

Bhopal, Dated: 16th July, 2004

No.1932/MPERC/2004. 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) enacted by the parliament, the Madhya Pradesh Electricity Regulatory Commission makes the MPERC (Transmission Performance Standards) Regulations, 2004

MPERC (Transmission Performance Standards) Regulations, 2004

A1: SHORT TITLE AND COMMENCEMENT

- 1.1 These Regulations may be called “Madhya Pradesh Electricity Regulatory Commission (Transmission Performance Standards) Regulations, 2004”.
- 1.2 These Regulations shall be applicable to State Transmission Utility/ Transmission Licensee in the state of Madhya Pradesh.
- 1.3 These regulations extend to the whole of the State of Madhya Pradesh.
- 1.4 They shall come into force on the date of their publication in the official Gazette of Madhya Pradesh.

A2: DEFINITIONS

- 2.1 In these standards, 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) "EHV/EHT" means Extra High Voltage/Extra High Tension (voltage level above 33,000 volts);
- (h) "Electricity Supply Code" means the Madhya Pradesh Electricity Supply Code, 2004 approved by the Commission;
- (i) "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
- (j) "Grid Code" means the set of principles and guidelines prepared in accordance with the terms of Section 86 (1) (h) of the Electricity Act 2003;
- (k) "HV/HT" means High Voltage/High Tension (voltage level above 650 volts but does not exceed 33,000 volts);
- (l) "IEGC" means the Indian Electricity Grid Code approved 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;
- (m) "Licensee" means a person who has been granted a license by the Commission under the Act and include MPSEB and any of its successor entity under the provisions of section 131 of the Act;
- (n) "LT" means Low Tension (voltage does not exceed 650 volts under normal condition);
- (o) "MPPTCL" means Madhya Pradesh Power Transmission Company Limited registered under the Companies Act, 1956;
- (p) "MPSEB" means the Madhya Pradesh State Electricity Board constituted under section 5 of the Electricity (Supply) Act, 1948 by State Government of Madhya Pradesh and functioning before commencement of the Act. The term MPSEB includes any of its successor entities created pursuant to section 131 of the Act;
- (q) "PGCIL" means Power Grid Corporation of India Limited, a Central Transmission Utility notified under sub-section (1) of section 38 of the Act;
- (r) "MP Act" means The Madhya Pradesh Vidyut Sudhar Adhiniyam 2000;

- (s) “Rules” means the Indian Electricity Rules, 1956 and/or any other rules made under Act;
- (t) “SLDC” means the centre established under sub-section (2) of section 31 of the Act and includes State Load Despatch Centre already functioning in the State having its control room at Jabalpur, an apex body to ensure integrated operations of the power system in the state;
- (u) “State Transmission System” means the system of EHV electric lines 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;
- (v) “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;
- (w) “User” means a person, including Generating Stations within MP, Transmission Licensees or Distribution Licensees within MP and open access customer who use the State Transmission System and who must comply with the provisions of the Grid Code;
- (x) "WREB" means Western Regional Electricity Board;
- (y) "WRLDC" means Western Regional Load Despatch Centre established under sub-section (1) of section 27 of Act.

2.2 Words and expressions used but not defined herein shall have meaning assigned to them in Electricity Act 2003, Indian Electricity Grid Code, Madhya Pradesh Electricity Grid Code and Indian Electricity Rules, 1956.

A3: OBJECTIVE

3.1 These standards lay down the guidelines to maintain the certain 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.

A4: 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 The 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) the Commission is required to specify and enforce standards with respect to quality, continuity and reliability of services by the Licensees.
- 4.5 Section 59 of the Act provides 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.
- 4.6 Failure to meet performance standards and payment of compensation to affected party has been covered under Compliance of Regulations. The penal and prosecution provision are as per section 142 of the Act.
- 4.7 The Commission therefore proposes to issue these Standards of performance of Transmission Licensee(s) as the regulation under sections 181 (1) and 181 (2) (za) of the Act.

A5: STANDARDS OF PERFORMANCE

- 5.1 The Transmission performance standards falls 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 may specify in discharge of its function, but however not attract the provision of sub-section (2) of the section 57.

5.2 Following standards falls under Category A as mandatory standards:

- (a) Voltage Variation
- (b) Frequency Variation
- (c) Safety Standards

These are statutory standards to be complied with by the Licensee as per Electricity Rules 1956. The new Rules under section 53 of Act are to be issued by the CEA in consultation with State Government. These standards shall be revised after new Rules under Act come into effect.

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. The Commission shall fix the time bound schedule for implementation/compliance of each parameter.

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

- (a) Feeder Availability
- (b) Sub-station Availability
- (c) Voltage Unbalance
- (d) Neutral Voltage Displacement (NVD)
- (e) Voltage Variation Index (VVI)
- (f) Frequency Variation Index (FVI)
- (g) Harmonics in Supply Voltage
- (h) System Average Interruption Frequency Index (SAIFI)
- (i) System Average Interruption Duration Index (SAIDI)
- (j) System Adequacy
- (k) System Security

A6: PHASING OF IMPLEMENTATION

6.1 Due to non-preparedness of Licensee, the performance standards established herein shall be implemented in phased manner in three stages as per following:

(a) Preliminary Stage (Level-1):

The time period of two (2) years immediately following approval of these standards shall be considered as Preliminary Stage. During preliminary stage, Standards marked at Level 1 shall be achieved.

(b) Transition Stage (Level-2):

Time period spreading up to three (3) years after preliminary stage shall be considered as Transition Stage. During this period the licensee is expected to upgrade its systems. Standards marked at Level 2 shall be achieved during Transition Stage.

(c) Final Stage (Level-3):

Period after expiry of Transition Stage when substantial improvements have been carried out and the system is considered to be in satisfactory condition with necessary capability improvement. Standards marked at Level 3 shall be achieved during Final Stage.

6.2 In all cases, where standards, for example Electricity Rules 1956, are specified by appropriate authorities, such standards shall be applicable from the preliminary stage itself.

Category A Standards

6.3 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.

6.4 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)	
400	+5	420.00	-10	360.00	IEGC
220	+10	245.00	-10	198.00	IEGC
132	+10	145.20	-10	118.80	IEGC
66	+10	72.60	-10	59.40	IE Rules
33	+6	34.98	-9	30.03	IE Rules
11	+6	11.66	-9	10.01	IE Rules

- (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 IEGC limits
- 2- Discoms drawal at a minimum power factor of 0.95 lagging
- 3- Loading of all lines limited to the Surge Impedance Loading (SIL) in normal conditions

- (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. Further State Transmission Utility /Transmission Licensee shall fulfill its responsibility to keep the frequency within following specified ranges:

Target Range (As per IEGC)	Variation (%)	Value (Hz)
Upper Limit	+1%	50.5 Hz
Lower Limit	-2%	49.0 Hz
Statutory Acceptable Limit (As per IE Rules, 1956)	Variation (%)	Value (Hz)
Upper Limit	+3%	51.5 Hz
Lower Limit	-3%	48.5 Hz

Frequency range for the extreme conditions from System Security point of view shall be as prescribed by WRLDC/WREB from time to time.

(c) Safety Standards:

- (i) State Transmission Utility /Transmission Licensee shall observe the general safety requirements as laid down in IE Rules, 1956 for construction, installation, protection, operation and maintenance of electric supply lines and apparatus.
- (ii) Following important sections of IE Rules 1956, but not limited to, shall be referred for detailed safety standards:
 - 1- Section 29 to 46 - General safety requirements
 - 2- Section 74 to 81 - Support Standards and Safety Clearances
 - 3- Section 87 to 88 - Line crossing and Guarding
 - 4- Section 90 - Earthing
 - 5- Section 91 - Safety and protective devices
 - 6- Section 92 - Protection against lightning
 - 7- Section 93 - Unused overhead lines
- (iii) 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.

- (iv) 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.

Category B Standards

- 6.5 Performance standards desirable with respect to providing quality, continuity and reliability of services by the Licensees which the Commission may specify in discharge of its function, but however does not attract the provision of sub-section (2) of the section 57 of the Act. These are intended as expected level of performance in order to provide quality, continuity and reliability of services to the consumers.
- 6.6 The Commission shall fix the benchmark for standards defined under Category B on the basis of data collected for at least one year and revise the levels to be achieved from time to time for ensuring improvement in the performance of State Transmission Utility /Transmission Licensee.
- 6.7 The Commission specifies following standards under Category B:

- (a) 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:

$$\% \text{ Availability of Feeder} = \frac{(\text{Total availability in hrs}) - (\text{Annual outages in hrs})}{\text{Total availability in hrs}} \times 100$$

Here, total availability in hours is equal to no. of hours in a year i.e. 8760 (non leap year)

Preliminary Stage – Level 1	95%
Transition Stage – Level 2	97%
Final Stage – Level 3	98%

- (b) Sub-station Availability:

The sub-station availability expressed in % is the measure of the extent of power transmission capacity remained available from a sub-station. Sub-station Availability shall be calculated based on following formula:

$$\% \text{ Availability of SS} = \frac{(\text{Installed capacity in MVA} \times 8760) - (\text{Outage in MVA} \times \text{hrs})}{\text{Total Installed capacity in MVA} \times 8760} \times 100$$

Preliminary Stage – Level 1	95%
Transition Stage – Level 2	97%
Final Stage – Level 3	98%

(c) Voltage Unbalance:

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 will 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 & arc furnace may induce unbalance in the supply voltages.

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

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	Implementation Stage
220kV and Above	2%	Preliminary Stage - Level 1
132kV	3%	Transition Stage - Level 2
33kV and 11kV buses in EHV Sub-station	3%	Transition Stage - Level 2

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.

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

(d) Neutral Voltage Displacement (NVD) (Level 1):

- (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 State Transmission Utility /Transmission Licensee shall ensure that the neutral point voltage of the transformers with respect to earth will not have potential greater than 2% of the no load phase to phase voltage of the transformer. This performance standard shall be achieved for following category of transformers:
 - 1- Star point of all EHT Transformers having 33kV on low voltage side
 - 2- Star point of all EHT Transformers having 11kV on low voltage side

(e) 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 i th hour in the period for which VVI is computed

V_s = RMS value of the nominal system voltage i.e. 400kV, 220kV and 132kV 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:

Preliminary Stage – Level 1	≤ 10	To be achieved for more than 90% of buses
Transition Stage – Level 2	≤ 6	To be achieved for more than 90% of buses
Final Stage – Level 3	≤ 4	To be achieved for more than 90% of buses

(f) 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 i th 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 and when implemented in the Western Region. Maintaining of FVI is a joint responsibility of all Constituents of Western Grid.

Preliminary Stage – Level 1	≤ 2.0
Transition Stage – Level 2	≤ 1.0
Final Stage – Level 3	≤ 0.5

(g) Harmonics in Supply Voltage (Level 3):

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 effect system operation and life of the equipments. 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:

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

$$V_{IHD} = \frac{V_i}{V_1} \times 100\%$$

Where,

V_i : ith harmonic of voltage

V_1 : Fundamental frequency (50 Hz) voltage

V_{THD} : Voltage total harmonic distortion

V_{IHD} : Voltage distortion of ith harmonic

Harmonic measurement shall confirm to IEC Std. 1000-4-7 or IEEE Std. 519. The Total Harmonic Distortion (THD) in voltage waveform determined in accordance with IEC Std. 1000-4-7 shall not exceed 1% at the interconnection point of EHV system. The measurement should be taken at 10 minutes interval and shall last for 1 week per site. State Transmission Utility /Transmission Licensee shall measure the THD at strategic such interconnection points which it consider prone to harmonic voltage generation at regular interval of 12 months.

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 will compile a list of all metering points, which are prone to harmonic generation for taking remedial measures.

6.8 System Average Interruption Frequency Index (SAIFI) (Level 3):

This index gives number of interruptions in power supply to loads expressed as per year per EHT Sub-station for a voltage class. All interruptions except due to acts of

nature (like earthquake, floods, storms etc.), fire, orders of civil/military authorities, scheduled outage (including three shift operation of agriculture pump sets), load shedding to meet capacity shortage, failure of PGCIL transmission system or failure of generating units (leading to grid failure or system islanding) of duration exceeding five (5) minute at a time shall be counted in computing the index.

$$SAIFI = \Sigma(A_i \times N_i) / N_t$$

Where,

A_i = Total number of sustained interruptions (each longer than 5 minutes) on i th feeder for the month (all 33kV and 11kV feeders emanating from EHT sub-stations to be included)

N_i = Connected load of i th feeder affected due to each interruption

N_t = Total connected load in the Distribution licensee's supply area

n = Number of 33kV and 11kV feeders emanating from EHV sub-station in the licensee's supply area

Implementation Stage	SAIFI
Preliminary Stage - Level-1	No limit
Transition Stage - Level-2 interruptions per year
Final Stage - Level-3 interruptions per year

Based on the information provided by the licensees, the Commission would notify the target levels for these indices annually.

6.9 System Average Interruption Duration Index (SAIDI):

This index gives weighted average interruptions in a year with reference to the total connected load on the system. All interrupted loads for duration exceeding five (5) minutes at a time in the year are counted in computing the index. Interruptions due to acts of nature, orders of civil/military authorities, scheduled outage (including three shift operation of agriculture pump sets), load shedding to meet capacity shortage, failure of PGCIL transmission system or failure of generating units (leading to grid failure or system islanding) shall be however excluded in the computation of this index. SAIDI gives the measure of average interruption time per EHT Sub-station on annual basis for a voltage class.

$$SAIDI = \Sigma(B_i \times N_i) / N_t$$

Where,

B_i = Total duration of sustained interruptions (each longer than 5 minutes) on ith feeder for the month (all 33kV and 11kV feeders emanating from EHT sub-stations to be included)

N_i = Connected load of ith feeder affected due to each interruption

N_t = Total connected load in the Distribution licensee's supply area

n = Number of 33kV and 11kV feeders emanating from EHT sub-station in the licensee's supply area

Implementation Stage	SAIDI
Preliminary Stage - Level-1	No limit
Transition Stage - Level-2 hrs/ year
Final Stage - Level-3 hrs/ year

Based on the information provided by the licensees, the Commission would notify the target levels for these indices annually.

6.10 System Adequacy:

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.

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:

Implementation Stage	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)
Preliminary Stage	7008	1752	20.00%

Transition Stage	8000	696	8.68%
Final Stage	8664	96	1.00%

6.11 System Security:

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 system security criteria.

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 a critical generator, 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.

Implementation Stage	System Security Level of “n-1” (Single Contingency) plus spinning reserve margin of:
Preliminary Stage – Level 1	No mandatory requirement
Transition Stage – Level 2	0.5% of system peak load
Final Stage – Level 3	1% of system peak load

A7: REPORTING REQUIREMENT AND COMPLIANCE

7.1 Quarterly Report

State Transmission Utility /Transmission Licensee shall furnish to the Commission a quarterly report in format prescribed at ANNEXURE-A, within 30 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 report at circle level. The consolidated report shall be based on circle-wise compilation for whole State Transmission Utility /Transmission Licensee. The circle-wise compilation and base data at sub-station level may be subject to Commission scrutiny as may be necessary.

- 7.2 For the purpose of this Regulation, a quarter 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 such electronic form as the Commission may direct or through compact disks or e-mail.
- 7.5 Compliance
- (a) Consequent to failure of State Transmission Utility /Transmission Licensee to meet overall performance standards, the affected Utility/Consumers shall be entitled to seek relief/compensation for any loss/damage suffered by them from State Transmission Utility /Transmission Licensee, as may be determined by the Commission.
 - (b) Further the State Transmission Utility /Transmission Licensee are subject to such fines/penalty and charges, which the Commission may impose as provided in the Act and regulations made there under.
 - (c) Commission at its own discretion may require the State Transmission Utility /Transmission Licensee to furnish a report on actual performance levels maintained against the standards specified by the Commission with its Petitions for Annual Revenue Requirement (ARR) and Tariff Determination and which shall be subject to public hearing for tariff setting by the Commission.

A8: MISCELLANEOUS

Annual Review of Performance Standard

- 8.1 The Commission in consultation with State Transmission Utility /Transmission Licensee shall review the performance standards for Transmission System as specified above annually. The first annual review shall be taken up by the Commission in March 2005.

Use of the Information

- 8.2 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

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

Savings

- 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

ASHOK SHARMA, Dy. Secy.

QUARTERLY REPORT ON TRANSMISSION PERFORMANCE STANDARDS

NAME OF STATE TRANSMISSION UTILITY/ TRANSMISSION LICENSEE

Report for quarter ending:.....

Date of submission:.....

Clause Reference	Category of Standard	Implementation Stage / Level	Performance Standard(s)	Measurable Parameter	Value of Measurable Parameter Specified by Commission		Actual Achievement for Quarter	Remarks
					Name of Parameter	Value specified		

Note:

1. The State Transmission Utility shall maintain the base data like Log Sheet, Complaint Registers and Interruption Register etc. at sub-station level.
2. For compilation of quarterly report at circle level base data of sub-stations shall be used.
3. The consolidated report for whole State Transmission Utility /Transmission Licensee shall be based on circle-wise compilation.
4. The circle-wise compilation and base data at sub-station level may be subject to Commission scrutiny as may be necessary.

Name of Reporting Officer:

Designation: