE

Southern Regional Power Committee (SRPC)

12. Sh. Asit Singh, Member Secretary
13. Sh. NRLK Prasad, SE

North Regional Power Committee (NRPC)

14. Sh. V.K. Singh, Member secretary
15. Sh. Praveen, EE

Western Regional Power Committee (WRPC)

16. Sh. P.D. Lone, SE

North-Eastern Regional Power Committee (NERPC)

17. Sh. Abhijeet Agarwal, EE

Annexure-II

Meeting to discuss implementation of the Unified Accounting Software for RPCs under the chairmanship of Member (GO&D), CEA

20-Nov-2023

Background

- 13th NPC meeting held on 5 July 2023 :

It was decided that the commercial subgroup of NPC will finalise the standardization of the formats and software of the commercial accounts and would be placed in next NPC meeting.

Background

➢ **Meetings of commercial subgroup of NPC:**

Meeting held on 8 Aug 2023-Main decisions:

i. Commercial accounts to be standardized were identified.

ii. ERPC will submit draft standard output formats.

ERPC submitted draft formats on 20.09.2023 and the same was circulated for the comments. SRPC vide email dated 04 Oct 2023 has provided comments.

Meeting held on 30 Oct 2023:

NPC Div. presented the draft formats based on ERPC and SRPC inputs. The draft was discussed and tentatively finalised and circulated for further comments. SRPC has provided further comments on final draft which will be suitably incorporated during implementation.

Agenda of the meeting

➢ **Meeting in the O/o Member (GO&D), CEA held on 20.10.2023:**

Member GO&D reviewed the works of standardization of the format and software of the commercial accounts issued by RPCs. After due deliberations, Member (GO&D), CEA has directed to schedule a meeting to discuss the implementation of the Unified Accounting Software for RPCs.

Accordingly, a meeting has been scheduled to discuss the following agenda points:

i. **Scope of work for Unified Accounting Software for RPCs. (DPR preparation, Standardization of Reports and formats etc.)**

ii. **Modalities for implementations of Unified Accounting Software for RPCs.**

iii. **Any other agenda item with the permission of the Chair.**

Proposal:

1. Nomination of nodal RPC for the following:
    a. Hiring of consultant for preparation of DPR
    b. Source of funding-PSDF/RPC fund
    c. Preparation of NIT
2. Selection of vendor for accounting software by nodal RPC
3. Execution of work order and certification of completion of work by Nodal RPC
4. O&M/AMC/Ownership of project by Nodal RPC

THANK YOU

Annexure-III

STANDARDIZATION OF OUTPUT REPORTS OF COMMERCIAL ACCOUNTS ISSUED BY RPCs

As per the decision in the 13th meeting of NPC held on 05th July 2023 and mandate given in Annexure-7: Accounting & Pool Settlement system under CERC IEGC Regulation 2023 and subsequent decision taken in the Sub group meeting held on 08th August 2023, ERPC secretariat has entrusted for preparing a draft standardization of Output format of all commercial accounts published by RPCs for accounting and settlement.

In this regard, ERPC vide email dated 20.09.2023 has provided draft standardization of Output format of all commercial accounts published by RPCs and the same was circulated for the comments. SRPC vide email dated 04 Oct 2023 has given their observation for standardization of output format.

A meeting of the commercial sub-group of NPC was held on 30.10.2023 through video conference to discuss Standardization of output formats of Commercial Accounts issued by RPCs. The standardised output formats of the commercial accounts have been modified based on deliberations in the meeting and circulated to all RPCs for comments. The comments/inputs dated 8.11.2023 was received from SRPC and the same has been suitably incorporated.

After consideration of comments of SRPC and visiting the accounts published by RPCs, the standardization of Output format of all commercial accounts published by RPCs has been prepared by NPC Division for uniformity in all commercial account. The same has been given below with the final suggestions:

Basis of Standardization of Output Formats:

1. Regulations of CERC and existing formats of commercial accounts issued by RPCs.
2. Unit of energy, power, INR and Constituent name should be unique and will be applicable for all RPCs output report format uniformly.
3. Final modifications of output format may be done during the development of Unified Accounting Software for all RPCs.

Note:

1. Proper mentioning of Amount (this shall be indicated along with sign (+/-) & Nature of Amount (this shall be indicated a Payable to Pool/ Receivable from Pool).
2. All Amounts shall be shown in Rupee terms.
3. Resolution of Power (in MW) & Energy (in MWH) figures shall be restricted to THREE Decimals in the Main Reports

A. Weekly Accounts

Standard Format of Commercial Accounts

1. DSM Account Format:

1.1 Final Weekly DSM Account

DSM Settlement Account for the week
From DD-MM-YYYY to DD-MM-YYYY

Entity	Total Deviation (MWHr)	Under Drawl Charges/ Over Injection Charges (Rs)	Over Drawl Charges/ Under Injection Charges (Rs)	Post-facto Charges/ Charges for Drawl without Schedule (Rs)	Final Charges (Rs)	Payable To Pool ("-")/ Receivable From Pool ("+")
States/UT/Drawee Entities						
Ent-1						
Ent-2						
....						
CGS						
CGS-1						
CGS-2						
...						
General Sellers						
GS-1						
GS-2						
...						
WS-Seller						
Solar Entity						
SE-1						
SE-2						
...						
Wind Entity						
WE-1						
WE-2						
...						
Inter- regional						

Inter- National						
Infirm generators						

(All Figs. in Rs.)

Payable To The Pool (A) :	
Receivable From The Pool (B) :	
__ Deviation (A-B) :	

1.2 Day-wise Report Format:

(All Figs. in Rs.)

Date	Total Scheduled (MWH)	Total Actual (MWH)	Deviation (MWH)	Final Charges (Rs)	Payable To Pool ("-")/ Receivable From Pool ("+")
States/UT/Drawee Entities					
Day-1					
Day-2					
Day-3					
Day-4					
Day-5					
Day-6					
Day-7					
Weekly Total					
CGS					
Day-1					
Day-2					
Day-3					

Day-4					
Day-5					
Day-6					
Day-7					
Weekly Total					
General Sellers					
Day-1					
Day-2					
Day-3					
Day-4					
Day-5					
Day-6					
Day-7					
Weekly Total					
WS-Seller					
Solar Entity					
Day-1					
Day-2					
Day-3					
Day-4					
Day-5					
Day-6					
Day-7					
Weekly Total					
Wind Entity					
Day-1					
Day-2					
Day-3					
Day-4					
Day-5					
Day-6					
Day-7					
Weekly Total					
Inter- regional					
Day-1					
Day-2					

Day-3					
Day-4					
Day-5					
Day-6					
Day-7					
Weekly Total					
Inter National					
Day-1					
Day-2					
Day-3					
Day-4					
Day-5					
Day-6					
Day-7					
Weekly Total					
Infirm Generator					
Day-1					
Day-2					
Day-3					
Day-4					
Day-5					
Day-6					
Day-7					
Weekly Total					

Note: Energy unit in MWH and upto 3 decimal.

2. Ancillary Service Account:

2.1 SRAS Settlement Account for the week from dd-mm-yyyy to dd-mm-yyyy

Payments to the SRAS Provider(s) from the DSM pool

Sr. No.	SRAS Provider	UP Regulation due to SRAS (MWh)	Down Regulation due to SRAS (MWh)	Net Energy (MWh)	Energy Charges/ Compensation Charges (Rs.)	Incentive Charges (Rs.)	Total Charges (Rs.)	Payable to the pool/Receivable from the pool

Total								

Notes :

1. Energy unit in MWH and upto 3 decimal.
2. Energy Charges/Compensation Charges for SRAS provider has been calculated as per the rate furnished by the respective SRAS providers in Format AS and the same published in RPC website.
3. The Incentive has been calculated based on actual performance of SRAS providers.

2.2 SRAS Actual Performance Statement by __RPC
from dd-mm-yyyy to dd-mm-yyyy

Sr. No.	SRAS Provider	dd-mm-yyyy	dd-mm-yyyy	dd-mm-yyyy	…	dd-mm-yyyy	dd-mm-yyyy	Remarks (Disqualification period)
		Actual Performance(%)	Actual Performance(%)	Actual Performance(%)	…	Actual Performance(%)	Actual Performance(%)	
					…			
					…			
					…			

2.3 TRAS Account:

TRAS Settlement Account for the week from dd-mm-yyyy to dd-mm-yyyy
(Short Fall/Emergency)

Net Charges Payable/Receivable by the TRAS Provider(s) to/from the Regional Deviation and Ancillary Service Pool Account in Shortfall/Emergency Condition

SL No.	TRAS Provider	Energy scheduled under shortfall/ Emergency TRAS-Up (MWH) (A)	Total Charges /Compensation Charges for Shortfall/Emergency TRAS-Up (Rs) (B)	Energy scheduled under Shortfall/Emergency TRAS-Down (MWh) (C)	Total Charges / Compensation Charges for Shortfall/Emergency TRAS-Down to be paid back to Pool (Rs) (D)	Net Charges (Rs) (E)=(B)-(D)	Payable from Pool to TRAS Provider/ Receivable by Pool from TRAS Provider

Notes:

A) TRAS settlement account for the week dd-mm-yyyy to dd-mm-yyyy has been prepared as per the detailed procedure for Tertiary Reserve Ancillary Services (TRAS) approved by CERC.

B) Total Charges for TRAS providers have been calculated as per the rates furnished by the respective TRAS providers and the same published in ___RPC website.

2.4 TRAS Settlement Account by RPC (Day Ahead and Real Time Market)

TRAS Account for Week from dd-mm-yyyy to dd-mm-yyyy.

Net Charges Payable/Receivable by the TRAS Provider(s) to/from the Regional Deviation and Ancillary Service Pool Account

S. No	**TRAS Provider Name**	**TRAS-Up in Day Ahead AS Market**				**TRAS-Up Energy in Real Time AS Market**				**Total Charges/ compensation charge for TRAS Up (Rs) (I)=(C)+(D)+ (G)+(H) (11)**
(1)	**(2)**	TRAS Up Cleared (MWh) (A) **(3)**	TRAS-Up Energy Scheduled (MWh) (B) **(4)**	TRAS Up Energy Charges (Rs.) (C) **(5)**	TRAS-Up Commitment Charges (Rs.) (D) **(6)**	TRAS Up Cleared (MWh) (E) **(7)**	TRAS-Up Energy Scheduled (MWh) (F) **(8)**	TRASUp Energy Charges (Rs) (G) **(9)**	TRAS-Up Commitment Charges (Rs) (H) **(10)**	
1										
2										
3										

TRAS-Down in Day Ahead AS Market		TRAS-Down in Real Time AS Market		Net Charges (Rs) (N)=(I)-(K)- (M) **(15)**	Payable from Pool to TRAS Provider/Receivable by Pool from TRAS Provider
TRASDown Energy Scheduled (MWh) (J) **(12)**	TRASDown Charges to be paid back to Pool (Rs) (K) **(13)**	TRASDown Energy Scheduled (MWh) (L) **(14)**	TRASDown Charges to be paid back to Pool (Rs) (M) **(15)**		
1					
2					

3. Reactive Energy Account Format:

3.1 Weekly Reactive Energy Account format after final Adjustment:

Regional Entity Name	MVArh_H	MVArh_L	Net Amount (Rs.)	Payable to Pool (-)/ Receivable from Pool (+)
States/UTs/ Drawee Utilities				
CGS				
General Sellers				
WS Seller (Solar Entity)				
WS Seller (Wind Entity)				
WS Seller (Others)				

(All Figs. in Rs.)

Payable To The Pool :	
Receivable From The Pool :	

3.2 Meter-wise Reactive Energy Details

Regional Entity Name	Station Name	Element Name	Meter No	MVArh_H	MVArh_L
Ent-1					
Ent-2					
…					

3.3 Day wise Format:

Reactive Energy export (-) / import (+) under high & low voltage condition
And Reactive Energy Charges thereof
(Reactive Energy Exchange in MVARH & Charges in Rs.)

Regional Entity Name	ISTS/BBMB/DVC etc.	Drawl Point	Day1 (HV, LV)...	……	Day7(HV, LV)	Total HV	Total LV	Charges HV	Charges LV

B. Monthly Accounts

1. REA Accounts Formats:

_____Regional Power Committee

Regional Energy Account for the Month of _____

1.1 Details of Plant Availability Factor (PAF) for CS Stations

High Demand Season for FY 20__-__

Peak Hours ( )

ISGS	IC (MW)	Auxiliary Consumption	NPAF (%)	PAFM (%)	PAFC (%)	High Demand Season				Low Demand Season			
						Peak Hour		Off-Peak Hour		Peak Hour		Off-Peak Hour	
						PAFM (%)	PAFC (%)	PAFM (%)	PAFC (%)	PAFM (%)	PAFC (%)	PAFM (%)	PAFC (%)
ISGS-1													
ISGS-2													
……													
…….													

1.2 Details of Plant Load Factor (PLF) for CS Stations

High Demand Season for FY 20__-__

Peak Hours ( )

ISGS	IC (MW)	Auxiliary Consumption	NPLF (%)	PLFM (%)	PLFC (%)	High Demand Season				Low Demand Season			
						Peak Hour		Off-Peak Hour		Peak Hour		Off-Peak Hour	
						PLFM (%)	PLFC (%)	PLFM (%)	PLFC (%)	PLFM (%)	PLFC (%)	PLFM (%)	PLFC (%)
ISGS-1													
ISGS-1													
……													
…….													

1.3 Details of Misdeclaration of Declared Capability by CS Stations

Entity	Mis Declaration Date	Incident No	No. of days for which FC Deductible

1.4 Weighted Average Percentage Allocation - Peak & Off – Peak Hours combined from ISGS for the FY 20__-__ Month- 20___

ISGS	Ben-1	Ben-2	…	…	…	…	…	Total
ISGS-1 (August-2023)								
ISGS-1 Cumulative2023-24)								
ISGS-2 (August-2023)								
ISGS-2 (Cumulative 2023-24								
…								
…								
ISGS-13 (August-2023)								
ISGS-13 (Cumulative 2023-24								

1.5 Details of Scheduled Energy to the Beneficiaries for Month, Year

1.5.a Energy Scheduled from ISGS to the Beneficiaries for Month, Year

All units in MWH

Entity		Ben-1	Ben-2	…	…	…	…	…	Total
ISGS-1									
ISGS-2									
…									
Hydro Stations	Name of Hydro stations								
	Free Energy of Hydro Stations								
Nuclear Stations									
Solar									
Wind									

Shared Projects								
STOA Export by Goa								

Note: Energy unit in MWH and upto 3 decimal.

1.5.b Energy Scheduled from Renewable ISGS for the Month, Year

All units in MWH

Entity	Total Energy Schedule (MWH)	Total Actual Energy (MWH)	Net Deviation for the purpose of REC (MWH)
SOLAR ENTITY			
S1			
S2			
…			
NON SOLAR ENTITY			
NS1			
NS2			
…			
Total Solar Deviation for the purpose of REC			
Total Non-Solar Deviation for the purpose of REC			

Note: Energy unit in MWH and upto 3 decimal.

1.6 Energy Scheduled above Normative PLF from Inter State Generating Stations for the FY 2023-24

(Incentive Energy)

1.6.a. High Demand Season

Details of Incentive Energy (in MWH) Beyond Target PLF								
		Incentive Energy Peak Period				**Incentive Energy Off Peak Period**		
Station Name	**State Name**	**Incentive Energy upto Last Month (A)**	**Incentive Energy upto Current Month (B)**	**Incentive Energy for the Month (C)=(B)-(A)**		**Incentive Energy upto Last Month (D)**	**Incentive Energy upto Current Month (E)**	**Incentive Energy for the Month (F)=(E)-(D)**
Station-1								

	Total							
Station-2								
	Total							
Station-N								
	Total							

1.6. b. Low Demand Season

Details of Incentive Energy (in MWH) Beyond Target PLF								
		Incentive Energy Peak Period				**Incentive Energy Off Peak Period**		
Station Name	**State Name**	**Incentive Energy upto Last Month (A)**	**Incentive Energy upto Current Month (B)**	**Incentive Energy for the Month (C)=(B)-(A)**		**Incentive Energy upto Last Month (D)**	**Incentive Energy upto Current Month (E)**	**Incentive Energy for the Month (F)=(E)-(D)**
Station-1								
	Total							
Station-2								
	Total							
Station-N								
	Total							

1.7. Compensation for Degradation of Heat Rate (SHR) and Auxiliary Energy Consumption (AEC)

As per Detailed Operating Procedure on Reserve Shutdown and Compensation Mechanism issued on 05-05-2017 by Hon'ble CERC.

From Date: dd-mm-yyyy, To Date: dd-mm-yyyy

1.7 a Information used for ECR calculation

Entity (SR-ISGS)	Installed capacity MCR (MW)	Normative SHR or Net SHR (kCal/kWh)	Normative SFC (ml/kWh)	CVSF (kCal/ml)	LPPF (Rs./MT)	LPSFi (Rs./KL)	Normative LC (kg/kWh)	LPL (Rs./kg)	Normative Aux. Cons (%)	CVPF (kCal/kg)	Actual GHR / SHR (kCal/kWh)	Actual SFC (ml/kWh)	Actual LC (kg/kWh)	Actual Aux. Cons (%)
ISGS-1														
ISGS-2														
...														
ISGS-13														

1.7 b Outage Data details for Stations for the Month, Year

Entity	Unit No.	Installed Capacity	Start-Date time	End Date time	Type of Outage
ISGS-X					
ISGS-X					
...					
Note: Outage Duration has been calculated from 01-04-2023 at 00:00 hrs.					

1.7 c Compensation Calculated for each ISGS Stations up to Month , Year

Energy charge rate (ECR) in Rupees per kWh on ex-power plant basis is determined to three decimal places.

ENTITY (SR-ISGS)	Average Unit Loading (%)	Total schedule (MWH)	ECR (Norm) (Rs/kWh)	ECR (Actual) (Rs/kWh)	ECR (SE) (Rs/kWh)	ECR (DC) (Rs/kWh)	EC (Norm) (Rs)	EC (Actual) (Rs)	EC (SE) (Rs)	EC (DC) (Rs)	EC (A)- EC (N) (Rs)	Comp (P) (Rs)	**Comp (F) (Rs)**
ISGS-1													
ISGS-2													
...													
ISGS-13													
TOTAL													

1.7 d Details of Entitlement and Schedule of Beneficiaries and SCED from ISGS

SR-ISGS	Ben-1		Ben-2		...		Ben-15		SCED	
	Ent (MW)	Sch (MW)	Ent (MW)	Sch (MW)	Ent (MW)	Sch (MW)	Ent (MW)	Sch (MW)	Ent (MW)	Sch (MW)
ISGS-1										
ISGS-2										

…										
ISGS-13										

1.7 e Proportion of (Un-requisitioned Energy of beneficiaries when Schedule is below 85% of its entitlement from ISGS) and (SCED)

Rounded off values are shown in the table below; however, actual values are considered for computation of compensation payable by beneficiary.

SR-ISGS (NTPC)	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	…	Ben15	SECD	Total
ISGS-1																	
ISGS-2																	
…																	
ISGS-13																	

1.7 f Compensation Amount payable by Beneficiary

SR-ISGS (NTPC)	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	…	Ben15	SECD	Total
ISGS-1																	
ISGS-2																	
…																	
ISGS-13																	
Total for each Beneficiary																	

1.7 g Statement of Compensation due to Part Load Operation on Account of SCED

Month, Year

SCED Generator	Decrement due to SCED up to the month (MWhr)	Compensation Amount Payable on account of SCED from National Pool Account (SCED) to SCED Generator **upto the month (Rs)**	Compensation Amount Payable on account of SCED from National Pool Account (SCED) to SCED Generator **for the month (Rs)**	Payable/ Receivable **for the month (Rs)**
ISGS-1				
ISGS-2				
…				
ISTS-13				
Total				

1.8 Details of Intra/ Inter Regional Exchanges through Power Exchanges (COLLECTIVE TRANSCATION DETAILS)

FROM DD/MM/YYYY TO DD/MM/YYYY

(In MWH)

	Indian Energy Exchange				Power Exchange of India				Hindustan Power Exchange Limited			
	Import (Region Peri)	Import(State Peri)	Export(Region Peri)	Export(State Peri)	Import(Region Peri)	Import(State Peri)	Export(Region Peri)	Export(State Peri)	Import(Region Peri)	Import(State Peri)	Export (Region Peri)	Export(State Peri)
DAM												
Total _____ Region												
Through _____ Region												
Inter national												
RTM												
Total _____ Region												
Through _____ Region												
Inter national												
GDAM												
Total _____ Region												
Through _____ Region												
Inter national												
HPDAM												
Total _____ Region												
Through __Region												
Inter national												

1.9 Bilateral Open Access Transactions (GNA/T-GNA/REMC Details) for the month …….

SL No.	Access	Applicant	From State	From Utility	To State	To Utility	IR Link	Approval No.	Schedule (MWh)
1	GNA								
2	GNA								
3									
4	TGNA								
	TGNA								
	…								
	…								
	REMC								
	REMC								

1.10 Certification of DC and Computation of Plant Availability Factor (PAF) and Plant Load Factor (PLF) for IPPs

Up to Month, Year

STATION NAME	State	Contracted Capacity (MW)	Availability up to the Month(kWh)	Plant Availability Factor (PAF)	Plant Load Factor (PLF)
IPP-1					
IPP-2					
…					

For Month, Year

STATION NAME	State	Contracted Capacity (MW)	Availability up to the Month(kWh)	Plant Availability Factor (PAF)	Plant Load Factor (PLF)
IPP-1					
IPP-2					
…					

1.11 Statement of Scheduled Energy for exported electricity by Generation Plants (using fuel except nuclear, gas, domestic linkage coal, mix fuel) for claiming Input Tax Credit

I. Generating Station Name

1. Month in which electricity was exported :
2. Name of Generating Station and Location :
3. Name of Company :
4. GSTIN of Company :
5. Installed Capacity of Generating Station (in MW) :
6. Connection point state and Region :
7. **Details of Scheduled Energy during the month** :

Domestic	
Name of Domestic Entity	**Scheduled Energy in (MU)**
…..	
……	
Power Exchange	
Subtotal Domestic Sale (A)	
Cross Border	
Name of Cross Border Country with Exporting entity	**Scheduled Energy in (MU)**
Subtotal Export (B)	
Total Scheduled Energy of Generating Station (C=A+B)	

Note: As per decision taken in the special meeting held on 01st May'2023 under the chairmanship of Member (Power System), CEA.

11. Availability, Schedule and Un-requisition Surplus Data of CGS (For Information) up to Month, Year

All values in MU. This is only for information. It has no commercial implications.				
STATION NAME (SR-ISGS)	AVAILABILTY	SCHEDULE	SURRENDERAT EX-BUS	SURRENDER AT GENERATOR TERMINAL (SURRENDER AT EX-BUS/(1-NAux))
ISGS-1 (NAux= XX%)				
ISGS-2 (NAux= XX%)				
…				
ISGS-13 (NAux= XX%)				

12. _____ Region High Demand & Low Demand Seasons and the hours of Peak and Off-Peak periods during a day declared by ___RLDC

YEAR (F.Y)	High demand Season	Low Demand Season

Period	Hours of Peak Period (4 Hours) during a day

2. RTA Format:

…….REGIONAL POWER COMMITTEE

2.1 RTA for the billing month ……..

S.No.	Name of DIC	GNA (MW)	GNA waiver (MW)	Net GNA (MW)	Usage based AC system charges (Rs.)	Balance AC system charges (Rs.)	National Component (Rs.)		Regional Component (Rs.)	Transformers component (Rs.)	Total Transmission Charges payable in Rs.
					AC-UBC	AC-BC	NC-RE	NC-HVDC	RC	TC	

2.2 Details of entity-wise bilateral billing

S.No.	DIC	Name of the Assets	Bilateral charges (Rs)	Remarks
	DIC1			
	DIC2			

3. RTDA Format:

…….REGIONAL POWER COMMITTEE

3.1 RTDA for the billing month ……..

SL No.	Gen/State/DIC	Located in State	Deviation due to Over drawl (MW)	Deviation due to Over injection (MW)	Total Deviation (MW)	Transmission Deviation Rate (Rs/MW)	Deviation Charges (in Rs.)
Beneficiaries of Region							
Inter State Generating Stations							
SELLER							
Inter-National							
Generating Station Under INFIRM Stage							
Inter-National							

3.2 Day wise RTDA format

…….REGIONAL POWER COMMITTEE

Day wise RTDA report for the Month …..

SL No.	Gen/State/DIC	Located in State	Deviation due to Over drawl (MW)	Deviation due to Over injection (MW)	Total Deviation (MW)	Transmission Deviation Rate (Rs/MW)	Deviation Charges (in Rs.)
Beneficiaries of Region							
Inter State Generating Stations							

SELLER							
Inter-National							
Generating Station Under INFIRM Stage							
Inter-National							

4. Ramping Accounting Format.

_____REGIONAL POWER COMMITTEE

Ramp Performance of Thermal Power Stations for Month										Month
Number of months in computation (M):										
Station	Total no. of Time Blocks (Tm)	No. of Time Blocks Where Declared Ramp Up & Down rate ≥ 1%(Td)	Td /Tm	No. of time blocks where scheduled ramp ≥ 1%/min (D)	Out of (D), no. of time blocks where actual ramp ≥ scheduled ramp (E)	Out of (D), no. of time blocks where actual ramp ≥ 1%/min (F)	Average actual ramp rate during blocks when scheduled ramp ≥ 1%/min (%/min) (AARR)	E/D	F/D	Recommended change in RoE (%)
Generator 1										
Generator 2										
Generator 3										
Generator 4										

5. SCED Account:

_____REGIONAL POWER COMMITTEE

SCED Settlement Account for the Month _____

SL No.	SCED Generator	Increment due to SCED scheduled to VSCED (MWHr) (A)	Decrement due to SCED scheduled to VSCED (MWHr) (B)	Charges to be paid to SCED Generators from National Pool (SCED) (in Rs) (C)= (A) x V.C.	Charges to be Refunded by SCED Generators to National Pool (SCED) (in Rs) (D)= (B) x V.C.	Net Charges (in Rs)	Payable (+) /Receivable (-)
1							
2							
3							
	Total						

6. Details of Delayed Payments to DSM, Reactive Energy, Congestion & Ancillary Services Pool and Interest Payable for Delayed Payments

SN	Constituent	Week No	Week	Amount Payable (Rs.)	Amount Paid (Rs.)	Difference(Rs.)	Due Date for Payment (7 Days)	Date of Payment	Interest to be paid for Delayed Payments
1									
2									
...									

*****

Regional Energy Account Statement

(Additional formats)

1. Details of Weighted Average Allocation from ISGS for 2023-24

1.1 Weighted Average Allocation - Peak & Off–Peak Hours combined from ISGS for the FY 2023-24 (August-2023)

(In MW terms)

ISGS	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	Total
ISGS-1 (August-2023)														
ISGS-1 Cumulative 2023-24)														
ISGS-2 (August-2023)														
ISGS-2 (Cumulative 2023-24)														
…														
…														

1.2 Weighted Average Allocation High Demand Season- Peak Hours from ISGS for the FY 2023-24 (April, 2023)

(In Percentage Terms)

ISGS	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	Total
ISGS-1 (April-2023)														
ISGS-1 (Cumulative 2023-24)														
ISGS-2 (April-2023)														
ISGS-2 (Cumulative 2023-24)														
…														
…														

(In MW Terms)

ISGS	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	Total
ISGS-1 (April-2023)														
ISGS-1 (Cumulative 2023-24)														
ISGS-2 (April-2023)														
ISGS-2 (Cumulative 2023-24)														
…														
…														

1.3 Weighted Average Allocation High Demand Season- Off Peak Hours from ISGS for the FY 2023-24 (April, 2023)

(In Percentage Terms)

ISGS	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	Total
ISGS-1 (April-2023)														
ISGS-1 (Cumulative 2023-24)														
ISGS-2 (April-2023)														
ISGS-2 (Cumulative 2023-24)														
…														
…														

(In MW Terms)

ISGS	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	Total
ISGS-1 (April-2023)														
ISGS-1 (Cumulative 2023-24)														
ISGS-2 (April-2023)														
ISGS-2 (Cumulative 2023-24)														
…														
…														

1.4 Weighted Average Allocation Low Demand Season- Peak Hours from ISGS for the FY 2023-24 (August, 2023)

(In Percentage Terms)

ISGS	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	Total
ISGS-1 (August-2023)														
ISGS-1 (Cumulative 2023-24)														
ISGS-2 (August-2023)														
ISGS-2 (Cumulative 2023-24)														
…														
…														

(In MW Terms)

ISGS	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	Total
ISGS-1 (August-2023)														
ISGS-1 (Cumulative 2023-24)														
ISGS-2 (August-2023)														
ISGS-2														

(Cumulative 2023-24)														
…														
…														

1.5 Weighted Average Allocation Low Demand Season- Off Peak Hours from ISGS for the FY 2023-24 (August, 2023)

(In Percentage Terms)

ISGS	**Ben-1**	**Ben-2**	**…**	**…**	**…**	**…**	**…**	**…**	**…**	**…**		**…**	**…**	**…**	**Total**
ISGS-1 (August-2023)															
ISGS-1 (Cumulative 2023-24)															
ISGS-2 (August-2023)															
ISGS-2 (Cumulative 2023-24)															
…															
…															

(In MW Terms)

ISGS	**Ben-1**	**Ben-2**	**…**	**…**	**…**	**…**	**…**	**…**	**…**	**…**		**…**	**…**	**…**	**Total**
ISGS-1 (August-2023)															
ISGS-1 (Cumulative 2023-24)															
ISGS-2 (August-2023)															
ISGS-2 (Cumulative 2023-24)															
…															
…															

2. Details of Incentive Energy for Inter State Generating Stations for the FY 2023-24

2.1 Details of Energy Scheduled above Normative PLF from ISGS – Up to April-2023 during Peak Hours

ISGS	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	Total
ISGS-1 (April-2023)														
ISGS-1 (Cumulative 2023-24)														
ISGS-2 (April-2023)														
ISGS-2 (Cumulative 2023-24)														
…														
…														

2.2 Details of Incentive Energy from ISGS – Up to April-2023 during Peak Hours

ISGS	Normative Schedule Energy in KWhr	Schedule Energy in KWhr	Incentive Energy in KWhr
ISGS-1			
ISGS-2			
…			

2.3 Details of Energy Scheduled above Normative PLF from ISGS – Up to April-2023 during Off-Peak Hours

SR-ISGS	Ben-1	Ben-2	…	…	…	…	…	…	…	…	…	…	…	Total
ISGS-1 (April-2023)														
ISGS-1 (Cumulative 2023-24)														
ISGS-2 (April-2023)														
ISGS-2 (Cumulative 2023-24)														
…														
…														
…														

2.4 Details of Incentive Energy from ISGS – Up to April-2023 during Off-Peak Hours

SR-ISGS	Nor.Schedule Energy in KWhr	Schedule Energy in KWhr	Incentive Energy in KWhr
ISGS-1			
ISGS-2			
…			

Additional formats of Output Data Files related to various Accounts:

SN	Output Data File Name (Name is indicative only)	Output Data File Description	Related Account (s)
1	Commercial_actual	Day-wise, Block-wise Actuals of all DSM Entities	DSM
2	commercial_actual_ananthapuramu_inj	Day-wise, Block-wise Actuals of Ananthapuram Entities	DSM
3	commercial_actual_pavagada_inj	Day-wise, Block-wise Actuals of Pavagada Entities	DSM
4	commercial_dev2022_ENTITY	Day-wise, Block-wise DSM Details of ENTITY;	DSM
5	commercial_dev2022_interregional	Day-wise, Block-wise DSM Details of (SR, WR) & (SR , ER)	DSM
6	commercial_postfacto_ENTITY	Postfacto Details of ENTITY from Eligible Sources	DSM
7	commercial_sch_sras_15minute	Day-wise, Block-wise Schedules of SRAS Providers	AS
8	commercial_sch_rras	Day-wise, Block-wise Schedules of TRAS Generators of SR	AS
9	commercial_reactive_states	Entity-wise, Station-wise, Element-wise, Meter-wise Weekly Reactive Energy Details	Reactive Energy Account
10	commercial_dev2022_ENTITY	Day-wise, Block-wise RTA & RTDA Details of ENTITY	RTA & RTDA
11	commercial_transmission_charges	Day-wise Details of Transmission Charges of all SR DICs	RTA & RTDA
12	commercial_ecr_data	ECR & Compensation Parameters of ISGS Stations	REA
13	commercial_ent_ENTITY	Day-wise, Block-wise Entitlement of ENTITY from all ISGSs	REA
14	commercial_entonbar_ENTITY	Day-wise, Block-wise On-Bar & Off-Bar Entitlement of ENTITY from all ISGSs	REA
15	commercial_gdam_px_iex	Details of G-DAM Transactions done in IEX	REA
16	commercial_gdam_px_pxi	Details of G-DAM Transactions done in PXI	REA
17	commercial_isgs	Day-wise, Block-wise Details of DC & Schedule of all ISGS	REA
18	commercial_modify_dc_sch_isgs	Modiefied Day-wise, Block-wise Details of DC & Schedule of all ISGS	REA
19	commercial_on_off_dc_isgs	Day-wise, Block-wise On-Bar	REA

		& Off-Bar DC of ENTITY from all ISGSs	
20	commercial_outage_data	Outage Details of all ISGSs	REA
21	commercial_pushp_beneficiary	Day-wise, Block-wise Details of allocation inclusive of PUShP Transactions of SR Beneficiaries	REA
22	commercial_px_ENTITY	Day-wise, Block-wise Details of DAM, GDAM, RTM, HPDAM Transactions in Power Exchanges	REA
23	commercial_remc_schedule	Day-wise, Block-wise Details of REMC Schedules involving SR RE Generators/ SR Entities	REA
24	commercial_rnw_schedule	Day-wise, Block-wise Details of RENEWABLE bilateral Schedules involving SR RE Generators/ SR Entities	REA
25	commercial_rtm_px_iex	Day-wise, Block-wise Details of RTM Transactions of SR Entities in IEX	REA
26	commercial_rtm_px_pxi	Day-wise, Block-wise Details of RTM Transactions of SR Entities in PXI	REA
27	commercial_sch_ENTITY	Day-wise, Block-wise Schedules of ENTITY from all Sources	REA
28	commercial_urs_ENTITY	Day-wise, Block-wise Details of URS Power scheduled to ENTITY from ISGSs	REA
29	Commercial_Gen_Parameters	Details of various Parameters of Generators present in the region	REA
30	commercial_sch_sced	Day-wise, Block-wise Schedules of SCED Generators of SR	SCED
31	commercial_sch_sced_acount	Day-wise, Block-wise Amounts from SCED Generators of SR	SCED

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Annexure-VII 14th NPC

No.A-60016/24/2012-Adm.I
Government of India
Ministry of Power
******

New Delhi, dated 30th November, 2016.

To
The Chairperson,
Central Electricity Authority,
Sewa Bhawan, R.K. Puram,
New Delhi.

(Kind attn.: Shri B.C. Mallick, Chief Engineer (NPC Division))

Sub:- Establishment of National Power Committee (NPC) – amendment in Composition of NPC – reg

Sir,

I am directed to refer to CEA's letter No.4/MTGS/NPC/CEA/2016/517 dated 01/06/2016 on the subject mentioned above and to say that the matter regarding inclusion of CEO, POSOCO as Member, NPC and replacement of CE(GMD) by CE(NPC) as Member Secretary, NPC has been considered in the Ministry and it has been observed that for this purpose *the NPC (Conduct of Business) Rules, 2011 will require to be changed. Therefore, considering the changing scenarios, the functions of NPC may also be broadened including the functions of maintaining the National Energy Account involving the inter-national and inter-regional transmission transactions."*

2. It is, therefore, requested that the comments of CEA in this regard may be furnished and a draft proposal may be submitted to this Ministry by 05/12/2016.

Yours faithfully,

(Satinder Kaur)
Under Secretary to the Government of India
Tele: 23715327.

Dir (NPC)
Please prepare a draft proposal as discussed
Mallick 1/12/2016

भारत सरकार
विद्युत मंत्रालय
केंद्रीय विद्युत प्राधिकरण
राष्ट्रीय विद्युत समिति
कटवारिया सराय, नई दिल्ली - 110016
वैबसाइट / Website: www.cea.nic.in

[ISO 9001:2008]

No. 4/MTGS/NPC/CEA/2016/ 216

Dated 05th December 2016

To,
The Joint Secretary (Trans),
Ministry of Power
New Delhi

Subject: **Establishment of NPC - amendment in Composition of NPC- Reg.**

Ref : 1.MoP order No.A-60016/24/2012-Adm-I dated 25.03.2013
2.CEA letter No.4/MTGS/NPC/CEA/2016/191 dated 19.01.2016
3.CEA letter No.4/MTGS/NPC/CEA/2016/63 dated 19.02.2016
4.MoP letter No. A-60016/24/2012-Adm-I dated 29.03.2016
4.CEA letter No. 4/MTGS/NPC/CEA/2016/ 517 dated 01.06.2016
5.CEA letter No. 4/MTGS/NPC/CEA/2016/ 154 dated 20.09.2016

Madam / Sir,

With reference to the MoP letter No.A-60016/24/2012-Adm.I dated 30th November 2016 (copy enclosed) on the subject addressed to Chairperson, CEA, the following are submitted for kind consideration:

Preparation and issuance of National Energy Account (NEA) for inter-regional and inter-national energy transactions by NPC Secretariat may be included as one of the functions of NPC Secretariat. Further, preparation of weekly National Deviations Settlement Mechanism Account (NDSM) and Reactive Energy Account (if required) as a part of NEA, may also be considered as one of the functions of NPC Secretariat. However, Regulations by CERC, based on which energy accounting is being done, at present do not mention about NEA and NDSM. Therefore, necessary policy guidelines by MoP would also be required to be given to CERC for incorporating necessary changes in the relevant Regulations for National Deviations Settlement Mechanism Account (NDSM) and National Energy Account (NEA).

A draft revised NPC (Conduct of Business) Rules has been prepared incorporating the additional function of NPC. The same is enclosed for needful please.

This issues with the approval of Chairperson, CEA

Encl: As above.

Yours faithfully,

Bmallick

(B.C.Mallick)
Chief Engineer, NPC

Annex to Order No. No. A-60016/24/2012-Adm-I dated ----------

National Power Committee
Conduct of Business Rules

CHAPTER I

GENERAL

1. Short title and commencement:

These rules shall come into force from the date of its formation i.e. 26-09-2011 and shall remain in force unless otherwise modified.

2. Definitions:

2.1 In these Rules unless the context otherwise requires: -

(a) 'Agenda' means the list of business proposed to be transacted at a meeting of the Committee.
(b) 'Committee' means the National Power Committee
(c) 'Meeting' means a meeting of the Committee convened by Member Secretary after consultation with Chairperson, NPC.
(d) 'Member' means the member of the NPC
(e) 'Rule' means National Power Committee (Conduct of Business) Rules, 2011.

3. Composition of NPC:

1. Chairperson, CEA – Chairperson, NPC
2. Chairperson, NRPC
3. Chairperson, WRPC
4. Chairperson, SRPC
5. Chairperson, ERPC
6. Representative of Chairperson, NERPC
7. Chairperson, TCC of NRPC
8. Chairperson, TCC of WRPC
9. Chairperson, TCC of SRPC
10. Chairperson, TCC of ERPC
11. Chairperson, TCC of NERPC
12. Member (GO&D), CEA
13. Member Secretary, NRPC
14. Member Secretary, WRPC
15. Member Secretary, SRPC
16. Member Secretary, ERPC
17. Member Secretary, NERPC
18. **CEO, NLDC, POSOCO**
19. **Chief Engineer, NPC Div., CEA – Member Secretary, NPC**

4. **Functions of NPC**

NPC shall carry out following functions for integrated operation of the power system of the country:

(i) To resolve issue among RPCs

(ii) Discuss and resolve issues referred to NPC requiring consultation among one or more RPCs, concerning inter-alia inter-regional implication or any other issue affecting more than one region or all regions

(iii) Preparation and issuance of National Energy Account (NEA) for inter-regional and inter-national energy transactions by NPC Secretariat.

Decisions taken in the NPC shall be considered concurred by the respective RPCs for implementation.

5. **Secretariat of NPC**

Secretariat of NPC will be provided by CEA and Chief Engineer (NPC Division), CEA will be Member Secretary. Secretariat shall perform the following duties namely:

a) Keep custody of records of proceedings of the Committee meetings.

b) Prepare agenda for the Committee meetings.

c) Prepare minutes of Committee meetings.

d) Take follow-up action on the decision taken in the Committee meetings.

e) Collect from constituent members or other offices or any other party as may be directed by Committee, such information as may be considered useful for the efficient discharge of functions of the Committee and place the information before the Committee.

f) Collection of data from NLDC on weekly basis (Interregional and International scheduled energy and actual energy data)

g) Preparation of Weekly NDSM and Reactive Energy Account (if required)

f) Preparation of monthly NEA

6. **Sub-Committees of NPC**

To deal with matters pertaining to the energy accounting and related issues there shall be a commercial sub-committee with the members drawn from representatives of each RPC Secretariat, RLDCs and NLDC. The commercial sub-committee shall be headed by the Chief Engineer (NPC Div,), CEA. NPC can create other Sub-Committees to deal with matters pertaining to operation and protection issues on national basis.

CHAPTER II
PROCEDURE FOR CONDUCTING NPC MEETINGS

7. Place and date of NPC Meeting

The place and date of the meeting shall be decided by Chairperson, NPC

8. Notice for the Committee Meetings and Agenda

8.1 Notice for the Committee meetings shall be issued by Member Secretary, NPC at least 25 days in advance in consultation with Chairperson, NPC. In case of emergency meetings required to be conducted to carry out urgent business, notice of one week is to be given.

8.2 The Agenda points for the meeting shall be sent to the Member Secretary by the members at least 20 days in advance of the meeting. The Member Secretary, NPC shall finalize the agenda and circulate the same to all its members at least 10 days in advance before the meeting.

8.3 Agenda for Committee meeting shall generally be put up after discussions in RPC.

8.4 Member Secretary, NPC may also put any agenda involving urgent matters/policy issue directly in consultation with Chairperson, NPC.

8.5 Member Secretary, NPC may convene a meeting at short notice on any urgent matter in consultation with Chairperson of the NPC.

9. Effect of Non-receipt of Notice of Meeting by a Member

The non-receipt of notice by any member of NPC shall not invalidate the proceeding of the meeting or any decision taken in the meeting.

10. Cancellation / Re-scheduling of Meeting

If a meeting is required to be cancelled or rescheduled the same shall be intimated to the members at the earliest by telephone / fax/ email.

11. Periodicity of Meetings

The Committee members shall meet at least once in six months. However, the Committee may meet any time to discuss any issue as and when required in consultation with Chairperson, NPC.

12. Quorum of NPC Meeting

11.1 The quorum of the meeting shall be 50% of its members.

11.2 NPC would take decisions based on majority/ general consensus of the strength present.

11.3 Members of NPC and NPC Secretariat shall participate in Committee Meetings. The Special invitees by the Committee may also attend the meeting.

13. Presiding Authority

13.1 The Chairperson, NPC shall preside over the meeting of NPC and conduct the meeting. The Member Secretary, NPC shall assist the Chairperson of NPC in conducting the meeting. If the Chairperson is unable to be present at the meeting for any reason, Member (GO&D) would preside over the meeting.

13.2 In the absence of Member Secretary, NPC, Director (NPC Div.), CEA shall function as Member Secretary to assist Chairperson, NPC.

14. Recording of the Minutes

The minutes of the meeting shall be finalized and circulated to all its members by the Member Secretary, NPC normally within 15 working days from the date of the Committee Meeting.

15. Confirmation of the Minutes

Minutes of the NPC meeting shall be placed in the next meeting for confirmation. However, in case of urgency the minutes may be confirmed by circulation.

16. Funding

Requirement of funds for hosting the meetings of NPC would be met through CEA's budgetary provisions. However, NPC may decide to create a fund for NPC in future for establishment expenses of its Secretariat.

CHAPTER III
MISCELLANEOUS

17. Savings of inherent Power of the NPC

17.1 Nothing in these Rules shall bar the NPC from adopting a procedure that is at variance with provisions of these Rules, if the NPC in view of the special circumstances of a matter or class of matters deem it necessary or expedient to deal with such a matter or class of matters.

17.2 Nothing in these Rules shall expressly or by implication, bar the NPC to deal with any matter or exercise any power for which no Rules have been framed and NPC may deal with such matters, and functions in a manner it thinks fit.

( )
Deputy Secretary

Annexure-VIII 14th NPC

National Power Committee

National Energy Account

Week from ----------to ----------

A. Deviation Settlement Account Statement

DSM Weekly Statement (From DD-MM-YYYY to DD-MM-YYYY)

Inter-regional							
From ↓/ To →	ER	WR	NR	SR	NER	Net Charges (Rs)	Payable To National Pool / ReceivableFrom National Pool
ER	-						
WR		-					
NR			-				
SR				-			
NER					-		
Inter-National							
Bhutan							
Bangladesh							
Nepal							
Dagachu HEP							
Basachu HEP							
…							

DSM Pool Summary	
Total Payable to National Pool	
Total Receivable from National Pool	
Net Total	

B. Settlement through National Pool Account

Region	DSM Surplus (+)/ Deficit (-) (A)	RRAS Charges paid from DSM Pool a/c (B)	RRAS Charges received in DSM Pool a/c (C)	AGC Net Charges paid from DSM Pool a/c (D)	Net Surplus (+)/ Deficit (-) (A-B+C-D)	Inter-Pool transfer required (Yes/No)
ER						
WR						
NR						
SR						
NER						
Total						

Reactive Energy Account Statement

Statement of Reactive Energy Charges

(For The Period from DD-MM-YYYY to DD-MM-YYYY)

1. Reactive Energy Charges with the National Pool (For the Period from DD-MM-YYYY to DD-MM-YYYY]

Regional Entity Name	MVArh_H	MVArh_L	Net Reactive Energy Charges (Rs.)	Payable to Pool (-)/ Receivable from Pool (+)
Inter-National				
IN-1				
IN-2				
…				
Reactive Pool Summary				
Total Payable to National Pool				
Total Receivable from National Pool				
Net Total				

SCED MONTHLY ACCOUNT STATEMENTS

1. National SCED Account Statement - for the month of <u>Month, Year</u>

*** (+) means payable from the 'National Pool Account (SCED)' to SCED Generator / (-) means receivable by 'National Pool Account (SCED)' from SCED Generator**

S.No	SCED Generator	Increment due to SCED scheduled to VSCED (MWHr) (A)	Decrement due to SCED scheduled to VSCED (MWHr) (B)	Charges To be Paid to SCED Generator from National Pool (in Rs) (C=A*VC)	Charges To be Refunded by SCED Generator to National Pool (in Rs) (D=B*VC)	Net Charges(in Rs) (E*= C-D)	Payable from SCED Pool (+)/ Receivable to SCED Pool (+)
	ERPC						
	ISGS1						
	ISGS2						
2	**NERPC**						
	ISGS1						
	ISGS2						
	NRPC						
	ISGS1						
	ISGS2						
	SRPC						
	ISGS1						
	ISGS2						
	WRPC						
	ISGS1						

	ISGS2						
	Total						

2. National Statement of Compensation due to Part Load Operation on Account of SCED for the Month of <u>Month, Year</u>

SCED Generator	**Decrement due to SCED up to themonth (MWhr)**	**Compensation Amount Payable on account of SCED from National Pool Account (SCED) to SCED Generator upto the month (Rs)**	**Compensation Amount Payable on account of SCED from National Pool Account (SCED) to SCED Generator for the month (Rs)**	**Payable to Pool/ Receivable from Pool for the Month (Rs)**
ERPC				
ISGS-1				
……				
NERPC				
ISGS-1				
……..				
NRPC				
ISGS-1				
…….				
SRPC				
ISGS-1				

…….				
WRPC				
ISGS-1				
……				
Total				

3. National net SCED Benefits Distribution Statement- SCED Generator for the Month of ……

Table 1: System Savings

Total Saving for the month (Rs.) (A)	Heat Rate Compensation (Rs.) (B)	Net Saving for the month (Rs.) (C)	SCED UP + DOWN in MWH (E)

Table 2: Share of System Savings for Merchant Generators

Generator	SCED Schedule MWH	Contribution in SCED	Benefit accrued to Generator (Rs.)	Estimated benefit (Rs. per KWH)	Final benefit (Rs.)

Table 3: Share of System Savings for Untied capacity

Generator	SCED Schedule MWH	Contribution in SCED	Benefit accrued to Generator (Rs.)	Estimated benefit (Rs. per KWH)	Final benefit (Rs.)

Table 4: Share of System Savings for tied capacity

System Savings (Rs.)	benefit for Merhant Generator (Rs.)	Benefit to United Portion of generator with part tied capacity (Rs.)	net savings for tied cap (Rs.)	Gen share (50%)	Discoms share (50%)	SCED UP Generators Contribution (Rs.)	SCED DOWN Generators Contribution (Rs.)

Table 4A: Share of System Savings for tied capacity for SCED UP & DOWN

For SCED Up

SCED UP Generators	SCED UP Schedule (MWH)	Contribution %	Generator's Contribution in Share of Saving (Rs.)	Estimated benefit (Rs. per KWH)	Generator Benefit subject to cap of 7 paise /kWh	Final Benefit to Generator (Rs.)	additional benefit for discoms (Rs.)
ISGS1							
ISGS2							
……							

For SCED Down

SCED Down Generators	SCED UP Schedule (MWH)	Contribution %	Generator's Contribution in Share of Saving (Rs.)	Estimated benefit (Rs. per KWH)	Generator Benefit subject to cap of 7 paise /kWh	Final Benefit to Generator (Rs.)	additional benefit for discoms (Rs.)

ISGS1							
ISGS2							
……							

4. National net SCED Benefits Distribution Statement- Beneficiary for the Month of ……..

Sl No	State	REGION	Total schedule Energy(Mwh)	50% Benefit sharing in (Rs)	Additional benefit sharing in (Rs)	Total benefit sharing in (Rs)
1	**State1**	**ER**				
2	**State2**	**ER**				
3	**…….**					
4	**State1**	**NER**				
5	**….**	**NER**				
6	**State1**	**NR**				
7	**….**	**NR**				
8	**State1**	**SR**				
9	**……**	**SR**				
10	**State1**	**WR**				
…..	**……**	**WR**				

Draft Protection Setting Protocol in Western Region

Objective: To provide and maintain effective protection system having reliability, selectivity, speed and sensitivity to isolate faulty section and protect element(s).
Scope: The substations and elements of the system which is under the control area of WRLDC.

1) Protocol 1: Proposer and approver of the settings:

The proposer of the relay setting can either be Local/Field testing Engineers or HQ and the approver for these settings can be HQ and Local/Field testing Engineers respectively. The implementer of the settings should be a different group who shall check the settings. This system is for having a cross check of the settings to be implemented. The relay settings to be adopted shall be as per the guidelines given in the *"Model Setting Calculations for typical IEDs, Line Protection Setting guidelines, Protection System Audit check list, Recommendations for Protection Management sub-Committee on Relay/Protection under Task Force for Power System Analysis under Contingencies" report.*

Roles and Responsibilities: All Utilities connected to ISTS system

2) Protocol 2: Review of settings at site: -

a) Checking and validating of the relay settings of substations in the respective control of the utility, shall be done once in 18 months.
b) Checking and validating of the relay settings of the substation and adjacent stations (where protection has mal operated) during disturbance at that station be done within one month of such disturbance.
c) The details of checking and validation should be noted in testing register and if required, WRPC will seek the entries of log books from the Utility.

Roles and Responsibilities: All utilities of WR

3) Protocol 3: Third Party Protection Audit and self-audit:

a) The Third-Party Protection Audit (TPPA) of the substations connected with ISTS system shall be got carried out by all Utilities, as per the approved SOP of the NPC which was adopted in the 48th WRPC meeting. The same shall be submitted to WRPC.

b) The self-audit of the substations connected with ISTS system shall be carried out by all Utilities, annually and shall be submitted to SLDCs/STUs for State S/Ss (State owned generating substations should be included in self audit) and WRLDC/WRPC/CTU for ISTS S/Ss.

The SOP of the NPC is enclosed at Annexure 1.2

Roles and Responsibilities:

All utilities of WR connected with ISTS system should plan the TPPA of the substations in their control area and submit it to WRPC.

WRPC & WRLDC to monitor the TPPA implementation of ISTS licensees and IPPs substations.

SLDCs/STUs to monitor the TPPA implementation of state-owned substations of GENCOs and TRANSCOs.

4) Protocol 4 : Database

The relay settings should be available at the STU-HQ/CTU for the State Substations/ISTS-substations and the same be forwarded to SLDCs/WRLDC, and WRPC for voltage levels of 400kV & above and ISTS lines (of all kV levels). A database of relay settings of all EHV substation elements of the state system should be maintained at SLDCs & STUs (utilities concerned should also maintain the same). A database of relay settings of all elements of 220 kV and above substations of WR should be maintained at WRPC, WRLDC and CTU.

Roles and Responsibilities:

Implementation of this protocol should be done by All utilities of WR

Relay setting data maintaining responsibility: SLDCs/STU, CTU, WRLDC and WRPC

5) Protocol 5 : New Transmission line Element Integration

a) In case a new transmission line/element is to be synchronized first time, the new element entity should approach respective CTU/STU/concerned utility where it is getting connected, for getting details of line parameter at remote end, and the distance relay's settings and zone timings.

b) The utilities at the remote end should provide the relay settings at their end along with the requisite data for carrying out protection setting of the new transmission line/element, to the entity integrating the new element in the system.

c) The Bus fault levels of the incidental system to the new elements shall be provided by WRLDC/SLDC, as the case may be, to the utility proposing to connect the new element.

d) The new utility shall then arrive at their settings for distance relays zone reach and timings and for that it shall adopt the overall settings of distance relay as per the guidelines approved in *"Model Setting Calculations for typical IEDs, Line Protection Setting guide lines, Protection System Audit check list, Recommendations for Protection Management sub-Committee on Relay/Protection under Task Force for Power System Analysis under Contingencies" report.*

e) The zone reaches and timings shall have to be suitably coordinated with the settings adopted in the remote stations. The settings at the remote S/Ss be modified in line with guidelines provided in *"Model Setting Calculations for typical IEDs, Line Protection Setting guide lines, Protection System Audit check list, Recommendations for Protection Management sub-Committee on Relay/Protection under Task Force for Power System Analysis under Contingencies" report.*

f) The new Utility shall consult with all the remote end Utilities, and the setting revisions shall be agreed by all these Utilities. All the remote end utilities shall

co-operate in the consultation process. The utility willing to integrate its elements in the system shall inform about their plan and proposed settings to WRLDC, WRPC, CTU and remote end utilities well in advance. The agreement of these settings be conveyed to WRLDC/WRPC for getting the new element connected to ISTS. WRLDC based on the above information shall allow integration of new element in the system. The utility willing to integrate its element shall get agreement with all the remote end utilities and convey the agreement (with relevant records) to WRLDC, WRPC and CTU before one month of the planned integration of the element.

g) These settings shall be forwarded to WRLDC/SLDC and with copies to CTU/STU/concerned utility and WRPC.

h) The agreed settings shall be as an interim arrangement which is required to ratified in PCM of WR. The Utility concerned should put up the settings of its system (new element) and remote end settings to WRPC before the next PCM, for getting this approved in PCM of WR.

i) For doubts or disagreement, if any, the matter can be referred to WRPC PCM, after adopting interim settings as above.

Roles and Responsibilities:

(i) New Utility:

- should consult (the consultation process should start at least 2 months before the planned integration date) the settings with the remote end Utilities and get it agreed among themselves.
- Should submit the proposed settings of their end to all the remote end utilities.
- Should get the settings agreed among all the remote end utilities. This shall be treated as interim settings. The agreement shall be conveyed to WRLDC/WRPC for time first time charging at least one month in advance of planned integration date.
- In case of difference of opinion on the setting the utility intending to integrate the new element shall immediately intimate the same to WRPC well in advance(at least one month prior to planned integration date).

- The settings adopted and change in remote end settings along with all the parameters considered for the settings be conveyed to WRPC before the next PCM for including it as agenda point in PCM.

(ii) WRLDC:

- After receipt of agreement of all the remote end Utilities and relevant data (as given under (i) above), WRLDC shall allow integration of the new element in the system.

(iii) WRPC :

- In case of disagreement of the settings, after receipt of such communication from the new entity shall arrange meeting of all the stake holders to resolve the issue.

6) Protocol 6: Network changes

In case of any network changes such as due to Protocol 5 above or otherwise, the existing utilities need to review the reaches and timings for the distance relay. For this the utility whose substation configuration is getting changed due to the network change/ addition, shall indicate to all remote ends and next to remote ends S/Ss, the new configuration of their network along with line lengths, conductor configuration etc. and their existing zone reaches and timings. It is then the responsibility of all the utilities, to apply the reaches (as per the guidelines provided in *"Model Setting Calculations for typical IEDs, Line Protection Setting guidelines, Protection System Audit check list, Recommendations for Protection Management sub-Committee on Relay/Protection under Task Force for Power System Analysis under Contingencies"*. Revise time settings so that it is coordinated for lines from their S/S for the changed configuration. They should also follow the timelines and the procedure as per the Protocol (5). They shall follow the proposer/approver model as per Protocol (1).

Roles and Responsibilities:

(i) Utility/Utilities incidental to the network changes:

- should consult (the consultation process should start at least 2 months before the planned integration date) the settings with the remote end Utilities and get it agreed among themselves.

- Should submit the proposed settings of their end to all the remote end utilities.
- Should get the settings agreed among all the remote end utilities. This shall be treated as interim settings. The agreement shall be conveyed to WRLDC/WRPC for time first time charging at least one month in advance of planned integration date.
- In case of difference of opinion on the setting the utility intending to integrate the new element shall immediately intimate the same to WRPC well in advance (at least one month prior to planned integration date).
- The settings adopted and change in remote end settings along with all the parameters considered for the settings be conveyed to WRPC before the next PCM for including it as agenda point in PCM.

(ii) WRLDC:

- After receipt of agreement of all the remote end Utilities and relevant data (as given under (i) above), WRLDC shall allow change of configurations in the system.

(iii) WRPC:

- In case of disagreement of the settings, after receipt of such communication from the new entity, WRPC shall arrange meeting of all the stake holders to resolve the issue.

7) Protocol 7 :

a) The Protocol 5 & 6, envisages in a detailed manner what data shall be provided and by whom. The responsibility of adopting a setting in line with *"Model Setting Calculations for typical IEDs, Line Protection Setting guide lines, Protection System Audit check list, Recommendations for Protection Management sub-Committee on Relay/Protection under Task Force for Power System Analysis under Contingencies",* rests with the utility, for which the Utility should be provided with the required data. The utility shall accordingly set the relays and convey the settings along with relevant data considered for arriving at the settings be conveyed to WRLDC/WRPC CTU & STU/SLDC. The settings/revision of settings adopted by the Utilities be agreed among

themselves and the settings are only for the interim period (from the time the new element/network changes of the new utility or existing utility, till the next PCM). The final settings will be approved in the PCM.

b) Further if it is not a new utility, then existing STU/SLDC/CTU/WRLDC/utilities are responsible for their jurisdictions. The main purpose is to establish a procedure for coordination of the settings among utilities of WR regarding the protection relay settings.

c) In case of complicated settings changes or disagreement among the Utilities concerned, then a small group of PCM members can meet and decide the interim settings and put up in the next PCM. Once the PCM vets these settings the settings approved in PCM shall be a permanent arrangement.

d) The whole idea is to guide a new utility to adopt the settings as per guidelines provided in *"Model Setting Calculations for typical IEDs, Line Protection Setting guide lines, Protection System Audit check list, Recommendations for Protection Management sub-Committee on Relay/Protection under Task Force for Power System Analysis under Contingencies"* for the flow of information.

8) Protocol 8: Vetting of the settings:

a) All the Utilities whose setting are getting because of integration of new element, changes in network shall be responsible putting up an agenda point to PCM.

b) PCM shall vet the settings and recommend for final setting implementation.

c) Utilities concerned shall submit all the relevant data assumed for arriving the interim setting and final setting.

d) They shall also submit the Raw Relay setting files of interim and final settings immediately after implementation of the same to WRPC and WRLDC for updating the relay setting database of WRPC & WRLDC.

Roles and Responsibilities:

All Utilities concerned.

Annexure-X 14th NPC

Standard Operating Procedure (SOP) on Providing VOIP Connectivity to Utilities' Control Centres with RLDC VOIP Exchange

1.0 Background

A meeting was held under the Chairmanship of Member Secretary (NRPC) on 06.07.2023 among NRPC, CEA, NRLDC/Grid India, CTU, POWERGRID, M/s Indigrid & M/s Sterlite regarding provision of VOIP connectivity to the control centre / coordination centre of Indigrid & Sterlite with NRLDC VOIP exchange.

After detailed deliberations in the meeting, CTU was advised to prepare a draft SOP for providing the VOIP connectivity to control centres of TSPs/ GenCos etc. and put up for deliberations in the upcoming TeST meeting (copy of minutes are attached at **Annexure-I**).

This SOP shall be applicable for all VOIP connectivity proposed by the TSPs/ GenCos etc. In future.

2.0 Provision in Regulations

(a) CERC (IEGC) Regulations, 2023 chapter 6 Regulation 28 **clause (7)** stating-

"Every generating station, and transmission substation of 110 kV and above shall have a control room manned by qualified operating personnel round the clock.
Alternatively, the same may be operated round the clock from a remotely located control room, subject to the condition that such remote operation does not result in a delay in the execution of any switching instructions and information flow:
Provided that a transmission licensee owning a transmission line but not owning the connected substation, shall have a coordination centre functioning round the clock, manned by qualified personnel for operational coordination with the concerned load despatch centres and equipped to carry out the operations as directed by concerned load despatch centres."

(b) CERC (Communication System for inter-State transmission of electricity) Regulations, 2017 , **clause 6 (i)** stating -

"The nodal agency for planning, and coordination for development of communication system for inter-State transmission system user shall be the Central Transmission Utility."

(c) CERC (Communication System for inter-State transmission of electricity) Regulations, 2017 , **Clause 7 (ix)** stating **-**

"The CTU shall provide access to its wideband network for grid management and asset management by all users."

3.0 Application for VOIP connectivity

Applicant Shall apply VOIP connectivity through RLDC VOIP Exchange for their control centre/ coordination centre through a letter alongwith their requirement duly filled in the format attached at **Annexure-II** to CTU for their review.

Applicant shall also submit the undertaking for all the expenses towards communication, cyber security compliance and any other requirements for this purpose shall be borne by them.

Applicant to comply CEA (Technical Standards for Communication System in Power System Operations) Regulations, 2020, CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2022, CERC (Communication System for inter-State transmission of electricity) Regulations, 2017, and CEA (Cyber Security in Power Sector) Guidelines, 2021, and their amendment issued time to time.

Typical connectivity diagram for VOIP connectivity is given at **Annexure-III**.

4.0 Grant of VOIP connectivity

CTU shall examine the connectivity application of TSPs/ GenCos etc. and if found suitable in all respects a letter regarding grant of connectivity shall be issued with a copy to RPC/ RLDC/ POWERGRID. Since POWERGRID is owning and maintaining the VOIP exchange system therefore all necessary configuration work and allotment of VOIP channel shall be provided by them.

In case during review of the application there are any observations, same shall be communicated to applicant for revised submission.

POWERGRID shall coordinate for such connectivity and also ensure proper functioning after configuration of VOIP channel into the RLDC VOIP exchange.

Annexure-I

सत्यमेव जयते

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
उत्तर क्षेत्रीय विद्युत समिति
Northern Regional Power Committee

दिनाँक: 11.07.2023

To,

1. Chief Engineer (PCD), CEA, New Delhi
2. Executive Director, Grid-India, NRLDC, New Delhi
3. C.G.M., POWERGRID, NR-1, Faridabad
4. Sr. G.M., CTUIL, Gurgaon
5. Head Regulatory, IndiGrid Trust, Mumbai
6. Vice President, Sterlite

विषय: Minutes of the Meeting held on 06.07.2023 to discuss regarding VOIP connection for IndiGrid Control Centre at NOIDA and Connectivity of Central control room of Sterlite with NRLDC

महोदय/ महोदया,

A meeting was held on 06.07.2023 under chairmanship of Member Secretary, NRPC for deliberation on providing VOIP connection to IndiGrid for its Control Centre at NOIDA and connectivity to Sterlite for its Central control at Gurgaon. Minutes of the meeting are enclosed herewith for perusal and reference.

भवदीय,

11/7/23

(अंजुम परवेज)
अधीक्षण अभियंता

संलग्नक :यथोपरि

प्रति: सदस्य सचिव के निजी सचिव, उत्तर क्षेत्रीय विद्युत समिति

Minutes of the Meeting held on 06.07.2023 to discuss regarding VOIP connection for IndiGrid Control Centre at NOIDA and Connectivity of Central control room of Sterlite with NRLDC

Member Secretary, NRPC welcomed participants from POWERGRID, IndiGrid, Sterlite, CTU, CEA and NRLDC, GRID INDIA. List of participants is attached as **Annexure**.

1. IndiGrid briefed that presently they have 12 Substations and 07 bay extensions Pan-India which are being operated on real-time basis from their control centre (CC) located at BDTCL-Bhopal S/s. He stated that IndiGrid is now setting up a new CC at NOIDA, for which they have requested to provide additional VOIP connection for their new CC at NOIDA from the existing VOIP exchange at NRLDC. This VOIP connection will be in addition to their existing VOIP connectivity with BDTCL-Bhopal CC.
2. NRLDC stated that the CC of the TSP, viz IndiGrid is important for coordination and operation with real-time grid operations being done by Grid-India; however, firewalls at both ends need to be installed to ensure cyber security.
3. POWERGRID also stated that VOIP connectivity can be given to IndiGrid provided that all necessary cyber security compliances are ensured.
4. IndiGrid proposed the option of a VOIP connection from IndiGrid's 400/220 kV Prithla substation (an existing ISTS asset which is already connected to NRLDC through VOIP) to their NOIDA CC with a new VOIP channel. It was also informed that all expenses, such as leased line communication from NOIDA CC to Prithla S/s and compliance of cyber security as per CEA guidelines including suitable Firewalls, Routers etc. at both ends of the link, shall be borne by IndiGrid.
5. In this regard, CERC(IEGC) Regulations, 2023 chapter 6 Regulation 28 clause (7) was highlighted by IndiGrid which states:

   (7) Every generating station, and transmission substation of 110 kV and above shall have a control room manned by qualified operating personnel round the clock. Alternatively, the same may be operated round the clock from a remotely located control room, subject to the condition that such remote operation does not result in a delay in the execution of any switching instructions and information flow:

   Provided that a transmission licensee owning a transmission line but not owning the connected substation, shall have a coordination centre functioning round the clock, manned by qualified personnel for operational coordination with the concerned load despatch centres and equipped to carry out the operations as directed by concerned load despatch centres.
6. It was decided that VOIP connection for IndiGrid Control Centre at NOIDA be given, provided that all necessary cyber security and other compliances are ensured.
7. Further, VOIP connectivity for Sterlite Control Centre / Coordination Centre at Gurgaon was also deliberated in the meeting. Sterlite informed that presently they do not own any substations; however, CC is required for coordination with RLDCs and other TSPs for

O&M of its existing transmission lines in WR. Sterlite also stated that they are upcoming with Substation also as ISTS asset in future.

8. Sterlite further stated that as of now they don't have any ISTS substation nearby their Control Centre planned at Gurugram, so they shall require VOIP connectivity directly from their CC to NRLDC. All expenses such as leased line communication from Gurgaon CC to NRLDC and compliance of cyber security as per CEA guidelines including suitable Firewalls, Routers etc. at both ends of the link shall be borne by Sterlite.
9. Considering the requirement of Sterlite and keeping provisions of CERC(IEGC) Regulations, 2023 chapter 6 Regulation 28 clause (7), VOIP connectivity to Sterlite as stated above was agreed upon.
10. CTU informed that along with the TSPs, some private GenCos are also approaching CTU for such VOIP connectivity; hence, there is a need to provide suitable provisions for them.
11. On this, MS, NRPC advised CTU to prepare a draft SOP for providing VOIP connectivity to control centres of TSPs/ GenCos and put up for deliberations in the upcoming TeST meeting of NRPC.
12. CTU stated that this permission for connectivity shall be provisional and finally shall be complied by them as per the SOP to be approved as discussed at point no. 11 above.
13. Further, NRLDC suggested that as per above CERC(IEGC) Regulations, 2023 many transmission licensees and generators may request for VOIP connectivity with NRLDC; hence, centralized firewall with sufficient ports and throughput shall be provided and shared by TSPs/GenCos etc., as it would be difficult and cumbersome to accommodate physical firewalls of every VOIP connection at NRLDC's end.
14. In view of the above, following were decided in the meeting:
    a. VOIP connectivity for IndiGrid Control Centre at NOIDA from Prithila S/s and VOIP connectivity for Sterlite Control Centre at Gurgaon with NRLDC were agreed upon.
    b. IndiGrid and Sterlite shall apply for the said connectivity to CTU following due procedure, and CTU shall permit the connectivity as per deliberations in the meeting.
    c. IndiGrid and Sterlte shall bear all expenses, such as setting up of communication lines, firewalls at both ends, etc., for their respective VOIP connections with ISTS grid. Compliance of cyber security as per CEA guidelines shall be ensured by IndiGrid and Sterlte. They shall provide an undertaking for the same to CTU along with the connectivity application.
    d. Draft SOP for VOIP connection to Control Centres of such TSPs/ GenCos will be prepared by CTU in consultation with Powergrid and Grid-India which may be deliberated in the upcoming TeST meeting of NRPC.

The meeting ended with a vote of thanks to the Chair.

*****

Annexure

List of Participants

NRPC Sectt.

1. Sh. V. K. Singh, MS
2. Sh. Anzum Parwej, SE
3. Sh. Santosh Kumar, SE
4. Sh. Praveen, EE
5. Sh. Kaushik Panditrao, AEE
6. Smt. Priyanka, Manager, POWERGRID, deputed at NRPC

CEA

1. Smt. Priyam Srivastava, DD, PCD,

POWERGRID

1. Sh. Narendra Kumar Meena, CM

GRID INDIA

1. Sh. Ankur Gulati, DGM, NRLDC, GRID- INDIA

CTU

1. Sh. T P Verma, CM,

IndiGrid

1. Sh. Lokendra Singh Ranawat, Head Regulatory
2. Sh. Prayas Gupta, Head Operation
3. Sh. Sangeet Attri, Sr. Manager
4. Sh. Vivek Karthikeyan, Asst. General Manager

Sterlite

1. Sh. Jeetendra Bisht, VP
2. Sh. Vivek Singhal, EVP
3. Sh. Anand Shukla, Manager
4. Sh. Mahesh Bhagat, Asst. Manager
5. Sh. Raghvendra Patil, Chief Manager
6. Sh. Prateek Rai, Chief Manager

Signed by Anzum Parwej
Date: 11-07-2023 17:01:34
Reason: Approved

Annexure-II

Format for details to be submitted with VOIP connectivity

Name of applicant:

Designation:

Contact number and email:

Organisation/ Utility:

Control Centre / Coordination Centre for which VOIP connectivity is required:

Whether Utility falls under CERC Tariff Regulation: Yes/ No

Connectivity Required from: RLDC/ ISTS S/s / ISGS G/s

Name of above Location:

No. of VOIP Channels Required:

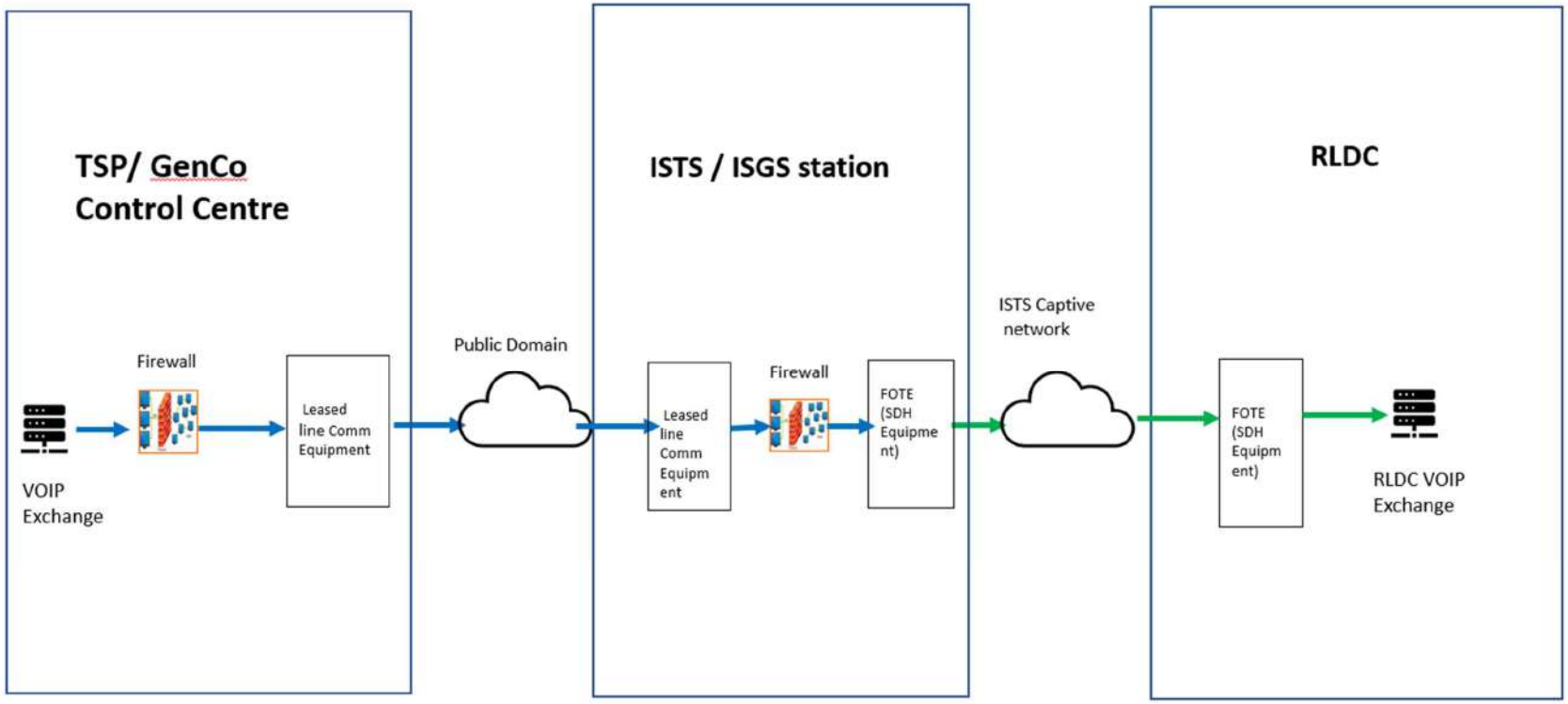
Cyber Security Compliance Provided: Yes/ No

Proposed Connectivity diagram:

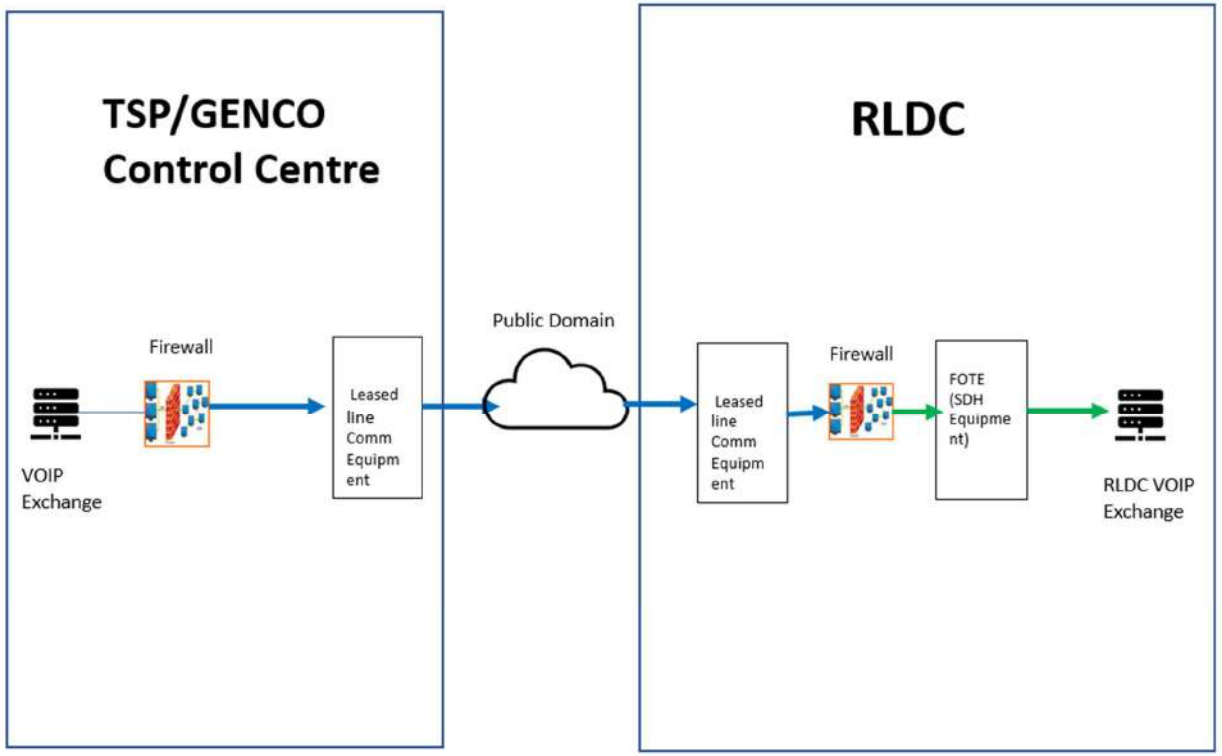
Annexure-III

Typical connectivity diagram for VOIP connectivity

A. VOIP Connectivity Diagram for TSP/ GENCO Control Centre from ISTS / ISGS Station



B. VOIP Connectivity Diagram for TSP/ GENCO Control Centre from RLDC directly



Annexure-XI 14th NPC

भारत सरकार केंद्रीय विद्युत प्राधिकरण दक्षिण क्षेत्रीय विद्युत समिति 29, रेसकोर्स क्रास रोड बेंगलूर- 560 009	सत्यमेव जयते	Government of India Central Electricity Authority **Southern Regional Power Committee** 29, Race Course Cross Road Bengaluru-560 009
Email:mssrpc-ka@nic.in	Web site: www.srpc.kar.nic.in	Phone: 080-22282516

सं/No.	SRPC/SE(O)/TF-AUFLS_dfdt/2023-24/ 4495-45	दिनांक/ Date	29th September 2023

सेवा में / To

Member Secretary
National Power Committee (NPC)
Central Electricity Authority
New Dlehi-110 066

विषय/ Subject:Report of the "Task Force on Implementation AUFLS & df/dt Scheme" -reg.

Ref: NPC letter No. CEA/GO-15-14/1/2021-NPC Division/280-295 dated 25th August 2023

महोदय/महोदया/ Sir/ Madam,

Enclosed, please find the final Report of the "**Task Force** on Implementation of Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme".

Submitted for kind needful please.

भवदीय /Yours faithfully,

29/09/2023

(के पी मधु / K P Madhu)
अधीक्षक अभियंता/सदस्य सांयोजक
Superintending Engineer/Member Convener

Copy to:

1. Smt. Rishika Sharan, Chief Engineer & Member Secretary, NPC, New Delhi
2. Shri Chandra Prakash, Chief Engineer GM, CEA, New Delhi
3. Shri P.D.Lone, Superintending Engineer, WRPC, WRPC, Mumbai
4. Shri Shyam Kejriwal, Superintending Engineer, ERPC, Kolkata
5. Shri Santosh Kumar, Superintending Engineer, NRPC, New Delhi
6. Shri S M Aimol, Superintending Engineer NERPC, Shillong.
7. Shri Satyendra Kumar Dotan, Director, NPC, CEA, New Delhi
8. Shri Vivek Pandey, General Manager, NLDC, New Delhi

Copy for kind information to:

1. SA to Chairperson, CEA, New Delhi.
2. SA to Member GO&D, CEA, New Delhi.
3. Chairman & Managing Director, GRID-INDIA, New Delhi.
4. Member Secretary, NRPC, New Delhi.
5. Member Secretary, ERPC, Kolkata.
6. Member Secretary, WRPC, Mumbai.
7. Member Secretary, NERPC, Shillong.

Report
on
Implementation of AUFLS and df/dt Scheme

Task Force Constituted by National Power Committee, CEA
Under Chairmanship of Member Secretary, SRPC

Report No. NPC/CEA/TF-AUFLS-001 September 2023

REPORT

OF

TASK FORCE

ON

IMPLEMENTATION OF

AUFLS AND df/dt SCHEME

EXECUTIVE SUMMARY

REPORT OF THE TASK FORCE ON

IMPLEMENTATION OF AUFLS AND df/dt SCHEME

EXECUTIVE SUMMARY

National Power Committee (NPC), vide letter No. CEA/GO-15-14/1/2021-NPC Division/250 dated 18th August 2023 and vide letter No. CEA/GO-15-14/1/2021-NPC Division/280-295 dated 25th August 2023 constituted a Task Force on Implementation of Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme with the following Terms of Reference:

i. Review the recommendations of the Report as per directions by the 13th NPC Meeting within two months.

ii. Prioritization of the loads under the AUFLS and df/dt scheme.

iii. To oversee the implementation of the report on Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme.

iv. Any other suggestions/recommendations on related matters.

The Task Force comprised of the following Members:

1	Member Secretary, SRPC	Shri Asit Singh	**Chairperson**
2	Chief Engineer NPC,CEA	Smt Rishika Sharan	Member
3	Chief Engineer GM,CEA	Shri Chandra Prakash	Member
4	Superintending Engineer, WRPC	Shri P D Lone	Member
5	Superintending Engineer, ERPC	Shri Shyam Kejriwal	Member
6	Superintending Engineer, NRPC	Shri Santhosh Kumar*	Member
7	Superintending Engineer, NERPC	Shri S M Aimol	Member
8	Director, NPC,CEA	Shri Satyendra Kumar Dotan	Member
9	General Manager, NLDC	Shri Vivek Panday	Member
10	Superintending Engineer, SRPC	Shri K P Madhu	**Member Convener**

* NRPC replaced Shri Anzum Parwej.

The Task Force reviewed report of the Sub-Committee to review the AUFLS and df/dt scheme in line with the decisions of NPC in its 13th Meeting and relevant Regulations in Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023 and identified the following:

- Total 25% relief will be planned in 4 stages-49.4 Hz, 49.2 Hz, 49.0 Hz & 48.8 Hz.
- Pumping load will be tripped before first stage (> 49.50 Hz). Battery energy system in charging mode will go in discharging mode (> 49.50 Hz), no storage will be in storage/charging mode at frequency < 49.50 Hz.
- All distribution licensees, STUs and bulk consumers shall provide automatic under frequency relays (UFR) and df/dt relays for load shedding in their respective systems to arrest frequency decline that could result in grid failure as per the plan given by the RPCs from time to time. The default UFR settings shall be as follows:

Sr. No.	***Stage of UFR Operation***	***Frequency (Hz)***
1	***Stage-1***	*49.40*
2	***Stage-2***	*49.20*
3	***Stage-3***	*49.00*
4	***Stage-4***	*48.80*
Note 1: All states (or STUs) shall plan UFR settings and df/dt load shedding schemes depending on their local load generation balance in coordination with and approval of the concerned RPC. *Note 2: Pumped storage hydro plants operating in pumping mode or ESS operating in charging mode shall be automatically disconnected before the first stage of UFR*		

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

  (a) The under-frequency and df/dt load shedding relays are always functional.

  (b) Demand disconnection shall not be set with any time delay in addition to the operating time of the relays and circuit breakers.

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

  (d) SLDC shall ensure that telemetered data of feeders (MW power flow in real time and circuit breaker status) on which UFR and df/dt relays are installed is available at its control centre. SLDC shall monitor the combined load in MW of these feeders at all times. SLDC shall share the above data with the respective RLDC in real time and submit a monthly exception report to the respective RPC. RLDC shall inform SLDCs as well as the concerned RPC on a quarterly basis, durations during the quarter when the combined load in MW of these feeders was below the level considered while designing the UFR scheme by the RPC. SLDC shall take corrective measures within a reasonable period and inform the respective RLDC and RPC, failing which suitable action may be initiated by the respective RPC.

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

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

Through detailed deliberations, the Task Force finalized the methodology for identification quantum of relief at each stages of AUFLS, distribution among Regions by NPC, distribution of relief quantum among State/UT in Regions by respective RPCs for implementation in the Region, guidelines for identification of feeders, Mapping of feeders, Reporting by SLDCs/RLDCs, Testing/inspection of UFRs, setting of UFR for Pumps & Energy Storage Systems (ESS).The observations and recommendations are elaborated in the Task Force Report,

Salient observations & conclusion by the Task Force are summarized below:

- **AUFLS Set Points and Quantum of Relief**

  Total 25% relief would be planned in four stages: Stage-1 at 49.4 Hz, Stage-2 at 49.2 Hz, Stage-3 at 49.0 Hz & Stage-4 at 48.8 Hz. The 25% total relief distribution in four stages would be in such a way that 5% in Stage-1, 6% in Stage-2 and 7% each in Stage 3 & 4.

- **Identification of AUFLS Quantum by NPC and RPCs**

  NPC Division to communicate the Region wise relief quantum (based on Regional Peak Demand Met during the previous year) by **31st of May** to RPCs for implementation in the next Financial Year (FY). Distribution of relief among State/UT to be carried out based on Regional relief and demand contribution in the average of Peak demand met ratio and demand met (consumption) ratio of State/UT in the previous FY.

- **Quantum Identification for AUFLS by States/UT and monthly vetting**

  Each SLDC shall carry out month-wise Stage-wise analysis and furnish to RPC/RLDC in the following manner:

  AUFLS Stage -1:

  Actual Relief for the month = Average actual load (for the month) of all the feeders identified in the stage**.** For this Feeders are to be mapped at SLDC. The mapping would be extended to RLDC. If feeders are not mapped then values are to be collected from field. (Any outage would not be excluded).

  Desired Relief for the month = (Recommended AUFLS quantum in the stage x Average demand for the month of State/UT)/Demand Contribution of the State/UT

  The same exercise would be repeated for each Stage.

As a general guideline Actual Relief for the month should be 10% more than the Desired Relief for the month considering the Relay/breaker issues and a resilient safety net.

The data would be vetted by RLDC and discussed in OCC Meetings of RPC.

- **Analysis of AUFLS Event**

AUFLS Stage-1:

Actual Relief during incident = (Actual relief (during incident) of all the feeders identified in the stage)

Desired Relief during incident= (Recommended AUFLS quantum in the stage x demand of State/UT at time of incident)/Demand Contribution of the State.

The same exercise would be repeated for each Stage.

The data would be vetted by RLDC and discussed in OCC Meetings of RPC.

- **Guidelines for identification of AUFLS feeders**

AUFLS relays under Stage-1 & Stage-2 should be implemented preferably on downstream network at 11/22/33 kV level and AUFLS relays under Stage-3 & Satge-4 should be implemented on upstream network at EHV (66/110/132 kV) level so that load relief obtained is fast and reliable.

- **Mapping of AUFLS feeders**

SLDCs in coordination with STU/Discoms, map the feeders for loading, breaker status etc. and create display for monitoring of all the stages. The SLDC would extend the mutually agreed displays to RLDC. SLDCs also develop the SCADA Displays Discom-wise/Sub SLDC wise as applicable as well as feeder wise for all the stages.

Mapping verification between SLDC and Discom/STU to be carried out at least once in three (3) months and between RLDC and SLDCs at least once in six (6) months.

SLDCs shall download the data and store it for two years. The Data should be made available to RPCs/RLDCs/CEA/CERC for further studies or analysis.

- **Settings of UFR for Pumping load/Energy Storage Systems**

All Energy Storage Systems would change from charging mode to discharging mode at 49.50 Hz. If it is not possible then they would be tripped at 49.50 Hz. If ESS is injecting active power at 49.50 Hz not to be tripped.

Pumping load will be tripped before AUFLS first stage. Irrigation Pumps would be tripped at 49.50 Hz

All the relays procured in future to have a sampling period ranging from three (03) cycles to five (05) Cycles. No additional time delay to be incorporated in the relay other than the inherent measuring time.

- **Testing/Inspection of UFR**

SLDCs shall in consultation with the Utilities responsible for testing should chalk out a plan of relays testing schedule before 1st of December and submit the same to RPC/RLDC. The periodicity of testing of relays shall be twice in a year at 110 / 132 kV level and above Substations and once in a year at 66 kV level and below Substations.

RPC would carry UFR inspection randomly on sample basis by the RPC Secretariat or through RLDC.

- **df/dt Scheme**

The df/dt load shedding is specific to regions and therefore, the quantum of load shedding required to be wired up under the df/dt scheme may be discussed at regional levels in the RPCs. The RPCs in consultation with the stakeholders can decide the set points and quantum of Load shedding required under df/dt scheme.

Various aspects as brought out above have been deliberated by the Task Force and action by the agencies have been finalized. However, SLDCs and concerned utilities to ensure proper setting of relays considering sluggishness to achieve the desired load relief at all the stages of AUFLS and df/dt.

REPORT

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ON

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INDEX

REPORT OF THE TASK FORCE ON

IMPLEMENTATION OF AUFLS AND df/dt SCHEME

1.0 INTRODUCTION

National Power Committee (NPC) in its 13th Meeting held on 05.07.2023 had accepted the report of the Sub-Committee (constituted as per the decision in 10th meeting of NPC) to review the AUFLS and df/dt scheme with the following observations:

a) The first stage will be set at 49.4 Hz.

b) Total 25% relief will be planned in 4 stages-49.4 Hz, 49.2 Hz, 49.0 Hz & 48.8 Hz.

c) Pumping load will be tripped before first stage (> 49.4 Hz). Battery energy system in charging mode will go in discharging mode (> 49.4 Hz), no storage will be in storage/charging mode at frequency < 49.4 Hz.

d) A Task Force under chairmanship of MS, SRPC with Members from Grid India, RPCs/NPC may be formed. The task force will also oversee the implementation of the report.

Keeping this in view, MS NPC, vide letters dated 18.08.2023 & 25.08.2023 constituted Task Force on Implementation of Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme with the following Terms of Reference:

i. Review the recommendations of the Report as per directions by the 13th NPC Meeting within two months.

ii. Prioritization of the loads under the AUFLS and df/dt scheme.

iii. To oversee the implementation of the report on Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme.

iv. Any other suggestions/recommendations on related matters.

A copy of the letters is at **Annexure-I**.

The Task Force committee was constituted with the following Members:

1.	**Shri Asit Singh,** Member Secretary, SRPC ……**Chairperson**	2.	Smt. Rishika Sharan, Chief Engineer NPC,CEA ……. Member
3.	Shri Chandra Prakash, Chief Engineer GM,CEA …… Member	4.	Shri P D Lone Superintending Engineer, WRPC …… Member
5.	Shri Shyam Kejriwal Superintending Engineer, ERPC ..…….. Member	6.	Shri Santhosh Kumar* Superintending Engineer,NRPC …….. Member
7.	Shri S M Aimol Superintending Engineer, NERPC …….. Member	8.	Shri Satyendra Kumar Dotan Director, NPC,CEA …….. Member
9.	Shri Vivek Pandey General Manager, NLDC …….. Member	10.	**Shri K P Madhu** Superintending Engineer, SRPC ……. **Member Convener**

* NRPC replaced Shri Anzum Parwej.

The Task Force had its Meeting on 11.09.2023 through Video Conferencing (VC) and deliberated various aspects in the implementation of AUFLS & df/dt scheme. During the deliberations, it was observed that the frequency setting adopted by all the Regions for the four stages of AUFLS are uniform and same as mandated in CERC (IEGC) Regulations, 2023. It emerged that the load relief to obtained shall be reviewed yearly based on the actual peak met during the previous Financial Year and implemented in the next Financial Year. Mapping of identified feeders at SLDC/RLDC needed to be ensured by the utilities and monitoring of the feeders at real time by control rooms.

2.0 PROVISIONS IN CERC REGULATIONS

Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023 effective from 01st October 2023 provides the following in respect of AUFLS and df/dt:

Regulation No.29: ***SYSTEM SECURITY***

……..

(12) All distribution licensees, STUs and bulk consumers shall provide automatic under frequency relays (UFR) and df/dt relays for load shedding in their respective systems to arrest frequency decline that could result in grid failure as per the plan given by the RPCs from time to time. The default UFR settings shall be as specified in Table-2 below:

Sr. No.	*Stage of UFR Operation*	*Frequency (Hz)*
1	*Stage-1*	*49.4*
2	*Stage-2*	*49.2*
3	*Stage-3*	*49.0*
4	*Stage-4*	*48.8*
Note 1: All states (or STUs) shall plan UFR settings and df/dt load shedding schemes depending on their local load generation balance in coordination with and approval of the concerned RPC. *Note 2: Pumped storage hydro plants operating in pumping mode or ESS operating in charging mode shall be automatically disconnected before the first stage of UFR.*		

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

(a) The under-frequency and df/dt load shedding relays are always functional.

(b) Demand disconnection shall not be set with any time delay in addition to the operating time of the relays and circuit breakers.

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

(d) SLDC shall ensure that telemetered data of feeders (MW power flow in real time and circuit breaker status) on which UFR and df/dt relays are installed is available at its control centre. SLDC shall monitor the combined load in MW of these feeders at all times. SLDC shall share the above data with the respective RLDC in real time and submit a monthly exception report to the respective RPC. RLDC shall inform SLDCs as well as the concerned RPC on a quarterly basis, durations during the quarter when the combined load in MW of these feeders was below the level considered while designing the UFR scheme by the RPC. SLDC shall take corrective measures within a reasonable period and inform the respective RLDC and RPC, failing which suitable action may be initiated by the respective RPC.

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

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

3.0 AUFLS SET POINTS AND QUANTUM OF RELIEF

The AUFLS setting with %age of quantum of load shedding concluded in the Report is given below (Table 10.1 in the Report):

Sr. No.	*Stage*	*Frequency*	*Demand Disconnection*	*Total Quantum of LS*
Stage-I Defense plan- Load Shedding				
1	I-A	49.2 Hz	3.50%	
2	I-B	49.0 Hz	3.50%	
3	I-C	48.8 Hz	4.00%	
4	I-D	48.7 Hz	4.50%	
5	I-E	48.6 Hz	4.50%	**20%**
Stage-II Desperate plan- Load Shedding				
6	II-F	48.4 Hz	6.00%	
7	II-G	48.2 Hz	6.00%	
8	II-H	48.0 Hz	6.00%	**18%**
Grand Total (Stage-I + II)				**36%**

In the 13th Meeting of NPC, it had been observed that the first stage will be set at 49.4 Hz and total 25% relief will be planned in four stages-49.4 Hz, 49.2 Hz, 49.0 Hz & 48.8 Hz. The AUFLS settings to be adopted for total relief of 25% of previous year peak demand met for implementation in the subsequent year.

The percentage relief from Stage-1 may be kept as 5 % since it is better to check the falling frequency and get sufficient quantum of relief at initial level itself and there may not arise the occasion for further reduction of frequency leading to more load shedding at other stages. In the Report of Expert Committee on IEGC also equal quantum of Load Relief was proposed for all stages. Keeping lower quantum of relief at higher level may lead to activation of lower stages since in most of the real time conditions the desired relief may not be achieved.

The Task Force recommended the following AUFLS Set Points and Percentage Quantum of Relief for implementation:

Table 1: AUFLS Set Points and Percentage Quantum of Relief

Sl No	Stage	UFR set points in Hz	Quantum of Relief
1	**Stage-1**	**49.4**	**5%**
2	**Stage-2**	**49.2**	**6%**
3	**Stage-3**	**49.0**	**7%**
4	**Stage-4**	**48.8**	**7%**
		Total	**25%**

4.0 IDENTIFICATION OF AUFLS QUANTUM BY NPC AND RPCs

NPC Division to communicate the Region wise relief quantum (based on Regional Peak Demand Met during the previous year) by **30th of June** to RPCs.

If the peak demand is lower than the previous year peak demand, the same settings should be continued (settings remain unchanged).

4.1. Methodology for AUFLS Quantum (MW) Distribution among Regions:

Let All India Peak Demand in Previous Year in MW= **AP**

Sum of Regional Peak in MW = (RP_{NR}+ RP_{WR} + RP_{SR} + RP_{ER} +RP_{NER})**= RP**

Table 2: Methodology for AUFLS Quantum (MW) Distribution among Regions

Region	Regional Peak Demand (MW)	Stage-1 49.4 Hz (5%)	Stage-2 49.2 Hz (6%)	Stage-3 49.0 Hz (7%)	Stage-4 48.8 Hz (7%)	Total (MW)
	(1)	(2)	(3)	(4)	(5)	(6)
Northern Region	RP_{NR}	0.05* RP_{NR}*AP/RP	0.06* RP_{NR}*AP/RP	0.07* RP_{NR}*AP/RP	0.07* RP_{NR}*AP/RP	Sum Clmn. (2) to (5)
Western Region	RP_{WR}	0.05* RP_{WR}*AP/RP	0.06* RP_{WR}*AP/RP	0.07* RP_{WR}*AP/RP	0.07* RP_{WR}*AP/RP	Sum Clmn. (2) to (5)
Southern Region	RP_{SR}	0.05* RP_{SR}*AP/RP	0.06* RP_{SR}*AP/RP	0.07* RP_{SR}*AP/RP	0.07* RP_{SR}*AP/RP	Sum Clmn. (2) to (5)
Eastern Region	RP_{ER}	0.05* RP_{ER}*AP/RP	0.06* RP_{ER}*AP/RP	0.07* RP_{ER}*AP/RP	0.07* RP_{ER}*AP/RP	Sum Clmn. (2) to (5)
North Eastern Region	RP_{NER}	0.05* RP_{NER}*AP/RP	0.06* RP_{NER}*AP/RP	0.07* RP_{NER}*AP/RP	0.07* RP_{NER}*AP/RP	Sum Clmn. (2) to (5)
All India	AP	Sum above	Sum above	Sum above	Sum above	25% OF AP

Sample calculation for AUFLS Quantum (MW) for 2023-24 is given below:

All India Peak Demand in 2022-23: 2,07,231 MW

Table 2A: Computation of AUFLS Quantum (MW) Distribution among Regions

Region	Regional Peak Demand (MW)	Stage-1 49.4 Hz (5%)	Stage-2 49.2 Hz (6%)	Stage-3 49.0 Hz (7%)	Stage-4 48.8 Hz (7%)	Total (MW)
	(1)	(2)	(3)	(4)	(5)	(6)
Northern Region	76,561	3270	3924	4577	4577	**16,348**

Western Region	71,677	3061	3673	4285	4285	**15,305**
Southern Region	64,337	2748	3297	3847	3847	**13,738**
Eastern Region	27,218	1162	1395	1627	1627	**5,812**
North Eastern Region	3,603	154	185	215	215	**769**
All India	**2,07,231**	**10394**	**12473**	**14552**	**14552**	**51,972**

4.2. Three options were considered by the Task Force for distribution of relief among State/UT. The Task Force recommended that Distribution of relief among State/UT to be carried out based on Regional relief and demand contribution in the average of Peak demand met ratio and demand met (consumption) ratio of State/UT in the previous FY.

4.3. After the receipt of the allocated load shedding quantum of the Region from NPC, AUFLS relief quantum should be distributed among the State/UT in the region by the RPCs by **July /August** in consultation with the stakeholders (in OCC Meeting).

Sample calculation for Northern Region is given below:

Table 3: State/UT contribution ratio for AUFLS Relief Quantum

State/UT	Actual Consumption in MU for 2022-23	Consumption Ratio	Actual Demand Met in 2022-23	Demand Met Ratio	State/ UT Contribution
	(1)	(2)=(1)/(A)	(3)	(4)=(3)/(B)	(5)=[(2)+(4)]/2
Chandigarh	1788	0.004	407	0.005	**0.004**
Delhi	35143	0.077	7695	0.089	**0.083**
Haryana	60945	0.133	12768	0.147	**0.140**
Himachal Pradesh	12542	0.027	2071	0.024	**0.026**
UT J&K & Ladhak	19322	0.042	2967	0.034	**0.038**
Punjab	69220	0.151	14311	0.165	**0.158**
Rajasthan	100057	0.219	17206	0.199	**0.209**
Uttar Pradesh	143050	0.313	26589	0.307	**0.310**
Uttarakhand	15386	0.034	2599	0.030	**0.032**
Total	457453 **(A)**	1.000	**86613 (B)**	**1.000**	1.000

4.4. Each State/UT relief quantum would be computed by RPC by distributing the NPC communicated Regional relief quantum based on ratio at 4.2. This quantum would become the base for monthly analysis of visible relief and also the analysis during any event.

Sample calculation of Demand Distribution for Northern Region:

Table 4: State/UT Demand Distribution in MW

State/UT	State/ UT Contribution	Load Relief in MW
	(a)=Column (5) of Table 3	(b)=a* B in Column (3) of Table 3
Chandigarh	0.004	330
Delhi	0.083	6342
Haryana	0.140	10743
Himachal Pradesh	0.026	1965
UT J&K & Ladhak	0.038	2928
Punjab	0.158	12118
Rajasthan	0.209	15978
Uttar Pradesh	0.310	23722
Uttarakhand	0.032	2436
Total	1.000	76561 **(C)**

4.5. Each State/UT Stage-wise AUFLS quantum would be computed by RPC. This Stage-wise recommended AUFLS quantum shall become the base for monthly analysis of visible relief and also the analysis during any tripping.

Sample calculation for NR is as follows:

Table 5: State/UT Stage-wise AUFLS in MW

State/UT	State/ UT Contribution	Stage-1 49.4 Hz (5%)	Stage-2 49.2 Hz (6%)	Stage-3 49.0 Hz (7%)	Stage-4 48.8 Hz (7%)	Total
	(c)=Column (5) of Table 3	NR in Column (2) of Table 2A* (c)	NR in Column (3) of Table 2A* (c	NR in Column (4) of Table 2A* (c	NR in Column (5) of Table 2A* (c	
Chandigarh	0.004	14	17	20	20	70

Delhi	0.083	271	325	379	379	1354
Haryana	0.140	459	551	642	642	2294
Himachal Pradesh	0.026	84	101	117	117	420
UT J&K & Ladhak	0.038	125	150	175	175	625
Punjab	0.158	517	621	724	724	2587
Rajasthan	0.209	682	819	955	955	3412
Uttar Pradesh	0.310	1013	1216	1418	1418	5065
Uttarakhand	0.032	104	125	146	146	520
Total	1.000	3270	3924	4577	4577	16348

5.0 QUANTUM IDENTIFICATION FOR AUFLS BY STATES/UT AND MONTHLY VETTING

5.1. States/UT shall identify the load relief for each stage considering the Quantum of relief and their demand contribution considering the intra-day, seasonality etc. 10% additional relief would be finalised considering the demand growth of the year, planned and forced outages, UFR and breaker issues etc. SLDC would communicate feeder-wise, Stage-wise details etc. to RPC/RLDC.

5.2. Each SLDC shall carry out month-wise Stage-wise analysis and furnish to OCC in the following manner:

AUFLS Stage -1:

Actual Relief for the month = Average actual load (for the month) of all the feeders identified in the stage**.** For this Feeders are to be mapped at SLDC. The mapping would be extended to RLDC. If feeders are not mapped then values are to be collected from field. (Any outage would not be excluded).

Desired Relief for the month = (Recommended AUFLS quantum in the stage x Average demand for the month of State/UT)/Demand Contribution of the State/UT

Similar exercise for each Stage.

The data would be vetted by RLDC and discussed in OCC Meetings of RPC.

5.3. Self-checking scheme: If Actual Relief for the month is **less the Desired Relief** for the month, **SLDC** would carry out feeder –wise analysis and in consultation with Discoms/STU take **corrective action** (like identifying new feeder, additional feeder, modifying the declared relief of feeders, verifying the mapped figures etc.). The same

would be implemented by SLDC/STU/Discoms before next OCC by submitting a compliance Report.

5.4. A**s a general guideline Actual Relief for the month should be 10% more than the Desired Relief for the month considering the Relay/breaker issues and a resilient safety net.**

Table 6: AUFLS – Monthly Report - …….(Month)

State/UT:……..

	Stage-1 49.4 Hz	Stage-2 49.2 Hz	Stage-3 49.0 Hz	Stage-4 48.8 Hz	**STATE TOTAL**
Recommended (A)					
Implemented (B)					
SCADA monitored (C)					
Actual flow on SCADA monitored (D)					
Balance implemented (E) = (B) – (C)					
Actual flow on balance implemented (F)					
Desired relief (G)= (B)x Average State Demand for the month/(State Demand Contribution)					
Actual relief (H) = (D+F)					
Deficit (-)/Surplus (+) H-G					

6.0 ANALYSIS OF AUFLS EVENTS

6.1. The following methodology to be adopted for AUFLS analysis during event:

AUFLS Stage-1:

Actual Relief during incident = (Actual relief (during incident) of all the feeders identified in the stage)

Desired Relief during incident= (Recommended AUFLS quantum in the stage x demand of State/UT at time of incident)/Demand Contribution of the State.

Similar exercise for each Stage.

The data would be vetted by RLDC and discussed in OCC Meetings of RPC.

6.2. If Actual Relief during incident is less the Desired Relief during incident, SLDC would carry out feeder –wise analysis and in consultation with Discoms/STU take corrective action. Necessary directions will be issued to Discoms/STU by SLDC. The same would be implemented by SLDC/STU/Discoms before next OCC by submitting a compliance Report.

6.3. The relief realization to be analyzed based on the demand at the time of incident. The data needed to be vetted by RLDC and discussed in OCC Meetings of RPC. Reason for non-tripping of the relays during the incident needed to be mentioned. If Actual Relief during incident is less than the Desired Relief during incident, SLDC would carry out feeder –wise analysis and in consultation with Discoms/STU take corrective action. Necessary directions shall be issued to Discoms/STU by SLDC. The same would be implemented by SLDC/STU/Discoms before next OCC by submitting a compliance Report.

6.4. SLDCs shall issue directions to state utilities to carry out self-testing of the relays and where ever tripping is not observed (due to discrepancy in measured frequency), such relays are recommended to retune to set the points accordingly at 49.41 Hz. or 49.42 Hz. etc. The implementation of the same is being monitored in OCC.

Table 7: AUFLS – Tripping Report at ….. hrs on ……..

State/UT:……..

Description	Stage-1 49.4 Hz	Stage-2 49.2 Hz	Stage-3 49.0 Hz	Stage-4 48.8 Hz	STATE TOTAL
Recommended (A)					
Implemented (B)					
SCADA monitored (C)					
Actual flow on SCADA monitored (D)					
Balance implemented (E) = (B) – (C)					
Actual flow on balance implemented (F)					
Desired relief (G)= (B)x State Demand at the time of tripping/(State Demand Contribution)					
Actual relief (H) = (D+F)					
Deficit (-)/Surplus (+) H-G					

Further feeder wise and Stage-wise details will also be furnished as per the Table given below:

Table 8: AUFLS – Feeder-wise Tripping Report at ….. hrs on ……..

AUTOMATIC UNDER FREQUENCY LOAD SHEDDING STAGE-1 (49.4)						
Sl No	Sub Station	Feeder Description	Average load per year (In MW)	Tripped (Y/N)	Reason if not tripped	Actual flow in MW
1						
2						
3						
4						
TOTAL MW RELIEF						

7.0 GUIDELINES FOR IDENTIFICATION OF AUFLS FEEDERS

The following to be considered for identification of feeders:

i. AUFLS relays under Stage-1 & Stage-2 should be implemented preferably on downstream network at 11/22/33 kV level.

ii. AUFLS relays under Stage-3 & Satge-4 should be implemented on upstream network at EHV (66/110/132 kV) level so that load relief obtained is fast and reliable as it is a desperate measure for areas that have disintegrated.

iii. As far as possible the feeders/transformers are feeding radial loads shall be identified.

iv. Telemetry availability would be considered as important factor so that the feeders/transformer loading can be extended to SLDC/RLDC for mapping

v. Feeders catering to critical loads are to be avoided. VIP areas, Airport, Metro, Railways, Defence, Govt Hospitals, Government Offices, continuous process industries etc. needs to be prioritized

vi. No mixed feeders with RE/Distributed generations should be identified. If identified the feeder should be never in injecting mode. Steps to segregate the feeder (load/RE/Distributed generation) would be taken.

vii. If Grid feeder is identified the other side breakers should be in normally open condition. If they are to be closed frequently then UFR with same set points to be provided at other ends.

viii. The feeders identified for AUFLS would be as far as possible not common for df/dt, scheduled power cuts, load shedding, SPS, ADMS etc. In case of difficulty to

identify dedicated feeders the same is to be approved in OCC/PCSC. Adequate care is to be taken if round robin scheme is adopted for ADMS, SPS etc.

ix. The Islanding loads/feeders which are to be retained would not be enabled for AUFLS. However loads in the Island can be identified for AUFLS but same has to be factored while designing the Island.

Chairperson, Task Force observed that the sampling rate is configured by the OEM and cannot be changed by S/S officials. There are relays with 3 cycle sampling rate and also with 6-10 cycle sampling rate. The only way to achieve the tripping at desired frequency is to set the relay set points based on the behaviour of each relay. 3-5 cycle sampling time is advisable since if response time is below 3 cycles, during some transients also unwanted tripping may happen.

NERPC mentioned that in their system most of the 33 kV feeders are radially loaded and 132 kV feeders are grid connected and difficult to get desired relief in tripping of 132 kV grid connected feeder since if relay trip at one S/s the load may be fed from other end. Requested that NER may be given some relaxation such that the feeders at 33 kV also may be identified at lower stages.

It was clarified that these are General Guidelines in which some changes may be carried according to specific constraints. However, if Grid feeder is identified the other side breakers should be in normally open condition. If they are to be closed frequently then UFR with same set points to be provided at other end also.

8.0 MAPPING OF AUFLS FEEDERS

SLDC in coordination with STU/Discoms map the feeders for loading, breaker status etc. and create display for monitoring. The SLDC would extend the mutually agreed display to RLDC. Display to be implemented at SLDC which would be extended to RLDC.

Table 9: AUFLS Monitoring in MW

Description	Stage-1 49.4 Hz	Stage-2 49.2 Hz	Stage-3 49.0 Hz	Stage-4 48.8 Hz	TOTAL (all the Stages)
Recommended (A)					
Implemented (B)					
Unmapped quantum (C)					
SCADA monitored (D)					
Actual flow (E)					
Desired relief (F)= (D)x State Demand/(State Demand Contribution)					
Deficit (-)/Surplus (+) E-F					

SLDC would further develop the SCADA Displays Discom-wise/Sub SLDC wise as applicable as given below:

Table 10: AUFLS Monitoring in MW STAGE-1 (49.4)

Description	DISCOM / SUB SLDC -1	DISCOM / SUB SLDC -2	DISCOM / SUB SLDC -3	.....	STATE TOTAL
Recommended (A)					
Implemented (B)					
Unmapped quantum (C)					
SCADA monitored (D)					
Actual flow (E)					
Desired relief (F)= (D)x Discom Demand/(Discom Demand Contribution)					
Deficit (-)/Surplus (+) E-F					

Similar display for all stages.

SLDC would further develop the SCADA Displays feeder wise as given below:

Table 11: Feeder wise AUFLS monitoring in MW

AUTOMATIC UNDER FREQUENCY LOAD SHEDDING STAGE-1 (49.4)											
Sl.No	Discom/ SUB-LDC	Voltage level	Substation / Feeder Name (A-B)	Average load (MW)	Relay function enabled (Y/N)	SCADA Visibility (Y/N)	Radial feeder (Y/N)	RE injection feeder (Y/N)	CB Status Both ends	Actual flow in MW(A)	Actual flow in MW (B)
1											
2											
3											
TOTAL (MW)											

Similar display for all Stages.

SLDCs would download the data and store it for two years. SLDCs would collect feeder loading details of unmapped feeders.

Concrete action plan with definitive timelines would be made by SLDC/STU/Discom to achieve 100% mapping. This would be followed up in OCC.

Mapping verification between SLDC and Discom/STU would carried out at least once in three (3) months. Mapping verification between RLDC and SLDC would be carried at least once in six (6) months.

Any change in feeder would be informed to RPC & RLDC and mapping would be ensured.

SE(P) WRPC informed that 85-90% of AUFLS relays installed in WR are at the voltage level of 11kV/22kV/33kV and also these relays are installed in many switching distribution level remotely located substations of the States. The implementation of the AUFLS display on SCADA system was deliberate in various forum of WRPC. However the States have expressed inability to implement the display in SCADA due to communication issues in remotely located S/Ss. However, efforts are still being made to improve the visibility of these feeders in SCADA.

9.0 SETTINGS OF UFR/PUMP LOADS/ESS

All Energy Storage Systems would change from charging mode to discharging mode at 49.45 Hz. If it is not possible then they would be tripped at 49.45 Hz. If ESS is injecting active power at 49.45 Hz not to be tripped.

Pumping load will be tripped before AUFLS first stage. Irrigation Pumps would be tripped at 49.45 Hz.

Load disconnection shall not be set with any time delay in addition to the operating time of the relays and circuit breakers.

During Testing if delay is observed (> 75 msec) in Relay Pick up and sending the command to breaker then set points to be enhanced to 49.41 Hz, 49.21 Hz, 49.01 Hz and 48.81 Hz as applicable or any higher value to ensure tripping 49.40 Hz, 49.20 Hz, 49.00 Hz and 48.80 Hz

All the relays to be procured in future to have a sampling period ranging from three cycles to five Cycles. No additional time delay to be incorporated in the relay other than the inherent measuring time.

With reference to the discussions regarding the trip setting of storage device operating in charging/pumping mode it is requested to consider the following inputs from NLDC.

(A) CEA Technical Standards of connectivity to the grid Regulations (2019 amendment), Connectivity standards mandate the wind generating stations, generating stations using inverters, wind - solar photo voltaic hybrid systems and energy storage systems as under

Quote

" The generating unit shall be capable of operating in the frequency range 47.5 to 52 Hz and be able to deliver rated output in the frequency range of 49.5 Hz to 50.5 Hz"

Unquote

In future several storage systems (BESS, PSP) are expected to be commissioned. Few hybrid RE stations with BESS/PSP are also envisaged. Considering the possible derating of inverter based resources at frequency below 49.5 Hz, it is desirable to take measures to arrest the frequency decline below 49.5 Hz. It is therefore desirable that the storage device operating in charging/pumping mode are tripped in a graded manner before the frequency dips below 49.5 Hz.

(B) Grid India vide its letter dated 2nd Jul 2018 had suggested to raise the UFR stage-I setting to 49.6 Hz and consider 49.8 Hz for initiating the tripping of pump storage/BESS operating in charging pumping mode. Thus keeping a margin of 0.2 Hz between tripping of storage and AUFLS stage-I.

(C) The Expert Group on IEGC considered 49.50 Hz as the nadir frequency for working out the AUFLS setting. Relevant extracts are quote below:

Under Frequency Relay (UFR) Settings: (a) Considering the All India electricity grid operating as a synchronous grid and being one of the largest grids in the world, the defence plans now need to be looked at from a national level rather than regional level. The same needs to be mandated in the IEGC itself rather than any discussion at the RPC level. As indicated in the section on primary response, for the reference contingency of 4500 MW generating station outage, the frequency would dip to 49.50 Hz and quickly recover to 49.70 Hz. So, the chances of the frequency falling below 49.50 Hz in an integrated large power system like India would be rare. The frequency would fall below this value only in case of part separation of systems leading to a generation deficit in one system

(D) The IEGC-2023 has mandated UFR stage-I as 49.4 Hz

It is suggested that the tripping of storage system (in charging pumping mode) may be initiated in a graded manner from 49.6 Hz onwards and to be complete by 49.5 Hz.

In view of NLDC observations the following is recommended:

All Energy Storage Systems would change from charging mode to discharging mode at 49.50 Hz. If it is not possible then they would be tripped at 49.50 Hz. If ESS is injecting active power at 49.50 Hz not to be tripped.

Pumping load will be tripped before AUFLS first stage. Irrigation Pumps would be tripped at 49.50 Hz.

10.0 TESTING/INSPECTION OF UFR

Testing Procedure SLDC for UFR by Discoms/STU:

i. Wherever relays are installed at 110 / 132 kV level and above S/s: The periodicity of testing shall be Twice in a year.

ii. Wherever relays are installed at 66 kV level and below S/s: The periodicity of testing shall be once in a year.

iii. SLDCs shall in consultation with the Utilities responsible for testing should chalk out a plan of relays testing schedule before 1st of December and submit the same to RPC/RLDC.

iv. Test shall be carried out by the State testing teams and report of the test carried out should be submitted to SLDC. SLDC shall submit a compiled progressive report of the same to RPC/RLDC every month. The format for testing of AUFLS relays is at **Annexure-II.**

v. SLDC should monitor the periodicity of test and ensure that the relays are tested as per the schedule. Deviation if any shall be intimated to RPC/RLDC with proper justification.

vi. If possible, relays through test up to breakers may be carried out. If this is not possible the continuity of trip circuit of UFR up to the trip coil of breaker should be checked during the testing.

vii. SLDC's shall ensure that at least 10% of the total relay testing be witnessed/carried out by other Circle Testing Engineer/RLDC/RPC.

Inspection of UFR Relays by RPC:

RPC would carry UFR inspection randomly on sample basis by the **RPC Secretariat or through RLDC.** The Sample Inspection Report is at **Annexure-III.**

Based on Inspection Report necessary directions would be issued by RPC which would be complied within six months.

11.0 df/dt SCHEME

In the Report it is mentioned that enabling frequency should be set at 49.9 Hz. i.e., the relay should always be enabled when the system frequency is below 49.9Hz. The following given in the Report:

Stage	'X' in MW = Largest generating station or peak import in the region whichever is higher			
	Enabling Frequency 'Hz'	df/dt setting 'Hz/sec'		Quantum of Load Shedding 'MW'
		RE rich	RE low	
Stage-1	49.9	0.10	0.05	30% of 'X'
Stage-2	49.9	0.15	0.10	40% of 'X'
Stage-3	49.9	0.20	0.25	50% of 'X'
The quantum is for a region as whole, and the RPCs shall decide how to further distribute the quantum amongst the States.				

The df/dt load shedding is specific to regions and therefore, the quantum of load shedding required to be wired up under the df/dt scheme be discussed at regional levels in the RPCs.

The RPCs in consultation with the stakeholders can decide on the quantum of Load shedding required to be wired up in Stage-1, 2 & 3 of the df/dt schemes.

In the Report, df/dt suggested for largest generating station/peak import in the region. Further the set point is suggested at 49.9 Hz which is lower most operating range of IEGC. The set point should be away from the operating range. **df/dt may be for credible contingency of each Region.**

The Task Force observed that df/dt load shedding is specific to regions and therefore, the quantum of load shedding required to be wired up under the df/dt scheme may be discussed at regional levels in the RPCs. The RPCs in consultation with the stakeholders can decide on the quantum of Load shedding required to be wired up in Stage-1, 2 & 3 of the df/dt schemes.

General Observations:

CE (GM), CEA opined that a comprehensive study needed to be carried out at National Leve l on the implementation of df/dt relays in the States. A common umbrella is needed at National Level (integrated grid) even though the issue is region specific.

NLDC suggested that it is very important that there should be a common methodology for df/dt relays at National Level. The settings/quantum may be Region Specific based on the LGB of each region taking care of most credible contingencies. He observed that in Rajasthan, there is concentrated RE and in case of trippings, the rate of fall of frequency may be high where as in WR where distributed RE generation are there the rate of fall in frequency may be less for the same quantum of trippings of generation. However it is pertinent to note that the same relay operation methodology (time duration for the operation of relay) should be identified for tripping of relays also.

MS SRPC informed that df/dt relays are implemented only in three regions (WR, NR and SR). Further studies needed to be carried out on the settings/quantum of df/dt relays and its implementation. In SR there are seven Islanding schemes in place, many SPSs, and other protection schemes and it is very difficult to get feeders for further protection schemes.

WRPC observed that the set points may be close to operating frequency.

MS SRPC informed that on other hand there was some recommendation that all protection settings should be away from operating range and accordingly df/dt settings in SR was kept at 49.5 Hz **& (0.2Hz/sec fall of frequency) and 49.3 Hz& & (0.3Hz/sec fall of frequency).** He opined that at present the concentration may be on implementation of AUFR relays. Subsequently df/dt relay issues may be discussed at NPC level and

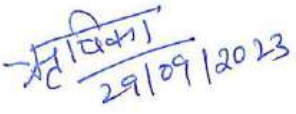
accordingly decision may be taken. At present df/dt relay implementation may be discussed and finalised at Regional Level.

GM, NLDC informed that it is appreciable to note that the recommendations are in line with New IEGC. He added that the df/dt relays are also equally important and need to take up seriously. It is not compulsory that all the regions need to have same set points since the contingencies will be different w.r.t different states. Monitoring certainly will help in getting confidence on safety net. Unfortunately most of the feeders are at lower voltage levels. For SLDCs it will be a challenge to acquire 100 % visibility but effort to be put to achieve the same. In Islanding visibility takes a significant role.

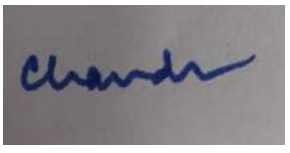
Acknowledgement

The Task Force is thankful to SRPC Secretariat for their assistance and support in preparation of the Report.

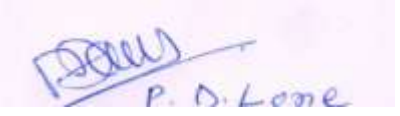
1. Superintending Engineer (O)
   SRPC
   - Convener of the Task Force



2. Chief Engineer (NPC)
   CEA

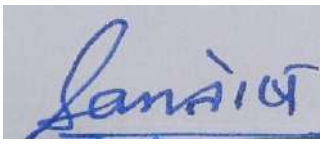


3. Chief Engineer (GM)
   CEA



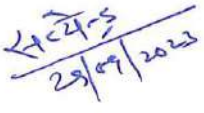
4. Superintending Engineer
   WRPC

5. Superintending Engineer
   ERPC

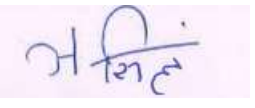


6. Superintending Engineer
   NRPC

7. Superintending Engineer
   NERPC



8. Director (NPC)
   CEA



9. General Manager
   NLDC

10. Member Secretary
    SRPC
    - Chairperson Task Force

ANNEXURE-I

Copy of letters dated 18th & 25th August 2023 from NPC

सत्यमेव जयते

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

No. CEA-GO-15-14/1/2021-NPC Division/250 Date: 18 .08.2023

To,

(As per distribution list)

विषय:- आटोमेटिक अंडर फ्रीक्वेंसी लोड शेडिंग (एयूएफएलएस) और डीएफ/डीटी योजना पर टास्क फोर्स के गठन के संबंध में।

Subject: - Constitution of task force on Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme-reg.

It was decided in the 13th NPC meeting held on 05.07.2023 at Kolkata that a task force under chairmanship of MS, SRPC with Members from GRID-INDIA, RPCs/NPC may be formed.

Accordingly, the Constitution of the task force is as follows:-

1	Member Secretary, SRPC	Chairperson
2	Chief Engineer NPC,CEA	Member
3	Chief Engineer GM,CEA	Member
4	Representative from WRPC	Member
5	Representative from NRPC	Member
6	Representative from, ERPC	Member
7	Representative from NERPC	Member
8	Representative from NPC, CEA	Member
9	Representative from GRID-INDIA	Member
10	K.P Madhu, SE, SRPC	Member Convener

Taskforce may opt other members from any organization, if required.

2. Terms of Reference of the Taskforce is as follows:-
   i. Review of the recommendations of the report as per directions by the 13th NPC meeting within 2 months.
   ii. Prioritization of the loads under AUFLS and df/dt scheme.
   iii. To oversee the implementation of the report on Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme.
   iv. Any other suggestions/recommendations on related matters.

3. In this regard, it is requested that RPCs and GRID-INDIA may send their nominations (of the Rank not below SE from RPCs and GM from GRID-INDIA) to cenpccea@gmail.com by 22.08.2023.

This letter is issued with the approval of the competent authority.

भवदीय/Yours faithfully

18/8/2023

(ऋषिका शरण/Rishika Sharan)
मुख्य अभियन्ता एवं सदस्य सचिव,रा.वि.स /
Chief Engineer & Member Secretary, NPC

Distribution list:

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3. Member secretary, ERPC
4. Member secretary, WRPC
5. Member secretary, NRPC
6. Member secretary, NERPC
7. Chief Engineer GM,CEA

Copy for kind information to:

1. SA to Chairprson,CEA
2. SA to Member GO&D, CEA

******

सत्यमेव जयते

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

No. CEA-GO-15-14/1/2021-NPC Division/289-295 Date: 25.08.2023

To,

(As per distribution list)

विषयः- आटोमेटिक अंडर फ्रीक्वेंसी लोड शेडिंग (एयूएफएलएस) और डीएफ/डीटी योजना पर टास्क फोर्स के गठन के संबंध में।

Subject: - Constitution of task force on Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme-reg.

It was decided in the 13th NPC meeting held on 05.07.2023 at Kolkata that a task force under chairmanship of MS, SRPC with Members from GRID-INDIA, RPCs/NPC may be formed.

In this regards, NPC division vide letter No- CEA-GO-15-14/1/2021-NPC Division/250 dated 18.08.2023 requested RPCs and GRID-INDIA to send nomination for task force on Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme.

Accordingly, based on the nomination received from RPCs and GRID-INDIA the Constitution of the task force is as follows:-

1	Member Secretary, SRPC	Shri Asit Singh	**Chairperson**
2	Chief Engineer NPC,CEA	Smt. Rishika Sharan	Member
3	Chief Engineer GM,CEA	Shri Chandra Prakash	Member
4	Superintending Engineer,WRPC	Shri P.D.Lone	Member
5	Superintending Engineer,ERPC	Shri Shyam Kejriwal	Member
6	Superintending Engineer, NRPC	Shri Anzum Parwej	Member
7	Superintending Engineer NERPC	Shri S M Aimol	Member
8	Director,NPC,CEA	Shri Satyendra Kumar Dotan	Member
9	General Manager, NLDC	Shri Vivek Panday	Member
10	Superintending Engineer, SRPC	Shri K.P Madhu	**Member Convener**

2. Terms of Reference of the Taskforce is as follows:-

i. Review of the recommendations of the report as per directions by the 13th NPC meeting within 2 months.

ii. Prioritization of the loads under AUFLS and df/dt scheme.

iii. To oversee the implementation of the report on Automatic Under Frequency Load Shedding (AUFLS) and df/dt scheme.

iv. Any other suggestions/recommendations on related matters.

Task force can co-opt any member, if required.

भवदीय/Yours faithfully

ऋषिका 21(2)
25/8/23

(ऋषिका शरण/Rishika Sharan)
मुख्य अभियन्ता एवं सदस्य सचिव,रा.वि.स /
Chief Engineer & Member Secretary, NPC

Distribution list:

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Copy for kind information to:

1. SA to Chairperson, CEA, Sewa Bhawan, RK Puram. New Delhi.
2. SA to Member GO&D, CEA, Sewa Bhawan, RK Puram. New Delhi.
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7. Shri Deepak Kumar., Member Secretary, WRPC, Plot No- F-3, MIDC Area, Marol, Opp. SEEPZ, Central Road, Andheri (East), Mumbai-400093.[email: ms-wrpc@nic.in]

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ANNEXURE-II

Format for testing of AUFLS Relays

Annexure - II

REGION:

Inspection of AUFLS Relays at Site: **Date & Time:**

Details of Relay: **System frequency:**

Make of Relay	Serial no.	Stage	Date of Inspection

State/Name of Power Utilities:

Name of Sub-station:

Sr. No.	Name of feeder	Normal load relief envisaged in MW	UFR setting 49.2/49.0/ 48.8/48.7/ 48.6/48.4/ 48.2/48.0 Hz	Actual load at the time of inspection	Whether the feeder included in any other load shedding (such as SPS, Islanding, manual /ADMS etc)	Frequency Testing equipment used		Relay pick up frequency, Hz	Pick up time, sec	Relay drop off frequency, Hz	Relay drop off time, sec	Relay through trip test carried out Breaker Tripped or not	If Realy trip test is not carried out then continuity of Trip circuit upto Breaker trip coil checked
						Make	Sr. No.						

Name, Designation & Signature of the Site Engineer present at that time of inspection

Name & designation & sign of 3rd party inspecting officer

Note: 1. The functional testing has to be carried out by readjusting the relay setting to the present grid frequency.

2. Details of UFR operational & load relief obtained may be furnished in separate annexures.

ANNEXURE-III

Sample RPC Inspection Report Format

Annexure-III

UFR and df/dt Relay Inspection Report

Name of Substation:

Owned by (Licensee):

Date of Inspection/Testing by RPC:

Sl. No.	Name of the feeder/PTR	Setting Details of UFR & df/dt Relay	Expected Load Relief (declared) MW)	Maximum load (MW) *	Average load (MW)*	Status of SCADA Mapping	Type of Feeder (Radial/Ring)	Observations (Including make of Relay)	Action to be taken

*** Load during previous six months**

Annexure-XII 14th NPC

Status of transactions on PUShP portal

S.No.	Original beneficiary	Generating station	Date (Power requirment date)	Time duration	Surplus power (in MW)	New Beneficiary	Cost (FC+ VC) (in Rs)	FC (in Rs)
1	Kerala	Kudgi STPS	16 April 2023	00:00 to 06:30 &19:00 to 00:00	105	Telangana	5.19	1.67
2	Kerala	Simhadri STPS	16 April 2023	00:00 to 06:30 &19:00 to 00:00	80.9	Telangana	4.15	1.67
3	UPPCL	Rihand STPS	10 May 2023	13:00 to 15:00	200	Punjab	2.48	0.84
4	UPPCL	Kahalgaon STPS-II	19 May 2023	15:00 to 18:00	250.95	Telangana	3.96	1.09
5	UPPCL	Farakka STPS-I&II	19 May 2023	15:00 to 18:00	33.28	Telangana	4.09	0.82
6	UPPCL	NPGC	19 May 2023	16:00 to 17:00	209.01	Telangana	4.75	2.17
7	UPPCL	UNCHAHAR2	19 May 2023	15:00 to 19:00	128.9	Telangana	4.61	1.1
8	UPPCL	Kahalgaon STPS-II	20 May 2023	15:00 to 18:00	250.95	Telangana	3.96	1.09
9	UPPCL	Farakka STPS-I&II	20 May 2023	15:00 to 18:00	33.28	Telangana	4.09	0.82
10	UPPCL	NPGC	20 May 2023	15:00 to 17:00	209.01	Telangana	4.75	2.17
11	UPPCL	UNCHAHAR2	20 May 2023	15:00 to 19:00	128.9	Telangana	4.61	1.1
12	Mizoram	Assam Gas Based Power Plant (AGBPP)	26 May 2023	00:00 to 01:00 & 22:00 to 00:00	12	Assam	7.12	1.96
13	Mizoram	Assam Gas Based Power Plant (AGBPP)	1 June 2023	00:00 to 02:00 & 18:00 to 00:00	12	Assam	7.12	1.96
14	Mizoram	Assam Gas Based Power Plant (AGBPP)	2 June 2023	00:00 to 02:00 & 18:00 to 00:00	12	Assam	7.12	1.96
15	Chandigarh	Rihand 1	08 July 2023	23:30 to 00:00	10	Punjab	2.36	
16	Mizoram	AGBPP	09 Aug 2023	19:00 to 00:00	12	Telangana	6.69	1.96
17	Mizoram	AGTCCPP	09 Aug 2023	19:00 to 00:00	6.44	Telangana	6.29	2.05
18	Mizoram	BGTPP	09 Aug 2023	19:00 to 00:00	31.05	Telangana	6.03	2.4
19	Mizoram	AGBPP	10 Aug 2023	19:00 to 00:00	12	Telangana	6.69	2.05
20	Mizoram	AGTCCPP	10 Aug 2023	19:00 to 00:00	6.44	Telangana	6.29	2.2
21	Mizoram	AGBPP	11 Aug 2023	00:00 to 2:00 &6:15 to 7:15 & 18:15 to 00:00	12	Telangana	6.69	2.05
22	Mizoram	AGTCCPP	11 Aug 2023	00:00 to 2:00 &6:15 to 7:15 & 18:15 to 00:00	6.44	Telangana	6.29	2.2
23	Mizoram	BGTPP	11 Aug 2023	00:00 to 2:00 &6:15 to 7:15 & 18:15 to 00:00	31.05 (26 blocks), 20 (9 blocks)	Telangana	6.03	2.4
24	UPPCL	DADRT2	11 Aug 2023	7:00 to 7:30	98	Telangana	5.92	
25	Mizoram	AGBPP	12 Aug 2023	00:00 to 1:00 &6:00 to 7:30 & 18:00 to 00:00	12	Telangana	6.69	2.05
26	Mizoram	AGTCCPP	12 Aug 2023	00:00 to 1:00 &6:00 to 7:30 & 18:00 to 00:00	6.44	Telangana	6.53	2.2
27	Mizoram	BGTPP	12 Aug 2023	00:00 to 1:00 &6:00 to 7:30 & 18:00 to 00:00	31.05 (20 blocks), 20 (14 blocks)	Telangana	6.03	2.4
28	Mizoram	AGBPP	13 Aug 2023	00:00 to 2:00 & 18:00 to 00:00	12	Assam	6.69	2.05
29	Mizoram	AGTCCPP	13 Aug 2023	00:00 to 2:00 & 18:00 to 00:01	6.44	Assam	6.53	2.2
30	Mizoram	BGTPP	13 Aug 2023	00:00 to 2:00 & 19:00 to 00:00	31.05 (20 blocks), 15 (8 blocks)	Assam	6.03	2.4
31	Mizoram	AGBPP	14 Aug 2023	00:00 to 2:00 & 18:00 to 00:00	12	Assam	6.69	2.05
32	Mizoram	AGBPP	14 Aug 2023	6:00 to 7:30	12	Telangana	6.69	2.05
33	Mizoram	AGTCCPP	14 Aug 2023	00:00 to 2:00 & 18:00 to 00:00	6.44	Assam	6.53	2.2
34	Mizoram	AGTCCPP	14 Aug 2023	6:00 to 7:30	6.44	Telangana	6.53	2.2
35	Mizoram	BGTPP	14 Aug 2023	00:00 to 2:00 & 18:00 to 00:00	31.05(18 blocks) , 15 (14 blocks)	Assam	6.03	2.4
36	Mizoram	BGTPP	14 Aug 2023	6:00 to 7:30	15	Telangana	6.03	2.4
37	MPSEB_ Beneficiary	SOLAPUR	19 Aug 2023	11:00 to 12:30	100 MW	MSEB_ Beneficiary	6.127	1.71
38	Mizoram	AGBPP	19 Aug 2023	00:00 to 2:30&5:30 to 7:30 &18:00 to 00:00	12	Telangana	6.698	2.05
39	Mizoram	AGTCCPP	19 Aug 2023	00:00 to 2:30&5:30 to 7:30 &18:00 to 00:00	6.44	Telangana	6.531	2.2
40	Mizoram	BGTPP	19 Aug 2023	00:00 to 2:30&4:00 to 7:30 &18:00 to 00:00	31.05 (32 blocks) , 23 (2blocks)	Telangana	6.03	2.4
41	Mizoram	AGBPP	20 Aug 2023	00:00 to 2:00 &17:00 to 00:00	12	Assam	6.698	2.05
42	Mizoram	AGBPP	20 Aug 2023	04:00 to 7:30	12	APTRANSCO	6.698	2.05
43	Mizoram	AGTCCPP	20 Aug 2023	00:00 to 2:00 &18:00 to 00:00	6.44	Assam	6.531	2.2
44	Mizoram	AGTCCPP	20 Aug 2023	4:45 to 7:00	6.44	APTRANSCO	6.531	2.2

45	Mizoram	AGBPP	21 Aug 2023	00:00 to 2:00&6:00 to 7:30 &17:30 to 00:00	12	Assam	6.69	2.05
46	Mizoram	AGBPP	21 Aug 2023	6:00 to 7:30	12	Telangana	6.69	2.05
47	Mizoram	AGTCCPP	21 Aug 2023	00:00 to 2:30 &17:00 to 00:00	6.44	Assam	6.53	2.2
48	Mizoram	AGTCCPP	21 Aug 2023	6:00 to 7:30	6.44	Telangana	6.53	2.2
49	Mizoram	AGBPP	22 Aug 2023	00:00 to 2:00&18:00 to 00:00	12	Assam	6.69	2.05
50	Mizoram	AGBPP	22 Aug 2023	6:00 to 7:30	12	Telangana	6.69	2.05
51	Mizoram	AGTCCPP	22 Aug 2023	00:00 to 2:30&17:00 to 00:00	6.44	Assam	6.53	2.2
52	Mizoram	AGTCCPP	22 Aug 2023	6:00 to 7:30	6.44	Telangana	6.53	2.2
53	Mizoram	AGBPP	23 Aug 2023	00:00 to 2:00&18:00 to 00:00	12	Assam	6.69	2.05
54	Mizoram	AGBPP	23 Aug 2023	2:00 to 7:30	12	Telangana	6.69	2.05
55	Mizoram	AGTCCPP	23 Aug 2023	00:00 to 2:00 &17:30 00:00	6.44	Assam	6.53	2.2
56	Mizoram	AGTCCPP	23 Aug 2023	2:30 to 7:30	6.44	Telangana	6.53	2.2
57	Mizoram	AGBPP	24 Aug 2023	00:00 to 03:30 &16:00 to 00:00	12	Assam	6.69	2.05
58	Mizoram	AGBPP	24 Aug 2023	03:30 to 16:00	12	Telangana	6.69	2.05
59	Mizoram	AGTCCPP	24 Aug 2023	00:00 to 03:30 &16:30 to 00:00	6.44	Assam	6.53	2.2
60	Mizoram	AGTCCPP	24 Aug 2023	03:30 to 16:30	6.44	Telangana	6.53	2.2
61	Mizoram	BGTPP	24 Aug 2023	00:00 to 04:00 & 07:00 to 00:00	31.05	Assam	6.09	2.4
62	Mizoram	BGTPP	24 Aug 2023	04:00 to 07:00	31.05	Telangana	6.09	2.4
63	Mizoram	AGBPP	26 Aug 2023	00:00 to 03:00 & & 07:00 to 09:30 &17:30 to 00:00	12	Assam	6.69	2.05
64	Mizoram	AGBPP	26 Aug 2023	03:00 to 07:00 & 09:30 to 17:30	12	Telangana	6.69	2.05
65	Mizoram	AGTCCPP	26 Aug 2023	00:00 to 03:00 &18:00 to 00:00	6.44	Assam	6.53	2.2
66	Mizoram	AGTCCPP	26 Aug 2023	03:00 to 18:00 &	6.44	Telangana	6.53	2.2
67	Mizoram	BGTPP	26 Aug 2023	00:00 to 03:00 & 06:00 to 09:30 &15:00 to 00:00	24	Assam	6.09	2.4
68	Mizoram	BGTPP	26 Aug 2023	03:00 to 06:00 & 09:30 to 15:00	24	Telangana	6.09	2.4
69	Mizoram	AGBPP	2 Sep 2023	00:00 to 02:00 &11:30 to 13:45	12	Telangana	6.69	2.05
70	Mizoram	AGBPP	24 Sep 2023	18:00 to 00:00	12	Assam	6.69	2.025
71	Mizoram	AGBPP	10 Oct 2023	00:00 to 03:00 & 05:30 to 08:30 & 18:30 to 00:00	12	Telangana	6.689	2.025
72	Mizoram	AGTCCPP	10 Oct 2023	00:00 to 03:00 & 05:30 to 08:30 & 18:30 to 00:00	6.438	Telangana	6.104	1.777
73	Mizoram	AGTCCPP	20 Oct 2023	00:00 to 02:00 & 05:30 to 06:30 & 15:30 to 00:00	6.438	Telangana	6.176	1.816
74	Mizoram	AGBPP	21 Oct 2023	00:00 to 02:00 & 05:30 to 08:30 & 16:00 to 17:30 & 23:00 to 00:00	12	Telangana	6.74	2.048
75	Mizoram	AGTCCPP	21 Oct 2023	00:00 to 02:00 & 05:30 to 08:30 & 16:00 to 17:30 & 23:00 to 00:00	6.438	Telangana	6.176	1.816
76	Mizoram	BGTPP	21 Oct 2023	00:00 to 02:00 & 23:00 to 00:00	31.05	Telangana	6.096	2.406
77	Mizoram	AGBPP	03 Nov 2023	16:30 to 19:30	12	Telangana	6.74	2.048
78	Mizoram	AGTCCPP	03 Nov 2023	16:30 to 19:30	6.438	Telangana	6.176	1.816
79	Mizoram	AGBPP	04 Nov 2023	16:30 to 19:30	12	Telangana	6.74	2.048

80	Mizoram	AGTCCPP	04 Nov 2023	16:30 to 19:30	6.438	Telangana	6.176	1.816
81	Mizoram	AGBPP	05 Nov 2023	17:30 to 19:00	12	Telangana	6.74	2.048
82	Mizoram	AGTCCPP	05 Nov 2023	17:30 to 19:00	6.438	Telangana	6.176	1.816
83	Mizoram	AGBPP	06 Nov 2023	16:45 to 19:15	12	Telangana	6.74	2.048
84	Mizoram	AGTCCPP	06 Nov 2023	16:45 to 19:15	6.438	Telangana	6.176	1.816
85	Mizoram	AGBPP	07 Nov 2023	17:00 to 19:00	12	Telangana	6.74	2.048
86	Mizoram	AGTCCPP	07 Nov 2023	17:00 to 19:00	6.438	Telangana	6.176	1.816
87	Mizoram	AGBPP	23 Nov 2023	17:15 to 18:45	12	Telangana	6.56	2.18
88	Mizoram	AGBPP	24 Nov 2023	16:45 to 19:15	12	Telangana	6.56	2.18
89	Mizoram	AGTCCPP	24 Nov 2023	16:45 to 19:15	6.438	Telangana	6.312	1.93
90	Mizoram	AGBPP	19 Jan 2024	07:00 to 09:00	5 (1 block) & 12 (7 blocks)	Telangana	7.04	2.37
91	Mizoram	AGTCCPP	19 Jan 2024	07:15 to 09:00	6.44	Telangana	6.51	2.12
92	Mizoram	AGBPP	20 Jan 2024	06:30 to 09:00	12	Telangana	7.04	2.37
93	Mizoram	AGTCCPP	20 Jan 2024	06:30 to 06:45 & 08:00 to 09:00	6.44	Telangana	6.51	2.12
94	Mizoram	AGBPP	24 Jan 2024	06:00 to 07:00	12	Telangana	7.04	2.37

Annexure-XIII 14th NPC

S.NO	Station	KV	Owner	State	Audit team	Month of Audit	TEAM
1	Chandrapur	400	MSETCL	Maharashtra	CSPTCL	DECEMBER	CS-A
2	Chandrapur GCR	400	MSETCL	Maharashtra	CSPTCL	2ND WEEK OF JANUARY	CS-B
3	Chandrapur HVDC	400	MSETCL	Maharashtra	CSPTCL	1ST WEEK OF FEBRUARY	CS-C
4	Chandrapur-II	400	MSETCL	Maharashtra	CSPTCL	LAST WEEK OF FEBRUARY	CS-A
5	Khaparkheda	400	MSETCL	DNH	CSPTCL	2ND WEEK OF MARCH	CS-B
6	Kolhapur	400	MSETCL	Maharashtra	CSPTCL	2ND WEEK OF APRIL	CS-C
7	Kudus	400	MSETCL	Maharashtra	CSPTCL	LAST WEEK OF MAY	CS-A
8	Alkud	400	MSETCL	Maharashtra	GETCO	DECEMBER	GJ-A
9	Bableshwar	400	MSETCL	Maharashtra	GETCO	2ND WEEK OF JANUARY	GJ-B
10	Chakan	400	MSETCL	Maharashtra	GETCO	2ND WEEK OF FEBRUARY	GJ-A
11	Kalwa	400	MSETCL	Maharashtra	GETCO	LAST WEEK OF MARCH	GJ-B
12	Kharghar	400	MSETCL	Maharashtra	GETCO	LAST WEEK OF APRIL	GJ-A
13	Lonikhand	400	MSETCL	Maharashtra	GETCO	1ST WEEK OF MAY	GJ-B
14	Lonikhand-II	400	MSETCL	Maharashtra	GETCO	1ST WEEK OF JUNE	GJ-A
15	Padghe	400	MSETCL	Maharashtra	GETCO	1ST WEEK OF JULY	GJ-B
16	Padghe HVDC	400	MSETCL	Maharashtra	GETCO	2ND WEEK OF JULY	GJ-A
17	Karjat	400	MSETCL	Maharashtra	GETCO	1ST WEEK OF AUGUST	GJ-B
18	Jejuri	400	MSETCL	Maharashtra	GETCO	LAST WEEK OF AUGUST	GJ-A
19	Akola	400	MSETCL	Maharashtra	MPPTCL	1ST WEEK OF JANUARY	MP-A
20	Aurangabad-M(Waluj)	400	MSETCL	Maharashtra	MPPTCL	3RD WEEK OF JANUARY	MP-B
21	Bhusawal (Khadka)	400	MSETCL	Maharashtra	MPPTCL	2ND WEEK OF FEBRUARY	MP-C
22	Deepnagar	400	MSETCL	Maharashtra	MPPTCL	1ST WEEK OF MARCH	MP-A
23	Dhule-MS	400	MSETCL	Maharashtra	MPPTCL	3RD WEEK OF MARCH	MP-B
24	Ektuni (Aurangabad(3))	400	MSETCL	Maharashtra	MPPTCL	1ST WEEK OF APRIL	MP-C
25	Koradi	400	MSETCL	Maharashtra	MPPTCL	3RD WEEK OF APRIL	MP-A
26	Koradi-II	400	MSETCL	Maharashtra	MPPTCL	2ND WEEK OF MAY	MP-B
27	Koyna stage-IV	400	MSETCL	Maharashtra	MPPTCL	1ST WEEK OF JUNE	MP-C
28	Nagothane	400	MSETCL	Maharashtra	MPPTCL	3RD WEEK OF JUNE	MP-D
29	New koyna	400	MSETCL	Maharashtra	MPPTCL	2ND WEEK OF AUGUST	MP-E
30	Nanded	400	MSETCL	Maharashtra	GOA	JANUARY	GOA
31	Parli-M	400	MSETCL	Maharashtra	GOA	FEBRUARY	GOA
32	Sholapur-M	400	MSETCL	Maharashtra	GOA	APRIL	GOA
33	Taptithanda	400	MSETCL	Maharashtra	GOA	MAY	GOA
34	Karad	400	MSETCL	Maharashtra	GOA	JUNE	GOA
35	Bhilai	400	CSPTCL	Chhattisgarh	MAHARASTRA	2nd WEEK OFJANUARY	MH-E
36	Jagdalpur	400	CSPTCL	Chhattisgarh	MAHARASTRA	2nd WEEK OF MARCH	MH-E
37	Kurud(Dhamtari)	400	CSPTCL	Chhattisgarh	MAHARASTRA	2nd WEEK OF MAY	MH-E
38	Marwa	400	CSPTCL	Chhattisgarh	MP	2ND WEEK OF JANUARY	MP-D

39	Raita	400	CSPTCL	Chhattisgarh	MP	LAST WEEK OF FEBRUARY	MP-D
40	Korba (W)	400	CSPGCL	Chhattisgarh	MP	2ND WEEK OF APRIL	MP-D
41	Korba (W)-Ext	400	CSPGCL	Chhattisgarh	MP	3RD WEEK OF MAY	MP-A
42	Khirsara(GSBPL)	400	GETCO	Gujarat	MAHARASTRA	DECEMBER	MH-F
43	Pachcham	400	GETCO	Gujarat	MAHARASTRA	LAST WEEK OF JANUARY	MH-F
44	Ranchodpura	400	GETCO	Gujarat	MAHARASTRA	LAST WEEK OF MARCH	MH-F
45	Vav(GIS)	400	GETCO	Gujarat	MAHARASTRA	LAST WEEK OF MAY	MH-F
46	Wanakbori	400	GETCO	Gujarat	MAHARASTRA	LAST WEEK OF JULY	MH-F
47	Wanakbori GIS	400	GETCO	Gujarat	MAHARASTRA	LAST WEEK OF AUGUST	MH-F
48	Ukai	400	GETCO	Gujarat	MPPTCL	DECEMBER	MP-E
49	Zerda(Kansari)	400	GETCO	Gujarat	MPPTCL	LAST WEEK OF JANUARY	MP-E
50	Bhachunda	400	GETCO	Gujarat	MPPTCL	LAST WEEK OF MARCH	MP-E
51	Shapar	400	GETCO	Gujarat	MPPTCL	LAST WEEK OF JUNE	MP-B
52	Bhogat	400	GETCO	Gujarat	MPPTCL	LAST WEEK OF AUGUST	MP-C
53	Astha	400	MPPTCL	Madhya Pradesh	MAHARASTRA	DECEMBER	MH-A
54	Badnawar	400	MPPTCL	Madhya Pradesh	MAHARASTRA	1st WEEK OF JANUARY	MH-B
55	Bhopal-MP	400	MPPTCL	Madhya Pradesh	MAHARASTRA	3rd WEEK OFJANUARY	MH-C
56	Bina-MP	400	MPPTCL	Madhya Pradesh	MAHARASTRA	3rd WEEK OFJANUARY	MH-D
57	Chhegaon	400	MPPTCL	Madhya Pradesh	MAHARASTRA	1st WEEK OF FEBRUARY	MH-A
58	Indore-MP	400	MPPTCL	Madhya Pradesh	MAHARASTRA	3rd WEEK OF FEBRUARY	MH-B
59	Julwania	400	MPPTCL	Madhya Pradesh	MAHARASTRA	1st WEEK OF MARCH	MH-C
60	Katni	400	MPPTCL	Madhya Pradesh	MAHARASTRA	3rd WEEK OF MARCH	MH-D
61	Kirnapur	400	MPPTCL	Madhya Pradesh	MAHARASTRA	1st WEEK OF APRIL	MH-A
62	Mandsaur	400	MPPTCL	Madhya Pradesh	MAHARASTRA	3rd WEEK OF APRIL	MH-B
63	Nagda	400	MPPTCL	Madhya Pradesh	MAHARASTRA	1st WEEK OF MAY	MH-C
64	Pithampur	400	MPPTCL	Madhya Pradesh	MAHARASTRA	1st WEEK OF MAY	MH-D
65	Sagar	400	MPPTCL	Madhya Pradesh	MAHARASTRA	1st WEEK OF JUNE	MH-A
66	Ujjain	400	MPPTCL	Madhya Pradesh	MAHARASTRA	3rd WEEK OF JUNE	MH-B
67	Malwa	400	MPPTCL	Madhya Pradesh	MAHARASTRA	1st WEEK OF JULY	MH-C
68	Guna(PBGTL)	400	MPPTCL	Madhya Pradesh	MAHARASTRA	3rd WEEK OF JULY	MH-D
69	Birsingpur	400	MPPGCL	Madhya Pradesh	MAHARASTRA	1st WEEK OF AUGUST	MH-A
70	Indira Sagar	400	MPPGCL	Madhya Pradesh	MAHARASTRA	3rd WEEK OF AUGUST	MH-B
71	Satpura	400	MPPGCL	Madhya Pradesh	MAHARASTRA	1st WEEK OF SEPTEMBER	MH-C
72	Singhaji Stg-II	400	MPPGCL	Madhya Pradesh	MAHARASTRA	1st WEEK OF SEPTEMBER	MH-D
73	Amona	220	GOA	GOA	MAHARASTRA	2ND WEEK OF FEBRUARY	MH-G
74	Tivim	220	GOA	GOA	MAHARASTRA	2ND WEEK OF APRIL	MH-G
75	Xeldem	220	GOA	GOA	MAHARASTRA	2ND WEEK OF JUNE	MH-G
76	Ponda	220	GOA	GOA	MAHARASTRA	2ND WEEK OF AUGUT	MH-G
77	Cuncolim	220	GOA	GOA	MAHARASTRA	2ND WEEK OF OCTOBER	MH-G

Annexure-XIV 14th NPC

Overview of the status of Islanding Scheme in all Regions									
Regions	**Number of Islanding Schemes**			**No. of Implemented/Inservice IS (Green Color)**	**No. of existing IS (Cat-A) which are Under Implementation/under review (Yellow Color)**	**No. of Newly proposed IS (Cat-B) which are under design/Under Implementaion stage (Yellow Color)**	**No. of Newly proposed IS (Cat-B) which are Implemented/Inservice (Red color)**	**No. of IS having SCADA visibility**	**Remarks**
	Cat-A	**Cat-B**	**Total**						
SR	4	3	7	7	0	0	3	7	-
ER	7	2	9	4	3	2	0	5*	*1-under implementation IS KBUNL IS is discontinued.
NR	4	7	11	4	1	6	0	6*	*3-under implementationIS /IS in design stage
WR	7	5	12	6	1	5	0	6*	*1-under implementation IS KBUNL IS is discontinued.
NER	2	2	4	0	2	2	0	2*	*2-under implementationIS /IS in design stage
Total	**24**	**19**	**43**	**21**	**7**	**15**	**3**	**26***	5-under implementationIS /IS in design stage

Category of Islanding Schemes:	
Category 'A' IS	Islanding Schemes which are existing or already planned and in implementation stage.
Category 'B' IS	Islanding Schemes which are newly proposed.
Category-'I' IS	Islanding Schemes which are designed for the major cities, senstive generation or strategic loads.
Category-'II' IS	Islanding Schemes other than category I are Category II IS
Colour codes of Islanding Schemes:	
Green	Implemented/In service Islanding Scheme
Yellow	Under review/ Under Implementation Islanding Scheme
Red	Newly proposed Islanding Scheme which are under design/under implementaion stage

Central Electricity Authority
National Power Committee Division

Monthly MIS report - Islanding Scheme (IS) of Sothern Region (SR)
Status updated on …….. 24.01.2024

SN (Color Coding for Island Implementation)	Name of Islanding Scheme	Category A/B	Sub Category- (City/Major Town/ Strategic Load/Sensitive Generation)	Status (Category A -In-Service/ Under Review/ Reviewed & Under Implementation) (Category B-DPR Preparation/Study/ Design/ Approval/Procurement/Commissioning/Implementation)	Timeline for completion of Review/ Reviewed & Under Implementation for Category A Timeline for implementation for Category B (DPR Preparation/Study/ Design/ Approval/Procurement/Commissioning/Implementation)	Progress of the scheme during the last month	Healthiness of the Scheme	Timeline for SCADA Visibility in Sub SLDC/ SLDC/ RLDC	Remarks, if any (Major Change in the scheme may also be intimated)	Color Coding for SCADA Display Creation
	I	II	III	IV	V	VI	VII	VIII	IX	
Category I										
1	Hyderabad IS	A	City/Major Town/ Strategic Load	Reviewed scheme implemented w.e.f. 31.07.2021/ In service	Review completed on 05.03.2021. Reviewed scheme put into service w.e.f. 31.07.2021. In line with SOP, the scheme was reviewed comprehensively in the Meeting to review Hyderabad Islanding Scheme held on 17.10.2023. Also the Islanding Schmemes are reviewed regularly in the monthly PCSC Meetings. In addition the Healthiness of the islanding scheme is monitored in the monthly PCSC meetings.	NA	Healthy	November, 2021/ Completed on 30.11.2021	—	
2	Chennai IS	A	City/Major Town/ Strategic Load	Reviewed scheme implemented	Review completed on 18.05.2021. Reviewed scheme put into service w.e.f. 31.05.2022. In line with SOP, the scheme would be reviewed comprehensively in the Meeting to review Chennai , Kudankulam & Neyveli islanding Schemes scheduled on 16.11.2023. Also the Islanding Schmemes are reviewed regularly in the monthly PCSC Meetings. In addition the Healthiness of the islanding scheme is monitored in the monthly PCSC meetings.	NA	Healthy	November, 2021/ Completed on 28.02.2022	—	
3	Kudankulam IS	A	City/Major Town/ Strategic Load/ Sensitive Generation	Reviewed scheme implemented w.e.f. 31.12.2021/ In Service	Review completed on 18.08.2021. Reviewed scheme put into service w.e.f. 31.12.2021. In line with SOP, the scheme would be reviewed comprehensively in the Meeting to review Chennai , Kudankulam & Neyveli islanding Schemes scheduled on 16.11.2023. Also the Islanding Schmemes are reviewed regularly in the monthly PCSC Meetings. In addition the Healthiness of the islanding scheme is monitored	NA	Healthy	December, 2021/ Completed on 31.03.2022		
4	Bengaluru IS	B	City/Major Town/ Strategic Load	Implemented w.e.f. 31.05.2022/ In-Service	The Scheme was identified in December 2020. Design completed in July, 2021, and the scheme was put into service w.e.f. 31.05.2022.	NA	Healthy	December, 2021/ Completed on 31.05.2022	—	
Category II										
5	Neyveli IS	A	City/Major Town/ Strategic Load	Reviewed Scheme implemented w.e.f. 01.11.2021/ In-Service	Review completed on 04.06.2021; Reviewed scheme put into service w.e.f. 01.11.2021. In line with SOP, the scheme would be reviewed comprehensively in the Meeting to review Chennai , Kudankulam & Neyveli islanding Schemes scheduled on 16.11.2023. Also the Islanding Schmemes are reviewed regularly in the monthly PCSC Meetings. In addition the Healthiness of the islanding scheme is monitored in the monthly PCSC meetings.	NA	Healthy	November, 2021/ Completed on 28.02.2022	—	

6	Visakhapatnam IS	B	City/Major Town/ Strategic Load	Implemented w.e.f. 31.07.2021/ In-Service	The Scheme was identified in Jan 2020, but owing to Covid-19 pandemic, the scheme was taken up for implementation in January, 2021. The scheme was put into service w.e.f. 31.07.2021. In line with SOP, the scheme was reviewed comprehensively in the Meeting to review Hyderabad Islanding Scheme held on 115.09.2023. Also the Islanding Schmemes are reviewed regularly in the monthly PCSC Meetings. In addition the Healthiness of the islanding scheme is monitored in the monthly PCSC meetings.	NA	Healthy	Novemeber, 2021/ Completed on 30.11.2021	—	
7	Vijayawada IS	B	City/Major Town	Implemented w.e.f. 30.11.2021/ In-Service	The Scheme was identified in April 2021. Design completed in July, 2021, and the scheme was put into service w.e.f. 30.11.2021. In line with SOP, the scheme was reviewed comprehensively in the Meeting to review Hyderabad Islanding Scheme held on 115.09.2023. Also the Islanding Schmemes are reviewed regularly in the monthly PCSC Meetings. In addition the Healthiness of the islanding scheme is monitored in the monthly PCSC meetings.	NA	Healthy	Novemeber, 2021/ Completed on 30.11.2021	—	

Central Electricity Authority
National Power Committee Division
MIS report - Islanding Scheme(IS) of Eastern Region (ER)

status as on 24.01.2024

S.No. (Color code for Islanding Scheme)	Name of Islanding Scheme	Category A/B	Sub Category- (City/Major Town/ Strategic Load/Sensitive Generation)	Status (Category A -In-Service/ Under Review/ Reviewed & Under Implementation) (Category B-DPR Preparation/Study/ Design/ Approval/Procurement/Commissioning/Implementation)	Timeline for completion of Review/ Reviewed & Under Implementation for Category A Timeline for implementation for Category B (DPR Preparation/Study/ Design/ Approval/Procurement/Commissioning/Implementation)	Healthiness of the scheme	Timeline for SCADA Visibility in Sub SLDC/ SLDC/ RLDC	Remarks, if any (Major Change in the scheme may also be intimated)
	I	II	III	IV	V	VII	VIII	IX
Category I								
1	Kolkata (CESC) IS	A	City/Major Town/ Strategic Load	Implemented/ In-Service.	The scheme was last reviewed in February, 2021. No operational constraints have been reported.	Healthy	Implemented on 13.11.2021	—
2	Patna IS	B	City/Major Town/ Strategic Load	Design Stage	Review of islanding study & designing of the logic: Completed Implementation of Islanding Scheme: By December'2022	NA	-	—
3	Ranchi IS	B	City/Major Town/ Strategic Load	Under Study	Feasibility study would again be done after the commissioning of PVUNL units.	NA	-	—
Category II								
4	Bakreswar TPS IS	A	Industrial and Railway load	Implemented/ In-Service.	The scheme was last reviewed in February, 2021. No operational constraints have been reported.	—	Implemented in January, 2022	—
5	Haldia (Tata Power) IS	A	Industrial areas of Haldia and Port	Implemented/ In-Service.	The scheme was last reviewed in February, 2021. No operational constraints have been reported.	—	Implemented in January, 2022	—
6	Howrah (Bandel) IS	A	Industrial load	Implemented/ In-Service.	The scheme was last reviewed in February, 2021. No operational constraints have been reported.	—	Implemented in January, 2022	—
7	IB valley TPS IS	A	MCL Load	Under-implementation.	The scheme is under implementation and expected to be completed by Sept 2022	NA	Septemebr 2022	—
8	Farakka STPS, NTPC IS	A	Industrial & ECL Load	Under revision	—	NA	Implemented in December'2021	In 194th OCC Meeting, JUSNL representative submitted that requisition for sanctioning of funds from Govt. of Jharkhand is in process and is expected to be approved in the first week of September 2022.
9	Chandrapura IS of DVC System	A	Industrial load	Under revision	The scheme is under Review and scheme is expected to complete by September 2022.	NA	September, 2022	Discussed in Special Meeting of ERPC held on 06.08.2021. Original scheme was with stage A of CTPS (3x120 MW). As stage A of CTPS has been retired, this scheme is being evolved considering the stage B of CTPS (2x250 MW).

Category of Islanding Schemes:	
Category 'A' IS	Islanding Schemes which are existing or already planned and in implementation stage.
Category 'B' IS	Islanding Schemes which are newly proposed.
Category-'I' IS	Islanding Schemes which are designed for the major cities, senstive generation or strategic loads.
Category-'II' IS	Islanding Schemes other than category I are Category II IS
Colour codes of Islanding Schemes:	
Green	Implemented/In service Islanding Scheme
Yellow	Under review/ Under Implementation Islanding Scheme
Red	Newly proposed Islanding Scheme which are under design/under implementaion stage

NA	**Not Applicable**

Central Electricity Authority
National Power Committee Division
MIS report - Islanding Scheme (IS) of Northern Region (NR)

Status as on 24.01.2024

S.No. (Color code for Islanding Scheme)	Name of Islanding Scheme	Category A/B	Sub Category- (City/Major Town/ Strategic Load/Sensitive Generation)	Status (Category A -In-Service/ Under Review/ Reviewed & Under Implementation) (Category B-DPR Preparation/Study/ Design/ Approval/Procure	Timeline for completion of Review/ Reviewed & Under Implementation for Category A Timeline for implementation for Category B (DPR Preparation/Study/ Design/ Approval/Procurement/Commissioning/Implementation)	Progress of the scheme	Healthiness of the scheme	Timeline for SCADA Visibility in Sub SLDC/ SLDC/ RLDC	Remarks, if any (Major Change in the scheme may also be intimated)
	I	II	III	IV	V	VI	VII	VIII	IX
Category I									
1	Delhi IS	A	City/Major Town/ Strategic Load	Implemented/Inservice	Revised Delhi islanding scheme has been implemented as informed by DTL in 48th TCC and 70th NRPC meeting.	NA	Healthy	Visible in Delhi SLDC	—
2	NAPS IS	A	Sensitive Generation	Implemented/Inservice	—	NA	Healthy	Visible in UP SLDC	—
3	Lucknow (Unchahar) IS	A	City/Major Town	Under Implementation Stage	—	Scheme has been approved in 59th NRPC meeting held on 31.10.2022. Installation of Ufrs is complete except at NTPC Unchahar end .	NA	Visible in UP SLDC	
4	RAPS IS	A	Sensitive Generation	Implemented/Inservice	—	NA	Healthy	Visible in Rajasthan SLDC	
5	Agra IS	B	City/Major Town/ Strategic Load	Planning / Design Stage	—	In principle approved in 215th OCC.Shall be taken up for final approval in 71st NRPC Meeting.	NA	Feb-24	
6	Jodhpur-Barmer-Rajwest IS	B	City/Major Town/ Strategic Load	Under Implementation	Draft DPR has been prepared and same is under approval from RVPN management and it would be shared shortly with NRPC Secretariat and NRLDC.	Scheme has been approved in 60th NRPC meeting held on 30.11.2022.	NA	—	
7	Nabha Power Rajpura IS	B	City/Major Town/ Strategic Load	Planning / Design Stage	DPR for PSDF funding is under preparation and is expected to be finalized by 31st Jan 2023.	Scheme has been approved in 60th NRPC meeting held on 30.11.2022.	NA	—	—
8	Pathankot-RSD IS	B	City/Major Town/ Strategic Load	Implemented/Inservice	—	Scheme has been approved in 60th NRPC meeting held on 30.11.2022. Scheme has been implemented in April 2023 as informed by Punjab in 206th OCC	NA	Visible in Punjab SLDC	—

9	Suratgarh IS	B	Strategic Load	Planning / Design Stage	Draft DPR has been prepared and same is under approval from RVPN management and it would be shared shortly with NRPC Secretariat and NRLDC.	Scheme has been approved in 60th NRPC meeting held on 30.11.2022.	NA	—	
10	Kullu-Manali-Mandi IS (Seasonal/May to October, Islanding scheme)	B	City/Major Town	Planning / Design Stage	Timeline to be intimated by HPSLDC	Scheme has been approved in 60th NRPC meeting held on 30.11.2022. UFR scheme submitted by HPSEB for funding from State PSDF has not been approved by Hon'ble HPERC and therefore HPSEB has been asked to explore the alternative mechanism for procurement of UFR.	NA	Visible in HPSLDC	
11	Shimla-Solan IS (Seasonal/May to October, Islanding scheme)	B	City/Major Town	Planning / Design Stage	Timeline to be intimated by HPSLDC	Scheme has been approved in 60th NRPC meeting held on 30.11.2022. Information from GE related to the control system of Bhaba HEP is awaited.	NA	Visible in HPSLDC	
Category II									

Category of Islanding Schemes:	
Category 'A' IS	Islanding Schemes which are existing or already planned and in implementation stage.
Category 'B' IS	Islanding Schemes which are newly proposed.
Category-'I' IS	Islanding Schemes which are designed for the major cities, senstive generation or strategic loads.
Category-'II' IS	Islanding Schemes other than category I are Category II IS
Colour codes of Islanding Schemes:	
Green	Implemented/In service Islanding Scheme
Yellow	Under review/ Under Implementation Islanding Scheme
Red	Newly proposed Islanding Scheme which are under design/under implementaion stage

NA	**Not Applicable**

Central Electricity Authority
National Power Committee Division
MIS report - Islanding Scheme (IS) of Western Region (WR)

status as on 24.01.2024

S.No. (Color code for Islanding Scheme)	Name of Islanding Scheme	Category A/B	Sub Category- (City/Major Town/ Strategic Load/Sensitive Generation)	Status (Category A -In-Service/ Under Review/ Reviewed & Under Implementation) (Category B-DPR Preparation/Study/ Design/ Approval/Procurement/Commissioning/Implementation)	Timeline for completion of Review/ Reviewed & Under Implementation for Category A Timeline for implementation for Category B (DPR Preparation/Study/ Design/ Approval/Procurement/Commissioning/Implementation)	Progress of the scheme	Healthiness of the scheme	Timeline for SCADA Visibility in Sub SLDC/ SLDC/ RLDC	Remarks, if any (Major Change in the scheme may also be intimated)
	I	II	III	IV	V	VI	VII	VIII	IX
Category I									
1	Mumbai Islanding Scheme	A	City/ Strategic Load	Implemented/Inservice	Last reviewed on 04.04.2021 and no operational constraints found.	NA	Healthy	Visible	The Scheme is healthy and visible on Maharashtra SLDC and WRLDC SCADA . WRLDC recommendations regarding improvements of visibility are under consideration by Maharashtra SLDC.
2	Uran Islanding Scheme	A	City/Major Town	Implemented/Inservice	Scheme last reviewed on 04.04.2021 and no modification required and no operational constraint found.	NA	Healthy	Visible	The Scheme is healthy and visible on Maharashtra SLDC. WRLDC recommendations about visibility are under consideration.
3	Surat Islanding Scheme	A	City/Major Town	Implemented/Inservice	Scheme last reviewed on 04.04.2021 and no modification required and no operational constraint found.	NA	Healthy	Visible	The Scheme is healthy and visible on Gujarat SLDC and WRLDC SCADA (as informed telephonically). WRLDC recommendations about visibility are under consideration.
4	Ahmedabad City Islanding Scheme	A	City/Major Town/ Strategic Load	Implemented/Inservice	Scheme last reviewed on 04.04.2021 and no modification required and no operational constraint found.	NA	Healthy	Visible	The Scheme is healthy and visible on Gujarat SLDC and WRLDC SCADA. WRLDC recommendations regarding improvements of visibility are under consideration by Gujarat SLDC.
5	KAPS 1&2 Islanding Scheme.	A	Sensitive Generation	Implemented/Inservice	Scheme last reviewed on 04.04.2021 and no modification required and no operational constraint found.	NA	Healthy	Visible	The Scheme is healthy and visible on Gujarat SLDC and WRLDC SCADA. WRLDC recommendations regarding improvements of visibility are under consideration by Gujarat SLDC.
6	KAPS 3&4 Islanding Scheme.	A	Sensitive Generation	Under Implementation	Last reviewed on 04-07 June, 2021.	—	Healthy	Visible	Requirement of Relay panel and UFR Relays are under finalization and will be frozen shortly.
7	Nagpur Islanding Scheme	B	City/Major Town/ Strategic Load	Design/Engineering Stage.	Schematic design finalised on during discussion on 01.04.2021, 24.06.2021, 26.06.2021	Approval for DPR from MSETCL board awaited.	NA	NA	DPR Submitted to NPC.
8	Jamnagar Islanding Scheme	B	City/Major Town/ Strategic Load	Design/Engineering Stage.	Schematic design finalised on during discussion on 01.04.2021, 24.06.2021.	DPR detailed engineering done. Enquiries for providing budget proposal raised on reputed manufacturers, the same is yet to be received.	NA	NA	DPR received at WRPC recently and will be submitted to NPC after scrutiny.
9	Bhuj(Anjar-Kukma) Islanding Scheme.	B	City/Major Town/ Strategic Load	Design/Engineering Stage.	Schematic design finalised on during discussion on 01.04.2021, 24.06.2021.	DPR detailed engineering done. Enquiries for providing budget proposal raised on reputed manufacturers, the same is yet to be received.	NA	NA	DPR received at WRPC recently and will be submitted to NPC after scrutiny.
10	Jabalpur Islanding Scheme	B	City/Major Town/ Strategic Load	Design/Engineering Stage.	Schematic design finalised on during discussion on 01.04.2021, 24.06.2021.	DPR submitted to PSDF.	NA	NA	PSDF Grant relieved and will be implemented in 1 year.
11	Raipur Islanding Scheme	B	City/Major Town	Design/Engineering Stage.	Schematic design finalised on during discussion on 01.04.2021, 24.06.2021, 28.06.2021.	DPR submitted to PSDF.	NA	NA	DPR Submitted to NPC.
Category II									
12	Vadodara/GIPCL Islanding Scheme.	A	Nandesari Industrial Load	Implemented/Inservice	Scheme last reviewed on 04.04.2021 and no modification required and no operational constraint found.	NA	Healthy	Visible	The Scheme is healthy and visible on Gujarat SLDC and WRLDC SCADA.

Category of Islanding Schemes:	
Category 'A' IS	Islanding Schemes which are existing or already planned and in implementation stage.
Category 'B' IS	Islanding Schemes which are newly proposed.
Category-'I' IS	Islanding Schemes which are designed for the major cities, senstive generation or strategic loads.
Category-'II' IS	Islanding Schemes other than category I are Category II IS
Colour codes of Islanding Schemes:	
Green	Implemented/In service Islanding Scheme
Yellow	Under review/ Under Implementation Islanding Scheme
Red	Newly proposed Islanding Scheme which are under design/under implementaion stage

NA	**Not Applicable**

Central Electricity Authority
National Power Committee Division
MIS report - Islanding Scheme (IS) of North Eastern Region (NER)

status as on 24.01.2024

S.No. (Color code for Islanding Scheme)	Name of Islanding Scheme	Category A/B	Sub Category- (City/Major Town/ Strategic Load/Sensitive Generation)	Status (Category A -In-Service/ Under Review/ Reviewed & Under Implementation) (Category B-DPR Preparation/Study/ Design/ Approval/Procurement/Commissioning /Implementation)	Timeline for completion of Review/ Reviewed & Under Implementation for Category A Timeline for implementation for Category B (DPR Preparation/Study/ Design/ Approval/Procurement/Commissioning/Implementation)	Progress of the scheme	Healthiness of the scheme	Timeline for SCADA Visibility in Sub SLDC/ SLDC/ RLDC	Remarks, if any (Major Change in the scheme may also be intimated)
	I	II	III	IV	V	VI	VII	VIII	IX
Category I									
1	Tripura Islanding Scheme.	A	City/Major Town	The scheme is reviewed and revised. Extra UFRs requuired. Tripura will procure the additonal UFRs soon. Under implementation		—	—	Completed	—
2	Upper Assam (Assam-I) Islanding Scheme.	A	City/Major Town	scheme being revised. Will be implemneted after finalization		-		Completed	—
3	Guwahati (Assam-II) Islanding Scheme	B	City/Major Town	DPR prepeared, approval obtained in 25th NERPC meeting.		work to start soon	NA		—
4	Itanagar Islanding Scheme	B	City/Major Town	Planning / Design Stage. Scheme and logic being finalized		work to start soon	NA		—
Category II									
No Islanding Scheme under this Category									

Category of Islanding Schemes:	
Category 'A' IS	Islanding Schemes which are existing or already planned and in implementation stage.
Category 'B' IS	Islanding Schemes which are newly proposed.
Category-'I' IS	Islanding Schemes which are designed for the major cities, senstive generation or strategic loads.
Category-'II' IS	Islanding Schemes other than category I are Category II IS
Colour codes of Islanding Schemes:	
Green	Implemented/In service Islanding Scheme
Yellow	Under review/ Under Implementation Islanding Scheme
Red	Newly proposed Islanding Scheme which are under design/under implementaion stage

NA	**Not Applicable**

Annexure XV 14th NPC

Mapping of Feeders under AUFLS schemes on SCADA system

The status available with NPC Division is as below:

RPCs	Status Updates from RPCs
SRPC	As on 31.10.2023 mapping was 94% in SR. Andhra Paradesh-87 %, Telangana-90 %, Karnataka-131%, Kerala-120 %, Tamil Nadu-96%, Puducheery-105%. **Details at Annexure-A (Updated Status)**
WRPC	Madhya Pradesh: 100 %, Gujarat: NIL, Maharashtra: NIL, Goa: NIL, Chhattisgarh: NIL, DDDNH-NIL (**updated status**)
NERPC	Assam-100 %, Meghalaya-100%, Nagaland-100%, Arunachal Pradesh – Nil Manipur – Nil, Mizoram – Nil (to be completed by Dec'23), Tripura – 20%. (updated **status**).
ERPC	Bihar- 100%, DVC-68%, West Bengal-41%, Jharkhand- 100%, Odisha-100%. **Updated status not received.** Details at Annexure-A
NRPC	UP-77.35 %, Punjab-90%, Haryana-99%, Delhi-100%, HP- 86.9%, Rajasthan-0%, (**Updated status)**

Annexure-A

(a) Details of Mapping of Feeders under AUFLS in SR

State			AP	TS	KAR	KER	TN	PUD	SR
Recommended	MW	A	1582	1686	2328	826	2993	91	**9506**
Implemented	MW	B	1590	1723	3225	985	3146	96	**10765**
	%	B/A	101	102	139	116	119	105	113
Mapped Quantum as on **31st October 2023**	MW	C	1389	1503	3083	985	3023	96	10079
Mapped Quantum & wrt Implemented	%	C/B	**87**	**87**	**96**	**100**	**96**	**100**	**94**

(b) List of feeders and SCADA data integration status under AUFLS scheme of Eastern Region

Stages	Bihar		DVC		West Bengal		Jharkhand		OPTCL	
	No of Feeders	**SCADA Data integrated**	**No of Feeders**	**SCADA Data integrated**	**No of Feeders**	**SCADA Data integrated**	**No of Feeders**	**SCADA Data integrated**	**No of Feeders**	**SCADA Data integrated**
Stage-I (49.4 Hz)	12	12	7	2	31	13	5	5	16	16
Stage-II (49.2 Hz)	10	10	6	5	26	13	5	5	16	16
Stage-III (49 Hz)	7	7	6	4	29	7	3	3	15	15
Stage-IV (48.8 Hz)	8	8	6	6	23	12	5	5	11	11
Total	**37**	**37**	**25**	**17**	**109**	**45**	**18**	**18**	**58**	**58**
In percentage (%)		100		68		41.28		100		100

(c) Details of Mapping of Feeders under AUFLS in WR

UTILITY	% OF Mapping under AUFLS Scheme	REMARKS
MADHYA PRADESH	100	Out **2409** feeders all have been mapped at State SCADA.
GUJARAT	NIL	80% of mapping will be completed within one year. (Total feeders **1761**)
MAHARASTRA	NIL	Mapping of AUFLS feeders on SCADA will be completed in 2 years As Maharashtra feeders are of 11kV and 22kV and SCADA visibility of DISCOM system is not in place in Maharashtra. (Total feeders **1235**)
CHATTISGARH	NIL	45 feeders out of 94 Chattisgarh feeders will be mapped in 3 months.

GOA	NIL	(Total feeders **8**)
DDDNH	NIL	(Total feeders **22**)

1. List of substations for Inspection/Testing of AUFLS & df/dt in SR Relays during the year 2023-24

State	Substation	Feeder	Declared Relief (MW)	Scheme	Testing conducted date
Andhra Pradesh	132/33 kV Dharmavaram	33kV feeders	26.00	AUFLS Stage-I at 49.4 Hz (Instantaneous)	**03-07-2023**
	132/33 kV Puttaparthy	33kV feeders	20.00		**03-07-2023**
	132/33 kV Eluru	33kV feeders	39.46		
	132/33kV Peda Tadepalli	33kV feeders	52.04		
	132/33KV Chintalapudi	33kV feeders	39.93		
	220/132/33kV Hindupur	33kV feeders	40.00	df/dt Stage-B: Frequency <=49.3Hz & (0.3Hz/sec fall of frequency)	
	132/33kV Peddapuram	33kV feeders	36.55	df/dt Stage-A: Frequency <=49.5Hz & (0.2Hz/sec fall of frequency)	
Karnataka	220 kV Yerandanahalli	Electronic City 1 & 2	67.00	AUFLS Stage-I at 49.4 Hz (Instantaneous)	**19-10-2023**
	66/11 kV Nandini Layout	20MVA Tr-1 & 31.5MVA Tr-2	18.00		**23-08-2023**
	220 kV NRS Rajajinagar	Telecom layout	27.00		**23-08-2023**
	220 kV Yachenahalli	66 kV feeders	56.80	df/dt Stage-A: Frequency <=49.5Hz & (0.2Hz/sec fall of frequency)	
Kerala	220kV Areakkode	110kV Kizhissery 1&2	40.00	AUFLS Stage-I at 49.4 Hz (Instantaneous)	**19.08.2023**
	220 kV Pallom	66kV feeders & 11kV TR	50.00		**19.08.2023**
	110 kV Pallom	Pampady & Kanjirappally	20.00		
	400kV Madakkathara	110 kV feeders	42&56	df/dt Stage-A&B	

-Tamil Nadu	230 kV Udanapalli	110 kV feeders	70.00	AUFLS Stage-I at 49.4 Hz (Instantaneous)	**28-06-2023**
	230 kV Thiruvalam	110kV feeders	114.00		
	230 kV Arasur	110kV feeders	48.00		
	230 kV Hosur	110kV feeders	120.00	df/dt Stage-A&B	**28-06-2023**
	230 kV Arasur	110kV Thudiyalur	48.00		
Telangana	400kV Narsapur	132kV Narsapur & Gummadidala-1&2 feeders	43.76	AUFLS Stage-I at 49.4 Hz (Instantaneous)	**Scheduled for 21/11/2023 & 22.11.2023**
	220kV Miryalaguda	132/33kV PTRs	55.62		
	220 kV Siddipet	132 KV Habsipur	22.74	df/dt Stage-A: Frequency <=49.5Hz & (0.2Hz/sec fall of frequency)	
	132 kV Siddipet	132/33 KV PTRs	25.92		

2. List of substations for Inspection/Testing of AUFLS & df/dt in WR Relays during the year 2023-24

AUFR & df/dt functionality testing carried out during 2023-24 in WR						
STATE	**UTILITY**	**Name of EHV Substation**	**Feeder Name**	**Month of Inspection**	**AUFLS FREQUENCY STAGE**	**df/dt FREQUENCY STAGE**
GUJARAT	GETCO	132KV CHILODA SUBSTATION	66 kV SADRA	Oct-23	49	
			66 kV Chhala		49	
			66 kV Shahpur		49	
			11 kV Palaj		49.4	
			11 kV Yadavnagar		49.4	
			11 kV Shiholi		49.4	
			11 kV Lekavada		49.4	
			11 kV Sardar		49.4	
			11 kV Magodi		49.4	

			11 kV Ishanpur		49.4	
			11 kV Dashela		49.4	
			11 kV mahundra		49.4	
			11 kV Lavarpur		49.4	
			11 kV Shahpur		49.4	
			11 kV gorvanta		49.4	
			11 kV topariya		49.4	
			11 kV MES		49.2	
			11 kV NMCC		49.2	
			11 kV Mota Chiloda		49.4	
			11 kV Pratiya		49.4	
			11 kV Gerisan		49	
	GETCO	220 KV Vijyapur	66 kV Pilvai		48.8	
			66 kV Kolwada		48.8	
	GETCO	220 KV jamla substation	66 kV ITLA LINE		49	
			66 kV VEDA-2 LINE		48.8	
	GETCO	66 KV VIJAPUR	KRUSHA		49.4	
			CHAMUNDA		49.4	
			CHANDASNA		49.4	
			KANAKPURA		49.4	
			BHAVSAOR		49.4	
			VIHAR		49.4	
			MOTIPURA		49.4	
			JALARAM IND		49.2	
			MANIPURA		49.4	
			VIJAPUR CITY		49.4	
			PILAWAI IND		49.2	
			PAVAN		49.2	
			DHWARIKA		49.4	
			MAHESWARPURA		49.4	
			AGLOD		49.4	
			KANBHA		49.4	
			JANA SANGPUR		49.4	
			DHANPURA		49.4	

			MAHADEVPURA		49.4	
			PATELPURA		49.4	
			KHANUSA		49.4	
	GETCO	220 KV Khanpur	66 kV Chiskari		49.2	
			66 kV Rakhial-1		49	
			66 kV Jindva		49	
			66 kV Halisa-1		49	
			66 kV Vinayak		49	
			66 kV Lihoda		48.8	
			66 kV Kadjodra		48.8	
MADHYA PRADESH	MPPTCL	220KV SUBSTATION MUNGALIYACHHAP,MPPTCL	33 kV Khajuri Sadak	Aug-23	49.2	
			33 kV Teelakhedi		49.2	
			33 kV Ratibad		49.2	
			33 kV Prempura		49.2	
			33 kV RMCU		49.2	
	MPPTCL	132KV CHAMBAL BHOPAL	33 kV HABIBGANJ NO.1		48.8	
			33 kV HABIBGANJ NO 2		48.8	
			33 kV RACHNA TAOWAR		48.8	
			33 kV KEELANDEV		48.8	
			33 kV HABIBGANJ NO.3 33 kV DB MALL		48.8	
			33 kV INTERCONNECTOR 3		48.8	
			33 kV INTERCONNECTOR 4		48.8	
			33 kV INDUSTRIAL NO.1		48.8	
			33 kV INDUSTRIAL NO.2		48.8	
			33 kV BHEL		48.8	
			33KV ANAND NAGAR		48.8	
			33 kV INTERCONNECTOR NO		48.8	
			33 kV INTERCONNECTOR NO.2		48.8	
			33 kV DRM		48.8	
			33 kV AIR		48.8	

			33 kV HOD		48.8	
			33 kV ISBT		48.8	
			33 kV GOVINDPURA		48.8	
			33 kV NEW CHAMBAL		48.8	
			33 kV AKVN 2		48.8	
	MPPTCL	220KV SUBSTATION,BHOPAL	BHOPAL 1		48.8	
			BHOPAL 2		48.8	
			BHOPAL 3		48.8	
			BERASIYA		48.8	
			AKVN 1		48.8	
			INTERCONN ECTOR 3		48.8	
			ECTOR 3		48.8	
			INTERCONN ECTOR 4		48.8	