Bhopal, Dated: 09/01/2025

No. 58/MPERC /2025 –. In exercise of powers conferred under Section 86 (1) (i) read with Section 57, Section 59 and Section 181(1) of the Electricity Act, 2003, the Madhya Pradesh Electricity Regulatory Commission (MPERC), hereby makes the following Regulations, namely -

Madhya Pradesh Electricity Regulatory Commission (Power Quality) Regulations, 2025

(G-49 of 2025)

CHAPTER – 1

PRELIMINARY

1.1. Short Title, Extent and Commencement

(1) These Regulations shall be called the "**Madhya Pradesh Electricity Regulatory Commission (Power Quality) Regulations, 2025 (G-49 of 2025)**".

(2) These Regulations shall extend to the State of Madhya Pradesh.

(3) These Regulations shall come into force with effect from the date of their publication in the official gazette of Govt. of Madhya Pradesh.

1.2. Objectives

The objective of these Regulations is to ensure the monitoring and maintenance of Power Quality parameters as prescribed by the CEA Regulations referenced herein. The scope covers key parameters, including supply voltage variation, voltage unbalance, flickers, voltage sags/dips, swells, and harmonics, both on the supply side and at consumer installations.

Power Quality refers to the degree to which voltage, frequency and waveform of a power supply system conform to prescribed specifications. Ideally, the power supply should be uninterrupted, maintain voltage level within acceptable limits, and exhibit a clean, noise-free sinusoidal waveform. Deviation from these standards, commonly known as poor power quality, can lead to degraded performance, premature equipment failures, and increased system losses. Power Quality disturbances can propagate upstream or downstream and could affect other consumers connected in the same supply network. Each disturbance arises from different causes and can have varying effects on electrical systems and equipment.

1.3. Definitions and Interpretations: Words or expressions or interpretations occurring in these Regulations and not defined herein shall have the same meaning as defined in the Electricity Act 2003, Rules and Regulations made thereunder, and applicable Standards as amended.

1) **'Act'** means the Electricity Act, 2003 (36 of 2003);

2) **'Authority'** means the Central Electricity Authority;

3) **'Contract Demand'** shall have same meaning as defined in Sub-section (p) of Clause 2.1 of Madhya Predesh Electricity Supply Code 2021 as amended;

4) **'Consumer'** shall have same meaning as defined in Sub-section (n) of Clause 2.1 of Madhya Predesh Electricity Supply Code 2021 as amended;

5) **'Designated Consumer'** means bulk consumers as defined in CEA (Technical Standards for Connectivity to the Grid) Regulations, 2007 as amended from time to time and identified as potential power quality polluters due to the presence of their installed non-linear loads, or otherwise covered under these Regulations. These Designated consumers subject to their potential to pollute power quality may include, but are not limited to, the following :-

   i. Commercial Buildings (such as Healthcare facilities, Hotels, Airports, Malls, etc.)
   ii. Information Technology (IT) and IT-enabled services
   iii. Automobiles
   iv. Iron & Steel
   v. Aluminum
   vi. Textile
   vii. Paper & Pulp
   viii. Chlor-Alkali

ix. Petrochemicals
x. Cement
xi. Pharmaceuticals
xii. Fertilizer
xiii. Food Processing
xiv. Plastic & Rubber
xv. Railways/Metros
xvi. Coal Mines
xvii. E- Charging Stations;

6) **'Distributed Generation Resource (DGR)'** shall have same meaning as defined in Sub-section (e) of Regulation 2 of Central Electricity Authority (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013 as amended;

7) **'Flickers'** means the impression of unsteadiness of visual sensation induced by a light stimulus whose luminance or spectral distribution fluctuates with time. It is caused under certain conditions by voltage fluctuation changing the luminance of lamps;

8) **'Harmonics'** means the sinusoidal component of a periodic wave, either Voltage or Current waveform, having a frequency that is an integral multiple of the fundamental frequency of 50 Hz;

9) **'Indian Standards (IS)'** mean standards specified by Bureau of Indian Standards;

10) **'IEC Standards'** means a standard approved by the International Electrotechnical Commission;

11) **'IEEE Standards'** means standards approved by the Institute of Electrical and Electronics Engineers;

12) **'Normal Operating Condition'** means operating condition for an electricity network, where generation and load demands meet, system switching operations are concluded, faults are cleared by automatic protection systems and in the absence of:

I. Temporary supply arrangement;

II. Exceptional situations such as:

a) Exceptional weather conditions and other natural disasters;

b) Force majeure;

c) Third party interference;

d) Acts by public authorities;

e) Industrial actions (subject to legal requirements); and

f) Power shortages resulting from external events ;

13) **'Point of Common Coupling (PCC)'** means the point of metering, or any other point on supply system of Distribution Licensee, electrically nearest to the particular load at which other loads are, or could be, connected. For service to users via a dedicated service transformer, the PCC is usually at the HV side of the transformer. For users supplied through a common service transformer, the PCC is at the LV side of the service transformer;

14) **'Power Quality Meter'** means a device suitable for monitoring and recording of power quality parameters complying with relevant standards referred to in CEA Regulations;

15) **'r.m.s. (root-mean-square) value'** means square root of the arithmetic mean of the squares of the instantaneous values of a quantity taken over a specified time interval and a specified bandwidth;

16) **'Supply Voltage Dip'** means a temporary reduction of the r.m.s. supply voltage at a given point in the electrical supply system of 10 to 90% of the declared voltage for a duration from 10 milliseconds (ms) up to and including 1 min. Typically a dip is associated with the occurrence and termination of a short-circuit or other extreme current increase on the system or installation connected to it;

17) **'Supply Voltage Swell (Temporary Power Frequency Overvoltage)'** means temporary increase in the r.m.s. supply voltage at a given point in the electrical supply system above 110% of the declared voltage for a duration from 10 ms up to and including 1 min;

18) **'Supply Voltage Swell duration'** means time between the instants at which the root mean square (r.m.s) voltage at a particular point of an electricity supply system exceeds the start threshold and the instant at which it falls below the end threshold;

19) **'Supply Voltage Swell start threshold'** means r.m.s. value of the supply voltage

specified for the purpose of defining the start of a supply voltage swell;

20) **'Supply Voltage Swell end threshold'** means r.m.s. value of the supply voltage specified for the purpose of defining the end of a supply voltage swell;

21) **'Transient Over Voltages'** means short duration oscillatory or non-oscillatory over voltages usually highly damped and with duration of few milliseconds or in microseconds;

22) **'Total Demand Distortion (TDD)'** means the ratio of the root mean square of the harmonic content, considering harmonic components up to the 50th order, expressed as a percent of the maximum demand current;

23) **'Total Harmonic Distortion (THD)'** means the ratio of the root mean square of the current harmonic content, considering harmonic components up to the 50th order, expressed as a percent of the fundamental;

24) **'Voltage Events'** mean sudden and significant deviations from normal or desired wave shape. Voltage events typically occur due to unpredictable events (e.g. faults) or due to external causes (e.g. weather conditions);

25) **'Voltage Fluctuation' or 'Voltage Variation'** means series of voltage changes or a cyclic variation of the voltage envelope, the magnitude of which does not normally exceed the specified voltage ranges; and

26) **'Voltage Unbalance'** means a condition in a poly-phase system in which the r.m.s. values of the line-to-line voltages (fundamental component), or the phase angles between consecutive line voltages, are not all equal. The degree of inequality is usually expressed as the ratios of negative and zero sequence components to the positive sequence component.

CHAPTER – 2

GENERAL

2.1. Assessment of Power Quality

2.1.1. The assessment of Power Quality shall consist of measuring various parameters of the power quality and comparing them with the standards as referred to in the Regulations notified by Central Electricity Authority (CEA) as amended from time to time.

2.1.2. **Power Quality Standards**

Measurements and monitoring of Power Quality parameters, Voltage and Current Harmonics shall be in accordance with the relevant IEC and IEEE Standards as referred to in CEA (Technical Standards for Connectivity to the Grid) Regulations, 2007, and CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013 as amended from time to time :

Provided that wherever nomenclature /number of the Standards is mentioned, the latest version of amendment of such Standards shall apply.

2.2. Scope and Extent of Application

2.2.1. These Regulations shall apply to Distribution Licensee(s) including Deemed Distribution Licensee(s), Designated Consumer(s) and Distributed Generation Resources (DGRs) as the case may be.

2.2.2. The Distribution Licensee shall identify Designated Consumers that have potential to pollute Power Quality and are capable of injecting harmonics into the distribution system beyond the applicable standards prescribed in the relevant CEA Regulations.

2.2.3. The scope of these Regulations is to specify the key Power Quality parameters of electrical supply at Point of Common Coupling (PCC). The key parameters of power quality of electrical supply considered in these Regulations to be controlled by Distribution Licensee are:

i. Supply voltage variations

ii. Supply voltage flicker

iii. Supply voltage unbalance

iv. Supply voltage Sag/ dips and swells

v. Supply voltage harmonics

The Power Quality parameter of electrical supply considered to be controlled by Designated consumer or DGR is:

vi. Current harmonics

2.2.4. The limits specified in these Regulations for power quality parameters shall apply only under normal operating conditions as defined in these Regulations.

2.2.5. The provisions concerning compensation to constituents (Designated Consumers, DGRs and Distribution Licensee) based on compliance or non-compliance with these Regulations, shall take effect in one year following the notification date of these Regulations. During such preparatory phase of implementation of these Regulations, inter-alia other activities, following shall be done:

i. The Distribution Licensee shall take appropriate measures to sensitize the Designated Consumers and DGRs.

ii. The Distribution Licensee shall issue a notice to all Designated consumers and DGRs apprising them of the provisions of these Regulations and also of their obligations to install Power Quality (PQ) meters within one year from the date of notification of these Regulations.

iii. Distribution Licensee shall install the Power Quality Meters at 33/11 kV Sub-stations/ strategic locations of Distribution Network of Discom within two years from the date of notification of these Regulations or such date as specified by CEA, whichever is earlier. A comprehensive plan in this regard shall be submitted by the Distribution Licensee within 2 months from date of notification of these Regulations. While installing the Power Quality meters strategic locations should be covered in the first year, gradually all 33 kV substations should be covered.

iv. The Distribution Licensee shall prepare appropriate guidelines for monitoring and reporting compliance with Power Quality Parameters. These Guidelines shall be submitted to the Commission within three months from the date of notification of these

Regulations. The Distribution Licensee shall propose clear provisions for the monitoring and maintenance mechanism of Power Quality Parameters, as well as compensation mechanism for all the constituents including Distribution Licensee(s) :

Provided that the Commission shall specify compensation Suo-Motu through separate order, if no proposal is submitted by the Distribution Licensee.

v. In the event that Designated Consumer/DGR fails to install power quality meters within the specified timeframe, a 30 days' notice shall be issued by the Distribution Licensee. After expiry of 30 days' notice Distribution Licensee shall install a power quality meter at the premises of Consumer /DGR at the cost of such consumer/DGR for 30 days. Such installations shall be facilitated by consumers /DGRs. Distribution Licensee after recording Power Quality Parameters of such Consumers/DGRs may impose compensation as determined by the Commission in case they fail to meet Power Quality Standards. Failure to install a Power Quality Meter shall attract penalties as per the provisions of Section 142 of the Electricity Act, 2003.

2.2.6. In order to enhance reliability, improve energy efficiency, ensure compliance with Power Quality Standards, and reduce disruptions and equipment failures due to poor power quality, the Distribution Licensee shall prepare Standard Operating Procedures (SoP) for conducting Power Quality Audits of their distribution network and submit to the Commission within six months from the notification date of these Regulations. The SoP shall cover the following:

a) The framework of the Frequency of Audit, scope and methodology for conducting the internal and external Power Quality Audit;

b) Procedures for comprehensive assessment of Power Quality Parameters as per standards referred to in CEA Regulations;

c) Sampling: Appropriate sampling techniques to evaluate the accuracy and reliability of recorded data across different Power Quality Parameters;

d) On-site Inspection: Physical inspections of substations, Point of Common Coupling /Metering Point to verify compliance with standards, and

e) Recommendations: Proposed corrective actions and strategies to enhance Power

Quality, mitigate risks, and optimize the performance of Discom's network.

Provided that the Commission may appoint Auditor at the cost of Distribution Licensee on such terms and conditions as may be laid down by the Commission, in case the Licensee fails to submit SOP within stipulated time.

Roles and Responsibilities of Distribution Licensees

2.2.7. The Distribution Licensee shall be responsible for maintaining the following Power Quality Parameters as per standards referred to in CEA Regulations:-

Power Quality Parameter:

i. Supply Voltage Variation;
ii. Supply Voltage unbalance;
iii. Voltage Sag (dip) and Swell; and
iv. Voltage Harmonics

2.2.8. In the event of failure to maintain Power Quality Parameters, the Licensee shall be liable to pay compensation to affected Designated Consumers.

2.2.9. The Distribution Licensee shall prepare an investment plan for the installation of Power Quality Meters at strategic locations within their distribution network in accordance with MPERC Guidelines for Capital expenditure by Distribution Licensee in Madhya Pradesh as amended from time to time.

2.2.10. The Distribution licensee shall publish the status of power quality parameters recorded through installed power quality meters on its portal on six monthly basis.

2.2.11. The Distribution Licensee shall be responsible for maintaining all Power Quality Meters in good working condition all times to ensure continuous and accurate power quality monitoring:

Provided that periodical testing and calibration of power quality meters shall be carried out as per recommendations of Original Meter manufacturer.

2.2.12. The Distribution Licensee shall make efforts to improve Power Quality in their supply area by deploying devices to mitigate power quality issues such as filters or controllers etc. For this purpose, the Distribution Licensee shall prepare an investment plan in

accordance with the MPERC Guidelines for Capital Expenditure by Distribution Licensees in Madhya Pradesh, as amended from time to time.

2.2.13. The Distribution Licensee shall ensure the data security and the data should only be used for identified purpose and should not be transferred to any other person without the consent of the specific Designated Consumer and DGRs.

2.2.14. It shall be the responsibility of the Distribution Licensee to comply with these Regulations and submit the half yearly and annual compliance report.

Roles and Responsibilities of Designated Consumer and DGRs

2.2.15. The Designated Consumers and DGRs shall install power quality meters within the time period as specified in these Regulations and share the recorded data of the meter thereof with the Distribution Licensee each month. The Designated Consumers and DGRs shall be responsible for maintaining all Power Quality Meters in good working condition all times to ensure continuous and accurate Power Quality Monitoring:

Provided that periodical testing and calibration of power quality meters shall be carried out as per recommendations of Original Meter manufacturer.

2.2.16. The Designated Consumers and DGRs shall be responsible to control the current harmonic injection into the electrical system within the standards referred into CEA Regulations. They shall deploy appropriate devices such as filters or controllers etc. at their works/ facilities, to mitigate Power Quality issues within one year from the notification of these Regulations.

2.2.17. The Designated Consumers and DGRs shall be liable to pay compensation to the Distribution Licensee for injecting current harmonics (with/without filter) into the Licensee's supply system beyond the standards referred to in the CEA Regulations. The level of compensation shall be specified through a separate order of the Commission.

Redressal of consumer complaints with regard to Power Quality:

2.2.18. The Consumer Complaints in relation to the Power Quality shall be redressed in the following manner: -

i. If Power Quality meter is installed and relevant power quality parameters' recorded data is available, the Licensee shall share the Power Quality parameters' data with the consumer and

in case of deviation from standards specified in the CEA Regulations, the Distribution Licensee shall :

a. ensure that the Power Quality Parameters' are brought as per standards specified in the CEA Regulations, as referred to in these Regulations, within ten days' of the receipt of a complaint, provided that no extension/upgradation of the network is involved; and

b. resolve the complaint within 180 days', provided that extension/ up-gradation of the distribution system is required.

ii. If Power Quality Meter is not installed and relevant Power Quality Parameters' recorded data is not available, the Licensee shall deploy Power Quality Meter/Analyzer for 30 days period on payment of "Power Quality Verification Charges (PQVC)" by the consumer as specified separately by the Commission under the provisions of MPERC (Recovery of Expenses and other Charges for providing Electric Line or Plant used for the purpose of giving Supply) Regulations (Revision-II), 2022 as amended from time to time . The Licensee shall record the Power Quality Parameters' data and share the same with the consumer:-

Provided that if the Power Quality Parameters' data are found within permissible limit, PQVC shall be refunded to the Consumer within30 days:

Further Provided that in case the Power Quality Parameters' data are found beyond the permissible limit from standards specified in the CEA Regulations , Licensee shall take action as per Regulation 2.2.18 (i) (a) and (b) above.

iii. The Consumer, who is aggrieved by non-redressal of his grievances of Power Quality, may make a representation for the redressal of his grievance to Electricity Consumers Grievances Redressal forums (ECGRF) constituted under Commission's Regulations namely MPERC (Establishment of Forum and Electricity Ombudsman for redressal of grievances of the Consumers), Regulations 2021 as amended.

iv. The ECGRF while redressing such grievances will refer to relevant records of Power Quality meters in respect of Consumer and the Distribution Licensee in accordance with Regulations 2.2.10 and 2.2.15 of these Regulations. In case Power Quality related information and records are not available or Power Quality Meter is defective at the Point of Common Coupling, ECGRF may order installation of such meter for a specific

period as per Guidelines issued under these Regulations to record respective Power Quality Parameters.

v. The ECGRF may also ask consumer and the Distribution Licensee to demonstrate compliance or otherwise with the Power Quality Standards as mentioned in Regulation 2.2.3 of these Regulations.

vi. After hearing the matter in accordance with the procedures laid down in MPERC (Establishment of Forum and Electricity Ombudsman for redressal of grievances of the Consumers), Regulations 2021 as amended, ECGRF shall pass a reasoned order giving details including but not limited to the following:-

a) Power Quality Parameter, regarding which complaint was made;

b) Parameter as recorded by Power Quality Meter specified under these Regulations and deviation from Standards;

c) Remarks, whether the provisions of these Regulations are complied with or not;

d) Whether the complainant consumer and the Distribution Licensee have deployed appropriate devices, such as filters or controllers, to mitigate Power Quality issues; and

e) Conclusion /compensation, as the case may be.

CHAPTER – 3

MISCELLANEOUS PROVISIONS

3.1 Power to Relax

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 these Regulations on its own motion or on an application made before it by an interested person

3.2 Power to Remove Difficulty:

If any difficulty arises in giving effect to any of the provisions of these Regulations, 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.

3.3 In the event of any inconsistency with other Regulations, the provisions of these Regulations shall prevail.

By order of the Commission
UMAKANTAPANDA, Commission Secy.

नियंत्रक, शासकीय मुद्रण तथा लेखन सामग्री, मध्यप्रदेश द्वारा शासकीय केन्द्रीय मुद्रणालय, भोपाल से मुद्रित तथा प्रकाशित—2025.