



**CUSTOMER SERVICE AND QUALITY
OF SUPPLY REGULATIONS**

for
SERVICE PROVIDERS
in the
ELECTRICITY DISTRIBUTION INDUSTRY

AUGUST 2021

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Table of Contents

PART I – PRELIMINARY PROVISIONS	5
1. CITATION	5
2. PURPOSE, APPLICABILITY AND SEVERABILITY	5
3. DEFINITIONS	6
CHAPTER 1 – COMMERCIAL PROVISIONS.....	9
PART II – RIGHTS AND DUTIES OF CUSTOMERS AND SERVICE PROVIDERS	9
4. RIGHTS OF A CUSTOMER.....	9
5. DUTIES OF A CUSTOMER	9
6. RIGHTS OF A SERVICE PROVIDER.....	10
7. DUTIES OF A SERVICE PROVIDER.....	10
PART III – ELECTRICITY SUPPLY	11
8. CONNECTION OF SUPPLY	11
9. APPLICATION FOR A NEW SERVICE	12
10. CUSTOMER CONTRIBUTION TO DEVELOPMENT.....	12
11. ILLEGAL CONNECTION	13
PART IV METERING.....	13
12. REQUIREMENT FOR A METER.....	13
13. SEPARATE METER	14
14. PREPAYMENT METER.....	15
15. REPOSITIONING OF METER AND OTHER ASSOCIATED HARDWARE.....	15
16. USE OF ALTERNATIVE MEASUREMENT DEVICE.....	16
PART V BILLING	16
18. ISSUE AND DELIVERY OF BILL.....	16
19. CONTENTS OF A BILL	18
20. ESTIMATED BILL.....	18
21. BILL PAYMENT	19
22. DISPUTED BILL	19
23. UNDERCHARGING.....	20
24. OVERCHARGING	20
26. REFUNDABLE ADVANCE.....	21

LDS

27. FINAL BILL	21
PART VI DISCONNECTION AND RECONNECTION OF SERVICE	22
28. TERMINATION OF SERVICE	22
29. TIME FOR DISCONNECTION OF SERVICE	22
30. SPECIAL NEEDS PROTECTION	23
31. WRONGFUL DISCONNECTION	23
32. RECONNECTION OF SERVICE	23
33. ORDER OF LERC TO RECONNECTION SERVICE	24
CHAPTER 2 – QUALITY OF SUPPLY STANDARDS OF PERFORMANCE PROVISIONS.....	24
PART VII RELIABILITY OF SUPPLY	24
34. INTERRUPTION FOR PLANNED MAINTENANCE AND NOTICE	24
35. EMERGENCY INTERRUPTION OF SUPPLY.....	25
36. LOAD SHEDDING.....	25
37. SAFETY OF SUPPLY.....	25
38. FREQUENCY AND DURATION OF INTERRUPTIONS.....	26
39. WRONGFUL INTERRUPTION OF SUPPLY.....	26
40. FIRE OUTBREAK.....	27
41. RESTORATION OF SUPPLY	27
PART VIII QUALITY OF SUPPLY.....	28
42. SYSTEM VOLTAGE.....	28
43. VOLTAGE COMPLAINT.....	28
44. POWER FACTOR.....	29
45. HARMONICS CONTROL.....	29
46. NEGATIVE SEQUENCE VOLTAGE.....	30
47. LOAD BALANCE.....	30
CHAPTER 3 FINAL PROVISIONS.....	31
PART IX MISCELLANEOUS PROVISIONS	31
48. REVISION OF METER.....	31
49. DEMAND SIDE MANAGEMENT AND AWARENESS	31
50. SUPPLY SIDE MANAGEMENT.....	31
51. AGREEMENTS WITH EMBEDDED GENERATOR.....	32
52. REPORTING REQUIREMENTS.....	32
53. COMPLAINTS AND DISPUTES.....	32

PART X ADVISORY FORUMS.....	33
54. TECHNICAL FORUM.....	33
55. NATIONAL ELECTRICITY CUSTOMER SERVICE COMMITTEE	33
56. ZONAL ELECTRICITY CUSTOMER COMMITTEE	34
57. TERMS AND CONDITIONS OF APPOINTMENT OF MEMBERS OF ADVISORY FORUMS.....	34
58. BREACHES AND PENALTIES.....	34
59. TRANSITIONAL PROVISIONS	35
SCHEDULE 1: SAMPLE TERMS AND CONDITIONS FOR NEW SERVICE (regulation 9. 4)	36
SCHEDULE 2: (regulation 9(5),13(2&3),15(2&3),24(1),43(4,5, &6),44(1),45(1) & 52(4)).....	37
SCHEDULE 3 – PENALTY/COMPENSATION	50
SCHEDULE 4– REPORTING REQUIREMENTS.....	53

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REPUBLIC OF LIBERIA
STATUTORY RULES AND ORDERS

Published on ---, 2021

Liberia Electricity Regulatory Commission

IN EXERCISE of the powers conferred by chapters 3,6, and 8 of the 2015 Electricity Law of Liberia, the Liberia Electricity Regulatory Commission (the Commission) makes the following Regulations this – day of --- 2021.

CUSTOMER SERVICE AND QUALITY OF SUPPLY REGULATIONS

LERC - REG. – 006

2021

PART I - PRELIMINARY PROVISIONS

1. CITATION

- (1) These Regulations may be cited as the Customer Service and Quality of Supply Regulations, 2021.
- (2) These Regulations come into force on the ----- day of ---2021.

2. PURPOSE, APPLICABILITY AND SEVERABILITY

- (1) These Regulations:
 - (a) establish the framework for delivery of safe, adequate, reliable, and non-discriminatory service by service providers;
 - (b) specify the rules governing the technical parameters and commercial relations between the service provider and a customer or a prospective customer; and
 - (c) prescribe performance benchmarks for electricity supply.
- (2) These Regulations apply to:
 - (a) a licensed service provider engaged in electricity distribution or sale services; and
 - (b) a customer, an affiliate of a customer or prospective customer.
- (3) If any provision in these Regulations shall for any reason be held invalid or unenforceable, the other provisions not affected thereby shall remain in full force and effect.



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3. DEFINITIONS

In these Regulations:

"Advance deposit"	Means an amount that has been lodged with the service provider as security against default in payment of electricity bill;
"Billing cycle"	The elapsed period between the last statement closing date and the next issued statement for electricity consumed;
"Certified electrician"	An electrician who has been recognized or certificated by the LERC, a recognized association of Liberian contractors, and/or a licensee;
"Customer"	Means a person or his successor in interest who purchases or receives electric power for consumption and not for delivery or resale to others, including a person who owns or occupies premises where electric power is supplied;
"Distribution system"	Means a system of electric lines and associated equipment (at 36kV and below) used to distribute electricity under a distribution licensee;
"Embedded generator"	Means a generator whose generating units are directly connected to a distribution system;
"Emergency"	Means an imminent occurrence of a situation that is out of the ordinary and that threatens to endanger a person, public safety, or cause damage to property;
"Harmonics"	Sinusoidal voltages and currents having frequencies that are integer multiples of the operational frequency of the power system;
LERC	Liberia Electricity Regulatory Commission;
"Lifeline customer"	A customer category based on monthly energy consumption of 20kWh or less;

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“Load shedding”	Temporary reduction in power system loads due to imbalance in electricity available to electricity demanded;
“LV”	Means “low voltage” of values less than 1kilovolt;
“Major fault”	An event resulting to 10% of customers losing electricity in the grid;
“Metering code”	Means the laws, codes, or other regulatory instruments about metrology applicable to a particular customer;
“Minor fault”	An event in the power system when timely addressed does not result to a reliability issue;
“Multi-tenant house”	distinct household that shares a meter with several other households;
“Negative sequencing voltage”	A balanced three phase voltage with opposite phase sequence as the original;
“Point of common coupling”	Means the electrical node where more than one customer is connected;
“Power factor”	Means the ratio of the kW to kVA measured over the same integrating period;
“Prepayment meter”	A type of energy meter that allows users to pay for electrical energy before it is used;
“Service”	Means electricity supplied to a customer by a service provider through distribution and supply network or for stand-alone system facilities operated under a license or permit issued by LERC;
“Service provider”	Means a legal entity licensed to provide a regulated activity or service;
“SAIDI”	The System Average Interruption Duration Index (SAIDI) is the ratio of total customer hours interrupted to total customers served. This is expressed in minutes and indicates

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the average duration a customer is without power; and

“SAIFI”

The System Average Interruption Frequency Index (SAIFI) ratio of total number of customer interruptions to the total number of customers served. This indicates the number of interruptions an average customer experience.



CHAPTER 1 – COMMERCIAL PROVISIONS

PART II – RIGHTS AND DUTIES OF CUSTOMERS AND SERVICE PROVIDERS

4. RIGHTS OF A CUSTOMER

- (1) A person is entitled to a connection to an electricity service if that person:
- (a) applies for the service within the concessional area of the service provider;
 - (b) complies with the requirements of the service provider; and
 - (c) has paid or is willing to pay for the service.
- (2) A customer or an affiliate of the customer is entitled to the provision of service that is safe, adequate, efficient, reliable, and non-discriminatory.
- (3) A customer or prospective customer is entitled access to service related information, including the following:
- (a) the procedure for obtaining a new service;
 - (b) metering and billing for the service;
 - (c) nature of the service being provided or required, including:
 - i. load profile and power factor;
 - ii. meter readings in relation to the customer's premises; and
 - iii. the customer's statement of account showing the account history;
 - (d) the approved tariff schedule or service fee;
 - (e) disconnection procedures;
 - (f) interruption in services;
 - (g) customer education on energy efficiency, conservation, and safety; and
 - (h) the procedure for seeking redress if the service provider infringes on the rights of a customer.
- (4) Subject to these Regulations, a service provider shall not deny the right of access of a customer to a service where that customer meets the reasonable requirements of the service provider.

5. DUTIES OF A CUSTOMER

- (1) A customer shall:
- (a) pay for the service received within the period specified in regulation 21
 - (b) use the service for the purpose for which the service was contracted;
 - (c) not illegally connect to the service;
 - (d) grant an employee or agent of the service provider, safe and reasonable access to the premises of the customer, to read a meter or inspect the

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service provider's equipment, where that employee or agent follows the procedure for grant of access prescribed in the service provider's Customer Charter;

- (e) comply with laws and regulations affecting services in the country;
- (f) not use electricity obtained legally in an unauthorized manner;
- (g) not tamper, interfere with or damage or permit another person to tamper, interfere with or damage a service provider's equipment or a meter;
- (h) not change the location of a meter;
- (i) not use electricity in a manner which interferes with the supply of the service to others;
- (j) not permit another person to use the electricity in a manner that interferes with the supply of the service to others;
- (k) report to the service provider;
- (l) any person who uses the service illegally or in a manner that interferes with the supply of the service to others;
- (m) emergencies such as broken poles, falling conductors, damaged transformers, fire outbreaks and other situations considered a safety compromise.

6. RIGHTS OF A SERVICE PROVIDER

1. A service provider is entitled to receive payment for services provided to customer within the period specified in regulation 21.:

2. A service provider may deny a customer or a prospective customer access to service if:

- (a) the electrical installations on the premises is inadequate to receive the service being requested;
- (b) debts previously incurred to the service provider are unsettled;
- (c) the customer refuses or fails:
 - i. to make a deposit requested by the service provider; and
 - ii. to comply with other provisions in these regulations.

7. DUTIES OF A SERVICE PROVIDER

A service provider shall:

- (a) make available to a customer, copies of its Customer Charter at no additional cost;
- (b) provide the electricity through the appropriate service connections and protective devices in accordance with the codes and industry standards;
- (c) provide a service that is safe, adequate, efficient, reliable, and nondiscriminatory;
- (d) cooperate with an independent entity to be appointed by the LERC to conduct a customer satisfaction survey every two years;

- (e) comply with the laws and regulatory guidelines affecting services in the country;
- (f) respond to all emergencies such as broken poles, falling conductors, damaged transformers, fire outbreaks and other situations considered a safety compromise; and
- (g) provide work order(s) for attestation by customer(s) for all work-related services assigned at the customer(s) premise(s).

PART III – ELECTRICITY SUPPLY

8. CONNECTION OF SUPPLY

(1) A service provider shall:

- (a) install, own, and maintain the equipment necessary for the supply and sale of electricity to customers; and
- (b) ensure that the supply is connected through an appropriate service connection and protective device in accordance with applicable standards.

(2) A customer shall:

- (a) ensure that the customer's electrical installation is safe for the supply of electricity;
- (b) provide safe and reasonable access to the customer's premises for the service provider to undertake works related to the supply of electricity;
- (c) keep vegetation at the customer's premises clear from the service provider's low and medium voltage distribution system; and
- (d) be responsible for the cost of removal of any privately owned property or reinstallation thereof for the service provider to carryout installation works requested by the customer(s).

(3) When a customer or an applicant for a new connection fails to comply with any of the provisions of sub-regulation (2), the service provider may:

- (a) in the case of a customer already connected to the distribution system, disconnect electricity supply to the premises;
- (b) in the case of an applicant for a new service, refuse to connect the premises to the distribution system.

(4) Despite sub-regulation (3), the service provider shall reconnect supply to the premises in accordance with regulation 32 when the customer complies with sub-regulation (2).

(5) A customer shall not:



- (a) use any electrical equipment or appliance that will interfere with, damage or degrade the quality of electricity supply to other customers in the service provider's distribution system;
- (b) increase the customer's contracted electricity demand without the consent of the service provider; or
- (c) intentionally interfere or knowingly allow interference with the service provider's distribution system, meter or any equipment that is used for supply of electricity to the customer.

(6) The service provider shall ensure that its distribution network is always free from vegetation and obstruction.

(7) The service provider shall ensure that a customer's premises is not connected to more than one distribution transformer feeder at any time.

9. APPLICATION FOR A NEW SERVICE

(1) An applicant in applying for electricity supply to the applicant's premises, shall:

(a) ensure that the electrical installation at the premises is carried out by:

(i) a qualified electrician duly certified by the LERC; or

(ii) a contractor who is a member of the Association of the Liberian Construction Contractors or other similar body recognized by the service provider; and

(b) obtain from the electrician or electrical contractor, a duly signed and dated Electrical Works Certificate (EWC) approved by the service provider.

(2) The applicant shall attach the EWC to the application form for a new connection and submit the application to the service provider.

(3) The service provider shall provide the application form for a new service presented in a manner that is easy to understand and state the terms and conditions for obtaining the service.

(4) The terms and conditions of supply may include those provided in **Schedule 1**.

(5) On receiving a complete application form, the service provider shall provide the applicant with an estimate and charges for the connection within the period as provided for in **Schedule 2**.

10. CUSTOMER CONTRIBUTION TO DEVELOPMENT

(1) A customer may with the approval of a service provider finance the development of the distribution system. A customer who finances the expansion of a distribution system for his connection, is entitled to refund if the service provider connects new customers



over a period of not more than 5 years. After 5 years, the line section falls under public domain and no further refund is paid to the customer who paid for it.

(2) The service provider shall develop guidelines for refunding the customer's contribution in such development over a period of not more than 36 months for the approval of LERC.

(3) LERC may direct the service provider to review the guidelines for the recovery of the customer's contribution periodically and shall approve the guidelines each time they are revised.

11. ILLEGAL CONNECTION

(1) An electricity supply to any premises made contrary to regulation 8 is illegal and shall be disconnected in accordance with the regulation 28(4).

(2) Illegal connection is a felony under the Power Theft Law, 2019 and shall be penalized accordingly.

(3) Despite sub-regulation (2), if it is established that an illegal connection resulted in damage to the service provider's or other third party's equipment, the person who made the illegal connection shall be liable for the cost of repairs or replacement of the damaged equipment.

(4) person under this regulation means any individual, association, partnership or corporation or public servant or an employee of licensee.

PART IV METERING

12. REQUIREMENT FOR A METER

(1) A potential customer must provide an appropriate location at the premises for the installation of the service provider's meter.

(2) The service provider shall:

(a) provide, install, own, and maintain a meter that will measure and record the quantity of electricity supplied to the customer within the specified accuracy limits of that meter's class;

(b) affix the meter at an appropriate place at the customer's premises or such other place, and position it in such a way as to allow for easy access to service provider and the customer(s);

(c) ensure that the meter is robust and easy to read by the customer;



- (d) ensure that the accuracy of the meter is maintained throughout its usage in accordance with the metering code;
- (e) test and if necessary, calibrate industrial customers' meters periodically;
- (f) when the meter becomes defective, replace it or provide an appropriate alternative to restore electricity supply to the customer;
- (g) seal each meter installed at the customer's premises in the presence of the customer or the customer's representative, who shall ensure that the seal is firmly in place; and
- (h) carry out revision of meters in its distribution system as part of its asset management policy in accordance with regulation 50.

(3) Despite sub-regulation (2)(g), a service provider may break the seal on the meter during testing, maintenance or repair and shall upon completion, reseal the meter in the presence of the customer or the customer's representative.

(4) A customer shall not tamper with or break the seal on a meter.

(5) A customer shall not transfer or remove an assigned meter to a premises for any purpose whatsoever.

(6) The Service Provider shall lodge with LERC for the purpose of creating a database information on the type of meter and their accuracy levels of all meters deployed in the distribution network.

13. SEPARATE METER

- (1) A service provider shall install a separate meter at the customer's premises when:
- (a) the customer requesting the separate meter is representing a distinct household that shares a meter with another household;
 - (b) facilities exist on the premises for the service provider to install the separate meter; or
 - (c) the person requesting the separate meter is willing to make the necessary modifications to the wiring system at no cost to the service provider to accommodate the separate meter.

(2) The service provider shall on receipt of the request visit the premises, assess the conditions and provide the applicant with an estimate for installing the meter within the period as specified in Schedule 2.

(3) If the applicant pays the related charges for the separate meter the service provider shall install and connect the separate meter within the period as specified in Schedule 2.

(4) A service provider which fails to provide the estimates for the separate meter or does not install the meter upon payment of the related charges within the time specified in sub-regulations (2) and (3) shall pay to the applicant the amount specified in Schedule 3.



- (5) If a tenant in a multi-tenant house or apartment applies for an exclusive electricity supply to that tenant's part of the house, the service provider shall:
- (a) treat the tenant's application in accordance with regulations 9(1) to 9(4), and
 - (b) connect the supply in accordance with regulation 9(5) if:
 - (i) the tenant's premises is rewired to isolate the tenants circuit from the electrical installation of the rest of the house; and
 - (ii) the landlord endorses the application of the tenant.
- (6) If there is a dispute between the landlord and tenant relating to the tenant's application under regulation 9(5), the matter shall be referred to the LERC to be resolved under its Complaint and Dispute Resolution Guidelines.

14. PREPAYMENT METER

- (1) A service provider shall ensure that a facility for the purchase of tokens or credit for a prepayment meter is:
- (a) established within not more than 2km from the customer in Monrovia and not more than 5km in other localities;
 - (b) available for online or remote vending or through a third-party system to buy electricity; and
 - (c) open for a minimum of eight hours six days in a week.
- (2) A service provider shall pay the penalties specified in Schedule 3 if it fails to:
- (a) make available a facility for the purchase of credit in respect of prepayment meter contrary to sub-regulations (1)(a); or
 - (b) keep the facility for the purchase of credit in respect of the prepayment meter open for the duration specified in sub-regulation (1)(c).

15. REPOSITIONING OF METER AND OTHER ASSOCIATED HARDWARE

- (1) A customer may apply to the service provider for a change in the position of the meter or other associated hardware at the customer's premises by stating the reasons for the request to the change in position.
- (2) On receiving the customer's request, the service provider shall furnish the customer with the estimate of charges for repositioning the meter and other associated hardware within the time specified in **Schedule 2**; if the request is reasonable.
- (3) If the service provider rejects the request, it shall inform the customer and the LERC of the reasons for the rejection in writing.
- (4) When the customer pays the required charges, the service provider shall reposition the meter and other associated hardware within the time specified in **Schedule 2**.
- (5) The service provider shall pay the penalties specified in **Schedule 3** if it fails to:
- (a) furnish the estimate of charges contrary to sub-regulation (2); or
 - (b) reposition the meter contrary to sub-regulation (4).

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16. USE OF ALTERNATIVE MEASUREMENT DEVICE

- (1) A service provider may install a load cut-out limiter or energy dispenser instead of a meter on a customer's premises if the monthly electricity consumption of the customer is below the stipulated threshold.
- (2) The service provider must however ensure that the alternative electricity measuring device does not adversely affect or interrupt the electricity supply to the customer.

17. METER COMPLAINT

- (1) A service provider shall visit a customer's premises and investigate within 24 hours after receiving a meter complaint from the customer in respect of the following:
 - (a) the meter on the premises is or may have been operating outside the permitted margin of error prescribed in the metering code; or
 - (b) an event has occurred, or circumstances exist which, the service provider may reasonably expect to have been the cause of the meter operating outside the margin of error.
- (2) The service provider shall, after establishing there is defect in the customer's meter, replace the defective meter within 48 hours. However, when it is established that the defect was due to tampering by the customer, the provisions in regulation 11 shall apply.
- (3) In the event the meter(s) cannot be replaced within the stipulated period as provided for in sub-regulation 2, the service provider shall make one available within a period of six months and estimate the consumption based on historical data and bill the customer accordingly for the six-month period.
- (4) The service provider shall achieve a minimum performance of at least 75% each calendar year and report to LERC on the level of performance achieved accordingly and this may be considered by LERC as a tariff review or adjustment benchmark.
- (5) A service provider that contravenes sub-regulations (3) shall pay the penalty specified in Schedule 3.

PART V BILLING

18. ISSUE AND DELIVERY OF BILL

- (1) A service provider may adopt a monthly, quarterly, or bi-annual meter reading system.
- (2) The service provider is encouraged to issue an electricity bill every month to a customer with demand meters indicating the electricity usage in the month as well as the other service-related charges. Exceptions are arrangements authorized by the regulator and customer(s) in the prepayment category.

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(3) A service provider that contravenes sub-regulation (1) and (2) shall pay the penalty specified in Schedule 3.

(4) Subject to sub-regulation (9), the service provider shall read and take a record of the meter recordings of a customer and issue and deliver a bill in respect of a metered customer 12 times a year, at the address of the customer by hand, electronic mail or any other appropriate and convenient method.

(5) If a service provider fails to deliver bills for a period of over three months, the customer is entitled to settle the accumulated bill by an installment payment plan as shall be agreed between the service provider and the customer.

(6) If the parties are unable to agree on a payment plan, the matter shall be referred to LERC for resolution.

(7) If the service provider fails to bill a customer for a period of over 12 months, the service provider cannot recover the cost of that service or arrears beyond the 12-month period unless the delay in billing occurred:

- (a) without any negligence on the part of the service provider; or
- (b) due to the customer's action.

(8) If the service provider's right to recover the cost of accumulated service from a customer is not vitiated by the events in sub-regulation (7), the service provider may recover the accrued cost of the service by an installment payment plan and shall not charge any interest on the amount.

(9) A service provider shall read a customer's meter recordings in a consistent cycle by adopting:

- (a) a monthly meter reading conducted on a specific date of each month;
- (b) quarterly meter reading conducted on a specific day of each quarter; or
- (c) a bi-annual meter reading conducted at the beginning and end of the year.

(10) Despite sub-regulation (9), a service provider may vary the meter reading by a maximum of three days.

(11) If the service provider adopts a quarterly or bi-annual meter reading, the service provider shall:

- (a) issue monthly estimated bills to the customer;
- (b) reconcile the estimated consumption with the actual consumption at the end of the reading period adopted; and
- (c) compute the final electricity charges at the end of the meter reading period using the approved electricity tariff.



(12) If a service provider's reading of a customer's meter is irregular and inconsistent with the specified reading cycle and as a result, the customer's bill covers a period over the usual billing cycle with implications for the level and quantum of the tariff, the service provider shall adjust the tariff on a pro rata basis to ensure that any inherent unfairness in the charge is removed.

19. CONTENTS OF A BILL

(1) A service provider shall ensure that each bill and its content shall be preserved for at least 3 years and at a minimum contain the following:

- (a) the name, address, locality and account number of the customer and customer class (residential, commercial, industrial, etc.);
- (b) the meter number;
- (c) the dates of previous and current meter recordings or estimates;
- (d) the previous and current meter recordings or estimates;
- (e) the date of issue;
- (f) the actual or estimated electricity consumption with the appropriate units;
- (g) the approved tariff and the amount due;
- (h) the payment due date;
- (i) the date of the last payment, if applicable;
- (j) the amount of arrears or any other charge with the details of the service provided, credit, refundable advance and balance brought forward;
- (k) the disconnection date for default on payment;
- (l) contact details of the service provider, that is, address, e-mail, telephone numbers, etc.; and
- (m) applicable charges and levies- VAT, street lighting, etc.

20. ESTIMATED BILL

(1) A service provider may estimate consumption for billing a customer for up to six months, if:

- (a) the meter is not functioning;
- (b) the meter is faulty and is registering incorrectly;
- (c) the meter has been tampered with; or
- (d) access to the premises is denied for any reason including safety, bad weather, industrial action or lockdown.

(2) The service provider shall indicate on the bill that it is estimated and state the reason for so estimating the consumption.

(3) When the problem in sub-regulation (1) is remedied and the service provider can read the customer meter, it shall, as soon is reasonable, reconcile the actual meter recording with the estimated electricity consumption.

- (4) A service provider shall calculate an estimated bill as follows:
- (a) if the service has been provided for a period of over 12 months, the amount shall be based on the average units used by the customer over the previous 12 months;
 - (b) if the service had been provided for less than 12 months, the amount shall be based on the average units used by the customer for the period the service was provided; or
 - (c) if the service is new, the amount shall be based on the estimated load and expected energy consumption provided by the customer on the application form.
- (5) If the estimated bill of a customer exceeds the actual consumption by more than 50%, the service provider shall deal with the matter in accordance with the provisions of sub-regulations (2) and (3) of regulation 24.

21. BILL PAYMENT

- (1) A customer shall pay a bill by the due date imprinted on the bill to avoid disconnection of supply.
- (2) Despite sub-regulation (1) the service provider may offer a customer special payment terms, including payment by installment under sub-regulation 5.
- (3) A service provider must establish payment schemes to facilitate collection of revenue from the sale of electricity such as:
- (a) direct debit to the customer's bank account under an agreement between the service provider and the customer; or
 - (b) payment on account with interest in respect of large amounts as determined by LERC.
- (4) If a customer pays an electricity bill by check or direct debit from a bank account and the payment is dishonored, the service provider may:
- (a) recover any bank charges incurred from the customer; and
 - (b) withdraw the customer's right to pay bills by check or direct debits.
- (5) A service provider may permit a customer to pay bills or the arrears in respect of electricity consumption by installment, if the customer proves to the service provider that the customer has financial difficulties resulting in the inability to pay the bill.
- (6) The service provider may demand that the installment payment be made concurrently with the current bill.

22. DISPUTED BILL

- (1) A service provider shall review and reconcile a bill that is disputed by the customer.



- (2) When a customer billing dispute is pending, the customer shall:
 - (a) pay any undisputed portion of the bill; or
 - (b) if the entire bill is in dispute pay a reasonable amount as shall be agreed between the customer and the service provider until the bill is reconciled.

- (3) If it is established after review that the bill is accurate, the customer shall:
 - (a) pay the amount accrued within 14 days of the reconciliation or review; or
 - (b) request an installment payment in accordance with sub-regulation (8) of regulation 18.

23. UNDERCHARGING

- (1) If a service provider undercharges a customer, the service provider shall first inform the customer of the undercharge and may afterwards take steps to recover the shortfall.
- (2) When the service provider decides to recover the shortfall under sub-regulation (1), the service provider shall give the customer the option to pay the shortfall by an installment payment plan but without interest.
- (3) The duration of the period of payment under the installment payment plan stipulated in sub-regulation (2) shall be equivalent to the period of the undercharge or a maximum of 12 months, whichever is less.
- (4) If the service provider establishes that a customer is illegally using electricity which results in undercharging the customer, the service provider is, without limiting the effect of the provisions of sub-regulation (2) of regulation 11, entitled to recover the shortfall.

24. OVERCHARGING

- (1) A service provider shall not deliberately overcharge a customer and the service provider that does so shall pay the penalty specified in Schedule 3.
- (2) If a service provider overcharges a customer, the service provider shall take immediate steps to correct the bill and credit the account of the customer with the full amount overcharged and inform the customer accordingly.
- (3) A customer is entitled to interest on an overcharged amount at a rate determined by LERC if the overcharge occurred continuously for three months or more.

25. ADVANCE DEPOSIT

- (1) A service provider may request a new postpaid customer to provide an advance deposit against electricity bills starting from the date of first supply.
- (2) The advance deposit shall be the estimated monthly consumption of electricity for two months. If the customer consistently pays their bills as required over a period of six months, the service provider shall refund the advance deposit.

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- (3) The service provider may in addition to the advance deposit, request a bank guarantee in respect of an industrial or commercial customer.
- (4) When the industrial or commercial customer consistently pays its bills as required over a period of 12 months, the bank guarantee option shall cease to apply at the expiration of the 12 month.
- (5) Further details relating to advance/security deposits are provided for in the Distribution Code.

26. REFUNDABLE ADVANCE

- (1) A service provider may request a customer to provide a refundable advance against the actual bills and any arrears that may accrue in respect of the customer's premises.
- (2) The refundable deposit shall be not more than twice the estimated monthly bill of the customer.
- (3) The service provider may offset the customer's refundable advance against any outstanding bill that is not in dispute.
- (4) If the service provider demands a refundable advance from a customer, the advance shall be subject to interest payment as shall be determined by LERC.

27. FINAL BILL

- (1) A customer intending to vacate or dispose of a premises shall:
 - (a) inform the service provider in writing, at least 10 working days of vacating or disposing of the premises, for the disconnection of service; and
 - (b) provide an address to which the last bill must be sent.
- (2) A customer that fails to comply with sub-regulation (1) (a) is liable to pay for electricity supplied to the premises.
- (3) If the customer gives notice of less than 10 days and the service provider is unable to disconnect the service before the customer vacates or disposes of the premises, the customer is liable for payment of electricity supplied to the premises up to 10 days from the date of actual notification or the date the service provider became aware that the customer has vacated the premises.
- (4) If the service provider receives the notice from the customer but fails to disconnect the supply within the 10 days of receiving the notice, the customer shall not be liable for the payment of electricity supplied to the premises after the 10 days.

LDS

PART VI DISCONNECTION AND RECONNECTION OF SERVICE

28. TERMINATION OF SERVICE

- (1) A service provider may disconnect service to a customer when the customer:
 - (a) requests the disconnection;
 - (b) fails to pay a bill for the service for more than 14 days from the date of the delivery of the demand for payment by the service provider; or
 - (c) defaults on an agreed payment schedule for the service.
- (2) A service provider that intends to disconnect a service under sub-regulation (1)(b) and (c) shall give the customer written notice of disconnection, at least 3 working days before disconnecting the service.
- (3) The service provider shall submit the form of disconnection notice for the approval of LERC.
- (4) A service provider may disconnect a customer's premises from its service mains of that service provider without notice if:
 - (a) the customer tampers or interferes with the supply equipment or a meter or permits another person to tamper or interfere with service provider's equipment or a meter;
 - (b) the customer illegally connects the service or allows the service to be used in a manner that interferes with the supply of the service to others;
 - (c) the customer uses a service that was legally connected in an unauthorized manner;
 - (d) the customer refuses to allow an employee or agent of the service provider to read a meter or check its equipment when the employee of the service provider or agent has followed the procedures prescribed in the Customer Charter for obtaining access;
 - (e) a part of the apparatus or equipment connected with the supply to the premises of that customer becomes defective or unsafe; or
 - (f) the disconnection is necessary for maintenance or repair work.
- (2) A service provider shall not disconnect the service if the customer:
 - (a) has lodged a complaint with the service provider or LERC in respect of a disputed bill; and
 - (b) has paid or continues to pay a reasonable amount as agreed by the parties or as determined by LERC.

29. TIME FOR DISCONNECTION OF SERVICE

- (1) Subject to these Regulations, a service provider may disconnect service to a customer only between the hours of 8.00.am to 5.00 pm from Monday to Thursday.
- (2) Despite sub-regulation (1), a service provider shall not disconnect the service:

LDS

- (a) on the eve of a public holiday or on a public holiday;
- (b) at a time when the service provider is aware or ought to be aware that there is an issue of safety to persons or property; or
- (c) during an emergency on or related to the premises of the customer.

30. SPECIAL NEEDS PROTECTION

(1) A service provider shall offer a customer an installment payment plan under regulation 21 where the customer demonstrates the inability to pay a bill, in the circumstances under sub-regulation (2).

(2) For the purposes of sub-regulation (1), the service provider shall offer a customer an installment payment plan if:

- (a) the service provider is aware that the customer is
 - (i) aged 70 years or above; or
 - (ii) disabled and the only adult on the premises;
- (b) a qualified medical practitioner certifies a medical emergency at the premises, which will be aggravated by the lack of the service; and
- (c) the premises is used as a health facility, home care facility for the aged, or a residential education facility.

(3) When a service provider intends to disconnect a customer that defaulted on a payment plan, the service provider shall give the customer at least 14 days' written notice before disconnecting the service.

(4) In the case of a home care facility for the aged or residential, health and education facilities, the notice shall be served on the principal officer of the facility.

31. WRONGFUL DISCONNECTION

A disconnection of a service is wrongful if the termination contravenes these Regulations. A service provider shall pay compensation to a customer for any act of a wrongful disconnection as provided in Schedule 3.

32. RECONNECTION OF SERVICE

(1) When a service provider disconnects a service to a customer for non-payment of bills, that service provider shall reconnect the service:

- (a) within twenty-four hours after the payment of:
 - (i) the full amount owed or the first instalment under an agreed instalment payment plan;
 - (ii) the applicable reconnection charge; and
 - (iii) other lawful charges related to the service.

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(2) If the service was disconnected due to a contravention of a provision of these Regulations by the customer, the service provider concerned shall reconnect the service within 24 hours after the service provider receives appropriate evidence that the violation has been corrected.

(3) If the service was disconnected for maintenance, repair work or safety reasons, the service provider shall reconnect the service within 24 hours of conducting the required maintenance, repairs or rectifying the defect.

33. ORDER OF LERC TO RECONNECT SERVICE

LERC may order the reconnection of a service by a service provider, when:

- (a) the service was disconnected in error;
- (b) a complaint has been lodged with the LERC and an undisputed bill has been paid; or
- (c) LERC is satisfied that the circumstances necessitate the reconnection.

CHAPTER 2 – QUALITY OF SUPPLY STANDARDS OF PERFORMANCE PROVISIONS

PART VII RELIABILITY OF SUPPLY

34. INTERRUPTION FOR PLANNED MAINTENANCE AND NOTICE

(1) A service provider may disconnect or interrupt electricity supply to a locality or a customer for the purpose of carrying out planned maintenance, including repair and installation of new equipment.

(2) Except in an emergency, the service provider shall not exercise the power in sub-regulation 1 unless it informs the customer of the intended disconnection or interruption and specifies the approximate duration of the interruption through:

- (a) a public notice; or
- (b) direct contact by telephone, electronic mail, satellite phone broadcast or any other appropriate information technology system.

(3) In the case of the public notice, it shall be given for a period of not less than three working days before the supply is interrupted.

(4) When the service provider interrupts supply, it shall restore the service within the stipulated period as provided in Schedule 2. A failure of the service provider to restore supply within the stipulated period shall result to payment of amount specified in schedule 3.

LDS

(5) A service provider shall pay amounts specified in Schedule 3 for a failure of the service provider to notify customers under sub-regulation 3.

35. EMERGENCY INTERRUPTION OF SUPPLY

(1) A supplier may in an emergency disconnect or interrupt supply to a customer without notice to the customer.

(2) The supplier shall take the appropriate measures to rectify the situation and immediately advise the customer.

36. LOAD SHEDDING

(1) A service provider may shed load only when:

(a) demand is likely to exceed supply as a result of a forced outage of a generating unit; or

(b) it is necessary:

- (i) to preserve the security of the transmission and distribution system;
- (ii) to reinforce or rehabilitate the distribution system; or
- (iii) for safety reasons.

(2) When the service provider decides to shed load under sub-regulation 1, it shall immediately notify LERC of the intended load shedding by telephone, email that shall be followed by a formal notice in hard copy.

(3) In addition to informing LERC, the service provider shall by a notice carried in newspapers and on radio or television inform the public of the intended load shedding and the duration thereof.

37. SAFETY OF SUPPLY

(1) A service provider shall ensure that its distribution system is safe and efficient for the supply of electricity to its customers and shall take the precautions necessary to avoid exposing the customer or the public to live electric cables.

(2) If a service provider is informed by the public or otherwise, that its part of the distribution system at a particular locality is faulty and may pose a danger to the public, the service provider shall visit that locality and isolate the faulty part of the network within:

(a) 2 hours, if the location of the fault is within a 20-kilometer radius of the service provider's office;

(b) 4 hours, if the location of the fault is within a 30-kilometer radius of the service provider's office; or

(c) 5 hours, if the location of the fault is beyond a 30-kilometer radius.

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- (3) The service provider shall place danger notices to warn the public of the danger.
- (4) The service provider shall rectify the fault and restore supply in accordance with regulation 41(1).
- (5) A customer shall not use electricity in a manner that would render the distribution system unsafe.

38. FREQUENCY AND DURATION OF INTERRUPTIONS

(1) Within each year, the service provider shall ensure that the cumulative electricity interruption for each customer within its operational area does not exceed:

- (a) 144 hours in Monrovia Grid;
- (b) 216 hours in a county capital city;
- (c) 432 hours in the other localities.

(2) Despite sub-regulation 1 the service provider shall ensure that the electricity interruptions within its operational area does not exceed 52 times in a year.

(3) Despite sub-regulations 1 and 2, the service provider shall ensure that the duration of each outage does not exceed:

- (a) 8 hours in Monrovia;
- (b) 12 hours in a county capital city;
- (c) 24 hours in the other localities.

(4) For purposes of this regulation, the period of an interruption shall be measured from the time the service provider is first informed of the interruption by:

- (a) a customer;
- (b) a person other than a customer;
- (c) any automatic system operated by the service provider in circumstances in which the supply to the customer's premises may reasonably be expected to have been interrupted.

39. WRONGFUL INTERRUPTION OF SUPPLY

(1) Wrongful interruption of supply occurs when a service provider interrupts supply to a customer in contravention of these Regulations.

(2) An interruption of supply to a customer shall not be deemed as wrongful if the interruption was:

- (a) the result of a major fault or damage to an indispensable equipment in the service provider's distribution system;

LDS

- (b) the result of a failure, fault or damage to either the transmission system to which the service provider's distribution system is connected or a generation station connected to that transmission system;
- (c) the result of a failure or fault in or damage to a generating station connected to the service provider's distribution system; and
- (d) one to which regulations 35, 36, and 37 are applicable.

40. FIRE OUTBREAK

(1) The occupier of a premises shall, in the event of an outbreak of fire on the premises, immediately notify a fire station and the service provider of such incident.

(2) The service provider shall provide the customer with the emergency numbers on the bill and the customer charter.

41. RESTORATION OF SUPPLY

(1) When a service provider is informed of an interruption in a customer's supply due to a fault or damage to the service provider's equipment or distribution system, the service provider shall unless the fault or damage was caused by a natural disaster, restore supply to the customer's premises as follows:

- (a) in the case of a minor fault, within:
 - (i) 8 hours in Monrovia or an industrial enclave;
 - (ii) 12 hours in a county capital city;
 - (iii) 24 hours in the other localities;

- (b) in the case of a major fault that would require capital intensive equipment, within:
 - (i) 24 hours in Monrovia or an industrial enclave;
 - (ii) 120 hours in a county capital city; and
 - (iii) 240 hours in the other localities.

(2) A service provider shall restore supply to a customer that has been disconnected for non-payment of a bill in accordance with regulation 32(1).

(3) If the supply to the customer's premises is interrupted as a result of a natural disaster, supply shall be restored by the service provider within the period specified in sub-regulation 1, when the situation normalizes.

(4) A supplier shall pay to the customer compensation in the sum specified in Schedule 3:

- (a) if the service provider fails to restore supply to the customer's premises in accordance with the time specified in sub-regulations 1; and

LDS

(b) in respect of each consecutive 12-hour period after the expiry of the period specified for restoration of supply.

- (5) The service provider shall not pay the penalty specified in sub-regulation 4 if:
- (a) it was not practicable for the service provider to be aware that the supply had been interrupted;
 - (b) the premises or the vicinity of the premises is supplied through an electric feeder situated on a riverbed or seabed; or
 - (c) the premises is situated on an island and no alternative means of supply to the island exists.

PART VIII QUALITY OF SUPPLY

42. SYSTEM VOLTAGE

A service provider shall ensure that the nominal voltage at the point of supply to a customer's premises or electrical installation is within plus or minus 10% of the following voltage levels:

- (a) 230 Volts;
- (b) 400 Volts;
- (c) 22/33 Kilovolts
- (d) 11 Kilovolts;

43. VOLTAGE COMPLAINT

(1) A service provider shall visit a customer's premises immediately it receives a supply voltage complaint to investigate and if possible, rectify the problem if the service provider:

(a) has been notified that the electricity supply to a customer's premises has been or is at a voltage outside the supply limits of the permitted variation specified in regulation 42; or

(b) may have reason to expect that an event that had occurred in the distribution system or in the power system external to the distribution system may have been the cause of the supply voltage being outside the limits of the permitted variations.

(2) The service provider shall rectify the problem within:

- (a) 8 hours in the Monrovia Grid or an industrial enclave;
- (b) 12 hours in a county capital city; and
- (b) 24 hours in the other localities.

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(3) The service provider shall within 48 hours after receiving notice of the supply voltage system problem, send an explanation of the cause of the problem to the customer.

(4) The service provider shall pay the penalty specified in Schedule 3, if it fails to visit the customer's premises to:

- (a) investigate and rectify a system voltage problem contrary to sub-regulation 1; or
- (b) communicate the explanation of the problem contrary to sub-regulation 2.

(5) Any variations from the relevant standard voltage levels under regulation 42, are as prescribed in Schedule 2.

(6) The service provider shall minimize the occurrence of voltage fluctuations which, shall not exceed the limits in the steady state as provided in Schedule 2.

44. POWER FACTOR

(1) An industrial customer's load power factor shall be within the relevant range prescribed in Schedule 2.

(2) A service provider shall advise an industrial customer on the appropriate steps to be taken to ensure that the customer is compliant with sub-regulation 1.

(3) Pursuant to sub-regulation 2, the customer shall within a period agreed with the service provider, install shunt compensators on the customer's electrical system to improve the power factor and minimize line losses.

(4) The service provider shall impose a power factor surcharge prescribed by LERC, if the customer fails to improve the power factor to at least 0.9 lagging.

(5) Despite sub-regulations 2 and 3, the service provider may install shunt compensators anywhere in its distribution system as may be necessary to minimize system line losses.

45. HARMONICS CONTROL

(1) A service provider shall ensure that the voltage harmonic distortions at the point of common coupling nearest to a customer's point of supply do not exceed the levels prescribed in Schedule 2.

(2) Despite sub-regulation 1, the service provider shall comply with the Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems specified in the applicable standards.



(3) A large customer, an industrial customer or a customer practicing net metering shall ensure that the voltage and current harmonic distortions in that customer's electrical system are within the limits prescribed in Schedule 2.

(4) The service provider may disconnect electricity supply to a customer when it is apparent to the service provider that a customer's voltage and current harmonic distortions exceed the limits prescribed in Schedule 2 and reconnect the customer as soon as the customer complies with the relevant limits.

46. NEGATIVE SEQUENCE VOLTAGE

(1) A service provider must ensure that the negative sequence voltage at the point of common coupling to customer's 3-phase system is less than 1% and not more than 2% for a period of five minutes in every 30 minutes.

(2) The service provider shall prevent the negative sequence voltage from fluctuating above 1% of an applicable voltage level and when it does fluctuate above 1% shall prevent it from exceeding 2% for a period of 5 minutes in every 30 minutes.

47. LOAD BALANCE

(1) A service provider, in supplying electricity to customers, shall ensure that the connections are made to balance the loads on the 3 phases of the distribution network.

(2) A customer, shall ensure that the current in each phase of the customer's 3-phase system does not deviate from the average of the 3-phase currents specified in the Distribution Code as follows:

- (a) 5% for a standard nominal voltage of up to 1kV; or
- (b) 2% for a standard nominal voltage above 1kV.

(3) Despite sub-regulation (2), the following deviations for periods of less than 2 minutes are permissible:

- (a) 10% for standard nominal voltage of up to 1kV, or
- (b) 4% for standard nominal voltage above 1kV.

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CHAPTER 3 FINAL PROVISIONS

PART IX MISCELLANEOUS PROVISIONS

48. REVISION OF METER

- (1) Each year, a service provider shall undertake an audit of its meters that have been in operation for 25 years or more and replace them.
- (2) Despite sub-regulation 1, the service provider shall within six months of the commencement of these Regulations, submit to LERC:
 - (a) an audit report of the meters in operation for 25 years or more; and
 - (b) a program for replacement of the meters within the subsequent 36 months.

49. DEMAND SIDE MANAGEMENT AND AWARENESS

- (1) Each service provider shall monitor the demand profile on its distribution system and develop a Demand Side Management (DSM) program to control demand.
- (2) Without limiting the generality of sub-regulation 1, the service provider shall:
 - (a) reduce the overburdening of the distribution network system and avoid making connections to the network without first providing adequate capacity or reinforcement to the network;
 - (b) advise every customer on efficient use of electricity as well as provide the customer with information that will assist the customer reduce electricity costs;
 - (c) undertake programs to help customers:
 - (i) understand their energy utilization decisions; and
 - (ii) shift consumption to align to system realities and optimized environmental and economic outcomes.

50. SUPPLY SIDE MANAGEMENT

The service provider shall:

- (a) adopt good asset management practices regarding its equipment and property to enable it provide efficient, safe, quality and reliable supply of electricity to customers;
- (b) develop and implement programs for the maintenance, operation, repair, refurbishment, acquisition and disposal of assets in order to:
 - (i) attain performance targets;
 - (ii) minimize risk associated with failure or underperformance of assets that would hinder efficient delivery of service to customers.

LDS

51. AGREEMENTS WITH EMBEDDED GENERATOR

(1) If a service provider intends to procure electricity supply from co-generation, wind power, solar power or mini-hydroelectric resources through a connection to its distribution system, the service provider shall:

- (a) enter into a tie-in agreement and supply contract with the embedded generator; and
- (b) comply with the provisions of these Regulations applicable to the embedded generator.

(2) The embedded generator shall comply with the regulations governing interconnection of facilities, commitment of units and dispatch, if applicable.

52. REPORTING REQUIREMENTS

(1) Subject to this regulation, the service provider shall prepare and submit to LERC, separate technical and financial reports once each quarter and shall each year report on the level of the standard of the service provider's performance for the relevant period as provided in Schedule 4.

(2) The service provider shall submit the reports specified in sub-regulation 1 to LERC as follows:

- (a) within 30 days of the end of a quarter in the case of the technical report;
- (b) within 30 days of the end of the quarter in the case of the financial report; and
- (c) within 40 days after the end of the year in the case of the annual reports.

(3) The contents of the report specified in this regulation shall include the following, as specified in Schedule 4:

- (a) Technical and Quality of Service KPIs;
- (b) Social and Environmental KPIs;
- (c) Commercial and Efficiency KPIs;
- (d) Financial KPIs and Statements.

(4) If a service provider fails to submit the reports in the manner specified in this regulation, it shall pay the penalty prescribed in Schedule 3.

53. COMPLAINTS AND DISPUTES

(1) A customer that is dissatisfied with the level and quality of service, may complain orally or in writing to the service provider.

(2) The service provider shall handle the complaint in accordance with its Customer Charter and Customer Complaints handling Procedure.



(3) If the service provider is unable to address the complaint or the customer is dissatisfied with the way the complaint was handled, the customer may complain to LERC for a resolution of the complaint under the Customer Complaints Regulations.

PART X ADVISORY FORUMS

54. TECHNICAL FORUM

(1) The LERC hereby establishes a technical advisory forum to be known as the Electricity Technical Committee.

(2) The Electricity Technical Committee shall oversee the development, implementation and monitoring of the standards, codes and rules governing the Electricity Supply Industry of Liberia.

(3) The members of the Committee shall be appointed by the Board and may consist of employees of the LERC, Licensees, Contractors and Professional Associations with experience relevant to the work of LERC.

55. NATIONAL ELECTRICITY CUSTOMER SERVICE COMMITTEE

(1) The LERC hereby establishes a national customer advisory forum to be known as the National Electricity Customer Service Committee.

(2) The National Electricity Customer Service Committee shall comprise:

(a) a chairperson who shall be appointed by the members constituted;

(b) one representative each of residential customers and commercial customers;

(c) one person nominated by organized labor or local industry; and

(d) one other person with knowledge in matters relevant to the functions of the Committee.

(3) The functions of the National Electricity Customer Service Committee are:

(a) to constantly review matters affecting the interest of customers;

(b) to undertake customer education, including awareness creation in relation to their rights, duties and efficient use of electricity;

(c) to monitor the performance of service providers nationwide;

(d) to make representations to and consult with service providers on matters affecting customers;



(e) to liaise with the Zonal Electricity Customer Committees and advise them on matters relating to customer service; and

(f) to make recommendations to LERC on how to improve customer service.

56. ZONAL ELECTRICITY CUSTOMER COMMITTEE

(1) Each service provider shall establish a customer advisory forum to be known as the Zonal Electricity Customer Committee in its operational zone of not less than three persons consisting of at least one representative each from residential customers, commercial customers and industrial customers where applicable.

(2) The other or additional members of the Committee must be knowledgeable in the electricity supply industry.

(3) The functions of the Zonal Electricity Customer Committee are:

(a) to constantly review matters affecting the interest of customers

(b) to undertake customer education, including awareness creation in relation to their rights, duties and efficient use of electricity;

(c) to monitor the performance of service providers in the operational zone of the service provider;

(d) to make representations to and consult with service providers on matters affecting customers;

(e) to receive customer complaints and forward them to LERC, and

(f) to make recommendations to LERC on how to improve customer service.

57. TERMS AND CONDITIONS OF APPOINTMENT OF MEMBERS OF ADVISORY FORUMS

LERC shall establish guidelines for the terms and conditions of the appointment of the Electricity Technical Committee, the National Electricity Customer Committee and the Zonal Electricity Customer Committee, respectively.

58. BREACHES AND PENALTIES

(1) When a service provider breaches any obligation imposed by these Regulations, it shall pay the penalty specified under the regulation.

(2) Where no penalty is specified in the regulation, LERC may impose the general penalty specified in Schedule 3.

(3) A customer commits an offence under the Power Theft Act if the customer:

(a) intentionally interferes or knowingly allows interference with the service provider's distribution system, meter or equipment, contrary to regulation 12(4) and 12(5);



- (b) obtains electricity supply illegally; or
- (c) tampers with or breaks a seal on a meter.

(4) Payment of compensation to customer by a licensee as specified in Schedule 3 shall require that:

- (a) customer shall request and completely fill in a claim form supplied by the licensee;
- (b) the licensee shall verify and process the claim within 10 days or reject same;
- (c) in the instance of a rejection, 5-day period shall be allowed for resolving the dispute with the customer;
- (d) the licensee may elect to pay in cash or alternatively in prepay electricity token of the cash amount if the customer is of the prepayment category;
- (e) all settled compensation claim must be paid within 10 days of settlement date.

59. TRANSITIONAL PROVISIONS

(1) A service provider shall achieve the requirements specified in parts VIII-Quality of supply within two years of entry into force of these Regulations.

(2) The payment of penalties and compensations prescribed in schedule 3 shall commence two years after the entry into force of these Regulations.

THE COMMON SEAL OF

LIBERIA ELECTRICITY REGULATORY COMMISSION

Was affixed pursuant to the ORDER OF THE COMMISSION

On this 18th day of August 2021



Dr. Lawrence d. Sekajipo, CPA, CFE, DBA, JSM
CHAIRMAN
BOARD OF COMMISSIONERS

SCHEDULE 1: SAMPLE TERMS AND CONDITIONS FOR NEW SERVICE
(regulation 9. 4)

The terms and conditions may include provisions that the applicant:

- (a) has no outstanding debt from a previous electricity bill at a different address other than a debt that is subject to a dispute;
- (b) shall inform the service provider in writing of the estimated load and anticipated energy consumption at the applicant's premises;
- (c) agrees to pay the requisite connection fee including a contribution to the development of the supply line if necessary;
- (d) will permit reasonable access at reasonable times and adequate protection for the supplier's agents during meter reading, rectification of faults, disconnection and reconnection and other lawful activities relating to the supply at the applicant's premises;
- (e) will provide an accurate contact address for the delivery of bills;
- (f) will not undertake supply which is not passed through a meter, tamper with a meter or other ancillary equipment associated with the supply;
- (g) will not use or permit to be used the electricity supplied to the applicant's premises for a purpose other than that for which it was contracted; and
- (h) will not connect or permit to be connected from the applicant's premises, without the prior consent of the service provider.

SCHEDULE 2: (regulation 9(5), 13(2&3), 15(2&3), 24(1), 43(4,5, &6), 44(1), 45(1) & 52(4))

Minimum Service Levels – Distribution					Proposed Performance Target																																					
Item No.	Category	Service measure	Standard																																							
			Steady State	Transient (1 min.)	Transient (10sec)																																					
1.	1. Quality of supply	Supply voltage ($N_{nominal}$) limits: Incl. ff voltages: i) Low Voltage: 230/415V ii) Medium voltage (incl): 11kV, 22 kV, 33kV, 34.5kV & 36kV]	$V_{nominal} \pm 10\%$	$V_{nominal} \pm 15\%$	(i) V_{ph} to Earth: 50-100% V_{ph} to Phase $\pm 20-100\%$ (ii) V_{ph} to Earth: +80-100% V_{ph} to Phase: +20-100%	Grid – 99% Island – 95%.																																				
2.	Quality of supply	Harmonic Content	<table border="1"> <thead> <tr> <th>I_{sc}/I_L</th> <th><11</th> <th>$11 < h < 17$</th> <th>$23 < h < 35$</th> <th>$17 < h < 35$</th> <th>THD</th> </tr> </thead> <tbody> <tr> <td>$<20^*$</td> <td>4.0%</td> <td>2.0%</td> <td>1.5%</td> <td>0.6%</td> <td>5.0%</td> </tr> <tr> <td>20<50</td> <td>7.0%</td> <td>3.5%</td> <td>2.5%</td> <td>1.0%</td> <td>8.0%</td> </tr> <tr> <td>50<100</td> <td>10.0%</td> <td>4.5%</td> <td>4.0%</td> <td>1.5%</td> <td>12.0%</td> </tr> <tr> <td>100<1000</td> <td>12.0%</td> <td>5.5%</td> <td>5.0%</td> <td>2.0%</td> <td>15.0%</td> </tr> <tr> <td><100</td> <td>15.0%</td> <td>7.0%</td> <td>6.0%</td> <td>2.5%</td> <td>20.0%</td> </tr> </tbody> </table> <p>Notes: 1. Even harmonics are limited to 25% of the odd harmonics listed above. 2. Current distortions that result in a DC offset, e.g., half-wave converters, are not allowed. 3. *All power generation equipment are limited to these values of current distortion, regardless of actual I_{sc}/I_L. 4. I_{sc}= maximum short-circuit current at Point of Common Coupling. 5. I_L= maximum demand load current (fundamental frequency component) at Point of Common Coupling. 6. THD =Total Harmonics Distortion 7. h = Odd harmonics order</p>			I_{sc}/I_L	<11	$11 < h < 17$	$23 < h < 35$	$17 < h < 35$	THD	$<20^*$	4.0%	2.0%	1.5%	0.6%	5.0%	20<50	7.0%	3.5%	2.5%	1.0%	8.0%	50<100	10.0%	4.5%	4.0%	1.5%	12.0%	100<1000	12.0%	5.5%	5.0%	2.0%	15.0%	<100	15.0%	7.0%	6.0%	2.5%	20.0%	Grid – 99% Island – 95%
I_{sc}/I_L	<11	$11 < h < 17$	$23 < h < 35$	$17 < h < 35$	THD																																					
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100<1000	12.0%	5.5%	5.0%	2.0%	15.0%																																					
<100	15.0%	7.0%	6.0%	2.5%	20.0%																																					
3.	Customer service	Notification of customer in advance of a planned interruption	At least 3 business days written notice ahead of the interruption specifying expected date, time and duration of interruption.			95% of the time																																				

LDS

4.	Customer service /Reliability of supply	Maximum duration of planned interruption for all voltage levels and network		Specify 8 hrs. max period without supply (Urban/Rural or UG cable /OH conductor)	95% of the time													
	Item No.	Service measure	Category	Standard	Proposed Performance Target													
5.	Reliability	Notification of customer following an unplanned interruption & continuous update of progress towards supply restoration		Within 1 hr. after incident and subsequently every 3 hrs. progress update	95% of the time													
6.	Reliability	Frequency and duration of planned interruptions per year -- reported by type of Feeder (exclude MEDs)		<table border="1"> <thead> <tr> <th></th> <th>Frequency No./cust/yr.</th> <th>Duration Hrs/yr.</th> </tr> </thead> <tbody> <tr> <td>Cable Feeder</td> <td>3</td> <td>18 hrs</td> </tr> <tr> <td>Urban O/H Feeder</td> <td>8</td> <td>36hrs</td> </tr> <tr> <td>Rural Feeder O/H</td> <td>8</td> <td>48hrs</td> </tr> </tbody> </table>		Frequency No./cust/yr.	Duration Hrs/yr.	Cable Feeder	3	18 hrs	Urban O/H Feeder	8	36hrs	Rural Feeder O/H	8	48hrs	100%	
	Frequency No./cust/yr.	Duration Hrs/yr.																
Cable Feeder	3	18 hrs																
Urban O/H Feeder	8	36hrs																
Rural Feeder O/H	8	48hrs																
7.	Maintenance (Unplanned)	Timeliness of rectification of faults and restoration of supply (By type of affected area) - MEDs excluded		<table border="1"> <thead> <tr> <th></th> <th>Minor Fault</th> <th>Major Fault*</th> </tr> </thead> <tbody> <tr> <td>Rural area</td> <td>24 hrs</td> <td>240 hrs</td> </tr> <tr> <td>County capital</td> <td>12 hrs</td> <td>120 hrs</td> </tr> <tr> <td>Urban/Industrial area</td> <td>8 hrs</td> <td>80 hrs</td> </tr> </tbody> </table> <p>* Major fault (requires capital equipment)</p>		Minor Fault	Major Fault*	Rural area	24 hrs	240 hrs	County capital	12 hrs	120 hrs	Urban/Industrial area	8 hrs	80 hrs	85%	
	Minor Fault	Major Fault*																
Rural area	24 hrs	240 hrs																
County capital	12 hrs	120 hrs																
Urban/Industrial area	8 hrs	80 hrs																

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8.	Reliability	Frequency and duration of planned interruptions per year (exclude unplanned major event days-MEDs)	Urban/ Frequency 6 / Duration 8 / Total Dur 48/ County Capital 6 / 12/ 72/ Rural 6/ 24/ 104/ hrs per year	100%
9.	Reliability	Frequency and duration of unplanned interruptions per customer per year – reported by type of Feeder (exclude MEDs)	Frequency No./cust /yr. Duration Hrs/yr. Cable Feeder 6 32 hrs Urban O/H Feeder 12 32hrs Rural Feeder O/H 24 120hrs	80%
	Category	Service measure	Standard	Proposed Performance Target
10.	Customer Service	Telephone services	24 hrs. fault receiving and emergency service Seven days a week	100%
11.	Customer service	Time to respond to telephone calls	85% within 30 seconds	95% of the time
12.	Customer service	Time to respond to written enquiries	95% within 5 business days	95% of the time
13.	Customer service	customer bill contestation complaint	(a) Response within 5 business days (b) Resolution within 5 business days.	100%
14.	Customer service	Time to respond to voltage complaints	1. LV reply within 12hrs. 2. MV reply within 12hrs.	1. 90% 2. 95%
15.	Customer service	Timeliness of rectification of faults and restoration of supply following voltage complaints	Within 24 hrs.	90%
16.	Customer service	Timeliness of appointment to visit	No later than 60 minutes of agreed time	95% of the time

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	customer premises				
17.	Customer service	Response to customer initial request for connection application (Provision of guidelines for application)	Within 24 hrs.	100% of the time	
18.	Customer service	Timeliness of provision of new connection estimates to customer	<u>Description of service</u> Meter installation and supply only Service Connection on existing LV network Connection requiring LV works Connection requiring MV works	<u>Urban</u> - 1 day - 1 week - 2 weeks - 4 weeks <u>Rural</u> 1 week 2 weeks 3 weeks 6 weeks	95% of the time
Item No.	Category	Service measure	Standard	Proposed Performance Target	
19.	Customer service	Timeliness of connection and activation of new service after payment	<u>Description of service</u> Meter installation and supply only Service Connection on existing LV network Connection requiring LV works Connection requiring MV work	<u>Urban</u> - 1 week - 2 weeks - 6 weeks - 3 months <u>Rural</u> 3 weeks 4 weeks 8 weeks 6 months	95% of the time
20.	Customer service	Maximum period allowed for estimated billing used for customer	Not more than 6 months <i>(NB: Estimate based on historical consumption)</i>	100%	
21.	Customer service	Disconnection for meter tampering or illegal connection (Power Theft)	Immediately following detection	100%	

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22.	Customer service	Request for disconnection by customer (Voluntary)	2 weeks as of dated notice.	99%
23.	Customer Service	Timeliness of resolving vending faults reported	Within 48 hours	95%
24.	Customer service	Timeliness for repositioning customer service line/meter request.	(a) Within 5 business days to submit assessments/charges (b) Within 5 business days to rectify upon payment of charges.	90%
25.	Customer service	Timeliness for the replacement of active operational meters over 20 yrs. old.	Not more than a year	90%
26.	Customer service	Credit Meter reading cycle	Once every month. Once in 3 months (guaranteed)	100% 100%
Item No.	Category	Service measure	Standard	Proposed Performance Target
27.	Customer service	Timing of Credit meter Billing and bill delivery	Time from billing to due date: 14 days Billing cycle: once per month	95% 100%
28.	Customer service	Bill payment	Within 14 days after due date (within which bill should have been delivered)	95%
29.	Customer service	Notice of disconnection due to non-payment	1. Notice of warning: 14 days after due date for payment. 2. Notice of disconnection - Disconnection effected after 7 days. 3. Disconnection not to be carried out: - after 2hrs before normal closing time of pay-point; and - over the weekend - day before public holidays	80%

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30.	Customer service	Timeline for response to meter accuracy check service request	Within 15 days after receipt of payment of related charges for service	95%
31.	Customer Service	Notice of Meter inspection by utility	The Licensee reserves the right to conduct spot checks as deemed expedient where tampering or theft is detected.	100%
32.	Customer Service	Customer Meter Installation location	Customer meter must be enclosed and located at a designated area readily accessible for reading and maintenance by the Licensee and readily accessible for reading and security by the customer.	100%
33.	Customer service	Availability of prepayment meter credit vending facility	At least: (a) Within 2-5 Km radius of prepayment meter customer or (b) Sufficient to reduce queuing time to less than 10 minutes (c) Minimum of 8 hrs. daily for six days each week	90%
Item No.	Category	Service measure	Standard	Proposed Performance Target
34.	Customer service	Timeliness of reconnection of disconnected service due to non-payment	Within a maximum of: City/Industrial 6hrs Urban 12hrs Rural 18hrs after settlement of bill (plus any charges)	(i) 70%: ≤ 60km radius distance ii) 50%: > 60km radius distance from district or regional office
35.	Customer service	Timeliness of reconnection of disconnected service due to tampering or illegal connection (Power Theft)	Not later than 2 days following regularization of connection and settlement of penalties/charges.	80%

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36.	Customer service	Timeliness of response to account query request	Within 5 working days following the request.					90%
37.	Customer service	Timeliness of response to a faulty meter complaint	i) Within 48 hours maximum where customer has not lost supply to premises. ii) Within 24 hours maximum where customer has lost supply to the premises					95%
38.	Customer service	Timeliness of replacement of defective meter following establishment of a Faulty meter complaint	Within 48 hours					75% /year
Item No.	Category	Service measure	Standard	Proposed Performance Target				
39.	Safety	Timeliness of isolation of faulty part of the network upon awareness of fault at location within various distances from district/regional office.	(i) Within 2 hours for faults within 30km radius (ii) within 4 hours for faults within 60km radius (iii) within 5 hours for faults within radius of >60km					75%
40.	Safety	Timeliness of rectification of faults and restoration of supply following safety alert (by type of fault)	(i) LV minor fault: Within 24hrs (ii) LV major fault: Within 48hrs (iii) MV minor fault: Within 48hrs (iv) MV major fault: Within 72hrs					90%

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41.	Customer service/ Complaints	Time to respond and resolve	General complaints received: a) by telephone, internet or in person – should be handled without referral within 3 days. b) in writing – respond within 3 days and resolve in 5 days	90% /year
42.	Customer service/ Complaints	Time to respond to enquiries	Enquiries for information/advice received: a) by telephone, internet or in person – should be handled without referral within 1 day. b) and requiring investigative work – respond within 3 weeks	90% /year
43.	Adequacy of supply	Load shedding period	(a) triggered by Distribution transformer overload shall not exceed 10 days (b) Triggered by forced outage of generating unit shall not affect a customer or category of customers for more than 15days	75% /year
44.	Adequacy of supply	Power factor limits @PoC	Power Factor ≥ 0.96	95% /year
45.	Efficiency	Distribution system losses	Average system loss calculated as a Percentage	LERC to set annually
Minimum Service Levels – Embedded (Distribution) Generation				
Item No.	Category	Service measure	Standard	Proposed Performance Target
46.	System frequency	Supply frequency limits @ PoC (Point of Connection)	Shall be within 50 \pm 5%	Grid – 99% Island – 95%
47.	System imbalance	Negative sequence current limits @ PoC (Point of Connection)	Shall be \leq 1%	95%

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48.	Quality of supply	Maximum Voltage Harmonic limits @ PoC (Point of Connection)	Voltage @ PoC ≤ 1kV >1kV & ≤36kV	THD 5.0% 3.0%	Odd 4% 2%	Even 2% 1%	95%	
49.	Quality of supply	Maximum Current Harmonic limits @ PoC (Point of Connection) (in %age of I _L)	Isc/IL h<11 <20* 20<50 50<100 100<1000 <1000	11<h<17 2.0% 3.5% 4.5% 5.5% 7.0%	23<h<35 1.5% 2.5% 4.0% 5.0% 6.0%	17<h<35 0.3% 0.5% 0.7% 2.0% 1.4%	35<h 5.0% 8.0% 12.0% 15.0% 20.0%	95%
51.	System stability	Maximum Short Circuit Fault levels @ PoC.	Voltage @ PoC ≤ 1kV 6.6 kV 11kV 22 kV 36 kV	System Fault Level (MVA) 36 250 350 500 2500	Short Circuit Current Fault Level (kA) 21.0 21.9 18.4 13.1 40.1		95%	
Minimum Service Levels – Transmission								
Item No.	Category	Service measure	Standard					Proposed Performance Target
52.	Reliability	Average no. of Interruptions @ PoC (Point of Connection)	SAIFI (max-specify) 52_times					Annually 100%

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53.	Reliability	Average duration of Interruptions @ PoC (Point of Connection)	SAIDI (max-specify) (a) 144 hours in Monrovia Grid; (b) 216 hours in a county capital city; (c) 432 hours in the other localities.	Annually 100%
54.	Reliability/ Efficiency	Availability	Availability of part or entire system (as desired)	100%
55.	Efficiency	Transmission system losses	Average system loss calculated as %age	LERC to set annually
56.	Reliability/ Adequacy	Loss of electricity supply service to one or more customers	No. of events /no customers/duration	Set and adjusted annually by LERC
57.	Reliability/ Adequacy	Energy not supplied by the system peak demand for that year	System minutes (20-25 minutes) – proposed compare with current situation for decision to be made.	Set and adjusted annually by LERC
58.	Reliability	Unreserved energy per year	Total MWh interrupted due to an unplanned outage of a transmission network asset per year	LERC to set annually
59.	System Reliability	Time to restore after a Total blackout @ POC	Average time taken to restore system power: 1. Normal weather (1hr) 2. Severe weather (4hrs)	1. 85% 2. 90%
60.	Reliability	Availability of transmission circuit to render service in period	Index of Transmission Reliability (ITR)	Calculated annually for major transmission circuits
61	Reliability	Transmission line faults	24 faults per 100km of transmission cct faults	95%
Item No.	Category	Service measure	Standard	Proposed Performance Target

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62.	Quality/ Reliability	Voltage limit – Normal State	V_{nominal} ±5% 1.No. of occurrences of deviations outside the limits 2.Total duration of deviations recorded 3. Maximum continuous period Recorded 4.Maximum deviation	LERC to set annually									
63.	Quality/ Reliability	Voltage limit – Alert State	V _{nominal} ±10% for ≤ 10 minutes	95%									
64.	Quality/ Reliability	Voltage limit – Emergency State	V _{nominal} ±10% for ≤ 30 minutes	95%									
65.	Quality/ Reliability	System frequency limit – Normal State (N)	Within 50Hz ±0.4% (49.8 to 50.2 Hz)	95%									
66.	Quality/ Reliability	System frequency limit – Alert State (A)	48.5<f≤49.5 A	40 times/year									
			50.5<f≤51.5 A	60 times/year									
67.	Quality/ Reliability	System frequency limit – Emergency State (E)	Outside 50Hz ±1% (i.e., <49.5 or >50.5 Hz) for ≤ 10 minutes	2 times/year									
			Outside 50Hz ±3% (i.e., <48.5 or >51.5 Hz) for ≤ 30 minutes	2 times/year									
68.	System stability	Maximum short circuit current (I _{sc,max}) and Fault clearance time (T _{fc,max}) limits	<table border="1"> <tr> <td>Voltage</td> <td>I_{sc,max} (kA)</td> <td>T_{fc,max} (ms)</td> </tr> <tr> <td>225kV</td> <td>40</td> <td>100</td> </tr> <tr> <td>66kV</td> <td>30</td> <td>250</td> </tr> </table>	Voltage	I_{sc,max} (kA)	T_{fc,max} (ms)	225kV	40	100	66kV	30	250	95%
Voltage	I_{sc,max} (kA)	T_{fc,max} (ms)											
225kV	40	100											
66kV	30	250											
69.	Quality	Phase displacement between voltages	Limits to be provided in TSO's Operational Manual	TBD									
70.	Quality	Phase voltage imbalance	V _{phase imbalance} ≤ 3% (Negative sequence component of phase voltages ≤ 3% of nominal value under normal conditions)	95%									
Item No.	Category	Service measure	Standard	Proposed Performance Target									

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71.	Quality	Maximum voltage flicker limit	IEEE Std 519-1992 (rev 2014)	95%
72.	Quality	Maximum harmonic limit	IEEE Std 519-1992 (rev 2014)	95%
73.	Efficiency	Power factor limits for large off-takers @ PoC(Point of Connection)	Power factor ≥ 0.9 lagging.	95%
Minimum Service Levels – Generation/PoC				
74.	Quality	Generator supply voltage limits @ PoC (Point of Connection)	Nominal voltage $\pm 5\%$	95%
75.	Quality	Generator supply frequency limits @ PoC(Point of Connection)	50Hz $\pm 0.4\%$ (Normal)	95% per month
76.	Quality	Generator reactive power supply limits @ PoC (Point of Connection)	± 0.85 P.F. Lagging or Leading	95%
77.	Adequacy/Reliability	Generator operating reserve capacity limits @ PoC (Point of Connection)	20% of rated contract capacity— Quick and spinning reserve margins	limit of deviation per period
78.	Reliability	Accuracy level between scheduled generation and actual delivery through AGC	Maintenance of required capacity for load requirement within 90%	limit of deviation per period
79.	Reliability (Black start capability)	Capability to synchronize hydro units to thermal during an incident/drill	Drills to be carried out at least 2 times in year using in-plant resources.	Synchronizati on within one hour per each incident /drill

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80.	System Protection relay co-ordination (Reliability/Safety)	Integrity on system grading, selected schemes setting etc.	By agreement with TSO /other interconnected party	TBD
Minimum Service Levels – Stand-Alone-Systems (SAS)				
81	Stand-alone-systems (SAS)	System performance monitoring	In accordance with IEC 61724	LERC to set annually

45

SCHEDULE 3 – PENALTY/COMPENSATION
regulation 13(4), 14(2), 15(5), 17(5), 18(3), 24(1), 31, 34(5), 41(4), 43(4), 52(4), 58(2), and 59(2)

SERVICE ACTIVITY	REFERENCE	CATEGORY	BASIC PENALTY TO LERC	BASIC COMPENSATION TO CUSTOMER	ADDITIONAL REFUND/PAYMENT
Untimeliness of provision of estimates on request for separate meter	regulation 13(4)	Category C		USD10 discount on estimate per affected customer	USD2.00 for each additional day
Untimeliness of installation of separate meter upon payment of related charges	regulation 13(4)	Category C		USD30 per affected customer payable in cash or electricity token	USD2.00 for each additional day
Failure to Establish facility for purchase of Prepaid token	regulation 14(2)	Category A	USD1000		
Failure to Keep Facility of Prepaid token accessible within operational hours	regulation 14(2)	Category A	USD200		
Untimeliness of Provision of estimate on request for repositioning of meter and other associated hardware	regulation 15(5)	Category C		USD10 per affected customer discount on estimate	USD2.00 for each additional day
Untimeliness of Repositioning of	regulation 15(5)	Category C		USD30 per affected customer payable in	USD2.00 for each additional day

45

meter and other associated hardware upon payment of related charges				cash or electricity token	
Failure to replace Faulty meter upon establishment by service provider	regulation 17(5)	Category B	USD300 per affected		
Failure to Estimate billing based on historical consumption	regulation 17(5)	Category A	USD100 per affected customer		
Failure to issue Monthly electricity bill	regulation 18(3)	Category A	USD100 per affected customer		
Overcharging customer monthly bills	regulation 24(1)	Category A	USD100 per affected customer		
Untimeliness to Restore customer supply due to Minor Faults	regulation 41(4)	Category B	USD3/ Affected customer		USD1.00/affected customer for each additional day
Untimeliness to Restore customer supply due to Major Faults	regulation 41(4)	Category A	USD1.50/ Affected customer		USD1.00/affected customer for each additional day
Wrongful disconnections	regulation 31	Category A	USD200 per		

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Untimeliness to respond to Voltage complaints	regulation 43(4)	Category A	affected customer USD200	
Untimeliness to notify Planned interruptions notification	regulation 34(5)	Category A	USD2.00/ Affected customer	USD1.00/affected customer for each additional hour
Untimeliness to Restore supply after Planned interruptions	regulation 34(5)	Category A	USD1.00/ Affected customer	USD0.50/affected customer for each additional hour
Untimeliness to submission of report	regulation 52(4)	Category A	USD500	
General Penalty	regulation 58(2)	Category A	USD50	

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SCHEDULE 4- REPORTING REQUIREMENTS
regulation 52(1)

Table 1 – Technical and Quality of Service KPIs				BENCHMARK
Indicator	unit	Description	FORMULA	
1. Network availability	Annual Percentage			LERC to set Annually
2. Capacity factor	Annual percentage	Ratio of average hourly generation to maximum possible generation at the installed capacity level (before losses)	Capacity Factor= (Net annual electricity generated (MWh))/(24hrsX364days)/installed Capacity (MW)	LERC to set Annually
3. Load factor	Annual percentage	Ratio of average hourly supply (before losses) to Peak annual demand of Power.	Load Factor= (Annual Electricity supplied (MWh))/(24hrsX364days)/Peak Annual Demand(MW)	LERC to set Annually
4. System average interruption frequency index (SAIFI)	Interruption/year	Ratio of the number of sustained customer interruption to the total number of customers served		LERC to set Annually
5. System average interruption duration index (SAIDI)	Hours/year	Ratio of the sum of all customer interruption duration (in minutes) to the total number of customers served		LERC to set Annually
6. Customer average interruption duration index (CAIDI)				LERC to set Annually

LDS

7. Momentary average interruption frequency index (MAIFI)					LERC to set Annually
8. Average energy not supplied per customer per year (AENS)					LERC to set Annually
Table 2 -- Transmission KPIs					
Grid loss ratio	Ratio	Energy dispatched to distribution/ Energy received from Generation			LERC to set Annually
Transmission Cost Index	Ratio	Total quarterly expenditure/Total energy received from Generation			LERC to set Annually
Transformer capacity utilization index (Substation)	Ratio	Transformer maximum load/Transformer installed capacity			LERC to set Annually
Transmission Losses	Ratio	(Energy from Power Station-energy delivered)/ energy from Power station			LERC to set Annually
System average interruption frequency index (SAIFI)	Interruption/year	Ratio of the number of sustained customer interruption to the total number of customers served			LERC to set Annually
System average interruption duration index (SAIDI)	Hours/year	Ratio of the sum of all customer interruption duration (in minutes) to the total number of customers served			LERC to set Annually
Customer average interruption duration index (CAIDI)					LERC to set Annually
Momentary average interruption frequency index (MAIFI)					LERC to set Annually

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Average energy not supplied per customer per year (AENS)				LERC to set Annually
Number of trees felled for poles				LERC to set Annually
Noise due to electrical transmission line erection				LERC to set Annually
Table 3 – Commercial and Efficiency KPI's				
1. Account receivable (debtor) days				LERC to set Annually
2. Bad debts				LERC to set Annually
3. Revenue collection rate				LERC to set Annually
4. Aggregate technical and commercial losses				LERC to set Annually
5. No. of customer per employee				LERC to set Annually
6. Energy generated/procured and distributed per employee				LERC to set Annually
7. Energy distributed per customer				LERC to set Annually
8. Total km of network per employee				LERC to set Annually
9. Operating cost per employee				LERC to set Annually
10. Major event – resulting in more than 10% of customers out of service for 24hrs				LERC to set Annually
1. % of household electrified per year	Percentage			LERC to set Annually

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2. No. of application for connections per year					LERC to set Annually
3. No. of applications approved per year					LERC to set Annually
4. Connectivity rate	Percentage		Number of households with a commercial connection to total household		LERC to set Annually
Metering Ratio	Ratio		Total number of customers metered to total number of customers		LERC to set Annually
Customer complaint response time	Ratio		Time from customer enquiry to time of resolution		LERC to set Annually
Operating Meter rate	%		Customers billed based on metering (including Prepay) as opposed to consumption estimates.		LERC to set Annually
Prepayment Meter rate	%		The number of customers who have prepayment meter divided by the number of customers with operating meter		LERC to set Annually
Table 4 -- Financial KPIs					
1. Return on total asset base (RAB)	Ratio		Tells how profitable a business is. A higher rate of return reflects higher profitability		LERC to set Annually
				$r_{RAB} = \frac{\text{Net income}}{\text{Average value of assets}}$	

2. Gross profit margin	Ratio	How much of the revenue left after deducting all cost items	$GPM = \frac{\text{total revenue} - \text{total cost}}{\text{total revenue}}$	LERC to set Annually
3. Net profit/loss margin	Ratio	The amount of net profit had from total revenue gained	$NPM = \frac{\text{Net profit}}{\text{Revenue}}$	LERC to set Annually
4. Current ratio/Working capital ratio	Ratio	Shows whether the firm's financial position can service its short-term obligation	$CR = \frac{\text{Current Assets}}{\text{Current liabilities}}$	LERC to set Annually
5. Gearing ratio	Ratio	How much of a firm's operation is financed by its equity capital or debt	$\text{Gearing} = \frac{\text{Debt}}{\text{Shareholder's Equity}}$	LERC to set Annually
6. Interest service coverage ratio	Ratio	Shows the firm's solvency to interest payment on outstanding debt	$ICR = \frac{\text{Earnings before interest and taxes (EBIT)}}{\text{Interest expense}}$	LERC to set Annually
7. Debt service coverage ratio	Ratio	Measures a company's ability to use its income to service all debt obligations	$DSCR = \frac{\text{EBITDA (Depreciation \& Amortization)} - \text{Capex}}{\text{Interest} + \text{Principal}}$	LERC to set Annually
8. Self-financing ratio	Ratio	A company's ability to finance its investment using own funds	$SFR = \frac{\text{Net value of assets} + \text{income}}{\text{Capex} + \text{Opex}}$	LERC to set Annually
9. Cash recovery index	Ratio	A scoring of a company's likelihood of recouping its investment.	$CRI = \frac{\text{Investment credit}}{\text{receipt on credit}}$	LERC to set Annually
10. Total debt to equity ratio	Ratio	Same as gearing ratio but with the addition of other fixed payment obligations.	$TD:TE = \frac{\text{total Debt} + \text{fixed payment obligations}}{\text{Shareholder's Equity}}$	LERC to set Annually
11. Total debt to total assets ratio		How much of asset is being financed with debt. High ratio equals high risk	$TD:TA = \frac{\text{Total debt}}{\text{Total assets}}$	LERC to set Annually