

Bhopal, the 3rd October 2024

No. /MPERC/2024/2198. In discharge of its functions under Section 86(1) (i) of the Electricity Act, 2003, Section 9(j) of Madhya Pradesh Vidyut Sudhar Adhiniyam, 2000 and in exercise of powers under Section 181(1) of Electricity Act, 2003, the Madhya Pradesh Electricity Regulatory Commission hereby, specifies the Madhya Pradesh Electricity Distribution Code (Revision-I), 2024.

MADHYA PRADESH ELECTRICITY DISTRIBUTION CODE (Revision-I), 2024

{RG-29 (I) of 2024}

CHAPTER 1

GENERAL

1. Short Title and Commencement:

- (i) This Code shall be called “**Madhya Pradesh Electricity Distribution Code (Revision-1), 2024 {RG-29 (I) of 2024}**”
- (ii) It shall come into force with effect from the date of its publication in the official gazette of the Govt. of Madhya Pradesh.
- (iii) This Code shall extend to the State of Madhya Pradesh.

1.1. Objectives:

The Distribution Code seeks to provide the framework and procedures that shall govern technical aspects of planning, development, operation, maintenance and use of the distribution systems of the Licensee in its area of supply. The Distribution Licensee and users of Distribution System shall adhere to the standards of service quality and shall ensure compliance with the provisions in this Distribution Code together with the provisions of Madhya Pradesh Electricity Grid Code and Madhya Pradesh Electricity Supply Code as amended. Distribution Licensee will, thus ensure that the supply system of the Licensee operates efficiently to provide reliable, economic and continuous service to all consumers or users.

1.2. Scope:

- 1.2.1. Provisions of Distribution Code shall be applicable to all Distribution System users including:
 - a) Distribution Licensee(s) (including deemed Licensee(s));
 - b) Open Access Consumers (OAC) connected to Distribution System;
 - c) Other Distribution Licensee (s) connected to Distribution System not owned by them;
 - d) Distribution System embedded Generators; and
 - e) Consumers

1.3. Compatibility with Indian Electricity Grid Code, Madhya Pradesh Electricity Grid Code and CEA Regulations:

- 1.3.1. This Distribution Code shall be applied in a manner consistent and compatible with the provisions of CERC (Indian Electricity Grid Code) Regulations, 2023, Madhya Pradesh Electricity Grid Code 2024, Madhya Pradesh Electricity Supply Code, 2021, MPERC (Conditions of Distribution License for Distribution Licensee (including deemed licensee) 2004 and MPERC (Framework for Resource Adequacy) Regulations, 2024 as amended.
- 1.3.2. All equipments of the users including cables, wiring and overhead lines shall comply with the safety standards specified under the safety regulations specified by Central Electricity Authority (CEA) under Section 53 of the Electricity Act 2003.
- 1.3.3. In addition, all users shall comply with the Guidelines issued by the Central Electricity Authority (CEA) and Regulations issued by Bureau of Energy Efficiency (BEE) under Energy Conservation Act, 2001, as amended.

1.4. Confidentiality:

- 1.4.1. The Distribution licensee shall not, other than as required by the Distribution code, disclose information made available to it to any other person without the prior written consent of the provider of the information.

1.5. Communication between Licensee and Users:

- 1.5.1. All communications made by Users to distribution licensee shall be in accordance with the provisions of the relevant chapter of the Distribution Code and shall be made to the designated nodal officer (s) appointed by Licensee.
- 1.5.2. Unless otherwise specifically required by the Code all communications shall be in writing, except that where operation time requires oral communication. Such oral communications shall be confirmed in writing as soon as possible.

1.6. Structure of Distribution Code:

- 1.6.1. The Distribution Code has been divided into following chapters:

- (i) Chapter 1: General
- (ii) Chapter 2: Definitions
- (iii) Chapter 3: Distribution Planning
- (iv) Chapter 4: Operation and Maintenance Planning
- (v) Chapter 5: Cross Boundary Safety
- (vi) Chapter 6: Incident Reporting
- (vii) Chapter 7: Distribution Protection
- (viii) Chapter 8: Miscellaneous

CHAPTER 2

DEFINITIONS

2.1. Definitions:

2.1.1. Words or expressions occurring in this Code and not defined herein shall have the same meaning as defined in the Electricity Act 2003, Rules and Regulations made thereunder, and applicable Indian Standards (IS) as amended.

1. "Act" means the Electricity Act 2003 (36 of 2003);
2. "Advanced Metering Infrastructure (AMI)" shall have the same meaning as defined in sub-section (da) of Section 2 of the CEA (Installation and Operation of Meters) Regulations, 2006 as amended;
3. "Distribution Licensee" shall have the same meaning as defined in sub-section (17) of Section 2 of the Act;
4. "Distribution System" shall have the same meaning as defined in sub-section (19) of Section 2 of the Act;
5. "Extra High Voltage" shall have the same meaning as defined in sub-clause (z) of Clause 2.1 of the Madhya Pradesh Electricity Supply Code 2021 as amended;
6. "High Voltage" shall have the same meaning as defined in sub-clause (ee) of Clause 2.1 of the Madhya Pradesh Electricity Supply Code 2021 as amended;
7. "Low Voltage" shall have the same meaning as defined in sub-clause (ii) of Clause 2.1 of the Madhya Pradesh Electricity Supply Code 2021 as amended;
8. "Open Access" shall have the same meaning as defined in sub-section (47) of Section 2 of the Act.
9. "Power System" shall have the same meaning as defined in sub-section (50) of Section 2 of the Act;
10. "Transmission Licensee" shall have the same meaning as defined in sub-section (73) of Section 2 of the Act; and
11. "User" in context of this Code means a person, including Distribution Licensee, Generator within the State boundary, connected directly to distribution system of Distribution Licensee including embedded Generator and any other Distribution Licensee in the same area of supply or connected to distribution system in that area due to any reason, whatsoever. User shall also mean a consumer/prosumer connected to the distribution system including the Open Access consumer connected through transmission or distribution system.

CHAPTER 3

DISTRIBUTION PLANNING

3.1 Introduction:

- 3.1.1 Distribution Planning is essential for protecting consumer interests by upholding quality and reliability, facilitating coordinated planning between transmission and distribution networks, ensuring standardized and efficient distribution network development, adhering to technical standards and fostering overall efficiency and competitiveness in the electricity industry.
- 3.1.2 To ensure adherence to safety measures, the Distribution licensee shall plan, construct and maintain the distribution system as per the prescribed Safety standards to prevent danger to the lives of human, animals and damage to the property. For this purpose, planning of distribution network shall comply with the following CEA Regulations, namely:

Sr. No.	Particulars
1	Distribution System Planning and Security Standards as per CEA (Technical Standards for Construction of Electrical Plant and Electric Lines), Regulations, 2022, as amended;
2	Distribution System Construction, Operation and maintenance Standards, Safety Standards for the Distribution System as per CEA (Measures Relating to Safety and Electric Supply), Regulation 2023, as amended;
3	The CEA (Technical Standards for connectivity to the Grid), Regulations, 2007 as amended ;
4	The CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013 as amended;
5	The CEA (Installation and Operation of Meters) Regulations, 2006 as amended

- 3.1.3 The Distribution licensee shall conduct Safety / Technical Audit at least once in a year or more frequently if necessary to identify technical flaws and deficiencies perceived by the reporting individuals /consumers that could potentially result in accidents in any of the Primary & Secondary distribution system. The Distribution Licensee shall upload the Safety/Technical Audit reports on their website within 45 days after the end of the financial year. Distribution Licensee shall prepare Standard Operating Procedures (SOP) and check list to identify the technical deficiencies in the system and take corrective action to ensure safe and efficient operation of the Distribution system. Such SOP shall be made available in public domain on its web portal within 45 days from publication of this Code.
- 3.1.4 The Distribution licensee shall provide a segment on its portal within 45 days from the publication of this Code that enables individuals or consumers to report safety violations in public areas caused by the Distribution licensee's distribution network, including transformer, feeder, service line, Pole and Distribution box etc. that could

endanger human or animal safety, cause a fire or property damage. On this segment of portal there should be facility to upload photographs in suitable format depicting safety violation. The information in this regard shall be widely circulated among consumers through appropriate means including mass media, bills, SMS, emails or by uploading on Licensee's website. The Distribution licensee must record action taken to fix and correct such defects on the Portal on monthly basis.

- 3.1.5 The technical and design criteria and procedures to be followed by the Distribution Licensees in planning and development of the distribution system are specified in this Code. This Code is also applicable to all users in the Distribution System for their planning and development in so far as they affect the Distribution System.
- 3.1.6 The Distribution Licensee shall have to plan his distribution network in such a way so as to meet all Regulatory requirements.
- 3.1.7 Loss reduction shall be key element for planning of distribution network.
- 3.1.8 Feeder wise /Area wise loss level shall be assessed as per the existing and future projected load conditions along with measures to match with future Distribution loss reduction trajectory. With the use of system studies software, the distribution system shall be studied against the existing and future projected load conditions and a short term and medium/long term program for development/addition/augmentation of the system (Transformers/ Feeders/ grid stations/ Substations etc.) shall be prepared based on the system study results.
- 3.1.9 The Distribution system shall be planned with an objective of meeting existing and future load growth efficiently and optimally and maintaining the desired redundancy level in the system to meet current & future supply requirements for reliable power supply. The approach for Integrated system planning of distribution network with upstream sub-transmission network shall be adopted to facilitate the analysis considering various contingency conditions with a view to identify loading pattern of various elements in the distribution network along with constraints in upstream network for taking appropriate improvement measures.
- 3.1.10 The planning methodology shall include the analysis of existing system and planning of optimal & efficient future requirement of Sub-transmission and Distribution system to meet the expected demand in the operational areas. The methodology shall also include the requirement of adequate communication system and IT infrastructure like Supervisory Control data Acquisition System (SCADA), Distribution Management System (DMS), Outage management System (OMS), Advance Metering Infrastructure (AMI), etc. for enhancing the reliability & quality of the power supply and better consumer satisfaction.
- 3.1.11 The broad approach for planning of distribution system shall be based on the following parameters:

- i. Ensuring Grid Stability.
- ii. Ensuring adequate network for existing as well as future needs preferably with "N-1" redundancy in the network subject to the site conditions and feasibility of network, to provide 24x7 reliable power supply (excluding Agricultural category).
- iii. Ensuring safety and eliminating hazards to human/ animal.
- iv. Optimization of loading of Feeders and Transformers (Power and Distribution transformers)
- v. Reducing technical & commercial losses by optimizing the network
- vi. Ensuring power quality parameters like voltage regulation, harmonics, reactive power compensation etc. in line with the applicable Standards/Regulations.
- vii. Adoption of Information & Communication Technology like AMI, SCADA/ DMS for metering, data acquisition, data analysis and control for better managing & planning the system.
- viii. Ensuring compliance of Reliability Indices including SAIFI /SAIDI as specified in MPERC (Distribution Performance Standards) Regulations, 2012 as amended or through separate orders.
- ix. Ensuring measures to integrate Renewable energy as per National and State level plans and policy.

3.1.12 For planning, design and construction of the distribution system, distribution licensee shall also be guided by the following Guidelines.

Sr. No.	Particulars
1	Bureau of Energy Efficiency (Manner and Intervals for Conduct of Energy Audit in Electricity Distribution Companies) Regulations, 2021 issued under the Energy Conservation Act, 2001, as amended
2	Guidelines for Capital Expenditure by Licensees in Madhya Pradesh under Regulation 10.3 of MPERC (The Conditions of Distribution License for Distribution Licensee (including Deemed Licensee)), 2004 as amended

3.1.13 In addition, Distribution licensee, while planning the network shall also be broadly guided by Electricity Distribution Network Planning Criteria, 2023 issued by the CEA.

3.1.14 The distribution system planning shall have the following attributes:

- i. Analysis of the existing distribution network and its operational situation.
- ii. Requirement to meet the load demand of all existing Users connected to it and all future Users seeking connection. Demand / load forecasting shall be governed by the provisions of MPERC (Framework for Resource

- Adequacy) Regulations, 2024 as amended.
- iii. Identification of inadequacies in the network considering future load projections and designing of optimal future network.
 - iv. Examining the options available to address the inadequacy in the system in a cost-effective manner, like enhancement of existing transformer / feeder capacity or reconfiguration of existing network or setting up a new substation etc.
 - v. Planning for replacing existing meters including defective meters with Smart Pre-paid or other pre-paid meters as per notification of the Ministry of Power, GoI and Regulations notified by the CEA and this Commission.
 - vi. Conformance to safety requirements by adhering to appropriate design standards.
 - vii. Identification of works to improve system performance to increase reliability and quality of supply and to reduce technical & non-technical losses.
 - viii. Adopting technically feasible solution for network inadequacy in such a way that system should operate at minimum overall cost, comprising both capital and running cost i.e. the proposals for expansion should comply with the standards and should be the least-cost optimal solution selected among technically-feasible alternatives.
 - ix. To adopt regular safety and reliability audits of all major equipments of the network.
 - x. Efficient Integration of Distributed Energy Resources (DERs) and Electric Vehicles (EVs) with the distribution grid.
 - xi. To ensure Reactive Power Compensation at appropriate places as per requirement for correcting voltage profile and reduce technical losses.
 - xii. Matching of sub-transmission and distribution planning with transmission sector planning.
 - xiii. Selection of network equipment based on merits of overall service life of electrical devices factoring both Capital Expenditure (CAPEX) & Operational expenditure (OPEX) to ensure optimization of cost and highest system reliability.

3.2 Planning Criteria:

Following broad criteria shall be adopted for planning the Sub-Transmission and Distribution system: -

- 3.2.1 The location of Sub-station shall be near to the load center as far as possible. Adequate power supply at normal voltage shall be available at grid sub-stations to meet the system demand. The transformation capacity and feeding line capacity at the Sub-stations may be such that the system demand is met even with the outage of one of the feeder or outage of largest capacity transformer.
- 3.2.2 The installed capacity of 33/11 kV sub-station shall be on the basis of spatial load forecast, demographic factors, space availability, right of way consideration, existing

network configuration and “N-1” redundancy considerations etc. The Sub-station may be planned with adequate capacity to cater to load growth for at least 5 years. The feeding lines may be planned for meeting the load of the sub-station up to 15 years considering Right of Way (ROW) issues.

3.2.3 Before deciding the ratings of the equipment in a sub-station, a schematic/layout diagram of the substation shall be prepared. There are a number of arrangements dependent upon system voltage, position of the sub-station in the system, flexibility, reliability of supply and cost etc. The factors to be considered while deciding the layout shall be as follows :-

- i All electrical safety requirements, clearances, fire detection & extinguishing system, earthing & ventilation etc shall be as per Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023 as amended. The layout must ensure that equipment maintenance can be carried out without disrupting the entire supply.
- ii As far as possible, there should be alternate arrangements in the event of outage of any one important network segment in terms of equipment/line.
- iii The layout shall be economical and should not hinder future expansion.
- iv The lay out of the sub-stations shall be such that the fire, in case of any emergency, shall not spread from one to other equipment and areas as far as possible.

3.2.4 The load bifurcation on nearby line /DT, augmentation of lines, use of energy efficient Distribution Transformers & use of automatic switched capacitors at 33 kV Sub-stations or at Distribution Transformer level shall be adopted to enhance the voltage profile at the farthest end.

3.2.5 The installation of Automatic Power Factor Controller (APFC) panels at LT level shall be explored as per requirement. The adequate capacity of Shunt capacitors should be connected on secondary side of 33/11 kV transformers, if found necessary, based on network studies conducted. Where the sub-station is feeding loads which have high harmonic levels, suitable harmonic filters shall also be installed.

3.2.6 The Distribution Licensee shall ensure that all assets are geo-tagged and properly recorded in the Fixed Asset Register. All 33 kV feeders, power transformers, 11 kV feeders, distribution transformers, and LT feeders must be digitally modelled with GPS mapping and consumer indexing. The digital model should include important parameters such as conductor sizes, lengths, feeder-wise power flow (including peak demand), and the ratings of power and distribution transformers (PTR and DTR), along with their standard resistance (R) and reactance (X) parameters. This approach will facilitate better resource planning, network monitoring, and augmentation.

3.2.7 In cases of sub-stations loaded with highly fluctuating loads like arc furnaces etc., flickers and voltage regulation problems may be overcome by installation of Static Var Compensators (SVCs) or Static Synchronous Compensator (STATCOM). Mainly in urban areas, where high voltage, beyond the specified limits may occur during off-peak

- period and less voltage during peak load period, the automatic reactive compensation (Capacitor + Reactors) may preferably be adopted. Capacitor banks shall be installed near inductive loads. Licensee shall ensure that all Capacitor banks installed are fully functional and are in good working condition. Suitable measuring instruments may be installed for monitoring functioning of Capacitor Banks on real time basis. Regarding reactive power management, a Master plan, considering peak loading and corresponding power factor of 33 kV and 11kV feeders shall be prepared. A report on status of reactive power compensation of these feeders shall be submitted by Licensee within 45 days after the end of the financial year.
- 3.2.8 The Distribution transformers to be installed in the field shall have standard rating as per relevant Indian Standards and shall follow Star rating criteria specified by BEE in accordance with BEE (Particulars and Manner of their Display on Labels of Distribution Transformers) Regulations, 2009 under Energy Conservation Act, 2001 as amended.
- 3.2.9 Licensee shall take measures to standardize the ratings of Distribution Transformers, switchgears etc to be used within the utility as per the load conditions in the utility areas. Such standardization of ratings would help in achieving reduction in inventory for purposes of Procurement & Maintenance and reduction in price on account of bulk purchase.
- 3.2.10 The distribution transformers in urban areas should operate at an average loading of 65%-75% of their rated capacity and have to be augmented when the maximum demand on the transformer reaches above 80% of capacity (sustained peak). In Rural areas, a slightly higher loading based on the time horizon of peak load and assessment of load growth should be considered for augmentation.
- 3.2.11 Standard conductor sizes should be adopted for 33 kV, 11 kV and LT lines to meet the expected load up to next 15 years' time period. The choice of conductor size shall consider factors such as thermal limit of conductor to meet expected load and voltage regulation. The choice of OH (Overhead) line or UG (Under Ground) cable shall be made based on the actual field conditions/ requirement of regulations and finances available etc. The distribution system shall be designed to provide an alternate path in the system for increasing the reliability of the system at all levels. The ABC cable/ covered conductor or UG cables shall be laid in theft prone areas.
- 3.2.12 The UG cables in Distribution network may be preferred in urban areas/densely populated areas including tourist & religious places due to safety reasons. U/G cables may also be used in disaster prone areas. However, UG cables take more time in case of locating & repairing of any fault in the cable. Hence, UG cabling system should be designed such as to provide the alternate path for feeding the loads through Ring Main units (RMUs) with the additional cable from nearby circuits.
- 3.2.13 As per CEA Regulations, in case of Electric lines of 33 kV and below passing through the protected areas (National Parks, Wildlife Sanctuaries, Conservation Reserves, Community Reserves), Eco- sensitive zones around the protected areas and Wildlife

Corridors, only underground cable shall be used.

- 3.2.14 Distribution licensee shall preferably use Under Ground (UG) cables for new works in the metropolitan area of the State and plan to replace existing Overhead line (OH) in to Under Ground (UG) cable, gradually in a span of time not later than 5 years from the date of notification of this Code or such extended period as the Commission may specify. Planning of such work should be so prioritised that feeders giving higher revenue per unit are replaced first. UG cabling may be taken up so as to give better services to such consumer areas in terms of lesser interruptions. If the licensee opts for UG network in theft prone areas, it is required to run pilot projects first, recording reasons and taking into account likely / projected returns, which should be verified through third party after execution of project. After thorough evaluations of such pilot project, UG network in theft prone areas may be scaled up.
- 3.2.15 It would be desirable to limit the length of feeders to a minimum to have better voltage regulation and reduced technical losses. The maximum length of the feeders would depend upon the conductor used and maximum load on the feeder keeping the voltage regulation at farthest end within limits. The voltage level wise feeder size and length shall be decided based on system studies considering various load conditions to meet voltage regulation at farthest end with least technical losses.
- 3.2.16 If the size of line conductor is inadequate or the voltage drop exceeds the prescribed limits, load on the feeder shall be reduced by transferring some load on new feeders/ nearby under loaded existing feeder or the line shall be augmented by replacing the existing conductor by higher size conductor. Most economic voltage level in the system may be determined through techno-economic studies taking into account the voltage regulation considerations, load to be supplied, loading limits of conductor, cost of losses and investment cost considerations etc.
- 3.2.17 HT/LT ratio is considered one of the performance indicators for Technical losses in any distribution system. HT/LT ratio of 1 (one) or more is considered to be good indicator for any distribution system. Discoms shall plan their distribution system keeping in view more HT lines as compared to LT lines to improve the HT/LT ratio to reduce T&D losses and low voltage problems suffered by consumers due to long LT network. Based on the technical and commercial requirement, HVDS (High Voltage Distribution System) may be explored.
- 3.2.18 The system configuration may be radial, ring or combination of both as per requirement, however, the radial configuration shall be minimized to improve reliability in the system. In urban areas, in densely populated areas and for essential services etc, the ring configuration shall be adopted, as far as possible.
- 3.2.19 Dedicated feeders shall be laid for major industrial consumers and critical loads like VIP loads, Airport, Hospitals, and Water Works etc. Provision of alternate feed should also be there, so far as possible for Hospitals, Airports, water works etc and "N-1" redundancy for feeding the Critical loads /important areas may be adopted. "N-1" redundancy is to ensure a high level of reliability and resilience against potential

failures and refers to the ability of a power system to remain operational even after the simultaneous failure of two independent components or elements within the system.

- 3.2.20 Harmonic distortion is caused principally by non-linear loads such as LED, Computers, TV, rectifiers and arc furnaces etc. and can affect the operation of a supply system. It may cause overloading of equipment or even resonance with the system leading to overstressing (excessive voltage & current). Other effects include interference with telephone circuits and broadcasting, metering errors, overheating of rotating machines due to increased iron losses, overheating of winding of transformer due to excessive third harmonics or excessive exciting current etc.
- 3.2.21 Distribution Licensee shall install sufficient number of Power Analysers for measuring Harmonics at regular intervals near the source of harmonics generation and shall use requisite filters/ correction devices at appropriate places to regulate the harmonics within the prescribed limits.
- 3.2.22 The total harmonic voltage distortion and individual harmonic voltage distortion at point of common coupling shall be in accordance with the CEA Regulations, as amended.
- 3.2.23 Periodic measurement of power quality parameters such as voltage sag, swell, flicker, disruptions shall be done as per relevant Regulations and Indian Standards (IS)/ International Electrotechnical Commission (IEC) Standards by the distribution licensee.
- 3.2.24 To improve the operational flexibility, to minimize restoration time of power supply and to prevent overloading of lines and transformers in real time mode, modern technologies such as Supervisory Control Data Acquisition System (SCADA), Real time Data Acquisition System (RTDAS), Distribution Automation, Automatic sectionalizer, Fault Passage Indicators (FPI), Ring Main Units (RMU), completely self-protected Transformers (CSPs) etc. shall be deployed in the Sub-stations and field. Adequate cyber security measures shall be ensured in deploying IT (Information technology) and OT (Operational Technology) System.
- 3.2.25 The installation of communicable system meters/ Smart Meters on all Feeders and Distribution Transformers shall be implemented as per CEA Regulations as amended. For increased system visibility, Geographic Information System (GIS) with asset mapping, consumer indexing, and integration with an Enterprise Resource Planning (ERP) system shall be implemented in conjunction with smart meters.
- 3.2.26 Adequate number of accredited testing laboratories /testing infrastructure for in- house testing of major items like Distribution Transformers, Power Transformers, Instrument transformers, meters, conductors, etc. shall be made available by the Discoms. Well-trained staff for testing of various distribution equipment shall also be deployed by the DISCOMs.
- 3.2.27 **Energy Audit:** Bureau of Energy Efficiency (BEE) has issued Regulations namely Bureau of Energy Efficiency (Manner and Intervals for Conduct of Energy Audit in

electricity distribution companies) Regulations, 2021 as amended, under provisions of the Energy Conservation Act, 2001 as amended, for conduct of mandatory Annual Energy Audit and periodic energy accounting in DISCOMs. Distribution Licensee shall ensure periodic energy audits as per these Regulations and provide a copy of the Report to the Commission within 45 days from the end of each quarter and also at the end of financial year.

3.2.28 Environmental Issues: The Distribution Licensee shall take due regards of environment regulatory guidelines in planning, design, construction and operation of distribution system. Environmental impact assessment shall be carried out for all major distribution projects like construction of sub-stations in green and reserved area. The required clearances and no-objection shall be obtained from State Pollution Control Board wherever prescribed.

3.2.29 Accreditation of electric plants with IS-18001 certification: Regulation 4(2)(i) of the CEA (Safety Requirements for Construction, Operation, and Maintenance of Electrical Plants and Electric Lines) (Amendment) Regulations, 2022, as amended, requires that the owner of any electrical plant or electric line obtain accreditation with the IS-18001 certification, which is the Indian Standard for Occupational Health and Safety Management Systems.

3.2.30 To address the rising pollution levels in the metros and the cities with a population of 100,000 and above, and in order to minimize the reliance on diesel generator sets, which significantly contribute to air pollution, it is essential for distribution licensee to ensure 24x7 uninterrupted power supply to all consumers. In this context, consumers currently using diesel generators as essential backup power are required to make transition to cleaner technologies, such as renewable energy sources combined with battery storage systems within 5 years from notification of this Code. This transition is contingent upon the reliability of the power supply in the respective city within the distribution licensee's service area. By implementing these steps, the goal is to reduce pollution and promote sustainable energy solutions, contributing to a healthier environment and better quality of life for residents.

CHAPTER 4

OPERATION AND MAINTENANCE PLANNING

4.1 Introduction:

4.1.1 This section outlines procedures and practices for efficient operation and maintenance planning of electric lines and plants connected to the Licensee's distribution system.

4.1.2 The Madhya Pradesh Electricity Grid Code, 2024, as amended addresses operational matters related to distribution and transmission system interfaces, requiring Licensees to obtain timely inputs and data from Users.

4.2 Distribution Control Center (DCC):

4.2.1 Distribution Control Center, established by each Distribution Licensee in its areas of supply under the provisions of "Madhya Pradesh Electricity Balancing and Settlement Code, 2023" as amended, shall inter alia, monitor the power supply and collect data on the quantum of power and energy flow at the interface points and to interact with State Load Despatch Centre (SLDC). This is essential to enable the SLDC to coordinate with the DCC directly in order to streamline the procedures for efficient operation of the distribution system. Key Functions of DCC shall be as follows :

a) To carry out the directions issued by the State Load Despatch Centre regarding system operation and Demand/ Load control in his areas of supply including followings:

- i. Monitoring of Power supply position
- ii. Demand estimation and projections
- iii. Contingency load management.
- iv. Implementation of power supply plan to Agriculture consumers

b) Monitoring and accounting the drawl of energy by the Distribution Licensee in his area of supply. The 33kV and 11kV feeders should be grouped to prevent repeated interruptions to the same set of consumers.

c) In order to carry out the above functions, the DCC shall have the required communication facilities with all the interface points and the State Load Despatch Centre, and other users.

4.2.2 Distribution licensee shall develop a separate portal for maintaining records of Power Supply Position comprising necessary details such as hours of supply, outage of 33kV/11kV feeders, details of load shedding and reason thereof along with corrective measures taken in each specific case. The record shall be updated on daily basis. A link shall be provided to the Commission to access the information of portal.

4.2.3 Distribution Licensee shall take all necessary measures to ensure the supply of 24x7 power to all consumers, excluding agricultural consumers, and shall not resort to any

load shedding at its own discretion, except as instructed by the State Load Dispatch Centre (SLDC) for Grid security. The Distribution Licensee shall submit a quarterly report on the power supply status to the Commission. In the event of any load shedding, the Licensee shall submit a report giving details of load shed (MW/MU), numbers of feeders, and consumers affected, to the Commission within 15 days from the date of occurrence, specifying the reasons for the load shedding and clearly indicating whether it was done under the instructions of the SLDC or Licensee.

4.3 Outage Planning:

- a) The Distribution Licensee shall furnish its proposed outage programs through DCC to the SLDC and the Transmission Licensee on a month- ahead basis.
- b) The outage program shall indicate duration and extent of load affected. It shall contain proposed work for which outage is planned, identification of lines and equipment of the Distribution System proposed to be taken out of service, date of start of outage, duration of outage, quantum of load affected and numbers of consumers affected.
- c) The outage plan proposed by the Licensee shall be in coordination with the Transmission outage plan and affected consumers.
- d) The above procedure shall not apply under emergency situation requiring immediate isolation of any part of the distribution system because of storm, danger to human life, danger to equipment etc..
- e) A dedicated portal will be developed by Distribution Licensee for monitoring of planned outages. It will allow outsiders agencies and Distribution Licensee officials to place online requisitions for shutdown. This portal shall be developed within 30 days from the date of notification of this Code taking into consideration the following :
 - (i) While placing the requisition for planned shutdown, the proposed date and duration shall be indicated.
 - (ii) Sanctioning authority for different voltage levels shall be designated by Distribution Licensee for conveying online permission on abovesaid requisition.
 - (iii) Sanctioning authority while processing the request for shutdown in an area will club multiple requisitions in that area and allow shutdown in one time slot in such a way that duration of shutdown is minimized and numbers of agencies working during the same period of shutdown are maximized. Requisition for shutdown shall have to be made preferably 10 days in advance by the Requisitioner.
 - (iv) All safety measures shall be adhered to by the concerned persons in accordance with relevant IS and CEA regulations.

- (v) Information for such planned outages shall be conveyed to affected consumers and Requisitioner(s) in advance through appropriate modes and record of delivery of such messages/information shall be maintained by the Distribution Licensee.
- (vi) Distribution Licensee shall issue Detailed Standard Operating Procedures (SoP) for requisitioning and sanctioning of planned outage by Outside agency /Discom within 30 days from date of notification of this Code.
- (vii) Distribution Licensee shall designate a reviewing authority at Corporate office level, to monitor whether permissions by sanctioning authority are given in transparent manner and whether planned shutdowns are executed within sanctioned time period.
- (viii) Reviewing authority shall review the durations of shutdowns availed and will recommend appropriate measures to minimize such durations. If needed, SoP may be amended accordingly.
- (ix) Reviewing authority shall identify the areas where repetitive planned outages are requisitioned by Distribution Licensee / Outside agency and sanctioned. Corrective measures shall be taken by Reviewing authority to minimize repetition of outages in such case.
- (x) Every six months, the reviewing authority shall provide a brief report to the Commission analyzing the shutdowns availed during the reporting period. The report should provide details of shutdowns clubbed together, repetition of shutdowns on same network area, comparison with same period outages for pre-portal regime and other details of analysis.

4.4 Contingency planning:

- a) A contingency situation may arise in the event of a blackout in the transmission system. A contingency may also arise on a part of the distribution system due to local breakdown in the distribution system itself. It may also arise due to a breakdown in the apparatus of the Transmission Licensee at the point of interconnection.
- b) In case of blackout affecting operations within any area of the distribution system, the Licensee shall restore the loads as per the instructions of SLDC.

4.5 Demand Management and Load Shedding:

- a) DCC shall resort to temporary load shedding for maintaining the load generation balance as instructed by the SLDC. This may also be necessary due to loss of any circuit or equipment or any other operational contingency.

- b) The DCC shall estimate Loads that may be shed in discrete blocks at each Interconnection Point in consultation with the Users supplied through independent circuits as required and submit the same to the SLDC. Such Users shall cooperate with the Licensee in this regard. The DCC shall work out the sequence of load shedding operations and the detailed procedure shall be furnished to the SLDC and to the person in-charge of Sub-Stations concerned where such load shedding has to be carried out.
- c) In case of automatic load shedding through under-frequency relays, the circuits and the amount of load to be interrupted with corresponding relay settings shall be intimated to the SLDC and persons in charge of the Sub-Stations of the Distribution Licensee as necessary.

4.6 Maintenance Planning:

- 4.6.1 Distribution Licensee shall develop their own Standard Operating procedures (SoP) with focus on preventive maintenance and routine maintenance. Copies of SoP shall be submitted to the Commission for record. Preventive maintenance of transformers, switchgears, lines and other installations shall be carried out as per SoP to eliminate untimely power interruptions. A dedicated maintenance portal for internal use shall be created to streamline the entire maintenance work process. The portal shall also facilitate concerned staff to upload the photographs before and after completion of maintenance works.
- 4.6.2 For carrying out maintenance activities and monitoring in effective manner, a Responsibility Matrix of officer(s) shall be prepared by Distribution Licensee at each voltage level. As per the Responsibility matrix, Licensee shall designate competent authority who will supervise and cross check the progress of works at desired periodicity. The Competent Authority shall ensure that maintenance activities are completed within stipulated time period.
- 4.6.3 Maintenance activities shall include Suevey, Planning, Execution and Cross verification as per following: -
- 4.6.4 **Preliminary line survey:** Line survey through Ground patrolling or other methods may be done to identify major and minor works for maintenance. The survey may include regular walk-in survey, night survey, thermo-vision scanning and drone survey for identification of defects or suspected fault locations. The survey findings can be recorded in a mobile app along with capturing of photo or it can be recorded in a survey book. The finding of the survey shall be submitted to the concerned officer for planning and scheduling related to material and labor. The subsequent surveys shall be done from the last pole where the survey was done on the previous day.
- 4.6.5 **Planning for maintenance:** The competent authority at DC/ division level along with concerned Departments such as STM (Sub- Transmission and Maintenance) will plan and schedule for maintenance based on the survey. In cases, where construction works are required, the competent department such as STC (Sub Transmission Construction)

may be consulted during planning and scheduling.

4.6.6 **Execution of maintenance activity:** Concerned staff shall execute the works as planned and record the progress in the mobile app and web portal. All the maintenance works shall be taken up as per relevant Indian Standards.

4.6.7 **Cross- Verification:** The competent authority should be designated by the Distribution Licensee to cross-check the works executed and update the progress in the Mobile App. In case of any defects in the works is identified post maintenance, pre and post photographs and activities of the repeat maintenance works shall be incorporated in the report.

4.7 **Interface with Generating Units including Captive Power Plant (CPP):**

4.7.1 If the Distribution Licensee has an interface with any generating unit including CPP with which an Agreement for this purpose exists, the Distribution Licensee and the concerned owner of the generating unit shall abide by the following provisions in addition to the provisions contained in this Code as applicable to all the Users:

(a) The owner shall provide suitable protection at the interface to protect his system from any damage due to normal and abnormal conditions in the Distribution System.

(b) If the generator is an induction generator, the owner shall take adequate precautions to limit the system disturbances, when the induction generator is synchronised in consent with the Distribution Licensee. Generating Company having induction generators shall install adequate capacitors to compensate the reactive power drawl. Also, whenever the power factor is found very low during starting period and causes voltage dip in the Distribution Licensee's system. the Distribution Licensee shall advise the owner to install capacitors and the generating company shall comply.

4.8 **Interface with Distributed Generation Resources:**

4.8.1 Distributed Generation Resources connected to Distribution System of Licensee shall be governed with CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013 as amended.

CHAPTER 5

CROSS BOUNDARY SAFETY

5.1 Introduction:

- 5.1.1 This chapter specifies the requirements for safe working practices for maintenance of equipments associated with cross boundary operations and lays down the procedures to be followed when the work is carried out on electrical equipments connected to another User's System.
- 5.1.2 Users including Distribution licensee shall comply with the provisions of CEA (Measures relating to Safety and Electric Supply) Regulations, 2023 as amended, applicable to electrical plant and electric line, and the person engaged in the generation or transmission or distribution or trading or use of electricity. Regulations also provide additional safety requirements for renewable generating stations (Solar and Wind energy installations, Biomass plants, and waste to energy plants, including Municipal solid waste or refuse derived fuel) and Electric Vehicle charging station.

5.2 Objective:

- 5.2.1 The objective of this section is to achieve an agreement on the principles of safety when working across a control boundary between the Distribution Licensee and the Users.

5.3 Control Persons and their Responsibility as per relevant CEA Regulations:

- 5.3.1 The Distribution Licensee and Users shall designate suitable persons to be responsible for safety co-ordination and ensuring observance of safety measures in their organizations. These suitable persons shall be referred to as "Electrical Safety Officers".
- 5.3.2 For every electrical installation in a factory with over 250 kW connected load, or in mines and oil-fields with over 2000 kW connected load, the owner or management must designate an Electrical Safety Officer to ensure compliance with safety provisions under the relevant Acts and Regulations.
- 5.3.3 The Distribution Licensee shall issue a list of Electrical Safety Officers with their names, designations, addresses and telephone numbers, to all the Users having direct control boundary with him. This list shall be updated promptly whenever there is any change of name, designation or telephone/mobile number, email ID of any Electrical Safety Officer named in the list. Similarly, details of Electrical Safety Officer designated by users shall be informed to concerned Distribution Licensee.
- 5.3.4 The Distribution Licensee shall develop an agreed written procedures for Cross Boundary Safety and continuously update the same. Copy of such written procedures shall be submitted to the Commission for records.

CHAPTER 6**INCIDENT REPORTING****6.1 Objective:**

- 6.1.1 An Incident in the system means occurrence of an event which causes the other connected systems to operate differently from the way in which these would have operated in absence of that event and may result into blackout, widespread outage, large scale power interruption, safety /fire/environmental hazard, and accidents etc.
- 6.1.2 A reporting system for operational performance and system Incidents is necessary for timely acquisition of information by various agencies and for maintaining system conditions for:-
- taking responsive action by the Licensees and the Users.
 - modifying subsequent planned operations to suit the new condition and status to which the system is propelled by the Incident.
 - taking preventive action, after analysis, to avert or reduce recurrence of such incidents which exert deleterious effects on the system.
 - planning measures to mitigate the adverse effects of the events already occurred and
 - facilitating Regulatory monitoring.

6.2 Cross-Boundary Operational effect:

- 6.2.1 An Incident in the System of a Distribution Licensee or a User is considered to cause a Cross Boundary Operational effect if the Incident causes the Others' system to operate differently from the way in which it would have operated in the absence of that effect.

6.3 Real Time Operational Reporting of Incidents by the Licensees and by the Users:**6.3.1 Oral intimation of Incidents:**

Incidents causing Cross-Boundary Operational effect must be reported to the relevant duty operator of the other entity immediately, either through phone or electronic communication, by the duty operator of the licensee or user in whose system the Incident occurred.

6.4 Oral and Written Reports of Incidents:

- 6.4.1 Any Incident considered important by a User which occurs in a User's system shall be intimated orally by a responsible officer of the User to a responsible officer of the Licensee within two hours of its occurrence.
- 6.4.2 Users must send a detailed report within six hours of oral intimation, confirmed by a signed post copy, within two days, or a preliminary report within four days if electronic communication is unavailable.

6.5 Written Reports by Users to Licensees:

- 6.5.1 The Users shall submit monthly written reports mentioning all significant and major incidents to the Licensee. The proforma is given below:
- Brief Description of Incident ;
 - Location of Incident and antecedent conditions including weather conditions;
 - Date and time of Incident ;
 - Plant, equipment and lines involved ;

- e) Supply interrupted, numbers of consumers affected and duration, if applicable ;
- f) Amount of generation lost in the case of small generators and CPPs, if applicable;
- g) Time taken to resume service. If not taken into service already, expected time to return to service;
- h) How safety Interlocks functioned when the incident occurred ;
- i) Whether operating instructions were followed after the Incident ;
- j) Damage to plant/equipment; if any;
- k) Details of Relay Operation/Indications , whether any malpractice observed ;
- l) Sequence of trippings, whether cascade trippings occurred ;
- m) Brief Excerpts from the Log Book ;
- n) Causes of the Event as analysed by the utility/company ;
- o) Remedial Measures; and
- p) System parameters before and after the Incident;

6.6 Written Reports by the Licensee to the Users:

- 6.6.1 Licensee shall send written reports regarding Incidents to a User as and when requested by the User, furnishing the reasonable details required by the User within a reasonable period.

6.7 Intimation of Incidents in a User's System by a Licensee to other Users:

- 6.7.1 An Incident occurring in a User's System may affect the Distribution Licensee's system and in addition the systems of other Users. In such a case the Distribution Licensee shall intimate all the Users affected or likely to be affected by the Incident as soon as possible and furnish the details which are necessary for the other Users including the following:

- (a) Brief Description of the Incident, time and date
- (b) The manner in which the other Users are likely to be affected by the Incident
- (c) Action taken by the Distribution Licensee to mitigate the adverse effects of the Incident on the other Users
- (d) Action required by the other Users to enable the Distribution Licensee to manage the situation created by the Incident

- 6.7.2 The information shall be given orally by the Distribution Licensee to the other Users as soon as possible but not later than 6 hours and the written reports shall be sent within two days.

6.8 Post Incident Joint Investigation:

- 6.8.1 After an Incident all affected Users and the Distribution Licensee may individually conduct investigation. Such independent investigations are the internal matters of the entities. It is provided that joint investigation of an Incident may be conducted only if all parties agree. Any proposal for joint investigation by a party and agreement/disagreement by other parties shall be in writing.

CHAPTER 7

DISTRIBUTION PROTECTION

7.1 Introduction:

- 7.1.1 Appropriate protection schemes with proper protection coordination are necessary to maintain the power system reliability and avoid damage to vital Electrical equipments. The correct operation of protective relays during faults will minimize trippings in distribution network. Therefore, coordination of protective relays at grid substation and downstream are very much essential to maintain the high reliability in Sub-transmission and Distribution Network.
- 7.1.2 Protection system and its co-ordination shall conform to relevant standards such as Indian Standards (IS) and International Electrotechnical Commission (IEC) as amended.

7.2 General Principles:

- (1) A well-designed protection scheme using Numerical or other appropriate Relays preferably with communication interfaces (compatible with common communication protocol such as Modbus) shall be used for primary protection i.e. incoming 33kV feeders and 33/11 kV Power Transformers. Secondary protection i.e. 11kV Busbars, 11kV feeders and 11/0.4 kV Distribution Transformers with suitable protection scheme shall be ensured by Distribution Licensees for quick and selective isolation of faults, protecting both equipment and personnel, and maintaining system stability and reliability.
- (2) Co-ordination of protection scheme of 33kV and 11kV lines with the originating EHV sub-station should be ensured to avoid major sub-station equipment/EHV transmission lines from tripping on through-faults due to delayed fault clearance in the distribution feeders. Protection on 33kV & 11kV transformers and lines (or their sectionalizing points) of HV system of Distribution Licensees shall be coordinated with settings of protection provided on 33kV & 11kV connection points at State Transmission Utility (STU) sub-stations.
- (3) The Protection Co-ordination Committee constituted under the provisions of Madhya Pradesh Electricity Grid Code 2024 as amended, of which Distribution Licensees are also members, shall meet on regular basis to discuss protection co-ordination and related issues such as malfunctions of protection and changes in the system configuration, if any and possible revised settings of relay. The Distribution Licensee shall investigate any malfunction of protection as may have occurred in system or other unsatisfactory protection issues as may be observed. The Distribution Licensee shall take prompt action to correct any protection malfunction or activity as discussed and agreed to in these meetings.
- (4) Short circuit studies required for deciding the relay settings shall be conducted by the Distribution Licensee and the Users. Routine checks on the performance of protective relays shall be conducted by Distribution Licensee.

7.3 Protection Manual:

- 7.3.1 Distribution Licensee shall prepare and enforce standard manual of protection indicating adequate protection requirement within the distribution system and connected Users' system. The Protection Manual shall cover protection of supply lines and Power and Distribution Transformers through which supply is provided to the consumers. A copy of protection manual shall be submitted to the Commission for record within six months of notification of this Code.

CHAPTER 8**MISCELLANEOUS****8.1. Installation and operations of Meters:**

8.1.1 All interface meters, consumer meters and energy accounting meters shall comply with the applicable Indian Standards and the CEA (Installation and Operation of Meters) Regulations, 2006 as amended.

8.2 Conditions of Connection:

8.2.1 The conditions for connection for Supply shall be governed by the applicable Regulations namely "Madhya Pradesh Electricity Supply Code, 2021", "MPERC (Recovery of Expenses and other charges for providing Electric line and Plant for the purpose of giving supply), Regulations, (Revision-II), 2022", "MPERC (Security Deposit) Regulations, (Revision-I), 2009", and "MPERC (Distribution Performance Standards) Regulations (Revision-II), 2012" as amended.

8.3 Power to Remove Difficulties:

8.3.1 If any difficulty arises in giving effect to any of the provisions of the Distribution Code, the Commission may, by general or specific order, make such provisions not inconsistent with the provisions of the Act, as may appear to be necessary for removing the difficulty.

8.4 Power to Relax:

8.4.1 The Commission may by general or special order, for reasons to be recorded in writing and after giving an opportunity of hearing to the parties likely to be affected by grant of relaxation, may relax any of the provisions of the Distribution Code on its own motion or on an application made before it by an interested person.

8.5 Power to Amend:

8.5.1 The Commission may, as and when considered necessary, by notification, amend this Code.

8.6 Repeal and Savings:

8.6.1 The Code namely "Madhya Pradesh Electricity Distribution Code, 2006 read with all amendments thereto, is hereby repealed.

By order of the Commission,
UMAKANTA PANDA, Secy.