

MINUTES OF THE FIRST MEETING OF STANDING TECHNICAL COMMITTEE
RE-CONSTITUTED BY FOR

Venue	: CERC, Upper Ground Conference Hall Chanderlok Building 36 Janpath, New Delhi
Day/ Date	: 11th December, 2023, Friday.
List of Participants	: Appendix – I

The First Meeting of the Standing Technical Committee was held on December 11, 2023, under the Chairmanship of Shri I.S Jha, Member (Technical), CERC. At the outset, the Chairman welcomed all the members of the re-constituted technical committee including special invitee for the meeting. The Chairman explained the rationale behind re-constitution of the Standing Technical Committee (STC) as per the decision in the 87th Meeting of the Forum of Regulators in view of the formation of separate working group on RE policy related issues. He emphasized that the terms of reference of the Standing Technical Committee have been updated so as to avoid any overlapping with RE Policy Working Group. The agenda items were then discussed during the meeting.

AGENDA 1: TOR OF THE STANDING TECHNICAL COMMITTEE

2. Senior Advisor (RE), CERC provided an overview of the Technical Committee's formation and its Terms of Reference. It was apprised that the standing nature of the STC would always imply that the Committee be headed by the Technical Member of CERC. It is informed that the Terms of Reference (TOR) of the Reconstituted STC include evolving framework on the technical issues of RE integration such as, implementation of Forecasting and Scheduling framework, Availability Based Tariff (ABT) framework, Ancillary Service framework at the State level etc. It was also informed that the Committee may co-opt any other member, as deemed fit and shall provide periodic report to the FOR on the deliberations of the Committee. DC(RA), CERC apprised the STC about continuation of the technical assistance to the STC by the USAID under SAREP Program. Thereafter the agenda items were taken up for discussion.

AGENDA 2: STATUS OF IMPLEMENTATION OF SAMAST

3. The Consultant apprised the STC on the implementation of SAMAST across various States. It was informed that the STC prepared a Model DPR for SAMAST in the past and also assisted some States in preparing their State specific DPRs for seeking grant under PSDF. The

status update on the SAMAST is based on the PSDF website which shows that almost all States are at various stages of implementation of SAMAST and grants have been sanctioned under PSDF and the States are at different stages of implementation.

4. It was informed that 29 States are in different stages of SAMAST implementation, with 22 in advanced stages of implementation where grants have been sanctioned. J&K and 6 Union Territories haven't begun implementation. It was informed that Gujarat has notified Intra-State ABT mechanism and has implemented SAMAST in the State. The Member, MPERC updated that SAMAST has been implemented in the State along with ABT mechanism and the projects sanctioned under PSDF have been completed apart from standby meter installation. It was also informed that Bihar has implemented the SAMAST and DSM Regulations would be implemented soon. The status update of Bihar may be updated accordingly.

5. The Members emphasised the importance of implementation of SAMAST and sought update on the implementations of various projects sanctioned under SAMAST vide grant under PSDF. It was decided that the NLDC may provide updated status on the completion of projects in the subsequent meetings. It was decided the Committee can handhold some of the States if required. It was also highlighted that Some States find it difficult to implement SAMAST in the absence of any linkages with transmission and distribution interface.

6. CMD, Grid India highlighted the importance of availability of intra-state resources during the crunch period as the required information in these regards is not readily available for some States, which becomes crucial from resource adequacy point of view. It was suggested that status update on implementation of ABT Mechanism across States may be considered by the STC in subsequent meetings in addition to the update on SAMAST. The STC directed the Grid India representative to provide update on the implementation of the ABT Mechanism state-wise after consultation with SLDCs.

7. After detailed deliberation, the Technical Committee directed the Consultant to prepare the update based on the categorisation of the States as i) States which have received the grants under PSDF funds but yet to finish the SAMAST implementation, (ii) States which are yet to receive Grants under PSDF for SAMAST and (iii) States which are yet to apply for PSDF grant. It was directed that the Consultant may provide update on the SAMAST with above categorisation in the subsequent meetings.

AGENDA 3: STATUS OF IMPLEMENTATION OF REGULATIONS ON FORECASTING, SCHEDULING AND DEVIATION SETTLEMENT

8. The Consultant apprised the STC on Forecasting & Scheduling Regulations and DSM Regulations across States. It was informed that 22 States have notified the Forecasting & Scheduling and Deviation Settlement Mechanism (DSM) Regulations(Annexre-II). It was apprised further that State of Orissa has published the draft Forecasting and Scheduling and

DSM Regulations and soon will be notified. It was also highlighted that seven States and six Union Territories have not initiated the regulatory process.

9. It was highlighted that the amendment in the inter-State DSM Framework may need to be updated accordingly. CMD Grid India highlighted differences in approach for RE DSM at intra-State and inter-State levels, proposing a shift to a schedule-based regime for intra-State to align with inter-State practices.

10. After detailed deliberation, the Committee emphasized the need for updates from States on the State level practice under RE DSM Regulations and also agreed upon inviting SLDCs to present their practices in Forecasting & Scheduling and DSM, which may be included in the next meeting.

AGENDA 4: DISCUSSION ON THE INDIAN ELECTRICITY GRID CODE (IEGC) AND ALIGNMENT OF STATE GRID CODE WITH IEGC

11. Joint Chief (Engg.), CERC, made a presentation on salient features of Indian Electricity Grid Code (IEGC) 2023(Annexure-III). It was highlighted that enabling framework for resource adequacy has been provided in the IEGC. It was informed that the FOR has recently endorsed Model Regulations on Resource Adequacy stipulating inter alia the methodology for generation resource adequacy assessment, generation resource procurement planning by the distribution licensees. After the presentation, the STC decided that more structured and detailed discussions will be required on the implementation of Resource Adequacy at State level.

12. It was informed that state of Madhya Pradesh has issued draft Regulations on the Resource Adequacy in line with the Model Regulations and would soon be finalizing the same. He also conveyed that as per the new Grid Code responsibilities of SLDC have increased while the capacity building of SLDC personnel are lacking and need to be addressed in line with KABIL Report.

13. It was informed that the IEGC provides detailed framework on reserves comprising of primary, secondary and tertiary services. It was highlighted that adequate secondary and tertiary reserves also need to be maintained within State control area and in absence of the same, a provision is made according to which NLDC may procure such reserves on behalf of States. It was also apprised that the IEGC contains provision for reactive power compensation for all regional entities including the generating stations.

14. Minimum turndown level revised as 55% or lower level as per CEA Regulations (which provides level of 40%) have been provided in the IEGC. This will help achieve grid management with enhancing RE. Due compensation shall be included in the meantime through regulations or order. It was also emphasised that the same needs to be extended for intra-State thermal generating stations. Provisions related to trial run and declaration of commercial operation of wind, solar, hybrid, pumped storage and ESS stations included in 2023 Grid Code.

15. Representative of Bihar apprised aligning Bihar State Grid Code with IEGC 2023 is already under preparation and soon the State will finalize the same.

16. The STC noted the presentation on the IEGC and emphasized the need to align the State grid code with IEGC. STC recommended that the State should ensure adequate reserves in the State Control Area and implement Resource Adequacy framework at the earliest.

Action Point(s) / Decision(s):

- (i) The Grid-India to update the Status of SAMAST implementation based on the categorization suggested during the meetings after consultation with the SLDCs;*
- (ii) The consultant to update on the state-wise implementation of ABT mechanism as per the consultation with Grid India and SLDCs;*
- (iii) Select SLDCs to present their practices in Forecasting & Scheduling and DSM in the subsequent meetings;*
- (iv) The State grid Codes be aligned with the IEGC. States to implement resource adequacy and ancillary service mechanism for State control area.*

APPENDIX -I

**LIST OF PARTICIPANTS OF THE FIRST MEETING OF THE OF STANDING
TECHNICAL COMMITTEE RE-CONSTITUTED BY FOR**

Sl. No.	Name & Designation	Organization
MEMBERS		
1	Sh. I. S Jha, Chairperson	Member (Technical), CERC
2	Sh. S R Pandey, Member	Member (Technical), Gujarat ERC
3	Sh. Prashant Chaturvedi, Member	Member (Technical), Madhya Pradesh ERC
4	Sh. S N Kalita, Member	Member (Technical), Assam ERC
5	Sh, A. K. Sinha, Member	Member (Technical), Bihar ERC (online)
SPECIAL INVITEES		
11	Sh. A S Bakshi,	Ex Member -CERC
12	Smt. Shilpa Agrawal, JC(Engg)	CERC
13	Sh. S R Narsimhan, CMD	GRID India
14	Sh. S C Saxena, ED	NLDC, GRID India
FOR SECRETARIAT		
15	Smt. Rashmi Somasekharan Nair, Dy. Chief (RA)	CERC
16	Smt. Sukanya Mandal, Assistant Chief (RA)	CERC
17	Sh. Ravindra Kadam, Sr Advisor (RE)	CERC
18	Smt. Jijnasa Behera, Research Officer	FOR
19	Ms. Nausheen, RA	CERC
OTHERS		
20	Sh. Ajit Pandit, IDAM Infra	SAREP
21	Sh. Dinesh Yadav, IDAM Infra	SAREP
22	Sh. Sumedh Agrawal, IDAM Infra	SAREP



South Asia Regional Energy Partnership (SAREP)

Standing Technical Committee of FOR: 1st Meeting

11 December 2023

STATUS OF IMPLEMENTATION OF SAMAST

States	SAMAST IMPLENTATION	
Region	SAMAST Implementation	WIP or Yet to Prepare
North	6 HP, HR, RJ, UP, DL & PB	2 UK & J&K,
West	5 MP, CG, Goa*, GJ & MH	
South	5 KA, TS, AP, TN & KL	
East	5 BR, WB, JH, OR & SK*	
North-East	7 AR, AS, MN, ML, MZ, NL, TR	
UT		6 CH, PY, DD, DNH, LD, AN
TOTAL	28	8

**Submitted proposal for PSDF Fund for SAMAST implementation*

STATUS OF FORECASTING & SCHEDULING REGULATIONS

States	F&S Regulations		
Region	Notified	Draft	Initiated/Not Published
North	5 RJ*, UP, UK, HR, PB		3 DL, J&K, HP (only Hydro potential)
West	4 CG, MP*, MH, GJ		1 Goa (no major Wind/Solar Potential)
South	4 AP, KR*, TS, TN, KERALA		
East	3 JH, SK, BR	1 OR	1 WB
North-East	5 AS, MN, ML, MZ, TR		2 AR, NL
UT			6 CH, PY, DD, DNH, LD, AN
TOTAL	22	1	13

* /st Amendment Published

STATUS OF DSM REGULATIONS

States	DSM Regulations		
Region	Notified	Draft	Initiated/Not Published
North	7 HP,* DL,RJ*, UK,HR, PB, UP\$		1 J&K
West	4 GJ, CG, MP, MH		1 Goa
South	4 TN,AP*, KR\$,TS*		1 KL
East	3 SK\$, BR\$, WB	1 OR	1 JH
North-East	4 ML, MN\$, MZ\$,AS		3 NL,AR,TR
UT			6 CH, PY, DD, DNH, LD,AN
TOTAL	22	1	13

* Amendment Published
\$ under F&S Regulations



THANK YOU

**FOR MORE INFORMATION AND UPDATES, VISIT THE
SAREP WEBSITE : <https://sarepenergy.net>**

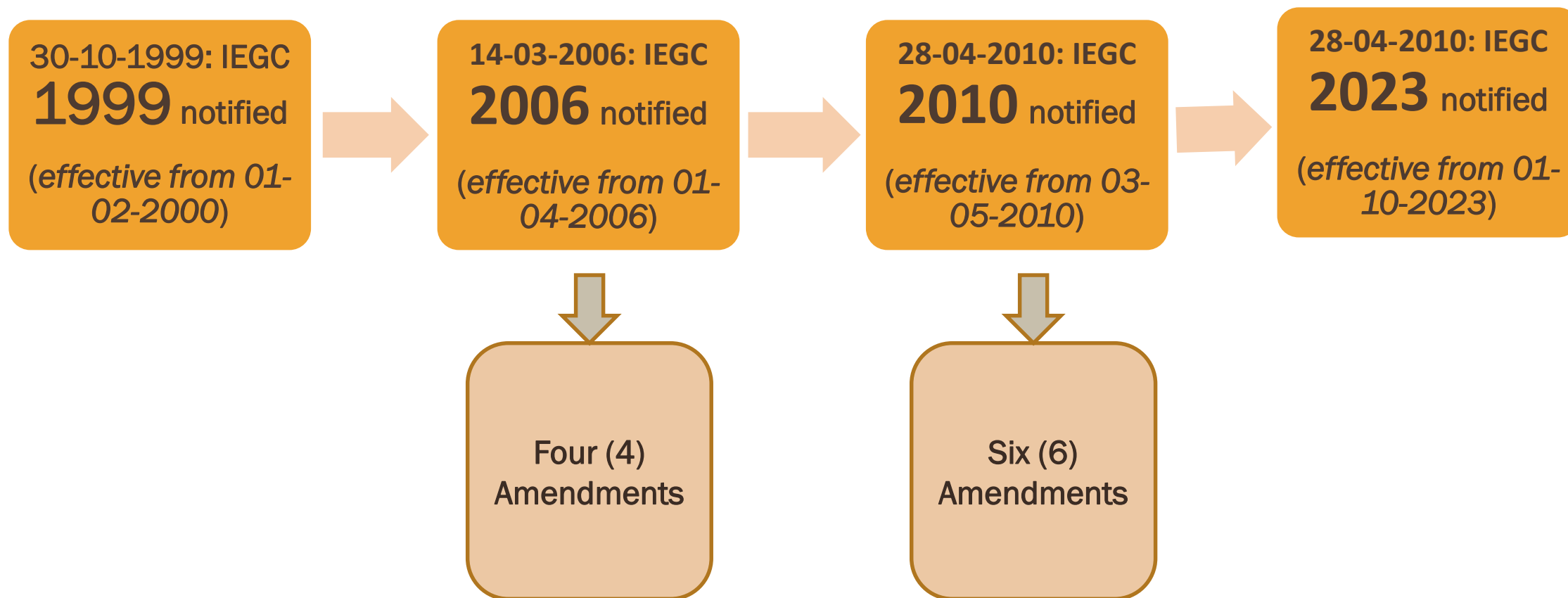
PRESENTATION ON

INDIAN ELECTRICITY GRID CODE 2023

ISSUED ON -29.5.2023

EFFECTIVE FROM 1.10.2023

INDIAN ELECTRICITY GRID CODE – PROGRESS SO FAR



Indian Electricity Grid Code – Objective



IEGC

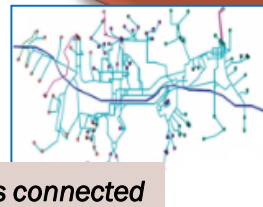


Technical Rules



Commercial Mechanism

Facilitates



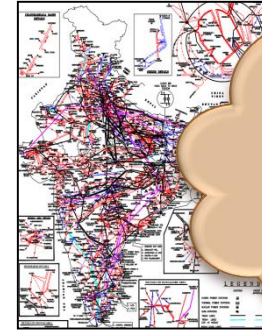
Entities connected to ISTS (or using it)

Applicable to all entities connected or using ISTS



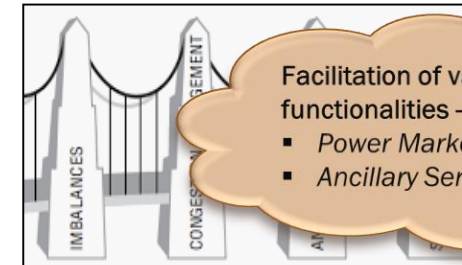
Documentation of principles and procedures to define relationship between –

- Users of ISTS
- NLDC
- RLDCs
- SLDCs



Facilitation of various aspects of grid –

- Optimal operation
- Coordinated and optimal maintenance planning of gen./trans. facilities
- Development/Planning of economic and reliable grid



Facilitation of various functionalities –

- Power Markets
- Ancillary Services



Facilitation of RE sources by specifying following for integration in grid –

- Technical aspects
- Commercial aspects

Indian Electricity Grid Code 2010 – *Structure*

Part 2: Role of Various Organizations and their linkages

Part 3: Planning Code for Inter-State Transmission

Part 4: Connection Code

Part 5: Operating Code

Part 6: Scheduling and Despatch Code

Part 7: Miscellaneous

Operating Philosophy

System Security Aspects

Demand Estimation for Operational purposes

Demand Management

Periodic Reports

Operational Liaison

Outage Planning

Recovery Procedures

Event Information

07 parts

PROVISIONS REVIEWED UNDER IEGC

Provision Reviewed

- Role of Various Organizations and their Linkages
- Planning Code for inter-State transmission
- Connection Code
- Protection and Commissioning Code
- Operating Code
- Scheduling and Despatch Code
- Miscellaneous

New Structure

- Role of Various Organizations and their Linkages
- ***Resource Adequacy Code***
- Connection Code
- ***Protection Code***
- ***Commissioning and Commercial operation Code***
- Operating Code
- Scheduling and Despatch Code
- ***Cyber Security***
- ***Monitoring and Compliance Oversight***
- Miscellaneous

RESOURCE PLANNING CODE

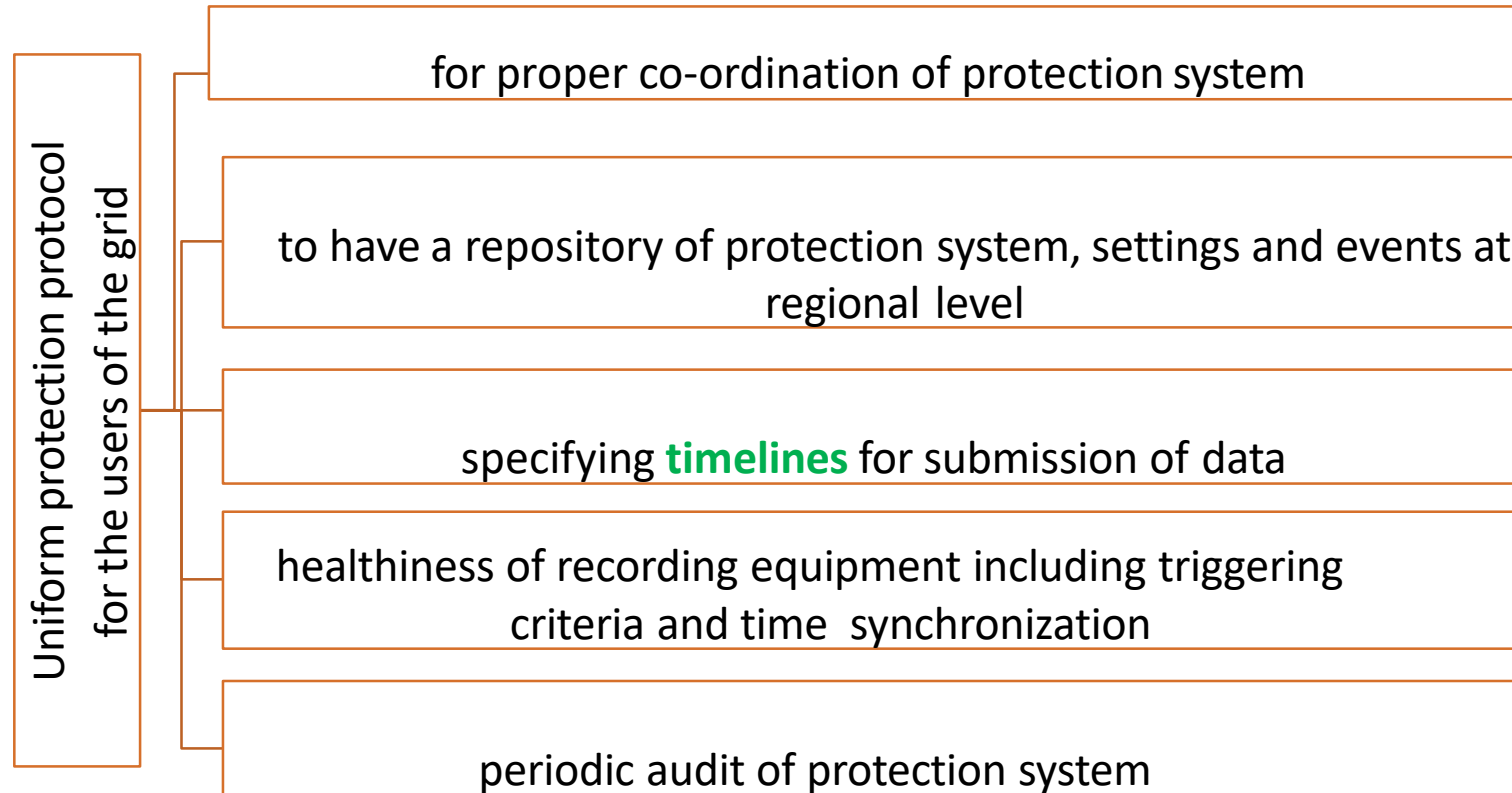
- The Planning Code has been renamed as Resource Planning Code. It covers the integrated resource planning including demand forecasting, generation resource adequacy planning and transmission resource adequacy assessment, required for secure grid operation.
- Each distribution licensee within a State shall estimate the demand in its control area in different time horizons, namely long-term, medium term and short-term .STU shall estimate the demand for the State considering diversity in different time horizons.
- **Forum of Regulators** may develop guidelines for demand estimation by the distribution licensees for achieving consistency and statistical accuracy by taking into consideration the factors such as economic parameters, historical data and sensitivity and probability analysis.
- Each distribution licensee shall assess the existing generation resources and identify the additional generation resource requirement to meet the estimated demand in different time horizons, and prepare generation resource procurement plan (considering planning reserve margin (PRM) taking into account loss of load probability and energy not served as specified by CEA.
- NLDC shall carry out a simulation of overall resource adequacy as an aid to States.
- **FOR** may develop a model Regulation stipulating inter alia the methodology for generation resource adequacy assessment, generation resource procurement planning and compliance of resource adequacy target by the distribution licensees.
- CTU and STU shall undertake transmission planning as per the Act for the ISTS and intra-State transmission system respectively.

CONNECTION CODE

- It covers the technical and design criteria for connectivity, procedure and requirements for physical connection and integration of grid elements.
- Grant of connectivity to ISTS shall be governed by GNA regulations.
- Users (including transmission licensees) seeking to get connected to the ISTS for the first time through a new or modified power system element shall fulfill the requirements and follow the procedures specified under this Code prior to obtaining the permission of the NLDC or RLDC or SLDC
- NLDC shall prepare detailed procedure for first time energization and integration of new or modified power system element and SLDC shall prepare the same at intra-State level.
- NLDC or RLDC, in consultation with CTU, STU or SLDC, shall carry out a joint system study six (6) months before the expected date of first energization of a new power system element to identify operational constraints, if any. Similar exercise shall be done by SLDC in consultation with STU for the intra-state system, and specifically for elements of 220 kV and above (132 kV and above in case of North Eastern region).

PROTECTION CODE

- New Code covering protection protocol, protection settings and protection audit plan of electrical systems.



- RPCs shall review protection setting atleast once a year
- Internal audit annually by users and third party audit in five years

COMMISSIONING AND COMMERCIAL OPERATION CODE:

- It covers
 - drawl of startup power and injection of infirm power
 - trial run operation
 - documents and tests required to be furnished before declaration of COD
 - requirements for declaration of COD.
- Provisions related to trial run and declaration of commercial operation of wind, solar, hybrid, pumped storage and ESS stations included in 2023 Grid Code.

TRIAL RUN OF GENERATING STATION-BROAD PRINCIPLE

1. thermal generating unit shall be in continuous operation at MCR for 72 hours on designated fuel:
 - short interruption or load reduction shall be permissible with the corresponding increase in duration of the test
2. A hydro generating unit shall be in continuous operation at MCR for twelve (12) hours:
3. Trial run of the solar inverter unit(s) shall be performed for a minimum capacity aggregating to 50 MW:
 - in the case of a project having a capacity of more than 50 MW, the trial run for the balance capacity shall be performed in a maximum of four instalments with a minimum capacity of 5 MW:
 - Successful trial run of a solar inverter unit(s) covered under sub-clause (a) of this clause shall mean the flow of power and communication signal for not less than four (4) hours on a cumulative basis between sunrise and sunset in a single day

DOCUMENTS AND TESTS REQUIRED FOR THERMAL (COAL/LIGNITE) GENERATING STATIONS

- ❖ OEM documents
 - Startup curve for boiler and turbine including starting time of unit in cold, warm and hot conditions
 - capability curve of generator
 - design ramp rate of boiler and turbine.
- ❖ Tests
 - Operation at a **load of fifty five (55) percent of MCR** as per the CEA Technical Standards for Construction for a sustained period of four (4) hours.
 - Ramp-up from fifty five (55) percent of MCR to MCR at a ramp rate of at least **one (1) percent of MCR per minute**, in one step or two steps (with stabilization 54 period of 30 minutes between two steps), and sustained operation at **MCR for one (1) hour**.
 - Demonstrate overload capability with the valve wide open as per the CEA Technical Standards for Construction and sustained operation at that level for at **least five (5) minutes**.
 - Ramp-down from MCR to fifty five(55) percent of MCR at a ramp rate of at least **one (1) percent of MCR per minute, in one or two steps (with stabilization period of 30 minutes between two steps)**.
 - Primary response through injecting a frequency test signal with a step change of ± 0.1 Hz at 55%, 60%, 75% and 100% load.
 - Reactive power capability as per the generator capability curve as provided by OEM considering over-excitation and under-excitation limiter settings and prevailing grid condition

OPERATING CODE:

- It covers operating philosophy, system security, reserves, control hierarchy, operational planning, outage planning, system restoration, real time operation, demand & load management, post despatch analysis, reactive power management and field testing.
 - framework for reserves comprising of primary, secondary and tertiary reserves
 - Reactive power compensation for all regional entities including the generating stations
 - Compensation for black start service
 - States have been obligated to ensure availability of the quantum of secondary and tertiary reserves within their control area as published by NLDC. In case of shortfall, NLDC shall procure on behalf of state with cost liability to the erring state.
 - System state to be categorized as Normal, Alert, Emergency, Extreme Emergency and Restorative state.
 - Periodic field tests to be carried out for generators and HVDC for ascertaining correctness and desired performance during an event in the system.

SCHEDULING AND DESPATCH CODE:

- It covers control area jurisdiction & responsibilities of LDCs, SCUC, SCED, procedure for scheduling & despatch.
 - Control area jurisdiction based on quantum of connectivity with ISTS or InSTS.
 - DC of a generating station to be restricted to its MCR.
 - Minimum turndown level of thermal generating station 55% or lower as per CEA Regulations.
 - Security Constrained Unit Commitment introduced to ensure adequacy of reserves.
 - SCED has been included
 - In case a generating station or unit thereof, opts to go under unit shut down, such generating station or unit thereof needs to fulfil its obligation to supply electricity to its beneficiaries.
 - The scheduling procedure has been modified to align with the GNA regulations.

Scheduling

Timeline	Activity	Product
6:00 a.m.	ISGS to Declare Capacity (DC)	GNA
7:00 a.m.	Entitlement of Beneficiaries by RLDCs	GNA
8:00 a.m.	Requisition by Beneficiaries	GNA
8:00 a.m.	SLDC to intimate Secondary & Tertiary reserves	AS
8:15 a.m.	Congestion Check by RLDCs	GNA
8:30 a.m.	Revised Schedule by Beneficiaries	GNA
9:00 a.m.	Final GNA Schedule.	GNA
9:00 a.m.	T-GNA Schedule requisition by Regional Entity	T-GNA
9:15 a.m.	T-GNA Schedule requisition by SLDC on behalf of Intra-State Entities	T-GNA
9:15 a.m.	Intimation of replacement of power by REGS	GNA
9:45 a.m.	Final T-GNA Schedule	T-GNA
9:45 a.m.	RLDC to incorporate replacement schedules	GNA

10:00 a.m.	DAM /TRAS Start	DAM
11:00 a.m.	DAM /TRAS Close	DAM
11:45 a.m.	Provisional DAM Result	DAM
12:15 p.m.	NLDC Exception	DAM
01:00 p.m.	Final DAM Schedule	DAM
02:00 p.m.	RLDC to process Exigency Application received upto 1 pm	T-GNA
02:00 p.m.	SCUC STEP 1- NLDC to publish List of Genco likely to be below Tech Min. considering unconstrained DAM results	SCUC
02:30 p.m.	SCUC STEP 2- Beneficiaries can revise schedule of Genco below Tech Min.- Final & binding schedules of identified Gencos	SCUC
03:00 p.m.	SCUC STEP 3- NLDC to commit identified Genco based on requirement. Bringing units upto Tech min. & also indicate URS in these GENCO to be kept as reserve.	SCUC
	Revision of Schedule & Exigency Applications	
22:45 p.m.	RTM Session open for 00.00 hrs. to 00.30 hrs.	RTM
23:00 p.m.	RTM Session close for 00.00 hrs. to 00.30 hrs.	RTM
23:15 p.m.	RTM Clearance & Scheduling	RTM
23:30 p.m.	NLDC to finalise schedules under RTM,SCED & Ancillary Services	RTM/SCED/AS
23:35 p.m.	RLDC shall publish the final schedules for despatch	RTM/SCED/AS

CYBER SECURITY CODE:

- It deals with measures to be taken to safeguard the national grid from spyware, malware, cyber attacks, network hacking etc.
- This is a newly added code wherein all users shall conduct Cyber Security Audit and also submit report in case of any cyber attack.
- All users, NLDC, RLDCs, SLDCs, CTU and STUs, power exchanges, QCAs, SNAs, shall have in place, a cyber security framework in accordance with Information Technology Act, 2000; CEA (Technical Standards for Connectivity) Regulations, 2007; CEA (Cyber Security in Power Sector) Guidelines, 2021
- Sectoral CERT (Computer Emergency Response Team) for wings of power sector, as notified by Government of India, from time to time, shall form a Cyber Security Coordination Forum with members from all concerned utilities and other statutory agencies to coordinate and deliberate on the cyber security challenges and gaps at appropriate level. A sub-committee of the same shall be formed at the regional level.

MONITORING AND COMPLIANCE CODE:

- monitoring of compliance of the GRID Code by various entities in the grid
- manner of reporting the instances of violations and taking remedial steps or initiating appropriate action. Two methodologies have been followed to ensure compliance: self audit and compliance audit.
- The self-audit reports by users, QCAs, SNAs shall be submitted to the concerned RLDC or SLDC, as the case may be.
- The self-audit reports by power exchanges shall also be submitted to the NLDC.
- The self-audit reports of NLDC, RLDCs, CTU, and RPCs shall be submitted to the Commission. The self-audit report of SLDC and STUs shall be submitted to the concerned SERC.
- Independent Third-Party Compliance Audit:

The Commission may order independent third-party compliance audit for any user, power exchange, QCA, SNA, CTU, NLDC, RLDC and RPC as deemed necessary based on the facts brought to the knowledge of the Commission.

SALIENT TAKEAWAYS

- Compensation for reactive power support and charges for deteriorating reactive power – for generators. The management of voltage is one of the most critical requirement with RE integration when in non-generation hours of RE, the evacuation lines due to being lightly loaded leads to high voltage. The framework of compensation to RE generator which may have inherent reactive power capability would help in managing voltage without requirement of costly STATCOMS.
- 5 paise/kVArh with escalation of 0.5 paise every year
- Trial run and COD for RE generating stations included with COD allowed for minimum 50 MW and further in batch sizes of 5 MW.
- Multiple RE generating stations can appoint a QCA for coordinated scheduling.
- Minimum turndown level revised as 55% or lower level as per CEA Regulations (which provides level of 40%). This will help achieve grid management with enhancing RE. Due compensation shall be included in meantime through regulations or order.
- Drawl of power during non-generation hours allowed under DSM in case generator is not able to schedule the power.
- Revision of schedule allowed from 7th /8th time block to RE generating station due to forecasting error or forced outage.
- RE generating stations are to be scheduled first followed by other generating station in merit Order. RE generating stations are not subject to merit order despatch.
- Black start charges: for actual injection @ 110 % of the normal rate of charges for deviation in accordance with DSM Regulations for the last block in which the grid was available

THANK YOU
