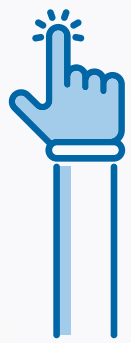




SIMPLIFIED LEGAL *And* **REGULATORY GUIDE:**

**Nigerian Electricity regulatory Commission
(NERC) Nigerian Electricity Supply and
Installation Standards Regulation, 2014**





CONTENTS

[Overview](#)

[Enabling Law](#)

[Objective\(s\)](#)

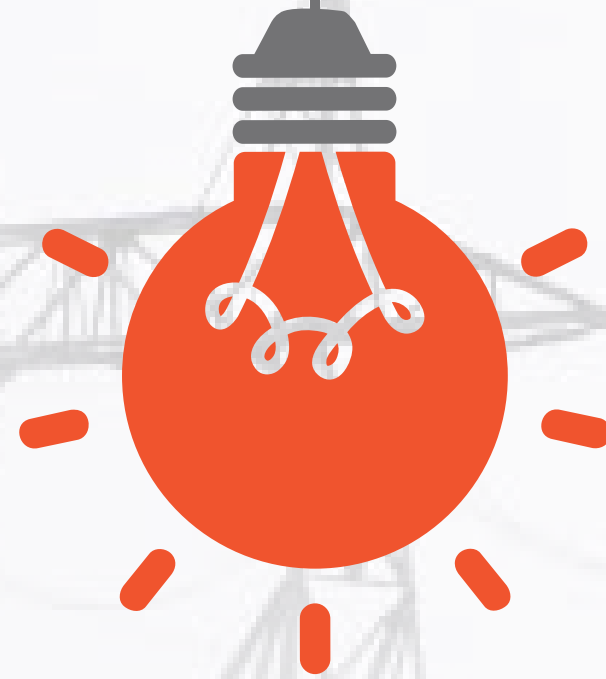
[Key Provisions](#)

[Key Stakeholders](#)

[Pricing and Tariffs](#)

[Incentives and Investment Opportunities](#)

[Sanctions and Penalties](#)



OVERVIEW

**Nigerian Electricity regulatory Commission
(NERC) Nigerian Electricity Supply and
Installation Standards Regulation, 2014**

OVERVIEW



The Nigerian Electricity Supply and Installation Standards Regulation (the Regulations) was promulgated in 2014 as a compendium of standards for the design, construction, and commissioning of electrical infrastructure in the Nigeria Electricity Supply Industry (NESI) approved by the Nigerian Electricity Regulatory Commission (NERC) to replace the Electricity Supply Regulations and the Electrical Installation Regulations of 1996. The Regulation provides the various requirements regulating the generation, transmission, distribution, and user's site standards, guides, and recommended practices for use in the Nigeria Electricity Supply Industry (NESI). The Glossary of Terms used in the Regulation and referenced in this guide can be found in the main Regulation¹ and in our [Glossary of Industry Terms](#).



The Electric Power Sector Reform Act of 2005² which gives the Nigeria Electricity Regulatory Commission powers to develop Standards and make Regulations serves as the legal backing for the Nigerian Electricity Supply and Installation Standards Regulation.³ [Please refer to EL's guide on the Electricity Act.](#)



OBJECTIVE

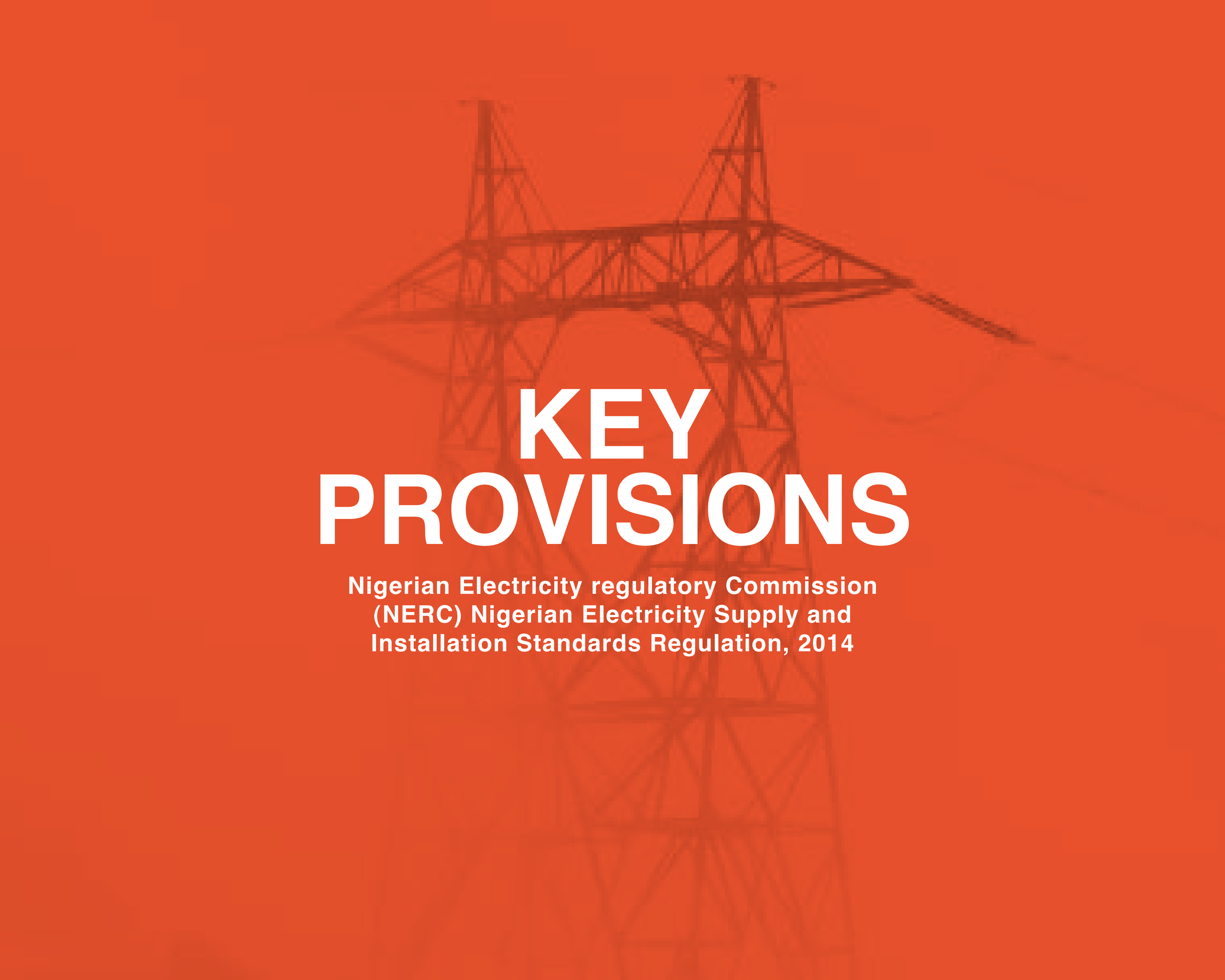
**Nigerian Electricity regulatory Commission
(NERC) Nigerian Electricity Supply and
Installation Standards Regulation, 2014**

OBJECTIVE



The following are the objectives of the Regulations:⁴

- The provision of guidelines on design, construction, and commissioning of the power system in Nigeria through the value chain of electricity generation, transmission, and distribution not covered in the Grid Code, Distribution Code, Metering Code and Health & Safety Code as amended.
- The promulgation of standards to be adhered to in the utilization of materials, equipment, and processes in line with the Electric Power Sector Reform Act of 2005, NERC's technical Codes, International Electrotechnical Commission (IEC) standards, etc.



KEY PROVISIONS

**Nigerian Electricity regulatory Commission
(NERC) Nigerian Electricity Supply and
Installation Standards Regulation, 2014**

KEY PROVISIONS



Qualifications

The Regulations provides that persons who engage in installation processes as engineering personnel, must have any COREN registrable qualification.⁵

Inspection

Licensees or persons involved in generation, transmission, and distribution must ensure that electrical facilities within their area of operation are regularly examined in accordance with the inspection provisions contained in the EPSRA,⁶ Distribution Code,⁷ Grid Code,⁸ Metering Code,⁹ and any other Regulation.¹⁰

Documentation and Reporting

Licensees in the electricity industry must undertake proper documentation of their activities and processes in line with the EPSRA, Distribution Code, Grid Code, Metering Code, and any other Regulation. Licensees are also expected to work in compliance with reporting obligations contained in the Commission's Reporting Compliance Regulation of 2009.¹¹

Environmental Impact Assessment (EIA)

Licensees in the electricity industry must notably possess an Environmental Impact Assessment (EIA) Report and Certificate from the Federal Ministry of Environment. The EIA Certificate must always be displayed in the place of business of the licensee and must be renewed regularly.¹²

Derogation

The Regulation provides that if any licensees or persons find that they would be incapable of complying with the provisions contained in the Regulation, such persons must comply fully with the processes for seeking derogation outlined in the "Derogation" provisions of the Grid Code, Distribution Code, and Metering Code.¹³

If the person seeking derogation happens to not be a licensee, such a person must report his or her inability to comply with the Regulation to the distribution company within their area of operation and must make reasonable effort to remedy such non-compliance within a reasonable time. If the person seeking derogation is a licensee however, the inability to comply with the Regulation must be reported to the Commission and such licensee must take steps to remedy such non-compliance within a reasonable time.



A request for derogation must contain the following information:¹⁴

- The details of the equipment and connection point in respect of which derogation is sought and the nature of and extent of non-compliance.
- The provision contained within the Regulation that the licensee or person might not be able to comply with.
- The reason for the inability to comply; and
- The remedial actions and the date by which compliance could be achieved.

Once the request for derogation is received, the Commission will ensure that consent is not unreasonably withheld, while considering the reasonableness of the request.¹⁵ In undertaking such consideration, the Commission may contact the licensee or person for further clarification regarding the request or seek further additional information or to discuss changes to the request and review possible remedial actions to achieve compliance as soon as reasonably practicable.¹⁶

Construction of Civil Works and Buildings

In the construction of civil works and buildings for the 330/132/33 kV Transmission and Sub-transmission Substations of the National Grid of Nigeria, there are certain technical requirements established within the Regulation regarding such undertakings.¹⁷

These requirements include:

- the design and development of all structures, buildings, layouts, and foundations in accordance with the operational, technical, and functional requirements of the line and substation facilities.
- the execution of design and testing procedures in line with provisions contained in the Nigerian Electricity Supply Industry Standards regulation.
- the design of civil works to provide a low maintenance durable end product suitable for its intended purpose.
- the design of buildings in line with the Nigeria Building Code and in a safe manner.
- the consolidation of an aesthetic outlook for structures.
- considering environmental impact in the design of civil works and buildings; and
- protection and report of archeological objects to relevant agencies during construction, etc.



The Regulation also stipulates the standards for major transmission equipment such as transformers, switch gears, reactors, relays, control panels, protection panels, etc.

Furthermore, regarding constructions of Substations, such must be executed in accordance with dictates contained within the NERC Health and Safety code, National Environmental Standards and Regulations Enforcement Agency (NASREA), National Emergency Management Agency (NEMA) and other relevant authorities; with emphasis given to the following areas: Conveniences and Bathrooms, Water Supply, Emergency Measures, Disposal of Pollutants, Switchyard Illumination, and Electrical Hazards.¹⁸

Construction of Transmission Lines

In constructing transmission lines, whether overhead, underground or special, such lines must be designed to comply with IEC Standards¹⁹ and provide reliable and safe power transmission capability, reduce the probability of uncontrollable propagation of failures (failure containment), and ensure safe construction and maintenance conditions.²⁰

Also, there are prescribed measurements regarding the width level of Right-Of-Way required for the construction of overhead transmission lines at certain voltage levels.

These are stated hereunder:²¹

- 330 kV – 50 meters;
- 132 kV – 30 meters;
- 33 kV – 11 meters; and
- 11 kV – 11 meters.

For safety reasons, no structures can be built under the Overhead line Right of Way and where such structures are built after the construction of the lines, the licensee will not be held liable.²²

The Regulation also stipulates the conditions for the construction of special transmission lines including underwater transmission line, transmission lines over bridges, etc. and the conditions for the design of civil works for Injection Substations which must conform with relevant extant Nigerian Industrial Standards and Codes in addition to international standards.²³

Construction within the Distribution Network

Persons engaged in construction within the Distribution Network are responsible for ensuring that safe work methods and practices are always employed and that requirements stated within the Regulations are met. Thus, all electrical works including overhead, underground, and



special distribution lines must be designed in a manner ensuring their safety regarding the electrical conditions likely to be experienced during service and the physical environment in which they will operate, considering foreseen and unforeseen risks likely to be encountered.²⁴

It is worthy of note that per the Regulation, Distribution Networks consist of 33kV, 11kV, and 400V Networks (and below).²⁵

Furthermore, the following are other obligations required of persons engaged in construction works within the Distribution network:²⁶

- Ensuring that all materials used in construction of an electrical work provide an assurance of safety in the lifespan of the installation.
- Taking into consideration, relevant environmental impacts in the design, construction, and installation of electrical works.
- Ensuring the thermal capacity of electrical works is sufficient to pass the electrical load for which they are designed.
- Ensuring that electrical works are of sufficient capacity to pass short circuit currents, which will enable the correct operation of protective devices.

- Ensuring that electrical works have sufficient mechanical and structural strength to withstand anticipated stresses and strains due to environmental and electrical service conditions.
- Considering extreme events which could occur in physical environments where electrical works are installed; and
- Preventing unauthorized access to electrical works as best as possible.

The Regulation also stipulates the conditions for the construction of special distribution lines including overwater and underwater distribution cables, distribution lines over bridges and other structures, distribution lines with aerial-bundled cables, etc.²⁷ and the conditions for the design of civil works for Distribution Substations which must conform with relevant the Regulation in addition to international standards.²⁸

Electrical installations by Users

Installations on Users' sites connected to any electrical power supply under the authority of a license granted under the Electric Power Sector Reform Act or installations on Users' sites with other sources of supply should be configured in the following ways:²⁹



- Single phase 2 wire supply at 230 Volts; and
- Three Phase 4-wire supply at 400 Volts

Furthermore, indoor installations in Users' sites must meet general criteria involving the consolidation of maximum safety to property, efficient utilization of electrical energy, minimum investment costs, and environmental concerns.³⁰ Also, every User installation must be designed, certified and approved by COREN registered electrical engineers.³¹

Based on the Regulation, Digital recorders are to be installed in every 330kV substation,³² while all Supervisory Control and Data Acquisition (SCADA)/Energy Management System (EMS) software are to be utilized in accordance with industry-accepted software standards produced by national and international organizations, such as American National Standards Institute (ANSI), International Organization for Standardization (ISO), International Electrotechnical Commission (IEC),³³ and Institute of Electrical and Electronics Engineers (IEEE).³⁴

Protecting Electrical Installations

Owners of electrical installations must undertake to provide Protective Relaying Systems (PRS) for their transmission

lines, transformers and bus bars which will help isolate faulty installations or equipment and thus prevent further damage to the installation.³⁵ The communication protocol utilized with the PRS should be in accordance with IEC Standards.³⁶

Transmission systems are also required to have a protection scheme which will be designed to be reliable, sensitive, selective, and dependable.³⁷ The protection scheme will cover Lines and Feeders: 330 and 132kV line protection;³⁸ Overvoltage;³⁹ Power Transformers and Shunt Reactors;⁴⁰ Breaker failure;⁴¹ Shunt Capacitor bank;⁴² Busbar;⁴³ Synchronism Check;⁴⁴ and Wide Area protection.⁴⁵

SCADA Systems Installations

All SCADA/EMS software must comply with the industry-accepted software standards produced by national and international organizations such as ANSI, ISO, IEC and IEEE and should be CIM (Common Information Model) compliant.⁴⁶

Inspections

Transmission installations will be inspected after construction is completed before energization is implemented by staff of the Commission or any appointed inspectors to that



effect.⁴⁷ Also, operators of distribution networks will be responsible for the development and implementation of inspection checklist(s) required for the preventive maintenance of all electrical equipment as specified by the original equipment manufacturer for optimal performance of the equipment.⁴⁸ Notably, at least once every six (6) months, there must be inspections implemented on distribution lines and equipment towards the discovery of broken insulators, broken/tilted poles, environmental conditions that may adversely affect the overhead distribution line, and developing defects or abnormalities on equipment.⁴⁹ Inspection checks will also be carried out on electrical installations in Users' sites.⁵⁰

Earthing

Earthing is the direct connection to ground of all exposed metallic parts of an electrical appliance or installation for the purpose of limiting voltage build-up relative to ground.⁵¹

Earthing must be done for all electrical equipment at Transmission networks and must be of solid type to fully protect personnel and equipment from lightning strikes, surges, and static charges. Per the Regulations, Earthing

is also significant because it aids in the discharge of fault current to earth in line with requirements established in IEC 60364-5-54 and the provisions of the Nigerian Code of Practice on Earthing (NCP 09).

Construction of Power Plants

Before construction of power plants can commence, Licensees must gain approval of the site where construction is to occur, from the Commission and other relevant agencies and the host community. In cases of involuntary displacement, the Licensee must have a resettlement plan in place to remedy that situation.⁵²

Also, applications for site approval must be accompanied by the following documents:⁵³

- A topographic map in 1-10,000 of the project site.
- Geotechnical Investigations report.
- Site Layout plan; and
- An Environmental Impact Assessment report

Licensees will also be required to submit a Geo-investigation of the site detailing its geology and geomorphology,⁵⁴ a detailed hydrological report,⁵⁵ obtain a water permit from the Federal Inland Waterways (if the water is to



be abstracted from inland water bodies for water use above 1000m³ per day),⁵⁶ and submit to the Commission, a Federal Ministry of Environment approved Environmental Impact Assessment Statement showing that environmental issues likely to arise from the construction of the plant have been addressed.⁵⁷

Also, Licensees or Generation Companies looking to build Generation Stations will be required to submit to the Commission a detailed engineering design of the power station based on applicable National and International Engineering codes and ensure that the Power Plant arrangement will permit reasonable access for operation and maintenance of equipment.⁵⁸



KEY STAKEHOLDERS

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(NERC) Nigerian Electricity Supply and
Installation Standards Regulation, 2014**

KEY STAKEHOLDERS



Nigerian Electricity Regulatory Commission (NERC)

Nigerian Electricity Supply and Installation Standards Regulation, 2015

NESIS Review Panel

The Commission has the authority to amend or repeal parts or all the provisions contained in the Regulation, upon recommendation from the NESIS Review Panel.⁶⁰

Nigerian Electricity Supply and Installation Standards (NESIS) Review Panel

The NESIS Review Panel is established by virtue of the Regulations⁶¹ and is responsible for regularly reviewing the standards established in the regulations from time to time.⁶²

The panel is made up of generation companies, distribution companies, Transmission Company of Nigeria, Federal Ministry of Power, System Operator, the Commission, etc.⁶³

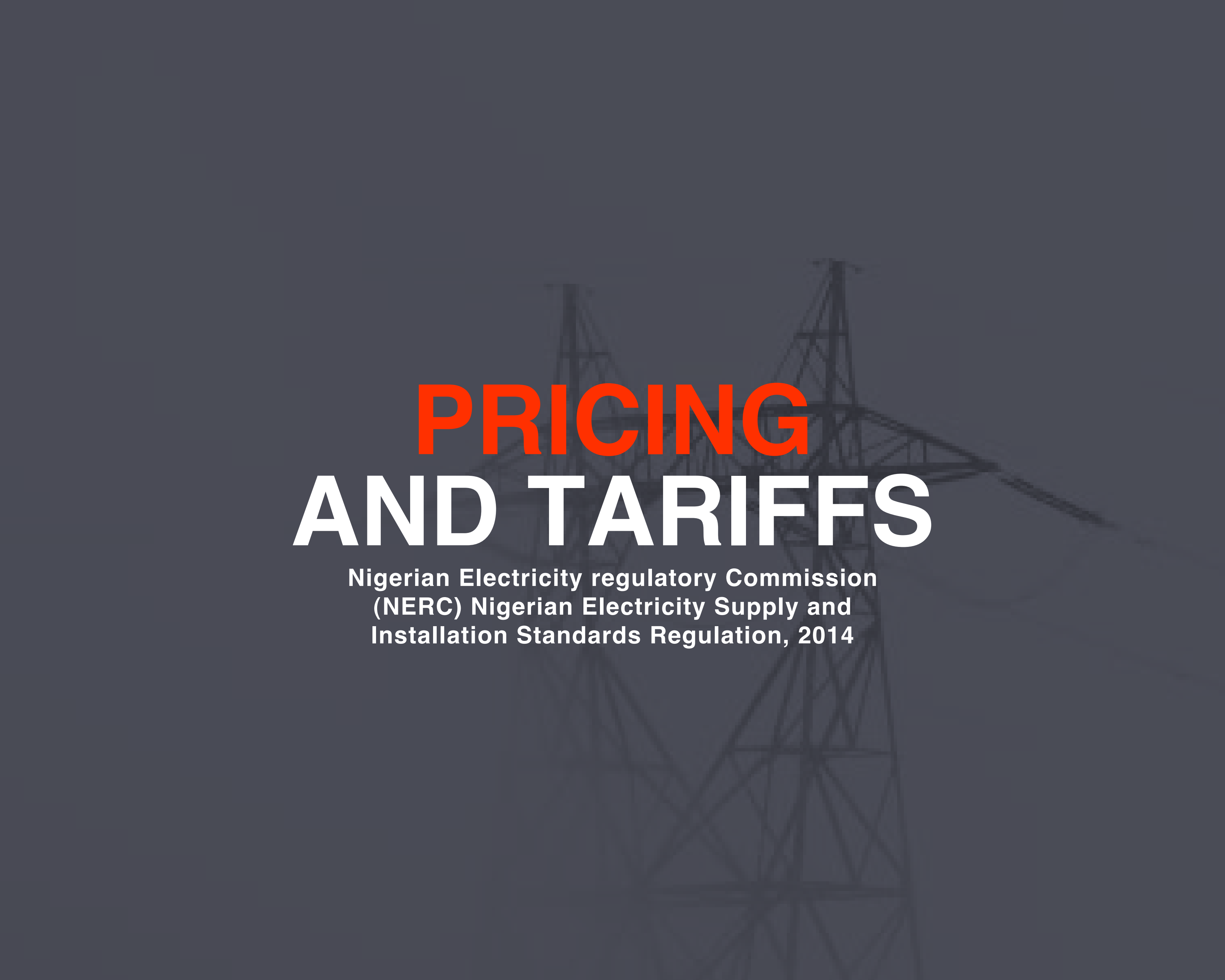
The Panel is maintained and funded by the Commission⁶⁴

The Panel also reviews requests for review submitted to it, submits requests for the review and amendment of the NESIS Regulations to the Commission and proposes changes to be made to the Regulations to the Commission for approval. The Panel also provides guidance regarding the implementation, performance and interpretation of the provisions in the Regulations, and maintains joint coordination arrangements with other regulatory review panels established under other Regulations and Codes such as the EPSRA, Grid Code, Metering Code, etc.⁶⁵



Nigerian Electricity Regulatory Commission

The Commission is responsible for the promulgation of the Regulation and notably has supervisory roles which include the appointment of inspectors to examine electrical facilities, ensuring that these facilities are adequate in line with relevant codes.⁵⁹ The Commission also enforces sanctions and penalties on licensees or persons who contravene provisions contained in the Regulation.

The background of the slide features a faint, dark silhouette of a high-voltage power transmission tower, also known as a pylon, which is a lattice structure. It is positioned centrally and extends from the bottom towards the top of the frame, serving as a thematic backdrop for the text.

PRICING **AND TARIFFS**

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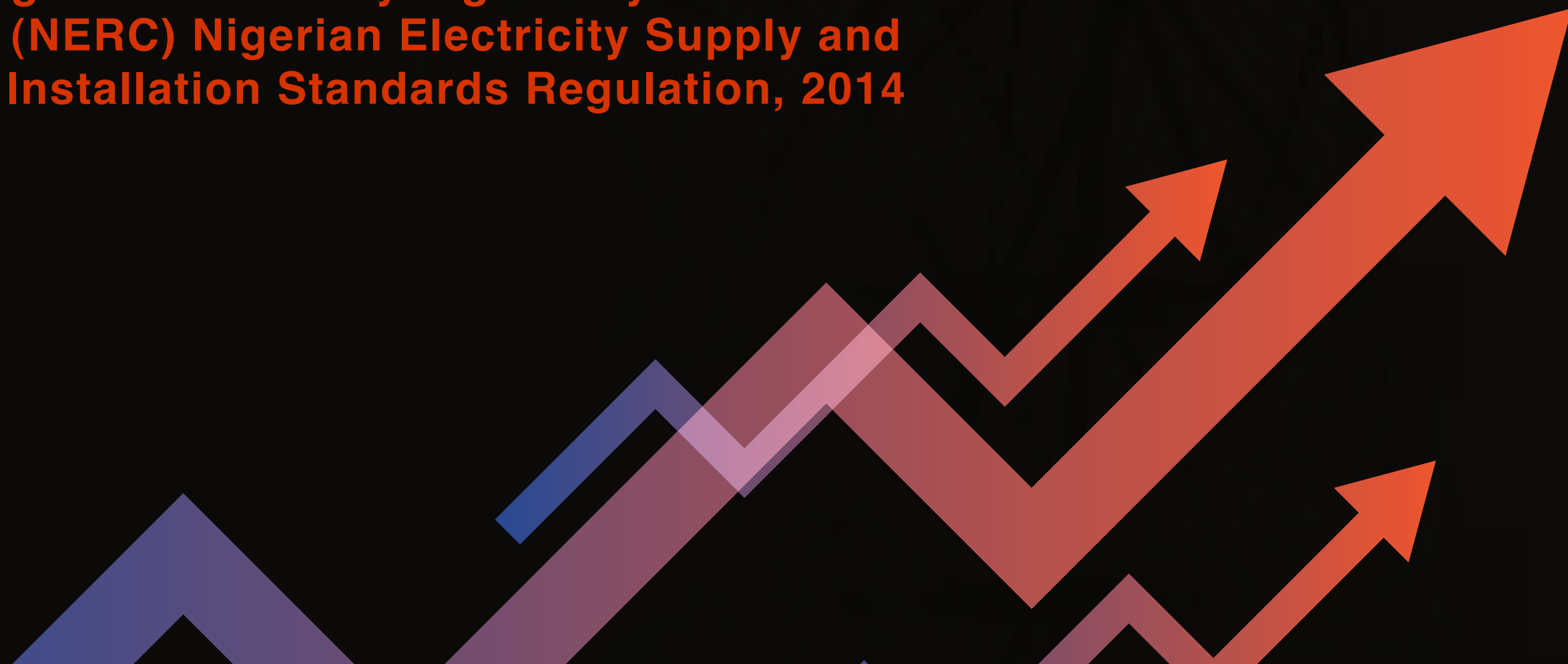
PRICING AND TARIFFS

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While the Regulation does not directly make provision for pricing and tariffs, it does dictate that Energy Metering Systems are to be installed and used for tariff metering for Bulk Inter-utility power flows at the trading Point - Point of Common Coupling (PCC) - between Transmission Company of Nigeria (TCN), Discos and Gencos.⁶⁶ The metering system should be installed on each circuit as a self-contained device recording the flow of both active and reactive energy.⁶⁷

INCENTIVES AND INVESTMENT OPPORTUNITIES

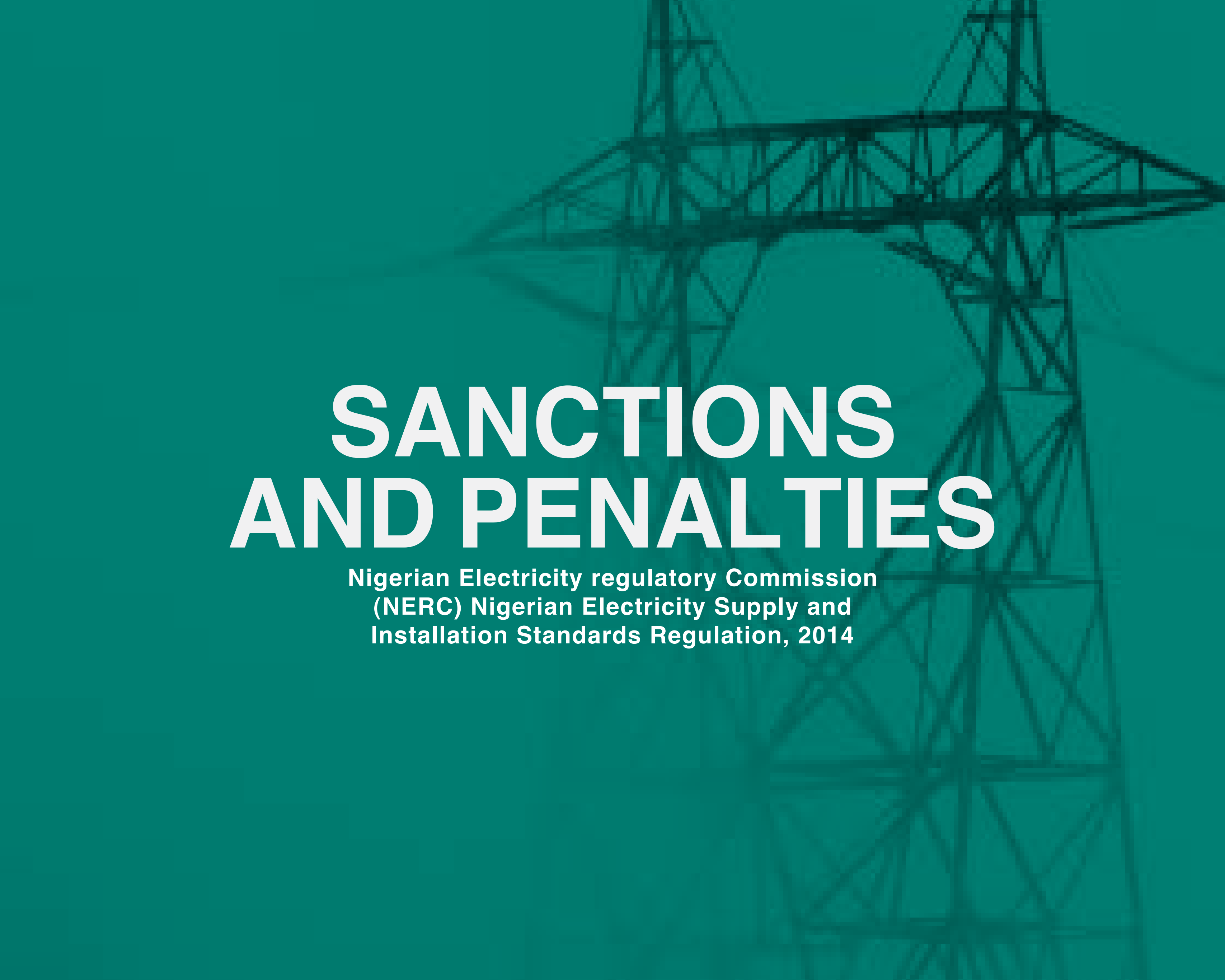
Nigerian Electricity regulatory Commission
(NERC) Nigerian Electricity Supply and
Installation Standards Regulation, 2014



INCENTIVES AND INVESTMENT OPPORTUNITIES



The Nigerian Electricity Supply and Installation Standards Regulation provides an avenue for investment in the form of electrical installations within the transmission or distribution networks. The Regulation also showcases an opportunity for investment in the construction of power plants by Licensees.



SANCTIONS AND PENALTIES

**Nigerian Electricity regulatory Commission
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SANCTIONS AND PENALTIES



The Regulations provides that any licensee or person who contravenes provisions contained in the Regulation, will be regarded as an offender and liable on conviction to certain penalties established in the Electric Power Sector Reform Act of 2005,⁶⁸ in addition to those stated within the Regulation. The default penalties prescribed for such offenders include:⁶⁹

- A fine not exceeding N100,000 and or an imprisonment term not exceeding one year (for a first offender).
- A fine not exceeding N500,000 and or an imprisonment term not exceeding three years (for subsequent offenders).

Also, certain offences are stated in the Regulation as acts which would attract penalties; these include:⁷⁰

- The failure of a participant to furnish information as at when required or a participant supplying false information.
- Causing unnecessary delay which ultimately hinders an inspector from performing his or her obligations as directed by the Commission; and
- A participant failing to furnish an inspector with correct information or information as at when it is required by the inspector.

The offences above would attract a fine not exceeding N100,000 and or an imprisonment term not exceeding one year.

Furthermore, the Commission can impose administrative fines of no more than N10,000 per day on licensees who contravene provisions contained in the Regulation. These fines will consistently be imposed day-by-day until the default by the licensee is remedied or fixed. However, if the default persists over time, such can lead to the suspension or withdrawal of the licensee's management by the Commission or may lead to the Commission issuing directives to another licensee to take over the undertaking of the defaulting licensee.⁷¹

The sanctions and penalties are subject to relevant provisions contained within the Electric Power Sector Reform Act.⁷²

Referenced Statutory Instruments

- Electric Power Sector Reform Act, 2005;
- Distribution Code for the Distribution Sector of the Nigeria Electricity Supply Industry – Version 02, 2019;
- Grid Code for the Nigeria Electricity Supply Industry (NESI) – Version 03, 2018;
- Metering Code for the Nigerian Electricity Supply Industry, 2013;
- Nigerian Electricity Regulatory Commission Reporting Compliance Regulations, 2009;
- Nigerian Building Code, 2018; and
- Nigerian Electricity Health and Safety Code, 2014.

Endnotes

1

NERC, Nigerian Electricity Supply and Installation Standards Regulations 2015. Available at <https://nerc.gov.ng/index.php/component/remository/Regulations/Nigerian-Electricity-Supply-and-Installation-Standards-Regulations-2015/?Itemid=591>

2

NERC, Electric Power Sector Reform Act (EPSR), 2005. Available at [https://nerc.gov.ng/index.php/component/remository/Regulations/Electric-Power-Sector-Reform-Act-\(EPSR\)-2005/?Itemid=591](https://nerc.gov.ng/index.php/component/remository/Regulations/Electric-Power-Sector-Reform-Act-(EPSR)-2005/?Itemid=591)

3

Sections 81 & 96(1)

4

Section 1.1

5

Section 1.5.2

6

NERC, Electric Power Sector Reform Act (EPSR), 2005. Available at [https://nerc.gov.ng/index.php/library/documents/Regulations/Electric-Power-Sector-Reform-Act-\(EPSR\)-2005/](https://nerc.gov.ng/index.php/library/documents/Regulations/Electric-Power-Sector-Reform-Act-(EPSR)-2005/)

7

NERC, The Distribution Code. Available at <https://nerc.gov.ng/index.php/library/documents/Codes-Standards-and-Manuals/The-Distribution-Code/>

8

NERC, Grid Code. Available at <https://nerc.gov.ng/index.php/library/documents/Codes-Standards-and-Manuals/Grid-Code/>

9

NERC, Metering Code. Available at <https://nerc.gov.ng/index.php/library/documents/Codes-Standards-and-Manuals/Metering-Code/>

10

Section 1.5.3.1

11

Section 1.5.4 ; See NERC, NERC Reporting Compliance Regulation 2009. Available at <https://nerc.gov.ng/index.php/component/remository/Regulations/NERC-Reporting-Compliance-Regulation-2009/?Itemid=591>

12

Section 1.5.6

13

Section 1.5.9

14

Section 1.5.9.2

15

Section 1.5.9.3

16

Section 1.5.9.4

17

Section 2.1

18

Section 2.5

19

Particularly IEC 60826

20

Chapter 3, Transmission Lines.

21

Section 3.1

22

Section 3.1

23

Sections 3.9 and 4.1

24

Section 5.1

25

Section 5.1

26

Ibid

27

Section 5.6

28

Section 6.1

29

Section 7.1

30

Section 7.2

31

Section 7.2.1

32

Section 8.3

33

IEC 61850

34

Section 8.4

35

Section 8.1

36

Particularly IEC-61850

37

Section 8.1.1

38

Section 8.1.1.1

39

Section 8.1.1.2

40

Section 8.1.1.3

41

Section 8.1.1.4

42

Section 8.1.1.5

43

Section 8.1.1.6

44

Section 8.1.1.7

45

Section 8.1.1.8

46

Section 8.4

47

Section 10.1

48

Section 10.2

49

Ibid

50

Section 10.3

51

Section 11.1

52

Section 12.1.1

53

Section 12.1.2

54

Section 12.1.3

55

Section 12.1.4

56

Section 12.1.5

57

Section 12.1.6

58

Section 12.2

59

Section 1.5.3.2

60

Section 1.5.7

61

Section 1.5.7

62

Section 1.5.7.1

63

Section 1.5.7.2

64

Section 1.5.7.3

65

Section 1.5.7.5

66

Section 8.2

67

Ibid

68

Section 94

69

Section 1.5.5.1

70

Section 1.5.5.2

71

Section 1.5.5.3

72

Sections 75 & 94(1)

73

Section 16(3)

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