

**REGULATIONS MADE UNDER SECTION 54 OF THE SRI LANKA ELECTRICITY ACT, No. 20 OF 2009**

BY virtue of the powers vested in me by Section 54 of the Sri Lanka Electricity Act, No. 20 of 2009, and on the recommendation of the Public Utilities Commission of Sri Lanka, I, Ranjith Siyambalapitiya, the Minister of Power and Renewable Energy, do by this order make the undermentioned Regulations on Electricity (Transmission) Performance Standards.

RANJITH SIYAMBALAPITIYA,  
Minister of Power and Renewable Energy.

13th July 2016.

L.D.B 3/2009 (iii).

**SRI LANKA ELECTRICITY ACT, NO. 20 OF 2009**

REGULATIONS made by the Minister of Power and Renewable Energy on the recommendation of the Public Utilities Commission of Sri Lanka, under sections 54 of the Sri Lanka Electricity Act, No. 20 of 2009 read with sections 24, 40 and 56 of the aforesaid Act.

**Regulations**

No. 1. These regulations may be cited as the Electricity (Transmission) Performance Standards Regulations of 2016.

2. These Regulations shall Establish –

- (a) procedural rules, requirements and indices for the assessment of –
  - (i) transmission system performance in respect of supply availability, supply reliability, supply quality, protection function, transmission system operation, transmission system expansion and generation acquisition; and
  - (ii) generation system performance.
- (b) the methodologies for-
  - (i) determining the appropriate values for the said indices; and
  - (ii) assessing the compensation to be paid to consumers and customers and claw back from the Allowed Revenue in the event the performance indices fall below target levels:

Provided that, appropriate levels setout in regulation 2 (b) (ii) shall be the guaranteed minimum standards of service that the Transmission Licensee shall achieve and maintain in the discharge of the Licensee's obligations.

3. These regulations shall be used in conjunction with the Grid Code of Sri Lanka and shall be applicable to -

- (a) Transmission Licensee;
- (b) Generation Licensees;
- (c) Distribution Licensees; and
- (d) Transmission Customers or Consumers.

4. The Transmission Licensee shall be responsible for –

- (i) operating its transmission system in accordance with the standards specified in these regulations; and
- (ii) preparing, submitting and disclosing the relevant information as setout in these regulations.

5. Transmission system users shall be responsible for –

- (i) disclosing necessary information to the Transmission Licensee as maybe reasonably required;
- (ii) a general awareness of the performance standards specified in these regulations and its implementation; and
- (iii) co-operating with the Transmission Licensee to ensure compliance with these regulations.

**PERFORMANCE INDICATORS AND METRICS**

6. The Performance indicators and metrics shall apply to –

- (a) transmission system supply availability;
- (b) transmission system supply reliability;

- (c) transmission system power quality;
- (d) transmission system protection system;
- (e) transmission system operations;
- (f) generation system performance;
- (g) transmission system expansion; and
- (h) generation acquisition.

#### **PERFORMANCE INDICES FOR SUPPLY AVAILABILITY**

7. The transmission system availability shall be assessed through two types of Performance Indices –

- (a) Individual Performance Indices; and
- (b) Overall Performance Indices.

#### **INDIVIDUAL PERFORMANCE INDICES FOR SUPPLY AVAILABILITY**

8. In individual Performance Indices, the availability of each Transmission System component shall be measured through the following performance indices calculated for a specified period:-

- (a) total number of interruptions and the total duration of such interruptions per transmission line/per underground cable; and
- (b) total number of interruptions and the total duration of such interruptions per grid substation transformer.

9. The Performance indices setout in regulation 8 shall be calculated separately, segregating Interruptions caused by:-

- (a) planned development and maintenance programmes of the Transmission Licensee;
- (b) failures of the respective transmission component itself; and
- (c) failures in any part of the power system other than the transmission system component under consideration.

#### **OVERALL PERFORMANCE INDICES FOR SUPPLY AVAILABILITY**

10. The overall performance of supply availability shall be measured through the assessment of the ratio of the circuit hours that were unavailable in a specified period of the circuit hours that were theoretically available during the same period–

- (a) to transmit electricity by –
    - (i) transmission overhead lines;
    - (ii) underground cables,
- differentiated according to the voltage.

(b) to transform electricity by grid substation transformers differentiated according to the transformation ratio and capacity.

11. In regulation 10, the indices shall be expressed in percentage(%).

12. The performance indices defined in regulations 8 and 10 shall be calculated separately segregating the failures caused by –

(a) planned development and maintenance programmes of the Transmission Licensee;

(b) shortcomings of the respective transmission components; and

(c) failure of any part of the power system other than that of the transmission system component under consideration.

13. In these regulations, the specified period for assessment of individual and overall performance indices referred to in the regulations 7 and 10(a) shall be one calendar month.

14. In calculating the performance indices, the following shall not be considered:-

(a) interruptions of less than 1 minute duration; and

(b) interruptions due to *force majeure* events.

#### **PERFORMANCE INDICES FOR SUPPLY RELIABILITY INDIVIDUAL PERFORMANCE INDEX FOR SUPPLY RELIABILITY**

15. The individual performance of supply reliability shall be measured through the number of sustained interruptions and the durations of such interruptions, that each connection point of a Distribution Licensee, Transmission Customer or Generation Licensee will experience within a specified period.

#### **OVERALL PERFORMANCE INDICES FOR SUPPLY RELIABILITY**

16. The following indices shall be used for the measurement of overall performance of supply reliability –

(a) Transmission System Average Interruption Frequency Index (TSAIFI)(number)- the total number of sustained interruptions at the connection points within a specified period divided by the total number of connection points made available to a Distribution Licensee, Generation Licensee, Transmission Customer, within the same period.

(b) Transmission System Average Interruption Duration Index (TSAIDI)(minutes)- the total duration of sustained power Interruptions at the Connection Points within a specified period divided by the total number of Connection Points within the same period.

(c) Estimated Energy Not Supplied (EENS) is an estimation of the energy not supplied to the connected loads of Distribution Licensee or Transmission Customer during a specified period.

17. The performance indices set out in regulations 15 and 16 shall be calculated separately segregating the interruptions owing to –

(a) planned development and maintenance programmes of the Transmission Licensee;

(b) shortcomings of the respective transmission component; and

- (c) failure of any other part of the power system other than that of the transmission system component under consideration.

18. The specified period for assessment of individual and overall performance indices referred to in the regulations 15 and 16 shall be one calendar month.

19. All performance indices referred to in these regulations shall be calculated on once in three months, biannually and yearly moving average basis.

20. In calculating the performance indices, the following shall not be considered:-

- (a) interruptions less than 1 minute duration; and  
(b) interruptions due to *force majeure* events.

### PERFORMANCE INDICES FOR POWER QUALITY

21. The power quality of an electricity supply is assessed by measuring the variations in voltage, phase angle, frequency, flicker and harmonics from the values and bands specified in the Grid Code:

Provided that these regulations shall apply in respect of non-compliance with the permitted variations in voltage, frequency, flicker and harmonics.

### VOLTAGE VARIATIONS

22. In these regulations,

- (a) voltage variations at connection points shall be assessed using data available in the Supervisory Control and Data Acquisition (SCADA) system.  
(b) the Transmission Licensee shall initiate a voltage measurement programme based on a methodology agreed with the relevant Licensee or Transmission Customer for connection points where such data is not available.

23. In these regulations, voltage measurement programme shall be based on the following:-

- (a) data collected by the Transmission Licensee according to regulation 17;  
(b) requests and complaints from the Distribution Licensee or Transmission Customers; and  
(c) requests from PUCSL based on complaints received.

24. The Transmission Licensee shall submit its voltage measurement programme to the PUCSL at least three weeks before the end of the preceding quarter and shall reach an agreement with the PUCSL by the first working day of the last week of the same quarter.

25. The Transmission Licensee shall prepare a report on voltage variation which shall comprise the following:-

- (a) a list of locations with dates and time periods of measurements;  
(b) locations where, voltage lies outside the limits defined in the Grid Code for more than 10% of the measurement period;

- (c) analysis of the results citing reasons for deviations and proposed remedies for the short comings with time targets;
- (d) list of locations where remedial measures have been taken in the last three quarters; and
- (e) list of locations where remedial measures have not been effected and reasons for such delays.

#### **FREQUENCY VARIATIONS**

26. In these regulations –

- (a) the Transmission Licensee shall measure the deviation in frequency from the standard value of 50Hz, over a period of one month using a sampling method agreed with the PUCSL;
- (b) if the deviation in frequency is outside the limits specified in the Grid Code, every efforts should be taken to rectify the defect; and
- (c) the PUCSL shall be informed of the long term and short term measures taken to remedy the situation.

#### **FLICKER AND HARMONICS**

27. In these regulations –

- (a) performance indicators to measure flicker and harmonics distortion, and the allowed ranges shall be those specified in the Grid Code;
- (b) flicker and harmonic measurements shall be measured at each connection point (Measurement at one point will be sufficient if the connection points are on a continuous bus.) at least once in two years, in accordance with the procedures laid down in IEEE 519 or IEC 1000-4-7. If more than one connection point is provided to a Distribution Licensee or Transmission Customer from the same grid substation, one measurement for each Grid Substation shall be considered sufficient to determine the flicker and harmonic distortion;
- (c) The Transmission License shall prepare a report on flicker and harmonics which comprise the following:-
  - (i) a list of locations with dates and time periods of measurements;
  - (ii) locations where, flicker and harmonic distortions lie outside the limits defined in the Grid Code for more than 10% of the measurement period;
  - (iii) analysis of results citing reasons for deviations and proposals for remedying the shortcomings with time targets;
  - (iv) a list of locations where remedies have been taken in the last three quarters; and
  - (v) a list of locations where remedial measures have not been effected and reasons for such delay.

#### **PERFORMANCE INDICES FOR THE POWER SYSTEM PROTECTION SYSTEM**

28. The Performance of the power system protection system shall be assessed through the monitoring of the protection relay operations and the Transmission Licensee's willingness to analyse the transmission system failures.

29. The Transmission Licensee shall prepare a report which shall comprise the following: -

- (a) Ratio (percentage) of the correct relay operations inclusive of autore-closing operations where applicable, to the total number of operations in respect of –
  - (i) 33kV feeder outlets,
  - (ii) generator incomers,
  - (iii) 132kV transmission circuits,
  - (iv) 220kV transmission circuits, and
  - (v) grid substation transformers.
- (b) ratio (percentage) of the number of analysis reports prepared on the transmission system partial and total failures, to the total number of partial and total transmission system failures that have taken place.

30. The Performance indices for power system Protection shall be calculated for each calendar month.

#### **PERFORMANCE INDICES FOR THE POWER SYSTEM OPERATION**

31. In these regulations –

- (a) the metrics which shall be considered for assessing power system operational performance are power and energy losses, dispatch and safety;
- (b) losses and safety are taken care of under the tariff formulation and the safety management system, respectively, only the performance of dispatch will be assessed;
- (c) performance report on energy dispatch shall comprise of the following:-
  - (i) ratio (percentage) of the cost of actual daily dispatch to the calculated cost of the scheduled daily dispatch;
  - (ii) the number of days where the percentage has exceeded 105%;
  - (iii) reasons for exceeding the level set out in subparagraph (ii); and
  - (iv) remedial action proposed to overcome the deficiency; and
- (d) all performance indices in respect of power system operations shall be calculated for each calendar month.

#### **PERFORMANCE INDICES FOR THE GENERATION SYSTEM**

32. In these regulations –

- (a) generation system performance is assessed through the comparison of actual values in respect of the following attributes of the power stations with those in accordance with the Power Purchase Agreements (PPA) where applicable :-

- (i) dispatch;
- (ii) auxiliary consumption; and
- (iii) availability.

- (b) the Transmission Licensee shall decide on the dispatch from a power plant on a day ahead basis. Actual dispatch from the power plants may differ from the scheduled dispatches.
- (c) the ratio of the actual dispatch and the scheduled dispatch for each calendar month for each power station shall be the performance indicator on dispatch and shall be calculated for each calendar month.
- (d) the performance indicator for auxiliary consumption will be the ratio (percentage) of the auxiliary consumption of a power station in a given period to the gross energy output by the same power station during the same period.

33. The performance indicator for auxiliary consumption shall be calculated on monthly basis for each Power Station and shall be compared with the benchmark to be established by PUCSL.

34. The availability factor-

- (a) is set out as the ratio (percentage) of the duration a power station has been available for operation to the total duration of the period considered;
- (b) shall be determined on a monthly basis for each power station by computing the non-availability of the power station due to forced outages and planned outages and comparing the value against the declared availability in the PPA.

#### **PERFORMANCE INDICES FOR TRANSMISSION SYSTEM EXPANSION AND GENERATION ACQUISITION**

35. In these regulations –

- (a) the performance indicator for the implementation of Transmission System expansion and generation acquisition projects shall be the ratio between the delay in achieving a milestone to the total duration within which that milestone has been planned to be completed;
- (b) the Transmission Licensee shall inform the PUCSL the transmission and generation acquisition projects that have been earmarked to be undertaken over the next five year period and the key milestones for each project with target dates of completion;
- (c) information required in paragraph (b) shall be submitted by the Transmission Licensee at the beginning of the year or at the commencement of these regulations, whichever occurs first.
- (d) The transmission licensee and PUCSL shall agree on the milestones on which the performance will be monitored.

#### **REPORTING AND FEEDBACK**

36. In these regulations –

- (a) the Transmission Licensee shall submit the report on the transmission system and generation system performance in accordance with these regulations on a quarterly basis;

- (b) the report shall be submitted to the PUCSL on or before the last working day of the first month of the next quarter;
- (c) the PUCSL shall respond to the said report on transmission and generation performance within two weeks from the receipt of the same;
- (d) the PUCSL shall follow up the progress of the proposed action plan and publish a report on the transmission and generation system performance every year, analysing the results and comparing with international benchmarks; and
- (e) the PUCSL shall take steps to compensate the relevant parties and claw back the funds as specified in the Schedule hereto.

## **IMPLEMENTATION**

### **IMPLEMENTATION STAGE**

37. Implementation of these regulations, shall be done in three stages, namely –

- (i) Preliminary Stage;
- (ii) Adaptation Stage; and
- (iii) Hands-on Stage.

38. The completion of the three stages shall not be more than 36 months from the date of these regulations come into force.

39. The PUCSL, in consultation with the Transmission Licensee, shall decide on the duration of each stage for the implementation of these regulations, taking into consideration the time periods specified hereto.

### **PRELIMINARY STAGE**

40. The preliminary stage shall have a maximum duration of 12 months and during this period, the Transmission Licensee is required to assess and acquire the information systems, financial and human resources.

41. The Transmission Licensee shall submit a report on the requirements within one month from the date of these regulations come into force, which shall include, but not limited to the following:-

- (a) assessment of the adequacy and the availability of its-
  - (i) human resources;
  - (ii) information systems;
  - (iii) procedures for collection of data; and
  - (iv) annual revenue requirements;
- (b) additional resources required; and
- (c) work plan for implementation with a target date of completion of all tasks within three months of receiving approval from the PUCSL.

42. The PUCSL shall examine the report, and approve the same or accept subject to modifications, or reject, within two weeks from the date of the Transmission Licensee submitting the report. The PUCSL shall provide an opportunity to the Transmission Licensee to justify its report, if PUCSL decides to reject or modify the same.

43. The Transmission Licensee shall commence work in accordance with the work plan immediately after PUCSL conveys its decision.

44. Within two months from the day PUCSL grants approval to the report described in regulation 41, the Transmission Licensee shall establish a database, which shall have the provisions to include all necessary data to compute the performance indices as specified hereto.

45. The PUCSL may inspect the databases and the Transmission Licensee shall cooperate with the PUCSL or its authorized representatives.

#### **ADAPTATION STAGE**

46. In these regulations –

- (a) the adaptation stage shall be maximum period of 12 months. During this period, PUCSL and the Transmission Licensee shall commence implementing the performance measurement and assessment programmes.
- (b) the Transmission Licensee shall ensure that all necessary information systems are established for the purpose of the calculation of the relevant indices within three months from the day the adaptation stage begins.
- (c) work on the calculation of performance indices both overall and individual shall commence immediately after making information systems operational.
- (d) before the end of the adaptation stage, the Transmission Licensee shall submit its first set of results to the PUCSL.

#### **HANDS ON STAGE**

47. In these regulations –

- (a) hands on stage, shall be maximum period of 12 months.
- (b) the PUCSL shall study the results submitted by Licensee with the objective of determining the appropriate levels for performance indices.
- (c) if the Transmission Licensee requests additional time for the completion of the tasks described hereto, the PUCSL may grant approval.
- (d) after deciding on the appropriate levels in accordance with paragraph (b), the PUCSL shall calculate the compensation to be paid to Distribution Licensee or Transmission Customer and the amounts to be clawed back from the Transmission Licensee's allowed revenue for non-compliance, using the formulae given in the Schedule.
- (e) the PUCSL and the Transmission Licensee shall adjust the specified levels for the performance indices where necessary and shall arrive at acceptable levels, studying the calculated results, upon completion of the hands on stage.

## **NON COMPLIANCE WITH PERFORMANCE TARGETS**

48. The PUCSL shall ensure that all processes and mechanisms for the calculation of compensation and claw back from the Allowed Revenue are in place.

49. The PUCSL and the Transmission Licensee shall jointly review the progress in areas of the processing of relevant data, calculation of the performance indices etc. during the implementation period of 36 months.

50. The failure of the Transmission Licensee to achieve the specified levels of performance shall not be considered as non-compliance:

Provided however –

- (a) failure to submit any or all the information specified in these regulations at the specified time or period;
- (b) incomplete or inaccurate data or reports;
- (c) failure to implement the procedure and information systems specified hereto within the specified period;
- (d) failure or unacceptable delay in the execution of the approved remedial actions and plans to improve quality of supply; and
- (e) failure or unacceptable delay in situations that imply inadequate power quality,

shall be considered as non-compliance.

51. The failure of the Transmission Licensee to achieve the approved levels of performance shall be considered as such Licensee's failure to utilize the funds approved in the tariff filing process to achieve the required efficiency.

52. In the event, the Transmission Licensee fails to utilize allowed funds to achieve approved levels of performance, it shall be considered that funds allocated for efficiency improvement have not been effectively utilized by such Licensee, and that amount shall be clawed back from the allowed revenue for the succeeding year.

53. The amount to be clawed back and the compensation to be paid shall be proportional to the levels of the performance achieved, and the formulae to be used for determination of such amounts are given in the Schedule.

54. The clawing back of funds or paying compensation to the Distribution Licensee or Transmission Customer in accordance with the regulation 52, shall be limited only for supply reliability, defined in the regulations 15 and 16.

55. The Transmission Licensee shall not be required to pay compensation and the PUCSL shall not claw-back from allowed revenue until five years after the date of operation of these regulations.

56. In these regulations, unless the context otherwise requires:-

“ac” means alternating current;

“Act” means the Sri Lanka Electricity Act, No. 20 of 2009;

“active power” means the product of voltage and current and cosine of the phase angle between them measured in units of –

Watt (W)

kilowatt (kW) =  $10^3$  W

Mega Watt (MW) =  $10^6$  W

Giga Watt (GW) =  $10^9$  W

Tera Watt (TW) =  $10^{12}$  W

“apparatus” means the all equipment in which electrical conductors are used, supported or of which they may form part;

“circuit hours” number of hours a transmission system component has remained available to carry out the functions expected of it;

“connection point” means a point at which a Distribution Licensee or Transmission Customer Plant or Apparatus connects to the transmission system;

“consumer” means a consumer of electricity in Sri Lanka and includes a prospective customer;

“customer” means a tariff customer;

“demand” means the requirement for active power and reactive power unless otherwise stated;

“Distribution Code” means a Code produced by Distribution Licensees pursuant to conditions of the License;

“Distribution Licensee” means a person appointed through a license issued by the PUCSL for the operation of the distribution system;

“distribution system” means the system consisting of lines owned and/or operated by a Distribution Licensee for the purposes of distribution of electricity from a grid substation to another substation, or to or from any external interconnection, or to deliver to customers, including any plant and Apparatus and meters owned or used by the Distribution Licensee in connection with the distribution of electricity;

“energy” means the quantity of electrical energy measured in units equal to one kilowatt hour (kWh) or multiples thereof such as:

1000 Wh = 1 kWh

1000kWh = 1 MWh

1000MWh = 1 GWh

“frequency” means the number of alternating current cycles per second (expressed in Hertz or Hz) at which a system is running;

“generating unit” means any apparatus which converts energy to electrical energy;

“generator” means a person or agency who generates electricity and who is subject to the Grid Code;

“Grid Code” means the Code implemented by the Transmission Licensee in terms of License issued;

“grid substation” means an assembly of equipment, including any necessary housing, for the conversion, transformation, switching or control of electrical power, where the incoming supply is at a High Voltage;

“High Voltage or HV” means the Voltage exceeding 33,000 Volt;

“interruption” means occurrence relating to equipment of the supply system which prevents its normal functioning;

“kVA” means the kilovolt ampere;

“License” means a License granted by PUCSL for the purpose specified;

“Licensee” means a person or a business entity to whom a license or authorization is issued by PUCSL, under the Public Utilities Commission of Sri Lanka Act, No. 35 of 2002 and Sri Lanka Electricity Act, No. 20 of 2009, for carrying out generation, transmission, distribution and supply of electrical energy;

“LKR” means the Sri Lankan Rupee;

“load” means the active and reactive power, as the context requires, generated, transmitted or distributed, and all similar terms shall be construed accordingly;

“MVA” means the Mega Volt Ampere = 1000 kVA;

“outage” means the removal of any part of the Transmission Licensee’s transmission system due to a breakdown or maintenance;

“party” means any person, corporate body, company, organization, authority, firm or association subject to provisions of the Distribution Code;

“Power Purchase Agreement or PPA” means the agreement entered into between a Generator and the Transmission Licensee pursuant to which the Transmission Licensee, agrees to purchase from the Generator the capacity of its generating units;

“power station” means an installation comprising one or more generating units (even where sited separately) owned and/or controlled by the same generator, which may reasonably be considered as being managed as one entity;

“protection” means the provisions for detecting abnormal conditions in a Transmission System or a part of it, and initiating fault clearance and activating alarms and indications;

“PUCSL” means the Public Utilities Commission of Sri Lanka established under Public Utilities Commission of Sri Lanka Act No 35 of 2002;

“Reactive Power or MVar” means the product of voltage and current and the sine of the phase angle between them, measured in units of volt-amperes reactive (VAr) and standard multiples thereof *i.e*

1000VAr = 1kVAr

1000 kVAr = 1MVar

“substation” means an assembly of equipment including any necessary housing for the conversion, transformation, switching or control of electrical power;

“Transmission Customer” means a person who requires a supply of electricity from the Transmission Licensee in pursuance of section 25 and 24(2) of SLEA and is supplied by the Transmission Licensee;

“Transmission Licensee” means a person appointed through a license issued by PUCSL for the operation of the transmission system;

“transmission system” means the system, which consists of high voltage electric lines and electric plant owned and operated by the Transmission Licensee and used for the purpose of transmission of electricity from a power station to a substation, or to another power station, or between substations, or to or from any external interconnection, including any plant and apparatus and meters owned or used by the Transmission Licensee in connection with the transmission of electricity;

“User or Transmission System User” means a person or entity that uses the Transmission Licensee’s transmission system. More specific definitions are identified in the Grid Code;

“working day” means any day other than saturday, sunday or a declared public holiday in Sri Lanka;

**SCHEDULE**  
**(Regulations 36 and 47)**  
**Compensation for Under-Performance**

**INDIVIDUAL PERFORMANCE FOR SUPPLY RELIABILITY**

1. The Transmission Licensee shall compensate the Distribution Licensees/Transmission Customers if the Individual Performance Indicators in supply reliability in a calendar year exceeds the specified levels approved by PUCSL for such indicators.

2. PUCSL shall calculate such amounts using the following formula and direct the Transmission Licensee to compensate the appropriate Distribution Licensees/Transmission Customers.

$$C_i^{Cust} = \sum_{a=1}^n t_{ai,j} \times \frac{year\ energy_i}{8760} \times Supply\ cost_i$$

where

$C_i^{Cust}$	Compensation to be paid by the Transmission Licensee to Distribution Licensee/ Transmission Customer “i” for Interruptions ‘n’ of type “j” during the calendar year owing to exceeding the tolerance specified for Individual Performance Indicator for such type of Interruptions.
n	Total number of Interruptions of type “j” to the Distribution Licensee/ Transmission customer “i”.
$t_{ai,j}$	Duration of the Interruption “a” of type “j” to customer “i”, expressed in hours
Year energy <sub>i</sub>	Energy sales to the Distribution Licensee/Transmission Customer “i” within the calendar year, expressed in kWh.
SUPPLYCOST <sub>i</sub>	Weighted average cost of supply in LKR/kWh to the Distribution Licensee/ Transmission Customer “i” at the Transmission/ Distribution boundary within the calendar year.

**OVERALL PERFORMANCE INDICES FOR SUPPLY RELIABILITY**

At the end of a calendar year, PUCSL shall calculate the funds Transmission Licensee has not effectively mobilized and claw back such funds from its Allowed Revenue, using the formula given below:

$$C_{i,j} = Max(C_{i,j}^{TSAIDI}, C_{i,j}^{TSAIFI})$$

where:

$C_{i,j}$  : Amount to be clawed back from the Allowed Revenue from the Transmission Licensee for non-compliance with the Overall Performance Standards on supply reliability in respect of the supply provided to Distribution Licensee/Transmission Customer “i” for Interruptions of type “j”, in the corresponding calendar year.

Max ( ): means the maximum of all the values indicated within the brackets

In the above formula the parameters shall be as follows:-

**Claw back of funds from Allowed Revenue for TSAIDI**

$C_{i,j}^{TSAIDI}$ , expressed in LKR shall be calculated as follows :

If the allowed level for  $TSAIDI_{i,j} = \overline{TSAIDI_{i,j}}$

$$C_{i,j}^{TSAIDI} = (TSAIDI_{i,j} - \overline{TSAIDI_{i,j}}) \times \frac{YearEnergy_i}{8760} \times SUPPLYCOST_i$$

If  $TSAIDI_{i,j} < \overline{TSAIDI_{i,j}}$ ,  $C_{i,j}^{TSAIDI}$  will be zero.

**Claw back of funds from Allowed Revenue for TSAIFI**

$C_{i,j}^{TSAIFI}$ , expressed in LKR shall be calculated as follows :

If allowed level of  $TSAIFI_{i,j} = \overline{TSAIFI_{i,j}}$

$$C_{i,j}^{TSAIFI} = (TSAIFI_{i,j} - \overline{TSAIFI_{i,j}}) \times \left( \frac{TSAIDI_{i,j}}{TSAIFI_{i,j}} \right) \times \frac{YearEnergy_i}{8760} \times SUPPLYCOST_i$$

If  $TSAIFI_{i,j} < \overline{TSAIFI_{i,j}}$ ,  $C_{i,j}^{TSAIFI}$  will be zero.

Where

$TSAIDI_{i,j}$  and  $TSAIFI_{i,j}$  Actual (registered) values of the Overall Performance Indices for supply reliability for the Distribution Licensee/Transmission Customer “i” of Interruptions of type “j” during the corresponding complete calendar year.

$\overline{TSAIDI_{i,j}}$  and  $\overline{TSAIFI_{i,j}}$  : Approved specified level of the selected Overall Performance Indices for the Interruptions of type “j” for the Distribution Licensee/Transmission Customer “i”

$YearEnergy_i$  : Annual Energy sales by the Transmission Licensee to the Distribution Licensee/Transmission Customer “i” during the complete calendar year, expressed in kWh.

$SUPPLYCOST_i$  : Weighted Average Cost of supply in LKR/kWh to the Distribution Licensee/Transmission Customer “i” at the Transmission/ Distribution boundary, within the calendar year.

**Claw back of funds from Allowed Revenue for EENS**

$$C_i^{ENS} = \left( \frac{EENS_i}{ETOT_i} - \frac{\overline{EENS_i}}{\overline{ETOT_i}} \right) \times YearEnergy_i \times CENS_i$$

If  $\left( \frac{EENS_i}{ETOT_i} - \frac{\overline{EENS_i}}{\overline{ETOT_i}} \right) < 0$ , then  $C_i^{ENS} = 0$

$EENS_i$  Actual (registered) values of EENS for a Distribution Licensee/Transmission Customer “i” during the corresponding complete calendar year, expressed in kWh.

$$\left( \frac{EENS_i}{ETOT_i} \right)$$

: Specified ratio of EENS to total Energy sales to a Distribution Licensee/Transmission Customer “i” during the corresponding complete calendar year

$$C_i^{ENS}$$

: Amount to be clawed back from the Allowed revenue for exceeding the levels specified for EENS, for the Distribution Licensee/Transmission Customer “i” expressed in LKR

$$CENS_i$$

: Economic cost of Energy not supplied expressed in LKR/kWh to Distribution Licensee/Transmission Customer “i”.

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