

Bhopal, the 4th August 2022

No.1609/MPERC/2022. In exercise of the powers conferred by sections 181 (1) and 181 (2) (za) read with section 57(1), 57 (2) and 86 (1) (i) of the Electricity Act, 2003 (36 of 2003), the Madhya Pradesh Electricity Regulatory Commission, hereby, makes the following Regulations, namely:-

**MADHYA PRADESH ELECTRICITY REGULATORY COMMISSION
(TRANSMISSION PERFORMANCE STANDARDS), (REVISION – II)
REGULATIONS, 2022 {No. RG - 9 (II) of 2022}**

1: Short title, Application and commencement.-

- 1.1 These Regulations shall be called “Madhya Pradesh Electricity Regulatory Commission (Transmission Performance Standards), (Revision – II), Regulations, 2022”.
- 1.2 These Regulations shall be applicable to State Transmission Utility / Transmission Licensees in the state of Madhya Pradesh.
- 1.3 These Revised regulations shall come into force from date of its publication in official Gazette of Government of M.P.

2: DEFINITIONS

2.1 In these Regulations, unless the context otherwise requires:

- (a) "Act" means the Electricity Act, 2003 (Central Act No. 36 of 2003);
- (b) "Commission" means Madhya Pradesh Electricity Regulatory Commission;
- (c) "Consumer" means any person who is supplied with electricity by the licensee and includes any person whose premises are for the time being connected for the purpose of receiving electricity from the licensee, persons who have applied for an electricity connection, persons whose supply is not yet connected even after due notice to avail connection or whose electricity supply has been disconnected. A consumer is -
 - (i) ‘Low Tension Consumer (LT Consumer)’ if he obtains supply from the licensee at low or medium voltage.
 - (ii) ‘High Tension Consumer (HT Consumer)’ if he obtains supply from the licensee at High Voltage.

- (iii) **'Extra High Tension Consumer (EHT Consumer)'** if he obtains supply from the licensee at Extra High Voltage;
- (d) **"Distribution Code"** means the Madhya Pradesh Electricity Distribution Code specified by the Commission for Distribution Licensees in the State of Madhya Pradesh;
- (e) **"Distribution Licensee"** means a Licensee authorised to operate and maintain a distribution system for supplying electricity to the consumers in his area of supply;
- (f) **"Distribution System"** means the system of wires and associated facilities between the delivery points on the transmission lines or the generating station connection and the point of connection to the installation of the consumers;
- (g) **"DISCOM"** shall mean the distribution Company or Vidyut Vitaran Company, wherein the "East Discom" shall mean the M.P. Poorv Kshetra Vidyut Vitaran Company Ltd., "WEST Discom" shall mean M.P. Paschim Kshetra Vidyut Vitaran Company Ltd. and "Central Discom" shall mean M.P. Madhya Kshetra Vidyut Vitaran Company Ltd;
- (h) **"EHV/EHT"** means Extra High Voltage/Extra High Tension (voltage level above 33,000 volts);
- (i) **"Electricity Supply Code"** means the Madhya Pradesh Electricity Supply Code, 2021;
- (j) **"Generating Company"** means any company or body corporate or association or body of individuals, whether incorporated or not, or artificial juridical person, which owns or operates or maintains a generating station;
- (k) **"Grid Code"** means the set of principles and guidelines prepared in accordance with the terms of Section 86 (1) (h) of the Act;
- (l) **"HV/HT"** means High Voltage/High Tension (voltage level above 650 volts and upto 33,000 volts);
- (m) **"IEGC"** means the Indian Electricity Grid Code notified by Central Electricity Regulatory Commission (CERC) and shall include any Grid Code specified by Central Commission under clause (h) of sub-section (1) of section 79 of the Act;

- (n) "Licensee" means a person who has been granted a license by the Commission under section 14 of the Electricity Act, 2003 and includes Deemed Licensees;
- (o) "LT" means Low Tension – voltage upto 650 volts;
- (p) "MPPTCL" means Madhya Pradesh Power Transmission Company Limited registered under the Companies Act, 1956 (No. 1 of 1956);
- (q) "PGCIL" means Power Grid Corporation of India Limited;
- (r) "SLDC" means a centre established under sub-section (2) of section 31 of the Act and includes State Load Despatch Centre already functioning in the State, as an apex body to ensure integrated operations of the power system in the state;
- (s) "State Transmission System" means the system of EHV network and electrical equipment operated and/or maintained by State Transmission Utility and/or any Transmission Licensee for the purpose of the transmission of electricity among generating stations, external interconnections, distribution systems and any other user connected to it;
- (t) "State Transmission Utility" means the Board or Government Company specified as such by the State Government under sub-section (1) of section 39 of the Act;
- (u) "User" means a person, including Generating Stations within MP, Transmission Licensees or Distribution Licensees within MP and open access customer who uses the State Transmission System;
- (v) "WRLDC" means Western Regional Load Despatch Centre established under sub-section (1) of section 27 of the Act.

2.2 Words and expressions used but not defined herein shall have the same meaning assigned to them in Electricity Act 2003, Indian Electricity Grid Code, 2010, Madhya Pradesh Electricity Grid Code, 2019, Central Electricity Authority (Grid Standard) Regulations, 2010. and Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010.

3: OBJECTIVE

- 3.1 These standards lay down the guidelines to maintain critical grid parameters within the permissible limits. They shall serve as guidelines for State Transmission Utility (STU)/Transmission Licensee to operate State Transmission System for providing an efficient, reliable, coordinated and economical system of electricity supply and transmission. The objectives of these performance standards are:
- (a) To ensure that the grid performance meets a minimum standard which is essential for the Users' system demand and proper equipment functions;
 - (b) To enable the Users to design their systems and equipment to suit the electrical environment that they operate in;
 - (c) To enhance the quality standards of the State Transmission System in order to move towards standard stipulated in or established under the authority of National and State Acts and Rules in the short term and gradually moving towards international standards in the long term;
 - (d) To monitor operational Performance of Transmission Licensee/ State Transmission Utility.

4: LEGAL PROVISIONS

- 4.1 The Commission in pursuance to provisions of section 57 read with section 86 (1) (i) of the Act is specifying these standards for State Transmission Utility /Transmission Licensee in the State of Madhya Pradesh. The Standards of performance specified herein are intended to serve as guidelines for State Transmission Utility /Transmission Licensee to operate the State Transmission system for providing quality, continuity and reliability of services;
- 4.2 Section 57 (1) of the Act stipulates that the Commission after consultation with Licensees and persons likely to be affected shall specify standards of performance of a Licensee or a class of Licensees;
- 4.3 Sub-section (2) of section 57 provides that if a Licensee fails to meet the standards specified under sub-section (1), without prejudice to any penalty, which may be imposed, or prosecution be initiated, he shall be liable to pay such compensation to a person affected as may be determined by the Appropriate Commission;

Provided that before determination of compensation, the concerned Licensee shall be given reasonable opportunity of being heard;

- 4.4 Under the provisions of section 86(1) (i) of the Act, the Commission is required to specify and enforce standards with respect to quality, continuity and reliability of services by the Licensees;
- 4.5 Section 34 of the Act provides that every transmission licensee shall comply with technical standards of operation and maintenance of transmission lines, in accordance with the Grid Standards as amended from time to time and subsequent relevant notifications, as may be specified by the Authority;
- 4.6 Section 73 of the Act provides that the Authority shall perform such functions and duties as the Central Government may prescribe or direct, and in particular to... ..

.....
(d) specify the Grid Standards for operation and maintenance of transmission lines";

- 4.7 Section 59 of the Act provides that every licensee shall, within the period specified by the Commission shall furnish the information with respect to level of performance. This has been covered in these regulations as Reporting Requirement (Refer Clause 7). This covers quarterly report on performance standards and publication of Annual Report under section 59 (2) of the Act;
- 4.8 Failure to meet performance standards and payment of compensation to affected party has been covered under Compliance of Regulations. The penal and prosecution provisions are as per section 142 of the Act;
- 4.9 The Commission, therefore, issues these Standards of performance of Transmission Licensee(s) as a Regulation, under section 181 (1) and 181 (2) (za) of the Act.

5: PERFORMANCE STANDARDS

5.1 The Transmission performance standards fall under two categories:

- (a) Category A - Those performance standards, where the provision of sub-section (2) of the section 57 is applicable for failure to meet the standards specified.
- (b) Category B - Those performance standards, which are desirable to provide quality, continuity and reliability of services by the Licensees, which the

Commission specifies in discharge of its function, but however not attract the provision of sub-section (2) of the section 57 relating to compensation to the persons affected.

5.2 Following standards fall under Category A as mandatory standards:

- (a) Voltage Variation
- (b) Frequency Variation
- (c) Safety Standards
- (d) System Availability
- (e) Feeder Availability
- (f) Transformer Availability
- (g) Outages Details and Restoration Time

5.3 Category B standards have been specified with the object of providing quality, continuity and reliability of services to the consumers under section 86 (1) (i) of the Act.

5.4 Following standards have been specified under Category B as desirable achievements:

- (a) Voltage Unbalance
- (b) Neutral Voltage Displacement (NVD)
- (c) Voltage Variation Index (VVI)
- (d) Frequency Variation Index (FVI)
- (e) Harmonics in Supply Voltage
- (f) System Adequacy
- (g) System Security
- (h) Energy Balance / Voltage Wise Losses
- (i) Capacity Addition
- (j) Top ten transmission lines with maximum congestion
- (k) SLDC - Technical Parameters and Monitoring of Voltage

6: PARAMETERS OF PERFORMANCE STANDARDS

Category A Standards

6.1 Those performance parameters, where the provision of sub-section (2) of the

section 57 is applicable for failure to meet the standards specified. The standards of performance are Conditions of License to be complied with by the Licensee.

6.2 The Commission specifies following standards under Category A:

(a) **Voltage Variation:**

- (i) Voltage Variation is defined as the deviation of the root-mean-square (RMS) value of the voltage from its nominal value, expressed in terms of percent. Voltage Variation may be either of short duration not exceeding one minute or long duration for a time greater than one minute.
- (ii) For the purpose of these standards, the sustained variation in steady state voltage exceeding one minute duration shall be considered. The specified permissible limits of sustained voltage variation shall not apply in the cases where the circumstances are reasonably beyond the control of State Transmission Utility /Transmission Licensee e.g. major break-downs, grid failures, accidents, system distress conditions etc.
- (iii) State Transmission Utility /Transmission Licensee shall make all possible efforts to ensure that the grid voltages remain within the following voltage levels at all EHT sub-stations of its Transmission System:

Voltage (kV rms)					
Nominal Voltage (kV)	Maximum		Minimum		Reference
	Limit (%)	Value (kV)	Limit (%)	Value (kV)	
765	+5	800	-5	728	MPEGC, 2019
400	+5	420	-5	380	MPEGC, 2019
220	+10	245	-10	198	MPEGC, 2019
132	+10	145	-7	122	MPEGC, 2019
33	+10	36	-9	30	MPEGC, 2019

- (iv) The compliance of above standards is subjected to following conditions:

- 1- Voltage is maintained by PGCIL, at Transmission Licensee/ State Transmission Utility interfaces, as per limits.
- 2- Discoms drawal at a power factor not below 0.95 lagging.
- 3- Loading of all lines limited to the Surge Impedance Loading (SIL) in normal conditions.

(v) The compliance shall be reported as per Annexure – 1A to 1E.

(b) Frequency Variation:

- (i) State Transmission System shall always operate as an integral part of the Western grid. However, frequency management is the joint responsibility of all constituents of the Western grid. State Transmission Utility /Transmission Licensee shall be responsible for complying with the provisions of IEGC/ MP Electricity Grid Code. Further State Transmission Utility /Transmission Licensee shall fulfill its responsibility to keep the frequency within following specified ranges:

Target Range (As per MPEGC, 2019)	Variation (%)	Value (Hz)
Upper Limit	+ 0.1%	50.05 Hz
Lower Limit	-0.2%	49.90 Hz

(ii) The compliance shall be reported as per Annexure – 2.

(c) Safety Standards:

- (i) State Transmission Utility /Transmission Licensee shall observe the general safety requirements as laid down in Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010 for construction, installation, protection, operation and maintenance of electric supply lines and apparatus.
- (ii) State Transmission Utility /Transmission Licensee shall designate suitable persons as designated officers as specified in Grid Code for coordination of safety procedures before work is taken up, during work, and after work is completed till the concerned system component is energized, both inside its own Transmission System

and across a control boundary between State Transmission Utility's/Transmission licensee's Transmission System and that of any user.

- (iii) State Transmission Utility / Transmission Licensee shall develop its own Operation and Maintenance Manual (including Safety Regulations) taking into consideration the safety requirements for the construction, operation and maintenance of electrical plants and electric lines as may be specified by the Central Electricity Authority under Clause (c) of section 73 of the Act.
- (iv) A consolidated report on the compliance of each clause of section 6.2(c) of this regulation shall be submitted to the Commission in the proforma enclosed at Annexure – 3.

(d) System Availability

The Availability of AC Transmission system shall be calculated as per MPERC (Terms & Conditions for Determination of Transmission Tariff) (Revision-IV), Regulations, 2020 and its amendment/ revisions.

The AC and HVDC System Availability shall not be below 98.0%.

The compliance shall be reported as per Annexure – 4 (a), (b) and (c).

(e) Feeder Availability:

The feeder availability gives the % of time during which the feeder remained available for transmission. Feeder Availability shall be calculated based on following formula:

$$AV_o(\text{Availability of } o \text{ no. of AC lines}) = \frac{\sum_{i=1}^o W_i(T_i - T_{NAI})}{\sum_{i=1}^o T_i}$$

Where, W_i = Weightage factor for i^{th} transmission line (As defined in Annexure – II of MPERC (Terms & Conditions for Determination of Transmission Tariff) (Revision-IV), Regulations, 2020 and its amendment/ revisions).

T_i = The total hours of i^{th} AC line block during the period under consideration (excluding time period for outages not attributable to transmission licensee for reasons given in Annexure – II of MPERC (Terms & Conditions

for Determination of Transmission Tariff) (Revision-IV), Regulations, 2020 and its amendment/ revisions).

T_{NAi} = The non-availability hours (excluding the time period for outages not attributable to transmission licensee taken as deemed availability as per Annexure – II of MPERC (Terms & Conditions for Determination of Transmission Tariff) (Revision-IV), Regulations, 2020 and its amendment/ revisions) for i^{th} AC line.

The Feeder Availability shall not be below 98.0%.

The compliance shall be reported as Annexure – 5.

Note: Tower collapse shall not be counted for the purpose of calculation of monthly availability of AC transmission line and HVDC bipole line.

(f) Transformer Availability:

The transformer availability expressed in % is the measure of the extent of power transmission capacity remained available from a transformer. Transformer availability shall be calculated based on following formula:

$$AV_q(\text{Availability of } q \text{ no. of ICTs}) = \frac{\sum_{k=1} W_k(T_k - T_{NAk})}{\sum_{k=1} T_k}$$

Where, W_k = Weightage factor for k^{th} ICT (As defined in Annexure – II of MPERC (Terms & Conditions for Determination of Transmission Tariff) (Revision-IV), Regulations, 2020 and its amendment/ revisions).

T_k = The total hours of k^{th} ICT block during the period under consideration (excluding time period for outages not attributable to transmission licensee for reasons given in Annexure – II of MPERC (Terms & Conditions for Determination of Transmission Tariff) (Revision-IV), Regulations, 2020 and its amendment/ revisions).

T_{NAk} = The non-availability hours (excluding the time period for outages not attributable to transmission licensee taken as deemed availability as per Annexure – II of MPERC (Terms & Conditions for Determination of Transmission Tariff)

(Revision-IV), Regulations, 2020 and its amendment/ revisions)
for k^{th} ICT

The Transformer Availability shall not be below 98.0%.

The compliance shall be reported as Annexure – 6.

Note: Failure of Inter-Connecting Transformer (ICT) and Reactor shall not be counted for the purpose of calculation of availability of Inter-Connectivity Transformer and Reactor.

(g) Outages Details and Restoration Time

Restoration time for different types of failures of transmission line, power transformers and reactors shall not exceed the following time limit:

S.No.	Type of Failure	Restoration Time (Days)
1	Insulator Failure	
	Plain Terrain	1
	Hilly/ Desert Terrain	2
2	Tower after collapse by Emergency Restoration System (ERS)	21
3	Tower after collapse	
	Plain Terrain	30
	River bed	50
	Hilly/ Desert Terrain	50
4	Phase conductor broken	
	Plain Terrain	2
	Hilly/ Desert Terrain	3
5	Failure of earth wire	
	Plain Terrain	2
	Hilly/ Desert Terrain	3
6	Failure of Power Transformer	
	Restoration of failed Power Transformer	180
7	Failure of Reactors	
	Restoration of the failed reactor	240

Note: Hilly/Desert terrain shall be as per notification issued by Central/State government from time to time.

The compliance shall be reported as Annexure – 7 (a), (b) and (c).

Category B Standards

6.3 These are the desirable performance standards with respect to providing quality, continuity and reliability of services by the Licensees but do not attract the provision of sub-section (2) of the section 57 of the Act for the present. These are intended to provide expected level of performance to provide quality, continuity and reliability of services to the consumers and for each violation of Standard, Licensee shall need to bring out the reasons for examination and analysis by the Commission on case to case basis.

(a) Voltage Unbalance:

- (i) The phase voltages of a 3-phase supply should be of equal in magnitude and phase angle. The loads on each phase should be balanced. Deviations shall result in decreased efficiency, negative torque, vibrations and overheating. Severe unbalance could lead to malfunctioning of some equipment. Some types of loads like X-ray machine, electric traction, induction and arc furnace may induce unbalance in the supply voltages.

$$\% \text{ Voltage Unbalance} = \frac{\text{Max Deviation from Mean of } \{VRY, VYB, VBR\} \times 100}{\text{Mean of } \{VRY, VYB, VBR\}}$$

- (ii) Subject to Distribution Licensee observing the Grid Code Connection Conditions in this regard, the voltage unbalance shall not exceed the values given below:

Voltage Level	Limit of voltage unbalance
765KV & 400 KV	1.5 %
220kV	2.0 %
132kV	3.0 %
33kV and 11 kV buses in EHV Sub-station	3.0 %

- (iii) The above limit for Voltage unbalance at the interconnection point

with Distribution System is subject to Distribution Licensee maintaining current unbalance between phases within limit of 3% applied for all feeders of one voltage class emanating from a sub-station including railway traction etc. measured at 3 sub-stations in a row.

- (iv) The Voltage unbalance shall be measured at sub-stations provided with measuring instruments having accuracy class within 1% limit.

The compliance shall be reported as Annexure – 8.

(b) Neutral Voltage Displacement (NVD):

- (i) Unbalance in loads on three phases cause shifting of neutral from earth potential. Neutral displacement is applicable for transformers with 'Star Point' solidly grounded. Under "solidly" grounded conditions, the potential of neutral should be equal to earth i.e. zero. But in actual conditions, the earthing of the star point is imperfect and so the star to ground offers small resistance. This results in flow of negative sequence currents (because $I_R + I_Y + I_B \neq 0$) through neutral to ground. The neutral therefore shifts from earth potential.
- (ii) Unbalance voltages and displacement of neutral will result in decreased efficiency, negative torque, leakage currents, vibrations and overheating. Severe unbalance and neutral displacement could lead to malfunctioning of some equipment. Some types of loads like X-ray machines, electric traction, induction and arc furnace may induce unbalance in the supply voltages and shift the voltage of neutral from earth potential.
- (iii) The neutral voltage displacement is determined by measuring the current flowing through the neutral to earth. Therefore, the State Transmission Utility /Transmission Licensee shall ensure that the current through neutral will not be greater than 2% of the full load current of transformer at normal conditions. This performance standard shall be achieved for following category of transformers:

- 1- Star point of all EHT Transformers having 33kV on low voltage side.

The compliance shall be reported as Annexure – 9.

(c) Voltage Variation Index (VVI):

- (i) Voltage Variation Index representing the degree of voltage variation from nominal value (in %) over a specified period of time shall be computed separately by the State Transmission Utility /Transmission Licensee for higher than nominal system voltage and lower than nominal system voltage as per the following formula:

$$VVI = \frac{100}{V_s} \times \text{Square Root of } \frac{\sum_{i=1}^N (V_i - V_s)^2}{N}$$

Where,

V_i = RMS value of measured voltage (in kV) at ith hour in the period for which VVI is computed.

V_s = RMS value of the nominal system voltage i.e. 400kV, 220kV and 132 kV etc. as may be applicable at the interconnection point.

N = Number of hourly measurements over the specified period of time.

The data from defective metering or any abnormal data shall be discarded from calculations. The VVI shall be computed on monthly basis:

$\leq 4\%$	To be achieved for more than 90% of buses
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The compliance shall be submitted as Annexure – 10.

(d) Frequency Variation Index (FVI):

A performance index representing the degree of frequency variation from nominal value of 50.00 Hz over a specified period of time:

$$FVI = 10 \times \frac{\sum_{i=1}^N (f_i - 50)^2}{N}$$

Where,

f_i = Actual frequency in Hz at ith time period

N = Number of measurements over the specified period of time

State Transmission Utility /Transmission Licensee shall observe the IEGC stipulations for Frequency Variation Index as $\leq 2.0\%$. Maintaining of FVI is a joint responsibility of all Constituents of Western Grid.

The compliance shall be submitted as Annexure – 11.

(e) **Harmonics in Supply Voltage:**

Many loads in power system produce current and voltages at frequencies in multiple of the fundamental frequency. These multiple frequency voltage and currents are called Harmonics and their ratio to the fundamental frequency is called harmonic order. Harmonics affect system operation and life of the equipment. Harmonics of odd order are more undesirable. Especially in Industrial sub-stations the effect of harmonics are more severe. Some types of loads like Induction & Arc Furnace, electromagnetic equipment such as X-ray machines etc. may produce harmonics in supply voltages. Distribution Licensees shall ensure that the loads connected at the interconnection points with State Transmission Utility /Transmission Licensee not induce any harmonic voltage and distort the supply waveform. Subject to Distribution Licensees observing the Grid Code Connection Conditions in this regard, State Transmission Utility /Transmission Licensee shall monitor the voltage harmonic levels at the supply points to the Users (Distribution Licensees, Generating companies and EHV consumer) and other strategic locations on the transmission system.

Harmonic contents of the supply voltage is indicated by the following indices:

$$V_{THD} = \sqrt{\sum_{i=1}^{40} \frac{V_i^2}{V_1^2}} \times 100\%$$

$$V_{iHD} = V_i \times 100\% / V_1$$

Where,

- V_i : ith harmonic of voltage
- V₁ : Fundamental frequency (50 Hz) voltage
- V_{THD} : Voltage total harmonic distortion

VIHD : Voltage distortion of ith harmonic

The transmission licensee shall ensure that the voltage wave-form quality is maintained at all points in the Grid by observing the limits given below:

S.No.	System Voltage (kV rms)	Total Harmonic Distortion (%)	Individual Harmonic of any particular frequency (%)
1	765	1.5	1.0
2	400	2.0	1.5
3	220	2.5	2.0
4	132	5.0	3.0
5	33	5.0	3.0

State Transmission Utility /Transmission Licensee shall intimate the programme to Generating Companies or Licensee as the case may be at least seven (7) days in advance and their representative may be present during such measurements. State Transmission Utility /Transmission Licensee shall compile a list of all metering points, which are prone to harmonic generation for taking remedial measures.

The compliance shall be reported as Annexure – 12.

(f) System Adequacy:

- (i) System adequacy is the ability of the electric system to receive the generated power or supply the aggregate electrical demand and energy requirements of their consumers at all times, taking into account scheduled and reasonably expected unscheduled outage of system elements.
- (ii) Adequacy of the power system is usually measured in terms of Loss Of Load Probability (LOLP). LOLP is the probability of transmission system capacity not being able to meet system load. LOLP can also be expressed as Loss Of Load Expectation (LOLE) in hours per year. This measure does not consider the amount or duration of the capacity shortfall. State Transmission Utility /Transmission Licensee is expected to achieve LOLE hours in percentage as under:

Nos. of hours in year when system demand can be fully met subject to generation availability (A)	Nos. of hours in year when system demand can not fully met even with generation availability (B = 8760 - A)	Loss Of Load Expectation (LOLE) in % of hours (C = B x 100/8760)
8664	96	1.00%

The compliance shall be reported as Annexure 13.

(g) System Security:

- (i) Security is the ability of the electric system to withstand sudden disturbance such as electric short circuits or unanticipated loss of system element. Refer Clause 6 of "Manual on Transmission Planning Criteria" by CEA for details on reliability criteria.
- (ii) The State Transmission System shall be designed for a security level of "n-1" i.e. to withstand a single contingency with little negative effect. This means the most severe fault or tripping of any generator or transformer or line should not result in instability of the system, overloading lines and/or transformers for more than 15 minutes, voltage drop of more than 10% when the system import is increased by 20%. State Transmission Utility /Transmission Licensee shall maintain the system security level of "n-1" (single contingency) plus spinning reserve margin for Steady State Operation.

System Security Level of "n-1" (Single Contingency) plus spinning reserve margin of:

1% of system peak load

The compliance shall be reported as Annexure - 14:

- (h) Energy Balance and Voltage Wise Losses**
The compliance shall be reported as Annexure – 15.
- (i) Capacity Addition**
The compliance shall be reported as Annexure – 16.
- (j) Top ten transmission lines with maximum congestion**
The compliance shall be reported as Annexure – 17.

(k) **SLDC - Technical Parameters and Monitoring of Voltage**

The compliance shall be reported as Annexure – 18 (a), (b), (c) and (d).

7: REPORTING REQUIREMENT AND COMPLIANCE

7.1 **Quarterly Report:** State Transmission Utility /Transmission Licensee shall furnish to the Commission a quarterly report in formats prescribed for each performance parameter (Annexure – 1 to Annexure -18), within 45 days of end of the quarter on actual performance vis-à-vis the performance standards laid down in these standards. The quarterly report shall contain all parameters irrespective whether such parameters are applicable during current quarter or not. The State Transmission Utility /Transmission Licensee shall maintain the base data like Log Sheet, Complaint Registers and Interruption Register etc. at sub-station level for compilation of quarterly reports. The base data at sub-station level may be subject to Commission's scrutiny as may be necessary.

7.2 For the purpose of this Regulation, a quarter during a financial year would mean as follows:

- (a) Quarter 1: April to June
- (b) Quarter 2: July to September
- (c) Quarter 3: October to December
- (d) Quarter 4: January to March

7.3 The Commission may, from time to time, modify the contents of the regulation/formats or add new regulation/formats for additional information.

7.4 In addition to the hard copies the information shall necessarily be submitted in electronic form through e-mail.

7.5 Any failure by the intra-State transmission licensee to maintain the standards of performance specified in these regulations shall render the said licensee liable to payment of compensation to an affected person claiming such compensation under the provisions of the Act:

Provided also that the payment of compensation by the Intra-State transmission licensee shall be without prejudice to any penalty, which may be imposed or any prosecution which may be initiated by the Commission as provided in the Act.

7.6 **Compensation for Category A:**

- (a) An affected person who has suffered a loss on account of non-adherence to the Standard of Performance by any intra-State transmission licensee may make an appropriate application to the Commission for award of compensation:

Provided that the Commission shall determine the compensation after giving reasonable opportunity to the transmission licensees of being heard:

Provided further that the compensation to be paid by the intra-State transmission licensee to the affected party shall be limited to the transmission charges of the particular element to the extent to which it has affected the supply of electricity to the affected person:

Provided further that the intra-State transmission licensee shall not be entitled to recover the amount of compensation awarded through tariff from the users of the transmission electricity:

Provided also that no claim for compensation shall be entertained if the application for the claim is filed after expiry of a period of ninety days from the end of the month when any failure by the intra-State transmission licensee to maintain the standards of performance specified in Clause (a), (b), (c), (d), (e) and (f) of Regulations 6.2 and ninety days from the date of restoration of transmission element, as the case may be, for the standards prescribed in clause (g) of Regulation 6.2 of these regulations.

- (b) Details of compensation shall be reported as per annexure -7 (c) .

8: MISCELLANEOUS

Use of the Information

- 8.1 The Commission shall have the right to use the information submitted by State Transmission Utility /Transmission Licensee as it deems fit including publishing it or placing it on the Commission's website and/ or directing the State Transmission Utility /Transmission Licensee to display the information in the licensee's website.

Power to Amend

- 8.2 The Commission may, at any time add, vary, alter, modify or amend any provisions of these regulations.

Repeal and Savings

- 8.3 The Regulation namely “MPERC (Transmission Performance Standards) Regulations,” (Revision-1), 2005 published vide Notification No. 2752/MPERC/2005 in the Gazette dated 17/11/2005 and read with all amendments thereto, as applicable to the subject matter of this regulation is hereby superseded.
- 8.4 Nothing in these Regulations shall be deemed to limit or otherwise affect the inherent power of the Commission to make such orders as may be necessary to meet the ends of justice or to prevent abuses of the process of the Commission.
- 8.5 Nothing in these Regulations shall bar the Commission from adopting in conformity with the provisions of the Act a procedure, which is at variance with any of the provisions of these Regulations, if the Commission, in view of the special circumstances of a matter or class of matters and for reasons to be recorded in writing, deems it necessary or expedient for dealing with such a matter or class of matters.
- 8.6 Nothing in these Regulations shall, expressly or impliedly, bar the Commission dealing with any matter or exercising any power under the Act for which no Regulations have been framed, and the Commission may deal with such matters, powers and functions in a manner it thinks fit.

Exemption

- 8.7 The Commission may relax adherence to specific performance standard during Force Majeure conditions such as war, mutiny, civil commotion, riot, flood, cyclone, storm, lightning, earthquake, grid failure, and strike/curfew, lockout, fire affecting the State Transmission Utility's / Transmission Licensee's installations and operation activities.
- 8.8 Commission under specific circumstances may also relax provisions of regulations in general or in specific cases for the period specified in its order.

By order of the Commission,
GAJENDRA TIWARI, Secy.

Annexure – 1A**Voltage Variation Performance Achieved During the Quarter Ending****Voltage – 765 KV Bus at EHV Substations****Standard Limits - Maximum +5% or 800 KV & Minimum -5% or 728 KV**

Sl. No.	Name Of Substation	Max. Voltage Actually Achieved		Min. Voltage Actually Achieved	
		%	KV	%	KV
1.					
N					

Annexure – 1B**Voltage Variation Performance Achieved During the Quarter Ending****Voltage – 400KV Bus at EHV Substations****Standard Limits - Maximum +5% or 420KV & Minimum -5% or 380KV**

Sl. No.	Name Of Substation	Max. Voltage Actually Achieved		Min. Voltage Actually Achieved	
		%	KV	%	KV
1.					
N					

Annexure -1C**Voltage Variation Performance Achieved During the Quarter Ending****Voltage – 220KV Bus at EHV Substations****Standard Limits - Maximum +10% or 245KV & Minimum -10% or 198KV**

Sl. No.	Name Of Substation	Max. Voltage Actually Achieved		Min. Voltage Actually Achieved	
		%	KV	%	KV
1.					
2.					
N					

Annexure – 1D**Voltage Variation Performance Achieved During the Quarter Ending****Voltage – 132KV Bus At EHV Substations****Standard Limits - Maximum +10% or 145 KV & Minimum -7% or 122 KV**

Sl. No.	Name Of Substation	Max. Voltage Actually Achieved		Min. Voltage Actually Achieved	
		%	KV	%	KV
1.					
2.					

Annexure – 1E**Voltage Variation Performance Achieved During the Quarter Ending****Voltage –33 KV Bus At EHV Substation****Standard Limits - Maximum +10% or 36 KV & Minimum -9% or 30 KV**

Sl. No.	Name Of Substation	Max. Voltage Actually Achieved		Min. Voltage Actually Achieved	
		%	KV	%	KV
1.					
2.					

Annexure - 2**Frequency Variation Performance Achieved During the Quarter Ending****Standard Frequency – 50 Htz****Target Range : Maximum +0.1% or 50.05 Htz and Minimum -0.2% 49.90 Htz**

Sl. No.	Frequency Range	Duration in %age of Time
1	Above 50.3 Htz	
2	From 50.05 to 50.3 Htz	
3	From 50 to 50.05 Htz	
4	From 49.90 to 50 Htz	
5	From 49.50 to 49.90 Htz	
6	From 49.2 to 49.50 Htz	
7	Below 49.2 Htz	

Annexure-3**Confirmation Report On Security Standards For the Quarter Ending**

Sl. No.	With Regard to	Whether Complied	Reason for Deviation, if any
1	General Safety Requirements		
2	Supports Standards and Safety Clearances		
3	Line Crossing and Guarding		
4	Earthing		
5	Safety and Protective Devices		
6	Protection Against Lightening		
7	Unused Overhead Lines		

Annexure – 5**Feeder Availability Achieved During the Quarter Ending****(Only For the Transmission Lines Falling Below the Standard Limits)****Standard Limits: 98.0%**

Voltage	Name of Transmission Line	Actual Achieved
765 KV	1	
	2	
	N	
400 KV	1	
	2	
	N	
220 KV	1	
	2	
	N	
132 KV	1	
	N	

Annexure – 6**Transformer Availability Achieved During the Quarter Ending****(Only For the Transformer Falling Below the Standard Limits)****Standard Limits: 98.0%**

Voltage	Name of Substation	Actual Achieved
765 KV	1	
	2	
	N	
400 KV	1	
	2	
	N	
220 KV	1	
	2	
	N	
132 KV	1	

Annexure – 7(a)**Outage Details**

Element Name	Outages	Restoration	Reason of Outage	Duration of Outage Attributable to				% Availability	Reason for Outage
				Transmission Licensee	Others	Force Majeure	Deemed Available		
				Hrs: Min	Hrs: Min	Hrs: Min	Hrs: Min		

Annexure – 7(b)**Elements where restoration time has exceed the standards**

Element Name	Standards restoration time specified in Regulations (in Days)	Actual restoration time (in Days)

Annexure – 7(c)Details of Compensation Paid

Particular	Violation	Compensation paid (Rs crores)
Frequency Variation		
Voltage Variation		
Availability		
a) System		
b) Feeder		
c) Transformer		
Restoration Time		

Annexure – 8Voltage Unbalance recorded During the Quarter Ending(Only For the Transformer Falling Below the Standard Limits)**Standard Limits:**

For 765 KV & 400 KV :- 1.5%

For 200KV :- 2%

For 132 KV & 33 KV:- 3%

Voltage	Name of Substation	Actual Achieved
765 KV		
400 KV		
200 KV		
132 KV		
33 KV		

Annexure – 9**Neutral Voltage Displacement recorded During the Quarter Ending****(Only For the Substations Falling Below the Standard Limits)****Standard Limits: 2% of Full Load Current of Transformer in Normal Conditions**

Name of Substation	Actual Achieved
1.	
2.	
N	

Annexure - 10**Voltage Variation Index achieved during the quarter ending****Standard Limits: Standard VVI \leq 4**

Voltage Level	Actual Achieved For 90% buses
765 KV	
400KV	
220KV	
132KV	

Annexure – 11**Frequency Variation Index achieved during the quarter ending****Standard Limits: Standard FVI \leq 0.5**

Actual Achieved

Annexure – 12**Harmonics in Supply Voltage recorded during the quarter ending****(Only for those substations where Harmonics in supply voltage are recorded)****Standard Limits:**

S.No.	System Voltage (kV rms)	Total Harmonic Distortion (%)	Individual Harmonic of any particular Frequency (%)
1	765	1.5	1.0
2	400	2.0	1.5
3	220	2.5	2.0
4	132	5.0	3.0
5	33	5.0	3.0

Name of Substation & Voltage level	Actual Percentage obtained
1	
2	
3	
N	

Annexure – 13(a)

System Adequacy achieved during the quarter ending

Standard Limits:- 1%

SR. NO.	DESCRIPTION	UNITS	TARGET FOR THE QUARTER	ACTUAL FOR THE QUARTER	CUMULATIVE TARGET TILL END OF CURRENT QUARTER	CUMULATIVE ACHIEVED TILL END OF CURRENT QUARTER	% VARIATION IN CUMULATIVE ACHIEVEMENT WRT CUMULATIVE TARGET	CUMULATIVE ACHIEVEMENT FOR THE SAME PERIOD LAST YEAR	% VARIATION CUMULATIVE ACHIEVEMENT COMPARED TO SAME PERIOD LAST YEAR
1	Max. Unrestricted Demand	MW							
2	Max. Demand Met	MW							
3	State Availability During Max. Demand Met (Thermal+Hydel+Css+pur+banking)	MW							
4	Avg. Demand Met	MW							
5	Base Demand (Min. Demand Met)	MW							

Annexure – 13(b)

Actual Achieved	
Nos. of hours in year when system demand can be fully met subject to generation availability	Loss of Load Expectation (LOLE) in % of hours

Annexure - 14

System Security Level achieved during the quarter ending

Standard Limits: 1.0 % of System Peak Load

Actual System Security Level Achieved

Energy Balance and Voltage Wise Losses										Annexure-15		
SR. NO.	DESCRIPTION	UNITS	TARGET FOR THE QUARTER	ACTUAL FOR THE QUARTER	CUMULATIVE TARGET TILL END OF CURRENT QUARTER	CUMULATIVE ACHIEVED TILL END OF CURRENT QUARTER	% VARIATION IN CUMULATIVE ACHIEVEMENT WRT CUMULATIVE TARGET	CUMULATIVE ACHIEVEMENT FOR THE SAME PERIOD LAST YEAR	% VARIATION IN CUMULATIVE ACHIEVEMENT COMPARED TO SAME PERIOD OF LAST YEAR			
b	Energy Sent to Paschim Khestra	MU										
c	Energy Sent to Madhya Khestra	MU										
d	Railway											
d.	Energy Sent to other Lincesse SEZ Indore	MU										
e	Total Energy Sent to Discoms	MU										
3	Energy Loss (1f-2e)	MU										
4	Total Transmission Loss((3*100/1f)	%										
6	Voltage wise Losses											
a.	At 400 kv Level	%										
b.	At 220 kv Level	%										
c.	At 132 kv Level	%										

Annexure -16Capacity Addition

SR NO	DESCRIPTION	UNITS	TARGET FOR THE QUARTER	ACTUALS FOR THE QUARTER	CUMULATIVE TARGET TILL CURRENT QUARTER	CUMULATIVE ACHIEVED TILL CURRENT QUARTER	% VARIATION IN CUMULATIVE ACHIEVEMENT TILL CURRENT QUARTER	% VARIATION IN CUMULATIVE ACHIEVEMENT COMPARED TO SAME QUARTER LAST YEAR
1	Capacity Addition							
a	Line							
	400kV line	ckt km						
	220 kV line	ckt km						
	132 kV line	ckt km						
b	Transformation capacity							
	400/ 220 kV	MVA						
	220/132 kV	MVA						
	132/33 kV	MVA						

Annexure -1 7Top 10 lines with maximum congestion

S No	Name of feeder	Quarter:		Remarks
		Max. Load in MW	Year: Average Load	
a		% Loading		
b				

Annexure – 18 (a)TRANSCO/SLDC Technical Parameters

Quarter:

Year:

Remote Terminal Unit (RTU)	No. of Points	RTUs Installed	RTUs Working	Major reason of RTU not in service
Thermal Stations				
Hydel Stations				
Local RTU				
400kV Substations				
220kV Substations				
132kV Substations				
RE Generator				
Railway TSS				
Total				

Annexure – 18 (b)

Status of Interface Meters						
Metering Status	No. of interface Points	Meters Installed	Meters Working	Class of most meters	Major reason of meter not in service	
Genco-Transco						
CGS/NHPC/NTPC/PGCIL						
Other State -Transco						
Open Access (SEZ)						
Transo-Discom (E/Z)						
Transo-Discom (C/Z)						
Transo-Discom (W/Z)						
TOTAL						

Annexure – 18 (c)

Total no. of 400kV Substations	No of 400kV Substations that deviated from maximum voltage variation limit		Total no. of 220 kV Substations	No of 220kV Substations that deviated from maximum voltage variation limit		Total no. of 132kV Substations	No of 132kV Substations that deviated from maximum voltage variation limit		Total number of substations where voltage level deviated from allowed voltage limits	
	Upper limit	Lower limit		Upper limit	Lower limit		Upper limit	Lower limit	Upper limit	Lower limit

Annexure – 18 (d)

Name of five 132/33kV Substations that recorded lowest voltages on 33kV in the quarter				Name of five 132/33kV Substations that recorded highest voltages on 33kV in the quarter					
Sr No.	Name of Substation	Date on which min voltage recorded	Voltage (least) recorded (kV)	Average Voltage (kV)	Sr No.	Name of Substation	Date on which max voltage recorded	Voltage (maximum) recorded (kV)	Average Voltage (kV)
1					1				